Foro di Pago Nacional

INNOVACION, COLABORACION, DESAROYO

Summary report of the Foro di Pago Nacional (FPN) Conference

Topic: Driving the Future of Payments
Date: November 13, 2025
Time: 8:30 a.m. - 13:00 p.m.
Venue: The Ritz-Carlton, Aruba
Attendance: Enclosure 1
Agenda:

Master of ceremonies: Ms. Larissa Bermudez		**Time**
1.	Registration	08:30 a.m.
2.	Welcome Words by Mr. P. Mungra, Executive Director, and Acting President, CBA (enclosure 2)	09:00 a.m.
3.	Opening Remarks by the Chair FPN, Mrs. M.M. Gonzalez, Executive Director, CBA (enclosure 3)	09:05.a.m.
4.	Keynote Speaker: "Modernization of the Payments Landscape in Aruba" by P.S. Tromp-Gomez, Vice-Chair FPN, and Division Manager Payment Systems, Treasury & Banking Operations, CBA (enclosures 4 and 5)	09:10 a.m.
5.	Keynote Speaker: "The Evolution of Fast Payments: Global and Regional Perspectives", Mrs. M. T. Chimienti, Senior Financial Sector Specialist, World Bank (enclosures 6 to 12)	09:35.a.m.
6.	Short Break	10:05.a.m.
7.	Keynote Speaker: "Retail Digital Florin for Inclusive Resilience – A Case Study for Aruba", Mr. R. Kock, Economist at the Research Department CBA (enclosure 13)	10:20 a.m.
8.	Keynote Speaker: "Inside The Eastern Caribbean Central Bank's CBDC Pilot: Key Insights, Outcomes and Lessons for the Future of Digital Money", Mrs. K. A. Johnson, Project Specialist/Manager DCash, Governor's Office, Eastern Caribbean Central Bank (enclosure 14)	11:00 a.m.
9.	Future Topics to Consider	11:40 a.m.
10.	Closing Remarks by the Chair FPN, Mrs. M.M. Gonzalez, Executive Director, CBA (enclosure 15)	11:45 p.m.
11.	Lunch and Networking	11:50 a.m.

1. *Registration*

   Registration for the Foro di Pago Nacional (FPN) Conference began at 8:30 a.m., accompanied by a light breakfast served until 9:00 a.m. Afterwards, participants proceeded to the conference room for the start of the FPN Conference.

2. *Welcoming words*

   Ms. Larissa Bermudez opened the FPN Conference as Master of Ceremonies and invited Mr. Prakash Mungra, Executive Director and Acting President at the Centrale Bank van Aruba (CBA), to deliver the welcoming words (enclosure 2).

   Mr. Mungra welcomed all attendees, including the Minister of Finance, Economic Affairs and Primary Sector, Mr. mr. Geoffrey Wever, international guests, and keynote speakers. He mentioned that the CBA is honored to host the third edition of the FPN Conference, and highlighted the steady growth in participation since the event's inception.

   Subsequently, he introduced this year's theme, "Driving the Future of Payments," remarking on the rapid pace of innovation transforming how people and businesses transact. Developments such as instant payments, digital wallets, and emerging technologies offer significant opportunities, while also presenting challenges in areas like security and financial inclusion.

   Mr. Mungra addressed the growing threat of cybercrime in Aruba, and reaffirmed the CBA's commitment to ensuring that everyone has access to safe payment instruments. In this context, he referenced to the ongoing legislative process for the enactment of the State Ordinance on the Basic Bank Account.

   He encouraged participants to actively exchange ideas on global and domestic payment developments, underscoring that collaboration is key to shaping the future of payments in Aruba.

   Mr. Mungra concluded by inviting Mrs. Miriam Gonzalez, Executive Director at the CBA and Chair of the FPN, to deliver the opening remarks and welcomed her to the stage.

3. *Opening remarks*

   Mrs. Miriam Gonzalez, Chairperson of the FPN and Executive Director of the CBA, proceeded with her opening remarks at the third edition of the FPN Conference (enclosure 3). She warmly welcomed all participants and conveyed her appreciation for their continued engagement with the FPN and the evolving payments landscape.

   Mrs. Gonzalez observed that innovations, such as digital currencies, biometric authentication, and artificial intelligence, are transforming financial services, reshaping economic activity, and redefining trust. These developments frame this year's conference, which focuses on payment modernization and the role of digital currencies in building secure, efficient, and inclusive financial ecosystems.

   Subsequently, she outlined the program for the day:

   - An update by Mrs. Penelope Tromp-Gomez, Vice-Chair of the FPN, on the CBA's ongoing and future payment modernization initiatives;
   - A virtual keynote by Mrs. Maria Teresa Chimienti of the World Bank on the evolution of fast payment systems globally and regionally;
   - Two sessions on Central Bank Digital Currencies (CBDCs), presented by Mr. Rynall Kock of the CBA and Mrs. Karina Johnson of the Eastern Caribbean Central Bank (ECCB).

   Mrs. Gonzalez concluded by thanking all stakeholders for their commitment to strengthening Aruba's payment ecosystem, encouraging active participation throughout the event.

4. *Keynote Speaker: "Modernization of the Payments Landscape in Aruba"*

   Mrs. Penelope Tromp-Gomez, Vice-Chair of the FPN and Division Manager of Payment Systems, Treasury & Banking Operations at the CBA, presented an overview of the modernization trajectory of Aruba's payments landscape (enclosure 4).

   Mrs. Tromp-Gomez started the presentation with an overview of I-Pago, the instant payment system of the CBA launched in January 2020, built on the ISO 20022 standard and operating 24/7/365. She remarked that I-Pago has grown steadily in both volume and value over the years, while cash withdrawals remained stable, demonstrating the coexistence of digital payments and cash in Aruba.

Subsequently, she presented key milestones in the ongoing enhancement and modernization of the I-Pago platform to date, namely:

- In 2021, message signing and investigation messaging were implemented to strengthen the security of payment messages;
- In 2022, the CBA published its Position Paper "Enabling Instant Payment Innovations in Aruba", which identified three use cases with the most significant potential benefits for consumers and merchants: Person-to-Person (P2P) payments, In-store payments, and E-commerce payments (enclosure 5)[1];
- In 2024, transaction coding was introduced to further improve payment transparency and reporting capabilities.

Furthermore, she elaborated on several upcoming developments of the I-Pago platform, including:

- Payment recall functionality, supporting fraud mitigation and operational efficiency;
- Request-to-pay (R2P) capabilities, improving cash flow, flexibility, and payment accuracy;
- An I-Pago app providing real-time notifications, QR-based R2P features, and transparency for consumers and merchants.

Mrs. Tromp-Gomez concluded by detailing broader initiatives of the CBA, including:

- Developing open banking standards in collaboration with the Centrale Bank of Curaçao and Sint Maarten;
- Implementation of Verification-of-payee security measures;
- Exploratory work on cross-border instant payments between Aruba and Curaçao;
- Draft legislation for payment service providers, payment systems, and basic payment accounts.

5. *Keynote Speaker: "The Evolution of Fast Payments: Global and Regional Perspectives"*
Mrs. Maria Teresa Chimienti, an expert in payments and market infrastructures with extensive experience at the World Bank and European Central Bank, discussed global fast payment systems, with emphasis on Latin America and the Caribbean (enclosure 6).

Mrs. Chimienti highlighted that fast payments, available in real or near real-time 24/7, are transforming digital financial ecosystems. Globally, real-time transactions reached 266 billion in 2023, and in Latin America and the Caribbean (LAC) region, fast payments now account for roughly 45% of digital transactions, up from 2% in 2017. Growth drivers include

[1] CBA (2022): Enabling Instant Payment Innovations in Aruba. Available at: https://www.cbaruba.org/readBlob.do?id=11902

low user costs, simplicity, awareness campaigns, and expanding use cases (person-to-person (P2P), person-to-merchant (P2M), bill payments, and Government-to-person (G2P)).

She added that while fast payments have boosted digital payments among banked individuals, their impact on financial inclusion for the unbanked population remains mixed due to the need for countries to address core enablers of financial access alongside reforms to fast payment systems. Furthermore, she elaborated on the emerging trends in fast payments, among which are cross-border payment interoperability, integration with open banking and APIs, potential synergies with CBDCs, and innovations such as request-to-pay, buy-now-pay-later services, and digital lending.

Mrs. Chimienti concluded her presentation with five policy priorities for LAC jurisdictions, as described in her World Bank article "Fast payments are driving digital transformation and inclusion in Latin America and the Caribbean" (enclosure 7)[2]:

- Ensuring nonbank access and interoperability to reduce fragmentation;
- Establishing governance frameworks aligned with public policy goals and maintaining a level playing field for private operators;
- Expanding use cases beyond P2P;
- Strengthening fraud prevention and operational resilience;
- Integrating fast payment systems with digital public infrastructure (DPI) to ensure scalability and future readiness.

Q&A Highlights – Keynote by Mrs. Maria Teresa Chimienti	
Q1	Have fast payment systems mainly been pushed by governments or central banks? And what does that type of "push" usually look like in practice?
A1	Mrs. Chimienti explained that it varies across countries. The push for developing fast payment systems may come from central banks or from government agencies. She referenced World Bank guidance describing policy and operational measures that central banks commonly use to support and accelerate system development (enclosures 8 and 9)[3].

[2] World Bank (2025): Fast payments are driving digital transformation and inclusion in Latin America and the Caribbean. Available at: https://blogs.worldbank.org/en/latinamerica/fast-payment-digital-transformation-latin-america

[3] World Bank. (2021): Considerations and Lessons for the Development and Implementation of Fast Payment Systems. Available at: https://fastpayments.worldbank.org/sites/default/files/2021-11/Fast%20Payment%20Flagship_Final_Nov%201.pdf
World Bank (2025): Driving Digital Transformation and Inclusion Fast Payments in Latin America and the Caribbean, Available at: https://openknowledge.worldbank.org/server/api/core/bitstreams/182f85f3-16f8-4b8b-8b61-ebf58674bbc1/content

	In the late 2010s and early 2020s, many countries in the LAC region recognized that the traditional role of central banks, focused primarily on oversight, was no longer sufficient to address persistent issues in the payments landscape. Challenges such as high market concentration, limited interoperability, and fragmented services prompted several central banks, including Brazil's, to adopt a more active operational role and launch their own fast payment systems. In these cases, the central bank used its operational capabilities as a tool to address gaps that the private sector had not effectively resolved, including introducing new rules, expanding system functionality, and providing infrastructure that enabled national-scale adoption. She emphasized that when central banks operate fast payment systems, a national brand and a coordinated communication strategy play a critical role. Examples from India and Brazil demonstrate that strong branding and unified user-experience guidelines, such as the presentation of services in mobile apps or the handling of errors, significantly support adoption.
Q2	Many FinTechs process payments across multiple Caribbean jurisdictions while settling funds abroad, creating challenges for oversight. With so many cross-border models emerging, how can countries navigate these developments and prepare for new types of services?
A2	The cross-border payments landscape is evolving rapidly, with several models emerging simultaneously. Some countries in the region are seeing domestic fast-payment systems extended abroad through partnerships between foreign payment providers and local banks: an approach comparable to correspondent banking but applied to modern closed-loop systems (enclosure 10)[4]. Similar models are appearing worldwide, including in Europe, while private-sector players, such as stablecoin issuers and digital-asset platforms, are increasingly offering cross-border services without having a physical presence in every jurisdiction. As a result, the market remains highly fluid, and it remains uncertain which models will ultimately dominate. She noted that stablecoins, potential links between national fast-payment systems, and CBDC-related experiments are all gaining attention. However, progress in these areas is gradual because they require political support, complex technical coordination, and alignment among countries. Her central message was that any regional or cross-border initiative must rest on a strong governance foundation. When a regional champion leads the effort, initiatives tend to be more successful, even if they unfold over a longer timeline. She added that the World Bank is currently examining global experiences to understand better which factors enable scalable, sustainable regional fast-payment initiatives.

[4] World Bank (2024): BIS Papers No 151: Central bank digital currencies and fast payment systems: rivals or partners? Available at: https://www.bis.org/publ/bppdf/bispap151.pdf

Q3	In countries where the central bank both operates the fast payment system and serves as regulator, how can governance be structured to avoid conflicts of interest? And what are the implications of cross-border payment developments and digital currencies for traditional payment systems?
A3	Mrs. Chimienti acknowledged the complexity of this issue and referred to a World Bank publication on governance arrangements for financial market infrastructures, which offers guidance on mitigating conflicts of interest (enclosures 11 and 12)[5]. Key approaches include clear separation of operational and oversight functions within the central bank, as well as the establishment of independent committees to ensure transparency, accountability, and equitable treatment of private-sector participants. She cited Colombia's fast payments legislation as an example that achieves this balance: the central bank operates the system while maintaining a governance framework that supports fair decision-making. Regarding cross-border services and digital currencies, she noted that private-sector providers, including traditional networks, stablecoin issuers, and digital platforms, are increasingly able to offer cross-border payments without a physical presence in every market. This introduces additional regulatory complexity and underscores the need for continuous coordination. In summary, she emphasized that a clear separation of operational and oversight functions, independent committees, and robust governance frameworks (e.g., Colombia) can help mitigate conflicts. Strong governance and coordination remain essential as new models mature and evolve.

6. *Short break*
   A brief intermission took place between 10:05 a.m. and 10:20 a.m.

7. *Keynote Speaker: "Retail digital florin for inclusive resilience – A case study for Aruba"*
   Mr. Rynall Kock, Economist at the Research Department CBA, gave a presentation on retail digital florin, where he explored the concept, potential impacts, and policy considerations (enclosure 13).

   He began by explaining that a retail digital florin is a type of CBDC, which could be either account-based (recorded as ledger entries similar to online banking) or token-based

[5] World Bank (2025): A Practitioner's Guide to Governance of Fast Payment Systems. Available at: https://fastpayments.worldbank.org/sites/default/files/2025-07/FPS_Governance%20Note_Final.pdf
World Bank (2025): Dispute-Resolution Mechanisms in Fast Payments. Available at: https://fastpayments.worldbank.org/sites/default/files/2025-09/Dispute%20Resolution%20Mechanisms%20in%20Fast%20Payments_Final.pdf

(where digital tokens are transferred directly between users). For example, sending Afl. 10 to a friend could involve a simple ledger update in an account-based system or the transfer of a digital "coin" in a token-based system.

Furthermore, Mr. Kock highlighted four key areas for central banks to explore when evaluating CBDCs: monetary stability, financial stability, financial inclusion, and financial integrity. Together, these areas support inclusive resilience, enabling the economy to adapt to shocks and support all social groups.

While the adoption of cryptocurrencies in Aruba remains limited, and cash continues to dominate, introducing a retail digital florin could provide benefits for the Aruban population as an alternative to cryptocurrencies. It could encourage cashless payments, enable faster transactions, and promote financial inclusion. However, there are also several risk factors that should be considered, such as bank disintermediation and cybersecurity concerns.

Mr. Kock concluded his presentation with several policy recommendations to make the digital florin practical, safe, and inclusive for Aruba:

- Incorporating features like offline payments;
- Using permissioned distributed ledger technology (for smart contracts);
- Implementing three-tiered know-your-customer (KYC) model;
- Promoting innovation by collaborating with the government, universities and the private sector;
- Running pilot projects under clear rules.

Q&A Highlights – Keynote by Mr. Rynall Kock	
Q1	Is a retail digital florin energy-intensive? Could it affect Aruba's electricity grid or renewable energy goals?
A1	Mr. Kock clarified that his study did not assess energy consumption. While it is a valid concern, this aspect was not analyzed in this case.

8. *Keynote Speaker: "Inside the Eastern Caribbean Central Bank's CBDC Pilot: Key Insights, Outcomes and Lessons for the Future of Digital Money"*
   Mrs. Karina Johnson, Central Bank Digital Currency Project Specialist at the Eastern Caribbean Central Bank (ECCB) gave a presentation on DCash's pilot design, implementation, and lessons learned (enclosure 14).

Mrs. Johnson explained that the pilot, initiated in 2018 and formally launched in March 2021, aimed to modernize payments while preserving the stability of the Eastern Caribbean dollar. Initially rolled out in four member states during the COVID-19 pandemic, it later expanded to all eight member countries of the Eastern Caribbean Currency Union (ECCU) before concluding in early 2024.

At the close of the pilot, 21 financial institutions and over 400 merchants had enrolled in the pilot, with approximately 2.5 million EC dollars in circulation and 5,000 active users.

Key features of DCash's pilot included:

- Legal framework granting official status to the digital EC dollar, protecting both participants and the reputation of the central bank;
- Private, permissioned distributed ledger (Hyperledger) for security, preventing double spending, and creating immutable transaction records;
- Tiered distribution model with the ECCB retaining sole issuance authority and financial institutions operating as intermediaries;
- Two wallet types: registry wallets (linked to bank accounts) and value-based wallets to support financial inclusion (consumers were not required to have a bank account);
- Operational resilience and real-world stress testing (hardware redundancy during the 2021 volcanic eruption in Saint Vincent and the Grenadines);
- Engagement strategies via community teams, media campaigns, and influencers.

Mrs. Johnson concluded her presentation with recommendations on how to successfully implement CBDCs by building trust and adoption through the following steps:

- Start digital currency research early on.
- Establish clear policy frameworks.
- Prioritize high-impact use cases.
- Ensure strong security and reliability.
- Maintain ongoing stakeholder communication.

Q&A Highlights – Keynote by Mrs. Karina Johnson	
Q1	Regarding the pilot: did you observe any fraud or other issues during wallet onboarding?
A1	Mrs. Johnson explained that there were no attempts at fraud during the pilot. She attributed this to low incentives for malicious activity, given the pilot's wallet limits. Adoption was strong for specific use cases,

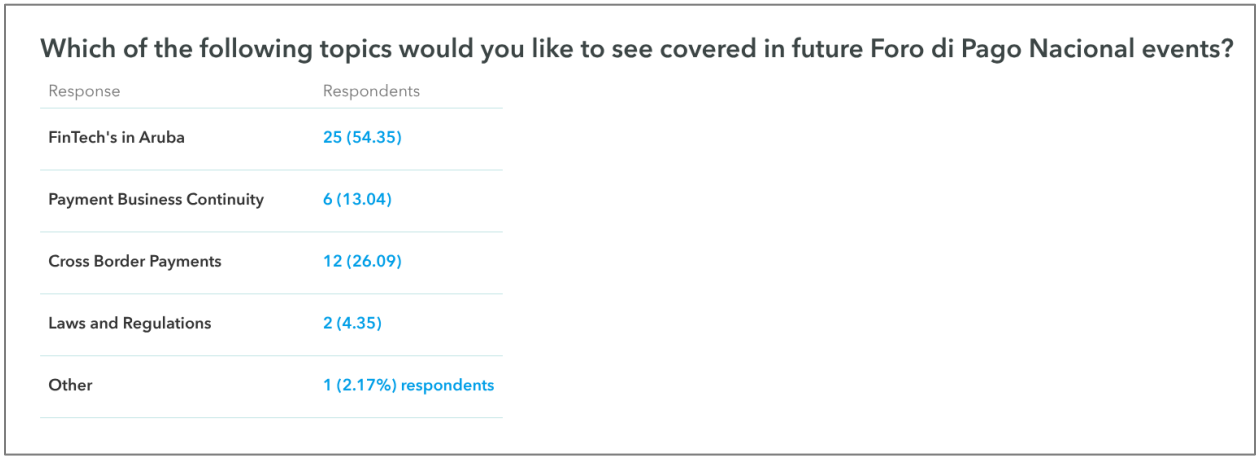
	particularly cross-border transactions by businesses with multiple jurisdictional presence, which benefited from Dcash's faster settlement compared to traditional interbank transfers.
Q2	What was the impact on financial institutions in the ECCU countries? How did CBDC affect deposits, liquidity, and banking solvency?
A2	Mrs. Johnson explained that the CBDC was non-interest-bearing, which limited any flight of deposits from commercial bank accounts. The ECCB worked closely with financial institutions throughout the pilot to maintain confidence and address concerns about potential competition with commercial banks' own mobile banking services. Lessons learned included the importance of integrating CBDC infrastructure with core banking systems, supporting bank-led wallets, and striking a balance between public access and revenue generation considerations for commercial banks, thereby encouraging continued innovation on the platform.

9. *Future topics to consider*

   Ms. Larissa Bermudez invited participants to select their future topics in the EventLeaf Guide App:

   - FinTech's in Aruba;
   - Payment Business Continuity;
   - Cross-Border Payments;
   - Laws and Regulations.

   The result of the poll was as follows:



Which of the following topics would you like to see covered in future Foro di Pago Nacional events?

Response	Respondents
FinTech's in Aruba	25 (54.35)
Payment Business Continuity	6 (13.04)
Cross Border Payments	12 (26.09)
Laws and Regulations	2 (4.35)
Other	1 (2.17%) respondents

10. *Closing remarks*

    The FPN Conference concluded with closing remarks from Mrs. Miriam Gonzalez, who expressed the CBA's gratitude to all participants for their energy and insights for this year's theme, "Driving the Future of Payments" (enclosure 15).

    Mrs. Gonzalez emphasized the importance of digital currencies and innovative payment technologies for financial inclusion and economic growth. Ensuring access enables broader participation in the global digital economy.

    Furthermore, she announced, based on last year's discussions, FPN's upcoming initiatives on payment scams and fraud including in-person awareness sessions for the elderly and a community-wide social media campaign to improve understanding of common fraud risks. In addition, she invited all stakeholders to join the working group sessions in April 2026.

    To conclude, Mrs. Gonzalez offered heartfelt thanks to the keynote speakers, Mrs. Maria Teresa Chimienti, Mrs. Karina Johnson, Mrs. Penelope Tromp-Gomez, and Mr. Rynall Kock, and to the CBA team for their efforts in organizing a successful event.

11. *Light lunch and networking*

    Ms. Larissa Bermudez thanked everyone for their engagement and valuable contributions throughout the FPN Conference, and invited all participants to a lunch and a networking opportunity.

Enclosure 1

Special guests:

1. Mrs. Soraya Bousaid, Fintech Supervision Specialist at the Centrale Bank van Curaçao en Sint Maarten
2. Mrs. M. Chimienti, Senior Financial Sector Specialist in the Finance, Competitiveness & Innovation Global Practice (FCI) at the World Bank
3. Mrs. K. Johnson, Central Bank Digital Currency Project Specialist at the Eastern Caribbean Central Bank
4. Mr. G. Wever, Minister of Finance, Economic Affairs, and Primary Sector of Aruba

Stakeholders from:

1. Aruba Airport Authority (AAA)
2. Aruba Bank N.V.
3. Aruba Fair Trade Authority (AFTA)
4. Aruba Food & Beverage Association (AFBA)
5. Aruba Hotel and Tourism Association (AHATA)
6. Aruba Tourism Authority (ATA)
7. Aruba Trade and Industry Association (ATIA)
8. Arugas N.V.
9. Banco di Caribe Aruba N.V.
10. Caribbean Mercantile Bank N.V.
11. Centrale Bank van Aruba
12. Centro pa Desaroyo (Cede) Aruba
13. Comerciante Uni Aruba (CUA)
14. CX Pay B.V.
15. Departamento di Asunto Social (DAS)
16. Departamento di Impuesto (DIMP)
17. Digicel Aruba
18. Directie Economische Zaken, Handel en Industrie (DEACI)
19. Directie Financiën
20. Fundacion Arubano di Esnan Visualmente Incapacita (FAVI)

21. Fundacion Cas Pa Comunidad Arubano (FCCA)
22. Island Finance Aruba (IFA)
23. Organisacion di Pensionado Publico Arubano (OPPA)
24. RBC Royal Bank (Aruba) N.V.
25. Sentoo
26. SETAR N.V.
27. Sindicato di Maestro di Aruba (SIMAR)
28. Stichting Algemeen Pensioenfonds Aruba (APFA)
29. Total Finance
30. Water-en Energiebedrijf Aruba N.V. (W.E.B.)

Enclosure 2

CENTRALE BANK
VAN ARUBA

Welcome words by Mr. Prakash Mungra,
Acting President of the Centrale Bank van Aruba,
at the third "Foro di Pago Nacional" Conference organized by the CBA on November 13, 2025, at the Ballroom of the Ritz Carlton Aruba.

Honorable, Mr. Geoffrey Wever, Minister of Finance, Economic Affairs, and Primary Sector,

Distinguished keynote speaker, and international guests,

Ladies and gentlemen,

Bon Bini!

It is with great pleasure that I welcome you on behalf of the Centrale Bank van Aruba to the Third Foro di Pago Nacional Conference. We are delighted to host you once again, and also to see the number of participants growing since we started with this event, for which we are highly grateful.

This year's theme, "Driving the Future of Payments," reflects the pace of change we are all witnessing in the payments area. Innovation in payments is transforming how we transact, how businesses operate, and how consumers experience financial services. Instant payments, digital wallets, and new payment methods and technologies are expanding at a fast pace, while at the same time challenging us in areas like security, and financial inclusion. As you will know, cybercrime is on the rise and also Aruba is not immune to these types of crimes. Also financial inclusion remains an important topic for the CBA. Nowadays, it is impossible to participate in society without having access to

basic payment instruments, including a checking account. Note in this regard that the draft State Ordinance Basic Bank Account is in the legislative process.

One of the main objectives of today's conference is to share developments and insights in the payments landscape which as you know is quickly evolving, both globally and domestically. I encourage you to engage actively, and to share your thoughts and ideas, which will assist in shaping the future of payments.

Ladies and gentlemen, without any further ado, I would like to invite my colleague, Mrs. Miriam Gonzalez, Executive Director at the Centrale Bank van Aruba and Chair of the Foro di Pago Nacional, to deliver the opening remarks.

Please give a warm welcome to Mrs. Miriam Gonzalez.

Enclosure 3

CENTRALE BANK
VAN ARUBA

Opening remarks by Mrs. Miriam M. Gonzalez, Executive Director of the Centrale Bank van Aruba and Chair of the "Foro di Pago Nacional", at the third "Foro di Pago Nacional" Conference organized by the CBA on November 13, 2025, at the Ballroom of the Ritz-Carlton Aruba.

Good morning ladies and gentlemen, distinguished guests. With protocol already established, I would like to proceed with my opening remarks.

First, I like to mention that this is our third Foro already. How time flies. I am very grateful to you all for attending our conferences, and for being present here today. We at the Centrale Bank van Aruba are glad that you are interested in payments, which is part of our daily lives and is developing at an accelerated pace. The way we pay is evolving faster than ever before, driven by digital currencies, biometric authentication, and Artificial Intelligence. From tap-to-pay to crypto wallets, the future of payments is not just about convenience, it is also about reshaping economies, empowering communities, and especially about redefining trust. This is precisely the reason we are focusing today on the evolution and modernization in payments, and on digital currencies. Both local and international experts will share their views on these topics.

The first presentation will be given by Mrs. Tromp-Gomez, Vice-Chair of the FPN. She will provide an update on CBA's ambition to continue modernizing Aruba's payment landscape. Afterwards, our first international keynote speaker, Mrs. Chimienti from the Worldbank, will give a virtual presentation on the evolution of fast payments and main design principles from an international perspective. This will be followed by two presentations which will focus on Central Bank Digital Currencies (CBDC). The first presentation will be given by Mr. Kock from the Research department of the CBA, who

will define what a retail CBDC is, and how it impacts central banks. He will outline the most effective implementation strategies for a retail CBDC, specifically a retail digital florin, based on the minimum design criteria and implementation framework. Subsequently, we will have our second international keynote speaker, Mrs. Johnson, from the Eastern Caribbean Central Bank (ECCB), who will elaborate on ECCB's real life experience with CBDC as a pilot named "Dcash". Dcash is the first CBDC issued by a currency union. These are all very interesting topics, and I look forward to your active engagement.

As I mentioned earlier, the CBA is very grateful for your presence today. Your interest to know more about payments and to contribute to building a more inclusive, secure, and modern payment landscape is truly inspiring. Let's make this once again a productive, interactive, and inspiring conference.

Thank you.

Enclosure 4

Centrale Bank van Aruba

MODERNIZATION OF THE PAYMENTS LANDSCAPE IN ARUBA

Mrs. Penélope Tromp-Gomez

November 13, 2025

Presentation Outline

1. Instant Payments in Aruba - Now

2. Instant Payments in Aruba – Future Plans

3. Other Payments Related Projects & Initiatives

4. Questions

1. Instant Payments in Aruba - Now

MODERNIZATION OF THE
PAYMENTS LANDSCAPE IN ARUBA

1.1 I-Pago

I-Pago is the brand name for the instant payment clearing and settlement mechanism launched by the CBA in January 2020.

Characteristics of I-Pago:

- 5 participants (CBA and all 4 commercial banks in Aruba)
- Enables instant account-to-account transfers
- Based on ISO 20022 standard
- 24/7/365 availability

1.1 I-Pago (Continued)

2021

Implementation of message signing and investigation message

2022

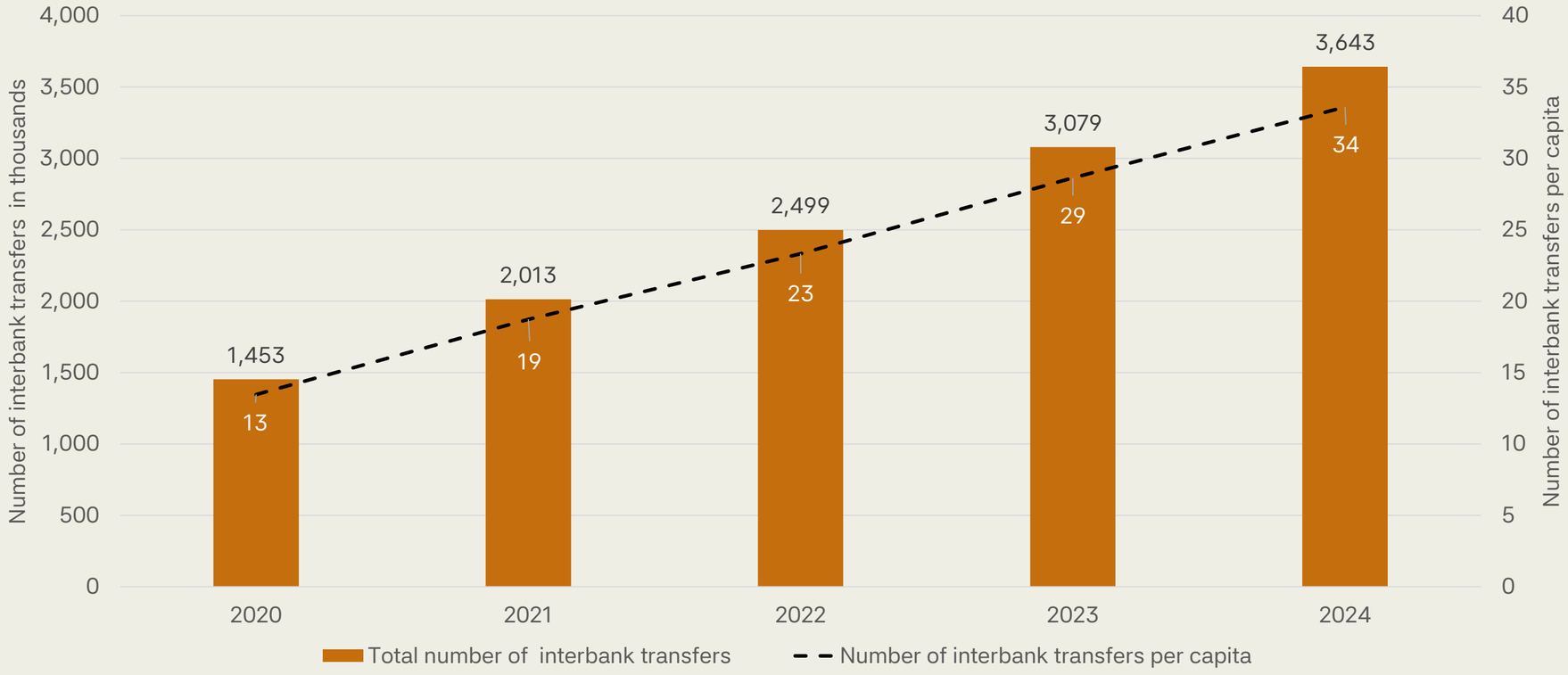
CBA published its Position Paper "Enabling Instant Payment Innovations in Aruba" identifying three use cases that could bring the most benefit to merchants and consumers

2024

Implementation of transaction coding

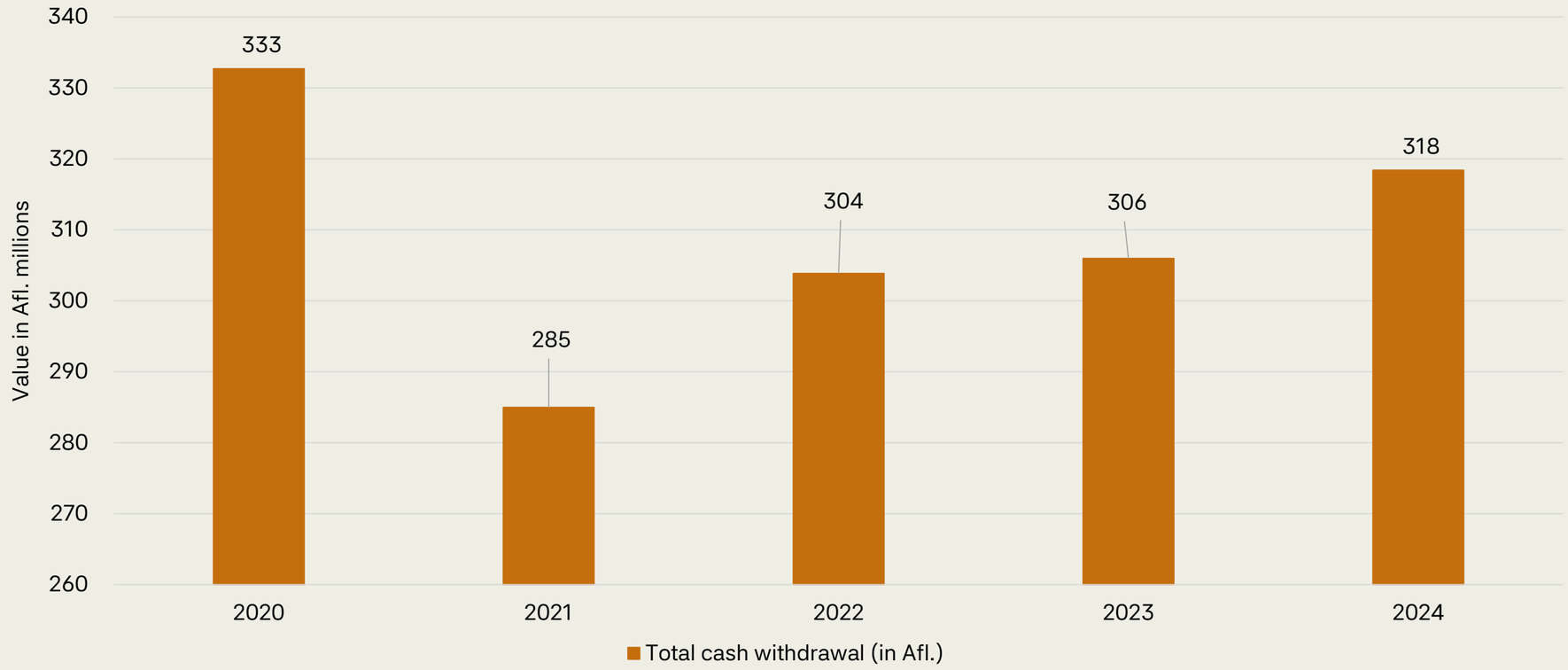
https://www.cbaruba.org/document/position-papers

1.2 I-Pago – Number of Transfers



1.3 I-Pago – Value of Transfers

1.4 Cash withdrawals by the commercial banks since the introduction of I-Pago



1.5 I-Pago vs. Cash Withdrawals

The simultaneous growth in both interbank transfers and cash withdrawals suggests that digital payment adoption is rising without replacing cash entirely. Instead of a full shift to cashless, the trend indicates coexistence of these two payment methods, possibly driven by consumer preference for flexibility (choosing between cash and digital).

2. Instant Payments in Aruba – Future Plans

MODERNIZATION OF THE PAYMENTS LANDSCAPE IN ARUBA

2.1 I-Pago – Next Steps

2026

1. Implementation of the payment recall functionality
2. Implementation of request to pay functionality
3. Implementation of an I-Pago app

2.2 Payment Recall Functionality

Allows a payer to request the reversal or cancellation of a payment that has already been initiated, typically due to fraud, technical issues or duplicate transactions.

Benefits:

- Fraud mitigation
- Operational efficiency

2.3 Request to Pay

A payment feature that allows a payee to send a secure request for payment to a payer. The payer can then review the request and choose to approve or decline the payment. The Request to Pay (R2P) can be initiated in a (bank) app, sent to payer via chat apps, QR codes or e-email.

Benefits:

- Greater payment flexibility
- Improved cash flow for businesses
- Reduced errors

2.4 I-Pago App

An I-Pago app will provide features such as:

- Enrollment to the R2P service for merchants and consumers, where they can register and link their bank account to the I-Pago app;
- Generate R2P QR code or payment link;
- Validate a R2P by scanning a QR code or tap on the payment link, where the user will be redirected to the corresponding banking app to either approve or decline a R2P request;
- View the R2P history and cancel pending requests that haven’t been paid.

Benefits:

- Seamless user experience
- Real time notifications
- Enhanced control and transparency

2.5 Next Steps - Objectives

- Ensure that I-Pago’s platform remains future-proof, scalable, and adaptable to emerging technologies;
- Offer tools to allow payment service providers to enhance the payment experience for the merchants and consumers;
- Offer cost-effective solutions for local payments through payment service providers.

To achieve these objectives, the CBA relies on the collaboration of commercial banks, which ultimately serve the end consumers.

3. Other Payments Related Projects & Initiatives

MODERNIZATION OF THE PAYMENTS LANDSCAPE IN ARUBA

3.1 Guidelines and Open Banking Standards

A set of technical and regulatory guidelines that enable secure and standardized sharing of financial data between commercial banks and third-party providers (TPPs), such as Fintech companies. These guidelines and standards set the rules that parties should adhere to when sharing financial data.

Benefits:

- Empower consumers;
- Encourage innovation;
- Increase competition and opportunity for collaboration between commercial banks and Fintech companies.

In collaboration with the Centrale Bank van Curaçao and Sint Maarten (CBCS) to ensure uniform standards across Dutch Caribbean.

(Target date: 2026)

3.2 Verification of Payee

A security feature used in banking to help prevent fraud and misdirected payments. It works by checking whether the name entered by a payer matches the name registered to the account number provided. This is especially useful in online bank transfers.

Benefits:

- Fraud prevention
- Error reduction
- Increased trust
- Improved customer experience

(Exploratory phase)

3.3 Cross-border Instant Payments Between Aruba and Curaçao

The ability to send and receive money across different countries (i.e. Aruba and Curaçao) in real time or near real time. Unlike traditional international transfers, which can take several days and involve multiple intermediaries, cross-border instant payments aim to make funds available to the recipient within seconds or minutes, regardless of geographical boundaries.

Benefits:

- Speed
- Transparency
- Cost efficiency
- 24/7 availability
- Enhanced customer experience

In collaboration with the CBCS (exploratory phase)

3.4 CBA Other Initiatives

- Draft State Ordinance on the supervision of payment service providers
- Draft State Ordinance on the supervision of payment systems
- Draft State Ordinance Basic Payment Account

4. Questions

MODERNIZATION OF THE
PAYMENTS LANDSCAPE IN ARUBA

Thank you

Enclosure 5

CENTRALE BANK VAN ARUBA

Position Paper
Centrale Bank van Aruba

Enabling Instant Payment Innovations in Aruba

FINAL VERSION

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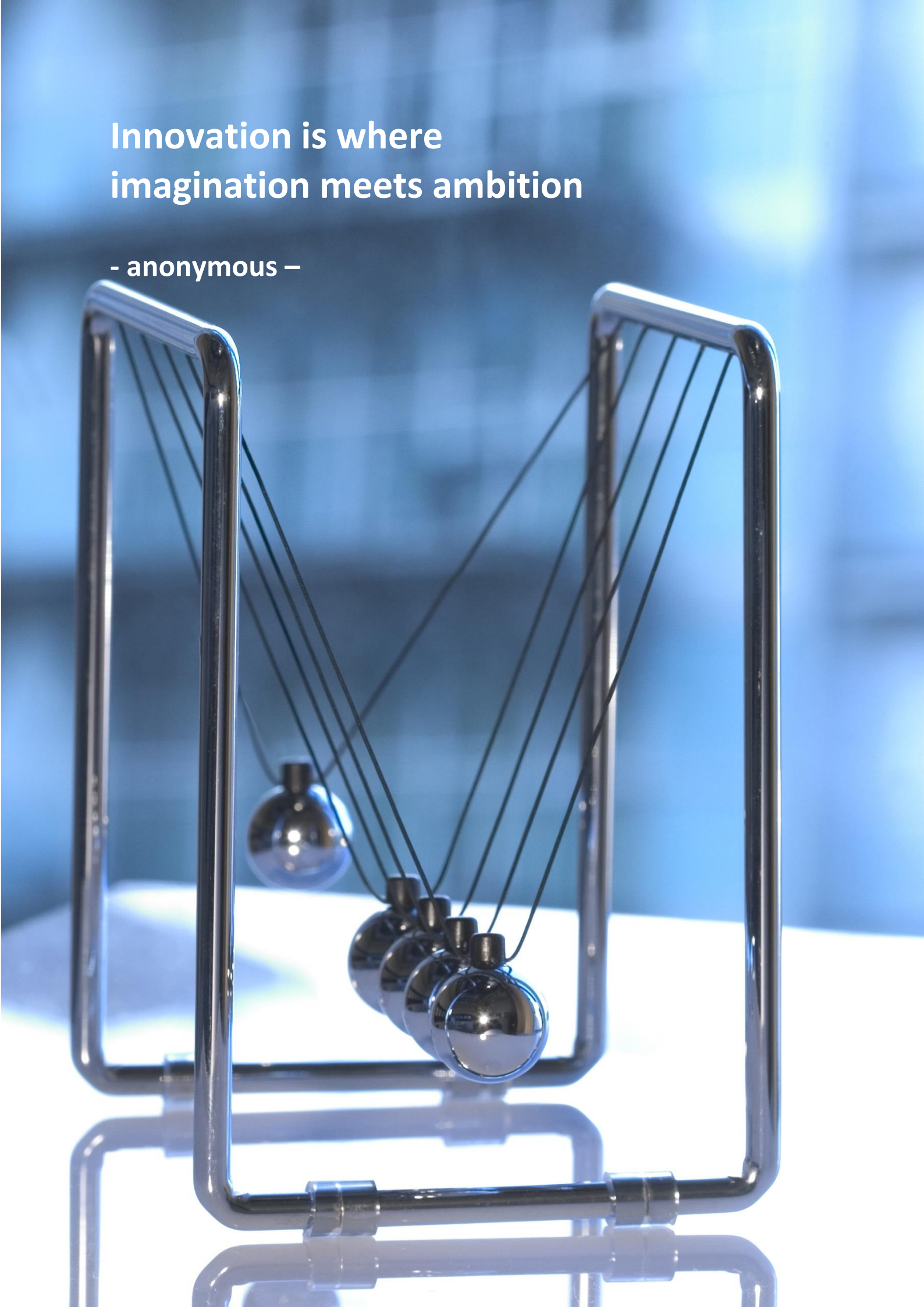
Innovation is where
imagination meets ambition
- anonymous –

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1. Purpose

History

During the period 1994 - 2020, the Centrale Bank van Aruba (CBA) operated a clearing and settlement system. The system was launched as Goldnet Clearing System and later renamed OnNet Clearing system (ONCS). However, the need to switch to a new, faster, and more secure payment infrastructure was becoming more and more essential and pivotal to the financial stability and economic development of Aruba.

In 2016, the CBA published its strategic plan 'Bela Yen, Nos Plan Strategico'. This 5-year strategic plan aimed, among other things, to modernize the payment infrastructure in Aruba to enhance its efficiency, reliability, and security. The first step towards this goal was to conduct a Fact-Finding Mission together with De Nederlandsche Bank in November 2016. The mission resulted in a clear set of items to be improved in order to achieve the goals set in Bela Yen.

In November 2017, the CBA published its first position paper, "Roadmap towards a modern payment infrastructure in Aruba", describing the way to achieve the ambitions set forth in Bela Yen.

I-Pago – Instant payments in Aruba

As part of its roadmap, the CBA reached a significant milestone in January of 2020 with the implementation of the Instant Payment infrastructure named I-Pago. I-Pago is accessible to all commercial banks in Aruba. All interbank payments for account-to-account[1] transfers initiated in Aruban florin can now be processed instantly, 24/7/365. I-Pago is based on industry standards and has the potential to be used as a single solution for account-to-account transfers.

Further modernization

Having implemented I-Pago, the CBA is ready to embark on the next phase of this project and benefit optimally from the I-Pago infrastructure by building new use cases utilizing this infrastructure.

In the next phase of this project, we will define and implement the use cases that can bring the most benefits to Aruba and further improve the payment experience (fast, secure, cost-efficient, practical, and simple) in Aruban florins (Afl.) for both sides of the transaction, namely, the merchants and the end-customers. To this end, the CBA has produced this second Position Paper, "Enabling Instant Payment Innovation in Aruba", which combines the ambition and vision of the CBA to further modernize the domestic payments infrastructure, the merchant and end-customer requirements, and the successful payment systems and innovations implemented across the globe.

This Position Paper outlines the current state of the (instant) payments landscape in Aruba, the current challenges, and how these challenges are addressed in the defined potential use cases. This Position Paper concludes with an outlook into the future, where continuous innovation plays a crucial role.

[1] Account-to-account (A2A) transfers are transfers from a bank account into another bank account. A2A transfers are commonly initiated through the consumer's Internet banking service, a biller's payment website, or telephone instruction from the consumer. Source: thefreelibrary.com

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2. Vision and Ambitions of the Centrale Bank van Aruba

In its previous Position Paper titled "Roadmap towards a modern payment infrastructure in Aruba" published in 2017, the CBA defined three high-level ambitions with the aim of improving the payment experience (see Table 1).

With the launch of I-Pago, the CBA has taken the first steps toward becoming a frontrunner in the Caribbean (ambition #1) by allowing all stakeholders to benefit from a modernized payment system (ambition #2).

This Position Paper "Enabling Instant Payment Innovations in Aruba" focuses on capitalizing on these developments and proposes valuable use cases that can be built on top of the I-Pago infrastructure. These new use cases will strengthen the position of the Aruban payment infrastructure as a leader in the Caribbean.

The third ambition of the CBA is related to the oversight role and not to the modernization project. Therefore, this ambition is not included in the scope of this document.

Table 1:

Three high-level ambitions of the CBA with respect to improving the payment experience

1	**Leapfrog the state of Aruba's payment infrastructure** The ambition set by the CBA is to upgrade the Aruban payment infrastructure and to leapfrog it into a Caribbean frontrunner.
2	**Beneficial to all stakeholders** All stakeholders/users of the Aruban payment infrastructure must benefit from the modernized payment system.
3	**CBA has an oversight role** The CBA plans to reduce its current operational responsibilities with regard to the clearing system and in exchange will take on an oversight role of the modernized payment system.

"The gales of creative disruption are upon us. And it is up to us, every single one of us, as captains, as a community, and as a country to rise to the occasion and seize the opportunities. Do not be riddled by the winds of ambiguity, but rather, ride the waves of digital transformation innovatively, and with integrity, I will add."

Jeanette R. Semeleer, President of the Central Bank of Aruba

Second annual CBA conference on Regulatory Technologies & The Future of Digital Transformation
Aruba, November 3, 2017

3. Current State of Payments in Aruba

In general, payments can be divided into different categories of use cases based on the profile of the sender and the receiver (person, business, or government), and the place of the transaction (proximity versus remote[2]) (see Table 2).

Table 2

Payment Use Cases

		Receiver		
		Person	Business	Government
Sender	Person	Proximity 1. Person-to-Person payments Remote 1. Person-to-Person payments	Proximity 2. In-Store payments Remote 3. E-Commerce payments 4. Bill payments 5. Recurring payments	Proximity 6. Taxes/Fines payments Remote 6. Taxes/Fines payments
	Business	Proximity 7. Store Refunds Remote 8. Salary/Pension payments	Proximity 2. In-Store payments Remote 4. Bill payments 5. Recurring payments	Proximity 6. Taxes/Fines payments Remote 6. Taxes/Fines payments
	Government	Remote 8. Salary/Pension payments Welfare, Government incentive or Tax returns	Remote 4. Bill payments 5. Recurring payments 8. Government incentive or Tax returns	Remote 9. Internal payments

Table 2 identifies 9 main use cases: 1. Person-to-Person payments, 2. In-Store payments, 3. E-Commerce payments, 4. Bill payments, 5. Recurring payments, 6. Taxes/fines payments, 7. Store refund, 8. Salary/Pension payments, Welfare, Government incentive or Tax returns, and 9. Internal payments. All of these use cases are currently available in Aruba and are facilitated by the current payment infrastructure, including I-Pago. However, not all are executed in the most effective and efficient way possible. Please note that use case 9 is not included in the scope of this document because it relates to internal government payments.

The I-Pago infrastructure already has improved the speed, reliability, and security of several of the use cases mentioned in Table 2. Furthermore, it also has made it easier to manage funds and reduce the number of late payments. The following sections will elaborate on the current payment methods used for each of the use cases already available in Aruba.

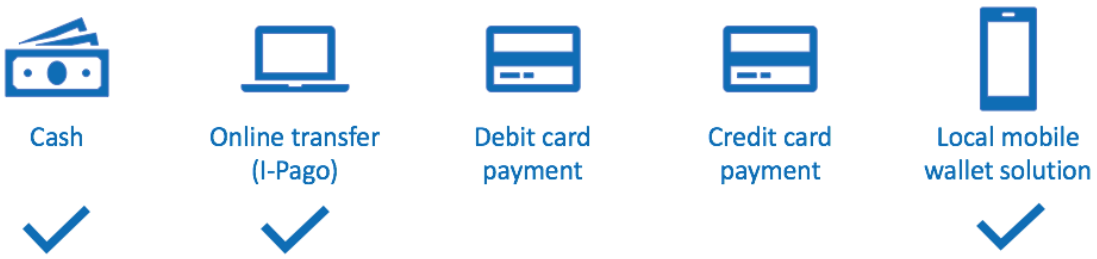
[2] Proximity payments are payments for which the sender and receiver are in close contact, for example, card and cash payments in a store. Remote payments are payments where a physical distance exists between the sender and receiver, for example, when paying a bill or making an online purchase.

3.1 Use Case 1: Person-to-Person payment

Sharing a restaurant bill, giving your kids pocket money, and paying the babysitter are examples of Person-to-Person payments**.** The traditional payment method for the Person-to-Person use case is the delivery of goods and services in exchange for cash (use case 1).

However, the increased acceptance of online and mobile banking has paved the way for greater use of the Person-to-Person use case. With the introduction of Instant Payments in Aruba, every account holder is able to send and receive a transfer of funds (in Aruban florins) within a few seconds, which is comparable to the speed and ease of using cash.

Alternatively, in Aruba, Person-to-Person payments also are possible with a local mobile wallet solution, which enables mobile payments between registered customers. Users have to maintain a balance on the wallet (maximum Afl. 350) from which they can make and receive payments to/from other users, through the use of Quick Response (QR) codes.



3.2 Use Case 2: In-Store payments

In Aruba, the most common payment methods for In-Store payments are the use of a card (credit/debit) and cash. All commercial banks issue debit and credit cards and distribute their own Point of Sale (PoS) terminals. In the current state, usage of a bank card with another bank's terminal may result in additional fees for the merchants and/or customers.

In addition, PoS terminals often are not integrated into cashiers' systems, resulting in reconciliation issues. Reconciliation of the payment received with the corresponding amount due has to be done manually by the cashier clerk, which is time consuming and can lead to human errors.

Furthermore, since the funds are not instantly available on the bank accounts of the merchants when using PoS terminals, these merchants may experience cashflow difficulties.

With I-Pago it currently is possible to pay for purchases In-Store, albeit a somewhat cumbersome process, by initiating an account-to-account transfer. The payment experience can be improved by making it easier, for example, by alleviating the need for the customer to type in the payment details of the merchant by using Near Field Communication (NFC) or QR codes.

The local mobile wallet solution is an additional payment method for In-Store payments, as several stores in Aruba are affiliated with the local mobile wallet solution. The same limitations for the Person-to-Person use case described above apply here as well. In addition, because of the limit of the wallet, only relatively small purchases can be made using this method of payment.

3.3 Use Case 3: E-Commerce payments

Buying a product on a website or mobile app is an example of web/E-Commerce payments. Payment methods used for those purchases in Aruba are, among others, cash-on-delivery, card payments (credit and debit) upon delivery, and web payments with credit cards and/or online transfers. Similar to the In-Store payment, an instant account-to-account transfer (online transfer) can be used to pay for goods or services online, but this online transfer is not very consumer friendly as users currently have to type in the payment details of the merchant to initiate the transfer.

3.4 Use Case 4: Bill payment and Use Case 6: Taxes/fines payment

The Bill payment and Taxes/Fines payment use case can be found in several quadrants of the use case table (Table 2), specifically in the Person-to-Business, Person-to-Government, Business-to-Business, and Business-to-Government quadrants. Considering that the payment methods used for these use cases are the same we will elaborate further on these use cases simultaneously.

The most commonly used payment methods for these use cases are cash, credit cards, debit cards, and account-to-account transfers (in Afl.).

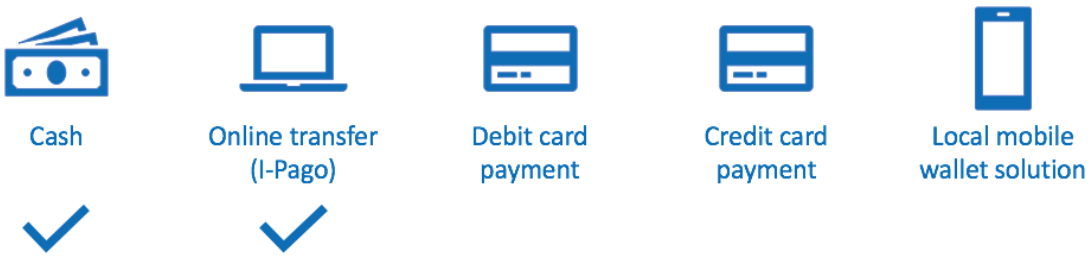
Stakeholders have indicated that the increased speed of the account-to-account transfer via I-Pago has been noticed and is appreciated. However, stakeholders have not indicated an improvement in reconciliation rates, despite moving to the industry messaging standard ISO20022. To fully benefit from the move to the industry standard, further standardization of process should be pursued, for example, the use of transaction codes or error messages.

3.5 Use Case 5: Recurring payments

The Recurring Payments use case is utilized for frequent transactions, such as payments of rent, subscriptions, energy and (mobile) telephone bills. Currently in Aruba, this use case is done via a regular account-to-account transfer, Direct Debit, or with cash.

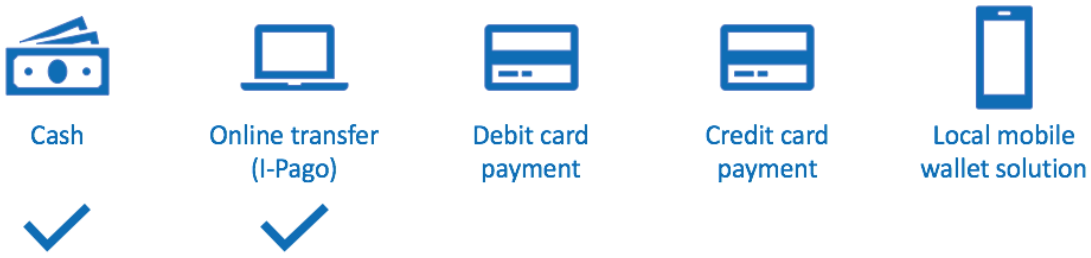
The introduction of I-Pago has improved the speed of the account-to-account transfer, but not the payment experience, as the Originator still needs to fill in the payment details of the merchant in the case of a regular transfer, set up a standing order or give consent in the form of a Power of Attorney.

Similar to the Bill Payment and Taxes/Fines Payment use case, the I-Pago infrastructure can be used to enhance the Recurring Payments use case. The Request-to-Pay functionality, for example, increases the control the Originator has over his/her bank account by actively providing approval for the recurring payments through the online/mobile banking environment.



3.6 Use Case 7: Store refund

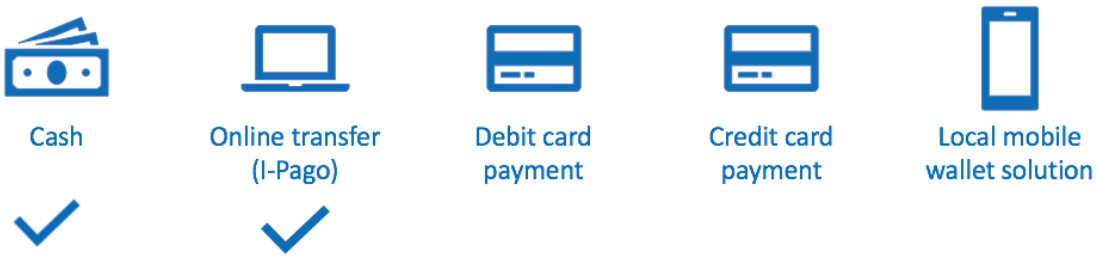
The Store refund is a use case where an original transaction needs to be reversed. If no reference to the original transaction is required, the regular bank transfer method can be used or via cash. However, if a link to the original payment is required, the I-Pago infrastructure can be enhanced to support the initiation of refunds, where the (original) Beneficiary uses the reference of the original transaction to initiate a refund, which will effectively reverse the original transaction.



3.7 Use Case 8: Salary/pension payments, welfare, government incentive, or tax returns

Government incentive payouts, tax returns, and salary & pension payments also were improved with the introduction of I-Pago. Funds are now instantly on the account of the recipient.

Currently, I-Pago also supports an instant batch payment scheme (BPA). The BPA is used, for example, by businesses and government entities for salary, pension, welfare payments, and tax refunds. However, some people still get their salary/payments in cash. The I-Pago infrastructure can be enhanced to include a more effective and efficient solution for this use case.



4. Ideal State

While all the use cases presented in Chapter 3 are already available in Aruba, we are certainly not benefitting optimally from all the possibilities and technological opportunities available to enhance the payment experience for both the merchant and end-customer (fast, secure, cost-efficient, practical, and simple).

The market feedback received from the respondents (as described in 4.1), the ambition and vision of the CBA (as described in 4.2), the merchant and end-customer requirements (as described in, respectively, 4.3 and 4.4) and the successful payment systems and innovations implemented across the globe (as described in 4.5) have been taken into consideration to determine the ideal payment state for Aruba. The use cases having the most benefits are identified and explored further in Chapter 6.

4.1 Market feedback

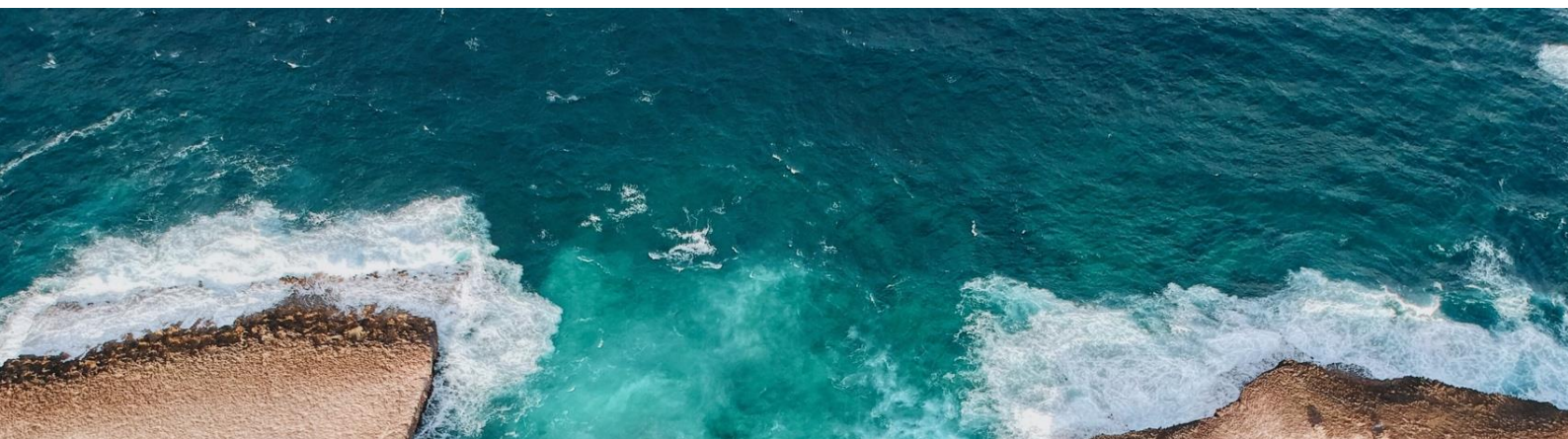
In 2016, the CBA interviewed several stakeholders (e.g. government entities, umbrella organizations representing the retail sector etc.) to assess their needs and requirements with regard to the domestic payment infrastructure. Subsequently, in 2020, the CBA conducted a follow-up survey to assess the interviewees' experience with the implementation of I-Pago and their needs and requirements for the further modernization of the payment landscape. The overall opinion of the respondents was that the move to Instant Payments via I-Pago is a significant improvement of the payment experience and a solid foundation for additional use cases, such as E-Commerce payments and In-Store payments.

Additionally, the CBA also conducted a survey among the commercial banks in 2020 with regard to the cards' infrastructure. The respondents indicated that efficient In-Store and E-Commerce payments are needed in Aruba. NFC technology and the sharing of a payment link were identified as potential technologies to improve the exchange of information between the Originator and the Beneficiary.

The general sentiment of the respondents was that the payment infrastructure is fragmented and inefficient. These observations were particularly cited in two use cases: the In-Store use case and the E-Commerce use case. In addition, the respondents strongly encouraged settlement in the local currency because settlement in foreign currencies invokes additional costs.

4.2 Ambition and vision of the CBA

The first ambition set by the CBA was to upgrade the domestic payment infrastructure, which was accomplished with the implementation of I-Pago. CBA will focus next on the second ambition, and that is to ensure that all stakeholders/users of the Aruban payment infrastructure will benefit from the modernized payment system. Therefore, implementing new use cases on top of the I-Pago infrastructure, increasing the awareness of new technologies available, and promoting the adoption of the use cases is now one of the several priorities of the CBA. These new use cases will promote Aruba's payment infrastructure as leading in the Caribbean.



4.3 Merchant requirements

Studies show that merchants typically have 4 main requirements for accepting payment methods.

1. Payment Guarantee

The merchant's priority, especially at the point of sale, is to ensure the payment is guaranteed. With I-Pago, for example, the funds are transferred instantly and are irrevocable.

2. Checkout Time

Accelerating check-out time is a key goal for many merchants. Debit card payments have one of the shortest check-out times of all payment types, and with the recent addition of NFC and "tap-and-go" payments, this method has become even faster.

3. Cost

The current cost-effectiveness of the card infrastructure in Aruba needs upgrading, as indicated by the stakeholders in the survey.

4. Availability of Funds

The prompt availability of funds is an important factor for merchants, and one in which Instant Payments (e.g., I-Pago) obviously has an advantage over cards.

4.4 Customer requirements

The customer selects a payment method based on a different set of requirements from the merchant's. The customer generally chooses the most convenient channel (e.g., card, mobile, NFC, QR code) to initiate and complete the transaction. In general, customers have three priorities.

1. Trust and Security

Customers always use a payment method that they can trust and feel is secure. According to a study carried out by the Baymard Institute, almost one-fifth of all abandoned online checkouts are a result of customers not trusting a website with payment information.

2. Cost and Transparency

The payment method needs to be low cost, and the costs associated with the method of payment need to be known up-front and should be transparent.

3. Convenience

Initiating a card transaction should be a quick and convenient process that is generally known and familiar. Initiating an Instant Payment In-Store is not yet as familiar as cards and/or cash payments. In most cases, the merchants accept cash and cards (debit/credit). Until all merchants accept methods of Instant Payments, customers will still need to resort to cash and/or a card (debit/credit) on occasion.

4.5 Payment trends across the globe

Fifty-six countries now have a live real-time payments scheme, compared to 14 just six years ago. In one year, six countries more than doubled their real-time payments volume, and four others more than doubled the value transacted on their real-time payment systems.

Payment speed has increased, as well as the payment use cases onboarded onto the Instant Payments rails. The use cases have expanded beyond Person-to-Person payments and are now increasingly covering more complex use cases, such as bill payments, E-Commerce payments, and In-Store payments. Leading the innovation in Instant Payments are the implementations of Swish in Sweden, MobilePay in Denmark, and Paym in the UK.

Swish is the leading digital payment solution in Sweden, with over 6.9 million people using the service, facilitating mobile transactions between both individuals and businesses through a cooperation between some of the largest banks operating within the country.

Bankgirot is supplying the infrastructure for Swish in the form of BiR, the instant payment rails in Sweden. The solution supports various use cases and overlay services, such as Request to Pay, an alias service, and real-time payments at the PoS.

MobilePay is a payments app that makes transferring money easier. With 5.7 million users, it supports a variety of situations, such as gift giving, arranging joint gifts, sharing dinner and splitting the bill, as well as bill payments.

The instant payment rails in Denmark (Straksclearingen) is the underlying rails for MobilePay and has been live since 2014. It covers P2P, P2B, B2B, & e-wallet through online and mobile banking channels, as well as various overlay services, such as an alias service (phone number or email), mandate management (approve on behalf of debtor), request to pay, with built-in detection of fraud patterns and anti-money laundering screening.

Paym is the leading payments app in the UK with over 4 million registered users. Paym is available for person-to-person payments, as well as for payments towards businesses.

Paym is developed on top of Faster Payments (live since 2008). Faster Payments supports multiple use cases (P2P, P2B, B2B, B2P, G2B, and G2P through mobile or online) as well as various overlay services, such as a request-to-pay service, account alias (mobile number), Confirmation of Payee, third-party beneficiary payments, standing order payments, forward dated payments, return payments, direct corporate access (bulk payments, just-in-time payments, emergency payouts, insurance, payday loans, etc.)

4.6 The Ideal State for the Current Use Cases/Gap analysis

Based on the market feedback, the ambition and vision of the CBA, the merchant and end-customer requirements, and the payment trends across the globe, the ideal state of the payments landscape in Aruba should include the following enhancements to the use cases mentioned earlier.

1.Person-to-Person payments

The Person-to-Person use case is a particularly important use case, because it impacts each user and has proven a catalyst for the other use cases. Trust, security, cost, transparency, and convenience are essential to improve the payment experience of this use case. In addition, the availability of an easy, user friendly, cheap, and safe solution for Person-to-Person payments in Aruba will drive the adoption of further use cases.

2.In-Store and E-Commerce payments

According to the market feedback received, In-Store and E-Commerce payments are prominent use cases in need of further improvement. In-Store payments based on the Instant Payment infrastructure can improve the payment experience, for both the merchant and the end-customer. Important aspects to take into consideration are checkout time, trust, security, cost, transparency, and convenience. In addition, the most convenient channel to initiate and complete the transaction should be implemented.

3.Bill payments

Although bill payments have already benefitted from the increased speed and standardization with the introduction of I-Pago, the reconciliation rates have not improved, according to the stakeholders. Further standardization of the message formats, transaction codes, and error messages would bring additional benefits. However, the stakeholders in Aruba have not indicated this as one of the most pressing challenges.

4.Recurring payments

Recurring payments have benefitted from the move to Instant Payments in Denmark and the UK with the introduction of Request-to-Pay. However, these overlay services were not introduced at the launch of Instant Payments in the UK and Denmark, but at a later stage (i.e., several years later). The development and introduction of a Request-to-Pay scheme enables the recurring payment use case on I-Pago. However, the stakeholders in Aruba have not indicated this as one of the most pressing challenges.

5.Store refunds

With the introduction of Instant Payments in the In-Store use case, an efficient method for Store refunds is a logical next step. However, the stakeholders in Aruba have not indicated this as one of the most pressing challenges.

Implementing all the mentioned use cases at once would increase the risk of a failed implementation due to the complexity thereof and limited resources available. Splitting the modernization project into smaller components will make the project more manageable and successful. Based on the above findings, the Person-to-Person, In-Store, and E-Commerce payments use cases would offer the most immediate benefits for the stakeholders and end-customers. Therefore, implementing these use cases is essential.

Taking this into account, the recommendation of this Position Paper is to start first with the implementation of the enhancements to the Person-to-Person, In-Store, and E-Commerce payments use cases. These will be referred to as the 'potential use cases'. The enhancements to the other use cases (Bill payments, Recurring payments, and Store refunds) could be explored further and implemented at a later stage.

In the following three chapters of this Position Paper, we focus solely on the potential use cases. Chapter 5 discusses the different steps in the flow of payment transactions and the four main actors therein. Chapter 6 describes the requirements of the potential use cases and the payment trends across the globe.

The Position Paper concludes with an outlook into the future, where continuous innovation plays a crucial role (Chapter 7).

5. Transaction Flow

To position the ideal state described in the previous chapter in the context of the Instant Payment infrastructure of Aruba, we are using the 4-corner model. This model consists of the 4 main actors in a payment transaction, namely, the Originator (the "sender" or "payer"), the Originator Bank, the Beneficiary Bank, and the Beneficiary (the "receiver" or "payee").

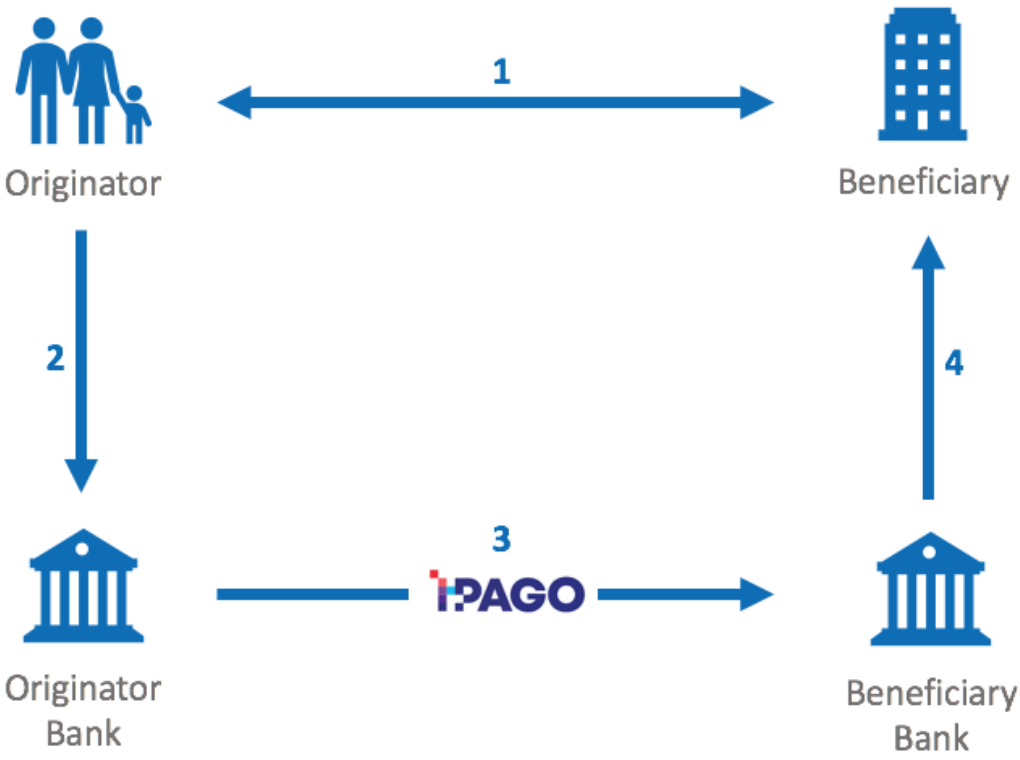


Figure 1: Transaction Flow

To facilitate innovation on top of the I-Pago infrastructure, the flows 1, 2, and 4 need to be improved. This improvement will ensure a secure and efficient payment system and, consequently, an improved payment experience for both the Originator and Beneficiary.

5.1 Step 1: Beneficiary – Originator

The first information exchange happens between the Beneficiary and the Originator. This exchange contains essential transaction details, such as account numbers, transaction amount, and remittance information. Two possible scenarios exist for sharing these payment details:

a. Instant Pull Payment

In the pull scenario, the Beneficiary initiates the transaction. The Beneficiary shares the payment details with the Originator (for example, through QR Code, NFC, or Payment Link), which includes the bank details, the amount, remittance information, and (optionally) additional information in the form of an attachment. The attachment functionality can be used for a variety of scenarios, ranging from simple things like a photograph of the bar bill to more sophisticated scenarios, such as an e-invoice.

b. Instant Push Payment

In the push scenario, the Originator initiates the transaction. The Originator enters the payment details and confirms the transaction for processing.

5.2 Step 2: Originator – Originator Bank

In the second step (2) in the transaction flow, the Originator needs to authorize the payment. This authorization can be facilitated through the use of a mobile banking app of the commercial banks or an I-Pago app.

5.3 Step 3: Originator Bank – Beneficiary Bank

The transaction is cleared and settled between the banks using I-Pago in the third (3) step of the transaction flow. This transaction is cleared and settled instantly, 24 hours a day, 7 days a week, 365 days a year. I-Pago forms the foundation of the Instant Payment developments proposed in this Position Paper.

5.4 Step 4: Beneficiary Bank – Beneficiary

In the fourth (4) step, the Beneficiary can see the status of the transaction in its mobile/online banking and/or receives the notification of the successful or unsuccessful completion of the transaction and the credit to the account of the Beneficiary.

A mobile banking app can support the instant notification required for the optimization of the fourth (4) step in the transaction flow. This functionality can be integrated in the current mobile banking apps of the commercial banks in Aruba (as is the case for example for PayM in the UK), or this can be a stand-alone 'I-Pago' app (as is the case for Swish in Sweden). The notification also can be facilitated through APIs,[3] depending on the use case.

Standards should be defined to ensure interoperability between the different banking applications, as well as the different actors in the full payment flow. These standards enable that a QR code, Payment Link (URL), or NFC generated by one bank can be scanned with the mobile banking app of another bank.

[3] An application programming interface (API) is a computing interface that defines interactions between multiple software intermediaries.

6. The Potential Use Cases

A wide range of use cases on top of I-Pago infrastructure is necessary to modernize the payments landscape and fulfill the needs of the stakeholders and other users of the system, including merchants, end-customers, thereby improving the payment experience of all users. In this chapter, we focus on the potential use cases of the modernization project presented in no particular order of priority. These use cases would offer the most immediate benefits for the stakeholders and end-customers, compared to the other use cases. Therefore, implementing these use cases is essential. The successful implementation of these use cases in other countries, such as the UK, The Netherlands, Belgium, Denmark, and Sweden will be considered benchmarks to design the ideal situation in Aruba.

6.1 Use Case 1: Person-to-Person payments

Successful implementations in Sweden and Denmark have shown the Person-to-Person use case to be the catalyst for the adoption of other use cases. In other words, the introduction of Instant Payments, which are an easy method for Person-to-Person payments that works both in a proximity as well as a remote scenario, often enables the acceleration of the adoption of other use cases.

Payments around the globe

A very successful implementation of person-to-person payments is Tikkie in the Netherlands. Leveraging the Dutch iDEAL e-payment scheme and messaging platform WhatsApp, Tikkie was able to grow to 6 million users in 3 years.

Currently, Tikkie supports sharing payment requests through a payment link (URL), as well as through QR codes.

How does it work?

A Person-to-Person payment follows the same steps as the transaction flow described in Chapter 5. As it builds upon the I-Pago infrastructure, the safety and security of the transactions are guaranteed. However, to ensure an optimal payment experience, sharing the payment details between the beneficiary and the originator needs to be seamless and as efficient as possible. Various solutions for this include the use of NFC technology, sharing QR Codes or an URL, and Request-to-Pay.

The requirements

To improve the first step (1) in the transaction flow of sharing the payment information (such as beneficiary account number, amount, and remittance information) from the Beneficiary to the Originator, the I-Pago infrastructure needs to facilitate this exchange efficiently by using one or more of the methods described in Table 3.

Table 3

Methods for exchanging payment information

NFC	Near Field Communication (NFC) functionality (cell phones, smartwatches, etc.) can be used for sharing information by tapping two devices together or tapping a device to an NFC reader.
QR-Code	"Quick Response" code, generated by the Beneficiary, which can be scanned by the Originator.
Payment Link (URL)	A payment link that can be shared through a messaging platform (such as SMS, Facebook Messenger, or WhatsApp) or email. The Originator can retrieve the payment details by viewing the link.
Request to Pay	The Beneficiary initiates a Request to Pay (via mobile, web, or API). This request will be sent by the Beneficiary bank to the bank of the Originator; subsequently, the payment request will be visible in the online/mobile banking environment of the Originator. The moment the Originator approves the payment request, an Instant Payment is triggered.

To optimize the second (2) step of the transaction flow, a mobile banking app that allows for instant authorization of the payment is a prerequisite. In the fourth (4) step, a real-time notification of the payment completion is required.

6.2 Use Case 2: In-Store payments

Using I-Pago for In-Store payments would greatly enhance the payment experience for both the customers as well as the merchant, i.e., it will eliminate the risk for merchants of not getting paid, and the risk for customers of delayed delivery of goods. Eliminating these risks is made possible because the release of goods and services can easily be synchronized with the payment.

The stakeholders identified the In-Store use case as one of the prominent use cases for Instant Payments, since the current card infrastructure for In-Store payments poses challenges.

As mentioned in Chapter 3, the current infrastructure is inefficient and cumbersome. The use of In-Store payments via I-Pago could alleviate these challenges by offering a user-friendly, cost-effective, and secure alternative.

Payments around the globe

NFC is recognized worldwide as a valid, trusted, and efficient payment method.

QR Codes are the dominant payment method in Asia, while they have not reached significant traction in Europe. QR codes are an effective payment method, with significant benefits over a traditional card payment.

The sharing of a payment link as a method of paying has long been the standard in schemes worldwide, such as for example, iDEAL in the Netherlands, and has recently seen success in the Person-to-Person use case as well. However, the sharing of a payment link has not made the transition to the In-Store use case yet.

How does it work?

The payment flow for In-Store payments encompasses the same steps as described in the 4-corner model (Chapter 5). However, several challenges exist in the process to enable In-Store payments.

1. The merchant has to generate a payment request based on the purchases registered in the cashiers' system. This payment request must be shared with the buyer. Various methods can facilitate this, e.g., NFC, QR Code, and/or Payment link.

2. The buyer has to authorize the payment. If done using a mobile app, the buyer needs an internet connection (either through the store's WiFi or via a mobile data subscription). Alternatively, an offline 'I-Pago' payment card via NFC can be used.

3. The merchant needs confirmation of the payment. If the payment is credited to the account, or the process hereto is unsuccessful, the merchant must be notified immediately, or in some scenarios, notification must be given to the specific cashier handling the request (if the merchant has multiple cashiers, for example, as currently in a supermarket, a restaurant, or a bar with multiple PoS devices).

The requirements

Instant Payments can be enabled in several ways in the In-Store use case. In addition, similar to the use cases described above (use cases 1 and 2), the payment steps 1, 2, and 4 in the 4-corner model need to be optimized.

To facilitate the first step (1) in the payment flows, various technology possibilities exist, as presented in Table 3 of Chapter 5, i.e., NFC, QR code, and URL.

In Table 4 below, the technology possibilities for the In-Store payments are presented. How each one of these methods works, and the merchant, customer, and CBA requirements for each one of the methods outlined below are considered.

Table 4

The technology possibilities and the requirements

	NFC	QR Code	Payment Link (URL)
How would this work In-Store?	Instant Payments at the PoS through NFC can be used in two ways. The mobile phone can be used to retrieve the transaction details and authorize the payment, by tapping the phone to an NFC device. This can be a regular PoS device, or any generic NFC reader. A second option is an NFC capable "I-Pago" card, which allow the Point-of-Sale/NFC reader to identify the bank account of the card holder. This in turn will allow the PoS to initiate a direct transfer from the card holder's bank account, and bypassing the international card schemes.	QR Codes can be used to efficiently transmit the payment details to the Originator. This can be done through a static QR (where the customer scans the QR code which identifies the merchant, fills in the amount and optionally a description, and authorizes the payment) or a dynamic QR (where the merchant will generate a specific QR Code, containing the merchant id, the amount, remittance and optionally even a link to a cashier's receipt, and the customer scans the QR code and authorizes the payment). After the receipt of the funds, the Beneficiary bank or the payment service provider will inform the merchant.	Instead of using QR codes to communicate payment details, a payment link (URL) can also be used. Although this method is more applicable to online, it can potentially also be used in-store. In this method, the link contains the payment details and is shared with the customer, either via e-mail, message platform (WhatsApp, Facebook Messenger) or SMS. By clicking on the link, the customer retrieves the details and can then authorize the payment.
Merchant Requirements	As the payment is processed as a regular bank transfer through I-Pago, payments are guaranteed and quick to complete. The payment is settled in local currency and funds are instantly available. The merchant need to have a bank account at one of the participating banks. The merchant also needs to incorporate one or more of the methods (NFC, QR Code, Payment Link) into his or her internal checkout process.		
Customer Requirements	Customers will need to gain trust with using a new payment method. A central brand, such as I-Pago, can help with this adoption. In addition, there is the potential to include a receipt as part of the payment message to increases the convenience for the customer, as well as the possibility for additional value added services, such as integrated loyalty cards. As the payment is processed as a regular bank transfer in local currency, the payment can be more cost-efficient.		
CBA Requirements	All the various payment methods include a secure authentication and authorization step, thus ensuring the safety and security of the payment. Since these payment methods use the regular bank transfer method, risk management and settlement risk are covered. The new payment methods available should be promoted to ensure the use by all stakeholders and end-customers.		

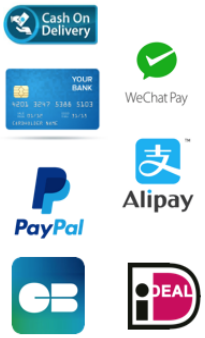
6.3 Use Case 3: E-Commerce payments

The E-Commerce use case has also been identified as one of the potential use cases that needs improvement. The transaction flow of this use case is similar to the previously described flow for the In-Store payments. The main difference between the E-Commerce and In-Store transactions is that all E-Commerce payments occur in principle remotely (i.e., on-line).

Currently, Aruba does not have a dominant solution to facilitate E-Commerce transactions in local currency as already mentioned in section 3.3.

Payments around the globe

Online shoppers in the US predominantly use credit cards. In France, Cartes Bancaires (the local card scheme) is the most popular, while PayPal is not far behind. In China, WeChat Pay or Alipay are the leaders. Cash is still the go-to payment method in Latin America, and the Netherlands favors iDEAL.



How does it work?

To initiate the payment (step 1 in the payment flow), three options are available.

1. In the first option, the web shop (Beneficiary) displays a QR code, which contains the details of the payment. The Originator scans the QR code and authorizes the payment. The Beneficiary receives an instant notification of the arrival of the funds through an API or via his/her mobile app.

2. In the second option, the web shop (Beneficiary) displays a Link. The Originator has to authorize the payment in his/her banking environment through the link, and the instant notification of the arrival of the funds is sent to the Beneficiary through his/her bank.

3. In the third option, the web shop (Beneficiary) sends a Request-to-Pay directly to the Originator Bank. The Originator Bank sends a push notification to the Originator to notify him/her of the pending request. Upon authorization of the Request-to-Pay, the Originator Bank initiates an Instant Payment. The Beneficiary receives the notification upon arrival of the funds through an API or via his/her mobile app.

In this potential use case, steps 2 and 4 are the same as the steps described in the transaction flow chart in Chapter 5, where the Originator authorizes the transaction in the banking environment, and the Beneficiary is notified via the Beneficiary Bank or payment service provider.

The requirements

For E-Commerce payments to benefit from Instant Payments, the first (1) step and the fourth (4) step in the 4-corner model of the transaction flow chart should be optimized.

To improve the first step (1) in the transaction flow chart, for the sharing of the payment information from the web shop to the customer, a QR Code or an URL should be implemented.

The fourth (4) step has to ensure a timely confirmation of payment to the web shop. This can be done via an API integration or via a mobile app, as described in Chapter 5.

Innovation distinguishes between a leader and a follower.

Steve Jobs –

7. Continuous Innovation

The payments landscape is constantly evolving and becoming more and more sophisticated. Innovative technologies, such as NFC, blockchain, and Bluetooth beacon payments, continuously challenge the existing payment systems. Customer demand also changes, and constant improvements emerge, as the innovative technologies become part of everyday life. The CBA intends to act both as an accelerator of innovation as well as a supervisor of the payment system itself, ensuring that new payment-related solutions and developments continue to be cost-effective, efficient, reliable, and secure, and that they benefit all stakeholders.

Trends around the globe

Corona-free payments are here to stay. The rise of contactless payments is irreversible. 67% of US retailers now accept some type of no-touch payment, and in Europe, Visa reports that 75% of in-store payments are now contactless. [13]

A second consequence of the pandemic is the rising importance of a true omnichannel experience. As curbside pickup has normalized, consumers no longer see a separation between online and physical presence, and the payment process should support this.

On the technology side, artificial intelligence is starting to prove its value in fraud detection. This will evolve and become an important part in the safeguarding of payments.

In Europe, the European Payment Initiative (EPI) aims to break the hegemony of the established international card brands, with an integrated (virtual and physical) card and mobile payments proposition.

In Asia and China, the integration of payments with social networks has been a leading example. This is now evolving from a platform that provides inclusive financial services to an open digital ecosystem that offers users a gateway into a comprehensive digital lifestyle.

In countries and continents with lagging financial inclusion, there is a renewed drive to bring the estimated 2 billion adults worldwide without bank accounts into the formal economic fold, which, for example, in Africa will be driven mostly through innovation in mobile money services such as M-Pesa and WeChat Pay.

Looking at the trends around the globe, the CBA sees innovation happening in a variety of areas and traversing all continents. Innovation is also spanning all aspects of the payments value chain, from initiating the payment with the trend towards contactless in the United States and Europe and the use of mobile wallets in Africa and Asia, to processing and safeguarding the payments with the advent of Artificial Intelligence in fraud detection.

With this Position Paper, the CBA maps out important steps towards further modernization of the Aruban payments landscape. I-Pago offers a solid foundation for the development of innovative enhancements for (new) use cases. To improve the payments experience for merchants, customers, and all other users of the payment infrastructure in the short to medium term, the CBA sees great benefit in implementing the Person-to-Person, In-Store, and E-Commerce payment use cases. However, to enable these use cases, additional assets need to be developed. In 2022, the CBA will explore how to and to what extent the potential use cases can be implemented to improve the payments experience in Aruba.

Facilitating payments for stakeholders who do not have a bank account at a commercial bank, is an area that also will be explored further to foster financial inclusion. Another example is facilitating the participation of residents with fluctuating income, tourists, and travelers. Allowing these groups also to utilize the I-Pago infrastructure could bring significant value to the system, as well as potentially massive cost savings in transaction and currency conversion fees.

As Heraclitus, a Greek philosopher, once said: “Change is the only constant in life.” The CBA will continue to promote the enhancement of payments to ensure that the payment infrastructure in Aruba maintains its leading position in the Caribbean and embraces all potential users.

Enclosure 6

PROJECT

FAST

FRICTIONLESS • AFFORDABLE • SAFE • TIMELY • TRANSACTIONS

The Evolution of Fast Payments: Global and Regional Perspectives

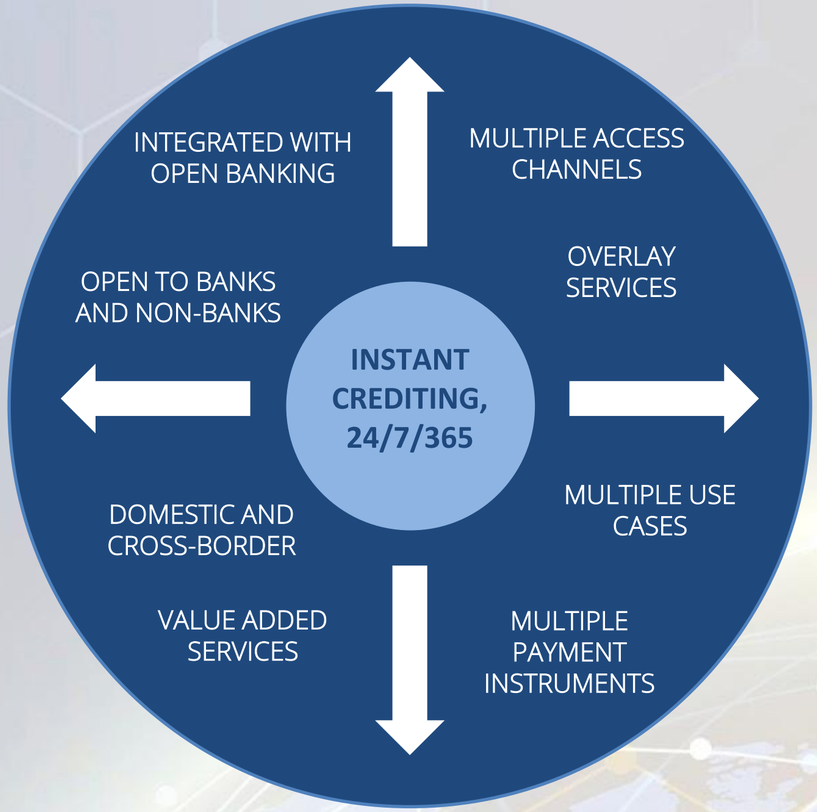
WORLD BANK GROUP

BACKGROUND AND CONTEXT:
DEFINITION OF FAST PAYMENTS

"Fast payments are defined as payments in which the transmission of the payment message and the availability of final funds to the payee occur in real time or near real time and on as near to a 24-hour and 7-day (24/7) basis as possible."

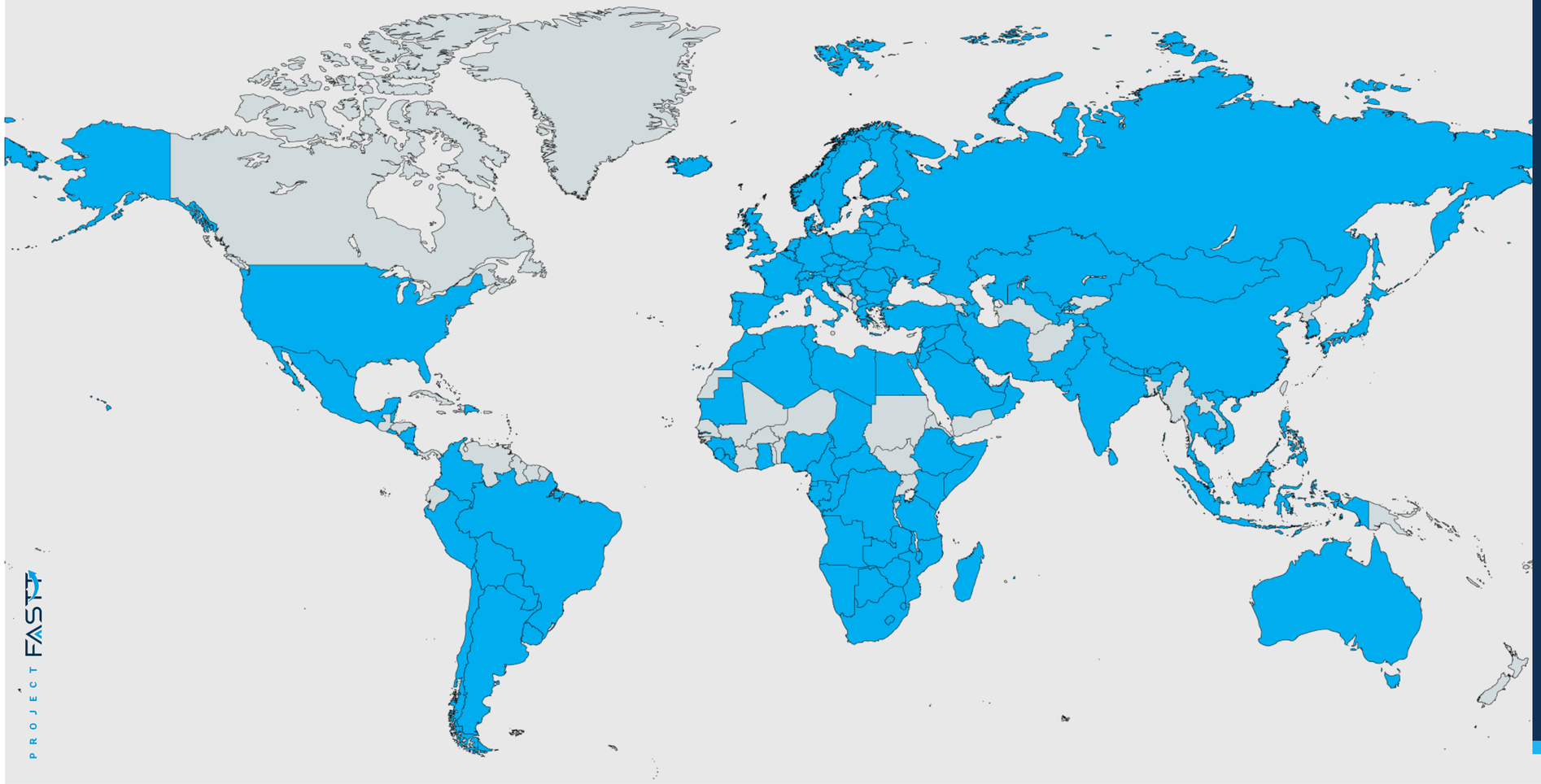
Source "FPS report by Committee on Payments and Market Infrastructures (CPMI)"

EVOLUTION AND INCLUSIVITY OF FPS



PROJECT FAST

FASTT TRACKER UPDATES



- Fast payments reached 266.2 billion real-time transactions globally in 2023, up 42.2% YoY (ACI Worldwide 2024)
- Instant payments accounted for 19% of all electronic transactions in 2024, expected to reach 27% by 2028 (https://www.ecb.europa.eu/press/other-publications/ire/focus/html/ecb.irebox202506_03~17c27de367.en.html)
    - 2.838 trillion non-cash transactions projected by 2028 (BIS Quarterly Review 2024)
- Projected Value of Real-Time Transactions Expected to hit US $575 billion by 2028 (ACI Worldwide 2024)

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MOTIVATION TO INTRODUCE FAST PAYMENTS

STAKEHOLDER	PRIMARY FPS IMPLEMENTATION DRIVERS
PUBLIC AUTHORITIES	• Digitization of payments • Leading innovation in the jurisdiction • Enhancing consumer experience
OPERATOR	• Market push (recommendation by financial institutions, banking, and payments associations) • Enhancing consumer experience • Digitization of payments • Leading innovation in the jurisdiction
PAYMENT SERVICE PROVIDERS	• Better costumer experience • Innovation/newer channels, use cases, and technologies • Competitor participants' fast payment offerings

PROJECT FAST

USER UPTAKE:
KEY DRIVERS

KEY TAKEAWAY

Low end-user prices, ease of use, and multiple use cases appear to be the main drivers of user uptake.

USER EXPERIENCE:
a convenient and simple user experience, seamless across access channels

EASE OF ACCESS:
to initiate payments (e.g., via digital channels such as the internet and, especially, mobile banking)

PUSH FROM GOVERNMENT OR CENTRAL BANK:
interventions and promotion of digital payments, including incentives for adoption

END-USER PRICING:
low end-user prices and transaction costs. Some central banks have issued guidelines reducing or waiving end-user costs/merchant fees.

AWARENESS INITIATIVES:
marketing campaigns by operators or individual participants, public announcements, and social-media marketing, including educational and promotional materials.

AVAILABILITY OF USE CASES:
P2P use case has been the major driver of user uptake, while the person-to-business (P2B) use case is also growing rapidly.

PROJECT FAST

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EMERGING TRENDS

CROSS-BORDER FPS INTER-OPERABILITY

Blueprint and design choices for a scalable cross-border payments network that would connect FPSs in multiple countries, enabling them to offer cross-border fast payments

CENTRAL BANK DIGITAL CURREN-CIES (CBDC)

A CBDC network and fast payments do not necessarily have to compete. One potential option would be using the FPS payment rails for CBDCs.

APIs / OPEN BANKING

The “open-banking-type” APIs have aided interactions between banks and third parties as well as interactions between a customer and its issuer payment system, and they have also enabled merchants to accept payment methods.

NEW USE CASES / SERVICES

Development and launch of new use cases and value-added services, such as BNPL, RtP, digital lending solutions, among others, leveraging innovation in digital finance.

PROJECT FAST

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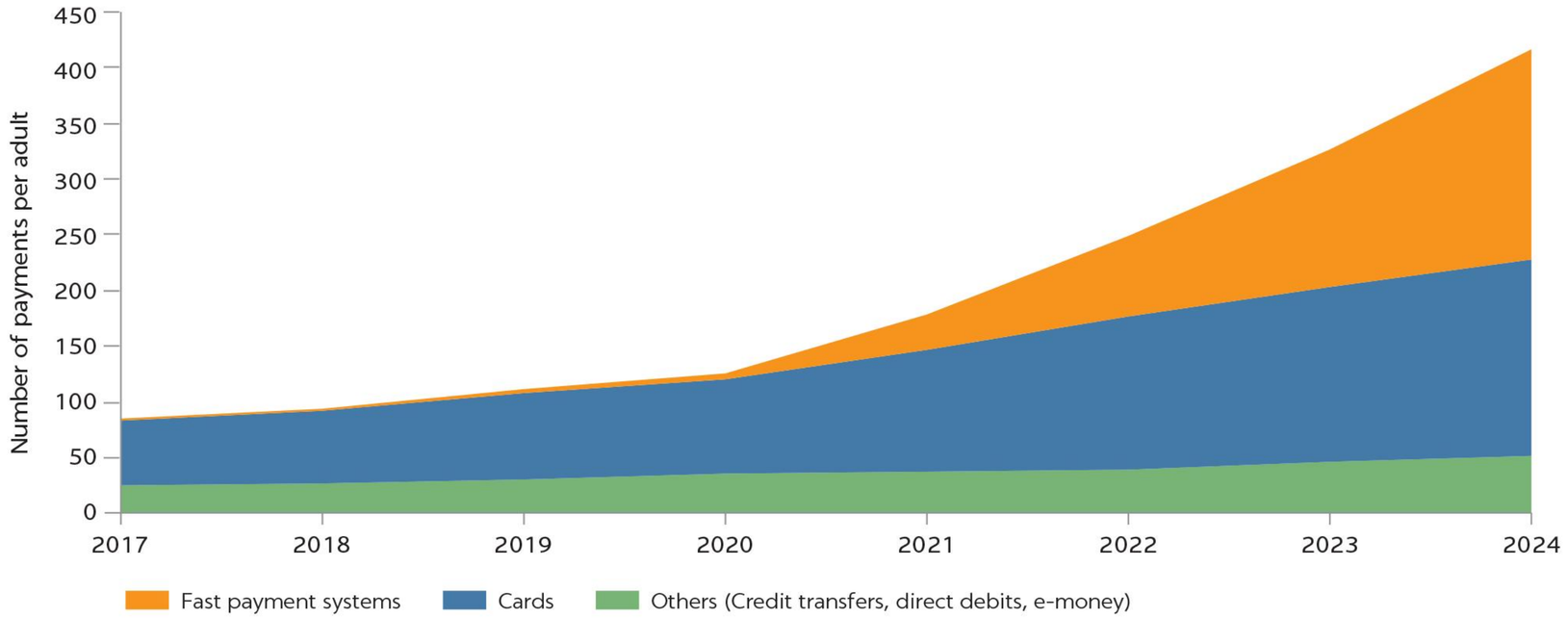
NEW REGIONAL REPORT ON FAST PAYMENTS IN LAC

- Analysis of trends in fast payments in 11 LAC countries based on information collected from Central Banks: transaction data, FPS characteristics, fraud
- Policy messages informed by the analysis and WB country, regional and global TA and engagements

COUNTRY	FPS #	NAME OF THE FPS SYSTEM	LAUNCH DATE OF FPS	SCHEME OWNER/ SYSTEM OPERATOR[a]
Argentina		*Transferencias 3.0*	12/2020	Private sector
Bolivia	FPS 1	*Módulo de Liquidación Diferida—QR BCB Bolivia*	12/2022	Central bank
	FPS 2	*ACCL $imple*	01/2019	Private sector
	FPS 3	*UNILINK*	01/2024	Private sector
Brazil		*Pix*	11/2020	Central bank
Chile		*Centro de Compensación Automatizado—CCA*	05/2008	Private sector
Colombia	FPS 1	*Transfiya ACH Colombia*	02/2020	Private sector
	FPS 2	*Redeban—Entre Cuentas*	10/2023	Private sector
	FPS 3	*Visionamos*	02/2004	Private sector
Costa Rica		*SINPE*	05/2015	Central bank
Dominican Republic		*Pagos al Instante BCRD*	11/2014	Central bank
El Salvador		*Transfer365*	06/2021	Central bank
Mexico		*Sistema de Pagos Electrónicos Interbancarios*	08/2004	Central bank
Paraguay		*Sistema de Pagos Instantáneos—SPI*	05/2022	Central bank
Peru	FPS 1	*CCE Transferencias inmediatas*	12/2020	Private sector
	FPS 2	*Visa Direct*	10/2020	Private sector

KEY FINDING 1: FAST PAYMENTS ARE DRIVING THE ACCELERATION OF DIGITAL PAYMENTS GROWTH IN LAC, NOW REPRESENTING 45% OF DIGITAL PAYMENTS VOLUME, UP FROM 2% IN 2017

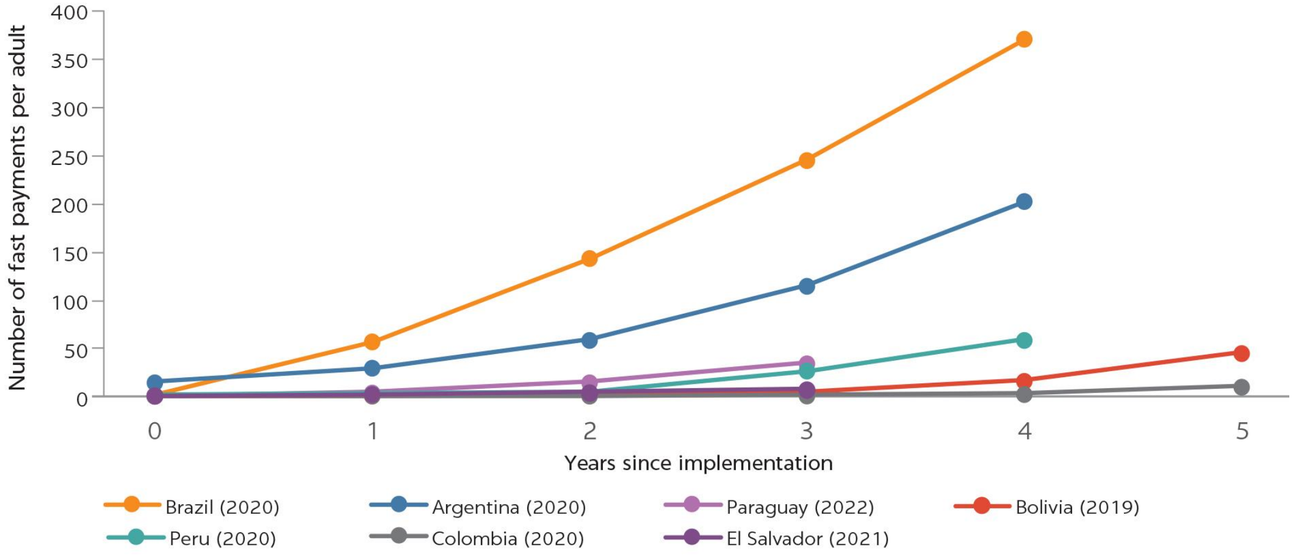
- Fast payments in LAC have experienced remarkable growth, with transaction volumes from 620 million in 2017 to 79.8 billion in 2024
- In 2024, each accountholder in LAC made 265 fast payments per year, on average—up from 2.9 in 2017.
- Across LAC, approximately $9.5 trillion was transferred via FPS in 2024.
- The key inflection point began in 2020: seven countries deployed FPS or fast-tracked FPS expansion between 2020 and 2023
- Regional growth in fast payments accelerated during 2020–24, with average annual growth in fast payments volume per adult of 145 percent—representing 63 percent of the total growth in digital payments volume
- Fast payments volume exceeded cards payments volume for the first time in 2024

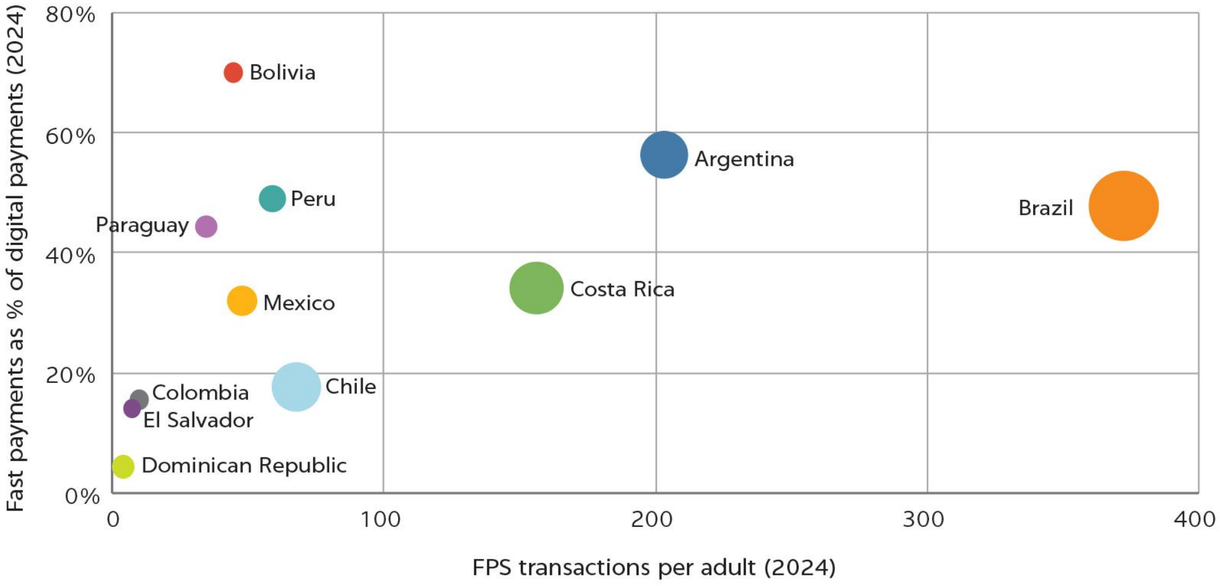


Source: Author's elaboration with data provided by central banks; United Nations Population Division (adults defined as age 15+).
Notes: "Others" include only centrally cleared transactions. "Cards" include payments made with debit, credit, and prepaid cards. Data includes only centrally cleared transactions, i.e. inter-PSP transactions.

KEY FINDING 2: THE GROWTH OF FAST PAYMENTS IN LAC HAS BEEN SHAPED BY THE INCREASINGLY PROACTIVE ROLE OF CENTRAL BANKS AS WELL AS FPS DESIGN CHOICES – WITH SIGNIFICANT HETEROGENEITY IN FPS OPERATING MODELS, SCALE AND IMPACT (1)

- Early reformers like Chile and Mexico were among the first LAC countries to foster the development of fast payments prior to 2020
- Several more recent FPS (e.g., Brazil) have quickly surpassed FPS that were established pre-2020 (e.g., Mexico)
- The Covid-19 pandemic catalyzed growth for some existing FPS (e.g., Costa Rica)
- By 2024, Brazil, Argentina, and Costa Rica have emerged as clear top regional performers in terms of FPS transactions per adult (>150)
- Fast payments now represent more than 40 percent of all digital payments in Argentina, Bolivia, Brazil, Paraguay and Peru

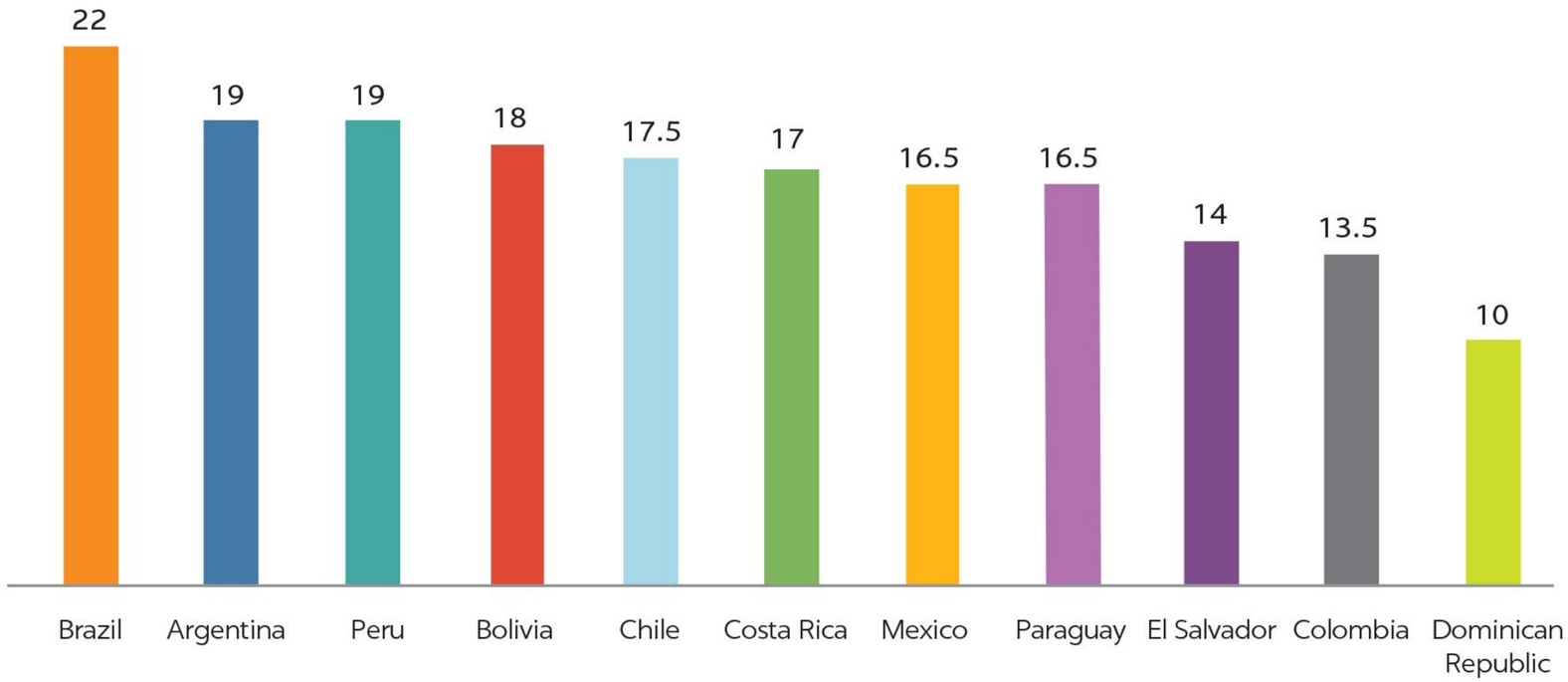




KEY FINDING 2: THE GROWTH OF FAST PAYMENTS IN LAC HAS BEEN SHAPED BY THE INCREASINGLY PROACTIVE ROLE OF CENTRAL BANKS AS WELL AS FPS DESIGN CHOICES – WITH SIGNIFICANT HETEROGENEITY IN FPS OPERATING MODELS, SCALE AND IMPACT (2)

- Some of the variation in FPS scale can be attributed to FPS design maturity
- The report presents a Design Maturity Index based on the following FPS characteristics:
  - Nonbank participation
  - Direct vs. indirect participation
  - Access channels
  - Payment instruments
  - Types of aliases supported
  - Use cases
  - Transaction limits
- Brazil demonstrates the highest level of FPS design maturity in LAC
- Most FPS in LAC demonstrate middle to high design-maturity levels, with some notable areas for further enhancement, including enabling direct access of nonbank PSPs (for example, Argentina and Paraguay), expanding use cases (as in Costa Rica and Mexico) and payment instruments (Peru).

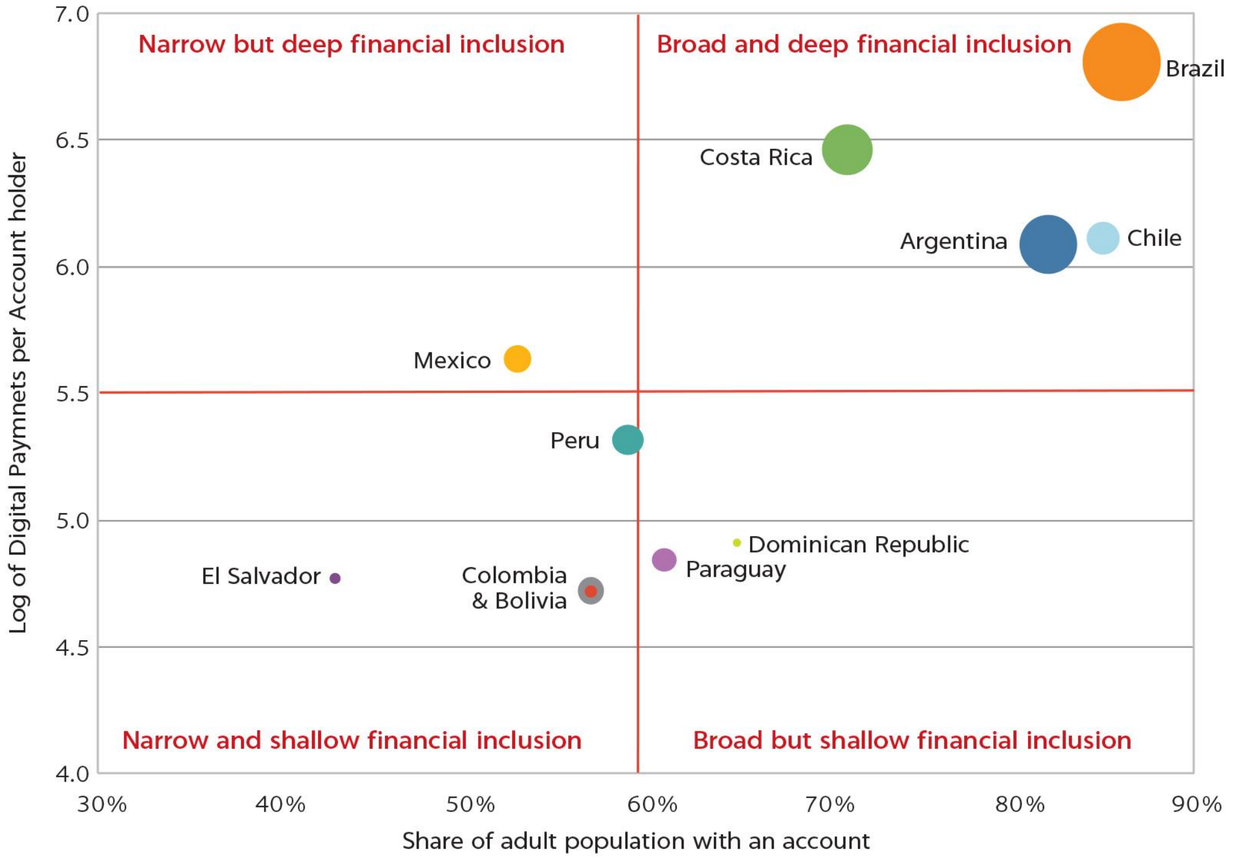
FIGURE 6 FPS design maturity index



Source: Author's elaboration.
Note: In the case of countries with multiple FPS, the most sophisticated FPS is included.

KEY FINDING 3: IN MOST LAC COUNTRIES, FAST PAYMENTS ARE DEEPENING DIGITAL FINANCIAL INCLUSION FOR BANKED POPULATIONS; MORE MIXED EVIDENCE ON EXPANDING FINANCIAL ACCESS

- The evidence on increasing account usage is clear: digital payments per accountholder have increased 280 percent between 2017 and 2024, from 154 to 587 payments per accountholder per year, on average—with 60.7 percent of this growth attributable to fast payments
- The increased use of digital payments via FPS is widespread across consumer segments: in Brazil and Costa Rica, more than 75 percent of adults use Pix and SINPE, respectively
- The data also shows that FPS growth complemented existing digital payment instruments, helping to expand the overall digital ecosystem and reduce reliance on cash
- The evidence for the impact of FPS expanding financial access is more mixed
- Recent empirical research from Brazil does suggest that mature FPS ecosystems can drive account opening
- Countries must address core enablers of financial access alongside FPS reforms

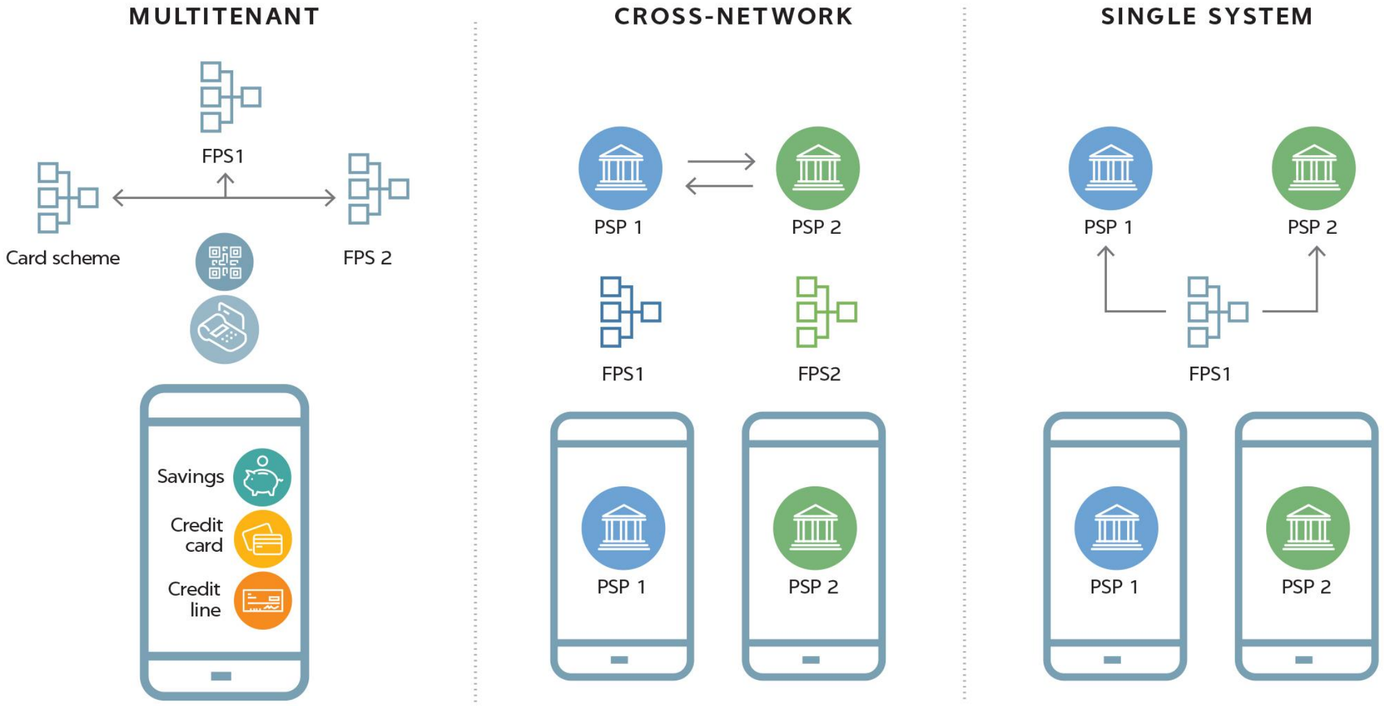


Source: Author's elaboration with data from central banks and the Global Findex database (World Bank).
Note: The size of the bubble represents the total number of FPS payments per adult in each country.

POLICY MESSAGE 1: NONBANK ACCESS AND EFFECTIVE INTEROPERABILITY – WITHIN AND ACROSS FPS – SHOULD BE PRIORITIZED TO ADDRESS SYSTEM FRAGMENTATION AND SUPPORT SCALABILITY AND MARKET EFFICIENCY

- Effective interoperability is critical for promoting competitive digital payment ecosystems as well as enhancing the utility of fast payments for consumers.
- FPS implementations in the region have frequently emerged as isolated initiatives of different stakeholder groups, often with different objectives.
- The LAC experience illustrates two main approaches to interoperability predicated on (i) "system-wide" interoperability through a single open FPS that sets the market standard, or (ii) "cross-system" interoperability
- Cross-system interoperability can be a complex undertaking.
- Multitenant interoperability emerges as a pragmatic solution to handle complexity and fragmentation, with a focus on the point of interaction.

FIGURE 12 Interoperability models



POLICY MESSAGE 2: GOVERNANCE ARRANGEMENTS FOR FPS SHOULD ENSURE ALIGNMENT WITH PUBLIC POLICY OBJECTIVES AND A LEVEL PLAYING FIELD FOR PRIVATE SECTOR OPERATORS

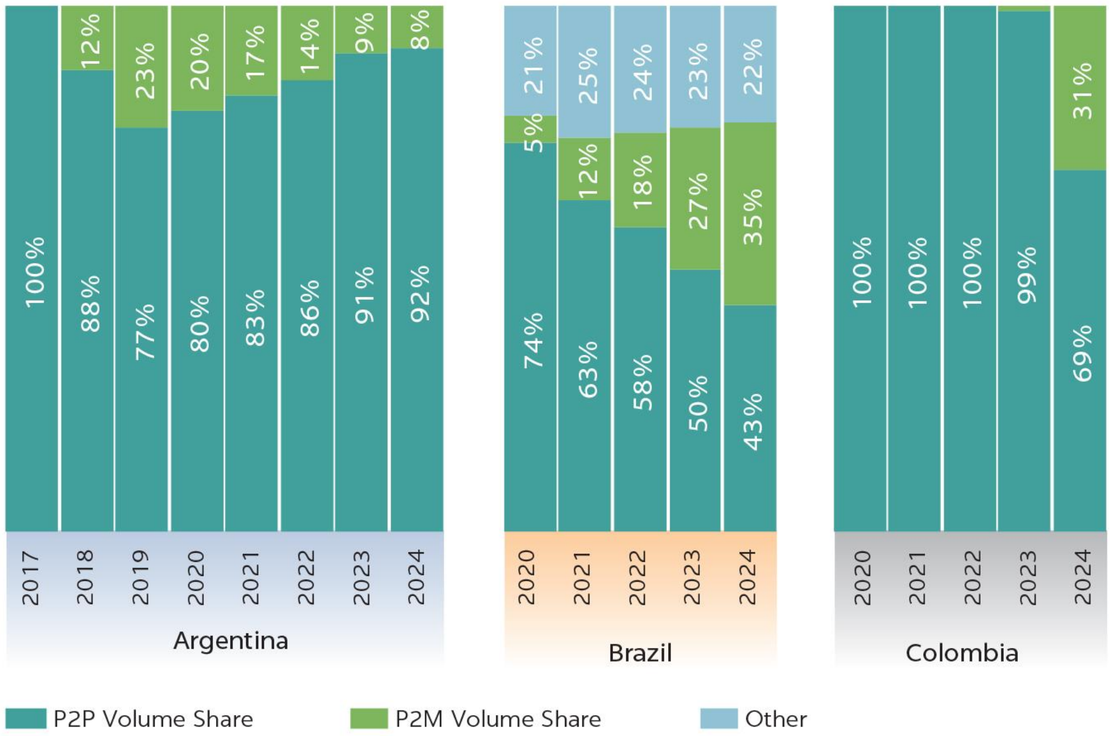
- Central banks have been key players through their various and evolving roles as payment system overseers, regulators, catalysts, and, increasingly, operators
- Starting in the mid-2010s, central banks became more actively involved in the regulation/oversight of retail payment systems, including earlier FPS initiatives.
- Several central banks nevertheless considered that these efforts would not be sufficient to change the status quo and began analyzing the possibility of directly operating an FPS
- Central banks in the region are increasingly taking up operational roles in FPS, including where private FPS are already operational.
- The experience of Brazil with Pix illustrates the merits of public-service provision in "bypassing" the complexity and fragmentation of traditional retail payments infrastructure that constrained FPS development.
- When the central bank relies on its regulatory and oversight functions to influence FPS governance, it should have sufficient powers and resources to undertake these functions.

COUNTRY	FPS #	NAME OF THE FPS SYSTEM	LAUNCH DATE OF FPS	SCHEME OWNER/ SYSTEM OPERATOR[a]
Argentina		*Transferencias 3.0*	12/2020	Private sector
Bolivia	FPS 1	*Módulo de Liquidación Diferida—QR BCB Bolivia*	12/2022	Central bank
	FPS 2	*ACCL $imple*	01/2019	Private sector
	FPS 3	*UNILINK*	01/2024	Private sector
Brazil		*Pix*	11/2020	Central bank
Chile		*Centro de Compensación Automatizado—CCA*	05/2008	Private sector
Colombia	FPS 1	*Transfiya ACH Colombia*	02/2020	Private sector
	FPS 2	*Redeban—Entre Cuentas*	10/2023	Private sector
	FPS 3	*Visionamos*	02/2004	Private sector
Costa Rica		*SINPE*	05/2015	Central bank
Dominican Republic		*Pagos al Instante BCRD*	11/2014	Central bank
El Salvador		*Transfer365*	06/2021	Central bank
Mexico		*Sistema de Pagos Electrónicos Interbancarios*	08/2004	Central bank
Paraguay		*Sistema de Pagos Instantáneos—SPI*	05/2022	Central bank
Peru	FPS 1	*CCE Transferencias inmediatas*	12/2020	Private sector
	FPS 2	*Visa Direct*	10/2020	Private sector

POLICY MESSAGE 3: DIVERSIFYING USE CASES BEYOND P2P PAYMENTS TO INCLUDE P2M AND LARGE-VOLUME RECURRENT STREAMS LIKE BILL AND G2P PAYMENTS CAN DRIVE ADOPTION, INNOVATION AND INCLUSION

- Use-case diversity is a key benchmark of FPS design maturity, yet LAC FPS are generally characterized by low use-case diversification.
- P2P payments have been the primary driver of FPS in most LAC-11 countries: P2P transactions represent an average of 76.1 percent of FPS transactions (volume) in 2024.
- As of 2024, only a few countries (Argentina, Brazil, Peru, and Colombia) have deployed dedicated P2M functionality, with a few others in the process of implementation
- FPS across the region also remain underutilized for large-volume recurrent payment streams such as government payments, bill payments, and mass-transit payments.
- Cross-border payments are another key opportunity
- Use-case diversification is also instrumental to sustainability and ecosystem growth.

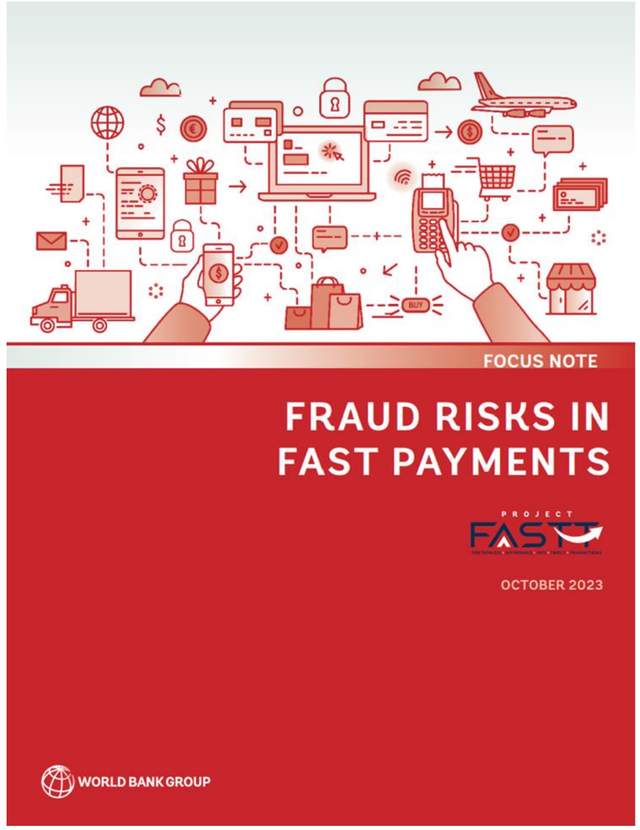
FIGURE 7 **P2P remains the dominant FPS use case in most LAC-11 countries**

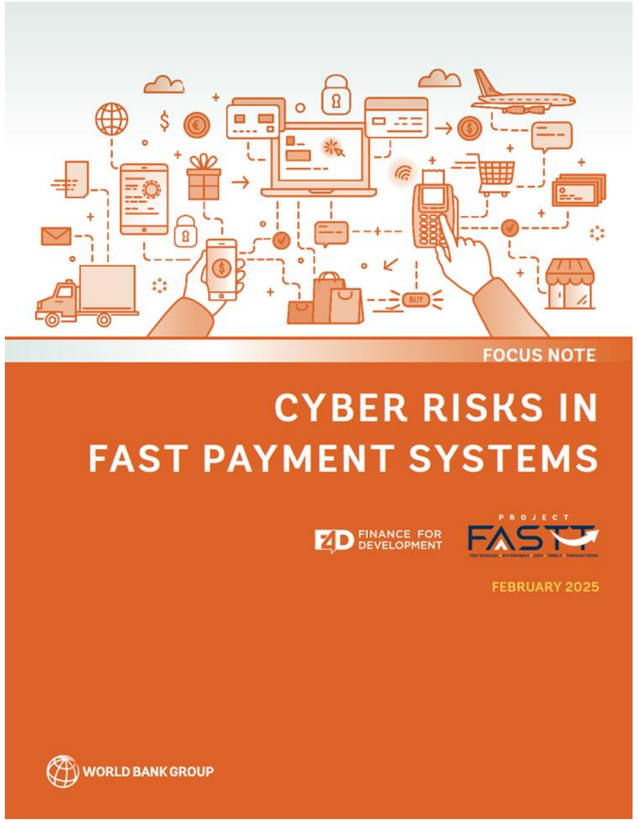


Source: Author's elaboration with data provided by central banks.
Note: The figure includes countries that reported FPS Volume disaggregated by use case.

POLICY MESSAGE 4: THE SUSTAINABLE GROWTH OF FAST PAYMENTS REQUIRES URGENT ACTION TO ADDRESS FRAUD AND SECURITY CHALLENGES AND ENSURE OPERATIONAL RESILIENCE

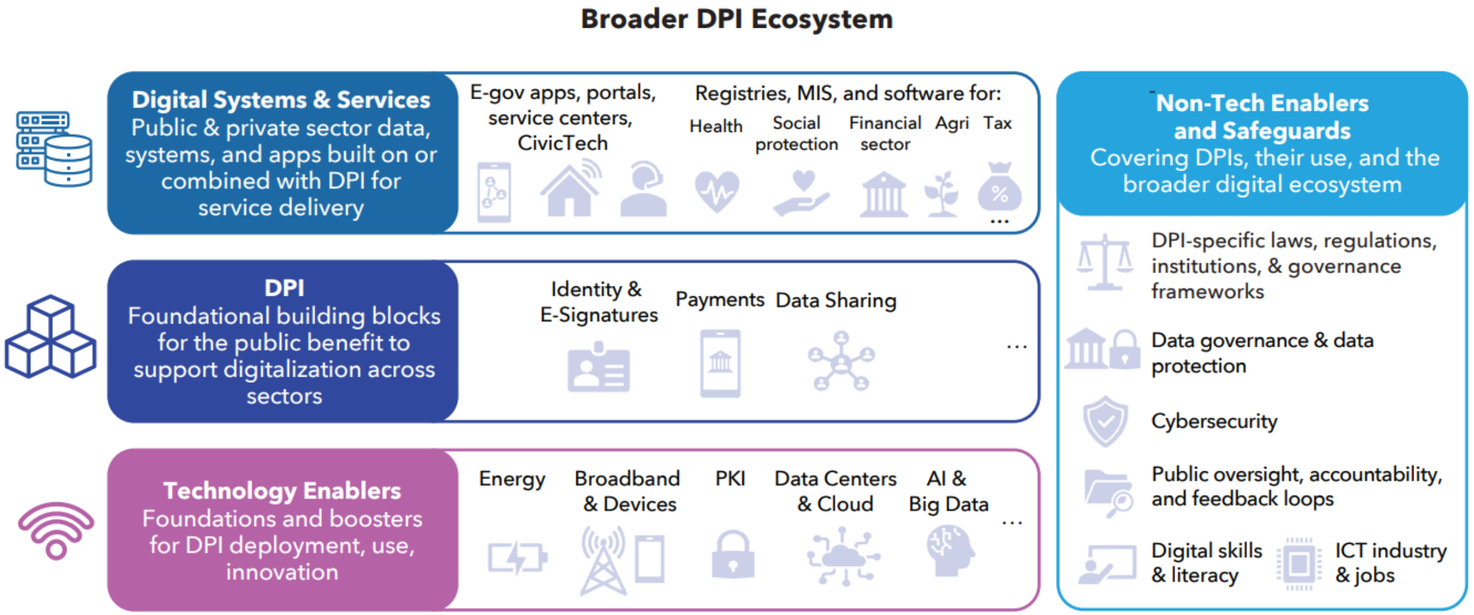
- FPS are attractive targets for fraud due to their speed, finality, and relative novelty.
- In Brazil, the value of Pix fraud increased more than sixfold between 2023 and 2024 while still accounting for less than 1 percent of Pix volumes
- However, most countries in LAC do not collect or report FPS fraud statistics, raising the question as to the real magnitude of this issue across the region, particularly for fast-growing FPS with less sophisticated frameworks for managing operational risk
- FPS operators should rise to the challenge and implement appropriate centralized fraud-management solutions.
- FPS operators should also implement multilayered cyber resilience frameworks based on international standards.





POLICY MESSAGE 5: STRATEGIES TO FUTURE-PROOF FPS AND ENSURE INTEGRATIONS WITH DPI CAN HELP ENSURE CONTINUED RELEVANCE AND INCREASE IMPACT

- There remains significant scope to enhance the design of FPS ecosystems in LAC to accommodate future innovations and facilitate greater integration with DPI, including digital ID systems and data-exchange frameworks
- Integration with digital ID is foundational to unlocking efficiencies in authentication, onboarding, and transaction flows across interoperable systems
- Policy makers should ensure that FPS are designed to integrate with DPIs, both domestically and across borders.
- As countries design and operationalize open-finance frameworks, these efforts and FPS reforms converge in the context of payment-initiation services
- Brazil's open-finance ecosystem effectively operates under a combination of central bank regulations and market-driven technical specifications, where (licensed) PIS providers have been integrated into the Pix ecosystem as scheme participants.



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Central Banks can take one or more different roles in FPS development initiatives, based on public policy objectives and the characteristics of the national payment ecosystem.

- Analysis of project economics and investment requirements
- RFP and procurement processes
- Structuring of the fast payment arrangement
- Definition of system specifications and operating procedures
- Settlement model considerations
- Legal and regulatory considerations
- Governance framework design
- Risk management and mitigation mechanisms, including cybersecurity aspects
- Interoperability with other systems and cross-border
- Management approach to drive ecosystem commitment
- Marketing and communication
- Assessment of access channels based on country context

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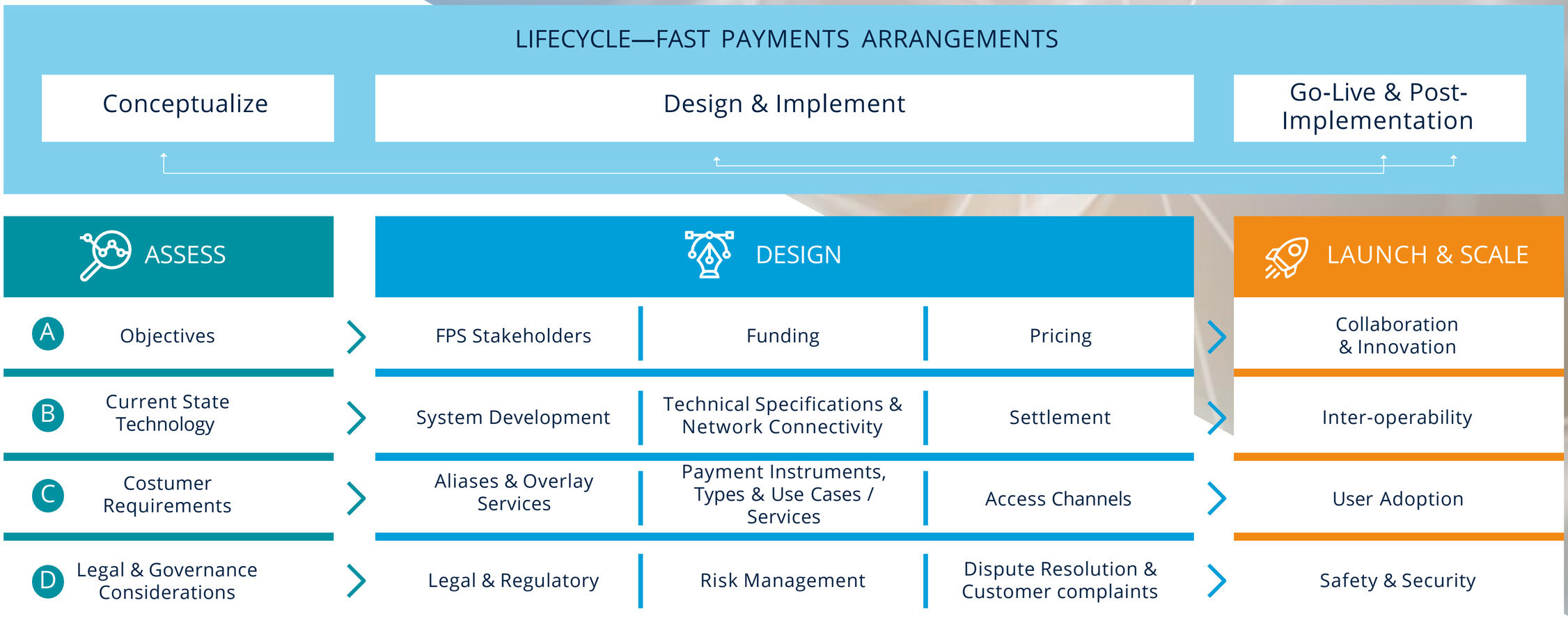
OVERVIEW OF THE FAST PAYMENTS DEVELOPMENT FRAMEWORK



PROJECT FAST

Published on **Latin America and Caribbean**

Fast payments are driving digital transformation and inclusion in Latin America and the Caribbean

DOUGLAS RANDALL, MARIA TERESA CHIMIENTI & GUILLERMO GALICIA RABADAN | NOVEMBER 05, 2025

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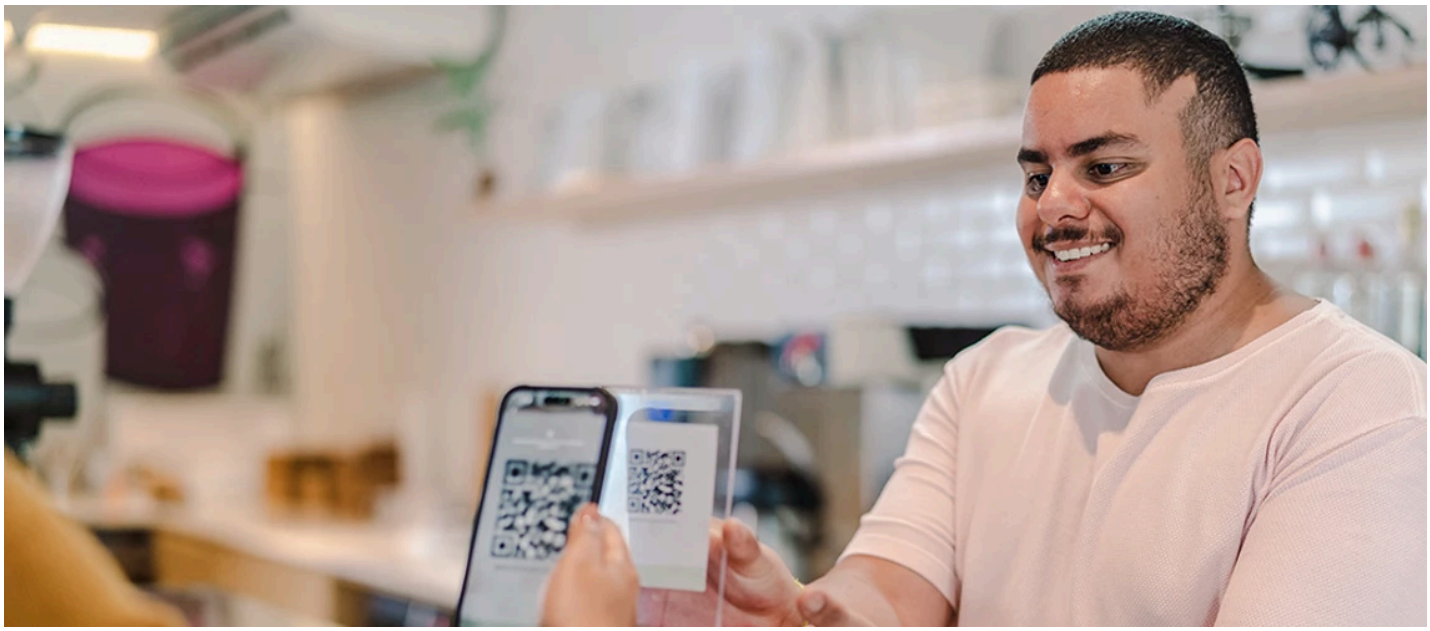


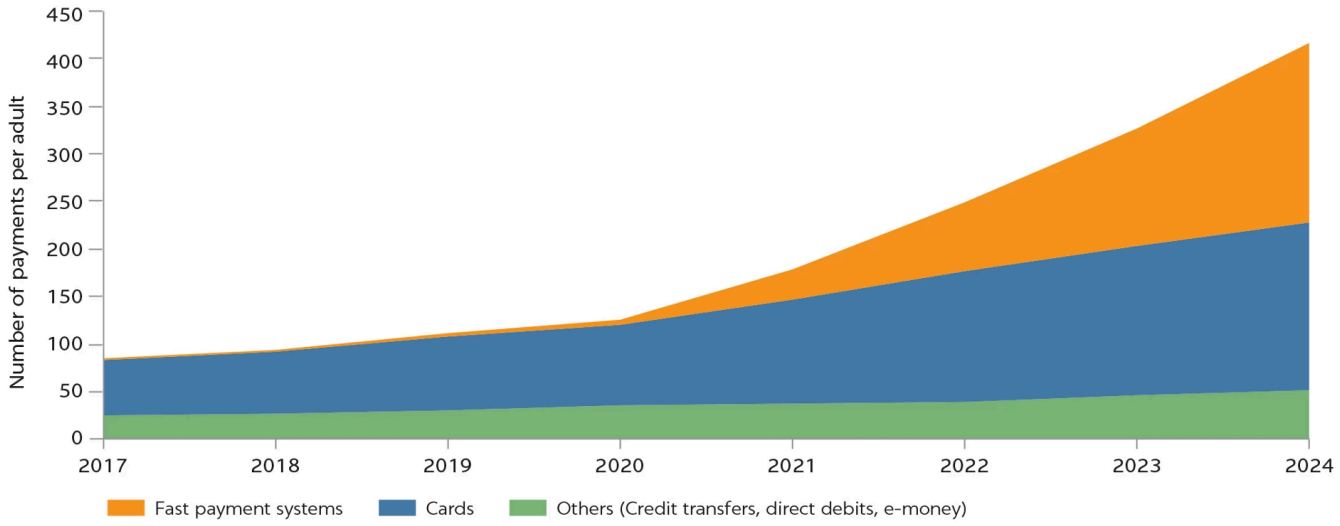
Not long ago, transferring money was a cumbersome and expensive task for most people living in Latin America and the Caribbean (LAC). It could require traveling to a bank branch during business hours, paying a fee, and waiting several days for the recipient to receive the funds. The introduction of digital wallets reduced some of these frictions, but many remained due to siloed payment infrastructures and uncompetitive markets.

However, over the past five years, the growth of fast payments—which can be sent 24/7 with real-time availability of funds to the recipient—has transformed digital finance ecosystems in the region by enhancing the speed, affordability, and user experience of digital payments𝕏.

At least a dozen LAC countries have developed fast payment systems (FPS)—the underlying infrastructure platform and a set of common rules that support fast payments—to drive digital transformation and inclusion**.** From *Sinpe* in Costa Rica, to *Pix* in Brazil, to *SPI* in Paraguay, millions of consumers across the region are now leveraging FPSs to make free or low-cost digital payments from their mobile phones, with recipients receiving the funds within seconds, regardless of their financial institution. These initiatives have helped to foster competition and innovation by leveling the playing field for payment service providers—whether large incumbent banks, cooperative financial institutions, or new fintech players.

A new report by the World Bank analyzes fresh data on FPS across 11 LAC countries and offers policy messages to support the further development of fast payments. The report finds a key inflection point began around 2020, when FPS deployments began in seven LAC countries, coinciding with a sharp increase in consumer demand for digital payments catalyzed by the COVID-19 pandemic. Our analysis shows that the number of fast payment transactions has increased 130-fold over the past eight years, from 620 million in 2017 to 79.8 billion in 2024.𝕏 Fast payments are now driving the growth of digital payments in LAC: in 2024, FPS accounted for 45 percent of digital payment volume—up from two percent in 2017—and surpassed card payment volumes for the first time.𝕏

FIGURE ES.1 **Fast payments are driving the acceleration of digital payments growth in LAC-11, now representing approximately 45 percent of centrally cleared digital payments volume**

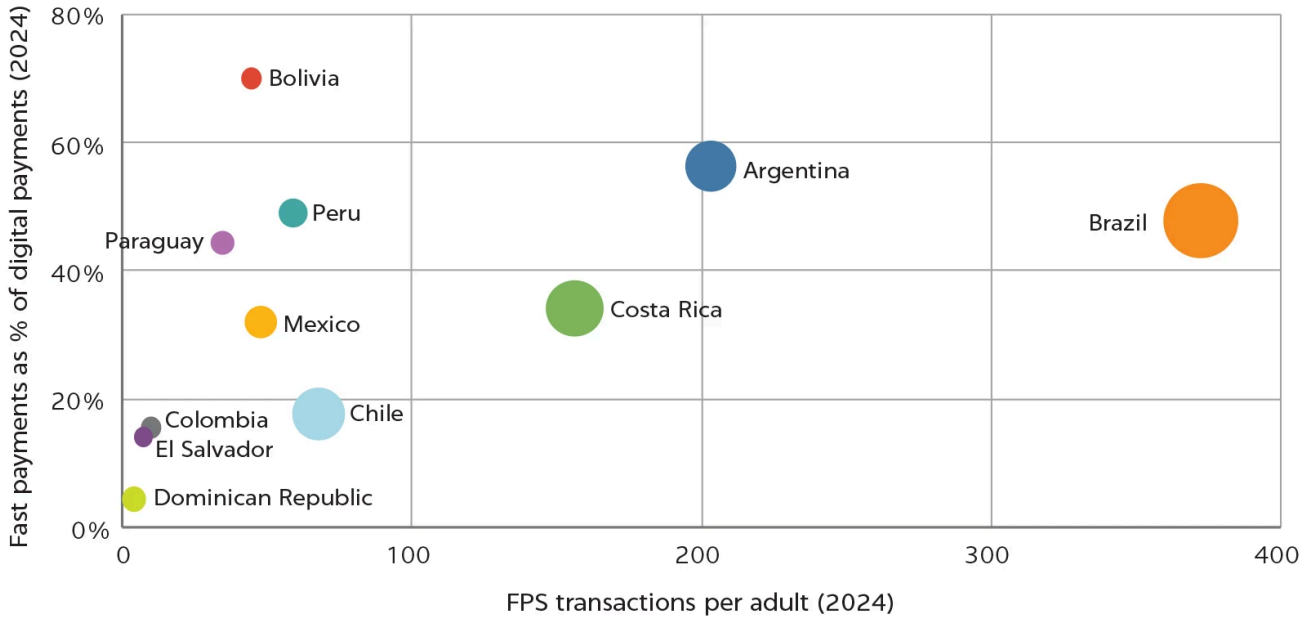


Source: Author's elaboration with data provided by central banks; United Nations Population Division (adults defined as age 15+).
Note: Data includes only centrally cleared transactions, i.e. inter-PSP transactions. "Cards" include payments made with debit, credit, and prepaid cards.

The report also shows that the 11 countries in the region have followed different FPS trajectories. Central banks have been key players through their various and evolving roles as payment system overseers, regulators, catalysts, and, increasingly, operators. Central banks now operate FPS in Brazil, Bolivia, Costa Rica, El Salvador, Mexico, and Paraguay. Fast payment systems design choices —including deployed use cases, access channels, and alias functionality—as well as governance and interoperability models, also explain the divergent trajectories of FPS across LAC.

As of 2024, three countries have emerged as top regional performers in terms of FPS transaction volumes: Brazil, Argentina, and Costa Rica (see Figure 3). Bolivia, Mexico, Paraguay, and Peru have also seen strong and sustained growth in fast payments since 2020 as their ecosystems mature. In several countries, fast payments are also gaining competitive traction within the broader ecosystem: in Argentina, Brazil, Bolivia, Paraguay, and Peru, fast payments now account for more than 40 percent of digital payment volumes.

FIGURE ES.3 **Fast payments now represent more than 40 percent of all digital payments in Argentina, Bolivia, Brazil, Paraguay, and Peru**



Source: Author's elaboration with data provided by central banks; United Nations Population Division (adults defined as age 15+).
Note: The size of the bubble represents the total number of digital payments per adult in each country. Data includes only centrally cleared transactions, i.e. inter-PSP transactions.

There is also strong evidence that fast payments are deepening digital financial inclusion through increased account usage: Across LAC, digital payments per account holder have increased from 154 to 587 payments per account holder per year, on average, with 61 percent of this growth attributable to fast payments. 𝕏 In the more mature markets, adoption of fast payments is widespread across consumer segments: In Brazil and Costa Rica, more than 75 percent of adults use *Pix* and *Sinpe*, respectively. FPS can also help spur innovation and amplify other strategies to deepen digital financial inclusion, such as open finance.

Despite recent progress, most LAC countries have significant scope to catch up to the top-performers regionally and worldwide. FPS ecosystems in some LAC countries remain fragmented, and most have not diversified use cases beyond person-to-person (P2P) payments, threatening long-term sustainability. And several countries —particularly those in Central America and the Caribbean—are just now beginning to develop their fast payment ecosystems.

To drive this agenda forward, we recommend that policymakers and private sector participants prioritize the following reforms:

- Ensure nonbank access and effective interoperability—within and across FPS—

- Governance arrangements for FPS should ensure alignment with public policy objectives and a level playing field for private sector operators
- Diversify use cases beyond P2P payments to include person-to-merchant (P2M) and bill and government payments in order to drive adoption and innovation
- Address fraud and operational resilience challenges to build trust and ensure the sustainable growth of fast payments
- Develop strategies to future-proof FPS and pursue integration with other digital public infrastructures to increase impact and ensure continued relevance

The momentum behind the fast payment agenda in Latin America and the Caribbean is very promising and suggests that universal digital financial inclusion may soon be a reality in the region.

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Enclosure 8

Considerations and Lessons for the Development and Implementation of FAST PAYMENT SYSTEMS

Part of the World Bank Fast Payments Toolkit

MAIN REPORT • SEPTEMBER 2021

WORLD BANK GROUP

FINANCE, COMPETITIVENESS & INNOVATION GLOBAL PRACTICE
Payment Systems Development Group

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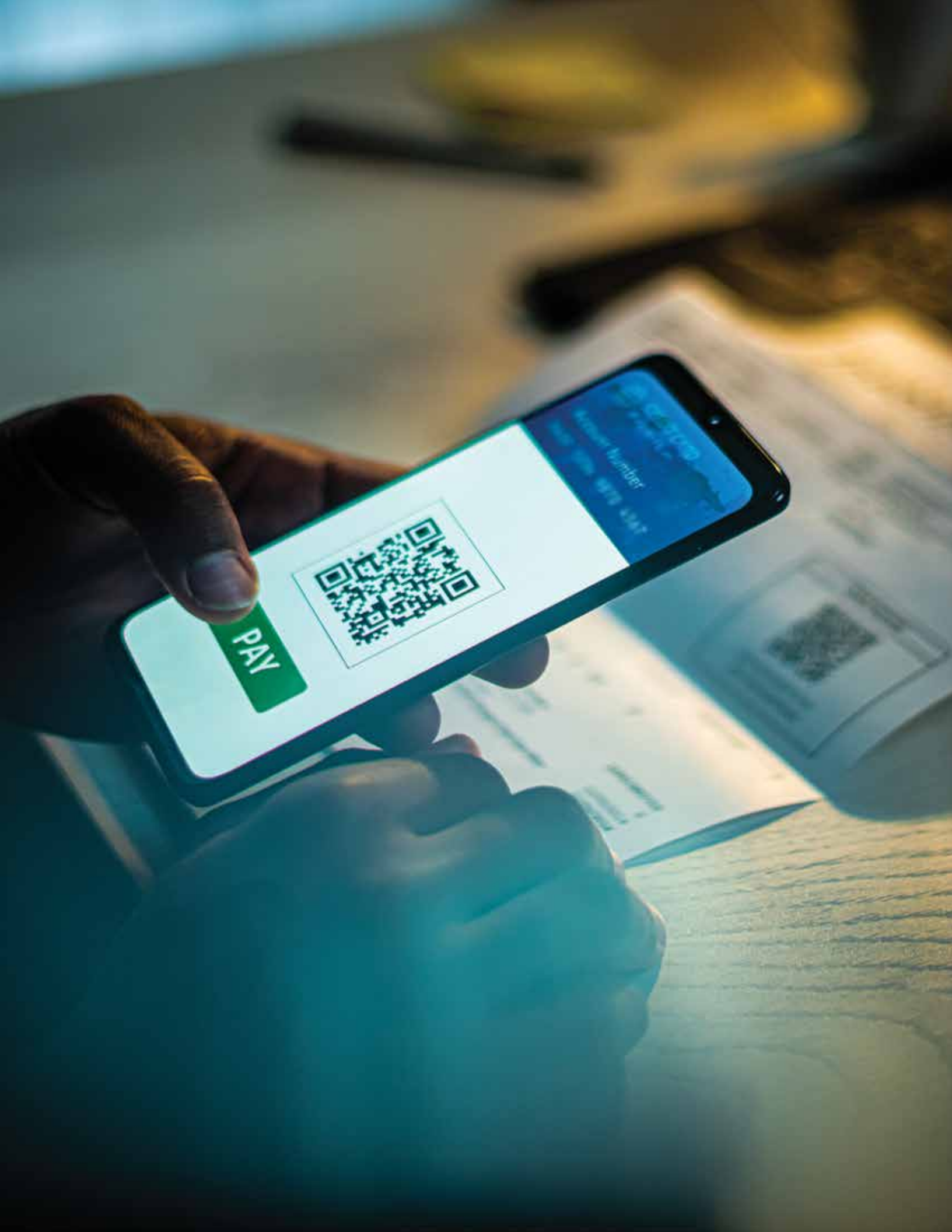
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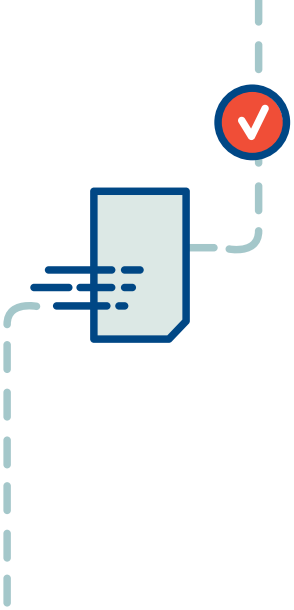


EXECUTIVE SUMMARY

BACKGROUND AND CONTEXT

For more than two decades, the World Bank has guided and supported jurisdictions as they develop a safe, reliable, and efficient National Payments System (NPS). In this context, the World Bank has been monitoring developments in fast payments and has undertaken a detailed study of fast payment implementations across the world. The policy toolkit provides guidance on the aspects that authorities need to consider when developing a Fast Payment System (FPS) and incorporating the same in their NPS reform agenda. The toolkit is based on the analysis of multiple FPS implementations across the world.

The Fast Payments Toolkit consists of the following three components. Moreover, a dedicated website (https://fastpayments.worldbank.org) has been created to house the document, along with the components, and is expected to be updated periodically to track fast payment implementations around the world.

1. Considerations and Lessons for the Development and Implementation of Fast Payment Systems (this report/guide)
2. Detailed analysis of FPS in a set of representative jurisdictions
3. Focus notes on specific technical topics deemed highly relevant for fast payments (see figure 4)

The specific tool that is developed in this guide has been informed mainly by 16 deep-dive jurisdiction reports. These 16 jurisdictions, while not exhaustive, are quite diverse in terms of their models/approaches to implementing and operating their fast payment arrangement.[1] Therefore, the guide is general enough to be applicable to different country circumstances.

The guide is being made publicly available along with the 16 deep-dive reports and 16 specific technical topic notes. Intermediate desk research on the global landscape and the exploration of an additional 25 jurisdictions have also informed the guide.

DEFINITIONS

Fast payments (also referred to as "instant payments," "real-time payments," and "immediate payments") are payments where the transmission of the payment message and the availability of final funds to the payee occur in real time or near real time, and as near to 24 hours a day, seven days a week (24/7) as possible. The associated service offered by payment service providers (PSPs) is referred to as a *fast payment service,* and the underlying scheme and system is referred to as a *fast payment scheme* and *fast payment system*.

FPSs come in various flavors. Some are newly purpose-built systems; others are part of an existing payment system and are simply a new scheme (enhancement using the existing system) or service. Further, some have a number of fea-

tures, some of which are offered as overlay services. Hence, to account for these differing implementation options, the term *fast payment arrangements* is used in the report. When referring to a specific system, the term *FPS* is used.[2] When referring to a specific scheme, the term *fast payment scheme* is used. And when referring to a specific service, the term *fast payment service* is used.

The features that characterize fast payment arrangement vis-à-vis other types of payment systems are discussed in box 1.

METHODOLOGY AND KEY CONSIDERATIONS

The analysis presented in this guide has been structured on the basis of a Fast Payment Framework, created *ex profeso* and illustrated in figure 1.

Module A: Three insights are covered in this module: motivation to introduce fast payments; stakeholder ecosystem and approach to setting up a fast payment arrangement; and funding and pricing aspects.

Module B: This module focuses on assessing the current state of technology in aspects such as payment processing and telecommunications. Five insights are covered in this module: infrastructure development; technical specifications; network connectivity; clearing and settlement; and interoperability.

Module C: This module focuses on assessing customers' needs, such as speed, payment certainty, simple and convenient user experience, pricing, clarity on the timing of delivery, and integration with bank account/mobile wallet/e-money, among others. Four specific insights are covered in this module: payment instruments, payment types supported, and use cases/services; overlay services and aliases; access channels; and user uptake.

Module D: This module focuses on some institutional requirements pertaining to fast payments. Three key insights are discussed here: legal and regulatory considerations; risk management; and customer dispute resolution. Some of these aspects are typically covered under the scheme rules of a payment system. Scheme rules define the way the system will operate and the behavior and interaction of partic-

BOX 1 FAST PAYMENTS VERSUS OTHER TYPES OF PAYMENT SYSTEM ARRANGEMENTS

Conceptually, the characteristic features of fast payments are real-time availability of funds to the beneficiary and the possibility to make payments 24/7/365 or close enough, regardless of the amount and type of beneficiary (as long as the latter has an account where the funds can be credited).

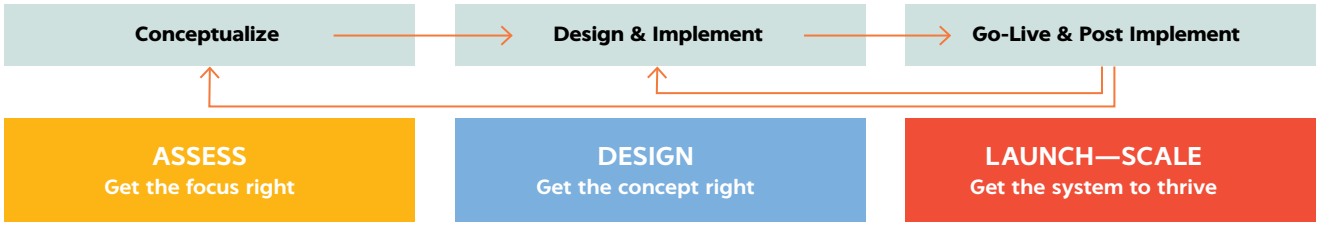
Other payment systems, such as real-time gross settlement (RTGS) systems, already give the possibility to credit an end user's account in real time. The materialization of this depends largely on the technical interfaces developed by RTGS participants between the system and their internal core banking systems.

In contrast, most RTGS systems are not able to fulfill the other feature of offering round-the-clock availability for ordering and executing real-time payments. Indeed, round-the-clock availability of real-time payments is a clear differentiator of fast payment arrangements versus other payment systems.[3]

Beyond these core characteristics, the technology behind many fast payment arrangements supports the development and launch of multiple, previously unheard of, value-added functionalities and services for end users (payers and payees). Those new functionalities promote and facilitate increased uptake and regular usage of fast payments for multiple purposes. This is a significant difference between them and RTGS systems, as most of the latter were built to cater solely to the needs of banks—and eventually other participating PSPs.

For operators and overseers/regulators, real-time availability of funds to beneficiaries and round-the-clock availability of systems to execute payments also raise some unique challenges. Robust management of operational risks, including business continuity, is more important than ever to ensure ongoing trust in fast payments. Moreover, possibilities for committing fraud seem to have expanded, as there is no lag between when a payment is initiated and when the funds are transferred to the beneficiary, coupled with settlement finality offered by most fast payment arrangements.

FIGURE 1: Overview of Fast Payments Framework



Module A: Structure—Covers an assessment of objectives and developing structural and pricing components in order to drive collaboration and innovation of the fast payment arrangement

Module B: Specifications—Covers an assessment of technology and designing technical specifications and development components to achieve interoperability

Module C: Features—Covers an assessment of customer requirements and determining payment instruments, payment types, use cases and access channels with the goal of driving up user uptake

Module D: Legal and Governance Considerations—Covers an assessment of governance requirements and deciding legal and regulatory frameworks, risk management practices, and dispute resolution mechanisms in order to enhance safety and security

ipants. Scheme rules are defined to minimize risks, maintain integrity, and provide a common, convenient, secure, reliable, and seamless payment experience to customers.

Insights into the various aspects that are highly relevant for fast payments are mapped to the various modules of the Fast Payment Framework, and on this basis, key considerations and learnings are drawn.

Overall, the analysis has clearly shown that the key levers for the adoption and uptake of fast payments have been the immediate availability of funds, even for small-value transactions, and the catalyst role of central bank in fostering the development of fast payment systems.

Other crucial elements that have fostered uptake include the following:

i. Coverage and openness of the fast payment arrangement, including a large variety of use cases, participation of a wide range of PSPs, and affordable pricing

ii. Convenience and ease of access, including accessibility through mobile phones, the use of aliases such as mobile numbers, the use of application programming interfaces (APIs), and common messaging standards

iii. A robust preexisting market context—namely, penetration of internet and mobile phones, quality and speed of other payment options, and overall competitiveness of the payments market

iv. Awareness-raising and educational campaigns for end users by public authorities, operators, and participants

LESSONS LEARNED AND FORWARD OUTLOOK

The more detailed key findings and learnings target specific—often multiple—stakeholders and are organized across the typical life cycle of a payment infrastructure project, as depicted in table 1.

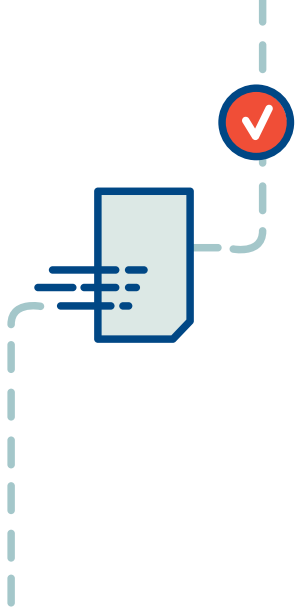
TABLE 1: Key Learnings

PROJECT CONCEPTUALIZATION STAGE			
1	Have clarity on the objective, including motivations/drivers for developing fast payment services in their jurisdiction.	5	Develop a plan for investing in infrastructure and recovering cost over a period of time, and avoid focusing on achieving profitability in the short run. The central bank should work together with stakeholders to identify the long-term benefits of the project (direct and indirect) and the broader long-term interests of the NPS.
2	Obtain knowledge of fast payment arrangements in other jurisdictions, including the key features of their operating models and service offerings.	6	Develop a good understanding of the infrastructure available in the broader ecosystem (for example, phone and communication network penetration) to determine which user needs and expectations the fast payment arrangement will be able to meet at launch and in its early stages of development.
3	As part of the design, focus on establishing a core platform and associated services on top of which other stakeholders can innovate and build further services.	7	Give due regard to the existing payments infrastructure setup, including such aspects as current familiarity with real-time payments, instruments available (for example, push and pull), NPS integration, support of use cases, settlement models, the accounting practices applicable to payments, and other banking activities operating 24/7, among others.
4	Underpin the business case with a clear vision of the role for the fast payment arrangement in terms of use cases and services it can offer to PSPs and the market in general. This is critical for developing a credible business plan and garnering industry support.	8	Study the existing internal infrastructure of banks and other potential PSPs and assess their ability to achieve immediate fund transfers with certainty. Jurisdictions could consider agreeing on minimum criteria for participation up front, in a way that ensures that at least the major banks and some other smaller banks and non-bank PSPs can be ready to join by the predecided "go-live" date.
PROJECT DESIGN AND IMPLEMENTATION STAGE			
9	Assign a top-notch project-management team. • The relevant stakeholders should also identify personnel with experience and competency and assign them the responsibility of project development and implementation. They should also be made duly accountable for the project. • Ensure continuity of the people/team assigned to this task to avoid delays in implementation.	16	Ensure fair, transparent, and risk-based access criteria that do not preclude membership based on institution type. This is critical to foster innovation and ongoing competition in the payment ecosystem, recognizing, though, that many smaller and mid-sized PSPs may opt for indirect participation, given the financial and technical requirements for direct participation.
10	Ensure structured planning and implementation to help mitigate implementation delays, including those related to stakeholder onboarding. It is essential to give participants sufficient time to adapt—that is, for contract negotiation, internal system development, and implementation.	17	Consider using APIs that have proven most useful for the connectivity of smaller participants and of other third parties (for example, entities that provide payment-initiation services), and to foster standardization of APIs in the payments market.
11	Going live with a basic service—with limited features—can be a good strategy to get the ball rolling. The design of the fast payment arrangement should nevertheless be flexible enough to accommodate multiple use cases/services based on dynamic market needs (that is, the "plug and play" approach).	18	Ensure that the pricing scheme(s) for participants promotes quick participant adoption. The joining fee, fixed fees (if any), and variable fees should not act as barriers for smaller players. At the same time, the operator should ensure sustainability in the medium- to long-term timeframe.
12	Consider user experience as a critical factor that needs to be kept in mind while designing and developing a fast payment arrangement. Focus should be placed on providing a seamless experience across all access channels. The elements that help enhance the customer experience include the use of aliases and services provided by third parties (for example, payment initiation).	19	Ensure that pricing policies for end users foster uptake in the short term, for which public authorities may encourage participants to offer fast payments as a low-cost (or even zero-cost) payment service. However, in the medium term, this will need to be reconsidered to ensure that participants have an incentive to introduce additional services and features.
13	Design and implement a strong governance framework for the fast payment arrangement. All participants (banks and non-banks) should be represented and have a say in the decision-making. The voices of external key parties, such as fintechs and telcos, also need to be heard and given due consideration.	20	Give due attention to the type of messaging standard adopted. The decision to adopt a particular message standard—proprietary or ISO—should be based on a careful analysis of the costs and benefits and factor in the need to facilitate the interoperability of domestic payment systems and, eventually, to enable cross-border payments. While other possibilities exist, ISO 20022 is emerging as a leading messaging standard for fast payments.

TABLE 1, *continued*

14	Undertake comprehensive testing before launch (operator and participants). A fully functional central testing platform for intra- and inter-participant testing can help identify issues early in the implementation phase.	21	Establish a clear, documented, effective risk-management framework to identify, measure, monitor, and manage the various risks, including those concerning potential criminal activity (for example, money laundering, the financing of terrorism, cyberattacks, and data breaches). Participants should also be mandated by their supervisor to set up robust internal controls for operational risks.
15	Have a comprehensive rulebook that contains all relevant rules, parameters, standards, and controls for the operational efficiency and overall soundness of the fast payment arrangement. This also promotes a level playing field for participants.	22	Agree on the settlement model and measures for the mitigation of settlement risk between operators/manager and operator/manager and participants. The measures should be cost efficient. Key decision factors include whether non-banks will be direct participants (for example, settling operations on their own behalf) and the specifics of the local ecosystem (for example, settlement services provided by the central bank or commercial banks).
PROJECT "GO-LIVE" AND POST-IMPLEMENTATION STAGE			
23	Collaborate during post-implementation to ensure that the fast payment arrangement will be able to reach its maximum potential over time.	27	Review risk-management frameworks periodically to mitigate evolving requirements and threats, including cyber. Technologies such as artificial intelligence and machine learning can help operators/managers detect failures in compliance and combat evolving threats.
24	Generate customer awareness in the initial years to increase registrations and uptake. Customers often require handholding to familiarize themselves with the new service and its functionalities.	28	Adapt some of the oversight tools and overall approach when it comes to fast payments, to ensure that the relevant systems or underlying arrangements operate safely and efficiently on an ongoing basis (applicable for regulators/overseers).
25	Keep the customer registration process simple, to increase uptake.	29	Leverage payments data to introduce innovative and customized solutions for end users (for system operators and system participants) without compromising data-protection and privacy aspects.
26	Adopt a product road map approach for new use cases/services and functionalities that shares the vision of the owner/operator with all participants (and other relevant stakeholders, such as telcos), ensuring that these stakeholders will be able to adopt these changes in a timely manner.	30	Evaluate on an ongoing basis whether the system continues to meet the evolving ecosystem needs; fosters the safety, efficiency, and reliability of the NPS; and has the right governance arrangements. Take appropriate actions based on the evaluation.

Finally, while many jurisdictions have implemented fast payments, their paths have varied significantly, owing to differences in the regulatory environment, support from the broader ecosystem, consumer preferences, support from the existing payments and ICT infrastructure, and existing/competing offerings. Each jurisdiction's uptake, experiences, and success have also varied. Similarly, the ownership and operating models have varied, and no particular model is more likely to succeed or fail.



1 INTRODUCTION

EMERGENCE OF FAST PAYMENTS

For what concerns payment infrastructures, in most jurisdictions, the National Payments System (NPS) traditionally comprised a real-time gross settlement (RTGS) system for large-value and time-critical payments; an automated clearing house (ACH) for lower-value payments (for example, using electronic fund transfer instruments or checks); card payment processing systems/switches; e-money clearinghouses (some jurisdictions are merging this with card payment infrastructure and, in a few cases, with ACH systems); and mechanisms for cross-border payments.

The global payments industry is nevertheless experiencing a paradigm shift driven by technological innovation, the changing priorities of central banks and other public authorities,[4] changes in economics, demographics, and customer needs for faster, cheaper, and more convenient means of making payments. As part of this evolution, a new type of payment service, fast payments, emerged and has been rapidly gaining track worldwide. Appendix C of this guide provides details on the main features and evolution of, and current trends in, fast payments.

Some of the benefits of fast payments derive from their effect on competition and potential to bolster dynamic efficiency gains. Immediate access to funds, coupled with low fees, can reduce what economists refer to as "switching costs" and make it easier to use multiple accounts. Switching costs are barriers to changing accounts and can include those costs that may impede clients from using different institutions to conducting different types of transactions. Fees, delays in access to funds, and impediments posed by user experience or operational constraints may dissuade cli-

BOX 2 DEFINING FAST PAYMENTS

The Committee on Payments and Market Infrastructures (CPMI) of the Bank for International Settlements defines fast payments as follows:

"Fast payments are defined as payments in which the transmission of the payment message and the availability of final funds to the payee occur in real time or near real time and on as near to a 24-hour and 7-day (24/7) basis as possible."

For the purposes of this guide, emphasis is placed on the immediate availability of funds to the beneficiary of a fast payment transaction—which can be an individual, a firm, or a government agency—and that these transactions can be made during an operational window during the day that is as large as possible, tending toward 24/7 availability.

ents from using a different institution for a transaction, even if they would derive other gains from doing so, such as from higher interest rates or lower fees.

A reduction in these frictions can also have an impact on what is referred to as "multihoming." This relates primarily to multisided platforms, of which retail payment systems are an example. Clients may choose to use a single platform (for example, an account or payment service) or may subscribe to multiple platforms (multihoming) to interact with different users and services or benefit from differential pricing. An example would be when clients hold an account with a conventional retail bank as well as an e-commerce payment service provider (PSP). They may be able to transact (or have significant advantages) with merchants on Alibaba only from their Alipay account; other payment services, such as for the receipt of salaries or to make interbank transfers, may require an account at a retail bank.

FPSs can also enhance "platform competition" for retail payments. Traditionally, alongside cash, card payment networks in most countries have dominated retail payments. With some exceptions, credit transfer systems were not used to make time-sensitive payments at the point of sale. FPSs, coupled in particular with the evolution of payment initiation and merchant services, are changing this. Open banking arrangements are enabling new independent providers to offer more choices to both merchants and consumers, enabling fast payments to compete with card networks and beginning to focus more competition on value-added services.

Fast payments have important but ambiguous effects on multibanking.[5] On the one hand, if FPSs have broad network reach or are accompanied by extensions in interoperability, in theory they can diminish the need for clients to hold multiple payment accounts in which they hold deposits. Knowing they can reach many or most other transaction counterparts quickly, or connect their account via payment overlay services, they may choose to concentrate their funds in a primary institution. On the other hand, reductions in barriers to making transfers between accounts may lead to an increase in multihoming. Consumers may be able to choose more readily between different service providers for different kinds of payments and other financial services in the knowledge that they can transfer funds between them instantly at little or no cost. This can shift the focus of competition between financial institutions away from price and network reach toward other features, such as interest rates or value-added services.

The pro-competition effects of fast payments may already be playing a role in some markets. For instance, in the corporate world, where instant low-cost transfers have been available for many years, multiple accounts have long been used to "sweep" balances overnight from different institutions into a single cash-management institution. Similarly, in retail markets, while the specific impact of fast payments is difficult to disentangle from other forces, it is reasonable to expect that speed and ease of transfers diminish barriers to picking different services from different institutions.

While the specific cause and effect may be difficult to distinguish, it seems likely that fast payments can have beneficial impacts on contestability and competition between services. To achieve this, they should be coupled with improved access mechanisms (for example, apps), low fees, and a wide scope of participants or transaction counterparts. The immediacy and ease with which funds can be transferred between such accounts is likely to enhance competition between, and uptake of, third-party services beyond those offered by the institution at which a current account is held.

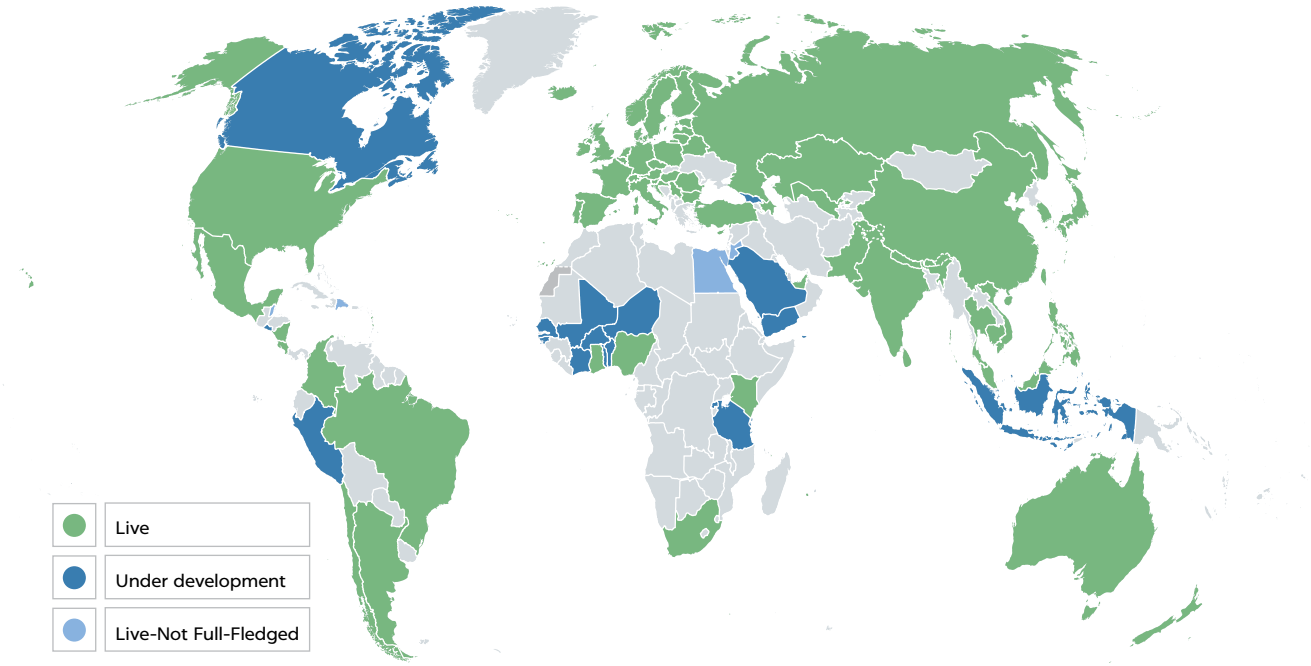
Among others, fast payments also play a key role in the digitization of government payments, either as critical infrastructure in the end-to-end government's payments architecture or by providing incentives for the adoption of digital payments by the end user. Fast payments have positive direct and indirect spillovers in the digitization of government payments when they are leveraged in the government's payments architecture or when fast payments are made available to the public on a general basis. One direct benefit of leveraging fast payments through the government's payments architecture is real-time collection of revenue, which allows the government to increase its expenditure capacity and efficiency. A similar benefit is perceived from disbursement of time-sensitive payments, such as wages, vendor's payments, and social-protection payments. For the latter, in most cases, social-protection payments are directed to vulnerable segments of the population, and for many recipients, such payments constitute their main source of income—hence, the relevance of leveraging payments infrastructure that allows the delivery of financial aid in the expected time. Furthermore, payments made by the government to address emergency situations are supported by fast payment schemes, which allow the completion of urgent transactions in real time and the delivery of financial aid in a timely manner.

Currently, several jurisdictions across the globe have implemented fast payments, and several others have announced their plans to go live.[6] These are illustrated in figure 2.[7]

Many of these implementations have been propelled—if not directly led—by central banks. The basic principle across all the jurisdictions remains essentially the same: to provide a fund transfer facility through which final beneficiaries can be credited in real time and that is available for making payments for as many hours as possible each day.

The growth in the contribution of fast payments has been significant. Figure 3 shows the yearly transaction value processed via the fast payment arrangement in selected jurisdiction as well as the number of fast payment transactions per capita.

FIGURE 2: Global Fast Payments Landscape[8]



Note: SCT Inst and BCEAO have been considered as a single jurisdiction

FIGURE 3: Fast Payment Statistics across Select Jurisdictions (2019)[9]

JURISDICTION	SYSTEM NAME (YEAR OF LAUNCH)	TRANSACTION VALUE AS PERCENTAGE OF GDP	TRANSACTION VOLUME PER CAPITA
Australia	NPP (2018)	12%	10.84
Bahrain	Fawri+ (2015)	4%	3.84
China	IBPS (2010)	112%	10.02
Hong Kong SAR, China	FPS	29%	5.82
India	UPI (2016)	15%	9.16
Nigeria	NIBSS Instant Payment (2011)	81%	7.05
Thailand	PromptPay (2016)	78%	36.85
UK	FPS (2008)	88%	36.46

ELEMENTS UNDERLYING A FAST PAYMENT ARRANGEMENT

In practice, fast payment arrangements consist of the following components or layers, known to form a payment system:

- The core clearing and settlement infrastructure: Some fast payment arrangements run existing/incumbent platforms; in other cases, a brand-new platform has been created *ex profeso* for fast payments.
- The operator, which can be a private-sector, public sector entity, or based on a public-private sector model
- The scheme or rulebook that governs the relationship between the participants, the operator, and other relevant parties[10]
- The overseer (and eventually also the regulator), which is typically the central bank
- Participating institutions
- End-user solution(s)
- Overlay services

To account for differing implementation options, the term *fast payment arrangements* is used throughout this document. When referring to a specific system the term *FPS* is used.[11] When referring to a specific scheme the term *fast payment scheme* is used. And when referring to a specific service, the term *fast payment service* is used.

All these elements are described in the following chapters of this report on the basis of the empirical findings from the analysis of specific FPSs. (See figure 4.)

2 THE FAST PAYMENTS TOOLKIT

The development and implementation of a safe, reliable, and efficient NPS is a crucial component of the World Bank's work in the financial sector, given its link to financial inclusion, stability, and economic development. In its unique role in guiding and supporting jurisdictions as they develop payments and market infrastructure, the World Bank has undertaken a study of fast payment implementations across the world to develop this policy toolkit for fast payment development and implementation (hereinafter the *Fast Payments Toolkit* or *toolkit*).

The toolkit has been designed to guide jurisdictions and regions on the likely alternatives and models that could assist them in their policy and implementation choices when they embark on their own fast payment implementation journeys.

The guide, the deep-dive reports for 16 jurisdictions, and the focus notes are being made available as part of the Fast Payments Toolkit. (See chart 1.)

FIGURE 4: The Fast Payments Toolkit

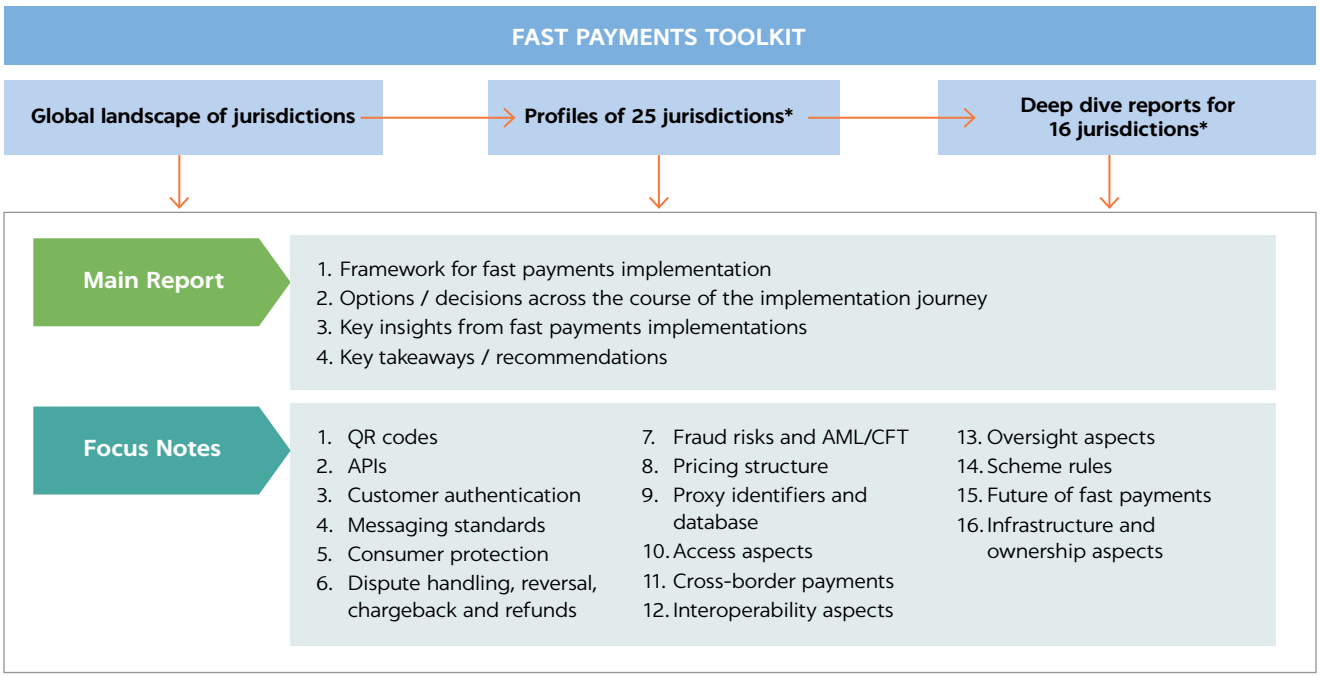


CHART 1: Fast Payments Toolkit Illustration

COMPONENT	OUTCOME
Global landscape	Overview of global FPS landscape, containing information on: • Fast payments overview • Customer features • Technological capabilities • System participation
16 Deep-dive reports/case studies	16 in-depth reports: 1. Australia: NPP 2. Bahrain: Fawri+ 3. Chile: TEF 4. China: IBPS 5. European Union: SCT Inst 6. Hong Kong SAR, China: Faster Payment System (FPS) 7. India: UPI and IMPS 8. Kenya: PesaLink 9. Malaysia: RPP 10. Mexico: SPEI 11. Nigeria: NIP 12. Poland: Express Elixir 13. Singapore: FAST 14. Thailand: PromptPay 15. United Kingdom: Faster Payments Service (FPS) 16. United States: RTP
16 Focus technical notes (as stand-alone notes)	Specific topic notes on topics of foundational and technical relevance to assist in fast payment implementations.

3 FRAMEWORK FOR ANALYZING FAST PAYMENT DEVELOPMENTS

As part of this guide, a framework for analyzing fast payment developments (hereinafter the *Fast Payments Framework*) has been created. This framework considers facts and experiences from all jurisdictions studied, but the main inputs have been extracted from the 16 jurisdictions in which a deep-dive analysis was performed. These 16 jurisdictions, while not exhaustive, are quite diverse in terms of their models/approaches to implementing and operating their fast payment arrangement. Indeed, the selection of these 16 jurisdictions was not random; rather, the express intent was to get a diverse mix of countries across various geographic regions and also adequate coverage across matured or developed and emerging economies.[12] Therefore, the proposed framework is considered general enough to be applicable to different country circumstances.

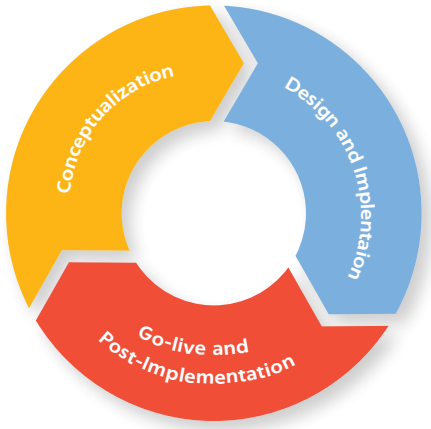
This Fast Payments Framework has two components: phases, and thematic areas or modules.

In turn, there are three phases: (i) assess; (ii) design; and (iii) launch and scale. These are aligned to a project development life cycle that suits fast payments and is illustrated in figure 5.

Then there are four broad thematic areas/modules: (a) the structure of the fast payment arrangements; (b) business and technical specifications and operating procedures; (c) features of the fast payment arrangement; and (d) legal, regulatory, and governance considerations and risk management. These are presented/matched under respective areas along with additional elements in figure 6.

Figure 6 accordingly collates all these components with the specific elements that ought to be looked at within each of the components. The framework is further elaborated and put into practice in section 4 of this guide.

FIGURE 5: A Project Development Life Cycle for Fast Payments



The main elements underlying each of the three phases are as follows:

- **Assess:** A detailed assessment of objectives, technology, customer requirements, and governance requirements is critical to set the right precedent. Some jurisdictions set up independent consultations to arrive at the "best" concept for their fast payment arrangement. An alternative is cooperation between the central bank and relevant stakeholders using existing cooperative bodies.
- **Design:** Key decisions are taken across multiple parameters to "get the concept right." A deep understanding of design considerations, from the structure of the fast payment arrangement to pricing and funding, technical specifications, front-end functionality, risk-management and dispute-resolution practices, and so on is essential.

- **Launch and Scale:** Once an arrangement goes live, the various stakeholders can start obtaining benefits, either directly from the new arrangement or indirectly via the competitive pressures it exerts over other service offerings. Then it is critical to get the new arrangement to thrive. The launch-and-scale phase is characterized by a need for continuous improvements and enhancements to keep up with technological advancements and evolving consumer needs.

As for the broad thematic areas or modules, these mainly cover the following aspects:

a. **Structure of the fast payment arrangement:** Focuses on the key drivers and objectives for considering the development of a fast payment project and covers an assessment of the motivations, proposed arrangements, stakeholder community, and pricing and funding issues, among others.

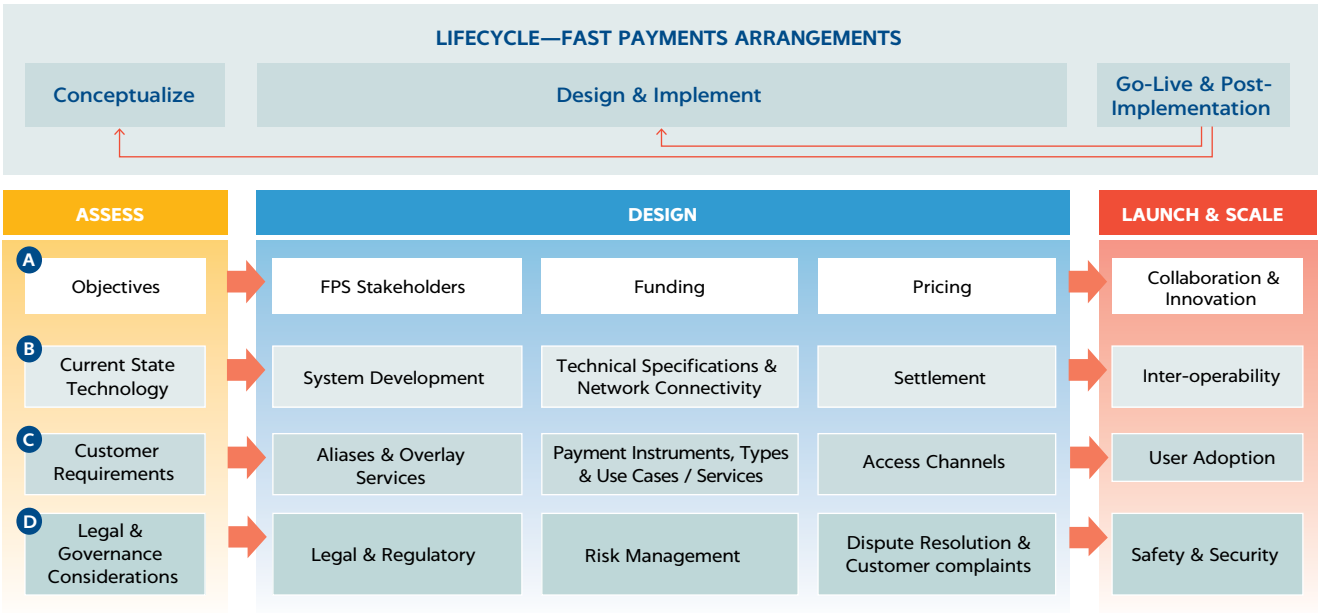
b. **System specifications and operating procedures:** Covers an assessment of technology and the determination of technical specifications and system development components.

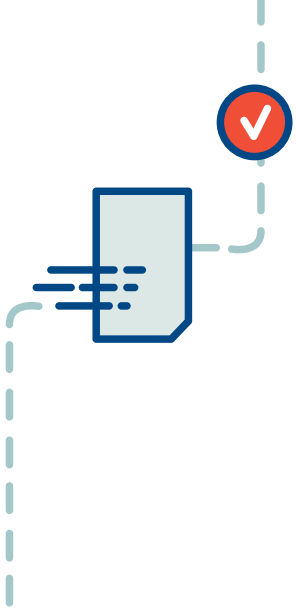
c. **Features of the fast payment arrangement:** Looks at customer requirements and determining payment instruments, payment types, uses cases, and access channels with the goal of driving up user uptake.

d. **Legal, regulatory, and governance considerations and risk management:** Covers an assessment of legal and regulatory aspects and deciding on governance requirements, risk-management practices, and other aspects to enhance safety and security.

The insights obtained from the deep-dive analyses and interviews with many other institutions are mapped to the different modules as per the proposed framework. This approach and the actual insights are analyzed in the next section of this guide.

FIGURE 6: Fast Payments Framework





4 PAINTING THE BIGGER PICTURE: WHAT HAVE WE LEARNED?

Insights into the various aspects and elements that are highly relevant for fast payments have been drawn from the comprehensive analysis of 16 jurisdictions, as well as from nearly 70 primary interviews and secondary research. These insights have been analyzed as components under the different modules. (See figure 7.)

These insights are described below, along with jurisdiction-specific inputs and any trends that may have been identified, to provide the reader with a holistic view of the decisions/options available.

4.1 MODULE A: STRUCTURE OF A FAST PAYMENT ARRANGEMENT

The following three insights are covered within this module:

- Motivation to introduce fast payments
- Stakeholder ecosystem and approach to setting up a fast payment arrangement
- Funding and pricing

4.1.1 Motivation to Introduce Fast Payments

Jurisdictions across different parts of the world have implemented fast payment arrangement (some have more than one). The motivation for going for FPS varies across such themes as financial inclusion, digitization, and driving innovation, among others. (See figure 8.)

The section below details the motivations to introduce fast payments, covering the findings and insights. These are presented under following heads: (i) stakeholder-specific drivers; (ii) public authorities' initiative/role (for example, NPS overseers, government agencies, and so on); and (iii) unique motivators.

i. Stakeholder-Specific Drivers

Perspectives on fast payments differ across stakeholders in terms of what the drivers of fast payment implementation are or ought to be.

In general, based on the analysis of 16 jurisdictions, it has been observed that when the fast payment project is led by

FIGURE 7: Components of the Different Modules

Module A: Structure
1. Motivation to introduce fast payments
2. Stakeholder ecosystem and approach to setting up fast payment arrangement
3. Funding and pricing

Module B: Specifications
1. Development of fast payment arrangement
2. Technical specifications
3. Network connectivity
4. Clearing and settlement
5. Interoperability

Module C: Features
1. Payment instruments, payment types supported and use cases/services
2. Overlay services and aliases
3. Access channels
4. User uptake

Module D: Legal & Governance Considerations
1. Legal and regulatory considerations
2. Risk management
3. Dispute resolution and customer complaints

FIGURE 8: Key Motivators for Introducing Fast Payments

FIGURE 9: Primary Fast Payments Implementation Drivers, as per Survey Findings[13]

STAKEHOLDER	PRIMARY FPS IMPLEMENTATION DRIVERS
Public authorities	• Digitization of payments • Leading innovation in the jurisdiction • Enhancing consumer experience
Operator	• Market push (recommendation by financial institutions, banking, and payments associations) • Enhancing consumer experience • Digitization of payments • Leading innovation in the jurisdiction
Payment service providers	• Better customer experience • Innovation/newer channels, use cases, and technologies • Competitor participants' fast payment offerings

the public sector, the agenda is driven by financial inclusion, payments infrastructure development, and payment digitization initiatives. (See figure 9.) Central banks have played a major role in most of these projects.

As can be observed from the jurisdiction-specific analysis in table 2, financial inclusion has served as a driver in Bahrain, India, and Mexico. In contrast, when the project is led by other stakeholders, or when the project is to enhance the basic infrastructure and functionalities already implemented, some of the drivers differ and/or are expanded—for example, toward enhancing customer experience and convenience to further incentivize customer uptake.

ii. Role of Public Authorities

The majority of surveyed regulators and participants believe that intervention and promotion of digital payment modes by the government and/or central bank at a national level is a critical driver for fast payment implementation.

In all but one of the jurisdictions shown in table 3, the central bank or other public-sector entities were directly involved in the discussions that led to the development and implementation of fast payments. In Thailand, for example, the government was involved from the conceptualization stage. In Thailand, as well as in Hong Kong SAR, China, and Malaysia, fast payments were introduced as part of a larger program of government measures. In contrast, in Poland, the development of fast payments was led by a technology and infrastructure institution of the Polish banking sector. More generally, it was found that over 75 percent of the jurisdictions included in the deep dives had a push from the central bank and/or other government agencies acting as a driver for fast payment implementation.

TABLE 2: Select Findings on Motivation

Australia	The Payments System Board of the Reserve Bank of Australia (RBA) decided to undertake a "strategic review of Innovation in the Australian payments system" in May 2010. The purpose was to identify opportunities for innovation in the Australian payments system. The conclusion of this review included the need for establishing fast payments. The key strategic objectives laid out by the RBA for the New Payments Platform (NPP) were to receive low-value payments outside normal banking hours, to send more complete remittance information with payments, and to address payments in a simple manner.
India	The overarching objectives of the Immediate Payment System (IMPS) and the Unified Payments Interface (UPI) have been facilitating financial inclusion and promoting digital payments. IMPS is a multichannel system that can be accessed using mobile, ATM, internet banking, bank branches, and so on. With the basic infrastructure in place, the Reserve Bank of India's focus expanded toward cooperation and collaboration for enhancing customer experience and convenience. To this end, an interoperable real-time 24/7 mobile-payment system, UPI, was launched in 2016.[14]
Mexico	The Interbank Electronic Payment System (SPEI) was introduced in the mid-2000s as Banco de México's new RTGS system. The objective was to process payments in real time, minimizing credit and liquidity risks. The system was designed to offer a high level of services to users and participants, including provisions for business continuity plans, adequate risk management, and legal certainty about a credit on the receipt account. Some years ago, it was upgraded to offer real-time payments 24/7. To further enhance the user experience, in 2019, Banco de México launched CoDi, which is a request-to-pay functionality that supports the use of QR codes, near-field communication (NFC), and messages through the internet for payments.
United States	In 2014, the Clearing House (TCH) launched its Future Payments Initiative based on the recommendations from its supervisory board, which consists of several industry leaders from financial institutions. The aim was to develop a strategic view of real-time payments based on an extensive study of payment needs in an increasingly digital economy. TCH worked closely with the Federal Reserve, TCH banks, and industry associations, including the National Automated Clearing House Association, American Bankers Association, Independent Community Bankers of America, National Association of Federally Insured Credit Unions, and Credit Union National Association, to identify consumer and business cases with the greatest need for fast payments that represent the best incremental value for customers. The Future Payments Initiative considered the experience and lessons from other countries that had already implemented fast payments. TCH also reviewed ways in which a fast payment arrangement for the United States could maintain and improve the safety and soundness of existing payment systems.

TABLE 3: Select Findings on Role of Governments and Regulators

Bahrain	There was a push from the government to adopt real-time transactions. The Central Bank of Bahrain consulted with the BENEFIT Company, to provide a real-time payment solution. BENEFIT also handles POS and ATM switch services in the country.
Hong Kong SAR, China	With a view to driving innovation and ushering in the era of smart banking in Hong Kong SAR, China, the Hong Kong Monetary Authority (HKMA) in 2017 introduced several major initiatives in the banking sector. One was to develop the fast payment system FPS and drive innovation by bringing e-wallets on the platform in addition to banks.
Malaysia	The Real-Time Retail Payments Platform (RPP) was created as part of a multiyear program to modernize and future-proof Malaysia's payments infrastructure. Pursuant to an industry-wide consultation facilitated by Bank Negara Malaysia (BNM), PayNet built RPP to meet the emerging and future needs of the economy. In line with the Interoperable Credit Transfer Framework issued by BNM, RPP was designed to provide fair and open access to banks and eligible non-bank PSPs, to facilitate interoperability and seamless payments between bank accounts and e-money accounts.
Poland	The introduction of fast payments was market driven. Initially, banks were hesitant to participate in it because they thought the existing system worked well. In this regard, the RTGS system took four to six hours to process transactions, which was perceived to be fast enough, and there was no need for immediate payments. Krajowa Izba Rozliczeniowa (KIR), a technology and infrastructure institution of the Polish banking sector, undertook extensive research with end users to gauge customer needs and make them aware of the benefits of introducing fast payments. Thus, KIR built consensus among customers by administering surveys and gauging their receptiveness toward the initiative and then pitched it to banks. While fast payments were initially viewed as a premium product, this view has changed over time.
Thailand	The National e-Payment Master Plan was created by the government with an objective to have an integrated digital payment infrastructure. Under this master plan, the PromptPay system was created to facilitate easy, safe, and convenient fund transfers for all—general public, businesses, and government. Initially, only bulk/batch payment service was developed in PromptPay, and it was used to transfer government welfare disbursements. This helped create awareness among the public about the system. In January 2017, the new credit transfer service was enabled in PromptPay, allowing for real-time person-to-person (P2P) interbank fund transfers.

continued

TABLE 3, *continued*

United Kingdom	In the early 2000s, the Cruickshank Report was published, providing the foundation for the development of fast payments in the country. The report pointed out the lack of innovation and need to upgrade the existing retail payment systems. (For example, even if other payment systems, such as BACS, were available, cash was still the most dominant payment instrument.) This led the government to mandate the Office of Fair Trade to provide recommendations for innovating the payments landscape in the United Kingdom. The office drafted a report that was taken to the Payment Systems Task Force, which was charged with developing fast payments to reduce the payment cycle from three days to a single day. This led to the development of the Faster Payments Service (FPS) in May 2005.

4.1.2 Fast Payment Stakeholder Ecosystem and Approach to Setting Up a Fast Payment Arrangement

The fast payment ecosystem typically consists of the central bank (and, in some cases, other regulators), the operator, the owner(s), participants, third-party providers, and end users (that is, individuals, merchants, and government agencies).

The following four aspects have emerged as key components of this insight and are covered in the sections below: (i) the division of roles between the overseer, owner, and operator; (ii) participants and access criteria; (iii) industry body collaborations; and (iv) the systemic importance of fast payment arrangements.

i. Division of Roles between the Overseer, Owner, and Operator

Central banks typically play a major role as overseers and, in some cases, also as operators (and owners) of the fast payment arrangement.

Central banks typically play the role of overseer of payment systems (and very often the broader NPS). The overseer role is generally accompanied by a regulatory function. In some cases, depending on the institutional setting, this regulatory function may be shared with a different regulatory authority or performed independently by the latter. A fast payment arrangement is usually considered a critical national payment infrastructure. Therefore, the overseer puts in place a monitoring mechanism to try to ensure that it operates in a safe and efficient manner. Toward this end, the overseer requires the operator to have adequate measures in place to address operational risk, liquidity risks, security, anti-money-laundering (AML), and other relevant aspects.

Box 3 provides details on observed ownership alternatives of fast payment arrangements. Additional information on ownership and funding is provided in section 4.1.3.

The operator or scheme owner is responsible for ensuring compliance with the scheme rulebook, operating procedures, and official regulations. The operator can be a separate legal entity owned by participating commercial banks and, in some cases, by the central bank on its own or jointly with participants. The operator may be a subsidiary of the central bank. As shown in table 4, the latter is the case in China, Hong Kong SAR, China, and Malaysia. In certain jurisdictions, such as Mexico, the central bank owns, operates, and oversees SPEI. The operator can also be a completely independent entity. It is also important to note that most jurisdictions already have existing retail payment system operators (for example, for the domestic bulk payment systems and/or payment card switch). In some cases, these same entities also operate the fast payment arrangement. For example, in Thailand, National Interbank Transaction Management and Exchange (ITMX) was chosen as PromptPay's operator, as it already had technical capabilities and was the largest payment system operator in the country. Overall, there seems to be a slight predominance of private-sector entities as operators of fast payment arrangements.

ii. Participants and Access Criteria

Participation of banks and non-bank PSPs of varied categories is crucial to the success of the fast payment arrangement. Furthermore, to encourage participation by banks and non-bank PSPs, surveyed overseers and operators believe that regulatory push/incentives are required in the initial years following launch. Jurisdictions can have either only direct participants or a combination of direct and indirect participants.

Participants in a payment system can be direct or indirect. In the case of fast payments, direct participants are typically banks with a direct link to the underlying payment system infrastructure and having a settlement account at the central bank's settlement system—if settlement occurs in central bank money. The settlement can take place in commercial bank money as well. Indirect participants are other financial institutions or other PSPs using the payment system infrastructure either directly or via a sponsor primary participant and leveraging the sponsor's settlement account with the central bank for settlement of their transactions. A few fast payment arrangements allow participation of intermediary PSPs that receive and transmit transfer of funds on behalf of other participants. For example, SCT Inst in the European Union allows intermediary banks to provide services to orig-

BOX 3 OWNERSHIP OF FAST PAYMENT ARRANGEMENTS

Both public-sector ownership (most often by the central bank) and private-sector ownership of fast payment arrangements are common, with an overall prevalence of the latter. In some cases, there is co-ownership of the central bank with commercial banks or other private-sector entities. Moreover, the ownership structure may change over time, often driven by the needs of the market, the broader objectives of the owners, and regulatory requirements. For example, some systems have moved from public ownership to cooperative user/membership-based organizations, and in some cases from there to other corporate arrangements like privately owned or publicly listed companies.

Central bank ownership of fast payment systems is often observed in cases where the central bank also operates some of the traditional key infrastructures for retail payments, such as the check clearinghouse and/or the automated clearinghouse for credit transfers and direct debits. This may be an indication that the central bank considers this arrangement as a natural continuation of its role as operator of retail payment systems. Other reasons for central bank ownership can include trying to ensure universal participation of eligible payment service providers (PSPs) and/or the notion that ownership control is critical for truly enhancing financial inclusion in a particular country context.

Public-sector ownership of retail payments infrastructure may raise pricing issues which need to be carefully considered. In some cases, the costs of developing the infrastructure are absorbed by the central bank in pursuit of its public policy objectives. In other cases, the central bank may be subsidizing operational costs, and therefore pricing of services to participants may not be reflecting the true costs of operating the fast payment system. In this regard, if those subsidies are kept beyond the short-term, central banks ought to consider the implications for long-term competition and efficiency.[15]

Another aspect that needs to be considered is the potential conflict of interest that may arise between the central bank's role as an operator of the retail payments infrastructure and its role as an overseer. The central bank should seek to avoid any impression that it might use its role as overseer of private sector systems to support unfairly the operation of its payment systems. The central bank may therefore make a clear functional and, if possible, also organizational separation of the two functions within the central bank's organizational chart.[16]

Private ownership of fast payment systems also entails some potential concerns. When these systems are owned solely by large participant banks closely tied to the market, they may be less willing to open the system and provide access to smaller banks or to non-bank PSPs. Also, a fast payment system entirely owned by the private sector is likely to require high upfront investment and transaction pricing consistent with a target investment recovery period, usually medium-term. High per transaction prices may deter participation, especially of PSPs that cater to low-income customers.

A central bank may intervene to ensure that a for-profit focus is balanced with a vision that considers the medium- to longer-term needs and developments of a market, fosters innovation, makes it possible for all types of PSPs to join and achieves regular usage by lower-income users and small and micro enterprises. Central banks in their role as regulators/overseers must also make sure that their interventions to ensure broad participation in the system do not dis-incentivize future investments by shareholders. In other words, mandating participation without giving due consideration to the investment and others costs that are borne by shareholders before they are able to realize or even clearly foresee a reasonable profit may limit future investments to grow the business and introduce vanguard technologies.

More generally, even in circumstances where the private sector in a given country appears unable to come to an agreement to develop a fast payments system and the central bank decides to intervene to take a more developmental role (i.e., ownership/operation), the central bank should consider this as a starting point and, from the outset, design the system in a manner that would enable system participants to innovate and, eventually, facilitate the transfer of ownership of and operational responsibility for the system to the private sector.

Finally, regardless of the ownership model, it is highly desirable that the owner/operator involve all relevant

continued

BOX 3, *continued*

stakeholders of a fast payment system in its governance arrangements. For example, a special consultative body or a consultative committee representing the interests of the wider participant/user base (beyond the initial shareholders) might be created for consultation on a regular basis or in relation to particular decisions of the organization's Board of Directors.[17] A major effect of this involvement of multiple stakeholders is to signal that ownership is not a *sine qua non* condition for having a say in the decision making of the organization. In any case, ownership should not be necessarily considered static; opening ownership to PSPs or other institutions different from the initial shareholders should be evaluated and eventually revised periodically.

TABLE 4: Select Findings on the Division of Roles between Overseer, Operator, and Owners

Australia	New Payments Platform Australia (NPPA) is the owner and operator of the NPP. The RBA is responsible for the oversight and regulation of payment systems in the country and empowered to set financial stability standards for clearing and settlement facilities. Furthermore, the RBA is the operator of the settlement module (that is, the Fast Settlement Service) that supports the NPP. NPPA was formed by the RBA as a result of an industry collaboration in response to the "strategic review of Innovation in the Australian payments system."
Chile	Centro de Compensación Automatizado (CCA) is a private ACH and the owner and operator of Transferencias en Línea (TEF), which is Chile's fast payments. CCA is owned by three banks: Banco de Chile, Banco Santander, and Banco de Crédito e Inversiones. These three banks have equal shareholding in CCA. Since June 1, 2019, the Financial Market Commission (Comisión para el Mercado Financiero, or CMF) has been the lead supervisory entity of financial markets in Chile and also the supervisor of TEF.[18]
China	The People's Bank of China is the owner of the Internet Banking Payment System (IBPS). It is being operated by China National Clearing Center, which is a public institution fully owned by the People's Bank of China and responsible for the operation, maintenance, and management of IBPS.
European Union	The European Central Bank is the overseer of the Single Euro Payments Area (SEPA) Instant Credit Transfer (SCT Inst) scheme, while the Euro Retail Payments Board fosters the integration of euro retail payments across the European Union. The European Payments Council (EPC) is the scheme manager and responsible for performing the functions of management and evolution of the SEPA scheme as defined in the rulebook. PSPs must be connected to at least one clearing and settlement mechanism (CSM) to receive or send payments. Following a decision by the European Central Bank's Governing Council, by November 2021 PSPs that have adhered to the SCT Inst scheme and are accessible in TARGET2 must also become reachable in the TARGET Instant Payment Settlement (TIPS) service. They will still be able to participate in another CSM in addition to TIPS, if they choose to do so. Those CSMs will also be connected to TIPS to ensure pan-European reachability.
Hong Kong SAR, China	Hong Kong's FPS is owned and overseen by the HKMA, and the operator is Hong Kong Interbank Clearing Ltd., a private company jointly owned by HKMA and the Hong Kong Association of Banks.
India	The National Payment Corporation of India (NPCI) is the owner and operator of IMPS and UPI. The PSS Act of 2007 designates the Reserve Bank of India (RBI) as the authority for regulation and supervision of payment systems in India. NPCI has been authorized by the RBI to operate IMPS and UPI.
Kenya	The Central Bank of Kenya is the overseer of the fast payment arrangement PesaLink. The Kenya Bankers Association is the owner of PesaLink but formed a separate entity called Integrated Payment Services Ltd. to operate it.
Malaysia	BNM is the overseer of payment systems in Malaysia, including the RPP. PayNet is the owner and operator of RPP. PayNet, formed by the merger of MyClear and MEPS, operates Malaysia's shared payment infrastructures for wholesale and retail payment transactions. PayNet is owned jointly by BNM and 11 commercial banks.
Mexico	Banco de México is the owner, operator, and overseer of SPEI. In 2019, Banco de México restructured the Directorate of Payment Systems to Directorate General of Payment Systems and Market Infrastructures to avoid conflict of interest and the duplication of human capital in these specialized roles. The central bank also created different directorates under the general directorate to fulfill its role as the operator and overseer (and regulator) of payment systems. This restructuring applies to all the payment systems operated by Banco de México.

continued

TABLE 4, *continued*

Singapore	Banking Computer Services Pvt. Ltd. operates Fast and Secure Transfers (FAST). The scheme owner for FAST is the Singapore Clearing House Association, which comprises the Monetary Authority of Singapore (MAS) and all the large commercial banks.
Thailand	The National ITMX is the owner and operator of PromptPay, whereas the Bank of Thailand (BOT) acts as its overseer. National ITMX was created as part of Payment System Road Map 1 (2002–04) published by the BOT. It is a legal entity owned by Thai banks. National ITMX was chosen as the developer and operator of PromptPay, as it already had the existing technical capability to operate the system and was the largest payment system operator running four payment systems (that is, ATM switch, card switch, bulk payments, and single fund transfers for branches and ATMs) when PromptPay was announced.
United Kingdom	Pay.UK acts as the operator of FPS. Bank of England and the Payment Systems Regulator oversee and regulate FPS. As a background to this sharing of roles, in 2019 a memorandum of understanding was signed between the Bank of England, Financial Conduct Authority, and Payment Systems Regulator to set out the roles and responsibilities of the bodies with respect to the payment landscape.
United States	TCH is the owner and operator of Real-Time Payments (RTP). TCH is a banking association and payments company that is owned by 24 commercial banks. TCH is regulated and examined regularly by supervisory staff from the Board of Governors of the Federal Reserve System, the Office of the Comptroller of the Currency, and the Federal Deposit Insurance Corporation.

inator and/or beneficiary banks in cases where they are not themselves direct participants in a CSM.

Systems that were introduced around 2010 initially started by allowing only banks to be participants. The rationale for allowing only banks to be participants was that banks are comprehensively regulated and subject to stringent capital requirements and thus are considered to be safe options for being participants in the FPS. For example, liquidity risk with banks is usually low, as they have access to several liquidity sources, often including intraday lending from the central bank to settle their positions. Non-bank PSPs in some cases do not have settlement accounts with the central bank; hence, their direct participation was a challenge. In these earlier systems, non-banks came in as a second step in select jurisdiction cases (such as India and the United Kingdom) to promote innovation, improve customer experience, increase competitiveness of offerings, and drive financial inclusion.

Varying access models for participation of non-bank PSPs across jurisdictions include the following:[19]

- ***Indirect participants:*** They are required to sign a commercial agreement with a bank that is a direct participant to use the payments infrastructure. PromptPay (Thailand), PesaLink (Kenya), and FPS (Hong Kong SAR, China), among others, have adopted this model.
- ***Direct participants:*** Eligible non-bank PSPs can be direct participants and fulfill their settlement obligations through their own settlement account at the central bank. System such as RPP (Malaysia) and SPEI (Mexico) have adopted this model.
- ***Direct connection to infrastructure but indirect for settlement:*** Non-bank PSPs can connect directly to the infrastructure but fulfill their settlement obligations through a commercial bank. In India, IMPS has adopted this model.

Most jurisdictions studied (see table 5) do not mandate the participation of banks but have seen a positive uptake from them. This can be attributed to the fact that most banks were involved from the conceptualization stage and that banks willingly joined the resulting fast payment arrangement. In contrast, in other jurisdictions, specific actions have been taken to promote the participation of banks. In Bahrain, for example, the Central Bank of Bahrain mandated that all banks provide inward Fawri+ transactions (real-time P2P fund transfers). Additionally, some jurisdictions introduced incentive measures to boost participant adoption.

In any case, different regulatory requirements need to be fulfilled by banks and other PSPs to qualify for direct or indirect participation. Still, at present, a slight majority of the jurisdictions studied allow only banks as direct participants. However, this is changing, and jurisdictions that did not allow direct participation by non-bank PSPs in their fast payment arrangement in the recent past are now allowing it (for example, Singapore and probably also Kenya in the near future).

TABLE 5: Select Findings on Participants in Fast Payment Arrangements and Access Criteria

Australia	The NPP allows as full participants authorized deposit-taking institutions or restricted authorized deposit-taking institutions with the RBA's Exchange Settlement Accounts (ESA) membership. These authorized deposit-taking institutions include banks, building societies, and credit unions.[20] The NPP has been designed to provide different pathways for entities to leverage the NPP's functionality. Financial institutions can either become full participants through direct membership or opt for indirect membership. They can also become "Settlement Participants" (they can perform clearing functions on behalf of a NPP full participant) and "Identified Institutions" (they can perform clearing and settlement functions on behalf of a NPP full participant). The NPP also allows "Connected Institutions" to connect directly with the system. The latter are able only to initiate payments from a customer's account and do not provide clearing and settlement services. Connected institutions need to meet the technical and other associated requirements.
Bahrain	A directive from the Central Bank of Bahrain provides the eligibility criteria for licensed banks and non-bank PSPs to participate, while the central bank's rulebook provides the overall regulatory requirements, conditions and process of licensing, and regulation and supervision of licensees that provide regulated financial services in the kingdom. The license application must be in the prescribed form and include the following: • A business plan specifying the type of activities to be conducted • Application forms for all controllers • Application forms for all controlled functions
Hong Kong SAR, China	A direct participant is a licensed bank in Hong Kong under the Banking Ordinance (Cap. 155 of the Laws of Hong Kong) that also participates in the Clearing House Automated Transfer System (CHATS) of the relevant currency in Hong Kong. An indirect participant is a stored-value facility (SVF) licensed by the HKMA under the Payment Systems and Stored Value Facilities Ordinance. It has access to all FPS services and engages a direct participant for settling funds in FPS.
India	Banks and prepaid payment instrument licensees are allowed to participate in both IMPS and UPI. Separately, UPI allows third-party payment initiation service providers, such as Google Pay and Amazon Pay, that connect to banks. This has facilitated a foray of fintechs into the payment system that brought greater technological know-how and better customer experience.
Kenya	Member banks of the Kenya Bankers Association are direct participants in PesaLink, while payment service aggregators such as fintechs are allowed as indirect participants. There are plans to upgrade the existing switch to allow the latter entities to connect directly to the PesaLink infrastructure. In this regard, Integrated Payment Services Ltd. has onboarded the vendor, and the project is expected to be completed in 2021.
Malaysia	Participation in the prior FPS was limited only to banks. Pursuant to the Interoperable Credit Transfer Framework issued by BNM, which came into effect July 1, 2018, PayNet has implemented an open-access regime where all banks and eligible non-bank e-money issuers are allowed to participate in the RPP as direct participants. As the RPP settles all transactions in the RTGS system, non-banks that are not direct participants in the latter may appoint a settlement bank to settle the RPP transactions on their behalf.
Mexico	All banks and non-bank financial entities that are regulated and supervised by Banco de México or other Mexican financial authorities are eligible to participate in SPEI.[21] The access requirements are essentially the same for all participants, thus ensuring equal treatment. Banco de México requires institutions that intend to participate in SPEI to satisfy the operational risk-management and information-security requirements it has established. It also has a review procedure to determine whether applicants meet the legal requirements for participation established in the SPEI regulation. SPEI participants are also able to participate in the overlay service CoDi if they fulfill a functionality certification and satisfy technological requirements specific to CoDi. Banks participating in SPEI that have more than 3,000 accounts and offer fund transfers through an app are also obligated to offer CoDi to their customers.
Poland	Only banks participate in Express Elixir, as they have settlement accounts with the National Bank of Poland. Since non-banks do not have access to the Sorbnet (Poland's RTGS system) account, they do not participate in Express Elixir.
Singapore	MAS has allowed non-banks to become direct participants in FAST since February 2021.
Thailand	PromptPay allows only commercial banks in Thailand to become direct participants. More specifically, to become a full participant in PromptPay, financial institutions must meet one of the following requirements: • Be a commercial bank under the Commercial Banking Act of 1962 • Be a financial institution established by specific law Moreover, interested financial institutions need to pay a membership fee and comply with the business rules set by National ITMX. Non-bank PSPs are allowed to become indirect participants through sponsor banks. Indirect participants are required to sign a commercial agreement with a direct participant before connecting indirectly with PromptPay.

continued

TABLE 5, *continued*

United Kingdom	Currently, both banks and non-banks can become direct participants. While non-bank PSPs were initially not allowed as direct participants, with the motive to promote competitiveness, a new access model was developed in 2018 that allows non-banks to connect directly to the central infrastructure of FPS. At the same time, they need not have a settlement account at Bank of England's RTGS system by becoming a "Directly Connected Non-Settling Participant." In this case, they are required to have an agreement with a sponsor bank that settles their transactions at the RTGS system.
United States	RTP allows every federally insured depository institution in the United States to connect. These institutions can connect with the system either directly or through third-party service providers (TPSPs). RTP participation rules define the following four participant categories: • **Funding participant:** The participant that has become a party to the RTP Prefunded Balance Account Agreement and requests and receives disbursements from the Prefunded Balance Account to its Federal Reserve account. In case it is a sending participant, it is required to fulfill prefunding obligations. • **Non-funding participant:** The participant that is not a funding participant and has designated a funding agent to act on its behalf to prefund in accordance with the RTP participation rules and RTP operating rules. • **Receiving participant:** The participant that holds the receiver's account and receives a payment message. • **Sending participant:** The participant that holds the sender's account and initiates a payment message. Non-bank PSPs such as PayPal and Venmo use RTP. They submit transactions via their bank, just as any other commercial user would do.

iii. Industry Body Collaborations

Industry bodies can play an important facilitating role in the development of fast payment projects.

Some jurisdictions have collaborations with industry bodies, such as banking associations. Many of these associations play a key role in creating a collaborative ecosystem by driving consensus among participant banks and therefore have often been relevant contributors to the deployment of fast payments. Banking associations also ensure the effective implementation of guidelines/regulations, including those governing pricing schemes, risk management, and dispute resolution. This ensures the safety and resiliency of the payment systems. In some cases (see table 6, as well as the case of Poland), industry bodies have gone beyond and actually funded or developed the fast payment project.

IV. Systemic Importance of Fast Payment Arrangements

Statutory definitions of systemic importance, where they exist, may vary somewhat across jurisdictions, but, in general, a payment system is systemically important if it has the potential to trigger or transmit systemic disruptions. This includes, among other things, systems that are the sole payment system in a country or the principal system in terms of the aggregate value of payments; systems that handle mainly time-critical, high-value payments; and systems that settle payments used to effect settlement in other systemically important financial market infrastructures (FMIs).

In some jurisdictions, fast payment arrangements are considered to be or have been designated a systemically important payment system (SIPS) by the central bank. Through this designation, they become subject to the Principles for Financial Market Infrastructures (PFMIs) published by CPMI and the International Organization of Securities Commissions (IOSCO).

In other cases, fast payment arrangements are designated "prominently important payment systems" or "system-wide important payment systems."[22] In either case, only a subset of the PFMIs becomes applicable to them. Two of the four jurisdictions described in table 7 classify their fast payment arrangement as systemically important. In one (Mexico), the classification as systemically important derives from the RTGS system, as fast payments run on this same platform.

4.1.3 Funding and Pricing to Participants

Fast payments require sophisticated infrastructure that translates into important investments. Fast payments also require attention to proper and effective pricing policies.

The infrastructure underlying fast payments should be able to handle large volumes and values of payments, execute multiple processes within seconds, and run clearing and settlement reliably with minimal errors and reconciliation issues across all participants. This requires significant investments in technology and operations during the project development phase.

In practice, the following two main types of funding mechanisms have been observed (see table 8):

- **Funding by public authorities:** Public authorities, in particular the central bank, provide full or partial funding to the fast payment arrangement and therefore are full owners or co-owners. Examples include Australia,

TABLE 6: Select Findings on Industry Body Collaborations

Kenya	Financial Sector Deepening, a nonprofit organization that supports the development of an inclusive financial market in Kenya, built the business case for PesaLink. It played an instrumental role throughout the development of the system.
Thailand	The National e-Payment Plan was driven by the government, although funding of PromptPay project was through the Thai Bankers Association, which works to execute BOT policies and projects through consensus. The BOT has provided approval to the association to establish the Payment Systems Office, which plays an important role in driving self-regulation among commercial banks. It also helps in interbank dispute resolutions. The Payment Systems Office has established a governance structure in the form of a joint steering committee that comprises members from commercial banks in Thailand.

TABLE 7: Select Findings on the Classification of Fast Payment Arrangements as per Their Systemic Importance

Mexico	SPEI is the central bank's RTGS system and therefore the core FMI in Mexico, and it is deemed a SIPS as per the Payment Systems Law.
Singapore	Payment systems in Singapore can be classified as a SIPS or as a "system-wide important payment system." FAST is classified as a system-wide important payment system and designated under the Payment Services Act.
Thailand	The BOT has deemed the ITMX system to be a "prominently important retail payment system." ITMX includes an interbank retail fund transfer system, such as ATM pool, bulk payment system and the PromptPay module for fast payments.
United Kingdom	FPS is recognized by HM Treasury under part 5 of the Banking Act (2009) as a systemically important FMI and is overseen by Bank of England.

TABLE 8: Select Findings on Funding

Australia	Twelve authorized deposit-taking institutions committed to funding the building and operation of the NPP and became the founding members and co-owners of the operator NPPA. The RBA played a significant role in establishing the broad direction of the industry's efforts and is also one of the founding members and co-owner of NPPA.
Hong Kong SAR, China	FPS is a HKMA-funded project.
Mexico	SPEI development costs have been borne by Banco de México.
Poland	Express Elixir was funded by system operator KIR, which is owned by multiple banks in Poland; the central bank is the largest shareholder.
Thailand	Funding for PromptPay was provided through the Thai Bankers Association, which coordinated with commercial banks.
United States	The cost of developing RTP has been shared by the consortium of commercial banks that own the operator TCH.

Hong Kong SAR, China, Malaysia, and Mexico. The reasons for public funding include ensuring prompt implementation of the fast payment arrangement and/or keeping final prices low or affordable for end users (often for a limited period of time), among others.

- **Funding by private sector:** Participants in the arrangement provide full funding through ownership of the operating entity, banking associations, or other means. Examples include Kenya, Thailand, the United Kingdom, and the United States (RTP).

On the other hand, the owner(s) of the fast payment arrangement can price the services provided to participants based on considerations such as the following:

- Generating profits
- Recovering investments, covering operational expenses, and preparing for future investment needs
- Recovering operational expenses only

The pricing strategy will depend on ownership (that is, private ownership will generally entail seeking profits or at least fully covering costs) and whether there is some type of initial or ongoing funding from public authorities and other operational arrangements.

In practice, the pricing structure of fast payment arrangements for services provided to participants generally comprises a combination of the following:

- **Joining fee:** Participants are required to pay a joining fee while onboarding the system. In general, the joining fee is structured to cover the due diligence that the operator must carry out to onboard the bank or other PSP and is usually proportional to the size of the participant. Jurisdictions such as Hong Kong SAR, China, India, Malaysia, and Thailand charge a joining fee to system participants. In Australia, direct participants are required to become shareholders of the operator NPPA.
- **Variable or per-transaction processing fees:** These are usually structured to cover the full complement of the operating expenses. Jurisdictions such as Australia, India, and the United States charge a per-transaction fee to the participants. RTP in the United States applies the same fee to all participants with no volume discounts, no volume commitments, and no monthly minimums. In Hong Kong, participants are charged on a per-transaction basis, and fees also depend on the transaction amount. In Thailand, a variable fee is applied based on the number of monthly transactions processed and follows a tiered approach.
- **Annual/fixed fee:** This is often used to cover a portion of the base operating expenses, recoup investment costs, and build up a reserve to fund future investment costs. It can be the only applicable fee or charged in addition to other fees. In Australia, apart from the joining fee, an annual fee is charged by the RBA for the services it provides. (See table 9.) In Mexico, the fixed annual fee is calculated by distributing system costs among participants based on the relative proportion of each participant's payments.

FIGURE 10: Fee Structure in Fast Payment Arrangements for Participants

JURISDICTION	JOINING FEE	ANNUAL FEE	VARIABLE FEE/ TRANSACTION FEE
Australia	✔	✔	✔
Bahrain		✔	✔
Chile		✔	✔
Hong Kong SAR, China	✔		✔
India			✔
Kenya			✔
Malaysia	✔	✔	✔
Mexico		✔	✔
Singapore	✔		✔
Thailand	✔		✔
UK		✔	✔
USA			✔

Different strategies can be followed to determine how much to load on fixed fees versus variable fees. A higher fixed fee relative to transaction fees is beneficial for participants with higher transaction volumes, whereas lower fixed fees relative to transaction fees are beneficial to participants with lower transaction volumes. Some operators might apply a tiered structure for the fixed fee based on the size and nature of the participant. Combinations that were observed are shown in figure 10. In certain cases, especially in complex fast payment arrangements, the operator could have additional avenues to charge fees to third-party apps, for third-party aggregators that are connected and/or for value-added services such as data analytics and fraud scoring.

In some cases, participants also pay interchange fees (for example, India and Thailand).

Participants usually recover the various costs they incur for participating in the fast payment arrangement by way of charges to their customers (that is, the end users). In many jurisdictions, transaction fees to end users have been capped (for example, by the overseer) to promote adoption, limiting the avenues of revenue for the participants. This is the case in Bahrain, Mexico, and Thailand, among others. A few jurisdictions, including Bahrain and Malaysia, have even waived the transaction fee up to a certain transaction-value threshold. Table 9 provides additional details on participating fee structures and customer pricing.

For more details, refer to the special topic note on pricing structure, which forms part of the Fast Payments Toolkit.

4.2 MODULE B: SYSTEM SPECIFICATIONS AND OPERATING PROCEDURES

This module focuses on assessing the current state of technology in aspects like payment processing and telecommunications. The following five insights are covered in this thematic area/module:

1. Infrastructure development
2. Technical specifications
3. Network connectivity
4. Clearing and settlement
5. Interoperability

TABLE 9: Select Findings on Fee Structures

Australia	All direct participants are required to become shareholders of NPPA, which operates on a fixed-cost-recovery model; operating costs are recovered from shareholders according to their size (shareholder band). The fixed-cost-recovery model provides an incentive to direct participants to increase the volume on the platform, as the marginal cost for additional transactions is very small, and this in turn influences the pricing offered to "Identified Institutions." NPPA's ultimate aim is to move to a unit transaction cost per transaction once volumes stabilize. A wholesale fee could also be charged to all participants, which will be the same regardless of participant size. An application fee is also payable to NPPA for new participants, along with a dispute-resolution fee charged by NPPA. The RBA charges only direct participants and settlement participants for the use of their ESA accounts. The fee charged by direct participants to submembers is based on the bilateral agreement between the parties. No guidelines have been provided by the RBA/NPPA. Transaction charges to end users depend on the commercial decisions of participants, and no upper cap has been set by the RBA/NPPA.
Hong Kong SAR, China	Participants are charged fees on a per-transaction basis, but the fee is also dependent on transaction amount. Participants are also charged a clearing-house admission fee and an interchange fee. Banks and SVFs have been given the liberty to decide the fee levied on end users.
India	The fee charged by NPCI is set by the NPCI board; inter-participant charges are decided by the IMPS/UPI steering committee; and transaction user charges are decided by the participants.
Malaysia	RPP participants pay an admission fee and monthly subscription fees. To encourage adoption, PayNet had waived both the admission fee for participants who were onboarded before December 31, 2019, and the monthly subscription fees for the initial first six months of participation. Additionally, PayNet applies a transaction-processing fee that varies according to the transaction type. In terms of customer pricing, for individuals and small and medium-sized enterprises, the transaction fee is waived (by order of BNM) for any transfers up to RM 5,000. For transfers above RM 5,000, a transaction fee may be applicable, although some banks are also waiving this fee to encourage adoption.
Mexico	Banco de México has adopted a pricing scheme that aims to cover the full costs of developing, maintaining, and operating SPEI without affecting its adoption adversely. Fees charged to participants reflect marginal zero processing costs, to incentivize among participants an efficient use of SPEI and reduce entry barriers. More specifically, Banco de México has established a scheme in which participants pay a fixed fee that allows them to send and receive an unlimited amount of payments. The annual fixed fee varies for different participants and is calculated by distributing total costs based on the share of each participant in the total number of payments made through the system during a specific period (the last five years). In addition, participants are required to pay an "operations fee" that is calculated on the basis of multiple factors, such as the number of returns for which a participant is liable, fund transfer orders done through CLS Bank, and the number of bytes retransmitted by SPEI at a participant's request. Regarding charges to end users, Banco de México forbids charges for receiving payments, but it allows participants to decide user charges for sending payments. All participants are required to register their customer fees with Banco de México. For payments made through the overlay CoDi, Banco de México has waived off end-user charges, including the merchant discount rate. Participants charge no fees to the payer or payee.
Singapore	FAST and PayNow operate on a cost-recovery basis. MAS does not regulate the pricing of payment services, and banks can make their own commercial decisions.
Thailand	Fees charged by National ITMX comprise a fixed fee (joining fee) and a variable fee. The joining fee is based on the following two components: 1. Size of the bank: Three tiers have been created based on size (that is, large, medium, and small). Larger banks are required to pay a higher joining fee. 2. Number of services to which participants subscribe: Participants can choose the services availed through PromptPay. The majority of charges are associated with fund transfer services, as it determines the amount of investment needed to connect with PromptPay. The variable fee is based on the number of monthly transactions submitted by a participant. This also follows a tiered approach. Large banks usually process a higher number of transactions and are given a cheaper tier. There is also an interchange fee between the participants for PromptPay transactions. There are no charges to individuals for payments through digital channels such as internet banking and mobile banking, whereas there are some nominal charges for channels such as ATMs and branches. These charges have been regulated by the BOT and vary between zero and B 10 for individuals and between B 10 and B 15 for juristic persons.
United Kingdom	The following categories of charges need to be paid by each participant: Relevant fee for onboarding each new participant • A monthly fee from each participant that directly connects to the system • Volume fee to cover the anticipated annual volume

continued

TABLE 9, *continued*

United States	RTP follows the same pricing structure for all participants, with no volume discounts, no volume commitments, and no monthly minimums, to ensure that financial institutions of all sizes participate on the same terms. System participants are not required to pay joining fees while onboarding the system. Participants pay only for the transactions they originate. There is an inter-participant fee in the form of a "Request for Payment Incentive Fee." Upon each successful RFP credit transfer sent in response to a request-for-payment message, the participant that initiated the request for payment owes the incentive fee to the participant initiating the RFP credit transfer. TCH facilitates the collection and disbursement of these fees between the participants. There is also a network connectivity fee, which is calculated by TCH and charged as a pass-through on a monthly basis. Connectivity costs apply to any participant with a direct connection. In the case of a TPSP, the connectivity fee is shared by the financial institutions connecting through it. Each RTP participant is free to decide the transaction charges that apply to end users.

4.2.1 Infrastructure Development

Infrastructure development is a complex process that must be evaluated holistically. Jurisdiction-specific approaches vary based on their existing ecosystem, customer needs, and the supporting infrastructure.

The following aspects of infrastructure development are covered as part of this section: (i) a new platform versus upgrading an existing one; (ii) development timelines; (iii) choosing an external vendor partner versus leveraging in-house capacity; and (iv) participant onboarding.

It is noted that during infrastructure development, certain amendments to existing acts have been made or new acts and regulations have been introduced. These aspects are discussed in Module D, as part of the insight into *legal and regulatory considerations*.

i. New Platform versus Upgrading an Existing One

Most fast payment arrangements have been developed as new infrastructures, as existing platforms were felt to be inadequate to cater to the very dynamic needs of fast payments.

During the preliminary desk research, it was found that nearly 90 percent of the 25 jurisdictions examined, developed their fast payment arrangement over a new platform. Jurisdictions make the decision based on factors such as existing capabilities, cost implications, customer experience, and supporting infrastructure. Typically, it has been observed that most jurisdictions evaluated the option of building over an existing payment platform but eventually created a new one, as their existing system could not cater to the dynamic needs of fast payments.

Key outcomes of the analysis include the following (see table 10 for additional details):

- Jurisdictions developed new platforms because existing capabilities did not support the technology, security, or infrastructural requirements of fast payments, such as 24/7 transaction processing, multiple channels, and significantly higher volume/scale of transactions. Among others, this was the case of Australia, Bahrain, and Poland.
- Other reasons for developing a new platform included promoting continuous innovation and leveraging the latest technologies (for example, India and Malaysia), and facilitating broader digitization initiatives (for example, Hong Kong and Thailand).
- In a few cases (such as Mexico), the jurisdiction opted for upgrading an existing platform.[23]

ii. Development Timelines

Most jurisdictions have adopted a phased approach for implementing their fast payment arrangement. The average implementation time of a basic fast payment functionality and service is between one and three years.

The timelines for fast payment implementation depend on such aspects as the functionalities that are intended to be available at launch, whether the timeline has been mandated by public authorities, and the time taken to get participants on board, among other factors.

Most jurisdictions have adopted a phased approach for implementation. (See table 11.) For example, many jurisdictions went live with a rather basic infrastructure enabling P2P payments. The infrastructure implementation of a basic

TABLE 10: Select Findings on New Infrastructure Development versus Existing System Upgrades

Australia	The NPP was built as a new platform to create a thriving environment for innovation (that is, to have the mechanism for more business services to exist on top of the platform). At the time of infrastructure development, the RBA and the industry considered upgrading the existing direct-entry system, instead of building a new platform from scratch. However, it was concluded that the direct-entry system would not be the right starting point and that an entirely new platform was needed, as this would be the least disruptive approach to both participating institutions and businesses and would allow those businesses that had a need for new services to access them.
Bahrain	The Electronic Fund Transfer System (EFTS) was built as a new platform, as it was envisaged that the existing RTGS system would be unable to support a large volume of transactions. EFTS supports Fawri+ for real-time P2P payments, Fawri for deferred payments, and Fawateer for bill payments.
India	UPI was built as a new platform. UPI offers an architecture framework and a set of standard specifications for application programming interfaces (APIs) to facilitate online payments. UPI evolved as a payment platform driving open and interoperable payment standards driven at the front end using mobile devices for P2P and person-to-merchant services. UPI has made buying and selling through fintech app solutions easier, for both e-commerce providers and consumers. This has created a huge demand in the fintech industry, as UPI has opened a host of opportunities for start-ups and e-commerce players to come up with innovative solutions that elevate the customer experience.
Malaysia	Instead of enhancing the prior Instant Transfer System, which operated on the legacy ATM/card switch and ISO 8583 messaging standard, the RPP was built as a new platform to provide a more open and scalable platform on which better overlay services could be developed. The objective was to develop an agile system that supports a richer messaging standard (ISO 20022) that could be improved continuously as the nature of the payments landscape changes.
Mexico	SPEI was developed in-house by Banco de México to handle all transactions—both high- and low-value transactions—and provide the desired service levels for large volumes. Although SPEI was a new platform when launched in 2004, Banco de México wanted to ensure a seamless transition for participants, so it reutilized the front-end components of the previous RTGS system (that is, SPEUA). Operating hours were extended to 24/7 in 2015. In 2019, Banco de México launched CoDi (in the form of a request-to-pay functionality) to enhance the user experience for retail payments.
Poland	KIR already operated Elixir (a conventional payment platform) that enjoyed high adoption. However, for fast payments, KIR decided to develop a new platform (Express Elixir), as it believed the nature of these payments is quite different. For example, the protocols of conventional payment platforms cannot be used for instant payments due to the different response times or data sizes of the latter. Parameters such as security, liquidity, and settlement mechanism also work differently.

fast payment functionality and service takes an average of one to three years. However, in some cases, even the implementation of this basic functionality took much longer, as was the case in Australia.

The phased approach is decided based on considerations such as the overseer mandating participation, system readiness, participant readiness, and even customer readiness. Mandating that banks with a large customer base participate (at least in receive mode) can play an important role in achieving critical mass.

Over the years, the operators subsequently introduced upgrades and additional functionalities in terms of payment types, use cases, and channels. A few operators have also opened their basic infrastructure for third-party providers to introduce more innovative payment solutions in the market.

iii. External Vendor Partner versus Leveraging In-House Capacity

The advantages and disadvantages of having an external vendor versus leveraging in-house development vary by jurisdiction. A majority of the jurisdictions analyzed in this study opted for an external vendor.

The main benefit of onboarding a vendor partner seems to be that they already have prebuilt, tested solutions. These can be customized and leveraged.

Jurisdictions that decide to bring in an external vendor typically go through a request-for-proposal process for vendor shortlisting and onboarding. Some of the key selection criteria for vendors include prior experience implementing fast payments or other payment systems, implementation timelines, the ability to customize to the jurisdiction's requirement, and an experienced team and agile delivery methods, among others.[24] In some jurisdictions, external

TABLE 11: Select Findings on System Development Timelines and Services Available at Launch

JURISDICTION	YEAR OF LAUNCH	TIME TO IMPLEMENT	SERVICES MADE AVAILABLE AT LAUNCH	REMARKS
Australia (NPP)	2018	Six years	The NPP went live with use cases such as P2P payments, merchant payments, and bill payments. In 2019, NPPA published a road map with plans to roll out the "Mandated Payments Services," which will enable use cases such as request to pay, future-dated payments, and bulk payments. All participating financial institutions are required to implement this capability by December 2021. Thus, it is anticipated that financial institutions will begin to roll out these services in early 2022.	The implementation of the NPP took approximately six years and was preceded by a two-year "strategic review of innovation" by the RBA. The initial target to launch the NPP was 2016. After the launch of the NPP, a few major banks were slow to make the new system available to their customers due to issues with internal systems and service providers.
Bahrain (Fawri+)	2015	Two years	Fawri+ supports P2P payments. The request-to-pay transactions can be made through BenefitPay, the national e-wallet payment system. Fawateer supports bill payments.	The banks experienced delays updating their systems, processes, and infrastructures.
China (IBPS)	2010	9–12 months	IBPS supports multiple use cases/services, such as P2P payments, bill payments, and recurring payments (credit card repayment, loan repayment).	In November 2009, the development process of IBPS started. In August 2010, technical preparation, system verification, and other critical processes were completed. The first group of participating institutions went online for trial operation on August 31, 2010. In December 2010, the second group of participating institutions entered into operation, while the third group did so in January 2011, thereby completing the nationwide launch of IBPS.
European Union (SCT Inst)	2017	One year	SCT Inst supports multiple use cases, such as merchant and bill payments and bulk and future-dated payments.	The EPC's SEPA request-to-pay scheme has been developed, and the adherence process for PSPs has started.
Hong Kong SAR, China (FPS)	2018	One year	FPS supports merchant payments, request to pay using QR codes, bulk/batch payments, and bill payments.	
India (IMPS and UPI)	IMPS—2010	Less than 12 months	IMPS went live with use cases such as P2P payments, merchant payments, bill payments, and bulk/batch Payments.	IMPS allowed inclusion of non-banks (prepaid payment instruments) as participants in 2011. It also extended support for channels such as internet banking and ATMs as adoption of the mobile-banking channel was then low.
	UPI—2016	Less than 12 months	UPI went live with use cases such as P2P payments, merchant payments, bill payments, bulk payments, and request to pay. Future-dated payments were launched under UPI 2.0 in 2018. UPI also extended support for use cases such as IPO subscription, signed QR, invoice in the box, and foreign inward remittances.	Prior to rollout of UPI, NPCI conducted a pilot launch with 21 member banks.
Kenya (PesaLink)	2017	Two years, six months	PesaLink supports bill payments and bulk payments as use cases. There are discussions to roll out request-to-pay use case.	It was necessary to take buy-in from all participating banks that posed a challenge during implementation.
Malaysia (RPP)	2018	One year	Currently, RPP supports P2P and merchant payments.	New use cases—that is, request to pay, consent (e-mandates), real-time debit, and cross-border payments—are under development.

continued

TABLE 11, *continued*

JURISDICTION	YEAR OF LAUNCH	TIME TO IMPLEMENT	SERVICES MADE AVAILABLE AT LAUNCH	REMARKS
Mexico (SPEI)	2004	Two years, four months	Initially, it facilitated P2P payments and bulk/batch payments. The overlay service CoDi, which enabled request-to-pay functionality, was developed in 16 months and was launched in September 2019. CoDi complements other use cases, such as merchant payments and bill payments.	SPEI has expanded its operating hours (currently 24/7) and participation criteria to meet the growing needs of the Mexican payments market.
Poland (Express Elixir)	2012	One year, six months	Express Elixir currently supports merchant payments, request to pay, and bill payments. It plans to provide bulk and batch payments in the future	
Thailand (PromptPay)	2017	One year, six months	The credit transfer service was launched in January 2017. Interbank bill payment service was enabled on November 2017. Request-to-pay functionality (PayAlert) was enabled in March 2018. The e-donation service was launched in July 2018.	Initially, PromptPay was supposed to go live in November 2016. Due to technical issues, it was delayed by two months. Since then, more use cases, additional payment types, and access channels have been enabled.
United Kingdom (FPS)	2008	Three years	FPS supports forward-dated payment, bill payment, standing orders, and bulk payments use case. In 2020, a request-to-pay functionality and confirmation of payee was launched.	
United States (RTP)	2017	Two years, six months	RTP system went live with use cases such as P2P payments, request to pay (called "request for payment"), bulk payments, merchant payments, and bill payments.	It took 12 months to define the system requirements in collaboration with market participants. Additionally, it took 12 months for system development and six months for testing and to onboard the initial six participants.

TABLE 12: Select Findings on External Vendor versus In-House Development

Australia	The industry committee contracted SWIFT to build the NPP's basic infrastructure. SWIFT is also responsible for operating the system. Additionally, the industry realized early on that it was important to have an initial consumer-oriented "convenience" service at launch for the platform to have traction. Thus, BPay was selected as the vendor to design the first overlay service (that is, Osko, the customer-oriented convenience service).
Malaysia	RPP was built by a shortlisted vendor—ACI. This company was chosen from other applicants, as their solution was agile and could be configured easily.
Mexico	SPEI's development was done using the in-house capability of Banco de México. As SPEI is the most important payment system, Banco de México consciously decided not to hire an external vendor. Additional factors for in-house development included development cost and considerations regarding the proprietary communication protocol used by Banco de México.
United Kingdom	The entire platform was built from scratch. An invitation to tender was circulated to five bidders. The successful joint bid resulted in Voca and LINK establishing a joint venture company called Immediate Payments Ltd.
United States	TCH partnered with Vocalink to develop RTP. A request for proposals was issued for vendor selection, and three service providers responded to TCH. After the selection process laid out by TCH, Vocalink was onboarded to develop the system in December 2015.

vendors are also contracted to operate and maintain the system for a period.

Table 12 presents findings on the choices made by select jurisdictions in this area. While the majority of jurisdictions analyzed opted for an external vendor to develop a new platform, some still went for an in-house development by the central bank (for example, Mexico) or the existing operator of a retail payment system (for example, Thailand).

iv. Participant Onboarding

Many operators of fast payment arrangements have already defined comprehensive and well-structured onboarding processes for participants.

As shown in table 13, most operators in the jurisdictions analyzed have defined the requirements and processes for participant onboarding. In general, the following main steps

in the onboarding process were identified through the deep dives:

- Interested entities have to communicate their intention of joining the fast payment arrangement to the operator and the central bank (or, when applicable, to another public authority acting as the regulator and/or overseer).
- The operator provides initial membership documentation to the applicants. Upon submission of the participation application and supporting documents, the operator accepts the application if all eligibility requirements have been satisfied. A membership fee (or equivalent) is often due at this time.
- Prospective participants are required to establish a secure connection with the core infrastructure to exchange payment and nonpayment messages with the operator and other participants. All prospective participants then have to go through extensive testing/certification to verify that they meet the technical requirements to connect to the system and to be able to operate satisfactorily. In some countries, the operator also requires an external auditor to conduct an audit of the participant before going live.
- Upon successful completion of the testing/certification, prospective participants have to enter into an agreement/contract with the operator by which they agree to observe and abide by the rules and operating procedures laid out by the central bank and the operator itself. A common operating procedure across the globe is the continued availability of a participant's fast payment gateway from the point of going live.

TABLE 13: Select Findings on Participant Onboarding Process

Australia	The NPP has designed a comprehensive and well-structured onboarding process for participants. Major steps during the onboarding process are as follows: • Application process: NPPA provides initial membership documentation. The applicant provides completed participation application and supporting documents. • Acceptance of participant application: NPPA accepts application if all eligibility requirements have been satisfied and determines the applicant's proportionate share of investment. (All direct applicants are required to become shareholders of NPPA.) • Plan and build: The participant develops the project plan and builds the system as per the technical design. • Certification and onboarding: The participant is required to meet test requirements (system/buddy testing). Once all testing and certification is completed, the participant is onboarded
Bahrain	For participation in EFTS, participants need to fulfill the following technical requirements, and testing is done prior to onboarding: • Documentation (participants need to enter a contract with BENEFIT), and technical requirement documents are provided. • Participants also need to adopt the standard ISO 20022 messaging format. • Prior to going live with the system, participants must complete the certification cycle. This includes initial testing with EFTS simulators as per predefined test scripts.
European Union	Applicants are required to submit to the EPC an executed undertaking and original adherence agreement, along with supporting documentation. As per the internal rules specified by EPC, an application date is specified when an applicant becomes a participant.
Hong Kong SAR, China	The onboarding process consists of the following: • Enrollment with HKMA for Hong Kong dollar-denominated (HKD) fast payments and/or Bank of China (Hong Kong) Ltd. for renminbi (RMB) fast payments. • Signing of confirmation letters agreeing to observe and abide by the HKD FPS rules and RMB FPS rules, respectively, as well as relevant operating procedures upon completion of enrollment. • After the completion of the onboarding process, Hong Kong Interbank Clearing Ltd. conducts testing with the intended participants to ensure they are technically ready.
Kenya	Participants must follow Integrated Payment Services standards along with a rigorous testing process. An external auditor conducts an audit of the participant before going live.
Mexico	For participation in SPEI, interested entities must communicate their intention to Banco de México. After this, the entity must complete the following: • Certification testing to verify the technical requirements to operate in SPEI • Operational risk-management and information-security requirements as established by Banco de México • Documentation (participants must enter into a contract with Banco de México)

continued

TABLE 13, *continued*

Singapore	Every participant has a comprehensive onboarding process in place. All prospective participants must go through an extensive industry testing before going live. The testing comprises the following three key stages: • Pretest: The focus is on making sure that the system and connectivity are stable before proceeding to the next step. • Industry test: This is the main testing stage that covers both functional and nonfunctional test cases. • Production acceptance test: Controlled live cutover. Transactions are processed using pre-identified accounts before opening the FPS to all customers of the participant.
Thailand	For participation in PromptPay, interested entities need to pay the membership fee and must comply with the business rules set by National ITMX. Other major steps include the following: • Certification testing to verify the technical requirements to operate in PromptPay • Undergo technical assessment • Documentation (participants must enter into a master agreement with National ITMX)
United Kingdom	Pay.UK undertakes risk assurance to consider the risks relating to the intended operation of a new participant applicant for entry to FPS. Participants need to provide self-certification for assurance. It covers the following aspects: • Sufficient controls will be in place and working for all risks that could affect FPS processing, operations, or service from the point of going live • Their compliance with the FPS scheme rules from the point of going live • The continued availability of their FPS gateway from the point of going live
United States	For participation in RTP, an interested entity must communicate its intention to TCH. After this, the prospective participant must undergo the following: • Certification testing to verify the technical requirements for handling both payment and nonpayment messages • Documentation (participants must enter into a participation agreement with TCH) TPSPs also have to certify all the entities connecting through it or the core banking solution (in the case of large TPSPs).

4.2.2 Technical Specifications

The following sections detail the findings and insights into the following select technical specifications that are most relevant for fast payments: (i) messaging standards; (ii) customer authentication; and (iii) APIs.

i. Messaging Standards

The ISO 20022 messaging standard is becoming the global benchmark for fast payments. Many operators that are still using other standards have expressed a desire to migrate to ISO 20022. Cost emerged as a key aspect delaying or even impeding this migration.

Messaging formats are standards for electronic data exchange between institutions participating in a payment system relating to several message categories, such as orders, invoices, customs documents, remittance advices, and payments.[25] Uniform messaging standards are critical to standardize payment flows with an increasing number of cross-border transactions and the advent of multiple payment systems. More specifically, messaging standards generally facilitate the following:

- Identification of senders and receivers
- Key attributes of a payment transaction, such as currency, amount, and value date
- Additional information alongside settlement data and format to enable the onward transmission and processing of transactions

The main messaging standards for domestic payment transfers include ISO 8583, SWIFT MT Standards, and ISO 20022, among others.

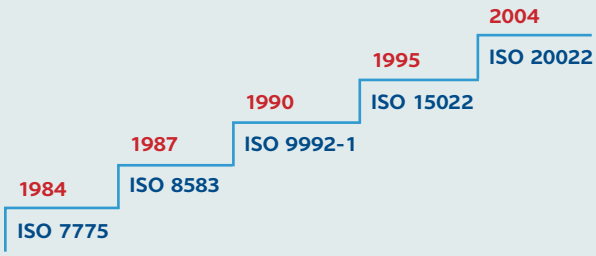
Desk research and the deep-dive analyses conducted for this Fast Payments Toolkit showed that ISO 20022 and ISO 8583 are currently the major messaging standards adopted by operators. A few have adopted XML-based proprietary messaging formats or proprietary messaging tools. (See figure 11.)

The main insights obtained in this area from the deep dives and select jurisdiction analyses (see table 14) are the following: (i) Operators are looking at adopting messaging standards that have controls and procedures in place (a) to protect message data from unauthorized disclosure and financial crime, (b) that help ensure the accuracy, completeness, and validity of messages and their delivery, and (c) that meet service availability requirements. In this context, many operators have migrated or intend to migrate to ISO 20022. (ii) The cost of upgrading messaging standards entails a significant investment in resources and technology by the operators of the FPS and its participants.

BOX 4 MESSAGING STANDARDS FOR PAYMENTS/FINANCIAL TRANSACTIONS

The International Organization for Standardization (ISO), an international standard-setting body, has defined various standards for facilitating the flow of messages related to payments/financial transactions. These standards have evolved due to the dynamic nature of payments and technological advancements.

The ISO 8583 messaging standard was designed for high-volume, low-latency payment instructions. It is predominantly used for card payments (ATMs and point-of-sale terminals). Messages do not contain invoices and beneficiary information that are not required for card payments. Over the years, some payment systems have modelled clearing and settlement functions using ISO 8583. One unique feature of this standard is that it was designed to support pull payments, and for this reason, it still has a huge role in transactions that are based on the auto-debit mechanism, particularly merchant payments where the merchant is driving the collection. Similarly, it can be used for direct debits. However, it offers limited capability for information exchange and has an unstructured format for exchanging the data. Due to this limitation, system participants may be unable to provide customized offerings to their client base.



ISO 20022 provides flexibility, as user institutions can modify payment messages over time based on evolving requirements. It also facilitates structured, well-defined, and data-rich information exchanges. ISO 20022 is the first messaging standard that has gone beyond information exchange and allows the standardization of messaging components, for which it is emerging as the global benchmark for real-time payments. Many operators that are still using ISO 8583 have expressed a desire to migrate to ISO 20022.

During migration to ISO 20022, it is important to define business requirements, clearing and settlement confirmations, and reporting mechanisms. Therefore, it is critical to have a clear definition of market practices. The financial institutions also have different automation capacity and time-to-market requirements. Additionally, it is also important to have a road map that defines how information would be shared between financial institutions after migration to a new standard.

FIGURE 11: Messaging Standards Adopted

JURISDICTION	ISO 20022	ISO 8583	PROPRIETARY
Australia	✔		
Bahrain	✔		
Chile		✔	
China	✔		
EU	✔		
Hong Kong SAR, China	✔		
India[1]		✔ (IMPS)	✔ (XML-UPI)
Kenya[2]	✔		
Malaysia	✔		
Mexico			✔ (Binary)
Nigeria			✔ (XML)
Poland	✔		
Singapore	✔		
Thailand	✔		
UK[3]		✔	
USA	✔		

1 India's IMPS is planning to migrate to XML format
2 Kenya's PesaLink is planning to migrate to ISO 20022
3 UK's NPA (new system under development) will use ISO 20022

TABLE 14: Select Findings and Insights into Current Use of Messaging Standards

Australia	The NPP adopted the ISO 20022 messaging standard, as it is flexible and extensible and therefore enables richer and more complete remittance information (280 characters) to be sent with a payment than other systems (for instance, the 18 characters currently available for direct-entry payments). It also envisioned a day where there might be enough fast payment arrangements in the world with ISO 20022 messaging capabilities. This would enable the linking of domestic fast payment arrangements through ISO 20022 capabilities, which could effectively replace correspondent banking.
Bahrain	Adopted ISO 20022, as it was the most widely used messaging format for fast payments, and countries were developing their system on this messaging standard.
European Union	SCT Inst adopted ISO 20022, as it has been adopted widely throughout the European Union (it has been adopted for SEPA credit transfers and direct debits) and worldwide and would therefore provide easier integration with other fast payment arrangements for cross-border payments.
Hong Kong SAR, China	ISO 20022 was adopted because it provides a rich data format and allows the use of standardized Chinese characters, thus meeting participants' need to carry different kinds of payments through the FPS.
India	IMPS adopted ISO 8583, as support for this standard was available with many banks at that time and speed to market was the priority for NPCI. UPI adopted XML-based proprietary messaging standard primarily because of the flexibility, ease of reading, and scalability it offered. It was felt that the flexibility provided by ISO was limited. For example, data elements such as tag length could not be custom-defined as per requirement. The payload was much higher in ISO than in native XML. Native XML protocol has provided the flexibility to have message-level acknowledgement, which has proved useful for message-level delivery and sanctity. Native XML protocols have allowed UPI to provide lots of innovative services—for example, check transaction status and validation of payment address in a short period. Hence, the view was that by adopting a proprietary XML format, changes would be lesser and quicker to implement.
Mexico	SPEI uses a propriety messaging standard developed by Banco de México. This protocol was established to make the exchange of information efficient and includes security checks that validate the authenticity of the participant that generates instructions.[26] An assessment was undertaken by Banco de México to compare ISO 20022 with this proprietary standard, and it was found that the weight/size ratio between the standards is 7:1. Banco de México also considers that its proprietary standard is very efficient and has no plans for migrating to ISO 20022. SPEI participants have also expressed no desire to migrate to an international standard.
Thailand	Most commercial bank systems and ATM networks use ISO 8583, whereas the PromptPay fast payment solution is based on ISO 20022. To resolve this issue, an adaptor was developed to translate messages from ISO 8583 to ISO 20022 and vice versa.
United States	ISO 20022 was chosen, as it enables a rich and consistent flow of information. Further, the use of ISO 20022 enables multinational financial institutions and corporations to utilize one message standard across all their payment-related activities. The use of ISO 20022 also positions RTP to support cross-border commerce and interoperability with other schemes, as real-time payments evolve in the global marketplace.

For more details, refer to the focus note on messaging standards, which forms part of the Fast Payments Toolkit.

ii. Customer Authentication

Operators and participants typically apply the same customer-authentication standards to users of fast payments as they do to users who perform transactions via other payment systems.

Authentication is the means to ascertain a customer's identity as the rightful initiator of a payment transaction. Looking at this more generically, it is the process of verifying the identity of a user, process, or device, often as a prerequisite to allowing access to resources in an information system.[27] Customer specifications across fast payment arrangements are typically based on regulations issued by central banks. Globally, there is a push toward using more robust customer authentication to reduce fraud and make fast payments more secure—with a focus on payments that are initiated remotely. However, strong customer authentication (SCA) may hinder a seamless customer experience. Box 5 describes SCA as conceptualized in the European Union's revised Payment Services Directive (PSD2), along with other issues on customer authentication.

SCA requirements and the need to balance these with a seamless customer experience are bringing major changes in security guidelines and operations. For example, as more account information and payment options are centralized on a single device used by consumers, the later are expected to have greater control and convenience.

The main insights into customer authentication stemming from the analysis of select jurisdictions are discussed in table 15. A general trend is that specific customer-authentication requirements are issued by the financial institutions that participate in the fast payment arrangement, rather than by the operator of the latter or the regulator. Some regulators do issue general guidelines to participants in connection with these requirements.

BOX 5 CUSTOMER AUTHENTICATION IN THE EUROPEAN UNION

Payment authentication and authorization include the steps of a transaction where a customer confirms who they claim to be (authentication) and is granted permission for the transfer (authorization).[28] Given that most fast payment arrangements have settlement finality, and that a transaction, once processed, cannot be reversed, customer authentication becomes critical. The use of biometrics in sender authentication is also becoming increasingly common. Whether a transaction is initiated by the payer or payee, authentication typically takes place at the payer's end. For a pull payment, the initiator of the payment (payee) does not authenticate itself, and the customer authentication takes place at the payer's end, using one or more factors of authentication.

In SCT Inst, strong customer-authentication (SCA) guidelines are mandated as part of the revised Payment Services Directive (PSD2). The core principle is to reduce payment fraud with minimal impact on the customer experience—that is, without introducing too much friction into the payment process.[29] SCA is an authentication process that validates the identity of the user of a payment service or of the payment transaction. More specifically, SCA indicates whether the use of a payment instrument is authorized.[30] The European Central Bank has developed draft regulatory technical standards[31] specifying the following: the requirements of SCA; the exemptions from the application of SCA; the requirements that security measures have to comply with to protect the confidentiality and integrity of the payment service users' personalized security credentials; and the requirements for common and secure open standards of communication between account-servicing payment service providers (ASPSPs), payment-initiation service providers, account-information service providers, payers, payees, and other PSPs.[32]

The proposed guidelines are key to achieve the objectives of PSD2 and introduce new requirements for authenticating online payments. PSD2 requires PSPs to apply SCA when a payer initiates an electronic payment transaction. PSPs include banks and other providers. SCA applies to all customer-initiated online payments across Europe. The main objectives of SCA are to minimize fraud, to create a more secure environment for online payments, to protect the confidentiality of the user's financial data, including personal data, and to add extra layers of protection by authenticating payments with additional identifying factors. The SCA check requires the following: possession (that is, "something you have," such as a card or phone), inherence ("something you are," such as a fingerprint, an iris scan, or your voice), and knowledge ("something you know," such as a PIN, password, or piece of memorable information).

The following two additional elements of SCA are also sometimes leveraged for multifactor authentication:

- "Somewhere you are" (location), which is commonly detected by a user's internet protocol address
- "Something you do" (behavior), least commonly used, in which actions such as gestures or touches (for example, on a picture) are observed to prove identities

The main challenge with implementing SCA requirements while maintaining a seamless and consistent user experience is largely determined by the ability of a firm (financial institution and ASPSP) to take advantage of all available PSD2 SCA exemptions. In particular, to take advantage of the Transaction Risk Analysis Exemption, ASPSPs will need not only to adopt advanced and effective capabilities to detect and report payment fraud that are able to determine, in real time, whether a particular transaction presents a low risk of fraud but also to consistently maintain overall fraud below levels predefined by the regulatory technical standards.

Countries such as Bahrain, India and Mexico use multifactor authentication techniques for fast payment transactions. The specifications across schemes are based on regulations by central banks. Globally, there is a push toward using SCA to reduce fraud and make online payments more secure. However, strong multifactor customer authentication may hamper seamless customer experience, and it is critical for organizations to strengthen authentication mechanisms while paying adequate attention to maintaining customer experience.

TABLE 15: Select Findings and Insights into Customer Authentication

Australia	There are no specific customer-authentication standards for making a NPP payment, as these payments are initiated by logging into the internet and mobile-banking application of a participating financial institution. This means that NPP payments are subject to the same fraud and security protections—including customer-authentication standards—that participating entities use for all of their internet and mobile-banking transactions (that is, two-factor authentication).
Bahrain	The central bank mandated banks to have SCA and authorization. Customers need to log in to their mobile or internet banking access channel and enter the beneficiary IBAN, which contains 22 alphanumeric characters, to complete the transaction process.[33]
Hong Kong SAR, China	HKMA has issued general guidelines to banks for customer authentication. Since 2018, all banks and SVFs have to ensure two-factor authentication. FPS does not impose any additional customer-authentication measures.
India	IMPS uses two-factor authentication. The factors are the following: • Mobile number and mobile PIN for mobile transactions • Card and ATM PIN for ATM channel • User ID and internet banking password/transaction password for internet banking channel For UPI, one-click, two-factor authentication is used. Device binding is used as the first factor, and the UPI PIN is used as the second factor. The mobile number is used for authenticating the first transaction, and the device fingerprint through the device is binding for subsequent transactions. While the system supports using biometrics (Aadhaar) as the second factor, it has not been implemented yet. Risk is further reduced by dividing the authentication requirements between the PSP and issuer bank: the first factor is validated by the PSP, and the second factor is validated by the remitter bank.
Mexico	To send an SPEI transfer through electronic channels, end customers have to use two-factor authentication. All SPEI participants are required to provide secure electronic channels and two-factor authentication schemes to their customers, according to regulatory guidelines from the National Banking and Securities Commission (Comisión Nacional Bancaria y de Valores or CNBV) and Banco de México.[34] These authorities are considering the harmonization of customer-authentication standards, as these currently vary based on the nature of the participant (that is, bank vs. non-bank).
United Kingdom	The Financial Conduct Authority, in consultation with the European Banking Authority, has mandated banks to implement SCA to enhance the security of payments and limit fraud. The implementation will span from September 14, 2019, to December 31, 2020, and the Financial Conduct Authority will continue to monitor the extent to which participants meet the expectation to provide any alternative means of authorization.

For more details, refer to the focus note on customer authentication, which forms part of the Fast Payments Toolkit.

iii. Application Programming Interfaces

Public authorities and operators worldwide believe that APIs are already revolutionizing the fast payment space, and that innovative solutions will continue to emerge through them.

APIs boost interoperability by providing easy access to fast payment arrangements and other aspects of banking, such as account details, lending, and other use cases. APIs also open the opportunity to create several interactions between stakeholders in the payment ecosystem (including third-party application providers) and consumers: from supporting the ability to initiate payments to assisting e-commerce transactions and other payment experiences, among many other applications. Box 6 provides details on APIs and their relevance for fast payments.

APIs are revolutionizing the fast payment space, and in most jurisdictions, operators and public authorities are clearly aware of this. (See country-specific insights and findings in table 16.) Fast payment operators generally define the API framework (for example, the main attributes that an API must possess to be used in connection with the system). While regulation is important to help ecosystems move toward maturity, it is also important to allow market forces to act as drivers to encourage innovation, flexibility, and change. In this regard, evidence shows that, in some jurisdictions, APIs for payments were part of a broader financial-services evolution to drive innovation across all aspects of banking. In other jurisdictions, APIs for payments were specifically developed/mandated. Furthermore, many jurisdictions are approaching APIs in stages across other aspects of banking—that is, account details, lending, and other use cases.

BOX 6 APPLICATION PROGRAMMING INTERFACES

An API provides access to service functionality and data within an application or a database. APIs can be used as a building block for the development of new interactions with humans, other applications, or smart devices.[35] In the context of web applications, the term *APIs* generally refers to JavaScript APIs in browsers. Of the various API types, standard communication protocol (SOAP), Representational State Transfer (REST), Graph Query Language (QL), gRPC, Thrift, and REST are used most commonly, as they offer greater flexibility (by supporting multiple data formats and call types) and can be understood easily.

APIs makes it easier for external applications to access specific services. Open banking, through the use of APIs, serves as a catalyst for fast payments by supporting the integration of more and more financial institutions. Standardized APIs enable inventive ways for providers to extend their digital capabilities and cater to the varied needs of customers across market segments while remaining cost efficient.

The functionalities being made available through APIs include merchant payments, transaction history, business-to-business payments, e-commerce payments, authentication, account balance, bill payments, profile management, P2P payments, and reversals. Product categories of open APIs in the digital financial services space include consent/identity, ecosystem expansion, data, and money movement APIs.[36] Key drivers for API innovation and growth are the demand for newer products that fintechs wish to cater to and banks increasingly trying to compete in the fintech playing field. The following are some of the common APIs used in the payments space:

- APIs for participants to connect to a payment system (for example, to the fast payment arrangement)
- APIs that enable direct participants to connect to the central infrastructure via third-party providers
- Bank APIs that allow indirect participants or customers to use the bank's interface
- Payment/account-initiation APIs
- Open banking APIs that allow third-party apps to interact with the bank and to initiate payments over the API
- Other adjacent APIs, such as confirmation of payee, which is used to validate the recipient information before initiating the faster payment
- Request to pay
- APIs for information reconciliation and monitoring
- APIs used in the settlement process for connection to the central bank
- Account aggregators

APIs help businesses and consumers access fast payments and initiate payments at any time and from any location. There is potential for APIs to be used (or are already being used) for communication between different players in the fast payment ecosystem, such as between payer and payer bank, payer bank and third-party players, and beneficiary bank and merchant, among others.

As APIs are used more and more, and considering the benefits of using APIs, there is a case to be made for API standardization.[37] API standardization promotes trustworthiness and reliability. Standardization of APIs for functions such as payments or the submission of reports (to the regulator) can reduce duplication of functionality and lead to cost optimization by promoting reuse.[38] API standardization, apart from others have the following benefits:

- Allows technology to be leveraged more effectively and enhance customer experience while maintaining security
- Simplifies development and implementation of capabilities, lowers costs, and reduces project development life cycle
- APIs contribute toward the reduction of fraud by facilitating quick communication with less friction
- APIs can help meet customer expectations by enabling value-added services and driving innovation in the payments space

TABLE 16: Select Findings and Insights into the Use of APIs in the Context of Fast Payments

Australia	The NPP API framework defines the key technical approach and mandatory data attributes for NPP APIs, aligned to ISO 20022. It is designed to support interoperability and standardization. APIs play an important role in helping innovators and third parties to use the NPP's capabilities. While NPPA does not mandate the use of this framework, it encourages NPP participants, TPSPs, and software developers to refer to this framework or build further upon it when developing API solutions for NPP transactions.
India	There are standardized APIs only for UPI payments. UPI provides flexibility to support extensive APIs because it uses a proprietary XML-based messaging format. Due to this, the adoption of APIs has been encouraging by banks and third-party application providers. APIs are extended by banks or NPCI for either connecting to PSPs/UPI for transactions or other value-added services, such as checking transaction status and retrieving transaction details. More recently, APIs are also being used for customer account aggregation for business use cases.
Mexico	Limited APIs are provided by Banco de México. SPEI allows the use of limited-purpose APIs for value-added services such as checking transaction status and retrieving transaction details. CoDi, the overlay request-to-pay service, also runs on an array of APIs that are open to all SPEI participants. Furthermore, Banco de México is considering allowing access to third-party open APIs.
United Kingdom	Under the framework developed by the Open Banking Implementation Entity (OBIE), three types of licenses are granted: account-information service provider, payment-initiation service provider (PISP), and card-based payment instrument issuer. Payment initiation, account aggregation, and card-based conformation of funds, among other services, are provided through these. The scope of the PISP includes domestic, international, schedule future dated, and standing order payments. The open-banking framework covers the technical and nontechnical elements, such as customer experience guidelines, operational guidelines (to track and monitor APIs developed by banks), the dispute-management process, the liability framework, the TPP accreditation process, a conformance testing tool, dynamic client registration, an API monitoring tool, and security specifications.

For more details, refer to the focus note on APIs, which forms part of the Fast Payments Toolkit.

4.2.3 Network Connectivity

Strong and secure network connectivity is a necessary condition for the sound operation of the different components of a fast payment technical infrastructure.

As mentioned earlier, during the onboarding process, participants are required to establish a secure connection with the core technical infrastructure. This technical connection allows participants to exchange payment and nonpayment messages with the operator and with other participants. The operator transmits, reconciles, confirms, and submits instructions for inter-participant settlement. The operator can also provide additional support services, such as the following:[39]

- Translation between messaging formats
- Defining and handling of error responses
- Additional fraud detection and money-laundering transaction-monitoring services
- Calculation of switch fees and interparty fees
- Reporting and providing of dashboards to participants and possibly the regulator

Stakeholders need to determine the messaging protocol for the communications between participants and the fast payment infrastructure and to establish a secure connection with the infrastructure using alternatives such as through the following:[40]

- A proprietary communication network
- The internet
- Existing messaging system such as SWIFT or ATM switch
- Third-party APIs

Jurisdiction analysis (see table 17) shows that as experience is gained operating fast payment infrastructures, some jurisdictions have made a distinct separation between the technical connection and settlement of funds, so that participants can connect to the system under a variety of approaches. In this model, participants can designate a TPSP to send and receive payment and nonpayment messages. It was also found that for most arrangements the access framework also enables smaller financial institutions (generally lacking the necessary technical capability) to connect easily to the system, also through APIs, as in the case of the United Kingdom. Participants can also appoint an agent financial institution to fulfill their settlement obligations.

TABLE 17: Select Findings on Network Connectivity

Australia	The NPP is a distributed switch of individual "payment access gateways" that route and exchange financial messages between each other. It also allows "Connected Institutions" to connect directly with the system. These institutions are able to initiate payments only from a customer account and do not provide clearing and settlement services. "Connected Institutions" need to meet the technical and other associated requirements for setting up a payment access gateway in their own environment. Financial institutions can also have indirect membership, solely to perform either clearing or both clearing and settlement on behalf of a directly connected NPP full participant.
India	When IMPS was launched, it was based on the existing National Financial Switch (that is, the switch for ATM transactions) operated by NPCI. The National Financial Switch was the core technological infrastructure supporting NPCI services. Gradually, IMPS operations were shifted to its own switch (called the Bharat Switch). Although the Bharat Switch was developed by an external vendor, NPCI owns the source code. UPI has its own central switch through which participants establish connection to the infrastructure. A key to the ubiquity of UPI has been participation of third-party application providers. These are typically large technology companies/merchants/aggregators/fintechs that connect to banks and provide UPI services to end users. Such services may include the onboarding of both customers and merchants by PSPs for transfers and/or merchant payment transactions, respectively. 1. Connectivity for third parties can be segregated on the basis of architecture: • Bank architecture–dependent model • Single PSP model • Multibank model (NPCI has mandated third-party application providers processing more than 5 percent of UPI's monthly volume to follow this model) • Service app model • Web/mobile app-based collect • QR/intent-based approach 2. Bank architecture–independent model (third party can connect to NPCI UPI central switch with limited functionality)
Mexico	SPEI uses an open-communication protocol that was specifically designed and does not require any specific architecture, programming language, or operating system. Banco de México provides participants with the protocol and all technical characteristics, so participants can choose between developing their own software for connecting their internal systems to SPEI or hiring a technical provider for this purpose.
United Kingdom	Participants can connect to FPS using the two following alternatives: • Through physical cables • Using third-party APIs If a participant connects through physical cables, it incurs costs, such as those for setting up the data center, the physical cables, and establishing the cross-linkage connection. Typically, it costs between $300,000 and $1 million to connect to the system using a physical network. There are additional expenses, such as a due-diligence cost for an audit at the data center to maintain data security. In contrast, if the participant opts to connect through third-party APIs, the above costs are reduced. Some players (for example, Form 3 and Payport) have connected to the central infrastructure using physical cables and provide technical support to other participants using APIs. The connectivity approach is suitable for small PSPs, as it reduces the onboarding time while allowing them to connect directly. Directly connected settling participants are directly connected to the central infrastructure of FPS and can carry out their own settlement, while directly connected non-settling participants are directly connected to the central infrastructure but require the former for settlement. Indirect agencies rely on direct participants for connection and settlement.
United States	RTP has made a distinct separation between the technical connection and settlement of funds. This allows participants to connect directly with the system but fulfill settlement obligations through other financial institutions. Alternatively, the participants can designate a TPSP to act on their behalf as agent to send and receive transmissions of payment messages, payment message responses, and nonpayment messages, using the TPSP's technical connection.

4.2.4 Clearing and Settlement

Clearing and settlement are core functions for ensuring a swift, safe, and seamless flow of funds from one participant to another. Different models for clearing and settlement exist in practice. The choice depends on several country- and system-specific considerations. While deferred net settlement is prevalent at present, real-time settlement models are becoming more common in new fast payment implementations.

Three types of inter-participant clearing models were observed as part of the study (see figure 12 and table 18):

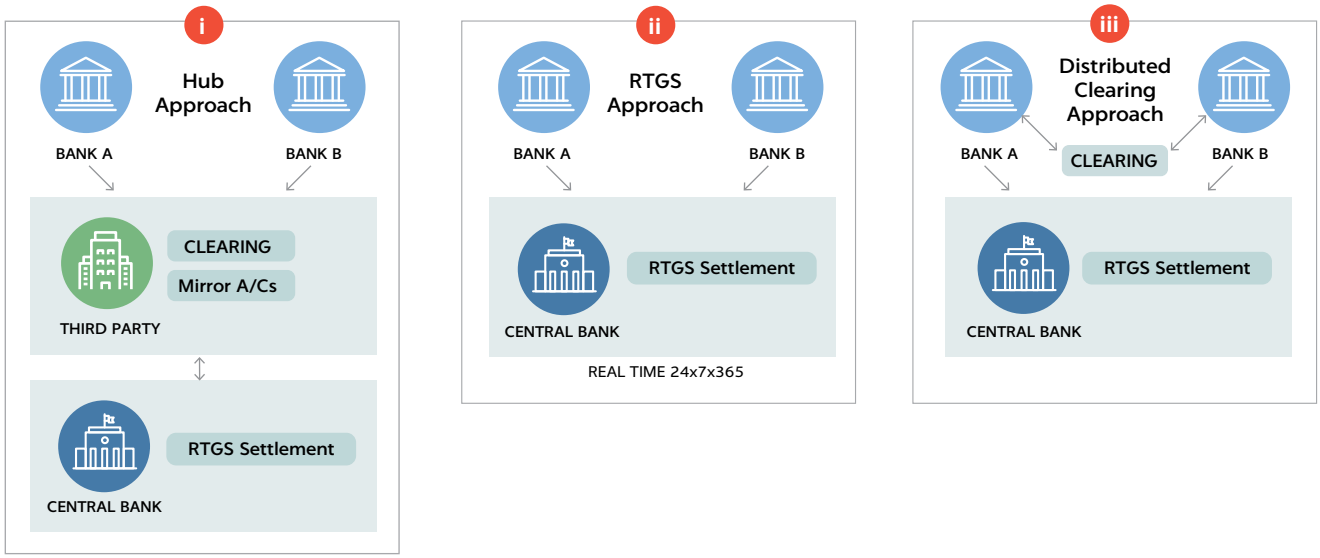
- **Hub approach:** A third-party organization (for example, a clearinghouse) acts as a hub handling the clearing between the participants and manages the downstream settlement with the central bank. The participants prefund the account or pledge collateral, and the clearinghouse performs real-time clearing and provides updates to the participants. The hub also sends settlement instructions to the central bank's RTGS system, where the actual movement of funds occurs. Jurisdictions that have adopted a hub approach include India, Singapore and the United Kingdom.
- **RTGS-based approach:** The RTGS system supports clearing and undertakes settlement of fast payment transactions. The RTGS system does not validate payment instructions received as part of the arrangement, and any failure of payment results in the return of the payment instruction to the originating participant. This approach has been adopted by Mexico and the United States.
- **Distributed clearing:** Validation and confirmation of payment instructions are carried out by the participating bank. Clearing is carried out in real time on a 24/7 basis. Subsequently, the payer bank instigates the settlement instruction to the central bank, which is processed on a real-time basis. Australia follows the distributed clearing approach.

Regarding settlement, the choice of a settlement model has important consequences on safety and efficiency. The two major payment settlement models for fast payments as observed in this study are (i) deferred net settlement and (ii) real-time settlement.

Deferred net settlement -(DNS): In a DNS model, the settlement of inter-participant obligations occurs on a net basis at some later time, at the end of a predefined cycle either once or multiple times during a day. This model is more efficient, as it reduces the liquidity needs. However, a DNS system has its inherent risk, as the buildup of net debit positions may give rise to credit risk if not properly managed by appropriate risk-mitigation measures such as debit caps, guarantee funds, prefunding, collateral arrangements, and so on.

Real-time settlement: In a real-time settlement model, there is continuous settlement of funds on an order-by-order basis. In this model, a fast payment transaction will be completed only if the relevant originating participant has adequate balances in its settlement account with the central bank (or other entity acting as the settlement agent). Credit risk between participants is therefore eliminated, and real-time settlement enables immediate finality of all payments.

FIGURE 12: Observed Clearing Models



However, demands on liquidity in this model are higher, and additional tools are generally required to manage liquidity risk. The latter may include access to the intraday credit facility from the central bank that is available for the RTGS system, though this facility is typically restricted to banks. There is also the issue that the RTGS system may be regularly closed for some hours during the day, in which case, a fast payment arrangement using this settlement model would face obvious difficulties to achieve real-time finality. Jurisdictions are observed to be increasing the operating hours for RTGS; some jurisdictions are making the RTGS available on a 24x7 basis.

Figure 13 shows the actual settlement models chosen by jurisdictions for fast payments. A DNS model has been adopted by 11 of the 16 jurisdictions studied. Nevertheless, the broader analysis of the more than 50 jurisdictions showed that real-time settlement is witnessing increased uptake, especially for new fast payment implementations.

Another trend that was observed in several jurisdictions (see table 18) is the adoption of prefunding for the fast payment arrangement, as in Poland and the United States. Prefunding in this case means that PSPs are required to place cash deposits in a segregated escrow account (or equivalent) to cover their expected transactions. Through prefunding, payment orders can be processed in real time, with no credit or liquidity risks. However, prefunding carries a cost, such as interest loss on the respective funds and opportunity costs.[41]

Finally, in all the jurisdictions studied, the central bank is involved in the settlement of inter-participant positions. Final settlement occurs in the RTGS system or RTGS-equivalent account maintained with the central bank of the country.

The rationale for adopting DNS or real-time settlement for FPS is based on market arrangements already in place for other retail payment systems. Whether the FPS is to be operated by the central bank itself, the system design and access to the RTGS, and whether the RTGS will be available on a 24x7 basis are also factors to consider when adopting a particular model for settlement. The benefit of DNS is liquidity saving due to netting, whereas continuous availability of funds is required for settlement in a real-time model.[42] The timing of inter-PSP settlement in a DNS arrangement varies across jurisdictions. DNS generates credit exposures between the PSPs, as the PSP credits the funds in the account of its customer before receiving the funds from the PSP of the payer, an implicit credit and a consequent credit risk. The credit and liquidity risk in DNS may exacerbate if not managed and mitigated. Some of the measures that are implemented to mitigate the risk associated with DNS are (i) limits on the maximum value of individual fast payments that can be processed; (ii) loss-sharing agreements that detail, ex ante, how the surviving participants would cover the loss created by a defaulting participant; (iii) limits on the maximum net debit or credit positions that can be established between participants, or on the maximum gross aggregate positions; (iv) collateralization of the debit positions, either with securities or cash collateral, to ensure that resources are available to support settlement; and (v) the prefunding of positions by individual participants, by means

FIGURE 13: Participant Settlement Models Adopted for Fast Payment Arrangements

JURISDICTION	DEFERRED NET SETTLEMENT	REAL TIME SETTLEMENT
Australia		✔
Bahrain	✔	
Chile	✔	
China	✔	
EU		✔
Hong Kong SAR, China		✔
India	✔	
Kenya	✔	

JURISDICTION	DEFERRED NET SETTLEMENT	REAL TIME SETTLEMENT
Malaysia	✔	
Mexico		✔ (Hybrid)
Nigeria	✔	
Poland	✔	
Singapore	✔	
Thailand	✔	
UK	✔	
USA		✔

TABLE 18: Select Findings on the Clearing and Settlement Models Used for Fast Payments

Australia	The NPP uses a real-time settlement model with a distributed clearing system. This has been the norm in Australia for many years. This clearing approach was chosen over a hub model because distributed clearing provides resilience—that is, if one node goes down, the other nodes can continue to be operational.
Chile	Final inter-participant settlement is performed on a DNS basis. Participants in TEF can choose either to clear transactions through a private clearinghouse (that is, Combanc) and perform final settlement via the central bank's RTGS system at the end of the day or to settle their obligations directly in RTGS.
European Union	For SCT Inst, PSPs must be connected to at least one CSM to receive or send payments. They can choose between pan-European providers such as TIPS or RT1 or regional providers such as STET, Equens Worldline, CEC, Iberpay, and others.[43] Transactions processed through TIPS are settled immediately in central bank money. ACHs offering SCT Inst services settle in their own books, although settlement is backed by funds held in a central bank account. In other words, the CSM's account at the central bank is used to support settlement in the CSM's books. In July 2020, European Central Bank's Governing Council decided that all PSPs that have joined SCT Inst and are reachable in the central bank's RTGS system, as well as all ACHs offering SCT Inst services, would have to join TIPS, to ensure full reachability among scheme participants.[44] Following the implementation of these measures, it will still be possible to settle transactions internally in a private CSM, but the funds backing these transactions will be held in TIPS, and cross-CSM transactions will be settled in TIPS.
Hong Kong SAR, China	FPS uses real-time settlement across the books of the HKMA (for Hong Kong dollars) and Bank of China Hong Kong (for renminbi) as long as sufficient funds are in the FPS ledger accounts of the originating participant. Each settlement participant has a settlement account (including a CHATS ledger account and an FPS ledger account) with HKMA in accordance with the conditions for the operation of the settlement account, whereas each clearing participant keeps an account with a settlement participant. Settlements are irrevocable and enjoy immediate finality.
India	Settlement service in IMPS and UPI is provided by NPCI (by virtue of its "Type D" RTGS membership) using a DNS model. Settlement occurs in the RBI's RTGS system. Participant settlement positions are passed as "Multilateral Net Settlement Batches" using the Net Settlement Interface. While the approach and process remain similar, IMPS and UPI settlements were separated by NPCI within the first year of UPI's launch because the net obligations had to arrive separately for the two systems in line with legal and regulatory requirements. The RTGS system, operated by the RBI, has been available around the clock on all days since December 2020. Settlement for IMPS and UPI now takes place six times a day 365 days a year with the RTGS system now being available on all days. NPCI is planning to extend the number of settlement cycles to eight in the near future. DNS was chosen owing to its *a priori* appropriateness for systems handling substantial volumes. Lower liquidity requirements were also deemed crucial. As per the RBI's directions, clearinghouses (such as NPCI) need to publish the time of arrival at the net settlement position for members to ensure adequate funds availability. Also, the time between arriving at the net settlement position and the actual posting of this position should be as short as possible.
Mexico	SPEI has adopted a hybrid real-time settlement system for payments. It uses a multilateral offsetting algorithm running in quick successions (every three seconds or a configurable number of payments) to clear and settle transactions. The algorithm selects those transactions that can be settled based on available balances in the participants' settlement accounts and clears and settles in batch mode. The transactions that cannot be settled because of a lack of liquidity remain in the queue, except for CoDi transfers. At the start of operations, participants transfer funds from their accounts at Banco de México's Account Holders Service System (SIAC) to their SPEI account. At the end of the day, positive balances in SPEI are credited to banks' current accounts in SIAC or to a concentration account within the system for participants without a SIAC account.
Poland	Express Elixir has adopted a prefunding model where all participating banks deposit funds in a fiduciary account maintained by the National Bank of Poland, whose balance determines whether a participant may submit payment orders. On this basis, each participant has a defined limit of transactions, and transactions are executed only up to that limit. If the limit for sent orders is exceeded, the payment order is rejected immediately.
United States	Settlement in RTP is done using a real-time settlement model through a fully prefunded account that is jointly owned by all the participating financial institutions in the Federal Reserve. All payments are prefunded by the sending participant into the joint account. RTP verifies and reserves settlement capacity by the sending participant before forwarding the payment to the receiving participant, eliminating the risk of settlement failure. In case the sending participant has an insufficient prefunded position to cover a payment, the core infrastructure will reject the payment. Overdrafts or negative prefunded positions are also not permitted in the RTP system. The use of a prefunded model eliminates the settlement risk and enables immediate finality of all payments.

of cash coupled with operational controls that keep positions from exceeding prefunded amounts. In contrast, individual fast payments involve the provision of irrevocable and unconditional funds by the payee's PSP to the payee. The technological capability and capacity of the RTGS to settle FPS in real time is also one of the factors to consider when deciding on the settlement model to be adopted. Real-time settlement implies that the PSP credits the funds to its customer only after settlement between PSPs has taken place. As a result, this settlement model avoids credit risk between participating PSPs and the need for having risk-mitigation measures to mitigate credit risk. The consequence, however, is that PSPs continuously require sufficient liquidity to ensure the settlement of fast payments.

4.2.5 Interoperability

Interoperability among payment instruments and arrangements—including fast payments—is a crucial feature of the NPS.

Some jurisdictions are already working on enabling retail cross-border payments via their fast payment arrangements.

Interoperability in the context of fast payments is enabled by a set of technical, process, and operational standards.[45] Common standards create a common language between banks and other PSPs for processing transactions and facilitate a seamless and efficient flow of information. Having a common standard across the whole payment ecosystem can also facilitate the integration of fast payments into other components of the NPS. Interoperability can also exist between PSPs, between payment instruments, and for such use cases as cross-border payments.

Table 19 provides details on interoperability as per the findings of the study. Perhaps the main aspect that emerges from this table is that the participation of non-banks in fast payment arrangements paves the way for interoperability between banks and non-bank PSPs. Through this participation, be it direct or indirect, most of the systems that were analyzed already support bank account-to-wallet transactions and vice versa.

Some jurisdictions are also working on enabling retail cross-border payments via their fast payment arrangements. For example, in Australia, the NPP infrastructure and associated rules framework have been enhanced and extended to support the domestic leg of an inbound cross-border payment with the creation of the scheme-agnostic business service International Funds Transfer Instruction. This enables correspondent banks to send these payments to the ultimate beneficiary or customer over the NPP as the final leg of the cross-border payment process. In the European Union, SCT Inst One Leg (Out) transactions for international transactions beyond the European Union are currently under development. The EPC has granted licenses to some non-eurozone countries, allowing them to use the building blocks of the scheme for non-euro transactions. In Kenya, banks have integrated with international money-transfer operators to facilitate inward remittances through PesaLink. In the case of Singapore and Thailand,

TABLE 19: Select Findings on Interoperability

Australia	Currently, the NPP does not support account-to-wallet transactions and vice versa. However, these transactions may be facilitated through over-the-top services provided by overlay service providers in the future. NPP payments can be made only by logging into the internet and/or mobile-banking application of a participating financial institution and authorizing a payment. The NPP enables transfers between accounts at different participating financial institutions, including between banks and non-banks.
China	Credit transfers, direct debits, and e-wallets are supported as payment instruments. IBPS supports account-to-wallet transactions and vice versa.
India	IMPS supports account-to-wallet transactions and vice versa. Such interoperability was supported by handling fields such as account identifiers with either an account number or a wallet number based on the instrument. Other aspects that were considered include differences in rules, such as permissible transaction limits or threshold balance requirements for prepaid payment instruments (PPIs). The RBI has allowed PPI issuers to give the holders of full-KYC PPIs (that is, PPIs that are compliant with know-your-customer requirements) interoperability through authorized card networks (for PPIs in the form of cards) and UPI (for PPIs in the form of electronic wallets).
Malaysia	Both banks and eligible non-bank PSPs (including wallet providers) participate in RPP. The RPP platform promotes interoperability and facilitates seamless payments between accounts maintained with banks (bank accounts) and non-bank participants (e-money accounts).
Mexico	SPEI allows direct participation by all regulated financial institutions. This allows interoperability between all participant banks and non-bank PSPs (that is, transfers between banks and non-banks).
Nigeria	NIBSS Instant Payment (NIP) allows both banks and mobile-money operators to participate in its system as direct participants, and transactions between the two are interoperable.
Thailand	Credit transfers and e-wallets are supported as payment instruments. PromptPay supports account-to-wallet transactions and vice versa.

the MAS and BOT linked PayNow and PromptPay in 2021. Challenges identified include aligning with regulations, complying with KYC/AML guidelines, risk control, and robust data security measures.

The main challenges identified in enabling real-time cross-border payments include agreeing on a common messaging standard and devising a viable clearing and settlement model, including rules for foreign currency exchange. Box 7 provides a deeper discussion of aspects related to integrating fast payment arrangements across borders.

For more details, refer to the focus notes on interoperability aspects and on cross-border aspects, which form part of the Fast Payments Toolkit.

BOX 7 CROSS-BORDER ASPECTS

The key difference between a domestic payment system and a cross-border payment arrangement is that a cross-border arrangement does not fall under a single set of laws and regulations. In practice, most cross-border payments today are processed using a proliferation of bilateral agreements between institutions, often leveraging international messaging networks for communication (but not for payment processing).

A number of industry players have launched new services or partnerships to improve the speed, transparency, and cost of cross-border payments through the innovative use of traditional systems or services or by leveraging new technology, such as distributed ledger technology. Some of these different approaches and examples are summarized below:

- SWIFT has launched global payment innovation (gpi) Instant, a new service for real-time cross-border payments and transfers. SWIFT gpi Instant carried out pilots with Australia's NPP for payments between Australia and China; Singapore's FAST, which involved 17 banks across seven countries (that is, Australia, Canada, China, Luxembourg, the Netherlands, Singapore, and Thailand); and banks and TIPS in Europe. The new service is being rolled out initially in the British market and Lloyds Banking Group is the first to go live. The gpi Instant service works by connecting SWIFT gpi with real-time domestic infrastructure. It enables banks to use existing infrastructure to provide better service 24/7, with faster speeds, clarity on fees, and predictability about when an end beneficiary's account will be credited.
- International card networks such as Visa and Mastercard have also pursued opportunities to leverage their infrastructures to improve cross-border payments. Visa's B2B Connect platform[46] is an API-based non-card network that uses distributed ledger technology to settle large-value transactions between financial institutions in the Visa network. B2B Connect provides a single, multilateral network that incorporates not only payments messaging but also ID-authentication and security features to allow banks to exchange cross-border payments on a same-day or next-day basis. Mastercard has recently announced a partnership with the international money-transfer start-up TransferGo to develop the near-real-time exchange of cross-border payments for consumers and businesses.[47] The initiative will leverage Mastercard Send and TransferGo's remittance network to allow customers to circumvent legacy correspondent banking networks to speed the processing of cross-border payments.
- The two largest global remittance providers have been active in developing partnerships to speed up cross-border transaction processing. In October 2020, Western Union announced real-time payout capabilities in 80 countries,[48] while MoneyGram has partnered with institutions such as Visa to enable fast payments between certain corridors. More recent entrants in the international remittance space, such as Wise (formerly TransferWise), have also seen success in recent years by providing international transfers at lower cost and faster speed than legacy remittance providers, including the ability for customers to compare the cost of international transfers between Wise and other PSPs (including fintechs, remittance providers, and financial institutions).
- Ripple has developed a network based on distributed ledger technology for cross-border payments. The RippleNet network allows financial institutions to send and receive international payments from a single prefunded account. RippleNet allows for fiat-to-fiat

continued

BOX 7, *continued*

transactions as well as the use of the XRP digital currency to bridge between different jurisdictions.

The G-20 has published a road map to enhance cross-border payments ahead of the G-20's October 2020 meeting.[49] The Financial Stability Board's road map includes five focus areas, four of which are centered on enhancements to current cross-border payment arrangements and improvements that can be made to existing payment systems that can enhance the speed, cost, transparency, and service levels experienced by consumers and businesses when sending or receiving international payments, as well as potential changes that may be needed for regulatory and supervisory frameworks. The fifth focus area looks at the potential for the development of new payment infrastructures and arrangements.

As with domestic payment systems, prior to the deployment of a new cross-border linkage or multilateral cross-border payment system, all relevant stakeholders should have a firm understanding of the goals, use cases, and target audience. The relevant authorities should analyze the following aspects: (i) determine key use cases/goal of FPS for cross-border FPS; (ii) assess existing payment systems for cross-border use; (iii) assess existing legal/regulatory frameworks; (iv) identify participating markets and participants in the fast payment arrangement; (v) determine an appropriate governance structure; (vi) determine key functionality and technical specifications; (vii) develop scheme rules and operational guidelines; (viii) develop tender specifications and assessment criteria (if applicable); (ix) assess tender responses and select a technology provider (if applicable); and (x) test and implement the cross-border arrangement.

A cross-border fast payment arrangement will require cooperation between financial institutions and national authorities from multiple jurisdictions. This international cooperation is absolutely vital.

4.3 MODULE C: FEATURES OF FAST PAYMENT ARRANGEMENTS

This module focuses on assessing customers' needs, such as speed, payment certainty, a simple and convenient user experience, pricing, clarity on the timing of delivery, and integration with bank account/mobile wallet/e-money, among others. The following four specific insights are covered in this module:

1. Payment instruments, payment types supported, and use cases/services
2. Overlay services and aliases
3. Access channels
4. User uptake

4.3.1 Payment Instruments, Payment Types Supported, and Use Cases/Services

The availability of key use cases, such as P2P and person-to-business (P2B, or merchant and bill payments), is critical for fast payment uptake and growth. While P2P payments have been the genesis of many fast payment arrangements, P2B payments—including through request to pay—are accelerating generalized adoption.

For what concerns payment instruments, all fast payment arrangements studied support credit transfers, and some also support direct debits and e-money as payment instruments. (See figure 14.) Direct debits are currently supported in China, Hong Kong SAR, China,[50] India, Nigeria, and Singapore, among others, and they are being developed in Australia and Malaysia. E-money payment instruments are supported in Chile, Hong Kong, India, Malaysia, Mexico, Nigeria, Thailand, and the United States.

Push and pull instruments are an alternate classification of payment instruments. (See characteristics in figure 15.) Push-payment instruments include credit transfers and e-money, while pull-payment instruments include checks and direct debits. Credit and debit cards are conceptually a pull transaction.

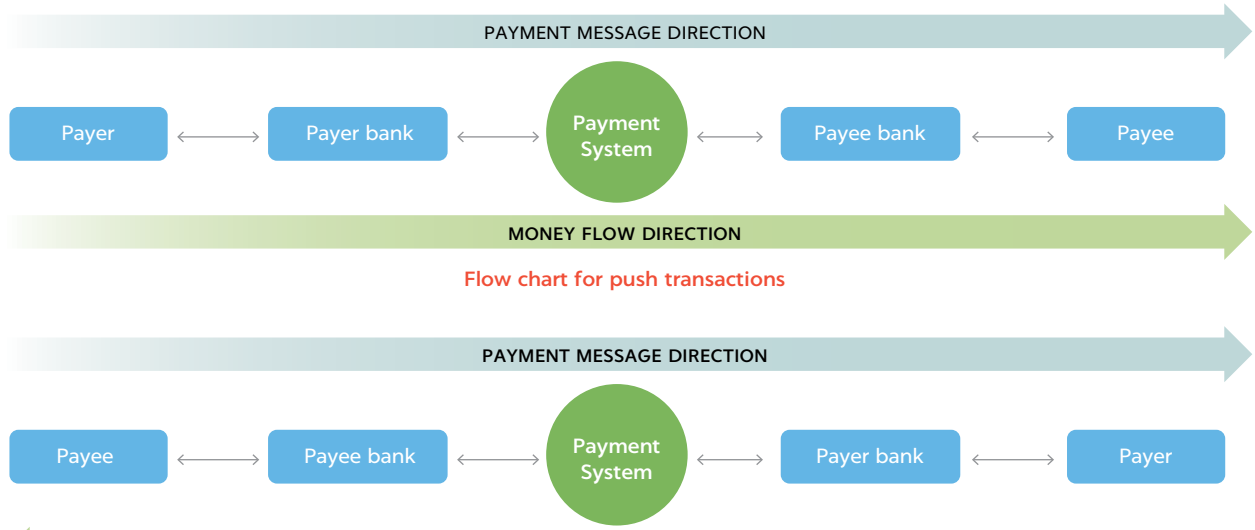
All fast payment arrangements studied have adopted a credit-push methodology that requires the payer to specify the account number (or proxy identity where aliases exist) of the payee in the payment message. This ensures that the payer controls the transactions that are initiated via her/his account. A few, including Bahrain, India, Poland, Thailand, and the United Kingdom, have also adopted credit pull. In cases such as Mexico's SPEI, the request-to-pay functionality is implemented as a credit push, as the movement of funds is initiated by the payer once it gives authorization to proceed with the request.

FIGURE 14: Payment Instruments Supported by Fast Payment Arrangements

JURISDICTION	CREDIT TRANSFER	DIRECT DEBIT	E-MONEY
Australia	✔		
Bahrain	✔		
Chile	✔		✔
China	✔	✔	
EU	✔		
Hong Kong SAR, China	✔	✔	✔
India	✔	✔	✔
Kenya	✔		

JURISDICTION	CREDIT TRANSFER	DIRECT DEBIT	E-MONEY
Malaysia	✔		✔
Mexico	✔		✔
Nigeria	✔	✔	✔
Poland	✔		
Singapore	✔	✔	
Thailand	✔		✔
UK	✔		
USA	✔		✔

FIGURE 15: Transaction and Message Flow for Push and Pull Payments



Furthermore, the adoption of fast payments depends largely on the type of payment types and use cases/ additional services provided by it. Arrangements supporting more payment types and use cases witnessed higher uptake and overall growth compared to arrangements with limited offerings.

Regarding payment types, these include payments between and among individuals, businesses, and governments. Every payment type can be segmented into categories, depending on the direction of the flow of the transaction. (See figure 16.)

FIGURE 16: Payment Types

PAYER \ PAYEE	CONSUMER	BUSINESS	GOVERNMENT
Consumer	P2P	P2B	P2G
Business	B2P	B2B	B2G
Government	G2P	G2B	G2G

FIGURE 17: Use Cases Supported by Fast Payment Arrangements

JURISDICTION	P2P	MERCHANT PAYMENT	BILL PAYMENT	REQUEST TO PAY	BULK PAYMENT	FUTURE-DATED PAYMENT
Australia[1]	✔	✔	✔			
Bahrain[2]	✔	✔	✔	✔		
Chile	✔		✔		✔	✔
China	✔		✔			✔
EU[3]	✔	✔	✔		✔	✔
Hong Kong SAR, China	✔	✔	✔	✔	✔	
India[4]	✔	✔	✔	✔	✔	✔
Kenya	✔		✔		✔	
Malaysia[5]	✔	✔				
Mexico	✔	✔	✔	✔	✔	
Nigeria	✔	✔	✔			
Poland	✔	✔	✔	✔		
Singapore	✔	✔	✔			
Thailand[6]	✔	✔	✔	✔	✔	
UK	✔		✔	✔	✔	✔
USA	✔	✔	✔	✔	✔	✔

1 In Australia, use cases such as Request to Pay, Future Payments and Bulk Payments are under development
2 In Bahrain, Request to Pay is supported by BenefitPay and Bill Payments by Fawateer
3 In EU, Request To Pay is under development4In India, UPI also supports Non-Financial Transactions, Initial Public Offering Subscription, and Foreign Inward Remittance
5 In Malaysia, new services, i.e. Request To Pay, Consent (e-Mandates), Real-Time Debit and Cross-Border Payments are under development
6 In Thailand, PromptPay also supports e-Donation

In turn, use cases/services are specific situations in which a payment product or service could potentially be used, such as for bill payments and merchant payments. Actual uses cases supported by fast payment arrangements in the studied jurisdictions are illustrated in figure 17.

The P2P payment type and use cases associated with it have been the genesis of many fast payment arrangements. As customers grew used to fast payments, they became more comfortable making merchant, bill, and government payments via this same platform. Furthermore, to increase merchant and bill payments, operators and participants in jurisdictions such as Hong Kong SAR, China, India, and Thailand have also provided incentives in the form of cashback offers, discounts, and coupons.

In any case, an important lesson is that large-scale adoption of P2P payments has been a cornerstone for the adoption of other payment types.

During the study, it was found that operators have adopted two main methods of introducing payment types and use cases.

- In certain jurisdictions, operators have defined the various payment types and associated use cases based on their understanding of the market. These were introduced in one go or in phases. For example, PromptPay in Thailand started only with inter-bank credit transfers. After its launch, support for several use cases/services, such as cross-bank bill payments, request to pay, and e-donations, were introduced in a phased manner.
- A few jurisdictions adopted a different method: The operator introduced the fast payment arrangement and let various market players decide on various use cases. Examples include SCT Inst in the European Union, Mexico, Poland, and the United Kingdom. For example, operators in Mexico and Poland were of the view that market players are in the best position to determine the use cases suitable for the local market and that their responsibility is to provide a robust underlying infrastructure that is flexible enough to support various innovative use cases.

Australia and Thailand provide examples of fast payments enabling business and government payment types and their associated use cases/services. In Australia, the NPP enables businesses to extend usage to accept merchant payments. Additionally, the NPP has published its own QR code standard for both dynamic and static QR codes that merchants can use. In 2019, NPPA published a road map with plans to roll out the Mandated Payments Services, which is the core capability to enable use cases such as request to pay, bulk/batch payments, and scheduled future payments. The development of this capability will involve considerable effort to implement, requiring changes to existing back-office processes and systems. All participating financial institutions are required to implement this capability by December 2021. In Thailand, merchant payments are allowed in PromptPay through the request-to-pay functionality and via QR codes. After the launch of standardized Thai QR codes, support for QR payment was enabled by launching MyPromptQR in September 2019. Furthermore, government agencies in the country are processing social-assistance cash transfers and tax refunds through PromptPay, which has resulted in significant increases in user registration in PromptPay.

Finally, one of the most noteworthy features in many fast payment arrangements is the availability of a request-to-pay functionality, as it offers a wide range of use cases across consumers and businesses. Request to pay also offers an effective alternative to card payments and traditional direct debits. Box 8 provides more details on the essentials of a request functionality.

Further, table 20 provides details on select findings on the request-to-pay functionality in fast payments studied for this guide. One key issue that emerged from the analysis of the jurisdictions in this table is that request to pay increases convenience to payers by eliminating the need to input multiple information details. Through this, recipients (in particular, merchants) can efficiently and seamlessly notify payers of the underling payment obligation so the payers can take action, but payers retain full control over the actual payment process (that is, the actual flow of funds).

BOX 8 REQUEST TO PAY IN FAST PAYMENT ARRANGEMENTS

In essence, a request-to-pay functionality enables a payee to make a request for the initiation of a payment by a payer. The payee and payer may be persons, businesses, or any other payment account holders. The essential steps in a request-to-pay process are the following:

- A request is made by the payee.
- The payer is provided with information on the amount, the purpose of the transaction, and payee information.
- The payer decides to approve or decline the request, resulting in the authorization (or refusal) of the payment.
- Upon approval of the payment request, the payer's PSP is instructed to execute a payment to the payee.

Some of the standard use cases associated with request to pay include P2P payments, e-billing/invoicing, e-commerce payments, and point-of-sale payments. Jurisdictions such as India, Thailand, the United Kingdom, and the United States, offer request-to-pay services as an underlying functionality of their fast payment arrangement, whereas other jurisdictions, such as Mexico, have introduced this functionality as an overlay service.

TABLE 20: Select Findings and Insights into Request-to-Pay Functionalities and Services

India	The UPI system supports request to pay, through which a user can request a payment using the UPI ID or saved contacts. After this, the payer has to authorize the payment to complete the transaction. Payers can define minimum and maximum validity time (or a default is set). An alert is also sent to payers before the collect request expires. Incrementally, certain security measures are added, including the following: • An option for customers to block UPI IDs to restrict future requests • Validation of core banking name • Standardized SMS for payers • Option to save requests (marked as "safe") • Velocity checks are performed, and there is a cap on transactions that can be initiated each day and week.
Kenya	Currently, PesaLink is upgrading its capabilities. Once completed, it will support new use cases, such request to pay, which will be instrumented as a pull-payment facility.
Mexico	Banco de México introduced a standardized request-to-pay functionality through the overlay service CoDi. It was designed to simplify and homogenize the experience of requesting a payment or answering a request to pay by payers. It has complemented such use cases/services as bill payments and merchant payments. In practice, CoDi's introduction has resolved the problem of inputting a lot of information. Security elements in CoDi are embedded in the request-to-pay message. Once a message is received, a payer will be redirected to her/his banking app and to the last step of the sending process of a traditional SPEI transfer order, in which all the information of the recipient account is already pre-populated and only a final validation is required. Banco de México has mandated banking institutions that offer a mobile-phone application and have more than 3,000 accounts to provide the CoDi services.
Thailand	The request-to-pay functionality PayAlert was enabled in March 2018 as an underlying functionality of PromptPay. The service allows vendors and businesses to send notifications to consumers to request payments. It consists of the following two steps: • Notification: Retailers/online sellers send messages along with their PromptPay IDs to buyers to request payments. • Payment: Buyers/payers receive messages via bank channels such as mobile banking and choose to confirm payments.
United Kingdom	In 2020, the request-to-pay functionality was launched, and "Confirmation of Payee" was also launched during the same period. It enables banks to verify the credentials of payees before processing transactions.
United States	RTP supports request-to-pay services. This functionality provides payees with an effective method to initiate a potential transaction, while also combatting fraud and allowing the payer to maintain control over the payment flow. (For example, the payer is provided with the necessary pre-populated information to authorize the payment, and only the payer can initiate the actual flow of funds.)

4.3.2 Overlay Services and Aliases

Overlay services and aliases have proved critical for increasing the velocity of uptake of fast payments and therefore have been or are being developed in most jurisdictions.

Overlay services enable support for access channels such as QR codes and additional use cases such as request to pay, schedule future payments, reconciliation, and aliases. With the help of overlay services, customers can typically make payments via mobile devices through user-friendly applications and aliases, thus enhancing customer experience.

Table 21 describes the experience of selected jurisdictions with overlay services. Most of them introduced overlay services as a follow-up, after the fast payment arrangement went live. Certain jurisdictions' offerings, such as Malaysia's DuitNow, Poland's BLIK, and the United Kingdom's Paym, are explicitly called out as overlay services. In the case of Mexico, overlay is owned by the operator, whereas in Australia and Poland, they are operated by separate entities. Yet in other cases, such as Singapore, the owner of the overlay service is a separate entity, but the entity operating them is the fast payment operator.

Aliases are regarded as a subcategory of overlay services and entail the use of mobile numbers, email IDs, and so on as proxy addresses for customer account numbers, allowing end users to make transactions without needing to know the specific account number of the payee, which is typically hard to remember. Some fast payment arrangements even offer proxy look-up for customer convenience. The simplicity associated with aliases has also been a major driver for widespread adoption of fast payments.

Payment system operators need to establish proxy databases to facilitate alias mapping. Globally, operators have adopted the following two main approaches for developing their proxy databases: (i) A centralized database: The mapping of the proxy identifier to accounts takes place through a central repository. A central database offers the most straightforward implementation of the proxy service. (ii) A decentralized database: An authentication message is sent to the beneficiary bank or other PSP to map the proxy identifier to the final beneficiary's account. Box 9 provides a more detailed discussion on the use of aliases for fast payments.

TABLE 21: Select Findings on Overlay Services

Australia	Osko, owned and operated by Bpay, a separate entity, is an overlay service on the NPP. It is a consumer-oriented "convenience" service that works together with banks and other financial institutions to enable NPP payments using existing online banking. More than 70 entities have rolled out Osko, and approximately 80 percent of transactions through the NPP are actually Osko-related transactions. Entities implemented Osko so they could easily route direct credit/entry transactions via Osko without changing the customer experience. This ensures common messaging, which allows end users to understand the service irrespective of which PSP they use. Osko payments can be used for person-to-person, person-to-business, business-to-person, and business-to-business payments.
Malaysia	DuitNow allows customers to send money instantly on a 24/7 basis to mobile numbers, National Registration ID Card (NRIC) numbers, passport numbers, or business registration numbers. DuitNow supports future-dated and recurring transfers.
Mexico	In 2019, Banco de México launched CoDi as an overlay service that added a request-to-pay functionality over the SPEI rail. CoDi also facilitates payments through proximity-based channels such as QR codes and NFC.
Poland	The Express Elixir system supports only bank account numbers to make fast payments. BLIK, an overlay service provider, uses Express Elixir's core capabilities to enable users to make real-time P2P transfers. BLIK enables the use of a mobile number as an alias.
Singapore	PayNow, the overlay service, is owned by the Association of Banks in Singapore, which is a separate entity from the owner and operator of FAST. PayNow acts as an initiating interface of payments in FAST for retail customers of nine participating banks.

BOX 9 ALIASES FOR FAST PAYMENTS

Proxy identifiers or aliases are unique identifiers that allow individuals and the business sector to transact in a seamless manner without needing to know the beneficiary's bank account details (such as bank name, bank account number, or branch code).[51] The simplicity associated with aliases has been a major driver for their widespread adoption, as a bank account number (10 digits long or longer) is difficult to remember. A proxy service can also help prevent bank account information theft, reverse look-up attacks, and automated skimming of customer information. Proxy identifiers should be easy to remember, easy to share without risk, and interoperable.[52]

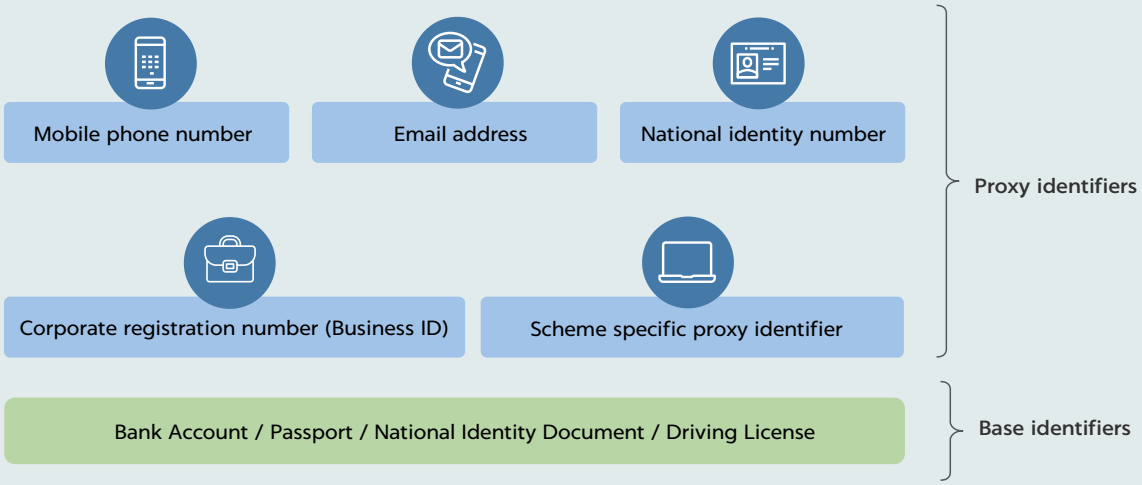
Apart from these parameters, cost and infrastructure requirements need to be evaluated when choosing the proxy identifiers. Implementation costs for a proxy service depend on its construction, capacity requirements, and data storage requirements. The most common proxy identifiers used in payment systems are mobile-phone numbers, email addresses, national ID numbers, corporate registration numbers, and payment scheme/service specific proxy identifiers.

Payment systems generally offer proxy look-up service as a key offering to enhance the customer convenience. PayPal and Apple Pay, among many others, are also offering customers a choice to use proxy identifiers (mobile numbers or email addresses) as a substitute to card numbers while making payments.

Proxy identifiers can be stored on centralized or decentralized databases that are encrypted and used for proxy identifier or alias mapping. Participants should also have suitable verification processes in place when customers are registering an alias. Proxy identifiers can be verified through several methods, such as biometrics (when smartphone capabilities are available), and via SMS and the verification of one-time passwords (when biometrics are not available). The use of biometric authentication provides superior security. The choice of a proxy database varies across different payment systems based on the regulatory environment, competition, and prevalent market practices in a particular jurisdiction. In Australia, a centralized database was put in place, as it had a centralized regulatory authority along with a single payment system operator, while in the European Union's SCT Inst, where multiple countries are involved, it is quite difficult to establish a centralized database.

When choosing a proxy identifier, making it easy to remember is important from a customer perspective, as the intention is to simplify the payments experience. The uniqueness of a proxy identifier is important from a technical perspective so that the payment system accurately identifies where to send the payment or request

BOX 9, *continued*



for payment. If the capability is introduced as a core functionality, there is more flexibility in how the capability can be used. While launching the proxy service, strong customer-verification standards need to be put in place to prevent the registration of fraudulent aliases. It is also critical to ensure that necessary controls are in place to prevent cybersecurity breaches and to establish independent testing of endpoints to ensure that controls are working as intended in all channels.

It is important to establish data-security and privacy measures while launching a proxy service. In addition, PSPs need to obtain consent from customers to use a particular proxy identifier. Payment system operators also need to put in place rules regarding fraud risk management and liability and to ensure that registering parties have suitable verification processes in place when customers are registering an alias.

By far, mobile-phone numbers are the most common form of alias. Furthermore, in most cases, the use of aliases is not enabled by the operators of fast payment arrangements but by the participants in those arrangements, often via an overlay service, as shown in table 22.

For more details, refer to the focus note on proxy databases and aliases, which forms part of the Fast Payments Toolkit.

4.3.3 Access Channels

Internet and mobile banking are the dominant channels in fast payments, although many arrangements still support transactions through branches.

Newer access channels, such as QR codes, are becoming significant drivers of fast payment adoption from both a participant and regulator perspective.

Further, jurisdictions where financial inclusion has been a driver for the launch of fast payments have also enabled the USSD channel to overcome the barrier of smartphone and data requirements.

Access channels refer to the modes used by customers to initiate fast payment transactions. Among others, access channels include branches, ATMs, self-service kiosks, mobile banking, internet banking, and QR codes. Figure 18 illustrates the various access channels and their current relevance for fast payments from a global perspective, while figure 19 shows the channels supported by the actual fast payment arrangements analyzed as part of the deep dives.

Although fast payments can be made through bank branches/ATMs, these traditional channels are not preferred by customers in most countries; instead, digital channels such as internet banking and mobile banking are primarily used. QR codes are increasingly emerging as key channels, especially for P2B use cases, and adoption is widespread in jurisdictions such as China and India, among others.

The following access channels are further discussed below: (i) QR codes, (ii) NFC, (iii) Unstructured Supplementary Service Data (USSD), and (iv) agents.

TABLE 22: Select Findings on Aliases

Australia	PayID is the addressing service that enables users, through their financial institution, to link their account to a simple, easy-to-remember, unique identifier. The types of PayID are an email address, phone number, Australian Business Number, Australian Company Number, Australian Registered Body Number, or Australian Registered Scheme Number. However, the type of PayIDs available vary from institution to institution. The majority offers only a phone number, email address, Australian Business Number, or an organization identifier, such as the company's name. PayIDs can be registered and managed only by participating financial institutions with encrypted account details. This service also provides confirmation of the payee's account name when a PayID is entered, which reduces the risk of misdirecting a payment compared with using an account number to address a payment. PayID has a secure central database to store all PayID information and is operated by SWIFT as part of the NPP platform. PayID sits in the infrastructure of the NPP. (That is, it is a part of the core capability of the platform and is an enabler that can be used by any overlay service.). However, NPPA does not have access to personal information in the addressing service. Only participants in the NPP have access to PayID information.
India	IMPS allowed a mobile number and mobile-money identifier (MMID) as aliases. MMID faced challenges during its initial years, as it is difficult to remember due to its structure. Subsequently, the MMID format was simplified. Learnings were incorporated in UPI by introducing a simplified UPI ID and its seamless creation process. UPI uses a virtual payment address (VPA) that acts as a unique identifier and is independent of a bank account number and other details. Users can set their custom VPAs, which can then be used to send or receive funds. It is in the format of username@handle or username@bank or username@upi. In the VPA, "username" refers to the username that customers can set in the UPI app, whereas "handle," "bank," and "upi" are the identifiers of banks or third-party applications and are called "handles." Addresses with the suffix "@UPI" act as global identifiers, for which address resolution is performed at the UPI's end. UPI ID data is mapped at the PSP's end for address resolution.
Malaysia	The DuitNow service was launched as part of RPP in December 2018. It enables a payer to make a seamless transfer simply by inputting the recipient's common identifier (DuitNow ID), which is linked to the recipient's account. The DuitNow ID that is supported under the DuitNow service includes the recipient's mobile-phone number, NRIC number, passport number, and business registration number.
Mexico	SPEI allows a mobile number as an alias or proxy to complete payments. This is done in a decentralized database, as customers have to link their mobile numbers with their PSP. To complete a transaction, customers have to input a mobile number together with the PSP name. The central bank is considering including the national ID number as an alias in the future.
Poland	The overlay service BLIK supports the mobile number as an alias.
Singapore	PayNow, the overlay service, enables retail customers to move Singapore dollar funds from one bank to another in Singapore through FAST by using only their mobile number or Singapore NRIC/FIN. PayNow also allows recipients to use the Unique Entity Number, the standard ID number of a business entity registered in Singapore, as a proxy address.
Thailand	PromptPay uses proxies such as the national ID, mobile numbers, corporate registration numbers (tax ID number), merchant ID, or e-wallet ID. Alias mapping is decentralized in PromptPay. Banks are required to map a customer's ID with the bank account number. Customers can use as an alias only a mobile number registered with a bank account.
United States	RTP does not support the use of aliases or proxies for payments. There are no plans to launch RTP's own social alias/proxy service because the market is already well served and existing alias/proxy services might transition to RTP payments to clear and settle transactions. Nevertheless, the RTP network allows third parties to enable alias or proxy payments. For example, PayPal and Venmo already use the RTP network for transfers to their client banks or credit union accounts using aliases. TCH has also entered into partnerships with Zelle to provide settlement services.

FIGURE 18: Access Channels and Their Relevance for Fast Payments

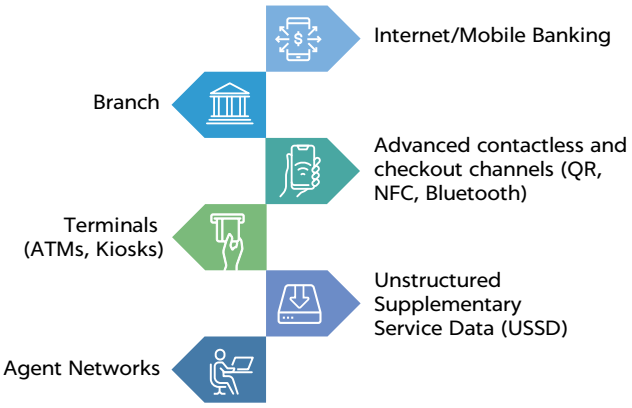


FIGURE 19: Access Channels Supported by Fast Payment Arrangements

JURISDICTION	INTERNET MOBILE BANKING	BRANCH BANKING	ADVANCED CHANNELS	TERMINALS (ATMS KIOSKS)	USSD	AGENT NETWORKS
Australia	✔		✔ (QR Code)			
Bahrain	✔	✔	✔ (QR Code)			
Chile	✔					
China	✔	✔	✔ (QR Code)			
EU	✔	✔	✔ (QR Code)	✔		
Hong Kong SAR, China	✔		✔ (QR Code)			
India	✔	✔	✔ (QR Code, NFC)	✔	✔	✔
Kenya	✔	✔		✔	✔	✔
Malaysia	✔	✔	✔ (QR Code)	✔		
Mexico	✔	✔	✔ (QR Code, NFC)	✔		
Nigeria	✔	✔	✔ (POS)	✔	✔	✔
Poland	✔	✔				
Singapore	✔	✔	✔ (QR Code)	✔		
Thailand	✔	✔	✔ (QR Code)	✔		
UK	✔	✔	✔ [1]			
USA	✔	✔		✔		

1 QR code under development

i. QR Codes

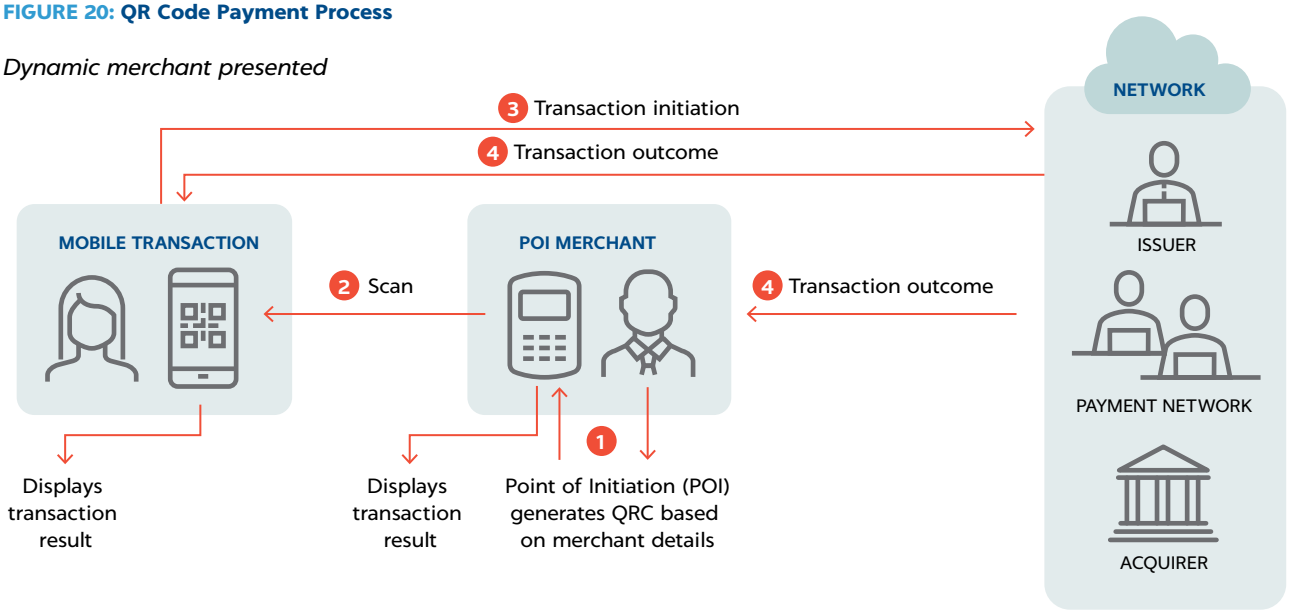
Recent advances in the payments landscape have been toward channels that support contactless and seamless checkout experiences, such as QR codes. These are becoming increasingly common, among both merchants and customers. As part of the desk research, it was found that over 50 percent of fast payments in 25 jurisdictions examined, support QR codes as an access channel. QR codes are classified based on two broad dimensions: the type of information (static or dynamic) and the presenter of the code (merchant or consumer).

The cost for smaller merchants to accept digital payments has come down with QR codes. The initial cost for acceptance infrastructure for card payments through point-of-sale machines for merchants is usually over $100, whereas the cost for QR code payment infrastructure (QR code sticker) can be as little as $1. The ongoing maintenance expense for static QR codes is limited and basically comprises reprinting the sticker in the event of wear and tear. Moreover, QR codes provide the flexibility to invoke various other peripheral services, such as redirecting to a merchant's website or running promotional campaigns. Hence, these additional features also foster customer adoption of QR codes, owing to an enhanced customer experience.

Public authorities around the world observed the success in select Asian jurisdictions and are working toward advancing QR payments to promote financial inclusion. For example, central banks in emerging markets such as Ghana have

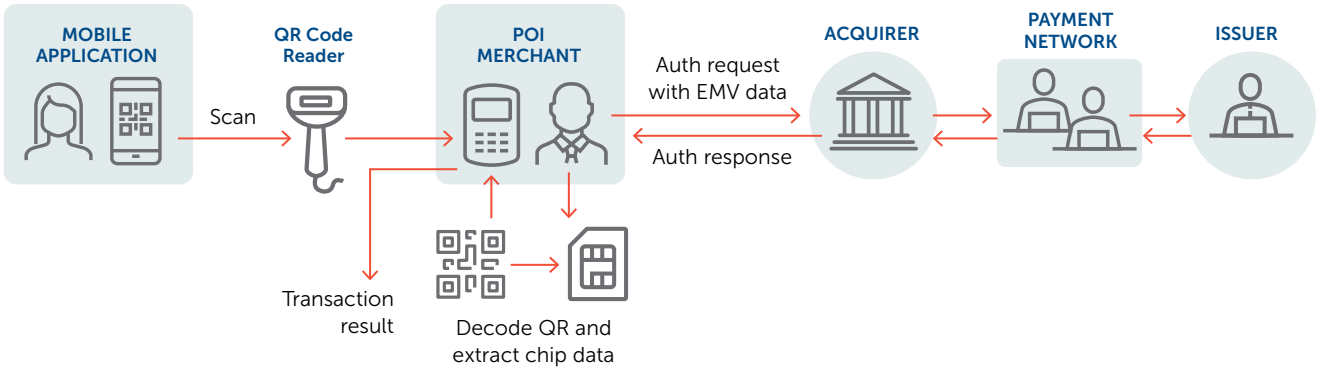
FIGURE 20: QR Code Payment Process

Dynamic merchant presented



1. Merchant generates and displays QR code based on merchant details
2. Consumer scans QR code using a mobile application to initiate the transaction, with CDCVM if required
3. Mobile application sends the transaction initiation request to the Network
4. The Network processes the transaction and informs the Merchant and the Consumer of the transaction outcome

Consumer presented



recently announced the launch of the Universal QR Code and Proxy Pay platforms, in their quest to increase the usage of digital payments.

In India, further to innovations in the QR code space, Google Pay has also enabled Audio QR (Tez) for payments. Certain jurisdictions, such as Mexico, enable QR code–based payments through their overlay service. In Poland, standards for presenting data via QR code were issued for the wider payment ecosystem. However, a specific set of standards for QR codes was not rolled out with the introduction of Express Elixir or in the overlay BLIK, because QR codes have not received much traction as a channel in the Polish market. Nevertheless, the operator of Express Elixir built the platform so that payments via QR codes can be enabled easily in the future, should the need arise.

QR codes can also facilitate interoperability when they are standardized. Jurisdictions such as Australia, Bahrain, Hong Kong, Singapore, and Thailand have based their standard on EMVCo's merchant presented QR specifications, as these are being adopted by a growing number of operators and participants. In India, the Bharat QR and UPI QR are interoperable, and customers can pay as per their will, regardless of the app they are using.[53] This has countered the inconvenience associated with multiple QR codes for different wallets for both the merchant and the customer.[54]

For more details, refer to the focus note on QR code standards, which forms part of the Fast Payments Toolkit.

ii. Near-Field Communication

NFC is a proximity-based access channel that allows the transfer of payment messages and data wirelessly through smartphones and other devices. It is widely used for facilitating merchant payments at NFC-enabled terminals. For example, fast payment arrangements in China, India,[55] and Mexico (for the CoDi overlay service) support NFC as an access channel.

iii. Unstructured Supplementary Service Data

USSD is a common technology for communication between GSM handsets and the back-end computer systems of mobile-network operators. It can be used on any phone, including feature phones. USSD is among the easiest and most affordable technologies to deploy, especially for mobile-network operators, because there are no additional merchant or customer hardware requirements apart from mobile phones.

In India, to facilitate transactions for non-smartphone and non-internet users, an interoperable platform based on USSD has been developed connecting all mobile-network operators. This was envisioned as an initiative of the financial-inclusion agenda to reach out to the digitally excluded. USSD allows customers to check bank balances, view mini-statements, and initiate fund transfers through their feature phones. Challenges were observed before the launch, as many stakeholders from the telecom industry had to be onboarded, and aspects related to revenue sharing had to be ironed out. User adoption of this channel has faced challenges over the years as well. Reasons range from limited user awareness, customer charges, frequent session time-outs/higher failure rates, and uneven user experience.

iv. Agent Networks

Agent networks are a channel that allows an assisted form of banking (typically found in emerging and developing economies) in which non-bank entities facilitate customer banking transactions. Agent networks are utilized to initiate fast payments in jurisdictions such as India, Kenya, and Nigeria.

In India, customers can make payments through an agent who acts as a trustworthy middle layer to guide a transaction. A key use case has been domestic migrant remittances, where the customers are not digitally savvy enough to make payments on their own, and risk sensitivity is also high because remittances involve a major portion of their income.

4.3.4 User Uptake

Low end-user prices, ease of use, and multiple use cases appear to be the main drivers of user uptake.

Jurisdictions have seen a range of growth drivers for fast payment uptake by end users, such as user experience, low user prices, convenience, and pushes from the government and the central bank, among others. The availability of use cases is also critical: the P2P use case has been the major driver of user uptake so far, while the person-to-business (P2B) use case is also growing rapidly. As per survey responses, different stakeholders perceive different drivers to be key to the adoption of fast payments. This is illustrated in figure 21.

Two key drivers are discussed below: end-user pricing and awareness campaigns.

i. End-User Pricing

Low end-user prices and transaction costs, as well as ease of access to initiate payments (for example, via digital channels such as the internet and, especially, mobile banking), have also been critical for end-user uptake.

FIGURE 21: Primary FPS Adoption Drivers as per Survey Findings

STAKEHOLDER	PRIMARY GROWTH DRIVERS FOR FAST PAYMENT ADOPTION
Central bank/ other regulator	• Interoperability among payment instruments and systems • Lower cost over other payment modes • Availability of key use cases—that is, P2P, P2B, and bill payments • Initiatives for encouraging merchant acceptance of fast payments
Operator	• Availability of key use cases—that is, P2P, P2B, and bill payments • Government intervention and promotion of digital payments at a national level • Banking and digital penetration in the jurisdiction
Participant	• Availability of key use cases—that is, P2P, P2B, and bill payments • Banking and digital penetration in the jurisdiction • Initiatives for encouraging merchant acceptance of fast payments

Regarding pricing, not long ago, end users in some jurisdictions had to pay extra for fast payments, as these were considered a premium service. As shown in the jurisdiction analysis in table 23, it is clear that increased competition played an important role in reducing prices, as operators and PSPs look to acquire end users and merchants to use the innovative use cases/services. Further, some central banks have issued guidelines either reducing or waiving end-user costs/merchant fees associated with fast payment transactions. India is an outlier in the area of pricing, as various incentives have been introduced for certain users (instead of making further direct reductions of end-user fees).

ii. Awareness Initiatives

Awareness initiatives—including marketing campaigns driven by operators themselves or individual participants, awareness drives, public announcements, and social-media marketing—have generally been successful at promoting user uptake. As shown in table 24, most jurisdiction-specific experiences in this area have included the production and dissemination

TABLE 23: Select Findings on End-User Pricing

Australia	The fee charged to customers for fast payments was only marginally higher than that charged for overnight payments. Additionally, Osko was implemented so that banks could easily route direct credit/entry transactions via Osko without changing the customer experience significantly. This helped increase adoption by making it seamless for the customers.
India	A referral bonus scheme for individuals was introduced wherein existing users of the Bharat Interface for Money (BHIM) UPI app are incentivized to onboard new users. A bonus is paid to both referrer and referee. A cashback scheme for merchants was also introduced to incentivize merchants for receiving payments on the BHIM UPI app. Merchant cashback is paid out on completion of a minimum of 50 credit transactions, of which at least 20 transactions are from valid unique UPI users. TPSPs are also providing incentives, such as cashbacks and promotional vouchers, for using their applications for UPI payments.
Kenya	During the initial months of COVID-19, the central bank mandated all the participants to waive end-user charges for three months. This led to a surge in transactions during the period.
Malaysia	BNM has mandated that the transaction fee be waived for individuals and small and medium-sized enterprises for transfers up to RM 5,000.
Mexico	Transactions via the overlay CoDi (that is, request to pay) are free of charge for both the payer and the payee. (If the latter is a merchant, then the merchant discount rate is zero.)
Thailand	In March 2018, PromptPay decided to waive charges for transactions through electronic channels. Moreover, competition within the banking sector has also played an important role driving the adoption of PromptPay. For example, banks have provided cashbacks on using the cross-bank bill payment service to customers.
Singapore	Retailers are not charged, and charges were waived also for corporations, to boost adoption at the time of launch.

TABLE 24: Select Findings on Awareness Initiatives

Australia	NPPA ran an above-the-line advertising campaign for a limited time introducing PayID, the platform's aliasing service. As a scheme, marketing is a core function for BPay, and it provides flyers, digital media, brochures, and outdoor advertisements, and it also provides co-branded material to each financial institution. BPay launched a marketing campaign for Osko that included a variety of digital and physical channels.
Bahrain	BENEFIT worked on national promotional campaigns to raise awareness and adoption of BenefitPay transactions.
Hong Kong SAR, China	HKMA undertook a range of measures to popularize FPS before its launch, including advertisements that detailed its benefits to users. HKMA developed a series of educational and promotional materials, such as announcements for broadcast on television and radio, as well as videos and electronic banners for digital platforms. HKMA also participated in trade fairs to promote the FPS with small and medium-sized enterprises and corporations.
India	Multiple promotional campaigns were launched by all ecosystem participants, including NPCI. For example, "UPI Chalega"—a UPI awareness campaign—was launched by NPCI in association with the participants.
Kenya	During the launch of PesaLink, Integrated Payment Services Ltd. invested in marketing activities to persuade customers to make payments through PesaLink.
Malaysia	Consumers were educated via social-media and print channels. While the participants were responsible for communicating to their customers, PayNet, as the operator, also performs customer education and usage campaigns. Additionally, BNM undertakes outreach initiatives to foster greater public awareness and confidence in the usage of e-payments.
Singapore	MAS worked closely with the Association of Banks in Singapore from April to July 2020 to launch an active campaign to promote PayNow and PayNow Corporate. The initiative also included a media campaign and consumer outreach efforts to raise public awareness of these e-payment solutions.

of educational and promotional materials before the initial launch of fast payments. In some cases, this was done not by the operator alone but by the various participants (individually or through industry organizations).

4.4 MODULE D: LEGAL AND REGULATORY CONSIDERATIONS, RISK MANAGEMENT, AND CUSTOMER DISPUTE RESOLUTION

This module focuses on some institutional requirements pertaining to fast payments. The following three key insights are discussed here:

i. Legal and regulatory considerations
ii. Risk management
iii. Customer dispute resolution

The legal and regulatory framework provides the sound legal footing for operations of FPS. The scheme rules provide the operational clarity of a payment system. Each FPS, designed and developed by an individual central bank/operator, has its own scheme rules. Scheme rules define the way the system will operate and the behavior and interaction of participants. Scheme rules are defined to minimize risks, maintain integrity, and provide a common, convenient, secure, reliable, and seamless payment experience to customers. Framing rules, standards, and guidelines with a certain degree of flexibility helps make implementation and subsequent upgrades easy. For example, to facilitate interoperability, scheme rules could define a high-level framework that bridges differences across solutions and addresses only areas that are essential for interoperability. Defining scheme rules while also supporting geography-specific rules and regulations brings variation and uniqueness to each implementation.

Every scheme has its own set of unique rules, applicable to all scheme participants. These rules specify the minimum requirement framework applicable to all members for operating while upholding the safety, security, soundness, integrity, and interoperability of the FPS. Scheme rules are defined and modified by schemes to support the use and advancement of services. Several factors need to be considered while defining scheme rules for an FPS. These range from the way different participants interact and the messaging formats they would use to communicate to the type of transactions that would be offered to customers and the settlement between the different participants.
A more detailed discussion on scheme rules in the context of fast payments can be found in the respective focus note that is part of the toolkit.

4.4.1 Legal and Regulatory Considerations

A sound regulatory and legal backing and high governance standards are critical aspects for a fast payment arrangement to operate safely and efficiently and to thrive.

A robust legal and regulatory framework promotes innovation in payments while at the same time ensuring the security and safety of the payment arrangements. The key pieces of legislation that are applicable to fast payments typically include the domestic regulations and laws pertaining to payment systems and services, banking, and the central bank, although some peripheral regulations or laws are applicable in some cases, such as those related to open banking, digital ID, KYC guidelines, and consumer protection.

Due to the instant nature of fast payments, the legal framework needs to provide legal protections on such issues as the moment in which payments are final and when the funds are legally transferred from sender to receiver.[56] The legal framework should also provide a sound basis for protecting the netting and settlement arrangements.

Table 25 shows that, in practice, these provisions were generally not created for fast payments *ex profeso* but already existed for the RTGS system and/or other systems that are designated as systemically important by the central bank. In such cases, the key task has been to ensure their applicability also to the fast payment arrangement.

Moreover, operators in most of the jurisdictions assessed as part of this guide have published a detailed scheme rulebook (or system rules) as well as detailed procedures. The scheme rules and detailed operating procedures shall address the various categories of participants (that is, direct participants, indirect participants, and overlay service provides, if applicable) and clearly indicate which of them apply to what kind of participant.

4.4.2 Risk Management

Fast payment arrangements are exposed to the same core risks as other payment systems.
During the deep-dive analysis, it was observed that most fast payment operators have adopted an enterprise-wide risk-management framework to manage all identified risks. Others have opted to focus on payment system–specific risks and, on this basis, built their risk-management framework.

The sections below detail risk management, covering the following specific risks and areas: (i) credit and liquidity risks; (ii) operational risk; (iii) compliance with AML and combatting the financing of terrorism (CFT) guidelines; and (iv) designating fast payment arrangements as SIPS.

TABLE 25: Select Findings on Legal and Regulatory Considerations

Hong Kong SAR, China	The Clearing and Settlement Systems Ordinance came into effect in November 2004. It governs payments in Hong Kong. However, in 2015, this ordinance was amended and retitled as the Payment Systems and Stored Value Facilities Ordinance to introduce a regulatory regime for SVFs. The latter are participants in FPS.
India	Under the Payment and Settlement Systems Act of 2007, the RBI took the following two actions: • Created the Board for Regulation and Supervision of Payment and Settlement Systems Regulations • Issued the Payment and Settlement Systems Regulations NPCI is regulated by the RBI and governed by the board, comprising representatives from member banks as well as independent directors.
Mexico	The legal and regulatory framework supporting SPEI activities is comprised of Banco de México's Organic Law and the Payments Systems Law. Circular No. 13/2017, Circular 14/2017 (SPEI Rules), and the SPEI Operating Manual complete SPEI's legal basis. Under the SPEI Regulation, the settlement of transfer orders takes place through a clearing process in accordance with the Payment Systems Law. Once SPEI settles a transfer order and sends the corresponding settlement notice to both the issuer and the receiver, the order is considered accepted for all purposes. It also covers the netting arrangements (as SPEI uses hybrid settlement). Other key topics covered by the SPEI Regulation include access requirements and the fee framework.
United Kingdom	The Financial Service (Banking Reform) Act of 2013 led to the formation of the Payment Systems Regulator. HM Treasury designated eight payment systems, including FPS, to be regulated by the Payment Systems Regulator for the purposes of part 5 of the aforementioned act.
United States	The legal framework supporting RTP activities comprises the RTP operating rules and RTP participating rules, along with existing payments laws, wherever applicable. The RTP operating rules have been drafted to define the rights and responsibilities of participants and TCH with respect to RTP. Among other topics, the participation rules address general eligibility requirements, the process for connecting to RTP through a TPSP, and requirements in the event of a change of name, form of organization, or control of a participant.

i. Credit and Liquidity Risk

Credit and liquidity risks vary across fast payment arrangements depending on the settlement model adopted. Of the seven participants that responded to this part of the survey, four believe that managing these risks is more challenging in fast payments than in other payment systems.

The choice of settlement model brings certain implications for stakeholders in the payments ecosystem when it comes to managing credit and liquidity risks. The main aspects and risk implications (and the need of risk mitigators) of a DNS model or a real-time settlement model were discussed in that section. This section covers issues that are particular to fast payment arrangements and provides details on how operators in the different jurisdictions studied are managing these risks. (See table 26.)

A significant difference between fast payments and other types of payment systems is that the liquidity needs extend beyond normal business hours, due to operations being performed 24/7. This is relevant for fast payment arrangements that use either a real-time settlement model or a DNS model. In the first case, participants may be unable to access certain liquidity sources (for example, central bank credit, interbank loans, and so on). In DNS models, liquidity risk may arise if inter-PSP settlement cycles are to be executed outside normal business hours in an effort to avoid building up large net debit positions. Even if settlement is executed in working hours in the next working day, during non-working hours participants in an arrangement using DNS that applies risk-mitigation techniques may be unable, for example, to post additional collateral to continue sending payment orders without these being rejected.

In practice, as shown in table 26, the facilities that support the management of credit and liquidity risks depend on multiple elements particular to each jurisdiction, starting from whether a DNS settlement model or a real-time settlement model has been adopted. The sophistication of each jurisdiction's financial infrastructure and financial markets also determines the type(s) of risk-management arrangements that can be put in place.

ii. Operational Risk

System reliability, cyber resilience, and containment of fraud are among the critical operational risk considerations for operators of platforms that process fast payments.

As per CPMI-IOSCO, operational risk is the risk that deficiencies in information systems or internal processes, human errors, management failures, or disruptions from external events will result in the reduction, deterioration, or break-

TABLE 26: Select Findings on Credit and Liquidity Risk

Australia	The RBA launched a new automated liquidity-management tool that is built into RITS while developing the Fast Settlement Service (FSS). Through this tool, institutions are able to adjust the amount of funds available in the FSS and RITS allocations of their ESA at the RBA by setting upper and lower "trigger points" on their FSS allocation and ensure that funds are available for both NPP and RITS transactions. The RBA also offers standing facilities, such as intraday repurchase agreements (repos), as well as "open" repos, to direct and settlement participants that settle FSS payments outside business hours and on weekends/public holidays.[57] The RBA is not exposed to any credit risk from the settlement of NPP payments in the FSS. NPP payments are settled using the member's FSS allocation, which cannot be overdrawn. However, RITS settlement hours are between 7:30 a.m. and 10:00 p.m. on business days, while the FSS settles NPP transactions 24/7. To address this, all ESA funds are transferred to the FSS allocation when RITS is not operating. The RBA's existing standing facilities can also be used to assist with liquidity management, by making additional ESA funds available on prespecified terms.
Hong Kong SAR, China	To manage credit risk, a sweeping mechanism is in place in CHATS and FPS to support liquidity transfers between Hong Kong dollar-denominated (HKD) CHATS ledger accounts and HKD FPS ledger accounts during CHATS operating hours. To facilitate banks' liquidity management for settling FPS transactions once HKD CHATS is closed, banks are allowed to borrow HKD funds from the HKMA, by entering into sale and repurchase transactions. HKMA accepts only high-quality securities to minimize credit exposures. There is no loss-sharing arrangement in FPS. In case of a failed settlement, the defaulting party will be fully liable for the failed payment. Each participant has a responsibility to ensure that it has enough liquidity to fulfill its payments in a timely and orderly manner. Default procedures are in place and regularly drilled to minimize the impact of a default on the system and participants.
India	NPCI has introduced the concept of a net debit cap, wherein limits are allotted to participants in IMPS and UPI as per the Settlement Guarantee Mechanism Policy. The net debit position is calculated after each transaction to minimize risk, and transactions are declined once the limit is 100 percent utilized. Net debit cap limits are reinstated for every settlement cycle except on specified holidays, as and when decided by the RBI for RTGS services. NPCI has also constituted a settlement guarantee fund comprising pledged cash collaterals and pooling of funds by way of committed lines of credit. In the event of a temporary failure, the amount is replenished by the defaulting member bank(s). In the event of permanent failure of a member bank(s), the net obligation of the default member bank(s) shall be borne by the surviving member banks that have participated on that day in that cycle. The recovered amount from the surviving member banks is used to replenish the funds utilized from the settlement guarantee fund to meet the settlement.
Mexico	In SPEI, there is no credit risk between participants, as SPEI does not establish procedures for participants to extend credit among themselves. Banco de México mitigates liquidity risks through the following two mechanisms: • Obtaining credit up to the value of assets that are deposited with Banco de México • Depositing liquid securities issued by the federal government, the Institute for the Protection of Bank Savings, and Banco de México itself under a repurchase agreement SPEI operates 24/7 and begins and ends its operations for value date purposes at 6:00 p.m. To achieve 24/7 operations, Banco de México implemented a mechanism to provide liquidity to participants after 6:00 p.m. The mechanism works as follows: every banking day, at 6:00 p.m., SPEI closes Day T, and Banco de México transfers the balance from participants' SPEI accounts to their SIAC (general ledger) accounts. A few seconds later, SPEI opens with zero balances. Banco de México then extends fully collateralized credit to participant banks in their SPEI accounts according to each bank's standing instructions, and payment exchange resumes. The credit is registered in participant banks' SIAC accounts when the latter opens at 7:00 p.m. (which is considered T+1). Individual payments are capped at Mex$8,000 ($400) outside banking hours.
United Kingdom	The United Kingdom follows a net sender cap mechanism to control settlement risk. This cap is the maximum amount that participants are allowed to send having netted off the value received from the value sent at that time. To eliminate settlement risk, each participant is also required to hold a cash sum equal to the value of the net sender cap in a separate Reserves Collateralization Account.
United States	Settlement risk is eliminated in RTP by using fully prefunded real-time settlement. TCH has a sole discretion to determine the prefunding requirement for the following: • Sending participant that is a funding participant in the system • Sending participant that is a non-funding participant but has a current prefunded position (participants with a funding obligation) • Each funding provider During Fedwire operating hours, participants with funding obligations and funding providers are required to monitor their current prefunded position and provide supplemental funding to the Prefunded Balance Account if the current prefunded position falls below the prefunded requirements. During non-Fedwire hours, supplemental funding is provided in advance to ensure that the funding provider's or participant's current prefunded position is sufficient to cover its anticipated payment origination activity. Funding providers and participants with funding obligations may have arrangements with each other to transfer liquidity through RTP Payments if their current prefunded position becomes low during non-Fedwire hours. Such liquidity transfers must be reported to TCH within 10 banking days following the day on which the liquidity transfer occurred, using procedures specified by TCH.

down of services provided by an FMI.[58] Operational failures can damage an FMI's reputation or perceived reliability, lead to legal consequences, and result in financial losses incurred by the FMI, participants, and other parties. In certain cases, operational failures can also be a source of systemic risk. Based on these considerations, as per principle 17 of the CPMI-IOSCO PFMIs, operators/managers should establish a robust framework to manage operational risks with appropriate systems, policies, procedures, and controls.

Some of the main aspects that are analyzed under operational risk include operational reliability, scalability, physical and information security, business continuity, and interdependencies with other payment and settlement systems. In this sense, aspects such as cyber resilience and combatting fraud are part of overall operational risk management. General findings and insights into operational risk management are described in table 27. Fraud and cyber resilience issues are discussed in more detail later as part of this same section. As per table 27, it is clear that operational risk containment continues to be a top-of-mind issue for operators, regulators, and participants, and such proven tools as business-continuity procedures are already standard across fast payment arrangements. Operators are also increasing requirements for participants to control operational risk, including fraud. These requirements are often mandated by overseers/regulators.

TABLE 27: General Findings on Operational Risk Management

Australia	NPPA's Incident Management Framework defines response/service-level agreements for identified risk/event types. Participants are required to have 24/7 operational support teams and resourcing to respond to alerts or incidents. Financial institutions that offer PayID payments are required to have controls in place to monitor, detect, and shut down any attempts to misuse the PayID service. This includes technical capabilities, such as automated lockouts, when usual activity is detected. Participants are required to have real-time fraud-protection and detection controls and capabilities, including KYC and AML controls and policies in place at the time of onboarding. NPP payments are subject to the same fraud and security protections that financial institutions use for all their internet and mobile-banking transactions.
Bahrain	Directives on EFTS from the Central Bank of Bahrain require BENEFIT and participating banks to have comprehensive information-security policies, standards, practices, measures, and controls to ensure the confidentiality, integrity, and availability of information/data processed or held to deliver EFTS services to customers.
European Union	For SEPA's SCT Inst scheme, comprehensive guidelines on fraud reporting have been drafted under PSD2 regulations. The EPC has a risk-management annexure that is disclosed only to participants and contains the mechanism for handling operational and fraud-risk activities.
Hong Kong SAR, China	In terms of the day-to-day operational risks associated with FPS, system operation is monitored continuously in terms of transaction volume, response time, whether service levels are met, system health, and so on. An instant-response procedure in case of a system/operational incident has also been developed. Business-continuity and contingency plans are also in place.
India	NPCI has constituted a Risk-Management Committee that reviews and approves the risk-management framework and policies proposed by the management team. The operational risk-management framework includes key elements such as the measurement, monitoring, reporting, identification, evaluation, and control of risk. NPCI also performs operational risk-assessment procedures when new systems, activities, and processes are introduced or undertaken. The procedural guidelines are published and contain various risk guidelines along with definitions of the roles and responsibilities of each participant in the ecosystem (sponsor, submember, PSP, and so on).
Mexico	Banco de México has an automated risk-management tool for mitigating operational risks in SPEI. There is constant monitoring through timers, and when SPEI is not able to meet the desired service level, a back-up system is activated to ensure business continuity.
Poland	No centralized guidelines have been issued for a risk-management framework by the regulator, the National Bank of Poland, or KIR. Nevertheless, all payment systems have to adhere to international best standards as described under the CPMI-IOSCO PFMIs and all other relevant guidelines mandated by the European Central Bank.
Singapore	MAS has issued PSN03 Notice on Reporting of Suspicious Activities and Incidents of Fraud,[59] which comprises guidelines for licensees, operators, and settlement institutions with regards to fraud-risk management.
United Kingdom	Confirmation of Payee is a name-checking service that has been identified by the Payment Systems Regulator and the payments industry as an important tool to help prevent authorized push-payment scams and accidentally misdirected payments. The service checks whether the name of the account to which a payer is sending money matches the name that the payer has entered.

continued

TABLE 27, *continued*

United States	TCH applies an operational risk-management framework to RTP. This framework includes significant resources devoted to system reliability and resiliency, security (for example, physical, operational, and network security), incident response, overall risk management, and comprehensive business-continuity plans. TCH has also established a tiered approach to fraud prevention and mitigation, as not all financial institutions participate in real-time payments at the same level. All participating financial institutions are required to do the following: • Comply with guidelines from the Federal Financial Institutions Examination Council as applied through prudential regulator examination • Report fraudulent behavior to TCH and/or the sending financial institutions • React to alerts from the centralized activity-monitoring utility Apart from these, there are additional compliance requirements for financial institutions that support RTP and permit third-party payments. In addition to the centralized fraud monitoring, TCH has the ability to limit RTP activities of participating institutions that violate system rules and risk-management requirements.

Fraud is generally defined as an act or omission that is intended to cause wrongful gain for one person and wrongful loss for another, either by concealing facts or otherwise. While fast payments provide several clear benefits, they also generate vulnerabilities. (See figure 22.) The rapidly growing number of transactions also makes the operations related to exception management more intense.

In 2018, the CPMI published the report *Reducing the Risk of Wholesale Payments Fraud Related to Endpoint Security*.[60] This toolkit targets primarily wholesale payments. Nevertheless, its elements are broad enough that they can be applied as well to fast payment arrangements.

For more details on fraud and fraud management, in addition to the CPMI report, refer to the special topic note on fraud and AML/CFT, which forms part of the Fast Payments Toolkit.

Cyber resilience is an integral part of operational risk management for all payment systems and other FMIs. It has gained significant prominence in recent years due to incidents involving malware infections, hacking, and so on. According, CPMI-IOSCO in 2016 published *Guidance on Cyber Resilience for Financial Market Infrastructures*.[61] Under this guidance, five primary risk-management categories (governance, identification, protection, detection, and response and recovery) and three overarching components (testing, situational awareness, and learning and evolving) should be addressed by operators/management across an FMI's cyber resilience framework.

Several jurisdictions have adopted measures that comply with these guidelines, as shown in table 28. One important finding of the jurisdictions analyzed here is that there does not seem to be a fast payment-specific angle to cyber resilience or, in some cases, the corresponding measures (for example, launching a cyber resilience committee or implementing cyber resilience-monitoring tools) have broader applicability than solely to fast payment arrangements (for example, to all payment systems, and even for the banking system as a whole).

iii. AML/CFT Compliance

With real-time payments, there are growing concerns about a potential increase in financial crimes such as money laundering and the financing of terrorism. This is because fast payment arrangements shorten the payment processing time and, with this, also decrease the *ex ante* time dedicated to AML/CFT analysis and fraud detection. In other words, in just a few seconds, system participants need to perform AML/CFT checks to ensure a secure payment environment for both customers and financial institutions.

As a result, participants processing real-time payments need to optimize their AML/CFT screening and fraud-detection processes while efficiently managing client-related risk. To fill this gap, an increasing number of third-party providers are offering real-time payment fraud-detection software that enables the AML/CFT checks and sanctions screening processes to be carried out within seconds by using cutting-edge technologies such as artificial intelligence and machine learning.

In most of the jurisdictions studied for this guide, public authorities have not issued guidelines for KYC/AML policies with specific applicability to fast payment arrangements. Participants are required to comply with the general KYC/AML guidelines issued by public authorities for banking/financial services.

For more details, refer to the focus note on fraud and AML/CFT, which forms part of the Fast Payments Toolkit.

4.4.3 Dispute Resolution and Customer Complaints

Addressing disputes and customer complaints in a robust and expeditious manner enhances the public's trust in fast payments.

Disputes are common irrespective of the type of payment method and system. Laws and rules that handle such disputes tend to differ by payment mechanism as well as jurisdiction.

FIGURE 22: Benefits and Potential Sources of Fraud Associated with Real-Time Payments

	SPEED	SETTLEMENT FINALITY	ALIASES	HIGHER TRANSACTION LIMIT	DATA-RICH TRANSACTIONS
Benefits	• Facilitate transaction completion in real time and ensures near-cash experience for end customers	• Transactions through fast payments systems are irrevocable in nature. This provision protects financial institutions from potential defaults	• Enables ease-of-payments and provides customer convenience	• With evolution of fast payment systems, daily transaction limit for payments would eventually increase	• With widespread adoption of messaging standard like ISO 20022 that facilitates better reconciliation, improves interoperability, business automation and enriched reporting. It will also enable businesses to better match customer payments to invoices, oversee their collections, predict cash flows, and track cross-border payments
Potential considerations	• Gives financial institutions scant time to monitor activities	• Certainty of immediate availability of funds	• With use of aliases and proxy identifiers in real time payments, it also presents security concerns around identity frauds	• The increased limit would present cyber criminals lucrative opportunities for frauds and financial crimes	• This might also increase the risk of exposure to malwares that could be embedded in payment attachments or links

TABLE 28: Select Findings on Cyber Resilience

Australia	NPPA has appointed an external security consultant as corporate IT security advisor who provides external guidance regarding cybersecurity and conducts an annual IT security audit.
Hong Kong SAR, China	The Cybersecurity Fortification Initiative was implemented in December 2016 to raise the cyber resilience of Hong Kong's banking system. The initiative is underpinned by the following two pillars: • The Cyber Resilience Assessment Framework is a risk-based framework for authorized institutions to assess their own risk profiles and benchmark the level of defense and resilience that would be required to accord appropriate protection against a cyberattack. • The Professional Development Programme is a localized certification scheme and training program for cybersecurity professionals, structured to train and nurture cybersecurity practitioners in the banking and IT industries and to enhance their cybersecurity awareness and technical abilities to conduct cyber resilience assessments and simulation testing Furthermore, the Cyber Intelligence Sharing Platform provides an effective infrastructure for sharing intelligence on cyberattacks. The timeliness of receiving alerts or warnings from a commonly shared intelligence platform can help the banking sector as a whole to prepare for possible cyberattacks
India	NPCI's Risk-Management Committee carries out periodic reviews of the various technological and cybersecurity-related developments. It also oversees the security incidents, information, cybersecurity assessments, and security-monitoring activities carried out by the Information Security Division. NPCI has also adopted measures that comply with CPMI-IOSCO guidance.
Mexico	To ensure the cyber resilience of SPEI, Banco de México has adopted measures that comply fully with the guidelines issued by CPMI-IOSCO.
Singapore	MAS makes it mandatory for financial institutions to comply with the following requirements: Establish and implement robust security for IT systems • Ensure that updates are applied to address system security flaws in a timely manner • Deploy security devices to restrict unauthorized network traffic • Implement measures to mitigate the risk of malware infection • Secure the use of system accounts with special privileges to prevent unauthorized access • Strengthen user authentication for critical systems as well as systems used to access customer information
Thailand	National ITMX has acquired the Intelligence Threat Management Service of UIH, an external cybersecurity vendor, for the monitoring, communication, and possible remediation of external threats, such as zero-day attacks, advanced persistent threats, and exploits. Further, National ITMX has also adopted measures that comply with CPMI-IOSCO guidelines.
United Kingdom	A cybersecurity framework has been adopted that helps to identify and protect from cyberattacks.

Fast payments generally achieve settlement finality immediately, and transactions become irrevocable and irreversible. Therefore, in general, account-based fast payments tend to be guaranteed funds with very limited instances of dispute rights. Nevertheless, some jurisdictions have carved out instances where the payer is entitled to a refund for fraudulent transactions, and the fraud payment risk is borne by either the payer's or the payee's financial institution. Other fast payment operators are beginning to define dispute-management requirements. These range from "light touch" models where payment inquiries are processed by the operator without specific rules or decisioning to more robust models with formal dispute requirements.

The section below discusses inter-participant disputes as well as end-customer disputes.

i. Inter-Participant Disputes

This refers to the resolution of disputes between participants in fast payment arrangements, typically arising out of non-compliance with system regulations. Table 29 shows that to

TABLE 29: Select Findings on Inter-Participant Disputes

Australia	In Australia, Regulations for NPP provide a detailed mechanism for dispute resolution, including the following items: Definition of dispute: This defines both the different parties between which a dispute can arise, and which disputes are eligible to be referred for resolution. • Commencement of proceedings: This details the different scenarios under which dispute-resolution proceedings may be commenced by either the NPPA or the aggrieved participant (including submembers). • Resolution of disputes: This states that a dispute can be referred to the NPP Operating Committee or NPP board either for resolution or directly for arbitration. In addition, it sets out the various criteria and conditions for the same. • Fees and costs: There are numerous fees and costs associated with dispute resolution, and these are detailed in the regulations. NPPA is to be reimbursed for all costs and expenses incurred by it in resolving a dispute.
Chile	Participants are encouraged to settle inter-participant disputes bilaterally and formulate their own guidelines for the same.
India	NPCI has a dedicated dispute-resolution system—the Bharat Clearing and Settlement System—for resolution of IMPS disputes. In BCS-IMPS, all disputes are settled in every settlement cycle. Similarly, the Unified Real-Time Clearing and Settlement—which is a back-office system for UPI—validates and processes the disputes raised by members. The adjustments are performed along with the previous business day's approved transactions. Member banks are required to perform reconciliation daily and raise adjustments, if needed. Member banks are also advised to handle the reconciliation operations on all days, irrespective of Sundays and other public holidays, and to have a round-the-clock help desk. In case the participant is not satisfied with the decision of the NPCI's dedicated panel, the dispute shall be referred to the RBI. The following interbank dispute and adjustment scenarios have been identified: • Beneficiary timed-out transaction: - Customer account is credited, but response got timed out (beneficiary to NPCI) - Customer account is not credited, and response got timed out (beneficiary to NPCI) - Customer account is not credited, and response got timed out (beneficiary to NPCI)—After reconciliation, it is found that the customer account cannot be credited because of a closed account, an inexistent account, and so on. • Chargeback: In case of a wrong or incorrect beneficiary account. • Chargeback acceptance/representment: Chargeback acceptance is the only confirmation; there will not be any fund movement between the beneficiary and remitter. • Pre-arbitration, pre-arbitration acceptance, and pre-arbitration rejection • Arbitration • Transaction credit confirmation: This option is provided only to notify the remitter bank that a customer account has been credited either online or by initiating manual credit. This will avoid raising chargeback by remitter bank. • Returns: Beneficiary bank can return the funds to the remitting bank where the beneficiary bank is not able to credit their customer's account.
European Union	As per the SCT Inst scheme rulebook, a dispute-resolution committee is responsible for investigating complaints from participants, including the dispute-resolution and appeal processes. Under the new rule published by the EPC in 2020, this committee replaced the former Compliance and Adherence and Appeals Committee.
Mexico	Guidelines on compensation of damages have been issued in SPEI rules and SPEI participant agreements. By using digital signatures for all transactions, SPEI's programming protocol ensures the authenticity of the information and that the issuer cannot repudiate payments once they have been sent. Furthermore, participants are connected to SPEI through a private network that uses encrypted communications. As the payment orders sent by the participants are pre-signed, this acts is a mechanism to avoid the interbank disputes.

continued

TABLE 29, *continued*

Nigeria	As per the Central Bank of Nigeria, each scheme shall establish its dispute-resolution mechanism to serve as an additional mechanism that will help participants resolve disputes in a timely and cost-effective manner. Disputes that arise between or across schemes may be referred through the director of the Payments System Management Department of the central bank to the Payment Initiative Coordinating Committee for resolution.
Poland	Participants are encouraged to settle inter-participant disputes bilaterally and formulate their own guidelines for the same.
Singapore	Participants are encouraged to settle inter-participant disputes bilaterally and formulate their own guidelines for the same.
Thailand	The National ITMX has a dedicated dispute-resolution mechanism that is followed by all the parties if there are any disagreements between the member banks. National ITMX also has a dedicated web portal service for member banks for interbank dispute resolution. No additional fee is charged by National ITMX for the dispute-resolution process.
United Kingdom	In 2016, specific guidelines were issued for the bank error recovery process in which a bank has duplicated a file and sent some payment error. There are also guidelines for when complete files get duplicated, and timelines are provided for all FPS participants to ensure that the funds are refunded to the originating bank.
United States	RTP operating rules incorporate existing law (that is, the Electronic Fund Transfer Act, regulation E, and Uniform Commercial Code, article 4A) that sets forth a well-established framework regarding banks' liability for unauthorized transactions from their customers' accounts, as well as specific requirements regarding the resolution of errors from consumer accounts. This structure simplifies the account-holding financial institution's dispute-investigation processes and minimize the need for a detailed set of interbank dispute-resolution rule. TCH does not act as a party to any dispute between participants regarding liability for erroneous or unauthorized RTP payments. Such determination is left to the participants through any available dispute-resolution and/or judicial process.

resolve disputes between the participants effectively, some system operators have put in place and publicized a dedicated dispute-resolution mechanism to ensure effective and time-bound resolution of these differences. This appears to be more common when the operator is the central bank. In other cases, there is no centralized dispute-resolution function/arrangement; participants are only urged to settle their disputes bilaterally.

For more details, refer to the focus note on dispute handling, refunds, reversals, and chargebacks, which forms part of the Fast Payment Toolkit.

ii. Customer Disputes

An effective complaint-handling process is fundamental for enhancing the customer experience and building trust in fast payments.

A range of safeguards, such as SCA and having a list of preapproved beneficiaries, can limit the number of disputes. Despite these safeguards, disputes may arise. Given that the transfer of funds takes place in real time, implementing refunds, reversals, and chargebacks in fast payments is more challenging than it is with card payments. Providing settlement finality further reduces incidents of refunds, reversals, and chargebacks.

In cases where a dispute is filed and it is recognized by the concerned parties that the transfer of funds was indeed erroneous or fraudulent, one of the following subsequent grievance-resolution mechanisms can be used:

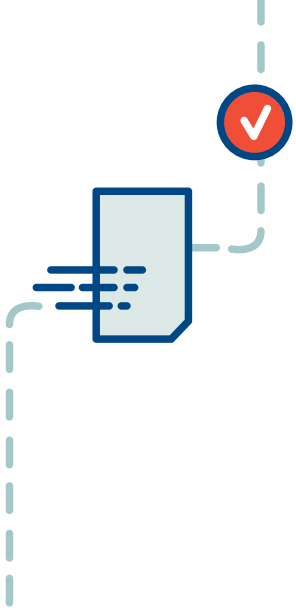
- The beneficiary makes a reverse transaction to the initial payer as per the predefined process set out by the fast payment operator, the participant, or TPSP.
- The payer can notify the issuing bank about the erroneous or fraudulent transaction, and the issuing bank can raise a chargeback request on behalf of the payer.

As per table 30, the most common case is that customer disputes are handled by the participants with their customers directly, with no involvement by the operator or the payments overseer/regulator. However, some overseers/regulators have issued minimum requirements in this area (for example, Hong Kong SAR, China, Mexico, and Thailand). Moreover, in some cases, a financial ombudsman can assist customers with their disputes.

For more details, refer to the focus note on dispute handling, refunds, reversals, and chargebacks, which forms part of the Fast Payment Toolkit.

TABLE 30: Select Findings on End-Customer Disputes

Australia	In case of any complaints related to NPP transactions, the first point of contact for customers is the associated financial institutions. • If an account has been compromised or funds have been taken from a user's account without his/her authorization, the user is required to contact his/her financial institution immediately. • If the user thinks someone has fraudulently used his/her information to create a PayID, the user should contact his/her bank immediately, and the bank will help launch an investigation. In addition, the Australian Financial Complaints Authority independently assists consumers and small businesses to make and resolve complaints about financial firms.
Bahrain	A directive from the Central Bank of Bahrain mandates that Fawri+ transactions are real time and irrevocable. Thus, there are no specific guidelines for dispute resolution. BENEFIT as an operator has customer-service and call centers to register customer complaints.
Chile	No centralized guidelines have been issued by either the regulator or the system operator for the resolution of customer complaints.
European Union	For the SCT Inst scheme, no centralized guidelines have been issued by either the regulator or the system operator for the resolution of customer complaints.
Hong Kong SAR, China	The HKMA has detailed a set of procedures to be followed by banks and SVFs when a customer complains of a transaction being processed to a wrong recipient.
India	Customer complaints need to be resolved bilaterally between the participants within the timelines stipulated by the RBI and NPCI. Moreover, in the case of UPI, it is mandatory to provide an option to raise complaints on the UPI-enabled app. In 2019, the RBI introduced an Ombudsman Scheme for Digital Transactions. It is an expeditious and cost-free apex-level mechanism for the resolution of complaints regarding digital transactions undertaken by customers. The Ombudsman for Digital Transactions is a senior official appointed by the RBI to resolve customer complaints against payment system participants. To resolve a grievance, the complainant first has to approach the system participant concerned. If the system participant does not reply within one month after receipt of the complaint, if it rejects the complaint, or if the complainant is not satisfied with the reply given, the complainant can file the complaint with the Ombudsman for Digital Transactions. Recently, NPCI launched Unified Dispute Resolution in UPI to provide faster online dispute resolution.
Mexico	SPEI rules establish guidelines on the service level for the end customers. Fraud-based disputes are handled directly by the SPEI participants with their customers. Banco de México has introduced the SPEI Information Module, which enables customers to monitor the status of their payments. This information module allows customers, for example, to find out whether the payment was returned for some reason or whether it was never made. With this information, users can check with their bank to find out more details on the status of payment.
Poland	Express Elixir participants are encouraged to formulate their own customer complaint-resolution procedures. Customer also have the option to seek a legal remedy under the Polish Chamber of Commerce if guidelines stipulated by the participants do not provide for impartial resolution of complaints.
Singapore	Customer complaint registration and resolution (including fraud reporting) is handled directly between the FAST participant and its customers.
Thailand	The BOT has prescribed consumer-protection measures for PSPs, such as the specification of the terms and conditions in service-level agreements for digital payment services, problem-solving procedures for service users, business rules, dispute-resolution agreement, and the compensation for damages.
United Kingdom	In case of an unauthorized transaction, a customer needs to report it to her/his financial institution. As the next step, the financial institution starts the investigation within two days of the complaint. When the financial institution finds clear evidence of a genuine mistake, then a request is initiated to the receiving financial institution. If the recipient does not dispute the claim, the amount is returned within 20 days of the complaint. If the financial institutions are unable to provide solutions for the disputes, the customer can report to Financial Ombudsman Service to resolve the dispute.
United States	There are no centralized guidelines for resolution of customer complaints. RTP operating rules nevertheless oblige the sending financial institutions to put in place policies and procedures for handling customer claims for unauthorized transfers and funds sent in error. Receiving financial institutions must also have policies and procedures to respond to requests to reclaim funds sent in error.



5 KEY LEARNINGS AND FORWARD OUTLOOK

The Fast Payments Toolkit, of which this guide is an integral part, is intended to provide guidance to jurisdictions considering developing/upgrading their FPSs and, through the various analyses included in the toolkit, eventually to assist them when making policy and implementation choices. The guide was informed mainly by the 16 deep-dive jurisdiction reports, which in turn were integrated from more than 70 interviews with a variety of stakeholders across the ecosystem (overseers, operators, and participants). The main findings and learnings are discussed in this chapter.

Overall, the analysis demonstrated that the key levers for the adoption and uptake of fast payments are the immediate availability of funds, even for very small-value transactions, and central banks that play a leading role either as the developers and operators of fast payment arrangements or as catalysts for their development by the private sector (and subsequently as overseers). Other important elements that foster uptake include the following:

i. Coverage and openness of the fast payment arrangement, including a wide range of use cases, participation of a wide range of PSPs, and affordable pricing
ii. Convenience and ease of access, including accessibility through mobile phones, the use of aliases such as mobile numbers, the use of APIs, and a common messaging standard
iii. A sound preexisting market context—namely, penetration of the internet and mobile phones, the quality and speed of other payment options, and the overall competitiveness of the payments market
iv. Awareness and educational campaigns for end users by public authorities, operators, and participants

The more detailed key findings and learnings are discussed below. The key learnings are summarized in figure 23, organized across the typical life cycle of a payment infrastructure project: the conceptualization stage, the design stage, and the "go-live" and post-implementation stage. Each of the key learnings is directed to one or more stakeholders across the ecosystem (that is, the overseer, owner, operator, and participants). Table 31 provides additional insights into these key learnings.

FIGURE 23: Stakeholder Mapping of Key Learnings

REGULATOR OPERATOR PARTICIPANTS OWNER

Conceptualization

1. Determine objectives for FPS launch
2. Understand market needs
3. Carry out stakeholder consultation

4. Assess other systems
5. Develop a business case
6. Garner industry support

7. Assess participants capabilities
8. Identify profit centers of participants
9. Take a long-term view

10. Carry out detailed assessments of existing infrastructure

Design & Implementation

1. Ensure structured planning
2. Build a dynamic, scalable system
3. Incorporate scope of innovation
4. Provision of indirect participation
5. Provision of participation of non-bank players
6. Introduce appropriate pricing schemes
7. Build customer trust in the system
8. Leverage APIs for connectivity

9. Focus on key development components
10. Incorporate robust risk management framework

11. Keep an adequate stress testing window
12. Adopt a common messaging standard
13. Decide on transaction limits & specifications

14. Assign a robust project management team

15. Work in collaboration

16. Incorporate a strong, legal framework
17. Establish common Payment Scheme governance

Go-Live & Post Implementation

1. Generate customer awareness

2. Adopt a product roadmap approach

3. Implement robust oversight mechanism

4. Evaluate risk mitigation measures

5. Facilitate post launch engagements

6. Provide customized solutions by leveraging payments data

TABLE 31: Key Learnings from the Application of the Fast Payment Framework

PROJECT CONCEPTUALIZATION STAGE			
1	Have clarity on the objective, including motivations/drivers for developing fast payment services in their jurisdiction.	5	Develop a plan for investing in infrastructure and recovering cost over a period of time, and avoid focusing on achieving profitability in the short run. The central bank should work together with stakeholders to identify the long-term benefits of the project (direct and indirect) and the broader long-term interests of the NPS.
2	Obtain knowledge of fast payment arrangements in other jurisdictions, including the key features of their operating models and service offerings.	6	Develop a good understanding of the infrastructure available in the broader ecosystem (for example, phone and communication network penetration) to determine which user needs and expectations the fast payment arrangement will be able to meet at launch and in its early stages of development.
3	As part of the design, focus on establishing a core platform and associated services on top of which other stakeholders can innovate and build further services.	7	Give due regard to the existing payments infrastructure setup, including such aspects as current familiarity with real-time payments, instruments available (for example, push and pull), NPS integration, support of use cases, settlement models, the accounting practices applicable to payments, and other banking activities operating 24/7, among others.
4	Underpin the business case with a clear vision of the role for the fast payment arrangement in terms of use cases and services it can offer to PSPs and the market in general. This is critical for developing a credible business plan and garnering industry support.	8	Study the existing internal infrastructure of banks and other potential PSPs and assess their ability to achieve immediate fund transfers with certainty. Jurisdictions could consider agreeing on minimum criteria for participation up front, in a way that ensures that at least the major banks and some other smaller banks and non-bank PSPs can be ready to join by the predecided "go-live" date.
PROJECT DESIGN AND IMPLEMENTATION STAGE			
9	Assign a top-notch project-management team. • The relevant stakeholders should also identify personnel with experience and competency and assign them the responsibility of project development and implementation. They should also be made duly accountable for the project. • Ensure continuity of the people/team assigned to this task to avoid delays in implementation.	16	Ensure fair, transparent, and risk-based access criteria that do not preclude membership based on institution type. This is critical to foster innovation and ongoing competition in the payment ecosystem, recognizing, though, that many smaller and mid-sized PSPs may opt for indirect participation, given the financial and technical requirements for direct participation.
10	Ensure structured planning and implementation to help mitigate implementation delays, including those related to stakeholder onboarding. It is essential to give participants sufficient time to adapt—that is, for contract negotiation, internal system development, and implementation.	17	Consider using APIs that have proven most useful for the connectivity of smaller participants and of other third parties (for example, entities that provide payment-initiation services), and to foster standardization of APIs in the payments market.
11	Going live with a basic service—with limited features—can be a good strategy to get the ball rolling. The design of the fast payment arrangement should nevertheless be flexible enough to accommodate multiple use cases/services based on dynamic market needs (that is, the "plug and play" approach).	18	Ensure that the pricing scheme(s) for participants promotes quick participant adoption. The joining fee, fixed fees (if any), and variable fees should not act as barriers for smaller players. At the same time, the operator should ensure sustainability in the medium- to long-term timeframe.
12	Consider user experience as a critical factor that needs to be kept in mind while designing and developing a fast payment arrangement. Focus should be placed on providing a seamless experience across all access channels. The elements that help enhance the customer experience include the use of aliases and services provided by third parties (for example, payment initiation).	19	Ensure that pricing policies for end users foster uptake in the short term, for which public authorities may encourage participants to offer fast payments as a low-cost (or even zero-cost) payment service. However, in the medium term, this will need to be reconsidered to ensure that participants have an incentive to introduce additional services and features.
13	Design and implement a strong governance framework for the fast payment arrangement. All participants (banks and non-banks) should be represented and have a say in the decision-making. The voices of external key parties, such as fintechs and telcos, also need to be heard and given due consideration.	20	Give due attention to the type of messaging standard adopted. The decision to adopt a particular message standard—proprietary or ISO—should be based on a careful analysis of the costs and benefits and factor in the need to facilitate the interoperability of domestic payment systems and, eventually, to enable cross-border payments. While other possibilities exist, ISO 20022 is emerging as a leading messaging standard for fast payments.

continued

TABLE 31, *continued*

14	Undertake comprehensive testing before launch (operator and participants). A fully functional central testing platform for intra- and inter-participant testing can help identify issues early in the implementation phase.	21	Establish a clear, documented, effective risk-management framework to identify, measure, monitor, and manage the various risks, including those concerning potential criminal activity (for example, money laundering, the financing of terrorism, cyberattacks, and data breaches). Participants should also be mandated by their supervisor to set up robust internal controls for operational risks.
15	Have a comprehensive rulebook that contains all relevant rules, parameters, standards, and controls for the operational efficiency and overall soundness of the fast payment arrangement. This also promotes a level playing field for participants.	22	Agree on the settlement model and measures for the mitigation of settlement risk between operators/manager and operator/manager and participants. The measures should be cost efficient. Key decision factors include whether non-banks will be direct participants (for example, settling operations on their own behalf) and the specifics of the local ecosystem (for example, settlement services provided by the central bank or commercial banks).
PROJECT "GO-LIVE" AND POST-IMPLEMENTATION STAGE			
23	Collaborate during post-implementation to ensure that the fast payment arrangement will be able to reach its maximum potential over time.	27	Review risk-management frameworks periodically to mitigate evolving requirements and threats, including cyber. Technologies such as artificial intelligence and machine learning can help operators/managers detect failures in compliance and combat evolving threats.
24	Generate customer awareness in the initial years to increase registrations and uptake. Customers often require handholding to familiarize themselves with the new service and its functionalities.	28	Adapt some of the oversight tools and overall approach when it comes to fast payments, to ensure that the relevant systems or underlying arrangements operate safely and efficiently on an ongoing basis (applicable for regulators/overseers).
25	Keep the customer registration process simple, to increase uptake.	29	Leverage payments data to introduce innovative and customized solutions for end users (for system operators and system participants) without compromising data-protection and privacy aspects.
26	Adopt a product road map approach for new use cases/services and functionalities that shares the vision of the owner/operator with all participants (and other relevant stakeholders, such as telcos), ensuring that these stakeholders will be able to adopt these changes in a timely manner.	30	Evaluate on an ongoing basis whether the system continues to meet the evolving ecosystem needs; fosters the safety, efficiency, and reliability of the NPS; and has the right governance arrangements. Take appropriate actions based on the evaluation.

In summary, while many jurisdictions have implemented fast payments, their paths have varied significantly, owing to differences in the regulatory environment, support from the broader ecosystem, consumer preferences, support from the existing payments and ICT infrastructure, and existing/competing offerings. Each jurisdiction's uptake, experiences, and success have also varied. For example, ownership/operation by a central bank can be as effective (or ineffective) as ownership/operation by the private sector. One important conclusion is therefore that there is no single right way to implement fast payments—what worked well in one place may not work in the other.

It also needs to be acknowledged that the crux of a thriving system lies in more than just a successful implementation. Jurisdictions must work consistently to incorporate enhancements and feedback so that fast payment arrangements reach their maximum potential. Functionalities will need to be improved regularly to adapt to changing demands from participants, end users, overseers, and the other stakeholders in the broader ecosystem.

5.1 WHAT'S NEXT FOR FAST PAYMENTS?

FPSs are emerging as a new payment infrastructure that is directly linked to transaction accounts and creating a truly independent payment mechanism alongside the payment cards that have dominated in-person and online payments in many countries. Now that domestic payments between transaction accounts (transaction accounts include bank account, mobile-money accounts, and accounts maintained with a licensed non-bank financial institution) happen in seconds and at nearly zero cost, the adoption of FPS is gaining traction. The BIS Innovation Hub is exploring how the success of fast payments can improve the cross-border payments experience. The Nexus project provides a blueprint

for a scalable cross-border payments network that would connect FPSs in multiple countries, enabling them to offer cross-border payments that reach their destination within 60 seconds.

Moreover, crypto assets appear to be on the rise globally, including some that certain individuals and firms consider to be a medium of exchange. If these crypto assets with payment capabilities gain more mainstream acceptance, a question will arise as to whether or how they shall or could become interoperable with existing payment systems, including fast payment arrangements.

Likewise, several experimental projects have tested how distributed ledger technology could be used in payments, considering the alleged benefits of programmability, increased automation, transparency, and network resilience. Recently, the industry has been giving more thought to how this technology could be integrated with fast payments. For example, some players in the industry believe that connecting the latter to existing distributed ledgers would facilitate programmable fast payments.

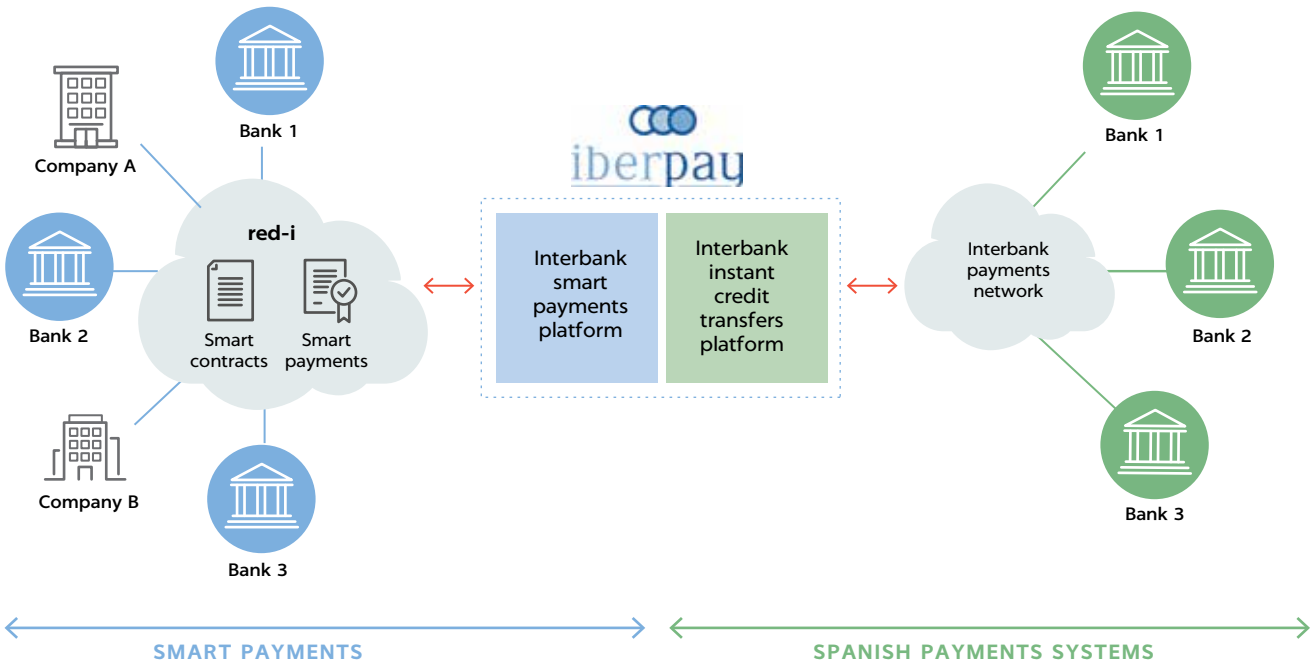
In this regard, in July 2020, five Spanish banks successfully completed a proof of concept for an interbank smart payment platform managed by Iberpay, the owner and operator of Spain's ACH and fast payment arrangement. Iberpay connected a blockchain network to an existing payments system. The effort included the deployment of an interbank smart payment platform and a permissioned interbank blockchain network. The proof of concept entailed the automatic execution of SCT Inst payments triggered by businesses' smart contracts running in the blockchain network, and their settlement by connecting with the Spanish Retail Payment System.[62] This arrangement requires interoperable messaging between the blockchain network and Iberpay's fast payment arrangement to facilitate the automated execution of payments. Iberpay plays the role of system integrator. This initiative is illustrated in figure 24.

As central banks continue to explore the development of central bank digital currencies (CBDCs),[63] the interplay between CBDCs and fast payments is likely to receive further attention. A CBDC network and fast payments do not necessarily have to compete. One potential option in this space would be using the FPS payment rails for CBDCs.

In addition, the availability of FPS on a 24/7 basis and facilitating payments for varied use cases is seen as a national payments rail. The uptake of fast payments has been encouraging across jurisdictions that implemented it. For instance, the growth in transaction volumes in India's UPI between 2019 and 2020 was 135 percent. Growth has been very rapid, reaching an annualized rate of around 12 fast payments per capita per year in just the second year of operation.

The availability of FPS on a 24/7 basis has removed the barriers of unavailability of systems matching the time zones of varied countries for cross-border payments and has overcome the delays for cross-border payments. The integration of the national FPS for cross-border payments has signified

FIGURE 24: Iberpay's Integration of a Distributed Ledger with STC Inst.



Source: EPC

the role of the national FPS for cross-border payments. The CPMI report *Enhancing Cross-Border Payments: Building Blocks of a Global Roadmap* recognizes that interlinking retail payment systems (including FPSs) and wholesale payment systems (such as RTGS systems) allows PSPs to interact directly through the linked infrastructures and reduces their reliance on traditional correspondent banking. The project Nexus provides a blueprint and the design choices to future-proof domestic payment systems for cross-border payments. The Nexus gateway can help overcome, or work around, some of the legacy design choices.

FPS that is accessed through mobile phones with rich data availability are more amenable to integration with promotions and marketing campaigns. This can be a strong motivator for uptake by merchants. Related to this, the evolution of "buy now, pay later" is enabling credit provisions to be embedded as part of the payment process, in some sense bringing capabilities usually seen with credit cards to payments from transaction accounts. This is further strengthened by the open-banking developments. When combined with open banking, FPS is allowing the seamless embedding of payment processes within commercial and social interactions, almost making the payment process invisible to the user.

In addition, access to APIs has allowed data to flow freely between the systems and participants. The functionalities being made available through APIs include merchant payments, transaction history, business-to-business payments, e-commerce payments, authentication, account balance, bill payments, profile management, P2P payments, and reversals. The "open-banking-type"[64] APIs have aided interactions between banks and third parties as well as interactions between a customer and its issuer payment system, and they have also enabled merchants to accept payment methods. How the implementation of, and access to, APIs in turn supports "open banking" differs across jurisdictions. For example, India's legal framework and the European Union's PSD2 both support API-led banking, but they differ in terms of their respective implementation strategy. NPCI leverages the unified "India Stack"[65] that enables banks to adopt APIs in a centralized way. On the other hand, PSD2 relies on individual banks to open their systems to others and to provide the APIs to process the payments and access account information data. This may lead to a situation where individual banks may publish their own security architecture and APIs. Although compliant with the standards proposed by regulator, they may all differ at the implementation level and be complex to integrate.

Among other things, open banking serves as an enabler for FPS, as it catalyzes more and more players to participate in FPS and, as a result, helps FPS become a competitive differentiator in the market. Open banking is perceived differently across jurisdictions. Some countries, such as Australia, Bahrain, and the United Kingdom, have created a well-defined regulator-driven framework, while others, such as the United States, have followed a more market-driven approach. In the United Kingdom, open banking was mandated by the Competition and Markets Authority to increase competition and innovation in the United Kingdom's banking market and to rebalance markets in favor of consumers. The impact on FPS of the rising uptake of open banking is potentially huge. Offerings that blend both capabilities stand to unlock the combined potential of open banking and FPS by addressing new payments journeys in innovative ways. Regulatory requirements and actions vary, but regulators have been encouraging in their role as facilitators for and enablers of reform. Open banking serves as a catalyst for FPS by supporting the integration of more and more financial institutions into FPS and needs to be embedded within the overall financial ecosystem.

Integration of FPSs into other financial market infrastructures has furthered the usage of fast payments. For example, investments in capital markets and payments for future transactions are opening the gates for integration for all markets. The access and integration of fintechs has furthered innovation in the space.

APPENDIX A: ACKNOWLEDGMENTS

EXHIBIT A1: External Advisory Experts Group

EXTERNAL ADVISORY EXPERTS GROUP		
INSTITUTION	**REPRESENTATIVE**	**TITLE**
Banque Centrale des États de l'Afrique de l'Ouest (BCEAO)	Ms. Akuwa Dogbe Azoma	Payment Systems Director
Committee on Payments and Market Infrastructures (CPMI)	Mr. Umar Faruqui	Member of Secretariat
European Central Bank (ECB)	Ms. Mirjam Plooij	Senior Market Infrastructure Expert
Central Bank of Egypt	Mr. Ehab Nasr	Assistant Sub-Governor, Payment Systems and Business Technology Sector
Fast Identity Online (FIDO) Alliance	Ms. Christina Hulka	Executive Director and Chief Operating Officer
Global System for Mobile Communication (GSMA)	Mr. Bart-Jan Pors	Director of Inclusive FinTech
National Payment Corporation of India (NPCI)	Mr. Dilip Asbe	Director and Chief Executive Officer
NPCI International Payments Limited (NIPL)	Mr. Ritesh Shukla	Chief Executive Officer
Bank of Jamaica	Mrs. Novelette Panton	Division Chief, Financial Markets Infrastructure
Bank of Jamaica	Mr. Mario Griffiths (Alternate)	Director, Payment System Policy and Development
Bank Negara Malaysia	Mr. Yip Kah Kit	Deputy Director, Financial Development and Innovation
Banco de México	Mr. Miguel Diaz	General Director of Payment Systems and Market Infrastructures
South Africa Reserve Bank	Mr. Tim Masela	Head of Payment Systems Department
UK Payment Systems Regulator (PSR)	Mr. Nick Davey	Payment Specialist
UK Payment Systems Regulator (PSR)	Ms. Nicole Coates (Alternate)	Technical Specialist

Special acknowledgment is made of the following contributors for the interviews and surveys conducted with the jurisdictions selected for the deep dives.

EXHIBIT A2: Contributors to Interviews and Surveys

NO.	REGION	CENTRAL BANK/OTHER REGULATOR	OPERATOR	PARTICIPANT
1	Australia	Reserve Bank of Australia (RBA)	New Payments Platform Australia Ltd. (NPPA)	National Australian Bank
				Bpay
				Osko
				Cuscal
				AusPay Network
2	Bahrain	Central Bank of Bahrain	BENEFIT	Bank of Bahrain and Kuwait
3	Chile	Comisión para el Mercado Financiero (CMF)	Centro de Compensación Automatizado (CCA)	Trans Bank
				BNP Paribas
4	China	People's Bank of China (PBC)	(China National Clearing Center) CNCC	
5	Europe	European Central Bank (ECB)	European Payments Council (EPC)	Unicredit
				CEC Belgium
				Deutsche Bank
6	Hong Kong SAR, China	Hong Kong Monetary Authority (HKMA)	Hong Kong Interbank Clearing Ltd. (HKICL)	NEAT
7	India	Reserve Bank of India (RBI)	National Payments Corporation of India (NPCI)	SBI
				Amazon Pay
				ICICI Bank
8	Kenya		Integrated Payment Services Ltd./ Kenya Bankers Association	Diamond Trust Bank
9	Malaysia	Bank Negara Malaysia (BNM)	PayNet	HSBC
10	Mexico	Banco de México	Banco de México	Banco Santander
11	Poland	National Bank of Poland	Krajowa Izba Rozliczeniowa (KIR)	Blik
12	Singapore	Monetary Authority of Singapore (MAS)	Banking Computer Services Pvt. Ltd. (NETS)	DBS
13	Thailand	Bank of Thailand (BOT)	National Interbank Transaction Management and Exchange (ITMX)	Kiatnakin Bank
				KasiKorn Bank
				2C2P
				Thai Banker Association
14	United Kingdom	Payment Systems Regulator (PSR)	Pay.UK	HSBC
				Wise
				Clear Bank
				UK Finance
				Ebury
15	United States	Federal Reserve Board	The Clearing House (TCH)	Citibank

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EXHIBIT A3: Organizations That Provided Inputs and Perspectives

NO.	SPECIAL TOPIC NOTE	ENTITY
1	Access to FPS	Wise
2	APIs	Central Bank of Mexico
		Dapi
		Sahamati
		Wise
		Form3
		W3C
		EMVCo
		GSMA
3	Consumer protection	Organisation for Economic Co-operation and Development (OECD)
		The International Financial Consumer Protection Organisation (FinCoNet)
		Central Bank of Portugal
		Reserve Bank of Australia
		Financial Services Regulatory Authority, Canada
4	Customer authentication	EMVCo
		FIDO Alliance
		GSMA
		W3C
5	Dispute handling, reversal, chargebacks, and refunds	Visa Inc.
6	Fraud risks and AML/CFT	Banco de México
		Datavisor
7	Messaging standards	Mastercard
		Nexo Standards
		PwC India
		SWIFT
8	Proxy identifiers and databases	NPPA
		SWIFT
		Thai Bankers Association
9	QR codes	Ant Group
		Central Bank of Mexico
		EMVCo

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APPENDIX B: GLOSSARY, ACRONYMS, AND ABBREVIATIONS

EXHIBIT B1: Glossary

TERM	DESCRIPTION
AI	artificial intelligence
Alias	Alternative identifier(s) to bank account holder details for increased convenience of the customer—for example, a mobile number or national ID number
AML	anti-money-laundering
ANSI	American National Standards Institute
API	application programming interface
Australia **ADI** **AFCA** **APRA** **DCS** **ESA** **FSS** **IFTI** **NPP** **NPPA** **PSB** **RADI** **RBA** **RITS** **RTPC**	 authorized deposit-taking institution Australian Financial Complaints Authority Australian Prudential Regulation Authority distributed clearing system Exchange Settlement Accounts Fast Settlement Services International Funds Transfer Instruction New Payments Platform New Payments Platform Australia Ltd. Payments System Board restricted authorized deposit-taking institution Reserve Bank of Australia Reserve Bank Information and Transfer System Real-Time Payments Committee
Authentication	Methods used to verify the origin of a message or to verify the identity of a participant connected to a system and to confirm that a message has not been modified or replaced in transit
Bahrain **CBB** **EFTS** **PLPD**	 Central Bank of Bahrain Electronic Fund Transfer System Personal Data Protection Law
BIC	Bank Identifier Code
BIS	Bank for International Settlements
CDD	customer due diligence
Channel	Modes used by customers to initiate transactions on FPS—for example, a branch, the internet, a mobile phone, a call center, or a letter
Chile **ACH** **CCA** **CMF** **TEF**	 Automated Clearing House Centro de Compensación Automatizado Comisión para el Mercado Financiero Transferencias en Línea

continued

EXHIBIT B1, *continued*

TERM	DESCRIPTION
China	
IBPS	Internet Banking Payment System
CNCC	China National Clearing Center
PBC	People's Bank of China
CFT	combating the financing of terrorism
Clearing service	A multilateral system or arrangement that provides its participants with clearing services for payment instructions; the institution responsible for the computation of obligations and the transmission of information through a payment system network
CPMI	Committee on Payments and Market Infrastructures
Credit risk	The risk that a counterparty, whether a participant or other entity, will be unable to meet fully its financial obligations when due, or at any time in the future
Debit cap	Quantitative limits on the fund transfer activity of direct participants in a system
Deferred net settlement	Netting that is deferred until a prearranged time (cycle) and settles on the final netted value at that time at the settlement service provider
Direct debit	Debit on the payer's bank account initiated by the payee; these are usually preauthorized
Direct/primary participants	Financial institutions that connect directly with the central clearing service provider to send and receive payment messages and have a direct account with the settlement service provider
Dispute resolution	Structured processes that address disputes or grievances that arise between the parties engaged in a particular payment
Distributed clearing	Validation and confirmation of the payment instruction are undertaken on a peer-to-peer basis between both banks, before initiating downstream settlement at the central bank
DNS	deferred net settlement
DRC	dispute-resolution committee
EDIFACT	Electronic Data Interchange for Administration, Commerce and Transport
e-KYC	electronic know your customer
EU	European Union
Europe	
CSM	clearing and settlement mechanism
EBA	European Banking Association
ECB	European Central Bank
EPC	European Payments Council
ERPB	Euro Retail Payments Board
GDPR	General Data Protection Regulation (legislative act of the European Union)
MIB	Market Infrastructure Board (governance body of the European Central Bank)
OBIE	Open Banking Implementation Entity
PSD2	Revised Payment Services Directive
SCA	strong customer authentication
TIPS	Target Instant Payment Settlement
e-Wallet	A software-based device that securely stores a user's payment credentials linked to a current account, a credit card, a debit card, or an e-money account for use in paying at physical stores or in e-commerce. When this device is a smartphone, e-wallets holders can use their phone to make payments. This is often referred to as a mobile wallet. Combined with fast payments, mobile payments offer multiple new possibilities for P2P and P2B payments, among others.
Fast payments	Payments in which the transmission of the payment message and the availability of funds to the payee occur in real time or near real time and as near to 24 hours a day and seven days a week (24/7) as possible. For the purposes of this study, emphasis is placed on the immediate availability of funds to the beneficiary of a fast payment transaction—which can be an individual, a firm, or a government agency—and that these transactions can be made during an operational window during the day that is as large as possible, with trends toward 24/7 availability.
Float	The period between when money is debited from a payer's account and credited to a recipient's account and interest is not paid to either the sender or the recipient of the payment
FMI	financial market infrastructure
GDP	gross domestic product

continued

EXHIBIT B1, *continued*

TERM	DESCRIPTION
General business risk	The risk related to the administration and operation of a financial market infrastructure as a business enterprise, excluding those related to the default of a participant or another entity, such as a settlement bank, global custodian, or another FMI.
Hong Kong SAR, China **CFI** **CHATS** **HKAB** **HKMA** **SVF**	Cybersecurity Fortification Initiative Clearing House Automated Transfer System Hong Kong Association of Banks Hong Kong Monetary Authority stored-value facility
Hub	A central application that a third-party organization runs as a hub to handle the clearing between the participants and manage the downstream settlement with the central bank's RTGS
Hybrid settlement	A settlement mechanism where payment can be processed either by deferred net settlement or real-time settlement depending on the volume of transaction, time to process, or value of the transaction
IBA	Indian Banks Association
IBAN	International Bank Account Number
IOSCO	International Organization of Securities Commissions
ITU	International Telecommunication Union
India **CCIL** **ERM** **IMPS** **MMID** **NEFT** **NPCI** **PPI** **RBI** **SGF** **TPAP** **UPI**	 Clearing Corporation of India Ltd. enterprise risk management Immediate Payment Service mobile-money identifier National Electronic Funds Transfer National Payments Corporation of India prepaid payment instrument Reserve Bank of India settlement guarantee fund third-party application provider Unified Payments Interface
Indirect participant	A financial institution using direct/primary participants as a sponsor for passing payment messages to the clearing service provider and leveraging the primary participant's account with settlement service provider for settlement
Interoperability	Technical or legal compatibility that enables a system or other mechanism (for example, a payment instrument) to be used in conjunction with other systems or mechanisms
Intraday liquidity	Liquid funds that can be accessed during the business day, usually to enable financial institutions to settle payment obligations on both a payment-by-payment basis and DNS cycles
IOSCO	International Organization of Securities Commissions
ISO	International Organization for Standardization
Kenya **IPSL** **KBA**	 Integrated Payment Services Ltd. Kenya Bankers Association
KYC	know your customer
Liquidity facility	A facility that can be drawn upon by certain eligible entities; in some cases, the facility can be used automatically at the initiative of the account holder, while in other cases, the liquidity provider may decide explicitly on each single request
Liquidity risk	The risk that a counterparty, whether a participant or other entity, will have insufficient funds to meet its financial obligations as and when expected, although it may be able to do so in the future
Malaysia **BNM** **NRIC** **PayNet** **RPP**	 Bank Negara Malaysia National Registration Identity Card Payments Network Malaysia Sdn Bhd Real-time Retail Payments Platform
ML	machine learning
MOU	memorandum of understanding

continued

EXHIBIT B1, *continued*

TERM	DESCRIPTION
Merchant discount rate	Rate charged to merchants for processing transactions
Messaging standard	A common definition of the syntax, structure, and semantics of a family of messages that are exchanged between counterparts
Mexico **CNBV** **CoDi** **SIAC** **SPEI** **SPEUA**	 Comisión Nacional Bancaria y de Valores Cobro Digital Account Holders Service System Interbank Electronic Payment System Extended Use Electronic Payments System
NDC	net debit cap
Netting	The offsetting of the value of obligations between or among participants in the payment system, thereby reducing the value that needs to be transferred between participants to settle all the payment obligations
NFC	Near-field communication—for example, using smart phones to make POS transactions
Nigeria **CBN**	 Central Bank of Nigeria
NIP	NIBSS Instant Payment
NPS	national payments system
PSB	Payment Scheme Board
PICC	Payment Initiative Coordinating Committee
NLP	natural language processing
Operational risk	The risk that deficiencies in information systems or internal processes, human errors, management failures, or disruptions from external events will result in the reduction, deterioration, or breakdown of services
Overlay service	Ancillary services that are often based on the real-time payments rails and are flexible, nimble drivers of innovation
Oversight	Oversight of payment and settlement systems and services is a central bank function whereby the objectives of safety and efficiency are promoted by monitoring existing and planned systems, assessing them against these objectives, and, where necessary, inducing change—for example, by a public authority
Payment system operator	Institution responsible for operating a payment system
Payment types	Payment types can be classified into the following three categories: *i) Individual payments:* • Person-to-person (P2P) payments include transfers of money to family members/friends without an underlying economic transaction (for example, remittances). Payments to other individuals in the social context (for example, to repay for a shared restaurant bill) also fall into this category. *ii) Business payments:* • Person-to-business (P2B) payments include retail payments associated with the purchase of retail goods and services from businesses, irrespective of the size of the business. • Business-to-person (B2P) payments typically involve periodic transactions in compensation for the work rendered by employees (that is, payrolls and other compensation-related payments, such as incentives) and are therefore normally characterized by a large number of transactions of relatively small value. • Business-to-business (B2B) payments: When one business is the payee and another business is the payer, it is called a B2B payment. B2B payments range from large-value payments associated with large intra-industry transactions (which are not in the focus of this report) to retail payments between small, medium-sized, and large enterprises *iii) Government payments:* • Person-to-government (P2G) payments include obligations that individuals pay to central, regional, and local public administrations. • Government-to-person (G2P) payments are characterized by a very large number of transactions, normally of small individual value. • Government-to-business (G2B) payments are characterized by a large number of transactions, and values vary widely, ranging from large-value procurement contracts to very small payments made with a government credit card or debit card. • Business-to-government (B2G) payments are typically periodic payments and characterized by a large number of transactions of varying sizes. B2G payments include corporate tax payments (for example, income taxes, sales taxes, and value-added taxes), fees for government services (for example, company registration, business permits, or licenses), penalties (for example, fines), and the employer's share of social-security contributions

continued

EXHIBIT B1, *continued*

TERM	DESCRIPTION
Payment instrument	Modes of payments that facilitate transactions between two parties. There are two types of payment instruments: cash and non-cash. Non-cash payment instruments include checks, credit transfer, debit and credit cards, direct debits, and e-wallets.
PBC	People's Bank of China
PFMI	Principles for Financial Market Infrastructures
PISP	payment-initiation service provider
Poland **KIR** **NBP**	 Krajowa Izba Rozliczeniowa S.A. National Bank of Poland
Prefunding	Prefunding is the requirement to hold segregated funds against a net debit cap or other agreed position in a payment system that can always be used for final settlement to reduce or remove credit or liquidity risks arising.
PSP	payment service provider
Real-time settlement	Settlement on a continuous, payment-by-payment basis, in real time.
Reconciliation	A procedure to verify the purpose of a payment—for example, between an invoice or bill and a subsequent payment
RFP	request for proposal
RTGS	real-time gross settlement
RTS	regulatory technical standards
Settlement agent	An entity that manages the settlement process for transfer systems or other arrangements that require settlement; the settlement agent sometimes differs from the owner or settlement institution of the system
Settlement bank	Either a central or a commercial bank used to effect fund settlements; an FMI typically maintains an account at one or more settlement banks to conduct fund settlements between or among its participants
Settlement risk	The risk that settlement in a fund or securities transfer system will not take place as expected; this risk may comprise both credit and liquidity risk
Settlement service provider institution	The institution across whose books transfers between participants take place to achieve settlement within a settlement system—that is, the institution responsible for interbank/company settlement of payment instructions—for example, central banks
Singapore **FAST** **MAS** **MEPS+** **SACH** **SCHA**	 Fast and Secure Transfers Monetary Authority of Singapore New MAS Electronic Payment and Book-Entry System Singapore Automated Clearing House Singapore Clearing House Association
SIPS	systemically important payment system
SLA	service-level agreement
SME	small and medium-sized enterprise
Straight-through processing (STP)	The automated end-to-end processing of trades and/or payment transfers, including the automated completion of confirmation, matching, generation, clearing, and settlement of instructions, without the need for rekeying or reformatting data
Stress testing	An estimation of the credit and liquidity exposures that would result from the realization of an extreme but plausible stress event—for example, credit and liquidity risks of counterparties
SWIFT	Society for Worldwide Interbank Financial Telecommunication
SWIPS	System Wide Important Payment System
Systemic risk	The risk that the inability of one or more participants to perform as expected will cause other participants to be unable to meet their obligations when due

continued

EXHIBIT B1, *continued*

TERM	DESCRIPTION
Thailand	
BOT	Bank of Thailand
CSS	Central Settlement System
PCI DSS	Payment Card Industry—Data Security Standard
National ITMX	National Interbank Transaction Management and Exchange
PIRPS	prominently important retail payment system
PSO	Payment Systems Office
PSC	Payment Systems Committee
TBA	Thai Bankers Association
UAT	user acceptance testing
UK	
BoE	Bank of England
FCA	Financial Conduct Authority
FPS	Faster Payments Service
NSC	net sender cap
PSR	Payment Systems Regulator
USA	
ABA	American Bankers Association
CUNA	Credit Union National Association
ICBA	Independent Community Bankers of America
FDIC	Federal Deposit Insurance Corporation
FFIEC	Federal Financial Institutions Examination Council
FRB	Board of Governors of the Federal Reserve System
NACHA	National Automated Clearing House Association
NAFCU	National Association of Federally Insured Credit Unions
OCC	Office of the Comptroller of the Currency
RTP	Real Time Payments system
TCH	The Clearing House
TLS	transport-layer security
TPSP	third-party service provider
Use cases	Specific situation in which a product or service could potentially be used
User charges	Fees levied on end users for conducting a transaction in a payment system
USSD	Unstructured Supplementary Service Data
Value date	The day on which the payment, transfer instruction, or other obligation is due and the associated funds and securities are typically available to the receiving participant.
XML	Extensible Markup Language

APPENDIX C: PRIMER ON FAST PAYMENTS

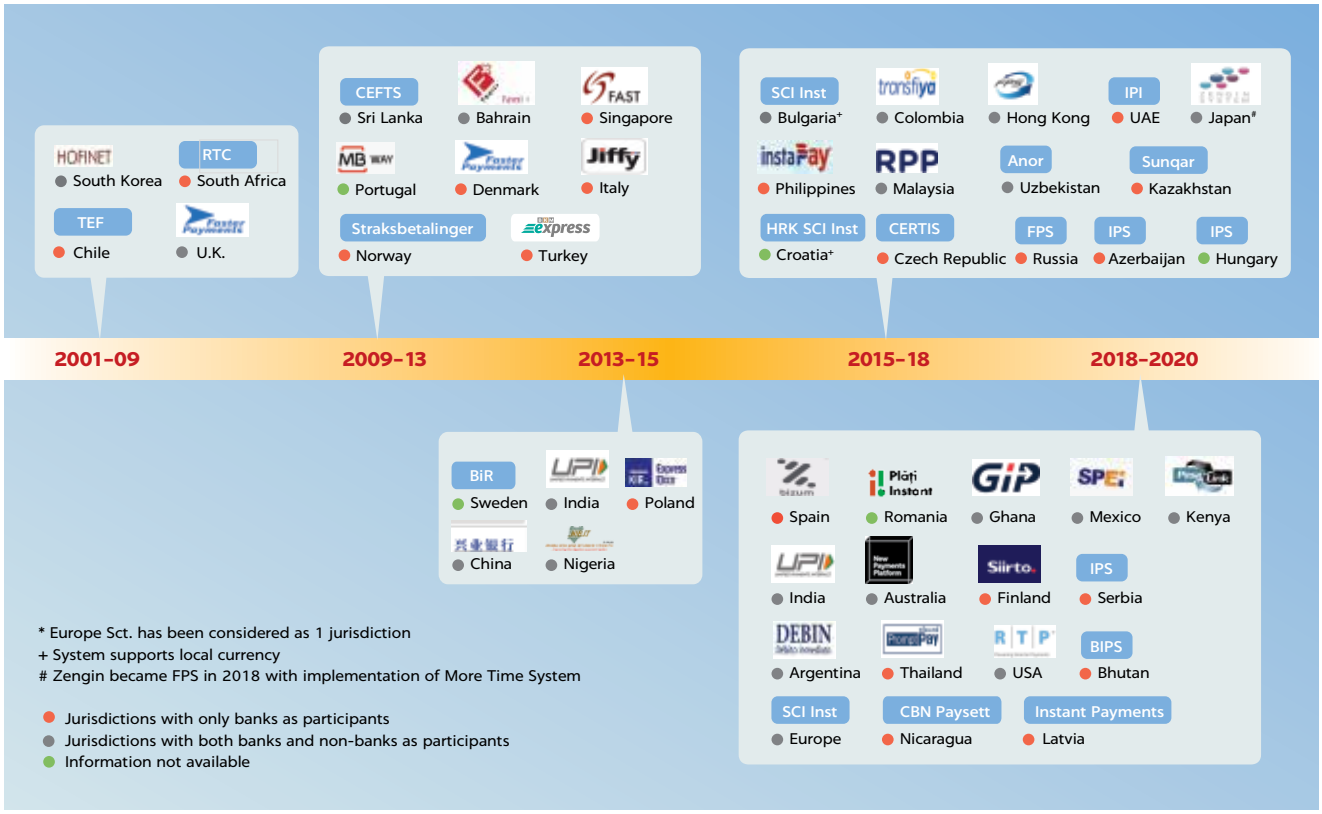
THE EMERGENCE OF FAST PAYMENTS AROUND THE WORLD

A few jurisdictions were pioneers in implementing fast payments when there were no global analogies and little market demand. This was the case of, for example, Chile, South Africa, South Korea, and the United Kingdom. Other jurisdictions started considering fast payments late in the first decade of the century after seeing the benefits and new opportunities brought by fast payments.

Exhibit C1 depicts the emergence of fast payments globally over the years. While a few arrangements have been present for a decade or more, it was in the last five years that most jurisdictions implemented fast payments. The wider emergence of fast payments was undoubtedly accompanied by advances in IT, especially with increases in access, adoption, and usage of smartphones.

The central bank has also been a major driving force for fast payment implementation, either as an operator or catalyst for a solution of this kind to be implemented. Certain jurisdictions, such as Poland and the United States, saw private operators introducing fast payments on their own due to an increased market need for the same.

EXHIBIT C1: Emergence of Fast Payment Arrangements over the Years



KEY CHARACTERISTICS AND BENEFITS PROVIDED

The key characteristics that are common across fast payment arrangements around the world are shown in exhibit C2. While all these characteristics are very relevant, this Fast Payments Toolkit has emphasized the immediate availability of funds to the beneficiary—which can be an individual, a firm, or a government agency—and that these transactions can be made during an operational window during the day that is as large as possible, with trends toward 24/7 availability

Implementation of fast payments has helped achieve the following benefits:

- Unlocking funds by providing beneficiaries with instant access to funds
- Meeting end-user demands for round-the-clock availability, which, together with immediate availability of funds, reduces uncertainty and increases the availability of working capital
- Acting as an innovation layer for the launch of new products and services
- Bringing new alternatives for P2B payments and, in this context, helping to drive financial inclusion and shift to a more formalized economy

Today, millions are experiencing these benefits. Merchants can accept fast payments remotely and can instantly access funds in their transaction accounts, just as they would with cash. This is particularly helpful to micro and small-business owners, who can then pay suppliers on time and fulfill other urgent payment obligations. Emergency funds from governments to individuals and businesses can be credited quickly. In some cases, domestic remittances are swiftly reaching family members in need, at a low cost.

Furthermore, fast payments have had a transformational impact on the wider payments ecosystem They have supported innovation in the broader payments landscape and increased end-user confidence in digital payment methods.

EXHIBIT C2: Key Characteristics of Fast Payment Arrangements

Instant and continuous
Payment should be available to beneficiary immediately and around the clock

Final
Payment once initiated should be final and cannot be revoked

Certain
Both originator and beneficiary should know the payment has been completed

Secure
Payment should reach the correct beneficiary securely

Select differentiators of fast payments when compared with other payment methods/systems are the following:[66]

- Instant settlement finality for both the payee and the payer, and the availability of final funds to the payee or the beneficiary occurs in real time. In other payment methods, such as card purchases, while the payer's account is debited in real time, the funds may or may not be made available to the beneficiary immediately. (It depends on agreement between the acquirer and merchant.)
- Transactions can be made through new modes of interfaces, such as third-party mobile applications of third-party providers.
- New access channels and transaction-initiation methods, such as QR codes, have been introduced.
- Membership is broader, and non-bank PSPs can also participate as direct participants in some cases, or as indirect participants.
- Channel innovations are complemented with use cases such as request to pay.
- Payments are supported with the help of aliases, such as phone numbers and email addresses, which increase user convenience.
- Fast payments are available around the clock.

The COVID-19 pandemic has also highlighted the growing relevance of fast payment. Many jurisdictions that have implemented fast payments have seen a surge in adoption and usage. For example, in Thailand, the government used the PromptPay system to channel relief funds quickly to citizens. In India, UPI transaction value grew about 8.3 percent month on month between March and November 2020. By contrast, it had grown about 4.5 percent month on month during the same period in 2019. Transaction value surged about 76 percent between February and November 2020.

The rapid adoption of fast payments, however, must be balanced with appropriate safeguards and risk-management frameworks. Innovations in payments should not come at the cost of overall security and safety. It is crucial, for example, to put in place robust fraud-mitigation mechanisms. For example, the risk of social-engineering attacks, such as phishing, affecting financial service users can be higher with fast payments due to the immediacy of fund transfers. These concerns need to be mitigated with robust monitoring systems, fraud-prevention tools, and training. Effective dispute-resolution mechanisms for participants vis-à-vis each other or the operator, and for end users, should also be in place.

DRIVERS OF FAST PAYMENTS ADOPTION AND UPTAKE

Adoption and uptake of fast payments vary significantly across jurisdictions. The key lever seems to be the immediate availability of funds, even for very small-value transactions. The following elements have also shown to be important determinants of uptake:

- **Coverage and openness of the system**
  Wider coverage helps maximize adoption and regular usage by both businesses and consumers. The following may drive wider coverage and openness:
  - Capability to facilitate both individual and corporate use cases: Restriction of fast payments to a narrow set of transactions—for example, P2P but not P2B or B2B—may limit potential use cases.
  - Support for both push and pull payments: Accommodation of both types of payments helps to offer a wider range of use cases/services to the end customers. Authorization is mandated to ensure that customer give consent prior to payment processing.
  - Participation of non-bank PSPs and other fintechs: The presence of more participants makes the system more valuable to each participant. Together with traditional participants such as banks, inclusion of non-bank PSPs, fintechs, and other technology companies will provide a wider user base and help boost adoption.
  - Affordability: Jurisdictions may see widespread adoption owing to efforts—often led by public authorities—to boost uptake that promote low or zero fees to end users.
- **Technology, access channels, and ease of use**
  Difficulties or limitations for users to initiate payments or an otherwise complex user experience may pose a significant challenge to uptake and regular usage. The following may ensure easy accessibility and a more user-friendly experience:
  - Accessibility via everyday devices: Many fast payment arrangements have demonstrated the importance of accessibility to services through mobile phones while also providing more transaction-initiation options.
  - The use of aliases (mobile numbers, national IDs, email IDs, or other user-chosen IDs) makes it convenient for users to take advantage of the payment services, which in turn promotes uptake.
  - Accessibility to the arrangement for PSPs via APIs and the usage of international messaging standards such as ISO 20022, which enable PSPs and other non-bank players to structure their service offering for fast payment end users.
- **Preexisting market context**
  Uptake is likely to be higher in economies where the preexisting market context enables the use of real-time payments. The following are a list of the preexisting market and technological factors that may affect the adoption of FPS in a jurisdiction:
  - Level of penetration/adoption of mobile phones (both smart phones and feature phones) and the usage of internet services
  - Quality and payment speed of other payment options (checks and so on)
  - The market competitiveness level in the payments space
- **Awareness programs**
  When public authorities, operators, and participants run awareness and educational campaigns on fast payments, uptake is likely to be higher.

INTEROPERABILITY

To facilitate a near-cash and seamless experience for all types of users, there has been increased focus on the interoperability of payment systems and payment instruments. Interoperability allows customers to determine which payment method to use based on the type of use case, user experience, size of payment, and cost of transaction. Without interoperability, these decisions would be driven by available solutions and offerings, as opposed to customer preference.

Technical innovations have helped support interoperability. Moreover, the fast payment infrastructure in many jurisdictions has been used by other non-bank PSPs to design and provide innovative payment solutions to the end customers. A paradigm shift is anticipated toward standardization in the payments industry, enabling interoperability across payment mechanisms, clearing and settlement systems, and liquidity providers.

Open APIs can serve as interoperability enablers, as they not only allow financial institutions to connect with other systems but also foster innovation. In this regard, the impact that rising uptake of open banking is having on fast payments (and payments in general) is significant.[67] The use of APIs in fast payments is providing the foundation for a widening array of new, innovative services from both incumbent, challenger banks and fintechs.

Near-real-time cross-border initiatives by global private players, such as SWIFT Global Payments Innovation (gpi), Visa

Direct, Mastercard Send, and PayPal's XOOM, can eventually also drive interoperability between fast payment arrangements in different jurisdictions. Adoption of common messaging standards will also facilitate cross-border payments

EVOLUTION AND FUTURE TRENDS

Like other aspects of the payment ecosystem, fast payments are in constant change. Most early arrangements entered the market with simple P2P payments. As user confidence grew, other payments types, such as to/from businesses and to/from government, were introduced. Furthermore, while push payments/credit transfers have been intrinsic to fast payments since their launch, some jurisdictions are making efforts to introduce pull-capability features.

Similarly, in the earlier versions, most fast payment arrangement enabled payments only via bank account numbers. This made small payments tedious, as people/merchants had to share account details to initiate payments. Hence, the use of aliases such as mobile-phone numbers or email addresses as a proxy for bank account number/details was introduced and became very popular, including for use cases such as social commerce, where social networks and media are used to conduct commerce between individuals.

Fast payments have also experienced a different journey based on the market environment where they operate. For example, due to the popularity of QR codes in Asia for merchant and bill payments, fast payment arrangements in this region have put significant effort in enabling the invoking of payments through this channel.

Fast payment arrangements must keep adapting and changing as the market conditions and people's preferences change over time. Their operators/managers should continue to be agile to accommodate other new features and solutions. Various operators and participants are now equipped with sophisticated analytical tools to help understand payment patterns and offer innovative customized solutions.

While new movements around crypto assets and central bank digital currencies, among others, are taking place, fast payments are likely to continue to play an important role in the overall innovation in the payments space, and these various innovations will coexist with one another.

SUSTAINABILITY

Currently, in most jurisdictions, the top banks have incurred the capital expenditure or investment costs to create fast payments. Some banks have used the implementation of fast payments as an opportunity to overhaul their entire core banking system. In other cases, it is the central bank that has incurred most of the investment costs to implement fast payments.

In this context, the business model currently being followed by many arrangements around the globe—based on very low or zero end-user fees to boost uptake—makes it very difficult for these banks to recoup their expense, and probably even the ongoing operational expenses, in the short to medium term. In other words, current pricing strategies for end users are not sustainable over the long run if the fast payment arrangement is owned by the private sector and intends to make a profit or at least to recover all costs incurred. The situation may be different where the central bank is the owner.

Nevertheless, in several jurisdictions there seems to be an understanding that capital expenditures and implementation costs are a one-time sunk cost to improve the overall payments infrastructure of the jurisdiction. This is likely to bring benefits that need to be quantified separately from the revenues obtained directly from the provision of fast payment services. Such benefits may include the following:

- Engaging new customer segments
- Reducing fraud risk throughout the whole payment ecosystem
- Improving long-term customer relationships
- Enabling innovative new product offerings to increase market share

CONSIDERATIONS FOR IMPLEMENTATION

Fast payment implementation is a complex venture, as it involves multiple stakeholders. Therefore, public authorities and operators need to be meticulous while making sensitive decisions. There is no single right way to implement a fast payment arrangement.

Jurisdictions have adopted different models, including different settlement mechanisms, liquidity provisions, messaging standards, and use cases. These differences are based on local market conditions, existing legacy systems, and cost considerations. It is important for all stakeholders to cooperate to ensure successful implementation. The critical decisions have to be based on sound metrics and analyses of key parameters, such as the overall local payment ecosystem (including telecommunications), participants' existing internal systems, funding, and regulatory and legal constraints.

APPENDIX D: STUDY METHODOLOGY

The study methodology was divided into four phases, as described below and shown in exhibit D1.

- **Phase 1** involved secondary research to understand the current state of fast payment arrangements and recent developments across 10 broad parameters in almost 70 jurisdictions worldwide (including implementations that are live, under development, and live but not fully fledged).
- In **Phase 2,** desk research was conducted for 25 jurisdictions identified for more detailed study, using publicly available information. The parameters studied ranged across regulatory and governance aspects, customer features, and technical capabilities. The 25 jurisdictions were selected based on geographical region, income levels, and the development stage of their fast payment arrangement.
- In **Phase 3,** the 25 jurisdictions were then further streamlined to include only jurisdictions with live fast payment implementations to obtain the final list of 16 jurisdictions where a deep-dive analysis was performed. The intent was to get a diverse mix of regions across various geographic regions, with adequate coverage across matured/developed and emerging economies, and jurisdictions with maximum coverage of use cases/features. The 16 detailed jurisdiction-specific reports were developed covering such aspects as objectives, system development process, business and operating model, technical specifications, and governance framework. These deep-dive reports were prepared based on in-depth secondary and primary research involving interviews with regulators, operators, and participants (banks and non-banks).
- Finally, in **Phase 4,** 16 topic-specific notes were developed covering aspects that are particularly relevant for fast payments.

EXHIBIT D1: Study Approach

APPROACH

Phase	Brief	Jurisdictions	Parameters	Brief approach	Source	Deliverable
1	FPS global landscape	Global	10	Broad characteristics/indicators offast payments were studied to provide a global overview	Desk research	Toolkit includes consolidated insights from all phases
2	25-jurisdiction profiles	25*	16	25-jurisdiction profiles were developed including high level information on technical specs, participants, governance arrangements and use cases/services	Desk research	
3	Deep dive assessment	16*	30	In-depth study across 16 jurisdictions was carried out	Desk research and primary interviews	
4	Focus notes	1. QR codes 2. APIs 3. Customer authentication 4. Messaging formats 5. Consumer protection 6. Dispute handling, reversal, chargeback and refunds	7. Fraud risks and AML/CFT 8. Pricing structure 9. Proxy database 10. Access aspects 11. Cross-border aspects 12. Interoperability aspects 13. Oversight aspects	14. Scheme rules 15. Future of fast payments 16. Infrastructure and ownership aspects	Desk research and primary interviews	

*SCT Inst has been included, which covers multiple jurisdictions across Europe

PARAMETERS	PHASE 1	PHASE 2	PHASE 3
Jurisdiction selection framework	Fast payments developments across the globe consisting of • Live arrangements • Under development • live-not full-fledged arrangements	25 jurisdictions were selected with representation across: • Geographical regions • Developed / developing nations and mix of jurisdiction economy size • Income levels • Jurisdictions who were early adopters of fast payments and jurisdictions with new arrangements developed over the last 2-3 years	For the deep dive study, framework used for shortlisting the 16 jurisdictions consists of three filters: • Implementation stage • Jurisdiction economics and regional distribution • Key features In this phase only 'Live Fast Payments Arrangements' were considered as greater information is likely to be available on the technical features of the payment systems, use cases, adoption statistics, FPS structure, rollout/ post-rollout actions

APPENDIX E: FULL JURISDICTION LIST

Jurisdictions, the name of their fast payment arrangement, and the development stage of the same at the time of this study have been summarized below.

EXHIBIT E1: Complete List of Jurisdictions/Systems Studied—Regional Classification

#	REGION	JURISDICTION	SYSTEM NAME	STAGE
1.	**North America, Central America, and the Caribbean**	Aruba	I-Pago	Live
2.		Belize	APSSS Instant fund Transfer (IFT)	Not fully fledged
3.		Canada	Real Time Rail RTR	Under development
4.		Costa Rica	—	Live
5.		Curaçao and Sint Maarten	—	Under development
6.		Dominican Republic	Instant Payments	Not fully fledged
7.		El Salvador	PayExpedite RTP	Under development
8.		Mexico	SPEI	Live
9.		Nicaragua	CBN PaySett	Live
10.		United States	RTP and FedNow	RTP: Live FedNow: Under development
11.	**South America**	Argentina	DEBIN	Live
12.		Brazil	SITRAF PIX	SITRAF: Not fully fledged PIX: Live
13.		Chile	TEF	Live
14.		Colombia	Transfiya	Live
15.		Peru	—	Under development
16.	**Europe**	Austria, Belgium, Bulgaria, Croatia, Cyprus, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Poland, Portugal, Slovenia, Spain, Sweden, United Kingdom	SCT Inst	Live
17.		Belarus	Instant Payment System (IPS)	Live
18.		Czech Republic	RTPE	Live
19.		Denmark	RealTime 24/7 P27	RealTime 24/7: Live P27: Under development
20.		Finland	Sirto P27	Sirto: Live P27: Under development
21.		Hungary	Instant Payment System	Live
22.		Iceland	—	Live

EXHIBIT E1, *continued*

#	REGION	JURISDICTION	SYSTEM NAME	STAGE
23.	**Europe, continued**	Italy	Jiffy	Live
24.		Latvia	Instant Payment	Instant Payment: Live
25.		The Netherlands	iDeal	iDeal: Not fully fledged
26.		Norway	Straksbetalinger	Live
27.		Portugal	MB Way	MB Way: Live
28.		Poland	Express Elixir	Live
29.		Romania	PlatiInstant	Live
30.		Russia	FPS	Live
31.		Serbia	Instant Payment Serbia	Live
32.		Spain	Bizum	Bizum: Live
33.		Sweden	BiR P27	BiR: Live P27: Under development
34.		Switzerland	SIC	Not fully fledged
35.		Turkey	RPS and BKM Express	RPS: Not fully fledged BKM express: Live
36.		United Kingdom	UK Faster Payment	Live
37.	**Middle East and North Africa**	Bahrain	Fawri+	Live
38.		Egypt	Phone Cash	Not fully fledged
39.		Jordan	JoMoPay	Not fully fledged
40.		Saudi Arabia	—	Under development
41.		United Arab Emirates	IPI	Live
42.		Yemen	WeNet Instant Transfer System	Under development
43.	**Sub-Saharan Africa**	Ghana	GIP	Live
44.		Kenya	PesaLink	Live
45.		Nigeria	NIP	Live
46.		Rwanda	RIPRS	Under development
47.		South Africa	RTC	Live
48.		Tanzania	TIPS	Under development
49.		West African Economic and Monetary Union. Eight member states include Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo.	BCEAO Digital Financial Services Interoperability Project	Under development

EXHIBIT E1, *continued*

#	REGION	JURISDICTION	SYSTEM NAME	STAGE
50.	**Asia**	Azerbaijan	Instant Payment System	Live
51.		Bhutan	Bhutan Immediate Payment System	Live
52.		Brunei	Payments Hub	Under development
53.		Cambodia	Fast Payment	Live
54.		China	IBPS	Live
55.		Georgia	—	Under development
56.		Hong Kong SAR, China	FPS	Live
57.		Indonesia	BI-FAST	Under development
58.		India	IMPS and UPI	Live
59.		Japan	Zengin	Live
60.		Kazakhstan	Sunqar	Live
61.		Malaysia	RPP	Live
62.		Maldives	Unified Payment Gateway	Under development
63.		Nepal	ConnectIPS	Live
64.		Pakistan	Raast	Live
65.		Philippines	InstaPay	Live
66.		Republic of Korea	HOFINET	Live
67.		Singapore	Fast	Live
68.		Sri Lanka	CEFTS	Live
69.		Thailand	PromptPay	Live
70.		Uzbekistan	Anor Instant Payment System	Live
71.		Vietnam	NAPAS	Live
72.	**Oceania**	Australia	NPP	Live
74.		New Zealand	—	Under development

APPENDIX F: THE 25 JURISDICTIONS SHORTLISTED FOR A MORE DETAILED REVIEW

This appendix identifies the subset of 25 jurisdictions/systems that were identified for jurisdiction-profile buildout via desk research, together with their geographic and category-wise distribution (as per the stage of development of their fast payment arrangement). The parameters that were studied are also described later in this appendix.

The 25 jurisdictions have representation across:

Geographical regions

- Developed/developing nations and a mix of jurisdiction economy size
- Country income levels
- Jurisdictions that were early adopters of fast payments and those with recent implementations (that occurred over the last two to three years).

For this same subset of 25 jurisdictions, exhibit F2 shows a distribution based on their geographic location and categorization based on the stage of development of the fast payment arrangement. Category 1 denotes "Live," Category 2 denotes "Under development," and Category 3 is "Live but not fully fledged."

EXHIBIT F1: List of Jurisdictions Shortlisted for Desk Research

#	REGION	JURISDICTION	SYSTEM NAME	STAGE
1.	North and Central America	Mexico	SPEI	Live
2.		United States	RTP	Live
3.			FedNow	Under development
4.	South America	Brazil	PIX	Live
5.		Chile	TEF	Live
6.	Europe	SEPA SCT Inst Nations (Austria, Belgium, Bulgaria, Croatia, Cyprus, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Poland, Portugal, Slovenia, Spain, Sweden, United Kingdom)	SCT Inst	Live
7.		Poland	Express Elixir	Live
8.		Spain	Bizum	Live
9.		Switzerland	SIC	Live but not fully fledged
10.		Turkey	RPS	Live but not fully fledged
11.		United Kingdom	Faster Payments	Live
12.	Middle East Asia and North Africa	Bahrain	Fawri+	Live
13.		Saudi Arabia	-	Under development
14.	Sub-Saharan Africa	Kenya	PesaLink	Live
15.		Nigeria	NIBSS Instant Payment	Live but not fully fledged
16.		South Africa	RTC	Live
17.		Tanzania	Tanzania Instant Payment System (TIPS)	Under development

EXHIBIT F1, *continued*

#	REGION	JURISDICTION	SYSTEM NAME	STAGE
18.	**Asia**	China	IBPS	Live
19.		Hong Kong SAR, China	FPS	Live
20.		India	IMPS and UPI	Live
21.		Japan	Zengin	Live
22.		Malaysia	RPP	Live
23.		Singapore	FAST	Live
24.		Sri Lanka	CEFTS	Live
25.		Thailand	PromptPay	Live
26.	**Oceania**	Australia	NPP	Live

EXHIBIT F2: Geographic and Category-wise Distribution of the 25 Shortlisted Jurisdictions

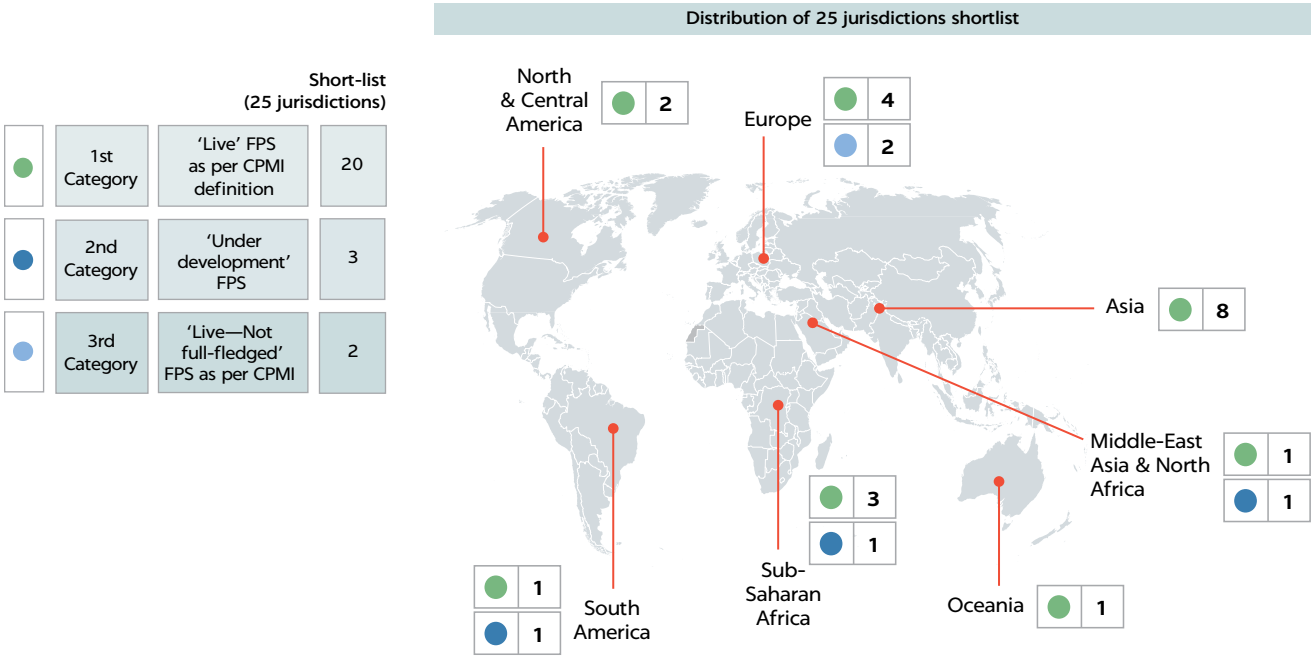
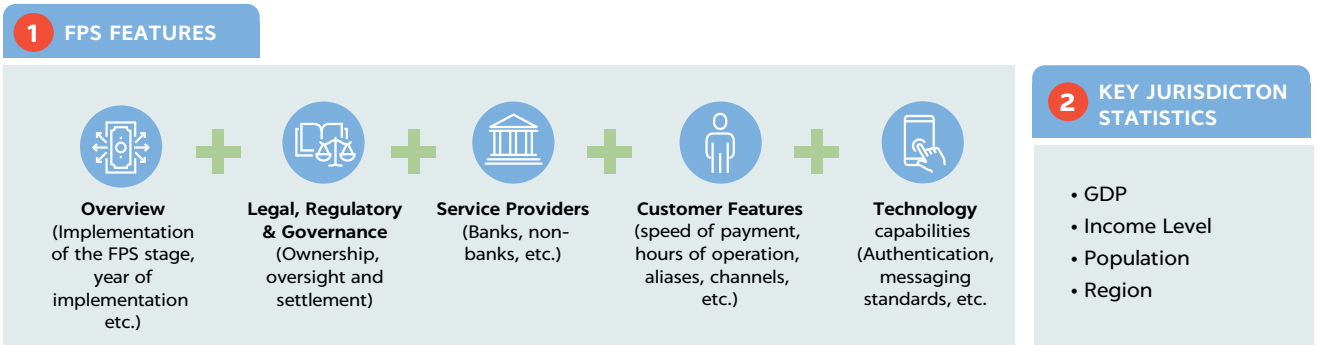


EXHIBIT F3: Key Parameters Studied in the 25 Shortlisted Jurisdictions



Desk research for these 25 jurisdictions was conducted using publicly available information on secondary sources. The parameters studied ranged across regulatory and governance aspects, customer features, and technical capabilities, as shown in exhibit F3.

APPENDIX G: METHODOLOGY FOR SELECTING THE 16 DEEP DIVES

The framework used for further shortlisting the 25-jurisdiction list to the 16 final deep-dive jurisdictions consisted of three filters. Each filter is detailed below.

FILTER 1: STAGE OF THE FAST PAYMENT ARRANGEMENT (THAT IS, "LIVE," "NOT FULLY FLEDGED," OR "UNDER DEVELOPMENT")

In case of jurisdictions with a live arrangement, greater information is likely to be available on the features of the payment system, use cases, adoption statistics, technical architecture, rollout/post-rollout actions (such as pricing strategy and transaction limits over the years), and so on. From the previous shortlist, the study identified 20 jurisdictions with live systems:[68] Australia, Bahrain, Chile, China, the European Union (SCT Inst), Hong Kong SAR, China, India, Japan, Kenya, Malaysia, Mexico, Nigeria, Poland, Singapore, South Africa, Spain, Sri Lanka, Thailand, the United Kingdom, and the United States.

FILTER 2: JURISDICTION ECONOMICS AND REGIONAL DISTRIBUTION

The objective of this filter was to ensure a balanced mix of region distribution, gross domestic product, and country income levels.[69] Exhibit G1 shows the 19 jurisdictions (excluding Europe's SCT Inst) mapped by region, country income level, and gross domestic product. Europe's SCT Inst was included in the 16-jurisdiction deep dives due to its scale, its use case of enabling cross-border transactions, and that PSPs can choose the CSM of their preference. In total, seven jurisdictions/systems were selected with this filter, as per the following.

- Australia, Bahrain, and Chile are the only jurisdictions with live implementations in their regions and were considered in 16-system list.
- While both Mexico and the United States are in North America, they are at considerably different stages of their fast payment journey (Mexico was introduced in 2004 with several upgrades to date, and the United States was introduced in 2017) and were hence considered in the 16-system list.
- China and India are larger economies with different income levels and relatively mature fast payment implementations and were therefore included in the 16-jurisdiction shortlist. Although Japan is also a large economy with a different income level, it was excluded, as it belongs to the same region, and China and India have relatively mature systems.

FILTER 3: KEY FEATURES OF THE FAST PAYMENT ARRANGEMENT

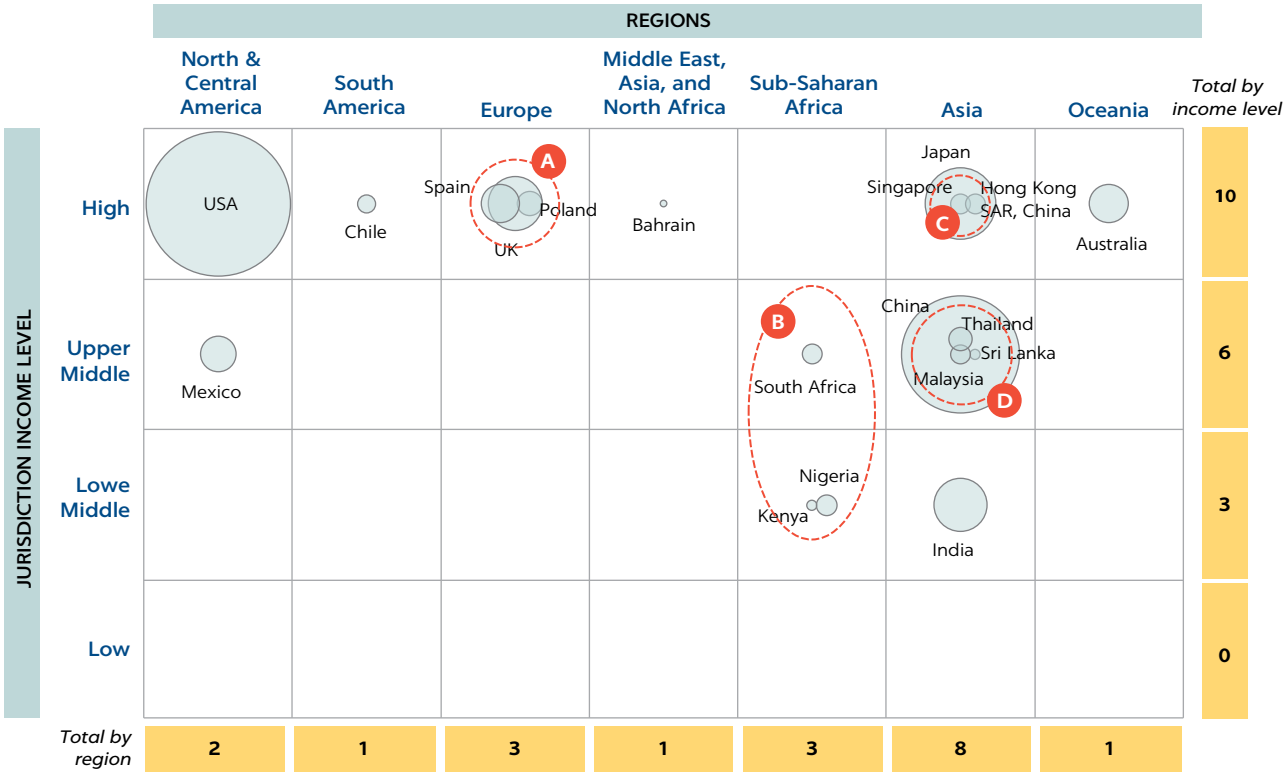
The remaining 11 jurisdictions were grouped into four clusters (A, B, C, and D in exhibit G1), based on geographic region and economies/income levels of similar size to analyze the features of their fast payment arrangements in Filter 3. The clusters are:

- **Cluster A:** Poland, Spain, and the United Kingdom
- **Cluster B:** Kenya, Nigeria, and South Africa
- **Cluster C:** China, Hong Kong SAR, China, and Singapore
- **Cluster D:** Malaysia, Sri Lanka, and Thailand

The objective of this filter was to select the jurisdictions with the maximum coverage of use cases/features. Comparison of the following features was performed among the remaining jurisdictions: the diversity of participants (that is, extension of participation to non-banks), the aliases supported for conducting transactions, the channels through which transactions can be performed, the provision of open APIs, the type of transactions, and use cases supported. Exhibit G2 shows the detailed list of features used to compare jurisdictions. The comparison was made cluster-wise to ensure a balanced mix of geographic regions.

Exhibit G3 compares the features of jurisdictions in Cluster A. On this basis, Poland (Express Elixir) and the United

EXHIBIT G1: Jurisdictions with Live Fast Payment Implementations Mapped by Region, Country Income Level, and Gross Domestic Product



Note: The size of the bubble is a representation of a jurisdiction's gross domestic product.[70]

EXHIBIT G2: Feature List for Comparison of Jurisdictions[71]

NO.	PARAMETER	FEATURE/OPTIONS	
1	**Non-banking entities allowed**	Yes/no	
2	**Alias**	• Mobile number • National ID number • Passport number • Name/virtual address	• Email ID • Company registration number • E-wallet ID/mobile-money identifier
3	**Channels**	• Internet banking • Mobile banking • Branch	• Advanced contactless checkouts (QR, NFC, Bluetooth) • Terminals (ATM, point of sale, kiosks) • USSD
4	**Open APIs**	• Yes/no	
5	**Transaction types**	• Individual • Business	• Government
6	**Use cases**	• Merchant payments • Bulk/batch payments • Cross-border transaction	• Request to pay • Schedule future payments • Bill payments

Kingdom (FPS) were selected for the deep dives. Spain was not included, as Bizum is a fast payment arrangement built on the SCT Inst scheme, which is already covered in the previous 25-system shortlist.

Exhibit G4 compared the features of the jurisdictions in Cluster B. Shortlisted jurisdictions based on the cluster analysis were Nigeria (NIBSS Instant Payment) and Kenya (PesaLink), as they have better features and higher uptakes.

Both jurisdictions in Cluster C (that is, Hong Kong SAR, China, and Singapore) were included for the deep dives owing to the multiplicity of features and uses cases they offer. (See exhibit G5.)

For Cluster D, Malaysia (RPP) and Thailand (PromptPay) were selected. Since the Asia region is well represented, and most of the features offered in Sri Lanka are also covered in other selected systems, Sri Lanka was not included for the deep dives.

EXHIBIT G3: Feature Comparison across Cluster A

A

#	REGION	JURISDICTION	YEAR OF IMPLEMENT-ATION	NON-BANKING ENTITIES ALLOWED	ALIAS	CHANNELS	OPEN APIS	TRANS-ACTION TYPES	USE CASES	ANY OTHER SPECIFIC USE CASE	RANK BASED ON FEATURE COVERAGE
1	Europe	Poland	2012	—			YES			Payment terminals for merchant payments using Blik code	
2		Spain	2016	—			—				
3		UK	2008	YES			YES				

Legend:
Above average (in terms of number features supported) amongst the identified 11 jurisdictions
Lowest to Highest relative ranking within cluster

EXHIBIT G4: Feature Comparison across Cluster B

B

#	REGION	JURISDICTION	YEAR OF IMPLEMENT-ATION	NON-BANKING ENTITIES ALLOWED	ALIAS	CHANNELS	OPEN APIS	TRANS-ACTION TYPES	USE CASES	ANY OTHER SPECIFIC USE CASE	RANK BASED ON FEATURE COVERAGE
1	Africa	South Africa	2006	—			—			Call centre (channel) supported	
2		Nigeria	2011	YES			—				
3		Kenya	2017	YES			—				

Legend:
Above average (in terms of number features supported) amongst the identified 11 jurisdictions
Lowest to Highest relative ranking within cluster

EXHIBIT G5: Feature Comparison across Cluster C

C

#	REGION	JURISDICTION	YEAR OF IMPLEMENT-ATION	NON-BANKING ENTITIES ALLOWED	ALIAS	CHANNELS	OPEN APIS	TRANS-ACTION TYPES	USE CASES	ANY OTHER SPECIFIC USE CASE	RANK BASED ON FEATURE COVERAGE
1	Asia	Hong Kong SAR, China	2014	YES			YES			Multi-currency	
2		Singapore	2015	—			YES				

Legend:
Above average (in terms of number features supported) amongst the identified 11 jurisdictions
Lowest to Highest relative ranking within cluster

EXHIBIT G6: Feature Comparison across Cluster D

D

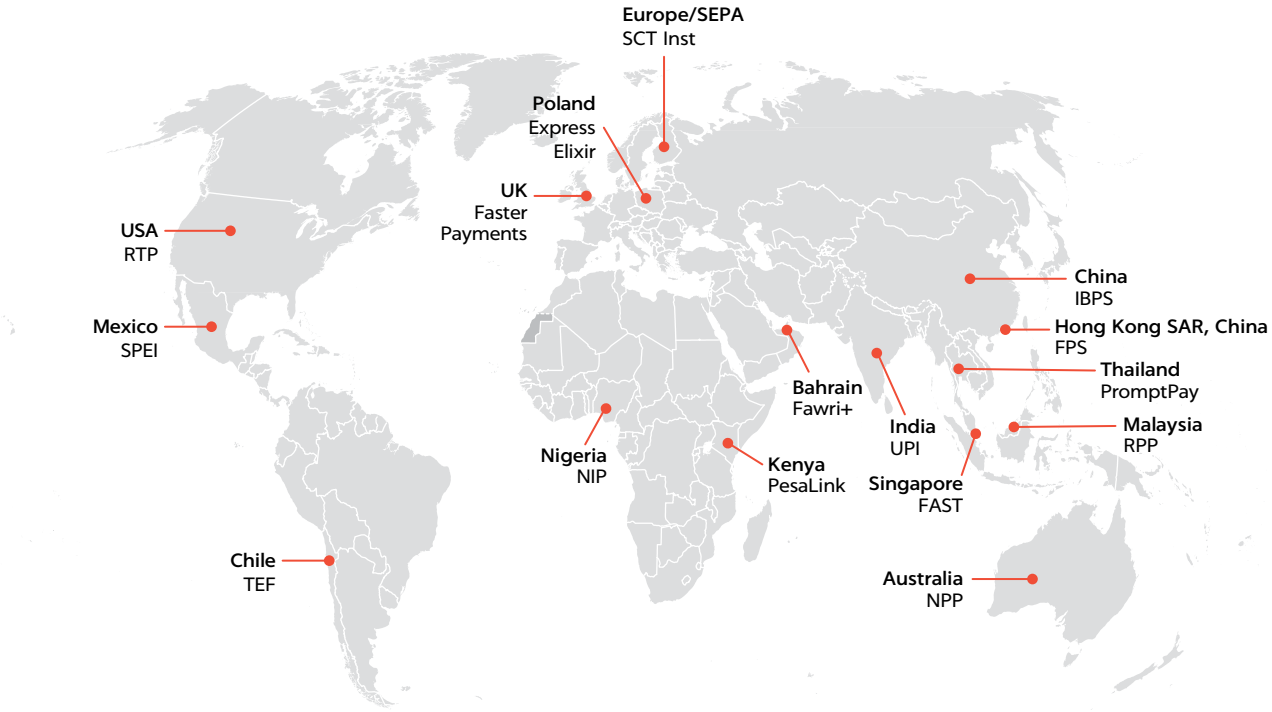
#	REGION	JURISDICTION	YEAR OF IMPLEMENT-ATION	NON-BANKING ENTITIES ALLOWED	ALIAS	CHANNELS	OPEN APIS	TRANS-ACTION TYPES	USE CASES	ANY OTHER SPECIFIC USE CASE	RANK BASED ON FEATURE COVERAGE
1	Asia	Malaysia	2018	YES			—				
2		Sri Lanka	2015	YES			—				
3		Thailand	2017	YES			—			E- Donation	

Legend:
Above average (in terms of number features supported) amongst the identified 11 jurisdictions
Lowest to Highest relative ranking within cluster

On this basis, the final list of 16 jurisdictions for the deep dives is as follows (mapped in exhibit G7):

1. Australia
2. Bahrain
3. Chile
4. China
5. European Union (SCT Inst)
6. Hong Kong SAR, China
7. India
8. Kenya
9. Malaysia
10. Mexico
11. Nigeria
12. Poland
13. Singapore
14. Thailand
15. United Kingdom
16. United States

EXHIBIT G7: Final List of 16 Jurisdictions for the Deep Dives



APPENDIX H: QUESTIONNAIRE FOR PRIMARY RESEARCH

CONTEXT AND GUIDELINES

Phase 2 of the engagement entails conducting interviews with subject matter experts across the selected 16 jurisdictions and seeking documentation directly from the regulator and payment system operators to gather in-depth FPS-related insights and to develop detailed jurisdiction-specific reports. A questionnaire was designed for the purpose of conducting these interviews.

This questionnaire was designed as a reference document for interviews with the following stakeholders:

- Regulators
- Payment system operator
- Participants in the payment system (including banks, payment companies, and so on)

The current format of the questionnaire was prepared with the intent to cover all possible scenarios irrespective of the FPS maturity in the jurisdiction. The questions are aligned with the areas included in the terms of reference document shared by the World Bank. The questions are overarching in nature; some are common across the three stakeholders.

The first area in the questionnaire pertains to the typology and technical specifications of the FPS. It has detailed questions pertaining to the FPS setup and its features, the alias and channels supported, the messaging format, and the business model.

The second section of the questionnaire deals with the legal, regulatory, and governance aspects of the FPS. It has detailed questions on the regulatory oversight and governance of the FPS, the type of participants allowed, access to APIs, risk-management measures, and infrastructure security.

The questionnaire was further customized for each individual jurisdiction depending upon its setups, including FPS maturity, features, use cases supported, technical architecture, and ecosystem participants in Phase 2. This ensured that the interviews conducted in Phase 2 were more targeted and provided valuable insights.

THE QUESTIONNAIRE

The following questionnaire was designed to conduct primary interviews with the relevant stakeholders.

1. TYPOLOGY AND TECHNICAL SPECIFICATIONS

FPS Setup and Its Features

QUESTION	REGULATOR	SYSTEM OPERATOR	PARTICIPANT
• What prompted the need to develop an FPS in the jurisdiction? - Was it regulatory driven? - Was it digitization of payment? - Was it market driven? - Was it part of an upgrade to an existing system? - Was financial inclusion a driver?	✔	✔	
• How was this system built? Was this a completely new system, or was it adapted/ upgraded from an earlier system?	✔	✔	
• Who helped you build the FPS infrastructure? Was an external vendor engaged for the same? How were the capabilities of the vendor assessed? Were multiple vendors engaged for various capabilities?	✔	✔	
• In case of a separate entity: Why did you create the separate entity to operate/clear the FPS? Do you feel that it led to a better-focused drive to adoption? **OR** • Why did you choose to operate the system in-house? Did you consider creating a separate entity to operate the system?	✔		
• How has the FPS system evolved over time? What have been the different technological advancements and upgrades?	✔	✔	✔
• How has FPS uptake been since introduction? What are some of the high-level adoption statistics of the same?			
• What are the eligibility criteria to participate in the FPS? How do merchants, consumers, or non-bank PSPs access the service?	✔	✔	
• What different transaction types and use cases are supported by the FPS? *Transaction types:* - Individual (P2P) - Business (P2B, B2P) - Government (P2G, G2P, B2G, G2B) *Use cases:* – Merchant payment – Bulk/batch payments – Cross-border payments – Schedule future payments – Request to pay – Bill payments – Direct debit		✔	✔
• Which use cases have seen most adoption? Which use cases have yet to pick up?	✔	✔	✔
• What were the other popular modes of non-cash payment in the jurisdiction before FPS introduction? How developed was the existing infrastructure for cards, internet, and mobile payment? What were their volumes of transactions? How did it change after introduction of the FPS?	✔	✔	✔
• What was the level of interoperability between various payment modes? Is your system interoperable with any of the preexisting modes of payment?	✔	✔	✔
• What different overlay services are currently offered to the customers? What has been the impact of these services on FPS adoption?	✔	✔	✔
• Any unique success story of the FPS in the jurisdiction? How has it enabled different PSPs to innovate and enhance the customer experience?	✔	✔	✔
• Do you think that banking and digital penetration had any effect on FPS adoption? Also, what has been the impact of FPS on financial inclusion and economic development?	✔	✔	✔
• Do any other systems operating in the jurisdiction allow real-time payments? Are these systems interoperable?	✔	✔	✔
Do you feel that interoperability between the systems would help in driving the real-time payments? Any future plans to move toward interoperability?	✔	✔	✔

Aliases and Channels

QUESTION	REGULATOR	SYSTEM OPERATOR	PARTICIPANT
• Are different aliases supported (such as mobile numbers, email addresses, national ID numbers, and so on) to improve accessibility for customers?	✔	✔	✔
• If not, any plans to do so in future? Are there any difficulties (such as security issues) involved in extending support for aliases?	✔	✔	
• What different channels are supported by the FPS? Are payments using NFC and QR codes supported?	✔	✔	✔
• What was the impact on FPS adoption when support for such channels as NFC and QR codes was extended?	✔	✔	✔
• If no channels are supported, do you have plans to extend support for channels such as NFC and QR codes?	✔	✔	

Messaging Format

QUESTION	REGULATOR	SYSTEM OPERATOR	PARTICIPANT
• What messaging standard is currently followed in the FPS? If not ISO 20022, any plans to migrate to the same in the near future?	✔	✔	
• In case a proprietary messaging standard is being used: What unique features are being employed in the current proprietary messaging format? Does it allow the outflow of information as in ISO 20022?	✔	✔	

Business Model

QUESTION	REGULATOR	SYSTEM OPERATOR	PARTICIPANT
• What was the estimated budget for the FPS development? What is the initial set-up cost? Also, please provide any subsequent outlay on maintenance and upgrades.	✔	✔	
• What is the business model of the FPS operator? How are the revenues utilized? Is it a nonprofit organization?	✔	✔	
• What is the pricing scheme for the PSPs (both fixed fee and variable fee)?	✔	✔	
• What additional cost did the participants have to bear to upgrade or modify their system to be able to connect to the FPS?			✔
• Are any charges levied on the customers? If so, are participants free to determine the charges?	✔	✔	✔
• Is there any upper cap on the charges that can be levied on the customers? How do participants decide transfer fees for the customers?	✔	✔	✔

2. LEGAL/REGULATORY AND GOVERNANCE ASPECTS

Regulatory Oversight and Governance

QUESTION	REGULATOR	SYSTEM OPERATOR	PARTICIPANT
• Does a separate statute for payments exist in the jurisdiction? Did it have to undergo amendments/modifications to implement the FPS in the jurisdiction?	✔		
• Was the FPS designated a SIPS and regarded as part of critical national infrastructure? Are there any plans to do the same?	✔		
• What regulatory oversights does the central bank have on the FPS in the jurisdiction, whether publicly or privately owned?	✔		
• What additional regulations did the central bank enforce over and above the ones governing the existing non-fast payment systems? Why were they required?	✔		
• Is a separate legal license or authorization required for the operator? How is the licensing done? What parameters are evaluated?	✔		
• Did the regulator issue any specific requirement on governance for operators of payment system? Or was the current governance framework adopted with some minor modification?	✔		
• How does the regulator ensure a proper governance structure in the FPS entities? Does it have an empowered representative on the board of the entity?	✔	✔	
• How does the regulator ensure the enforcement and adherence to various regulations and compliances by the FPSs? What internal and external checks are present for the same?	✔	✔	
• How does the system operator and participant ensure that their activities comply with the regulatory requirements? Is there an automated system to red flag noncompliance, or are regular manual audits conducted for the same?		✔	✔
• Are there independent directors on board and other relevant forums in the system operator or the payment system participants to act as control mechanisms against any noncompliance?		✔	✔
• What kind of documentation/toolkit is in place for smooth onboarding? What is the typical timeline for integration testing and onboarding? What are some of the best practices they have adopted?	✔	✔	✔

Participation of Non-Banks to the System

QUESTION	REGULATOR	SYSTEM OPERATOR	PARTICIPANT
• What additional benefits did the empanelment of non-bank financial companies bring to the FPS?	✔	✔	✔
• Does the regulator or system operator believe that it can widely increase the coverage of the payment system through non-bank entities? What challenges does it foresee in empaneling non-bank financial institutions to the FPS?	✔	✔	
• What challenges did the regulator or the system operator face in ensuring the same standards of governance and adherence as banks in the non-bank financial institutions?	✔	✔	
• How does the regulator or system operator ensure the enforcement and adherence to various regulations and compliances by the FPSs? What internal and external checks are present for the same?	✔	✔	
• What is the onboarding process for non-banking participants to the system? Are there additional checks and documentations when compared to banks? Why are they needed?	✔	✔	✔
• Do non-banking participants face any challenges in accessing the payment system facility? Is there an equality with the banks on the same system?	✔	✔	✔
• How do the non-banking participants ensure strict compliances with various norms and regulations regarding payments?			✔

Third-Party Access (Using Open APIs)

QUESTION	REGULATOR	SYSTEM OPERATOR	PARTICIPANT
• Was the third-party access of APIs a part of the design of the system? Or was it based on requests from stakeholders?	✔		
• Was a feasibility study conducted on the benefits of providing third-party access of APIs to the entire ecosystem?	✔		
• What was the impact of third-party access to FPS and did the system see a surge in transactions after sanctioning access through open APIs?	✔	✔	✔
• Is access to APIs open to the wider community, or is it reserved only to select few organizations?	✔	✔	✔
• Are the banks and other financial institutions well equipped to develop APIs and do they have an agile infrastructure? What is the potential for the use of open-source technologies to develop interoperable FPS in your jurisdiction?	✔	✔	✔
• Do banks currently publish their APIs for other use cases, and, if so, has the implementation been industry-wide or limited to a select few banks?	✔	✔	✔
• How has the experience of opening access to third parties been? Did a large number of institutions come forward and access the interface?	✔	✔	
• What kind of adoption of APIs have they seen? What impact has it had on innovation, customer experience, and usage of FPS?	✔	✔	
• If third-party access is to be implemented, what additional regulations/checks do you foresee, and what would the estimated timelines be for the same?	✔	✔	
• What challenges do participants face in accessing open APIs? Have they really been able to promote innovation in the payment ecosystem? What additional changes would you suggest?	✔	✔	✔

Risk Management

QUESTION	REGULATOR	SYSTEM OPERATOR	PARTICIPANT
• Why did you choose <particular settlement mechanism>? Did you benchmark other FPS settlement mechanisms before choosing this one?	✔	✔	
• How does the regulator and system operator minimize liquidity risks of various participants in the FPS? Are the intermediaries required to deposit some collateral with the operator of the payment system? How is the collateral value arrived at?	✔	✔	
• What is the liability model for payment settlements (for example, on banks/balanced), and what is the governance structure to regulate and oversee participating entities (for example, NPCI in India, OBIE+FCA in the United Kingdom, and PaymentsNZ in New Zealand)?	✔	✔	
• With regard to risk management, what comprehensive risk-management system are the operators of the FPS required to deploy that effectively controls various credit and operational risks?	✔	✔	
• Does the regulator and system operator publish a risk manual with standard operating procedures for the payment entity and its participants to abide by?	✔	✔	
• How are the payment intermediaries currently regulated? Do they follow certain service-level agreements/operational benchmarks? How well connected are they with banks and customers?	✔	✔	✔
• Which dispute-resolution mechanism is deployed? Is there a dedicated portal and department to handle grievances of all relevant stakeholders—that is, the payment system operator, participating institutions, and customers?	✔	✔	✔
• Is there a governing manual or separate regulations to guide the resolution-providing authorities? What principles are taken into consideration while evaluating such issues?	✔	✔	✔
• What AML/CFT guidelines are stipulated by the regulator? How does the regulator and system operator ensure that the FPS is not abused for any such criminal economic activity?	✔	✔	
• What mechanisms are in place to ensure business continuity in case of unforeseeable events?	✔	✔	✔

Data and Cybersecurity

QUESTION	REGULATOR	SYSTEM OPERATOR	PARTICIPANT
• How do the stakeholders ensure that users' sensitive data remains completely secure?	✔	✔	✔
• Does the regulator mandate that users' financial data be stored within its jurisdiction?	✔	✔	
• What security requirements are mandated by the regulator to be put in place by the system operator and the participants? Are specific minimum requirements prescribed for the application, initiation of transaction, transferring of money, and so on?	✔	✔	✔
• What procedure for sharing customer information with third parties do the system operator and participants currently follow, and what are the use cases for the same? How well do customers accept data sharing, and what challenges have you seen/do you foresee in the domain?	✔	✔	✔
• What measures are in place to ensure quick remediation in case of a data security breach?	✔	✔	✔
• Are cybersecurity regulations at par with global standards to ensure secure data sharing? What controls and checks are in place to ensure a secure data-sharing mechanism?	✔	✔	✔
• What control mechanisms are in place in case of an unfortunate cybersecurity breach? Is there backup infrastructure to ensure the stability of the system and continuous operation?	✔	✔	✔

ENDNOTES

1. Annex G contains the detailed methodology used for the deep dives, including the criteria for selecting the jurisdictions.
2. Also, note that both Hong Kong SAR, China, and the United Kingdom use the acronym "FPS" for their fast payment arrangements.
3. Payment card systems also offer real-time availability for authorizing payments. However, as a general rule, the funds are not transferred from the payer to the payee in real time.
4. Objectives often include enhancing financial inclusion, promoting competition, and expanding the use of digital payments, among others.
5. A note published in 2017 by the Organisation for Economic Co-operation and Development highlights the different inter-relationships between single versus multihoming and competition; see https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP/WD%282017%2933/FINAL&docLanguage=En.
6. As per secondary research done over the course of this study.
7. This figure shows jurisdictions with live implementations in which fast payments operate 24/7, as well as others in which they do not yet operate 24/7.
8. https://empower1.fisglobal.com/rs/650-KGE-239/images/Flavors-of-Fast-Report_2020.pdf?mkt_tok=NjUwLUtHRS0yMzkAAAF7vrNPXhBylhl__g8mBLlesiELwUpsxSE5CGXUAJ0aCLncHaDBuj5f0y5PNgs3m78kQZTXdAuLlnoWqTKe0x0rhj4rlUQ4oFFu1bG8YxyPtXcT6lQ; https://go.aciworldwide.com/rs/030-ROK-804/images/ACI_Prime_Time_for_Real-Time_Report.pdf. The complete list of jurisdictions is provided in appendix E.
9. In Mexico, SPEI is used both as an RTGS system and for fast payments for retail customers. Therefore, its transaction value as a percentage of gross domestic product is significantly higher than in other jurisdictions.
10. These can range from liquidity providers to third-party technology providers, central securities depositories, and so on.
11. Also, note that both Hong Kong SAR, China, and the United Kingdom use the acronym "FPS" for their fast payment arrangements.
12. Three filters were applied: (1) Implementation Stage; (2) Country Economics and Regional Distributions; and (3) Key Features. For example, only "live" fast payment arrangements were considered, as greater information was available on technical features, use cases, adoption statistics, and rollout/post-rollout actions. For additional details on how the selection was made, see annex D.
13. These implementation drivers are based on responses received to surveys conducted with the 16 jurisdictions that had been chosen for the deep-dive research.
14. With UPI, a customer is able to initiate a transaction from any UPI app (irrespective of the bank where the customer holds an account).
15. For further details, see the World Bank's "Retail Payments Package", in particular World Bank (2012), "Developing a Comprehensive national Retail Payments Strategy", Washington. Available at: https://documents1.worldbank.org/curated/en/839121469729131991/pdf/84076-REPLACEMENT-FILE-PUBLIC-Developing-comprehensive-national-retail-payments-strategy.pdf
16. For further details, see CPMI-IOSCO (2015), "Application of the *Principles for financial market infrastructures* to central bank FMIs", Basel. Available at: https://www.bis.org/cpmi/publ/d130.htm
17. For further details on the role of governance see the World Bank's (2021), *Governance of Retail Payment Systems—Keeping Pace with Changing Markets.* Available at: https://elibrary.worldbank.org/doi/pdf/10.1596/36210
18. Supervision of privately owned retail payment infrastructures is delegated to the banking supervisory agency based on article 82 of the Organic Law of the Central Bank of Chile and articles 12 and 75 of the General Banking Law.
19. In addition to these models, some other parties are granted "access" to the system through a third-party account-initiation mode, as in the case of UPI in India.
20. In 2018, the Australian Prudential Regulation Authority established the restricted authorized deposit-taking institution framework to assist potential new entrants to the banking industry, particularly small firms with limited financial resources. This allows eligible entities to seek a restricted authorized deposit-taking institution license, allowing them to conduct a limited range of business activities for two years while they build their capabilities and resources.
21. At the start of SPEI's operations in 2004, only banks were allowed to participate in the system. However, given the operative, technological, and risk-management characteristics of SPEI, Banco de México has allowed non-bank financial institutions to participate in it since 2006.
22. For example, "system-wide important payment systems" are systems whose disruption could affect public confidence in payment systems or the broader financial system. Although a disruption or failure in these systems may have system-wide implications and may affect many users, there is negligible risk of systemic impact to financial stability.
23. From this set of analyzed jurisdictions, Japan and South Africa upgraded their existing systems.
24. In Bahrain, an external consultant was onboarded to evaluate vendor capability.
25. https://www.bis.org/cpmi/publ/d31.pdf
26. The proprietary format is based on binary messages constructed with a predefined layout: HEADER + BODY. HEADER includes control information: destination, message ID, and body size. BODY includes the binary payload for messages based on data types (char, short, int, string, and arrays) to transport data. The messages also include digital signatures for nonrepudiation purposes and encryption for confidentiality purposes.
27. https://csrc.nist.gov/glossary/term/authentication
28. https://www.cgap.org/sites/default/files/publications/2021_01_Technical_Guide_Building_Faster_Better.pdf
29. https://www.jpmorgan.com/europe/merchant-services/insights/PSD2
30. https://ec.europa.eu/commission/presscorner/detail/en/QANDA_19_5555
31. Please refer to Draft Regulatory Technical Standards on Strong Customer Authentication and Common and Secure Communication under Article 98 of Directive 2015/2366 (PSD2) for additional details on regulatory technical standards (https://eba.europa.eu/sites/default/documents/files/documents/10180/1761863/314bd4d5-ccad-47f8-bb11-84933e863944/Final%20draft%20RTS%20on%20SCA%20and%20CSC%20under%20PSD2%20%28EBA-RTS-2017-02%29.pdf?retry=1)
32. https://eba.europa.eu/sites/default/documents/files/documents/10180/1761863/314bd4d5-ccad-47f8-bb11-84933e863944/Final%20draft%20RTS%20on%20SCA%20and%20CSC%20under%20PSD2%20%28EBA-RTS-2017-02%29.pdf
33. Transactions through BenefitPay, the national e-wallet payment system, are processed through multifactor authentication.
34. CNBV has issued guidelines for banks regarding customer-authentication standards. Banks have to adopt the two-factor authentication for customer authorization for all services used, including SPEI. SPEI rules published by Banco de México establish requirements for institutions other than banks. At the same time, SPEI rules reinforce the guidelines issued by the CNBV.

35. https://www.gartner.com/en/information-technology/glossary/application-programming-interface-api
36. https://cgap.apidashboard.io/
37. In India, despite the absence of a standard framework, the Reserve Bank of India has issued several regulations that have ushered in a wave of initiatives.
38. ABS-MAS Financial World, Finance-as-a Service: API Playbook.
39. https://www.cgap.org/sites/default/files/publications/2021_01_Technical_Guide_Building_Faster_Better.pdf
40. As discussed in the participant onboarding subsection, direct participants are required to establish this connection and undergo testing and certifications before going live.
41. Payment system operators typically do not pay any interest on the cash collateral amounts placed with them; see https://www.mnb.hu/letoltes/mnb-op-124-final.pdf.
42. Committee on Payments and Market Infrastructures, Fast Payments—Enhancing the Speed and Availability of Retail Payments (BIS, November 2016) https://www.bis.org/cpmi/publ/d154.pdf.
43. There are some instances where the participant is connected to more than one CSM.
44. https://www.ecb.europa.eu/paym/intro/news/html/ecb.mipnews200724.en.html
45. The technical standards include (i) standards used for messaging; (ii) API standards used for exchanging information and instructions; and (iii) standards for acceptance infrastructure and for customer payment-initiation devices, such as QR codes. Messaging standards and APIs were discussed earlier in this guide in Module B, while QR codes are covered in Module C.
46. https://usa.visa.com/partner-with-us/payment-technology/visa-b2b-connect.html
47. https://www.paymentsjournal.com/new-mastercard-launch-allows-fast-and-secure-cross-border-payments/
48. https://www.pymnts.com/news/cross-border-commerce/cross-border-payments/2020/western-union-expands-real-time-payouts-to-80-countries/
49. https://www.abe-eba.eu/media/azure/production/1550/cryptotechnologies-in-international-payments.pdf; https://www.fsb.org/wp-content/uploads/P131020-1.pdf
50. In Hong Kong SAR, China (and other jurisdictions), an eDDA (electronic direct debit authorization) is provided as a value-added service by FPS. Hong Kong SAR, China, supports two types of eDDA: Standard eDDA, which is initiated by the payer, and Simplified eDDA, which is initiated by the payee. In Standard eDDA, the payer initiates an eDDA via mobile or internet banking. In the case of Simplified eDDA, the payee who has an SVF account can set up an eDDA as the payee account for debiting the bank account to replenish the SVF account balance as and when needed.
51. https://developer.visa.com/images2/products/visa_direct/ads_technical_specifications_v3.0.pdf
52. https://pay.google.com/about/business/static/data/GPay_RTP_2019.pdf
53. The RBI has notified all payment service operators to shift to one or more interoperable QR codes. Migration shall be completed by end-March 2022.
54. https://www.rbi.org.in/scripts/FS_Notification.aspx?Id=11987&fn=9&Mode=0
55. In India, UPI supports NFC, although its adoption has been challenging due to an infrastructural issue.
56. https://www.bis.org/cpmi/publ/d191.pdf
57. https://www.rba.gov.au/publications/bulletin/2018/sep/the-new-payments-platform-and-fast-settlement-service.html
58. SIPS are considered FMIs. Further, some fast payment arrangements are considered SIPS.
59. Notice issued under the Payment Services Act of 2019 on regulated entities' obligation to report suspicious activities and incidents of fraud. Applicable to Designated Payment System Operator, Designated Payment System Settlement Institution, Standard Payment Institution, Major Payment Institution, and Money-Changing Licensee and not limited to FAST.
60. https://www.bis.org/cpmi/publ/d178.pdf.
61. https://www.bis.org/cpmi/publ/d146.pdf
62. https://www.europeanpaymentscouncil.eu/news-insights/insight/programmable-instant-payments-dlt-networks-and-distribution-digital-money.
63. The People's Bank of China has already gone live with a pilot of its Digital Currency Electronic Payment (DCEP) project, while Sweden's Riksbank has recently begun the second phase of its e-krona project.
64. Open banking is the secure way to open up the bank systems for third-party players to leverage the customer-consented financial data to build applications and innovative financial services that can give customers more control over their information, leading to more choice in their banking, resulting in added confidence in the use of their data and eventually helping them get a much better deal for their money.
65. The India Stack is in essence the combining of NPCI's projects for digital payments and Aadhaar's identity and authentication prowess via APIs.
66. While these differentiators are common to FPS, they do not appear in all FPS.
67. As open banking continues to revolutionize the payments landscape, it is important to decide which parties have permission to access customer data. Customers should give consent to access their data and for certain specific purposes only.
68. Turkey's RPS system (which is a not fully fledged fast payment arrangement) and the United States's FedNow system (which is under development) were considered in the 25-jurisdiction shortlist but were not considered for the next filters even if the corresponding jurisdictions already have other live fast payment arrangements in place.
69. For country income levels, the World Bank's country income classification and country listing was used.
70. The chart is for representation purpose only and is indicative.
71. Relative comparison based on secondary research and publicly available information, for the purpose of shortlisting 16 counties. Scores were produced by dividing the available feature count by the maximum number identified. For ranking by computer, a weighting of 1 was given to all parameters except "Non-banking entities allowed" and "Open APIs" (which were given a ranking of 0.5).

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Enclosure 9

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Driving Digital Transformation and Inclusion

Fast Payments in Latin America and the Caribbean

NOVEMBER 2025

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ACRONYMS AND ABBREVIATIONS

ACH	automated clearing house
CBDC	central bank digital currency
DPI	digital public infrastructure
EMDE	emerging market and developing economy
FPS	fast payment systems
G2P	government to person
LAC	Latin America and the Caribbean
NFC	near field communication
NPCI	National Payments Corporation of India
PFMI	Principles for Financial Market Infrastructures
PIS	payment-initiation services
POS	point of sale
PSP	payment service provider
P2G	person to government
P2M	person to merchant
P2P	person to person
P2PM	person to person and merchant
QR	quick response
RTGS	real-time gross settlement
SPEI	*Sistema de Pagos Electrónicos Interbancarios* (Interbank Electronic Payments System)
UPI	Unified Payments Interface

All dollar amounts are US dollars unless otherwise indicated.

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1 EXECUTIVE SUMMARY

Fast payments are transforming digital finance ecosystems in Latin America and the Caribbean (LAC) by improving the speed, affordability, and user experience of digital payments. Transferring money has historically been a cumbersome and expensive task. It could require traveling to a bank branch during business hours, paying a fee, and waiting several days for the recipient to receive the funds. The introduction of digital wallets reduced some of these frictions, but many remained due to siloed payment infrastructures and uncompetitive markets—challenges that have been particularly persistent in LAC.[1] The recent growth of fast payments—payments that can be sent 24/7 with real-time availability of funds to the payee—have transformed digital finance ecosystems by driving improvements in affordability, interoperability, and user experience. Millions of consumers in LAC can now make free or low-cost digital payments from their mobile phones, with recipients receiving the funds within seconds, regardless of their financial institution.

Fast payments can drive digital financial inclusion, with positive impacts on financial resilience, digital transformation, and productivity growth. By alleviating the cost, accessibility, and product design barriers that have historically constrained the uptake of accounts and digital payments, fast payments can promote greater usage of digital financial services among banked populations and attract unbanked populations into the formal financial system. Empirical studies have found positive impacts of fast payments on account opening and usage, access to credit, and bank efficiency.[2] Greater digital financial inclusion, in turn, strengthens financial resilience for vulnerable populations and enables economy-wide digital transformation and productivity growth.

Recognizing the transformative potential of fast payments, policy makers and financial-sector participants in LAC have prioritized the development of fast payment systems (FPS). FPS are the underlying infrastructure platform and set of common rules that support fast payments. FPS can be new purpose-built systems or enhancements of existing systems. They can be operated by central banks or private entities. Well-designed FPS can be core elements of

digital public infrastructure (DPI),[3] together with digital ID and data-exchange frameworks.[4] FPS were first introduced in LAC in the early 2000s by first-mover countries like Mexico and Chile. However, the key inflection point began in 2020, with a period of multicounty FPS reforms (e.g., Argentina, Brazil, and Paraguay) coinciding with the COVID-19 pandemic. FPS or similar arrangements are now operational in at least 12 LAC countries, and several more are developing their FPS strategies and infrastructure.

This report analyzes new data on FPS in LAC and offers policy messages to support the further development of fast payments. This report provides one of the first regionally-focused, cross-country analyses of fast payments data, leveraging a unique dataset derived from a survey of 11 central banks in LAC countries with operational FPS or similar arrangements: Argentina, Bolivia, Brazil, Chile, Colombia,[5] Costa Rica, the Dominican Republic, El Salvador, Mexico, Paraguay, and Peru (referred to subsequently as "LAC-11"). The report analyzes transactional data and information on the FPS design characteristics and governance models. Based on this analysis and the World Bank's regional and country-level engagements with policy makers and FPS operators, the report also offers several key policy messages.[6]

KEY FINDINGS

KEY FINDING 1 Fast payments are driving the acceleration of digital payments growth in LAC, now representing approximately 45 percent of digital payments volume, up from 2 percent in 2017.

Fast payments in LAC-11 have experienced remarkable growth, with transaction volumes increasing 130-fold in eight years, from 620 million in 2017 to 79.8 billion in 2024. In 2024, each accountholder in LAC-11 made 265 fast payments per year, on average—up from 2.9 in 2017.[7] Across LAC-11, approximately $9.5 trillion was transferred via FPS in 2024.

The key inflection point began in 2020: seven countries—Argentina, Brazil, Colombia, El Salvador, Paraguay, Bolivia, and Peru—deployed FPS or fast-tracked FPS expansion between 2020 and 2023. At the same time, the COVID-19 pandemic triggered an urgent need for safe, contactless transactions, accelerating both consumer demand—particularly for person-to-person (P2P) payments—and policy action. While digital payments were already growing steadily, driven by cards and traditional credit transfers, the launch of FPS introduced a new layer of speed, flexibility, and reach that significantly accelerated usage. Regional growth in fast payments accelerated during 2020–24, with average annual growth in fast payments volume per adult of 145 percent—representing 63 percent of the total growth in digital payments volume. Fast payments now account for nearly 45 percent of digital payments volume in LAC-11—up from just 2 percent in 2017 and overtaking card payments for the first time in 2024. Throughout this report, digital and fast payments refer only to payments made across payment service providers (PSPs), i.e. inter-PSP transactions and/or cleared through a central infrastructure, in order to provide a like-to-like comparison between FPS and other retail payment systems.

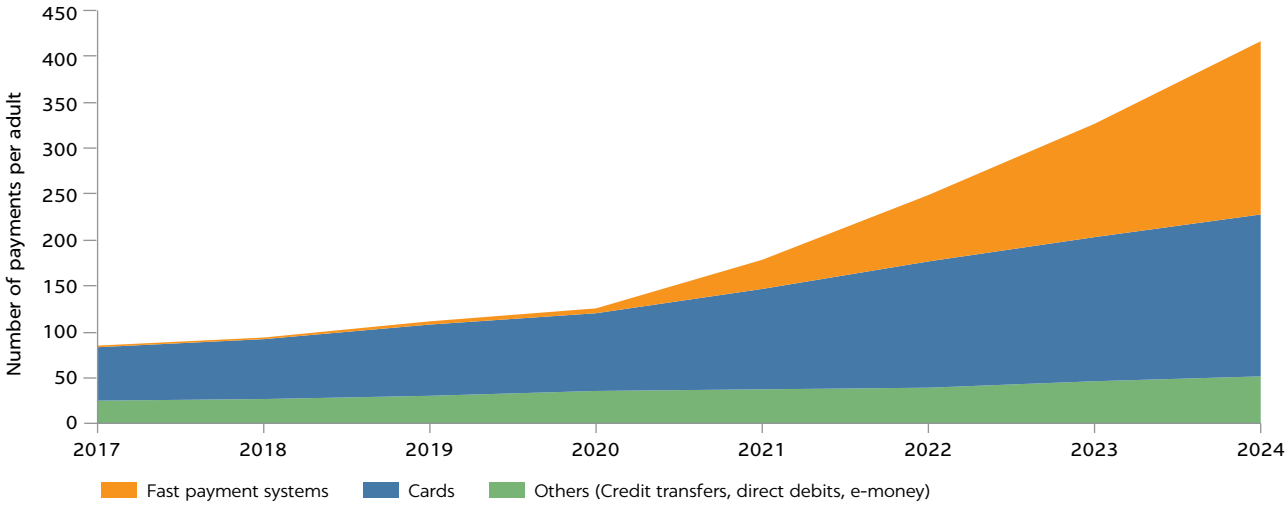
KEY FINDING 2 The growth of fast payments in LAC has been shaped by the increasingly proactive role of central banks as well as FPS design choices—with significant heterogeneity in FPS operating models, scale and impact .

The exponential growth of fast payments in LAC is the product of a range of factors, including expansions in digital connectivity, the growing market power of fintechs, and shifting consumer behaviors. Central banks have also been key players through their various and evolving roles as payment system overseers, regulators, catalysts, and, increasingly, operators. In the late 2010s and early 2020s**,** several LAC central banks began to conclude that the persistence of market dynamics that impeded innovation, competition, and financial inclusion—for example, vertically integrated market structures and fragmented payment ecosystems—may require that they expand their role. By 2023, the central banks of Brazil, Bolivia, El Salvador, and Paraguay had joined the central banks of Costa Rica and Mexico in operating their own FPS. The central banks of Colombia and Peru are currently in the process of launching their own FPS, alongside existing private-sector FPSs in those countries. On the other hand, central banks in Argentina, Chile, and Uruguay opted to continue to leverage their roles as FPS catalysts and regulators/overseers to drive FPS ecosystem reforms.

Whether a central bank operates an FPS tells only part of the story. Indeed, the experience across the region reveals diverse trajectories in FPS adoption and impact, also driven by heterogeneity in FPS design, governance and regulatory approaches, and ecosystem integration.

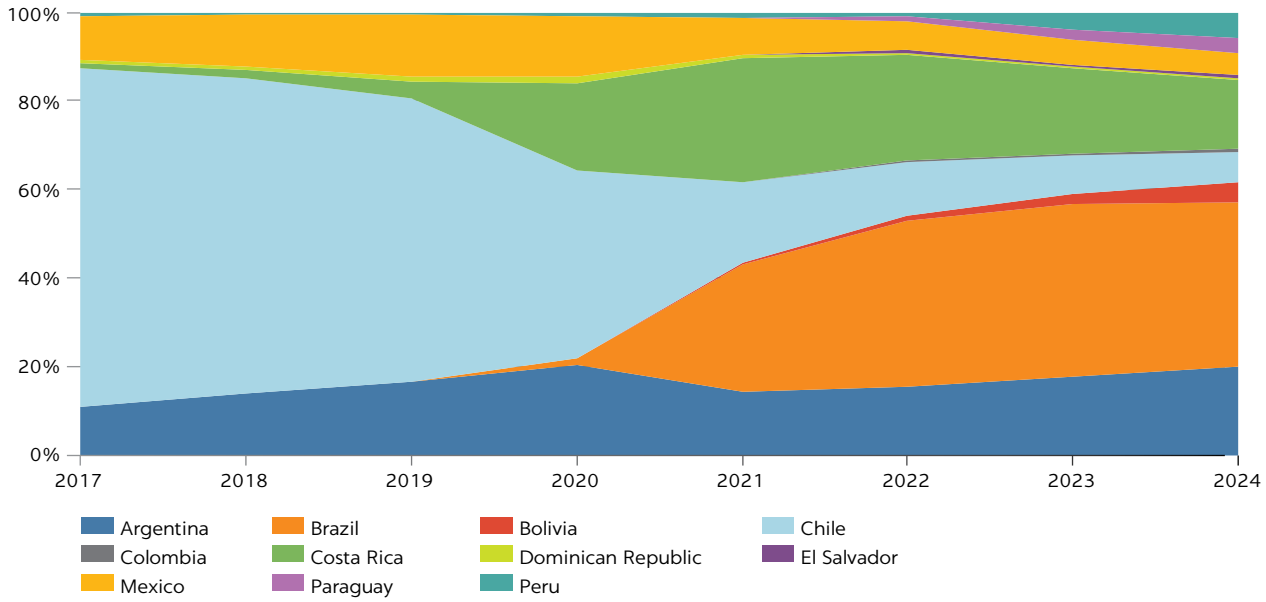
Early reformers like Chile and Mexico were among the first LAC countries to foster the development of fast payments prior to 2020. By 2024, however, Brazil, Argentina, and Costa Rica have emerged as clear top regional performers in terms of FPS transactions per adult (see Figure ES 2). Brazil, in particular, stands apart, with an average of 372 FPS transactions

FIGURE ES.1 **Fast payments are driving the acceleration of digital payments growth in LAC-11, now representing approximately 45 percent of centrally cleared digital payments volume**



Source: Author's elaboration with data provided by central banks; United Nations Population Division (adults defined as age 15+).
Note: Data includes only centrally cleared transactions, i.e. inter-PSP transactions. "Cards" include payments made with debit, credit, and prepaid cards.

FIGURE ES.2 **Chile and Mexico were early adopters of fast payments, but Brazil, Argentina, and Costa Rica now lead in terms of FPS transactions per adult (FPS transactions per adult, by country, 2017–24)**



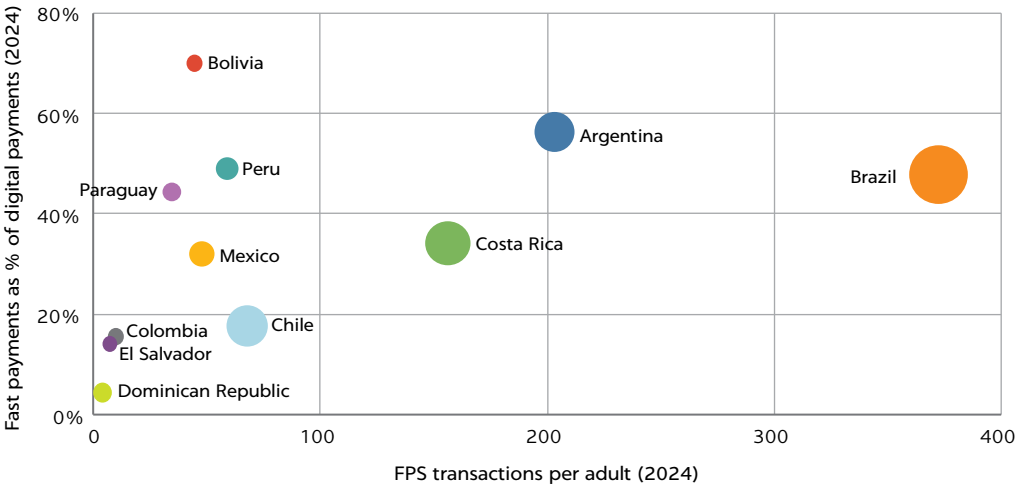
Source: Author's elaboration with data provided by central banks; United Nations Population Division (adults defined as age 15+).
Note: Each country's relative share per year is determined by first calcuating the FPS Volume per adult in each country, then summing the values, then calculating the relative share of each country. Thus the population of each country is weighted equally. Data includes only centrally cleared transactions, i.e. inter-PSP transactions.

per adult in 2024 and accounting for 80 percent of all FPS transactions in LAC-11. Brazil's *Pix* model has demonstrated how solid regulatory foundations, open infrastructure, and a wide range of use cases can quickly transform the retail payments market; FPS now anchors Brazil's digital payments landscape. Brazil's progress is remarkable even by global standards: while India continues to lead the world in overall FPS volumes, it lags behind Brazil on a per-adult basis with 167 FPS transactions per adult in 2024. Based on available data, it appears that only Thailand exceeds Brazil's per-adult volume of fast payments, with 399 in 2024. Brazil's achievement is even more notable given that Thailand's *PromptPay* was launched in 2017, India's *UPI* in 2016, while Brazil's *Pix* only began operations in 2020.

Argentina also stands out as a high-performing case in LAC, albeit through a different approach, characterized by incremental reforms led by the central bank and an infrastructure operated by the private sector. Argentina's fast payment scheme—*Transferencias 3.0*, officially launched in 2020—represents the culmination of nearly a decade of policy reforms and infrastructure enhancements in fast payments. In Argentina, FPS transactions have reached 203 per adult in 2024, on average, up from 2.9 in 2017.[8] Costa Rica's FPS—*SINPE Móvil,* operated by its central bank—was established in 2015 but gained rapid adoption beginning in 2020 with the onset of the COVID-19 pandemic; as of 2024, Costa Rica registered 156 FPS payments per adult, on average, up from 0.3 in 2017.

Bolivia, Mexico, Paraguay, and Peru have also seen strong and sustained growth in fast payments since 2020 as their ecosystems mature; adults in these countries now make 30–60 fast payments per year, on average, up from fewer than one in 2017. In Argentina, Brazil, Bolivia, Paraguay, and Peru, fast payments now account for more than 40 percent of all digital payments, demonstrating strong competitive traction within the broader ecosystem.

FIGURE ES.3 **Fast payments now represent more than 40 percent of all digital payments in Argentina, Bolivia, Brazil, Paraguay, and Peru**



Source: Author's elaboration with data provided by central banks; United Nations Population Division (adults defined as age 15+).
Note: The size of the bubble represents the total number of digital payments per adult in each country. Data includes only centrally cleared transactions, i.e. inter-PSP transactions.

TABLE ES.1 **Growth in fast payment transactions, 2017–2024**

	FPS TRANSACTIONS PER ADULT					2023–24 Growth in FPS Transactions per Adult (%)
Country	**2017**	**2019**	**2021**	**2023**	**2024**	
Argentina	2.8	6.8	29	115	203	76
Bolivia	0	0	0.7	16	45	182
Brazil	0	0	57	247	373	51
Chile	19	26	36	54	68	25
Colombia	0	0	0.2	2.5	10	308
Costa Rica	0.3	1.6	56	123	156	27
Dominican Republic	0.2	0.5	1.4	2.8	4	43
El Salvador	0	0	0	3.7	7.2	93
Mexico	2.6	5.7	17	35	48	38
Paraguay	0	0	0	15	34	132
Peru	0.2	0.2	2.5	26	59	130
LAC-11 average	**1.6**	**3**	**32**	**124**	**190**	**53**

Source: Author's elaboration with data provided by central banks; United Nations Population Division (adults defined as age 15+).
Note: Data includes only centrally cleared transactions, i.e. inter-PSP transactions.

Some of the variation can be attributed to FPS design maturity. The analysis in section 2.2 shows that several countries still have opportunities to expand and strengthen FPS design to maximize scale and impact—learning from both regional and global experiences. Brazil demonstrates the highest level of FPS design maturity in LAC, thanks to a broad range of use cases, universal access with direct- and indirect-participation options, extensive access channels, and alias functionality. Most FPS in LAC demonstrate middle to high design-maturity levels, with some notable areas for further enhancement, including enabling direct access of non-bank PSPs (for example, Argentina and Paraguay), expanding use cases (as in Costa Rica and Mexico) and payment instruments (Peru). Finally, El Salvador and the Dominican Republic lack key elements of fast payment arrangements such as 24/7 availability (as in the Dominican Republic) and instant crediting of funds to the payee (El Salvador).

Several countries are taking important steps to strengthen their FPS frameworks. Colombia, the Dominican Republic, and Peru, while initially limited by fragmented implementation and narrow use cases, are preparing more comprehensive upgrades to their FPS ecosystems. In El Salvador, the capabilities of *Transfer365* will be enhanced with a digital financial identity system and interoperable QR codes. With solid foundations in place, Mexico and Costa Rica also have opportunities for continued innovation—for example, to expand use cases.

Several other LAC jurisdictions are at different stages of developing their FPS strategies and infrastructures. In South America, Uruguay has significantly accelerated FPS reforms in the last few years, achieving 24/7 operations in the private sector-operated clearinghouse and introducing a P2M use case in 2023 and 2024, respectively. Ecuador is characterized by fragmentary and partial solutions: in this context, the central bank has recently promoted interoperability through regulation. In Central America, Honduras, Guatemala and Nicaragua have nascent fast payment ecosystems, often characterized by interoperability challenges. In the Caribbean region, Aruba and St. Martin and Curacao have live FPS, whereas Barbados, Belize, Guyana, Trinidad and Tobago are at different stages of developing FPSs.

KEY FINDING 3 In most LAC countries, fast payments are deepening digital financial inclusion for populations with a transaction account, with more mixed evidence on expanding financial access.

Financial-sector policy makers have long distinguished between financial access and usage. Financial access is the ownership of a transaction account, while usage refers to whether the account is utilized to make payments or save. Those who have an account and use it regularly are financially included. Leveraging digital technologies such as digital wallets can generate *digital* financial inclusion. Beyond payments, data generated from the use of fast payments can be leveraged by financial institutions, with user consent, to offer appropriate financial products and services, particularly to individuals and small businesses with thin credit files. For those with financial access, the convenience and affordability of fast payments can significantly increase account usage. In theory, by increasing the utility of accounts and digital payments, fast payments can also pull unbanked adults into the formal financial sector, increasing financial access.

Have fast payments in LAC deepened digital financial inclusion or expanded financial access or both? The evidence on increasing account usage is clear: digital payments per accountholder have increased 280.1 percent between 2017 and 2024, from 154.4 to 587.0 payments per accountholder per year, on average—with 60.7 percent of this growth attributable to fast payments. The increased use of digital payments via FPS also appears to be widespread across consumer segments: in Brazil and Costa Rica, more than 75 percent of adults use *Pix* and SINPE, respectively.[9] The data also shows that FPS growth complemented—rather than cannibalized—existing digital payment instruments, helping to expand the overall digital ecosystem and reduce reliance on cash. In many LAC-11 economies, card payments, after a drop in 2020, have continued to grow at or above prepandemic rates, even alongside dramatic FPS expansion. FPS have also spurred innovation and amplified other strategies to deepen digital financial inclusion, such as open finance in Brazil—notably one of the few LAC countries with a data sharing framework to enable permissioned third-party access to customer data. As fast payment ecosystems mature and the broader policy frameworks evolve, further analysis is needed on the implications of FPS for other financial services.

The evidence for the impact of FPS expanding financial access is more mixed. Many of the LAC countries that launched or reformed FPSs around 2020 with strong subsequent growth in fast payments during 2020–24 have also seen strong growth in account ownership between 2017 and 2024 (Findex data-collection periods). For example, account ownership grew by 33 percentage points in Argentina and 12–17 percentage points in Brazil, El Salvador, Mexico, Paraguay, and Peru during that period. For some countries—Argentina, El Salvador, and Paraguay—the growth in account ownership was spread across both data-collection periods: 2017–21 and 2021–24. For others, like Brazil, Mexico, and Peru, there was minimal or even negative growth during 2021–24. This may be because the initial burst of FPS-driven

account opening was concentrated during 2020–21, at the height of the pandemic. In Costa Rica and Bolivia, there was little growth in financial access between 2017 and 2024, despite strong growth in fast payments.[10]

Recent empirical research from Brazil does suggest that mature FPS ecosystems can drive account opening. The 2024 study finds that a 1 percent increase in the number of active users of *Pix* in a municipality leads to an increase of 0.8 percent in the number of people opening bank accounts for the first time. The study also finds complementarity effects across other dimensions, suggesting that *Pix* drove increases in the use of a range of payment instruments (not only fast payments) as well as access to credit and client growth in both traditional and digital banks. These findings suggest that more mature and inclusive FPS ecosystems—which encompass a wide range of use cases and promote interoperability across providers—do have the potential not only to deepen digital financial inclusion but also to expand financial access. More research is needed to determine the causal impacts of FPS on financial inclusion and access. As highlighted in the policy messages that follow, policy makers and FPS operators should take deliberate measures to design FPS ecosystems not only to deepen digital financial inclusion for the banked but also to drive expansions in financial access among unbanked populations.

POLICY MESSAGES

Despite progress, a range of challenges constrain the scale of live FPS and its impact on digital financial inclusion and financial access in several LAC countries. A lack of interoperability across platforms and payment instruments weakens ecosystem efficiency and inhibits user centric experiences. Governance frameworks and high compliance costs restrict participation and interoperability, particularly for fintechs and e-money issuers, reducing the potential for equitable growth. FPS have often focused primarily on P2P use cases—leaving untapped opportunities in such areas as person-to-merchant (P2M), bill payments, government-to-person (G2P) transfers, transit, and e-commerce. Emerging fraud risks, cybersecurity threats, and weak consumer protection frameworks threaten user confidence if not addressed holistically. Looking ahead, FPS must evolve to integrate with DPI and align with emerging technologies. A strategic, future-proof approach—anchored in inclusive design, regulatory clarity, and public-private coordination—is essential to ensure that FPS remains a pillar of digital transformation in the region.

POLICY MESSAGE 1 Nonbank access and effective interoperability—within and across FPS—should be prioritized to address system fragmentation and support scalability and market efficiency.

Effective interoperability is critical for promoting competitive digital payment ecosystems as well as enhancing the utility of fast payments for consumers. From the user perspective, effective interoperability means the ability to send and receive fast payments regardless of the payer or payees' payment service provider (PSP), whether it be a bank, mobile money operator, fintech, financial cooperative, or microfinance institution.

FPS implementations in the region have frequently emerged as isolated initiatives of different stakeholder groups, often with different objectives. The resulting fragmentation can result in poor user experience and inefficiencies, poses increased costs for integration, and is especially problematic for large-volume users, such as governments and utility companies, as well as for merchants, who must support redundant systems. Fragmentation would be deleterious to smaller markets now approaching FPS implementation in the region and should be avoided through timely central bank involvement.

The LAC experience illustrates two main approaches to interoperability predicated on (i) "system-wide" interoperability through a single open FPS that sets the market standard, or (ii) "cross-network" interoperability, often mandated through regulation and supported by shared/centralized infrastructure components/functionalities. Brazil, Costa Rica, and Mexico are examples of the system-wide model, whereas Colombia and Boliva have set out a framework for operationalizing the cross-network model among various FPS. Both strategies require central bank involvement: LAC illustrates different combinations of central bank roles across the two models, though more often system-wide interoperability relies on infrastructure owned and operated by the central bank. A third approach (multitenant interoperability) relies on a national quick response (QR) standard and the ability of payment-initiation channels such as QR codes and near field communication (NFC) to grant seamless access to multiple networks.

Network-wide constructs emphasize the need for a robust, inclusive governance framework, fair and open access, and system scalability and operational resilience. Participation of nonbanks in FPS is the backbone of (system-wide) interoperability. However, indirect (only) access models for nonbanks increasingly raise concerns about sponsor banks' fees, service levels, and access to commercially sensitive information. Inclusive access models that allow direct participation by

nonbanks have several advantages, including increased competition. Some countries with significant nonbank sectors, such as Argentina and Paraguay, still lack direct-participation models for some types of nonbank PSPs, constraining interoperability and competition. Network-wide interoperability is particularly relevant for countries at the early stage of FPS development and/or jurisdictions characterized by a lack of economies of scale and coordination issues. In this context, timely action to promote the development of an open FPS that serves the entire market can help create a common infrastructure layer and a governance framework for standardization, potentially dispensing with the need of more-complex cross-network constructs.

Cross-network interoperability can be a complex undertaking. Cross-network interoperability frameworks must go beyond enabling the exchange of messages and require broader standardization and alignment efforts encompassing technical aspects and business rules. Regulatory interoperability mandates might create a sense of urgency and mobilize the private sector, but effective implementation rests on a set of common rules and standards across schemes as well as technical components for alias management and inter-scheme clearing and settlement.

Multitenant interoperability emerges as a pragmatic solution to handle complexity and fragmentation, with a focus on the point of interaction. The most immediately viable option for enabling ecosystem-level interoperability in LAC might be a multitenant model that allows multiple payment schemes to coexist and interoperate through a shared access point.

POLICY MESSAGE 2 Governance arrangements for FPS should ensure alignment with public policy objectives and a level playing field for private sector operators.

Retail payments efficiency and other important public policy objectives such as financial inclusion are largely influenced by a complex interplay of cooperation and competition. For decades, LAC central banks have endeavored to achieve a better cooperation-competition nexus following very different patterns of involvement in retail payments governance. Starting in the mid-2010s, central banks became more actively involved in the regulation/oversight of retail payment systems, including earlier FPS initiatives. Several central banks nevertheless considered that these efforts would not be sufficient to change the status quo and began analyzing the possibility of directly developing and operating an FPS (see Chapter 1).

The experience of Brazil with *Pix* illustrates the merits of public-service provision in "bypassing" the complexity and fragmentation of traditional retail payments infrastructure that constrained FPS development. Central banks in the region are increasingly taking up operational roles in FPS, including where private FPS are already operational. Of the 11 countries analyzed in this report, central banks operate FPS in seven countries (Bolivia, Brazil, Costa Rica, the Dominican Republic, El Salvador, Mexico, and Paraguay), while the private sector operates FPS in five (Argentina, Bolivia, Chile, Colombia, and Peru). In Bolivia, FPS are operated by both the private sector and central bank, as will soon be the case in Peru and Colombia. Argentina provides a unique example of private infrastructures operating under a public mandate and harmonized rules. New FPS projects in the Caribbean region are led by the respective central banks.

When the central bank acts as owner/operator and is also the regulator and overseer of retail payment systems and services, it needs to consider how best to address any possible tensions between functions. This issue may be exacerbated where an FPS operated by a central bank coexists with FPS operated by the private sector. The central bank must ensure that it applies regulatory and oversight standards consistently to all FPS and may need to review the internal organization of payment functions to ensure separation of operational and regulatory/oversight roles. Transparency of key decisions regarding the FPS and open consultations help foster trust and accountability. Ultimately, operating an FPS requires an extraordinary effort from central banks, particularly as they must keep pace with market innovations. Central banks should regularly review the mix of roles and forms of public intervention.

When the central bank relies on its regulatory and oversight functions to influence FPS governance, it should have sufficient powers (for example, licensing/authorization, sanctioning powers, powers to obtain information) and resources to undertake these functions. In practice, though, enforcement has been limited in the area of governance, and many private FPS still preserve a governance structure misaligned with international standards and best practices. More often, central banks have played a pivotal role in revising access policies enabling direct participation of nonbank PSPs. However, these efforts may be frustrated by the lack of modern regulatory frameworks for payment services. International experience also points to additional tools that could be explored by LAC central banks, such as central bank representation in the FPS board of directors and the publication of strategic blueprints that steer and guide the FPS operator to make improvements or remedy identified gaps.

Notably, there are no examples in LAC of joint public-private ownership models as seen in other regions—for example, in Jordan, Malaysia, and Türkiye. These experiences can provide helpful references as the respective roles of the public and private sector are re-evaluated from time to time, and central banks consider options to increase private sector's "skin in the game" while preserving a strong influence on FPS governance.

POLICY MESSAGE 3 Diversifying use cases beyond P2P payments to include P2M and large-volume recurrent streams such as bill and government payments can drive adoption, innovation, and inclusion.

Use-case diversity is a key benchmark of FPS design maturity, yet LAC FPS are generally characterized by low use-case diversification. Indeed, P2P payments have been the primary driver of FPS in most LAC-11 countries, representing the vast majority of FPS transaction volumes. As of 2024, only a few countries (Argentina, Brazil, Peru, and Colombia) have deployed dedicated P2M functionality, with a few others in the process of implementation.[11] In LAC-11, Brazil stands out as the only country where P2M have achieved consistent scale, increasing from 5 percent in 2020 to 35 percent of total FPS volume in 2024.

Use-case diversification is also instrumental to sustainability and ecosystem growth. FPS pricing policies have generally prioritized affordability and user uptake. In most LAC-11 countries P2P transactions are free for end users, with zero-fee policies often mandated through regulation or embedded in FPS rules. This reflects a deliberate strategy to support affordability and mass adoption. However, in the absence of use-case—and pricing—diversification, PSPs may lack incentives for innovation, such as via high-quality user interfaces. On the other extreme, pricing and merchant acquiring practices for P2M tied to traditional business models may negate the added value of FPS. In Peru, fast payments have been effective in undercutting long-standing bank transfer pricing structures—only to raise P2M prices to similar levels as other payment instruments once mass adoption had been reached. FPS pricing requires close central bank scrutiny.

P2M functionality can also help recalibrate fiscal policies to address rising concerns about "tax asymmetry" between FPS and other payment systems, supporting small merchant formalization as their transaction volumes and values increase, and striking a balance between broadening the tax base and financial inclusion. One promising approach is the use of transitional merchant categories, such as India's P2PM (person-to-person-and-merchant) designation for low-volume sellers.

FPS across the region also remain underutilized for large-volume recurrent payment streams such as government payments, bill payments, and mass-transit payments. For example, integration with government payment systems remains limited, with a few exceptions (for example, Brazil, Costa Rica). A more coordinated strategy across treasury-management information systems, frameworks for the delivery of social-protection payments, e-government platforms, and FPS operators is required for designing G2P payment mechanisms anchored in interoperable, real-time payments infrastructure. Mass-transit use cases are in the early stages of exploration, where FPS and QR codes can represent a mechanism to facilitate the transition from closed- to open-loop transit payments. In contrast to other regions (e.g., East and South Asia), LAC FPS operators have not leveraged or planned to leverage these systems for cross-border regional payments. Different implementation models and level of development of FPS across the region, among other factors (e.g., legacy arrangements with mixed results, cross-border acceptance models through partnerships between PSPs rather than system interlinking), may have discouraged action on this front.

A narrow focus on P2P threatens to stall FPS adoption and relevance. Policy makers and operators should develop a strategic road map to guide the rollout of new use cases through a broader, structured process whereby the operator identifies new functionalities and products to be developed over time and engages participants and other relevant stakeholders in the design and implementation of new solutions.

POLICY MESSAGE 4 The sustainable growth of fast payments requires urgent action to address fraud and security challenges and ensure operational resilience.

FPS are attractive targets for fraud due to their speed, finality, and relative novelty. Many FPS are still building advanced capabilities for fraud detection, transaction monitoring, and consumer protection—features that have long been standard in mature networks like card systems.

In Brazil, the value of *Pix* fraud increased more than sixfold between 2023 and 2024 while still accounting for less than 1 percent of *Pix* volumes. However, most countries in LAC do not collect or report FPS fraud statistics, raising the question as to the real magnitude of this issue across the region, particularly for fast-growing FPS with less sophisticated frameworks for managing operational risk. The survey also reveals low levels of preparedness to manage fraud risks,

with most FPS lacking support for centralized fraud information sharing and fraud-detection capabilities.

FPS operators should rise to the challenge and implement appropriate centralized fraud-management solutions. The extent to which centralized tools are feasible and appropriate in a given country depends on several factors—from the FPS legal basis to technical capability and market structure—and the decision to implement such tools should be based on an open, transparent process. Mandated dispute-resolution frameworks, while broader in nature, help PSPs fulfill their responsibilities vis-à-vis fast payment users (who may have been victims of fraud) in a consistent manner and are an important component of consumer protection frameworks. These measures should be underpinned by robust payment service regulation—from multifactor authentication to outsourcing and third-party risk management, and zero liability for unauthorized transactions—as well as coordinated enforcement.

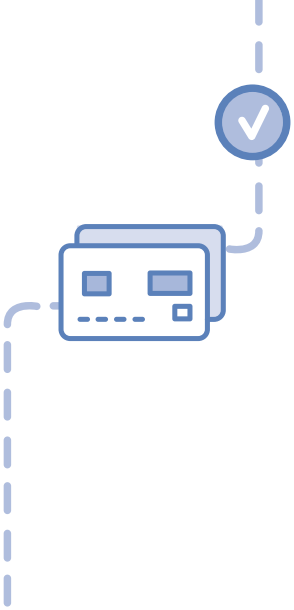
FPS operators should also implement multilayered cyber resilience frameworks based on international standards. This includes strong governance, proactive threat detection, secure integration practices, and continuous testing. Regulators should ensure that FPS are recognized as critical infrastructure and enforce mandatory incident-response protocols and minimum cybersecurity thresholds across all participants. In this context, reliance on open-source technologies warrants careful consideration of trade-offs, including resources required to ensure smooth implementation, maintenance, and ongoing security.

POLICY MESSAGE 5 Strategies to future-proof FPS and ensure integration with DPI are necessary to ensure continued relevance and increase impact.

There remains significant scope to enhance the design of FPS ecosystems in LAC to accommodate future innovations and facilitate greater integration with DPI, including digital ID systems and data-exchange frameworks.

Integration with digital ID is foundational to unlocking efficiencies in authentication, onboarding, and transaction flows across interoperable systems. Without a DPI vision, FPS in LAC risk missing key opportunities to enhance their impact and relevance within the broader digital transformation. Policy makers should ensure that FPS are designed to integrate with DPIs, both domestically and across borders. Central banks can lead this agenda by fostering open architectures, encouraging private-sector innovation, and establishing metrics to track how FPS contribute to financial inclusion, resilience, and digital transformation.

As countries design and operationalize open-finance frameworks, these efforts and FPS reforms converge in the context of payment-initiation services (PIS). PIS facilitate the seamless integration of digital payments in social and commerce interactions, enabling new solutions (like variable recurring payments and account sweeping), fostering competition, and enhancing user experience. FPS can play a key role in orchestrating PIS, including by setting technical standards—for example, API specifications—and participation requirements. Brazil's open-finance ecosystem effectively operates under a combination of central bank regulations and market-driven technical specifications, where (licensed) PIS providers have been integrated into the *Pix* ecosystem as scheme participants.



2 A 20-YEAR JOURNEY TOWARD FAST PAYMENTS IN LATIN AMERICA AND THE CARIBBEAN

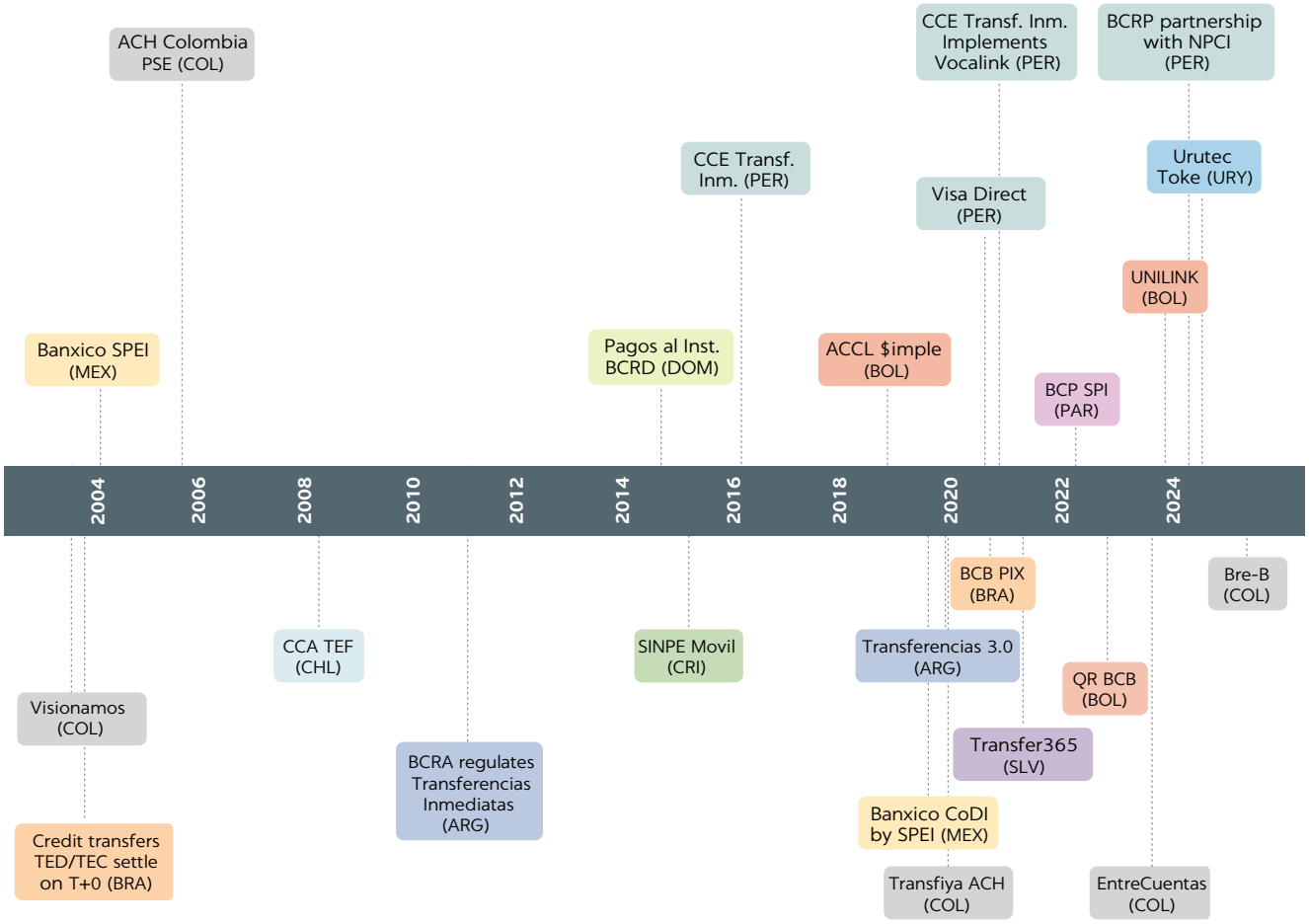
The transformative impact of fast payments in LAC has its roots in two decades of institutional and policy reforms and digital transformation. The exponential growth of fast payments in LAC, beginning in 2020 and catalyzed by a wave of FPS deployments and the COVID-19 pandemic, is the product of a range of factors, including expansions in digital connectivity, the innovation and growing market power of fintechs, and shifting consumer behaviors. Central banks have also been key players through their various and evolving roles as FPS catalysts, operators, overseers, and regulators. Seen through the lens of central bank involvement, the evolution of fast payments in the region provides insight into the importance of a sound governance framework[12] to ensure that FPS remain reflective of participant community and user needs and support broader public policy objectives. This section briefly retraces LAC's 20-year journey toward fast payments with a focus on the role of central banks, highlighting key considerations for the regional FPS agenda.

2.1 FAST PAYMENTS EMERGE WITH LIMITED CENTRAL BANK INVOLVEMENT (LATE 2000S–EARLY 2010s)

In the 2000s and early 2010s, the concept of fast payments began to gain traction, but typically under a different concept of "fast." In most LAC countries during this time, end-of-day crediting to final beneficiaries, or even T+1 crediting, was considered to be innovative and probably fast enough. In fact, time-critical transactions were only those of financial market participants. For the purposes of this section, these early arrangements to achieve a more rapid crediting to end beneficiaries will be referred to as "faster payment systems," to differentiate them from today's definition of "fast" or "instant" payment systems, which are characterized by the immediate availability of funds to the payee and 24/7 availability.[13]

Those faster payment arrangements were managed almost exclusively by private-sector entities. Banking consortia were early movers in this regard in LAC, mainly via the bankers' association, either as the direct operator of the payment arrangement or via an affiliate, subsidiary, or other closely linked entity. Those banking consortia were typically controlled by the largest commercial banks in each country, meaning that the views and interests of smaller/newer banks were rarely factored into the design and operating rules of the faster payment systems. Even less so the opinions and interests of nonbank financial institutions (such as financial cooperatives, microfinance institutions, and e-money issuers) that already provided some form of payment service(s) to their customers. Examples of these developments throughout LAC include Argentina, Chile, Colombia, and Peru, among others. In Brazil, there was already a "tradition," dating to the 1980s and early 1990s, to achieve rapid crediting to end beneficiaries due to the hyperinflation that the country experienced during those years. Some specialized payment-processing entities emerged as a result of this need that were not always associated to the large banking consortia.

FIGURE 1 **LAC's 20-Year Journey toward Fast Payments**



Source: Author's elaboration with data provided by central banks.

During this period, the institutional priorities of central banks were focused on their real-time gross settlement (RTGS) systems, with limited involvement in or formal powers over retail payment systems. During this period, payment systems departments in most central banks throughout the region had not been formally incorporated into the organizational structure. Most of the payment systems departments that did exist were focused almost exclusively on their national RTGS system and possibly other large-value payment systems and systemically important settlement systems. Most retail payment systems were not regulated or overseen by the central bank or other financial-sector regulators. Indeed, many central banks did not have the "formal powers" to even require data from most retail payment system arrangements. Nevertheless, some central banks began monitoring retail payment system developments on a regular basis through informal arrangements.[14]

Only a few central banks in the region (and elsewhere around the world) were involved in the operation of retail payment systems. Central banks that did operate retail payment systems were primarily operating check-clearing systems, mainly because many of these systems were still clearing and settling large-value items, which gave central banks a "legitimate" interest in their operation due to potential systemic risk considerations. A few central banks also operated traditional automated clearing houses (ACHs) for electronic funds transfers (for example, Banco Central de Costa Rica's first interbank transfer service via SINPE, launched in 1997, and Banco de la República of Colombia with ACH Cenit since 1999). Central banks operating ACHs were fundamentally concerned about achieving safe and sound clearing and settlement of interbank payment obligations within a reasonable time limit, meaning typically T+2 or T+1, and with a reasonable final price for end customers, including government entities. These central banks that

decided to operate ACHs perceived at that time that the private sector was unable to achieve these objectives.

In summary, the typical scenario during this period was a *faster* payments arrangement operated and governed by a banking consortium, with little involvement from smaller banks and nonbank financial institutions and very limited regulatory and/oversight involvement from central banks. Furthermore, faster payment systems operated by central banks typically did not coexist with similar systems operated by the private sector.

Together with Costa Rica, Mexico is an exception to this early-stage general trend of private-led faster payment arrangements. In 2005, *Banco de México* launched its RTGS system, the Interbank Electronic Payments System (*Sistema de Pagos Electrónicos Interbancarios,* SPEI). Although SPEI was initially used mainly for transactions between banks, from its conceptual design it was not only conceived as a system for large-value payments but also intended for processing payments of federal government agencies, mainly the National Treasury. A few years later, *Banco de México* introduced a "real-time" payment service for end beneficiaries. Though "innovative" at that time, it was rudimentary compared to current standards. For example, at the very beginning, SPEI regulations granted up to one hour to the receiving party to credit the funds to the end beneficiary. This time limit was not always achieved in practice.[15] *Banco de México's* SPEI service for end beneficiaries was also an exception to the general trend because it operated alongside the service offered by CECOBAN (a banking consortia), which at that time was offering the *Transferencias Electrónicas de Fondos* service, consisting of deferred (T+1) credit transfers. Banco de México required banks to offer both services to their customers, disclosing the prices and other key conditions (that is, availability of funds) for each in internet banking and for in-person transactions.

Chile was also an exception to the general trend, moving early toward a deployment of truly fast payments. In Chile, *Transferencias en* Línea—which was designed in 2008 to achieve real-time crediting of funds to beneficiaries—was created by a private clearinghouse, the *Centro de Compensación Automatizado*, owned solely by three large banks. Nevertheless, the financial-sector regulators did play a substantial role in the materialization of this project, motivated primarily by somewhat technical concerns, such as reducing interbank settlement risk and, secondarily, improving product design and convenience for bank customers.

2.2 EARLY EFFORTS DISPLAY LIMITS AS CENTRAL BANKS BEGIN TO INSTIGATE CHANGE (MID-2010s)

Starting in the early to mid-2010s, central banks began to pay more regulatory/oversight attention to retail payment systems and eventually also to payment services. Examples include regulators in the European Union, the United States, and other jurisdictions that started issuing regulations, or at least basic operational standards, for privately operated retail payment systems, mainly card payment systems at that time, followed by other retail payment systems. Several reasons explain the increased involvement of central banks in retail payments, such as (i) the global trend to advance financial inclusion, which gained prominence in the early 2010s; (ii) the fact that core payments infrastructure like the RTGS system had reached maturity in most countries; and (iii) the development and expansion of payment system departments in many central banks, which could extend their purview beyond the systemically important components of the national payments system.

Several arrangements began to emerge with features similar to those of the current concept of real-time crediting to final beneficiaries. In Brazil, *Camara Interbancária de Pagamentos* was already offering (close to) real-time crediting by this time. In the Dominican Republic, in an effort similar to the one launched by *Banco de México* some years back, in 2014 the *Banco Central de la República Dominicana* extended the service of its RTGS system to create *Pagos al Instante,* providing close to real-time crediting of funds to end beneficiaries. Mexico's SPEI service for end beneficiaries had been upgraded, and real-time crediting of funds had already become a basic feature. Peru's privately operated ACH (owned by commercial banks) started developing its instant payment service also around the same time. In Costa Rica, *SINPE Móvil*—a mobile payment overlay built on top of SINPE—was launched in 2015.

Yet other features of a modern FPS were not present, such as 24/7 availability or the ability to use an alias to make and receive payments, among others. Other gaps/shortcomings of fast payments efforts around that time in most jurisdictions in the region included the following:

- *High costs for consumers.* Fast payments were expensive for end beneficiaries, due to, among other reasons, low economies of scale, as not all banks and other PSPs were participants in the systems/scheme members. Those services that did not rely on high prices to end customers had to be cross-subsidized, and some were eventually discontinued.

- *Slow pace of development and scale.* FPS (or the legacy faster payment systems described in the previous section) evolved only very slowly, largely as a result of low competition and the barriers imposed on smaller banks, nonbank financial institutions, and nonbank PSPs, either because they were unable to act as direct participants or as a result of the absence of a mechanism to influence in any meaningful way the decision-making of the arrangement. Hence, those FPS did not cater to major market developments and disruptions during those years and fell short of not only leveraging the fintech revolution to enhance the user experience but also including emerging e-money issuers serving the unbanked.
- *Competing interests of market infrastructure owners.* The dual role of larger banks in owning an FPS and/or an ACH and also being participants in card networks as card issuers and acquirers—and, in some cases, even being the owners of one or more of other key elements of the card value chain—from which they derived important revenues, is likely to have hindered or at least delayed the development of more efficient fast payment solutions for the country as a whole.

Governance arrangements did not materially differ from the earlier stage of "faster payment" development; however, the gradual involvement of central banks in the regulation/oversight of FPS and other retail payment systems began to instigate some change. Issued in 2012, the CPMI-IOSCO Principles for Financial Market Infrastructures (PFMI), originally intended for systemically important payment systems (and other financial market infrastructures), became an important guiding element also for the involvement of central banks in regulating and overseeing privately operated retail payment systems and their owners and management. In several jurisdictions around the world, concepts such as a retail payment system being of "system-wide importance" or "prominently important payment systems" were developed to designate those retail payment systems that would be subject to regulation/oversight and the principles (a subset of the PFMI) that would be applicable to them. While not all central banks in LAC adopted this approach, most central banks in the region did develop policies for significantly stronger regulation and oversight of retail payment systems and gave powers to their payment systems department to conduct these activities on a regular basis.

Several central banks nevertheless considered that these efforts would be insufficient to change the status quo and began analyzing the possibility of directly developing and operating an FPS. This trend became more noticeable in the latter part of the 2010s and in the early 2020s, as described in the next subsection.

2.3 A MAJOR SHIFT IN FPS GOVERNANCE (LATE 2010s–PRESENT)

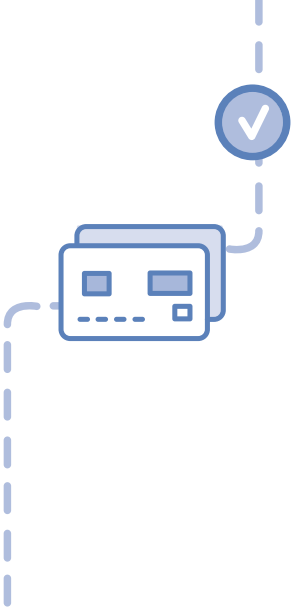
In the late 2010s, in those countries in which an FPS had not yet been implemented, several central banks were already active as catalysts for such a system to be developed by the private sector. Central banks performed this role in addition to the regulatory/oversight roles over retail payments they had acquired a few years back.

Around the same time, and increasingly during and after the COVID-19 pandemic, some central banks in the region drastically changed their role in connection with fast payments. Many of the failures central banks had identified and tried to tackle via regulation and oversight had not been resolved satisfactorily. In particular, central banks found it especially difficult to overcome the dominance of vertically integrated market structures and fragmented payment ecosystems (for example, because of the limited participation of nonbank PSPs in FPS or the presence of two or more FPS catering to different market segments) that were hindering innovation and limiting the reach of digital financial services. In Brazil, the central bank (*Banco Central do Brasil*) had initiated a dialogue with market participants for an industry-led FPS development since 2014, guided by specific policy objectives, including increasing financial inclusion, reducing the use of cash, and developing interoperable mobile payment services. However, industry proposals struggled with implementation, inducing the central bank to take a leading role while continuing to engage with the industry through consultation in the process of FPS design and implementation. By 2022, in addition to Brazil, central banks in at least six other countries were operating their own FPS: Bolivia, Costa Rica, the Dominican Republic, El Salvador, Mexico, and Paraguay.

Some central banks opted for directly operating an FPS even if other fast payments options were already available. In most cases, the central banks operating FPS are the sole FPS operator in the country. However, in Bolivia, Colombia, and Peru, central banks operate or plan to operate an FPS alongside existing private-sector FPS. For example, in Colombia, the central bank (*Banco de la República of Colombia)*, decided to undertake a role as FPS operator, among other roles, not only to put pressure on the other existing market arrangements to enhance service levels,

quality, and price for end users but also to ensure interoperability between the various schemes. In parallel, the central bank will operate the centralized infrastructure enabling the interoperability between all FPSs operating in the country. The central bank of Bolivia (*Banco Central de Bolivia*) was motivated in part by the objective of strengthening the overall availability and continuity of fast payment services through an FPS operated by the public sector. More recently, the *Banco Central de Reserva del Perú* announced its partnership with the National Payments Corporation of India (NPCI) to develop an FPS similar to India's UPI. The motivations of the Peruvian central bank include, among other things, providing a low-cost, digital public good accessible to a wide range of PSPs and consumers in order to expand available use cases and promote digital financial inclusion.[16] Incidentally, the experience of Bolivia, Colombia, and Peru introduces a relatively new scenario, where the central bank simultaneously operates a (new) FPS and acts as the regulator of one or more existing, private FPSs, raising a potential conflict of interest (see Section 3.1).

In contrast, in Argentina, Chile, and Uruguay, the central banks did not opt for operating their own FPS. Nevertheless, for several years already, the central banks have been playing relevant roles for FPS development and enhancement through their actions as catalysts and regulators/overseers. Most of these central banks have worked intensively on, or have committed to, achieving interoperability of the various existing fast payments offers and the underlying instruments and channels. For example, Argentina's *Transferencias 3.0* can be understood as a set of common rules and standards that apply equally to banks and nonbank PSPs, as well as to all three scheme administrators in the country. More recently, the Argentine central bank extended the mandatory use of the interoperable QR code also to card-based transactions initiated by bank apps and mobile wallets. Some central banks have also intervened on elements that directly or indirectly affect end-user pricing. This experience suggests that, as FPS regulators, central banks play a critical role in defining key aspects of FPS scheme rules to achieve interoperability and an inclusive fast payment ecosystem.



3 THE FAST PAYMENTS OPPORTUNITY IN LATIN AMERICA AND THE CARIBBEAN

The emergence of FPS in LAC is addressing long-standing and structural challenges constraining the growth of digital financial service ecosystems in the region.[17] Recurring challenges include low competition, barriers to accessing payment infrastructure and user data, limited interoperability, high costs, and a misalignment between account/payment product design and the needs of excluded/underserved segments. FPS can provide a neutral, low-cost rail for both incumbents and new entrants and a pragmatic approach to interoperability through open-access policies, broad participation, and wide coverage of payment types and use cases. FPS can foster competition and slash digital payment costs, particularly at the point of sale (POS), where cards have long represented the dominant or sole electronic payment instrument and price out smaller merchant segments. Finally, FPS can contribute to financial inclusion by enabling the provision of convenient and affordable payment solutions, endowing users with the ability to better control their funds and generating data insights to access other financial services.

The analysis in this section is based on a survey of central banks in LAC jurisdictions with operational FPS or similar arrangements as of 2023.[18] The survey was conducted in early 2025 and received responses from central banks in 11 jurisdictions (see Table 1). These jurisdictions collectively represent 91.1 percent and 86.3 percent of 2024 LAC total GDP and population, respectively. The survey collected information on characteristics and design features of FPS (for example, participants, use cases, payment instruments, access channels, fees, and so on), as well as transactional data covering the period 2017–24. The survey also collected information on fraud.

3.1 THE GROWTH OF FAST PAYMENTS IN LAC, 2017–24

Fast payments in LAC have experienced remarkable growth. Fast payment transaction volumes have increased 130-fold over the past eight years, from 620 million in 2017 to 79.8 billion 2024 (see Figure 2). Similarly, the total value of fast payment transactions has increased 6.6-fold, from $1.4 trillion in 2017 to $9.5 trillion in 2024.

Early reformers like Chile, Mexico, and Argentina accounted for nearly all fast payment transactions prior to 2020 (see Figure 3). In 2017, fast payments were not widely available in most countries in LAC. Some countries—like Costa Rica and Peru—had already launched their FPS, but the average adult made fewer than one fast payment per year. In Mexico and Argentina, adults were making an average of 2.5–3 fast payments per year. Only in Chile were fast payments reaching scale, with an average of 19.3 fast payments per adults per year.

The key inflection point for fast payments in LAC began in 2020, with a period of multicountry FPS reforms coinciding with the COVID-19 pandemic. Between 2020 and 2023, seven countries—Argentina (*Transferencias 3.0*, 2020), Brazil

TABLE 1 **Fast payment systems included in LAC-11 analysis**

COUNTRY	FPS #	NAME OF THE FPS SYSTEM	LAUNCH DATE OF FPS	SCHEME OWNER/ SYSTEM OPERATOR[a]
Argentina		*Transferencias 3.0*	12/2020	Private sector
Bolivia	FPS 1	*Módulo de Liquidación Diferida—QR BCB Bolivia*	12/2022	Central bank
	FPS 2	*ACCL $imple*	01/2019	Private sector
	FPS 3	*UNILINK*	01/2024	Private sector
Brazil		*Pix*	11/2020	Central bank
Chile		*Centro de Compensación Automatizado—CCA*	05/2008	Private sector
Colombia	FPS 1	*Transfiya ACH Colombia*	02/2020	Private sector
	FPS 2	*Redeban—Entre Cuentas*	10/2023	Private sector
	FPS 3	*Visionamos*	02/2004	Private sector
Costa Rica		*SINPE*	05/2015	Central bank
Dominican Republic		*Pagos al Instante BCRD*	11/2014	Central bank
El Salvador		*Transfer365*	06/2021	Central bank
Mexico		*Sistema de Pagos Electrónicos Interbancarios*	08/2004	Central bank
Paraguay		*Sistema de Pagos Instantáneos—SPI*	05/2022	Central bank
Peru	FPS 1	*CCE Transferencias inmediatas*	12/2020	Private sector
	FPS 2	*Visa Direct*	10/2020	Private sector

a. The same entity can act as scheme owner and system operator.

(*Pix*, 2020), Colombia (*Transfiya ACH Colombia*, 2020/*Entre Cuentas* Redeban, 2023), El Salvador (*Transfer365*, 2021), Paraguay (*SPI*, 2022), Bolivia (*QR BCB*, 2022), and Peru (*Visa Direct*, 2020/*CCE*, 2021)—deployed FPS or fast-tracked FPS expansion. At the same time, the COVID-19 health crisis triggered an urgent need for safe, contactless transactions, accelerating both consumer demand—particularly for P2P payments—and policy action. Regional growth in fast payments per adult accelerated during 2020–24, with average annual growth of 145 percent.

As of 2024, Brazil, Argentina, and Costa Rica have emerged as top regional performers in terms of fast payment transactions per adult—the only three countries with more than 100 annual fast payment transactions per adult. Brazil's 2020 launch of *Pix* was a watershed moment for fast payments in Latin America, achieving exponential growth due to its open-infrastructure design and user experience, and further catalyzed by the COVID-19 pandemic. As of 2024, Brazilian adults make an average of 372 FPS transactions per year, accounting for 80 percent of all FPS transactions in LAC-11. Brazil's progress is remarkable even by global standards: while India continues to lead the world in overall FPS volumes, it lags behind Brazil on a per-capita basis with 167 FPS transactions per adult in 2024. Based on available data, it appears that only Thailand exceeds Brazil's per-capita volume of fast payments, with 399 in 2024. Brazil's achievement is even more notable given that Thailand's *PromptPay* was launched in 2017, India's *UPI* in 2016, while Brazil's *Pix* only began operations in 2020. Argentina's incremental reform program—kicked off in 2011 and culminated with launch of *Transferencias 3.0* in 2020—has achieved scale via an FPS operated by the private sector. Argentinians now make 203 fast payments per year, on average, up from 2.8 in 2017. Costa Rica's FPS—*SINPE Móvil*, operated by its central bank—was established in 2015 but gained rapid adoption beginning in 2020 with the onset of the COVID-19 pandemic; as of 2024, Costa Ricans make 156 fast payments per year, on average, up from 0.3 in 2017.

Bolivia, Mexico, Paraguay, and Peru have also seen strong and sustained growth in fast payments since 2020 as their ecosystems mature. Adults in these countries now make 30–60 fast payments per year, on average, up from fewer than one in 2017. Chile has also seen continued expansion in fast payments usage, albeit from a higher baseline and lower recent growth, reaching 67.6 fast payments per adult in 2024. Colombia stands out as having a combination of multiple and relatively well-established FPSs and a very modest scale-trajectory (see Figure 4). This is likely due to the persistent market power of closed-loop solutions and a high share of intra-PSP transactions as well as limited functionality of early FPS implementa-

tions. Despite sustained growth of their FPSs, the Dominican Republic and El Salvador still have fewer than 10 fast payments per adult per year, highlighting the importance of the ongoing FPS reforms in both countries. The rate of user adoption in the highest-performing countries is now more than 70 times that of the lowest-performing countries. This disparity should be seen through the lens of system design, underscoring the importance of FPS features that underpin fast payments' value proposition to customers (see Section 2.2).

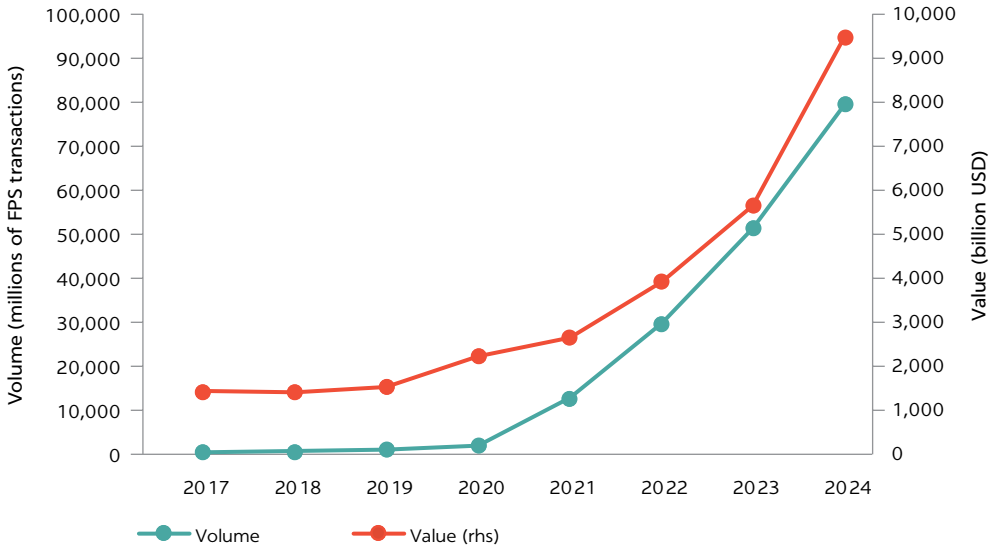
Growth in fast payments remains strong across the board, but the most recent data suggests that Bolivia, Colombia, Peru, and Paraguay remain on encouragingly strong growth paths. The average growth rate in fast payment transactions per adult between 2023 and 2024 was 100.5 percent across all 11 countries (see Figure 5). However, the 2023–24 growth in Bolivia, Colombia, Peru, and Paraguay—all above 130 percent—suggests particularly encouraging growth paths in the coming years, albeit from relatively lower baselines compared to top regional performers like Brazil, Argentina, and Costa Rica. More concerning are the countries that have both low baselines and lower growth: Mexico and, to a larger degree, the Dominican Republic lag behind their country peers in terms of fast payment transactions per adult, and each has a recent annual growth rate of 40–45 percent.

Several other LAC jurisdictions are at different stages of developing their FPS strategies and infrastructures. In South America, Uruguay has significantly accelerated FPS reforms in the last few years, achieving 24/7 operations in the private sector-operated clearinghouse and introducing a P2M use case in 2023 and 2024, respectively. Ecuador is characterized by fragmentary and partial solutions: in this context, the central bank has recently promoted interoperability through regulation. In Central America, Honduras, Guatemala and Nicaragua have nascent fast payment ecosystems, often characterized by interoperability challenges. In the Caribbean region, Aruba and St. Martin and Curacao have live FPS, whereas Barbados, Belize, Guyana, Trinidad and Tobago are at different stages of developing FPSs.

3.2 DESIGN FEATURES THAT UNDERPIN THE FPS VALUE PROPOSITION IN LAC

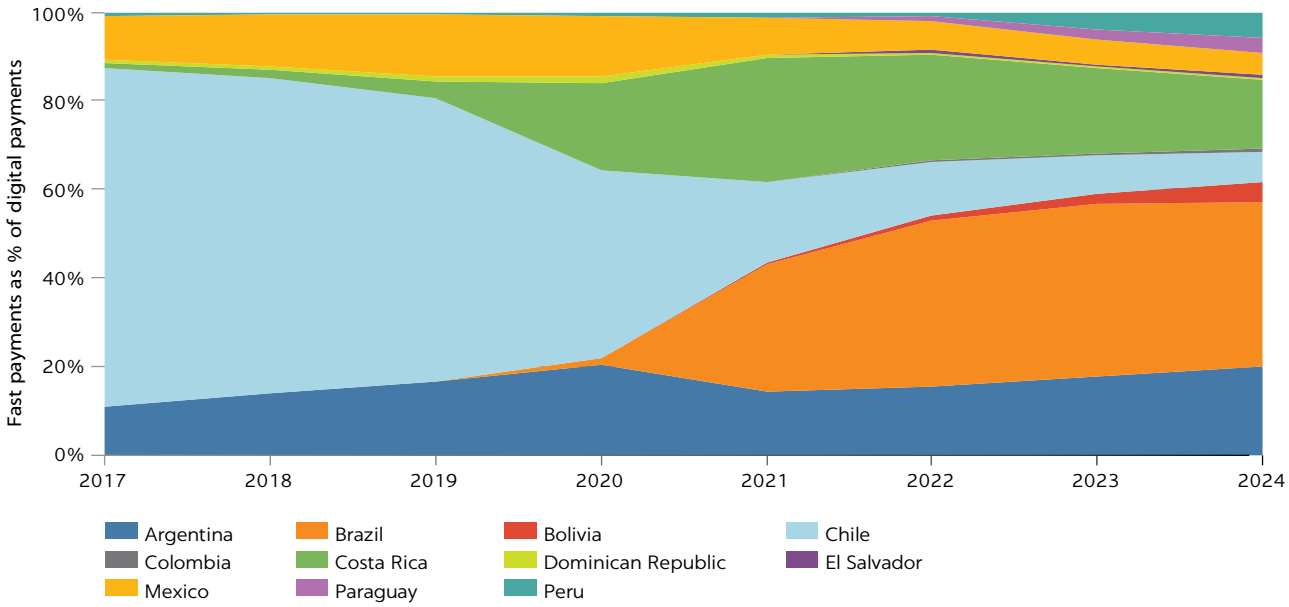
FPS models and design features vary widely across the LAC region. For the purposes of the analysis in this section, 10 key features were used to analyze and compare FPS design choices: 24/7 operation, speed of availability of funds, participant diversity, access models (direct and indirect participation), nonbank direct access, variety of access channels, supported payment instruments, alias functionality, range of use cases (domestic), and transaction limits. These key

FIGURE 2 **FPS transaction volumes and value have grown rapidly since 2020**



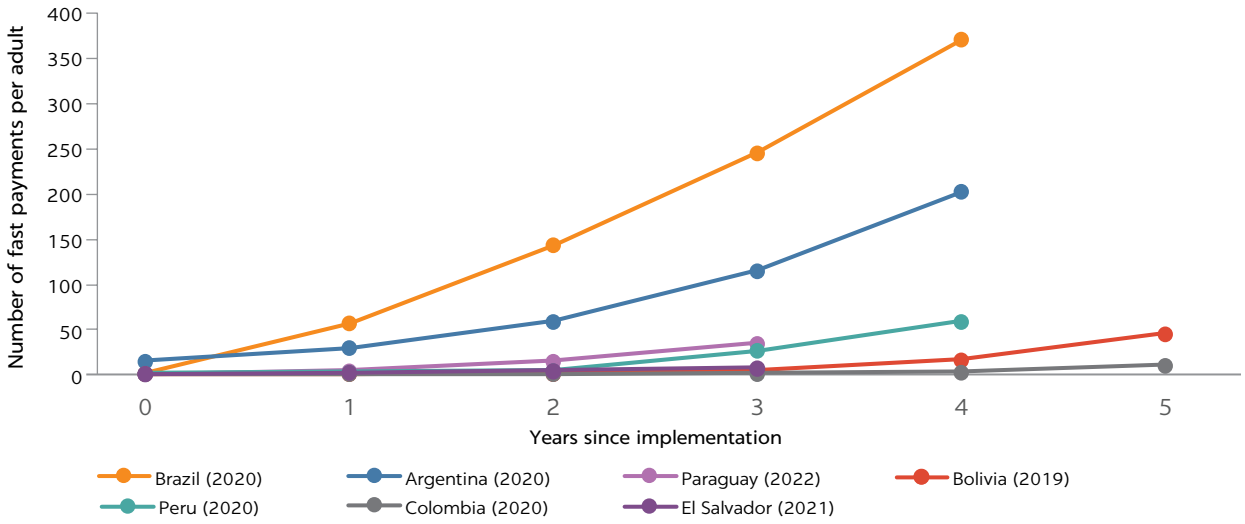
Source: Author's elaboration with data provided by central banks.
Note: Data includes only centrally cleared transactions, i.e. inter-PSP transactions."

FIGURE 3 **Chile and Mexico were first movers, but Brazil, Argentina, and Costa Rica now lead in terms of FPS transactions per adult (FPS volume share per adult, by country, 2017–24)**



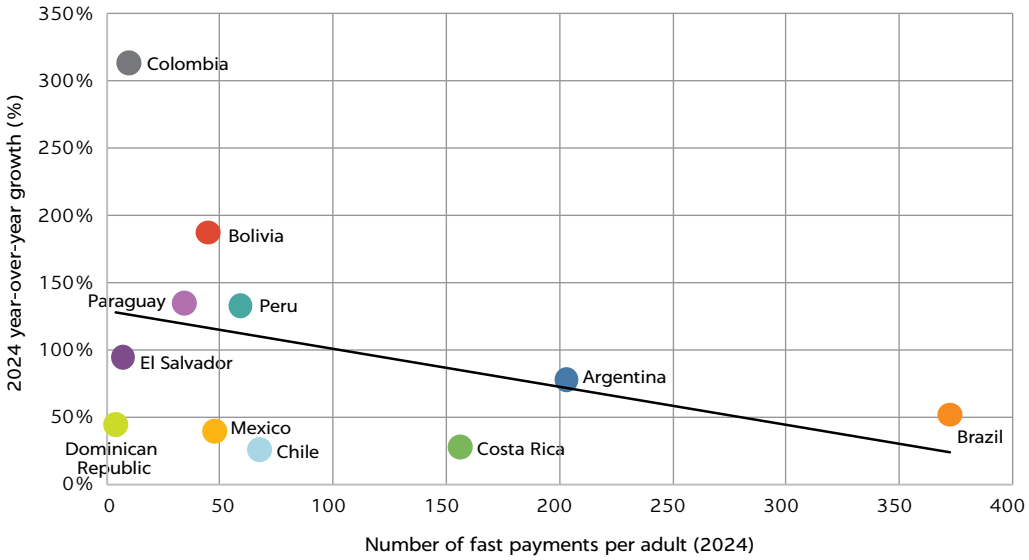
Source: Author's elaboration with data provided by central banks; United Nations Population Division (adults defined as age 15+).
Note: Each country's relative share per year is determined by first calcuating the FPS Volume per adult in each country, then summing the values, then calculating the relative share of each country. Thus the population of each country is weighted equally. Data includes only centrally cleared transactions, i.e. inter-PSP transactions."

FIGURE 4 **LAC-11 countries have followed diverse FPS-scale trajectories, with Brazil and Argentina growing most quickly**



Source: Author's elaboration with data provided by central banks; United Nations Population Division (adults defined as age 15+).
Note: Due to variations in launch months within calendar years and data availability, T+0 corresponds to the year prior to the launch year (noted in parentheses) for Colombia and Paraguay, and for the launch year for Argentina, Bolivia, Brazil, El Salvador, and Peru. Countries that launched FPS prior to 2018 are not included due to limited data. Data includes only centrally cleared transactions, i.e. inter-PSP transactions.

FIGURE 5 **Colombia, Bolivia, Paraguay, and Peru are showing high rates of recent growth in fast payments, possibly closing the gap with Brazil, Argentina, and Costa Rica**



Source: Author's elaboration with data provided by central banks; United Nations Population Division (adults defined as age 15+).
Note: Data includes only centrally cleared transactions, i.e. inter-PSP transactions.

TABLE 2 **Growth in fast payment transactions, 2017–2024**

	FPS TRANSACTIONS PER ADULT					2023-2024 GROWTH IN FPS TRANSACTIONS PER ADULT (%)
COUNTRY	2017	2019	2021	2023	2024	
Argentina	2.8	6.8	29	115	203	76
Bolivia	0	0.0	0.7	16	45	182
Brazil	0	0.0	57	247	373	51
Chile	19	26	36	54	68	25
Colombia	0	0.0	0.2	2.5	10	308
Costa Rica	0.3	1.6	56	123	156	27
Dominican Republic	0.2	0.5	1.4	2.8	4.0	43
El Salvador	0	0.0	0.0	3.7	7.2	93
Mexico	2.6	5.7	17	35	48	38
Paraguay	0	0.0	0.0	15	34	132
Peru	0.2	0.2	2.5	26	59	130
LAC-11 average	1.6	3.0	32	124	190	53

Source: Author's elaboration with data provided by central banks; United Nations Population Division (adults defined as age 15+).
Note: Data includes only centrally cleared transactions, i.e. inter-PSP transactions.

features have been synthetized in a composite measure: the FPS Design Maturity Index (see Box 1 and Appendix A).

The FPS Design Maturity Index reveals that most countries still have significant scope to enhance the design of their FPS (see Figure 6).[19] Brazil scores highest, thanks to a broad range of use cases, direct- and indirect-participation options, extensive access channels, and unmatched alias functionality. Argentina, Peru, Bolivia, Chile, Costa Rica, Mexico and Paraguay demonstrate middle to high sophistication levels and are characterized by fewer payment instruments, limited alias functionality or more limited use-case breadth. The Dominican Republic and El Salvador show more basic setups lacking some key FPS features (24/7 operation and/or instant availability of funds).

Nonbank participation is a critical feature of modern FPSs: all countries enable nonbank access in some form, but direct access for licensed nonbanks is not universal. All countries with an operational FPS permit direct participation of at least some nonbank PSPs, including fintechs, telcos, and digital wallet operators. In seven countries—Argentina, Bolivia, Brazil, Colombia,[20] Costa Rica, Paraguay, and Peru—nonbanks now outnumber banks in FPS participation (including direct and indirect participants). This openness has spurred service diversity and broader outreach. However, some countries where nonbank PSPs play a particularly significant role, such as Argentina and Paraguay, still lack direct-participation models for some types of nonbank PSPs. In Argentina, the *Proveedores de Servicios de Pago* lack direct participation, as is also the case in Paraguay for *Entidades de Medios de Pago Electrónicos*. In both countries, these include some of the largest providers of digital payments, and their exclusion could constrain interoperability and limits competition.

Settlement models in Latin America show a mix of real-time and deferred approaches that reflect each country's financial infrastructure and risk tolerance. Brazil, the Dominican Republic, Paraguay, and one of Colombia's systems oper-

BOX 1 THE FPS DESIGN MATURITY INDEX

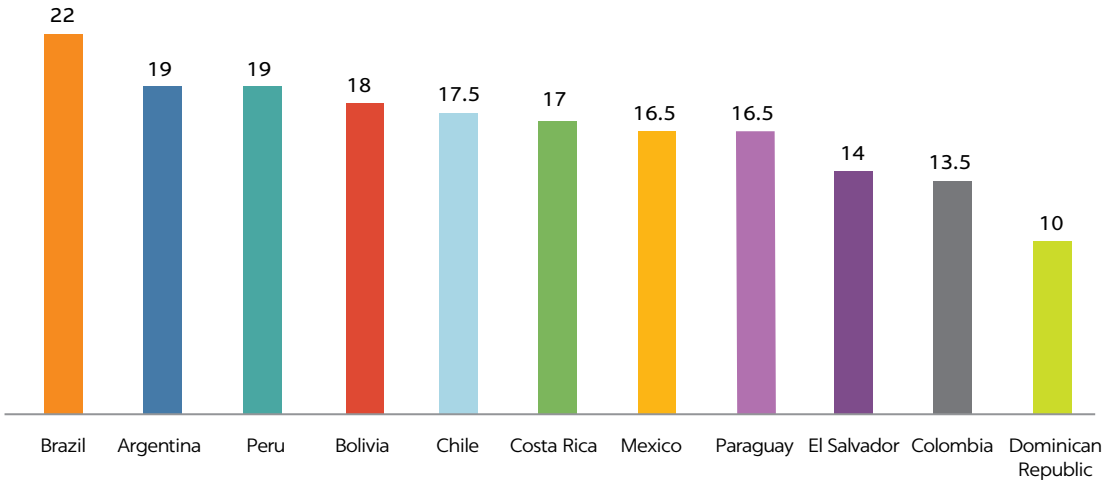
The FPS Design Maturity Index is a composite index calculated by aggregating the number of points achieved according to the following methodology:

- 24/7 operation: Yes = 3 points, no = 0 points.
- Speed of availability of funds: Instant availability = 3 points, otherwise = 0 points.
- Number of participant types (banks, nonbanks): Both = 1 point, only banks = 0 points.
- Participation scheme type (direct, indirect): Both = 1 point, only direct = 0 points.
- All types of licensed nonbanks can participate directly in the FPS: Yes = 2 points, no = 0 points.
- Number of access channels (mobile application, internet banking, QR codes, ATMs, agents, POS devices): More than four channels = 2 point, three or four channels = 1.5 points, fewer than three channels = 1 points.
- Number of payment instruments (credit transfer, direct debit, other): More than one = 2 point, only one = 1 points.
- Types of aliases supported (phone number, email address, national ID, corporate registration number, scheme-specific proxy identifier, other): More or equal to three = 3 points, two = 2 points, one or two = 1 points, zero = 0 points).
- Type of domestic use cases that has been technically enabled by the FPS operator and has gone live at the time of assessment (P2P, P2M, G2P, P2G, other): 1 point for each use case, with a maximum score of 5 points.
- Transaction limits specified at the FPS level (no limits, limits): No limits = 1 point, high limit (more than US$500 per day) = 0.5 points, low-value limits = 0 points.

The maximum score is 23. In the case of countries with multiple FPS, the most sophisticated FPS is included. The calculation of the score reflects the adherence of the system's instruments, rules and procedures to the criteria above, based on information provided by the participating central banks and other publicly available information.

Source: Author's elaboration.

FIGURE 6 **FPS design maturity index**



Source: Author's elaboration.
Note: In the case of countries with multiple FPS, the most sophisticated FPS is included.

ate under real-time gross settlement, ensuring immediate inter-PSP settlement. In contrast, Argentina, Chile, El Salvador, and several systems in Peru, Bolivia, and Colombia rely on deferred net settlement, prioritizing efficiency through batch processing over instantaneous settlement. Hybrid models are present in Costa Rica and Mexico, offering a balance between speed and liquidity optimization.

Access channels in LAC FPS ecosystems have evolved toward mobile-first environments, but quality and consistency vary significantly. Countries such as Brazil, Argentina, and Paraguay offer native integration with mobile apps, QR code scanning, and responsive APIs that facilitate real-time execution and simplified front-end design. These systems allow users to initiate payments from banking apps, digital wallets, or merchant interfaces with minimal friction. In Mexico, similar capabilities exist through SPEI's CoDi platform, although merchant and consumer uptake has lagged. In contrast, El Salvador and the Dominican Republic have yet to achieve seamless or standardized mobile integration across institutions. In these markets, access is often limited to specific PSPs or routed through online banking portals, reducing real-time usability. Costa Rica's *SINPE Móvil*, while widely adopted, is built as an overlay, rather than a native application, limiting its integration with merchant environments and broader digital ecosystems.

Aliases—used to simplify payment initiation and enhance interoperability—are gaining traction across most FPSs, though implementation status varies. In Brazil, Argentina, and Paraguay, aliases allow users to transact using phone numbers, email addresses, phrases selected by end users, or national IDs, instead of full account details. These systems have proven critical in scaling P2P usage and reducing onboarding friction for new users. In contrast, prior to Bre-B, Colombia supported aliases in some FPS platforms (for example, *Redeban* and *Transfiya*), but not universally or in an interoperable manner across the ecosystem. Costa Rica's *SINPE Móvil* also leverages mobile numbers as proxies but lacks multi-alias options. Mexico faces a similar situation with DiMo, an overlay service that runs on top of SPEI and allows to make interbank transfers by using mobile phone numbers as aliases. As aliases continue to shape user expectations, gaps in implementation increasingly represent a competitive and inclusion disadvantage.

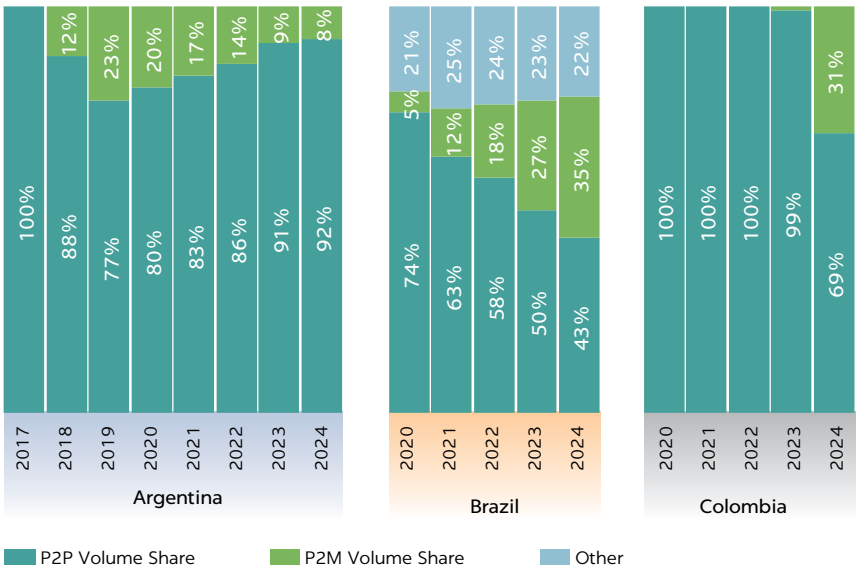
Use-case diversity is a key benchmark of FPS maturity, but adoption remains uneven across the region. As of 2024, only a subset of countries with operational FPSs have fully deployed P2M functionality, and a few others are still in the process of implementation. Argentina, Brazil, Chile, and Peru are currently offering live and full-scale P2M functionality through their FPS platforms. Paraguay has not yet deployed P2M use cases but is in the process of doing so. In Mexico, the CoDi platform was launched to promote merchant payments, but its uptake has been limited, and lacks integration at the POS terminals. Costa Rica, despite high mobile and wallet penetration through *SINPE Móvil*, remains limited to P2P. In Colombia, P2M is supported by only one FPS, but an effort to ensure P2M interoperability is under way.

A few countries—particularly Brazil and Argentina—have also begun incorporating public-sector payments, such as taxes and utility services, positioning FPS as a central infrastructure for broader government payments.

The evolution of P2P and P2M transaction shares across Argentina, Brazil, and Colombia illustrates varying levels of progress in use-case diversification—but also reveals that P2M has become consistently relevant at scale only in Brazil (see Figure 7). Between 2020 and 2024, Brazil stands out as the only country where P2M transactions have grown year after year, increasing from 5 percent to 35 percent of total FPS volume. In contrast, Argentina showed early promise, with P2M reaching 23 percent in 2019 following the introduction of *Transferencias 3.0*, but its share has since declined to just 8 percent by 2024—suggesting that growth has remained concentrated in P2P use. It should be noted though that these data may "conceal" the vast acceptance ecosystems of large technology firms (e.g., e-commerce and food/grocery delivery platforms) and high volumes of on-us transactions, which represent de-facto "parallel" systems and, depending on the country, may be more or less integrated with the domestic FPS. Colombia, after years of operating FPS systems without merchant functionality, saw a sudden jump in P2M usage in 2024—from 1 percent to 31 percent—indicating that merchant enablement is only now beginning to take hold. Taken together, the data underscores that while multiple countries have enabled P2M use cases, Brazil is currently the only LAC country where merchant payments via FPS have achieved consistent, scalable growth, positioning it as a reference for deeper P2M integration. Section 4.1 further examines the opportunities for use-case diversification in fast payments.

Transaction limits across FPS platforms remain significantly lower than traditional payment instruments, such as cards, often as a risk mitigation measure. Transaction limits can be used by policy makers and FPS operators as a risk mitigation measure, including to support fraud mitigation and AML/CFT compliance. While most LAC FPS systems have progressively raised ceilings since launch, they still impose more conservative thresholds than credit or debit cards, which often allow virtually unlimited spending within account or credit limits. Brazil's *Pix,* for instance, has default nighttime P2P caps of R$1,000 (approximately $200), with higher thresholds allowed for verified users during business hours. Argentina's *Transferencias 3.0* launched with moderate caps for P2P transactions that can be adjusted based on user profile and transaction context. Peru's CCE *Transferencias Inmediatas* permits FPS transfers up to S/. 30,000 (approximately $8,000), one of the highest in the region, while Costa Rica's *SINPE Móvil* still limits most users to $200–4,000, depending on institutional rules. Transaction limits established at the FPS-level can discourage adoption and broad-based use of fast payments if set too low; in most cases, PSPs are in a better position to adjust clients' transaction limits based on risk assessments. Indeed, as fraud controls, user authentication, and liquidity management

FIGURE 7 **P2P remains the dominant FPS use case in most LAC-11 countries**



Source: Author's elaboration with data provided by central banks.
Note: The figure includes countries that reported FPS Volume disaggregated by use case.

improve, many regulators and operators are considering tiered or dynamic limit models to close the gap and expand FPS utility in high-value scenarios.

As mentioned earlier, pricing is a critical element of the FPS value proposition in LAC, where cost has traditionally been perceived as a high barrier to owning and using transaction accounts. In general, end-user pricing strategies for fast payments in LAC have prioritized affordability and user uptake, particularly for P2P payments. In the majority of countries with mature systems—such as Brazil (*Pix*), Argentina (*Transferencias 3.0*), and Paraguay (SPI)—P2P fast payment transactions are entirely free for end users. Costa Rica's *SINPE Móvil* allows free transfers up to a capped limit, and Bolivia's three coexisting systems report a zero-average fee for P2P, despite allowing commissions up to Bs 10 (roughly $1.44). These zero-fee policies are often mandated through regulatory guidance or institutional incentives, reflecting a deliberate strategy to drive mass adoption and support inclusion, particularly among low-income and first-time users. In Peru, fast payments have acted as vehicle for undercutting long-standing pricing structures in traditional ACH transfers.

On other hand, merchant payment pricing across the region is uneven, with some markets following uncongenial ad valorem models and others lacking the flexibility and incentives needed to expand P2M use cases. FPS transactions do not expose PSPs to merchant credit risk and benefit from scale and automation, resulting in declining marginal costs per transaction. Furthermore, ad valorem pricing can act as a "regressive tax" by placing a heavier burden on smaller merchants and low-value transactions, particularly those with limited bargaining power and those who must operate on razor-thin margins. In Argentina the central bank via regulation exempted low-value payments (up to 1,000 units of purchasing power (for ARG-denominated transactions, and $/€1,000 for USD/EUR-denominated transactions); after that, merchant fees must be set within a range (0.6 percent-0.8 percent of the transaction value). At the same time, preventing PSPs from earning revenues may discourage market participation, in the absence of other incentives, especially when PSPs can earn revenues through other networks. The experience of Mexico, which removed fees for CoDi, the QR-enabled interoperable fast payments scheme, was characterized by low private sector engagement.

FPS pricing in LAC should be calibrated to reflect costs, promote inclusion, and at the same time allow reasonable revenues to guarantee resiliency and innovation. Where ad valorem pricing can disadvantage small merchants and low-value transactions, international experience shows clear alternatives, including fixed-fee or hybrid models (see Box 3). Regulators can promote tiered structures that combine zero or capped fees for small-value payments, fixed fees for mid- and high-value transactions, and clear disclosure of charges. Countries with flat-fee regimes can further advance inclusion by exempting low-value payments, while those with ad valorem models should evaluate whether fees reflect true marginal costs and consider introducing caps or transitioning to hybrid approaches. As FPSs continue to expand, aligning pricing frameworks with principles of efficiency and inclusion will be essential to protect small actors, broaden adoption, and spur innovation in digital payments.

Even the most mature FPSs in LAC have room to improve and can learn from global FPS experiences. The maturity of FPS in LAC still lags behind several other countries that have built a comprehensive ecosystem of use cases to reflect the central role these systems now play in their economies. A clear example is India's UPI, which offers design innovations largely absent in LAC but with strong potential to enhance inclusion and usage. These include options to make and accept transactions in low-connectivity scenarios, tailored use cases for large volume payments like mass transportation and government payments, integration of Digital ID, simplified onboarding for micro and small merchants, and integration with credit lines and cards.

3.3 FAST PAYMENT SYSTEMS AS A CATALYST FOR DIGITAL PAYMENTS

FPS have become the principal driver of digital payment growth in LAC-11. Overall usage of digital payments per adult in LAC-11 has more than quadrupled since 2017. The rapid growth of digital payments across LAC-11 reflects a confluence of long-term reform and short-term disruption, most notably the rollout of FPS and the COVID-19 pandemic. As discussed in Section 2.1, seven countries deployed FPS infrastructure between 2020 and 2023. The COVID-19 pandemic helped to catalyze the growth of these new FPS but also boosted the growth of FPS launched during the 2010s. In Costa Rica, for example, the pandemic significantly boosted the uptake of *SINPE Móvil,* which had been launched in 2015 but reached scale only during the crisis. Between 2020 and 2024, fast payments per adult grew at an annual average rate of 145 percent, accounting for 63 percent of the total

BOX 2 REGIONAL AND INTERNATIONAL EXPERIENCE ON FPS PRICING TO END USERS

The marginal cost of processing an electronic payment does not meaningfully increase with the value transferred, so percentage-based charges amount to an arbitrary "tax" on higher-value payments. Ad valorem fees can deter usage. For example, businesses or individuals may avoid using an instant transfer for large payments if a high-percentage fee applies, sticking with cash or slower methods. Fixed fees, by contrast, promote fairness and transparency, and when set at a low level (or waived entirely), they encourage broad adoption of the FPS.

Thailand: PromptPay: Thailand's PromptPay, launched as part of a national digital payments initiative, also implemented a tiered flat-fee structure that effectively makes most routine transfers free or extremely cheap. Under PromptPay's standard tariff (set by authorities in agreement with banks), transfers up to a threshold are free, and above that only a few baht per transaction are charged. For example, transfers not exceeding B 5,000 (about $150) incur no fee; transfers from B 5,001 to B 30,000 cost just B 2; those up to B 100,000 cost B 5; and even the largest allowed transfers cost only B 10 (about $0.30).

Nigeria: NIBSS Instant Payments (NIP): Nigeria has one of Africa's most established FPS in Africa, NIP. From inception, NIP's pricing has been based on flat fees per transaction, not on a percentage of the transfer value. NIBSS (which is coowned by the central bank and commercial banks) charges participant banks a few naira per transaction. Banks in turn typically charge customers a fixed fee as well. In mid-2023, NIBSS took a further step to cut the switching fee for NIP by 25 percent, from N5.00 to N3.75 (approximately $0.005) per transaction.

Sweden: Swish: Sweden's widely adopted fast payment system operates on a fixed-fee model that prioritizes affordability and simplicity. For individuals, Swish is entirely free of charge. Users can send and receive payments instantly via a mobile phone without incurring any fees. For businesses and registered organizations, Swish applies a nominal flat fee per received payment, typically around SKr 2 (roughly $0.20), although the exact fee may vary slightly by bank. Importantly, organizations are not permitted to pass this fee on to consumers, ensuring that end-user pricing remains stable.

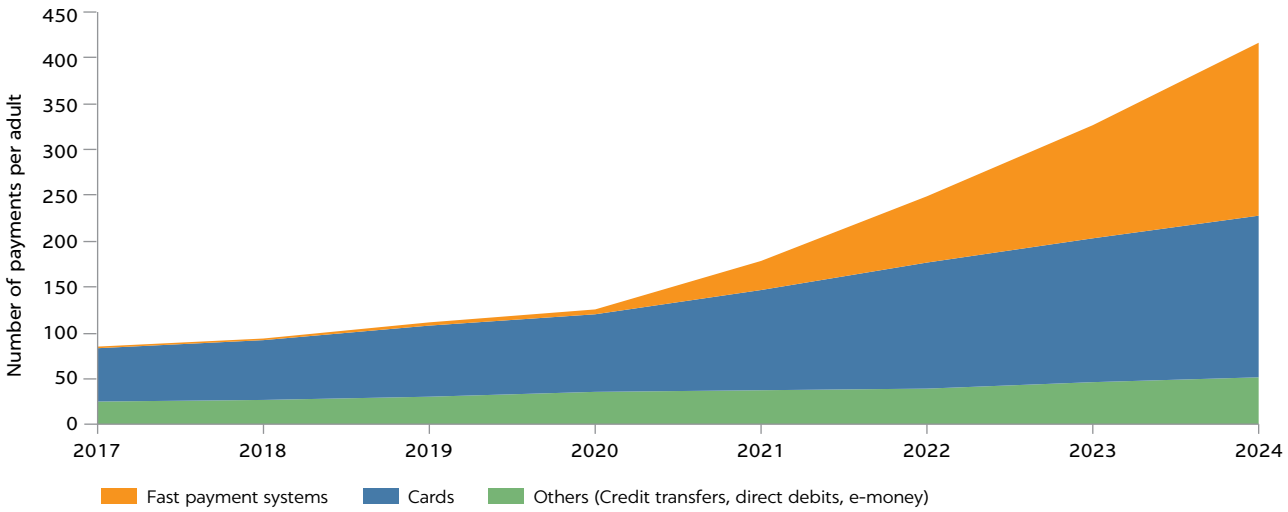
Source: Author's elaboration based on public information.

growth in digital payments. Fast payments now account for nearly 45 percent of all (centrally cleared) digital payments in LAC-11—up from just 2 percent in 2017.[21]

In a few LAC-11 countries, FPS have become the leading digital payment rail by volume, overtaking traditional card rails. In Bolivia, Argentina, Peru, Brazil, and Paraguay, FPS now account for close to or more than 40 percent of all digital transactions—70.0 percent, 56.4 percent, 48.9 percent, 47.7 percent, and 44.4 percent, respectively. Costa Rica has also shown strong FPS penetration in the digital payment market, with a 34.2 percent share. In contrast, other countries remain dominated by other forms of digital payments (principally cards). In Mexico, cards still lead with 67.3 percent, but FPS has risen to 32.0 percent. Colombia and Chile remain more heavily card-dominated, with cards making up 61.5 percent and 82.4 percent of transaction volumes, respectively, and FPS trailing at 15.6 percent and 17.6 percent, respectively. A more detailed analysis[22] reveals that Brazil and Argentina have had the strongest acceleration in the FPS share of digital payments since the FPS launch. Peru, Paraguay, and Bolivia also demonstrate solid momentum, while Costa Rica, Mexico, and El Salvador present more gradual growth trajectories. In contrast, the Dominican Republic and Chile register minimal change. These differences underscore varying levels of FPS integration into retail payment ecosystems.

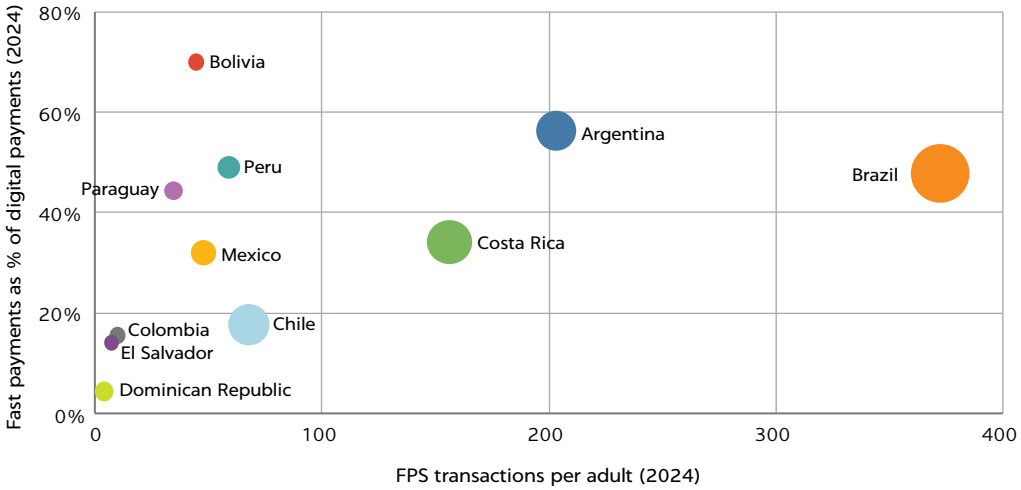
When accounting for the development of the digital payment ecosystem, some countries show greater FPS traction than others. When assessing the development of the digital payment ecosystem, the Competitive Dominance Index[23] provides a composite view of FPS traction. This index captures both the depth of adoption (usage intensity) and the relative importance of FPS compared to other digital rails. For instance, while Bolivia shows a high FPS share, accounting for 70 percent of total digital payment volumes (see Table 3), it ranks low on the 2024 index (31.3), suggest-

FIGURE 8 **Fast payments are driving the acceleration of digital payments growth in LAC-11, now representing approximately 45 percent of centrally cleared digital payments volume**



Source: Author's elaboration with data provided by central banks; United Nations Population Division (adults defined as age 15+).
Notes: "Others" include only centrally cleared transactions. "Cards" include payments made with debit, credit, and prepaid cards. Data includes only centrally cleared transactions, i.e. inter-PSP transactions.

FIGURE 9 **Fast payments now represent more than 45 percent of all digital payments in Argentina, Bolivia, Brazil, Paraguay, and Peru**



Source: Author's elaboration with data provided by central banks; United Nations Population Division (adults defined as age 15+).
Note: The size of the bubble represents the total number of digital payments per adult in each country. Data includes only centrally cleared transactions, i.e. inter-PSP transactions.

ing that its FPS dominance stems more from limited competition than widespread usage. In contrast, Brazil (177.8) and Argentina (114.4) lead the region, reflecting strong FPS penetration in highly digitalized markets.

FPS growth at this stage has complemented—rather than cannibalized—existing digital payment[24] rails, with recent growth in card payment volumes exceeding prepandemic trends. In many LAC-11 economies, card payments, after a drop in 2020 due to mobility restrictions, which hindered in-person transactions, have continued to grow at or above prepandemic rates, even alongside dramatic FPS expansion. Card payment volumes have grown 23.5 percent annually on average during 2021–24, exceeding the average annual rate of 19.0 percent during 2017–19 (see Table 4. The acceleration in card growth has been particularly pronounced in Costa Rica, Mexico, and Peru. Brazil and Bolivia were the only countries in which

growth in card payment volumes slowed during 2021–24 relative to 2017–19, but in both cases annual card growth remained above 13 percent. It appears that, at this stage of FPS development in most LAC-11 countries, FPS have helped expand the overall digital ecosystem, bringing new users into formal finance and encouraging multirail usage depending on value, channel, or use case. Indeed, empirical evidence from Brazil has also shown that the introduction of *Pix* has led to greater use of payment products across a range of instruments.

Relative to card payments and other digital payment instruments, FPS are being primarily leveraged for lower-value transactions in most LAC-11 countries. Across LAC-11, FPS on average represent 45 percent of all (centrally cleared) digital payment transaction volumes but just 34 percent of all digital payment transaction values. This suggests stronger adoption of FPS for small-ticket P2P transactions and low-value P2M and limited use for higher-value use cases such as bill payments and business-to-business payments, which remain dominated by credit transfers and card rails in most countries. Indeed, the average ticket size of FPS transactions is less than 60 percent of that of non-FPS transactions in Argentina, Brazil, Bolivia, Colombia, Costa Rica, and Peru. For example, in Costa Rica, the average ticket size for an FPS transaction is $28, equivalent to just 11 percent of the average value of a non-FPS digital payment transaction ($245) (see Table 5).

TABLE 3 Competitive Dominance Index

COUNTRY	FPS TRANSACTIONS PER ADULT	SHARE OF FPS TRANSACTIONS IN DP (%)	INDEX VALUE
Brazil	372.5	47.7	177.8
Argentina	203	56.4	114.4
Costa Rica	156	34.2	53.3
Bolivia	44.7	70.0	31.3
Peru	59.1	48.9	28.9
Paraguay	34.4	44.4	15.3
Mexico	47.6	32.0	15.3
Chile	67.6	17.6	11.9
Colombia	10	15.6	1.6
El Salvador	7.2	14.1	1.0
Dominican Republic	4	4.5	0.2

Source: Author's elaboration with data provided by central banks; United Nations Population Division (adults defined as age 15+).
Note: Data includes only centrally cleared transactions, i.e. inter-PSP transactions.

TABLE 4 Card payment volumes have accelerated along with FPS in most LAC-11 countries

COUNTRY	2017–19 (%)	2021–24 (%)
Argentina	16.6	21.0
Bolivia	25.1	13.2
Brazil	20.4	15.8
Chile	19.8	19.4
Colombia	18.3	21.8
Costa Rica	12.8	23.2
Dominican Republic	9.3	18.2
El Salvador	n/a	31.6
Mexico	14.7	25.5
Paraguay	n/a	35.7
Peru	22.5	33.2
Average LAC-11 (unweighted)	17.9	23.5

Note: Compounded annual growth rate.

TABLE 5 Average size of digital payments in US dollars (2024)

COUNTRY	AVERAGE DP VALUE PER PAYMENT	AVERAGE FPS VALUE PER PAYMENT	AVERAGE NON-FPS VALUE PER PAYMENT	AVERAGE FPS / AVERAGE DP VALUE PER PAYMENT
Argentina	706	312	1,215	26%
Brazil	124	80	164	49%
Bolivia	95	59	179	33%
Chile	268	1,405	25	5,704%
Colombia	177	27	204	13%
Costa Rica	171	28	245	11%
Dominican Republic	214	2,128	123	1,726%
El Salvador	221	838	120	701%
Mexico	52	79	39	202%
Paraguay	42	62	26	242%
Peru	63	46	79	58%

Source: Author's elaboration with data provided by central banks.

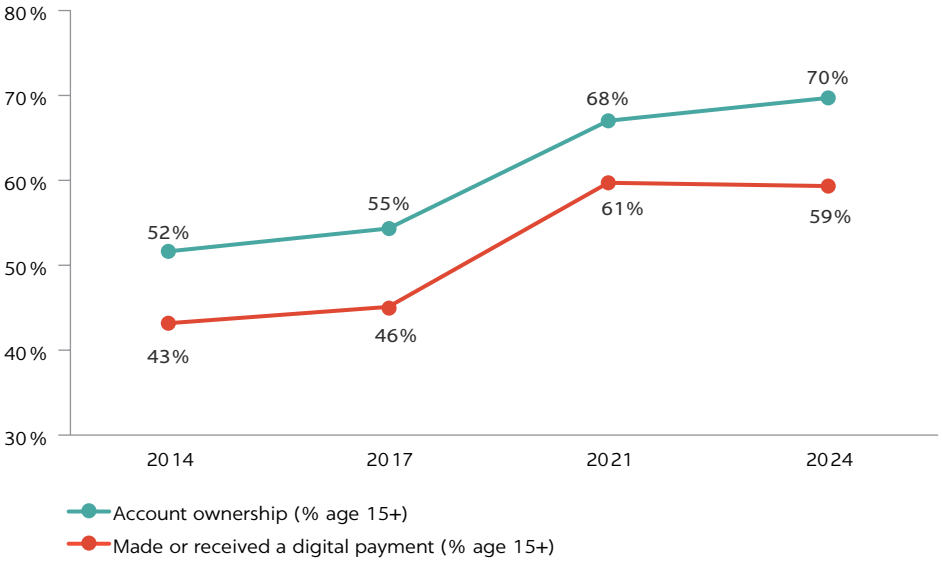
FPS in some LAC-11 markets are relevant for higher-value transactions due to design gaps for retail use, yet this also underscores their potential for business and large-value payments. In several countries, including Paraguay, Mexico, Chile, El Salvador, and the Dominican Republic, the average ticket size for FPS transactions exceeds that of non-FPS transactions (see Table 5). This outcome reflects structural considerations: either high or absent transaction limits, combined with the lack of retail-oriented design features such as limited use cases and user-friendly experiences for retail users. At the same time, this pattern highlights the potential of FPS to serve business payments and other higher-value use cases, where speed and efficiency can deliver significant benefits.

3.4 ARE FAST PAYMENTS BROADENING OR DEEPENING FINANCIAL INCLUSION?

The growth of fast payments requires basic levels of financial access—for example, account ownership—but can also serve to deepen digital financial inclusion and/or broaden financial access. Financial-sector policy makers have long distinguished between financial access and usage. Financial access is the ownership of a transaction account (with a bank or other licensed provider), while usage refers to whether the account is utilized to make payments or save. Those who have an account and use it regularly are financially included. Leveraging digital technologies such as digital wallets can generate *digital* financial inclusion. Making or receiving a fast payment requires access to an account; thus, for those with financial access, the convenience and affordability of fast payments can significantly increase account usage. Beyond payments, data generated from the use of fast payments can be leveraged by financial institutions to offer customized financial products. Recent research suggests that after an FPS is launched, the population borrowing from and saving in a financial institution rises by 3.9 and 3.0 percentage points, respectively.[25] In that sense, it is also possible that fast payments are likely to scale more quickly in markets with broad levels of ex-ante financial access (such as Brazil) compared to those with low levels of account penetration (for example, El Salvador). In theory, by increasing the utility of accounts and digital payments, fast payments can also pull unbanked adults into the formal financial sector, increasing financial access.

Account ownership and the use of digital payments in LAC has increased significantly over the past decade, but growth has slowed in the post-pandemic period. Account ownership in LAC[26] has risen significantly over the past decade, from 52 percent of adults (ages 15 and older) in 2014 to 70 percent in 2024 (see Figure 10). The use of digital payments has risen in tandem, from 43 percent of adults in 2014 to 59 percent in 2024. However, the growth rate of both indicators slowed notably from 2021 to 2024. This may reflect a trend correction following the large increases in account ownership and digital payment behavior during

FIGURE 10 **Account ownership and usage of digital payments has increased significantly since 2017, with slower progress since 2021**



Source: Global Findex Database (World Bank).

the pandemic: increases in financial inclusion after the pandemic may have been netted out by some share of the population reverting to informal financial behaviors (for example, someone who opened an account to receive an emergency G2P payment during the pandemic but did not subsequently use the account).

Fast payments appear to be deepening digital financial inclusion. The evidence on deepening digital financial inclusion is clear: digital payments per accountholder have increased 280.1 percent between 2017 and 2024, from 154.4 to 587.0 payments per accountholder per year, on average—with 60.7 percent of this growth attributable to fast payments. The increased use of digital payments via FPS also appears to be widespread across consumer segments: in Brazil and Costa Rica, more than 75 percent of adults use *Pix* and SINPE, respectively.[27] As discussed above, the data also shows that FPS growth complemented—rather than cannibalized—existing digital payment instruments, helping to expand the overall digital ecosystem and reduce reliance on cash.

The evidence for the impact of FPS on expanding financial access is more mixed. Many of the LAC countries that launched or reformed FPSs around 2020 with strong subsequent growth in fast payments during 2020–24 have also seen strong growth in account ownership between 2017 and 2024 (Findex data-collection periods). For example, account ownership grew by 33 percentage points in Argentina and 12–17 percentage points in Brazil, El Salvador, Mexico, Paraguay, and Peru during that period. For some countries—Argentina, El Salvador, and Paraguay—the growth in account ownership was spread across both data-collection periods: 2017–21 and 2021–24. For others, like Brazil, Mexico, and Peru, there was minimal or even negative growth during 2021–24. This may be because the initial burst of FPS-driven account opening was concentrated during 2020–21, at the height of the pandemic. In Costa Rica and Bolivia, there was little growth in financial access between 2017 and 2024, despite strong growth in fast payments.

Recent empirical research from Brazil does suggest that mature FPS ecosystems can drive account opening. The 2024 study finds that a 1 percent increase in the number of active users of *Pix* in a municipality leads to an increase of 0.80 percent in the number of people opening bank accounts for the first time. The study also finds complementarity effects across other dimensions, suggesting that *Pix* drove increases in the use of a range of payment instruments (not only fast payments), as well as access to credit and client growth in both traditional and digital banks. These findings suggest that more mature and inclusive FPS ecosystems—that encompass a wide range of use cases and promote interoperability across providers—do have the potential not only to deepen digital financial inclusion but also to expand financial access.

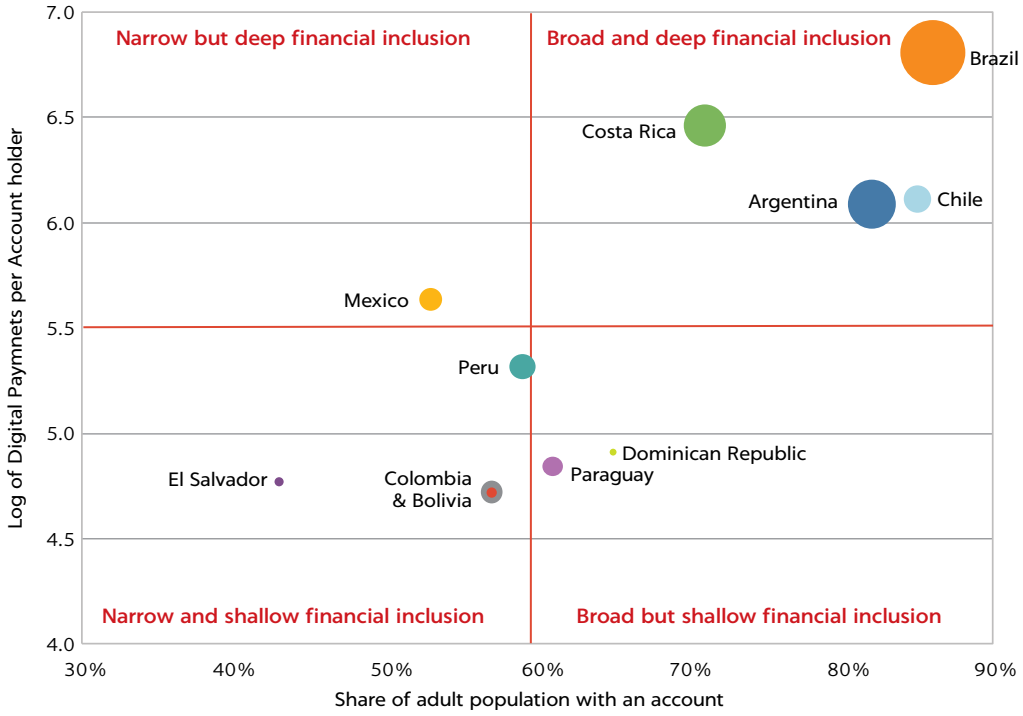
There remain significant opportunities to leverage FPS reforms to drive digital financial inclusion and financial access in Bolivia, Colombia, the Dominican Republic, El Salvador, Mexico, Paraguay and Peru. As of 2024, levels of financial access and digital financial inclusion are strongly correlated, but the residual variation also indicates notable divergence across LAC country experiences. A two-dimensional framework highlights that, while there is a broad correlation between financial access (as measured by account ownership) and digital payments usage (as measured by the average number of digital payment transactions per accountholder), there is signification variation across countries. By crossing these two dimensions, countries are classified into the following four quadrants:

- *Broad access and deep financial inclusion.* Argentina, Brazil, Chile, and Costa Rica have both broad levels of financial access (over 70 percent account ownership) and intense digital payment usage (more than 400 digital payments per accountholder per year, on average). This suggests inclusive and mature digital financial service ecosystems (often anchored in FPS).
- *Broad access but shallow financial inclusion.* Paraguay and the Dominican Republic have moderate levels of financial access (over 60 percent account ownership) but relatively shallow digital payment usage (fewer than 150 digital payments per accountholder per year on average). This suggests opportunities to further leverage FPS to drive digital payment usage.
- *Narrow access but deep financial inclusion.* Mexico has somewhat intense digital payments usage (281 digital payments per accountholder per year, on average) but concentrated among a relatively narrow population in terms of financial access (53 percent account ownership). Indeed, Mexico shows that digital and fast payments can develop and transform financial behaviors, but only among a narrow segment of the population. This suggests a need to prioritize addressing core enablers of financial access as well as ensure that FPS models are designed to meet the needs of underserved populations.
- *Narrow access and shallow financial inclusion.* Bolivia, Colombia, and El Salvador have both narrow levels of

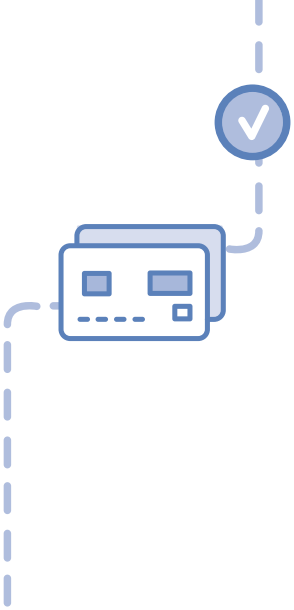
financial access (40–60 percent account ownership) and shallow digital payments usage (fewer than 120 digital payments per accountholder per year, on average). This suggests opportunities to address both core enablers of financial access as well as further leverage FPS to drive digital payment usage.

The analysis shows a differentiation between systems that are truly inclusive and mature versus those where digital payment activity remains fragmented or concentrated in specific user groups. It is notable that the four countries classified as having broad access and deep digital financial inclusion—Argentina, Brazil, Chile, and Costa Rica—are also those with the largest number of *fast* payments per adult (as indicated by the size of the bubble in Figure 11). Opportunities to leverage FPS to drive digital payment usage may be most relevant in Bolivia, Colombia, the Dominican Republic, El Salvador, and Paraguay. The analysis also shows that complementary reforms to drive financial access—for example, legal and regulatory frameworks that enable competitive and diversified financial sectors, the development of agent networks, robust consumer protections, etc.—are particularly urgent in several countries including Bolivia, Colombia, El Salvador, and Mexico.

FIGURE 11 **Digital payments can help drive financial inclusion progress but broader reforms are also needed**



Source: Author's elaboration with data from central banks and the Global Findex database (World Bank).
Note: The size of the bubble represents the total number of FPS payments per adult in each country.



4 FAST PAYMENTS CHALLENGES IN LATIN AMERICA AND THE CARIBBEAN: GOVERNANCE AND INTEROPERABILITY

Governance arrangements are a critical determinant of FPS scale and impact in LAC, whether the FPS is publicly or privately owned. FPS ownership models vary across the region. Neither public nor private ownership alone determines FPS implementation outcomes; on the contrary, regardless of the ownership model, governance arrangements are a critical component of any organization and have a bearing on sound decision-making, accountability, and the pursuance of public policy goals. Governance, as per the PFMI, is the set of relationships between owners, boards of directors (or equivalent), management, and other relevant parties in a payment or other settlement system, including participants, authorities, and other stakeholders.[28] While no one governance approach works for every country/FPS, this section argues that certain elements of the governance framework require careful consideration if FPS are to scale and generate meaningful impact on digital transformation and inclusion. The section also outlines how markets with multiple FPS—a recurrent feature of the LAC FPS journey (see Section 1)—can face more complex governance challenges.

Interoperability is another key challenge for fast payments that is closely intertwined with governance arrangements. Interoperability refers to the ability of different payment systems, platforms, and service providers to connect, exchange, and use information seamlessly across institutional and technical boundaries. At its core, interoperability ensures that users can initiate and receive payments regardless of the specific provider, wallet, or network they are using. This ability to transact fluidly across systems enhances user experience, expands choice, and promotes inclusion. True interoperability spans multiple layers—technical, operational, legal, and business. This involves harmonized standards for APIs, settlement, alias management, and user interfaces. Without such alignment, financial ecosystems remain fragmented, limiting the scale and impact of payment innovations. Sound governance arrangements support the consideration of public interests, including broad interoperability, and provide a transparent and inclusive environment for complex technical and business negotiations. Conversely, where governance arrangements fail to recognize and mitigate conflicts of interest, or stakeholders are not involved in major decisions, interoperability challenges are more likely to arise.

This section identifies the main issues for FPS governance and interoperability in LAC and discusses strategies to address them. Section 3.1 describes key trends in LAC FPS governance and extrapolates observations for adapting governance frameworks to the changing fast payment landscape. Section 3.2 discusses interoperability challenges stemming in particular from multiple FPS schemes and identifies different approaches to overcoming these challenges to achieve ecosystem-level interoperability. Section 3.2 also discusses opportunities for interoperability between FPS and digital ID.

4.1 ADAPTING GOVERNANCE FRAMEWORKS TO NEW MARKET REALITIES

Governance is a well-understood concept that has been comprehensively covered by international standards and

guidance (see Box 4); therefore, this section focuses on specific issues that have emerged in the LAC FPS evolution thus far. FPS evolution in LAC highlights the following three key trends:

i. *Compared to other regions, LAC hosts more markets with multiple FPSs and a combination of public and private fast payment initiatives.* Bolivia, Colombia, and Peru each has three or more FPSs and had at least one privately operated FPS prior to the central banks implementing/deciding to implement their own FPS. These central banks have invoked market failures, competition, interoperability, financial inclusion, and resilience.[29] Through Bre-B, Colombia's interoperable fast payment ecosystem, the central bank has outlined the key elements of a governance framework for a multi-FSP market that rests on regulatory-driven harmonization and central bank provision of critical ecosystem functions (settlement in central bank money, centralized alias directory), as well as a public system that will compete with private networks and interconnect with them following the same standards and obligations (see below).[30]

ii. *More central banks in the region have become FPS operators.* Of 16 FPS in 11 jurisdictions covered in the World Bank survey, half are operated by central banks. The forthcoming launch of *Drixi,* the Colombian central bank's own FPS, and the collaboration between the central bank of Peru and NPCI, will likely tip the scale against privately operated FPS. Only five years ago, prior to the launches by the central bank FPS of Brazil, El Salvador, Bolivia, and Paraguay, privately operated FPS dominated the regional landscape. Interestingly, there are no examples in LAC of joint public-private ownership models as seen in other regions—for example, in Jordan, Malaysia, and Türkiye.

iii. *Central banks that do not operate an FPS require proactive tools to steer private initiatives toward, and/or induce when warranted, public policy objectives.* Such tools may include regulation, stakeholder convening, and oversight. Nevertheless, enforcement can be challenging in practice. Argentina provides a unique example of three private infrastructures (COELSA, Prisma, and Banelco) operating under a public mandate and harmonized scheme rules, coupled with public-private collaboration on technical aspects through the *Comisión Interbancaria para los Medios de Pago de la República Argentina*.

From these trends, it emerges that fast payments lie at the heart of a complex interplay of cooperation and competition in LAC retail payment markets[31]—where governance can play a decisive role. Retail payments efficiency and other important public policy objectives like financial inclusion are largely influenced by the degree of cooperation and competition in a given market. For decades, LAC central banks have endeavored to achieve a better cooperation-competition nexus, following very different patterns of involvement in retail payment markets. The general rule of "cooperation in the upstream market and competition in the downstream market" remains broadly valid for FPSs and should (continue to) guide central bank action. The experience of Brazil with *Pix* could be interpreted as illustrating the merit in public-service provision of bypassing the complexity and fragmentation of traditional retail payments infrastructure that held off market development. By contrast, public-service provision might be more difficult to justify without the benefits of consolidation and might need to put a stronger emphasis on enabling cross-network interoperability (see Section 3.2).

FPS can significantly expand central bank operational responsibilities; moreover, as FPS operators, central banks will continuously need to ensure that their FPSs are up to date with market trends and innovations. Decision-making on issues like this at a central bank is quite different from that of a profit-seeking private operator. Reliance on forums with wide stakeholder representation, such as the *Pix* Forum in Brazil, can be used to help central banks make better decisions in this regard (see Box 5).

Central banks that operate FPS also need to continuously reassess the rationale and form of public-sector intervention. Some central banks that operate an FPS have had achieving lower prices for end users as one of their objectives for engaging in this role. If this involves some form of subsidization, at some point these central banks will have to ask themselves whether maintaining this policy over the medium term and beyond will not deter the private sector from developing other fast payments solutions—some that could be superior to what is currently offered (on a subsidized basis) by the central bank.

When the central bank acts as owner/operator and is also the regulator and overseer of retail payment systems and services, it needs to consider how best to address any possible conflicts of interest. This issue is not new—insofar as central banks often operate retail payment systems like cheque clearing systems and automated clearing-houses, and also oversee them—butmay be exacerbated in the event of the coexistence of an FPS operated by the central bank with FPS operated by the private sector, and in markets where traditionally the central bank has con-

BOX 3 INTERNATIONAL STANDARDS AND GUIDANCE ON GOVERNANCE WITH RELEVANCE TO FPS

A leading general reference is the G20/OECD Principles of Corporate Governance, which aim to provide *"shareholders, board members and executives, the workforce and relevant stakeholders, as well as financial intermediaries and service providers with the right information and incentives to perform their roles and help to ensure accountability within a framework of checks and balances."*

There is also extensive guidance for financial market infrastructures (FMIs), of which FPSs are a subset. The PFMI set out the international standards for FMIs. Principle 2 states: "An FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders."

The G20 Global Partnership for Financial Inclusion has made a recent contribution in the paper "Policy Recommendations for Advancing Financial inclusion and Productivity Gains through Digital Public Infrastructure (DPI)." Its focus is on DPI—that is, interoperable, open, and inclusive systems to provide essential, society-wide, public, and private services. Digital payment systems (especially FPSs) are one of three main types of DPIs. The following policy recommendations in the guidelines are relevant to governance of FPS:

- *Policy recommendation 2:* Develop well-designed DPIs and the broader enabling environment through a widely accepted set of good practices.
- *Policy recommendation 3:* Encourage appropriate risk-based regulation, supervision, and oversight arrangements for financial-sector use of DPIs.
- *Policy recommendation 4:* Promote sound internal governance arrangements.

Focusing more specifically on retail payment systems, the World Bank published "Governance of Retail Payment Systems: Keeping Pace with Changing Markets" in 2021. It expands on the PFMI in the specific area of retail payment systems, noting their increasing economic significance, diverse stakeholder communities, and complex policy trade-offs. The paper draws on examples from around the world to provide specific guidance on key governance issues and concludes with 11 themes for consideration for stakeholders of such systems, including

- Designing for the public interest;
- The roles of public authorities, particularly the central bank;
- Stakeholder involvement in governance;
- Transparency and management of perceived conflicts of interest; and
- The need for ongoing review and evolution of governance as market circumstances change.

Source: A Practitioner's Guide to Governance of FPS, Project FASTT Focus Note, World Bank, July 2025, *https://fastpayments.worldbank.org/sites/default/files/2025-07/FPS_Governance%20Note_Final.pdf*.

fined its operational role to systemically important payment systems and other financial market infrastructures. For FPS, the essence of this conflict lies in the potential lack of objectivity or conflicting interests within the institution, which in the extreme may lead the central bank, in its role as regulator/overseer, to set standards that may put private FPS at a disadvantage or hold them to higher standards. The PFMI recognize this conflict and address it through the functional independence of the operational and oversight functions. The central bank must ensure that it applies regulatory and oversight standards consistently to all FPS. Central banks may need to review the internal organization of payment functions to achieve clear separation of operator and oversight functions.[32]

The growth of fast payments emphasizes the urgent need to expand the central bank oversight toolbox. This might require increasing oversight resources and updating oversight frameworks and methodologies. A more prominent role as operator does not downplay the significance of central bank oversight. In some countries, volumes of transactions, the role the FPS plays within the economy, and a lack of substitutability may warrant the application of the PFMI or a subset thereof.

Regarding the governance arrangements of private FPS, in some cases a positive evolution has been observed, mainly due to the growing involvement of the central bank as regulator and overseer. As mentioned earlier, the

BOX 4 *'PIX* FORUM'

In Brazil, a working group was created to collaborate with *Banco Central do Brasil* (BCB) on the development of *Pix*. This dialogue platform contributed significantly to the design of the system. Therefore, BCB decided not to dismantle it after publication of the general framework and converted it into a permanent advisory committee (coordinated by BCB) with a consultative function. The committee is called the *Pix* Forum.

The forum's purpose is to support BCB in the establishment of the rulebook for the system, and it maintains the original constitution and engagement rules. (That is, BCB poses technical consultations to the forum, which provides feedback for the central bank to analyze, informing development decisions and presenting technical proposals.) The forum gathers four times per year; general meetings involve about 300 participants and dedicated working groups on specific topics.

The members of the *Pix* Forum are *Pix* participants, national associations representing end users, providers and potential providers of IT services (individually or through representative associations of national scope), and clearing houses, as well as providers of clearing/settlement services that offer liquidity-provision mechanisms within the scope of *Pix*. Thematic working groups may be set up to address specific issues, such as business, standardization, and technical requirements; IP messages; and security.

Source: A Fast Payments Championing Handbook for Central Banks, Project FASTT Focus Note, World Bank, June 2024.

PFMI have been a guide for central banks also for overseeing retail payment systems. Principle 2 on governance requires a financial market infrastructure to have objectives that explicitly support public interest considerations, among other features. Hence, in several countries the regulator/overseer has made it clear, including via specific regulatory provisions, that privately operated FPS can no longer be run simply as a profit-maximizing venture and/or one that caters solely to the interests of a small group of large shareholding banks. This kind of central bank influence cannot yet be regarded as the general case in LAC, though. More often, central banks play a pivotal role in making it a reality for nonbank PSPs to act as direct participants in an FPS. These efforts might be moot in the absence of modern payment service regulation and authorization/licensing and oversight frameworks for nonbank PSPs. In some countries, systems controlled by a consortium of large banks may still be reluctant to allow these nonbank PSPs—and even smaller banks—as direct participants, often with the argument of preserving the safety of the FPS arrangement.

International experience offers different models of private scheme governance and mechanisms to ensure adequate consideration of public interests. Poland's KIR and South Africa's BankservAfrica are bank-owned operators that have a mechanism for smaller participants to be collectively represented in shareholding and on the board alongside large banks that appoint their own directors. At KIR, this role is performed by the banking association; at BankservAfrica, a special corporate vehicle is owned collectively by smaller participants, who have the right to appoint a director. In South Africa, the board itself appoints a minority of independent directors to sit alongside owner-appointed directors, bringing different perspectives and skills to the board. In India, the Reserve Bank of India appoints its own director to the board of bank-owned NPCI.

4.2 ACHIEVING ECOSYSTEM-LEVEL INTEROPERABILITY

Some countries made notable progress in fostering interoperability through their FPS, demonstrating that inclusive design and nonbank participation can significantly enhance reach and system utility. Brazil's *Pix* and Costa Rica's SINPE, among others, offer examples of systems that allow nonbank participants, such as e-money issuers, fintechs, and other PSPs, to directly access and operate within the national infrastructure. This inclusive model has expanded system reach, enhanced service diversity, and increased usage across various demographic segments. By enabling direct access to the payment infrastructure, these systems reduce dependence on traditional banks, lower transaction costs, and create more opportunities for innovation in digital payment offerings.

In other markets, the coexistence of two or more schemes highlights the necessity of interoperability frameworks. An increasing number of countries now host multiple FPS platforms—sometimes simultaneously developed by central banks, private banks, and fintech consortia. These coexisting platforms often operate in isolation, leading to parallel systems with different rules, standards, and technical specifications. This fragmentation can result in poor user experience and inefficiencies and pose increased costs for integration, and it is especially problematic for large-volume users such as governments, utilities, and digital merchants, who must support redundant systems. Without harmonized interoperability frameworks, these schemes risk duplicating infrastructure and locking users into specific channels. Full ecosystem integration requires enabling transactions across these FPS schemes to enable users and merchants to move funds freely, regardless of the origin platform. If these issues are left unaddressed, the benefits of FPS modernization may be undercut by a fractured digital payment landscape. Card networks' real-time payment capabilities, such as instant push-to-card transfers, can expand consumer options and may be instrumental for digital wallet interoperability (for example, Yape-Plin interoperability in Peru).[33] However, they are not fully integrated within cross-scheme interoperability frameworks.

As FPS expand into merchant environments, integration with POS systems has emerged as a major use case. Real-time payments at the POS promise lower costs and faster settlement for merchants, but their effectiveness depends on seamless coexistence with card-based systems. In most markets, FPS and card payments are processed through separate hardware, QR codes, and authentication flows. This duality creates friction for both consumers and merchants, who must toggle between systems or manage multiple devices. Interoperability between FPS and card schemes at the POS level can significantly enhance user experience by enabling real-time payments through existing acceptance infrastructure. For this to happen, systems must share QR standards and support tokenized credentials.

The growing adoption of QR codes as a versatile acceptance method requires common standards and amplifies the urgency for interoperability to avoid inefficiencies. QR code payments are becoming increasingly popular across LAC due to their low-cost implementation and smartphone ubiquity. Yet many FPS, banks, and digital wallets deploy their own QR formats, which are not readable across platforms. This lack of standardization prevents merchants from using a single code for all customers and forces users to check whether their app supports a given QR. It also increases reconciliation complexity for acquirers. National or regional QR standards—based on EMVCo or similar—are essential to foster interoperability. These should support both dynamic and static QR formats and embed metadata that allows routing across networks. Governments should mandate these standards and promote their adoption across schemes to ensure consistency, reduce merchants' burden, and foster seamless acceptance.

However, format standardization alone is not enough; initiation channels like QR codes and NFC must enable seamless access to multiple networks through a single point of interaction. While harmonizing QR code formats is a valuable first step toward interoperability, true ecosystem efficiency demands more than standardized design. In LAC, most schemes have adopted QR codes and, increasingly, NFC as low-cost, user-friendly payment-initiation methods. However, these are often tied to proprietary networks, locking both merchants and consumers into specific platforms. As a result, a merchant must display multiple QR codes or install different interfaces to serve various customer segments, while consumers must navigate fragmented acceptance environments. The future of payment initiation should be network-agnostic, allowing a single QR or NFC touchpoint to dynamically route transactions across FPS, card networks, or other schemes, regardless of the origin.

The introduction and expansion of FPS are expected to further reshape market structure while incumbents seek to retain market share. As FPS continue to gain traction, their disruptive potential will continue to trigger strategic responses from traditional players who see their market position challenged. Many incumbents are developing proprietary or consortium-led alternatives—often with overlapping functionalities—to retain their market position and customer relationship. LAC markets may continue to see a multiplication of platforms with fast payment capabilities, each vying for dominance. While such diversity can foster competition and innovation, it also increases inefficiencies and creates inconsistent user experiences. Without policy intervention to guide these systems toward technical and operational interoperability, the region may find itself with an abundance of real-time payment options that are functionally siloed.

In this context, it is imperative for central banks to prioritize the development of interoperability frameworks in consultation with the private sector. Regulators and market participants in LAC face a variety of strategic pathways to achieve interoperability, depending on their market structure, stakeholder landscape, and policy priorities. While some countries may benefit from consolidating existing sys-

tems under a unified infrastructure, others will need to support coexistence. The decision to pursue a specific model depends on the degree of fragmentation, overlap in use cases, and institutional and governance factors.

There are three main approaches to interoperability: single-system, multitenant, and cross-network.[34] A single-system approach relies on centralization, where most participants operate within one core platform using unified standards. A multitenant model allows distinct systems to coexist while offering users a single access point to various payment networks. Cross-network interoperability focuses on enabling inter-network clearing and settlement. These approaches are not necessarily mutually exclusive but can be deployed sequentially or in combination. For example, multitenant access and cross-network approaches can be integrated to provide full interoperability. A structured decision framework can guide authorities through the trade-offs and implementation complexities of these models (see Table 6).

TABLE 6 Interoperability models

MODEL	IMPLEMENTATION CONSIDERATIONS
Single-system, via mandatory participation or reachability (receive-only) requirements *Example:* Brazil, Costa Rica, Mexico	• This model requires a clear legal basis for mandatory participation in a given system. • The designated system must have scalable capacity, be flexible enough to accommodate multiple use cases/services based on market needs, and have a governance framework in line with international standards. • This model allows for minimal market disruption.
Cross-network, via an "interoperability facilitation layer" that allows transaction routing, alias resolution, and cross-network settlement. *Example:* Argentina, Colombia	• This model is suitable for markets characterized by a combination of multiple networks and a limited degree of cross-membership. • Systems are broadly compatible (for example, in terms of message format, access criteria, and technical design features). • The central bank or independent entity is willing to own and operate the interoperability facilitation layer.
Multitenant. Users can access different instruments (for example, instant credit transfers, cards, e-money) from the same point of interaction.	• This model is suitable for contexts characterized by a combination of multiple networks and a significant degree of cross-membership. • Networks have misaligned message formats, access criteria, and technical design features that hinder cross-network interoperability. • This model allows for competition at the point of interaction but does not alone enable cross-network transfers.

FIGURE 12 Interoperability models

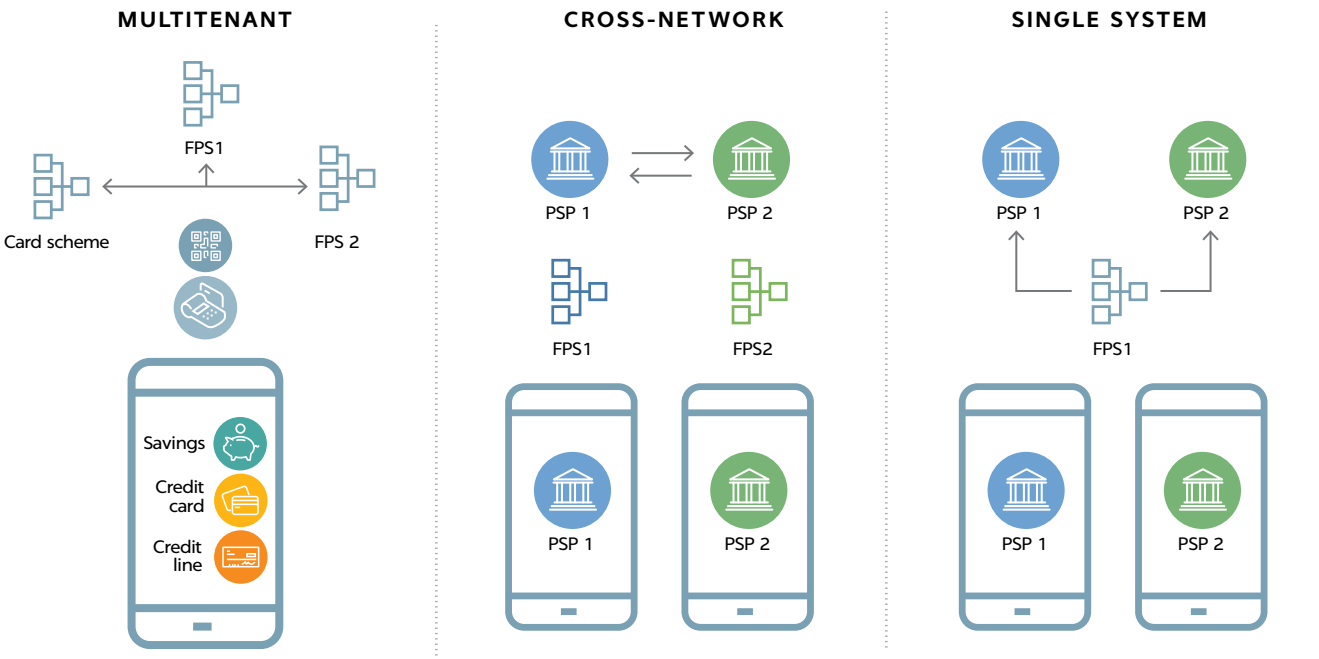
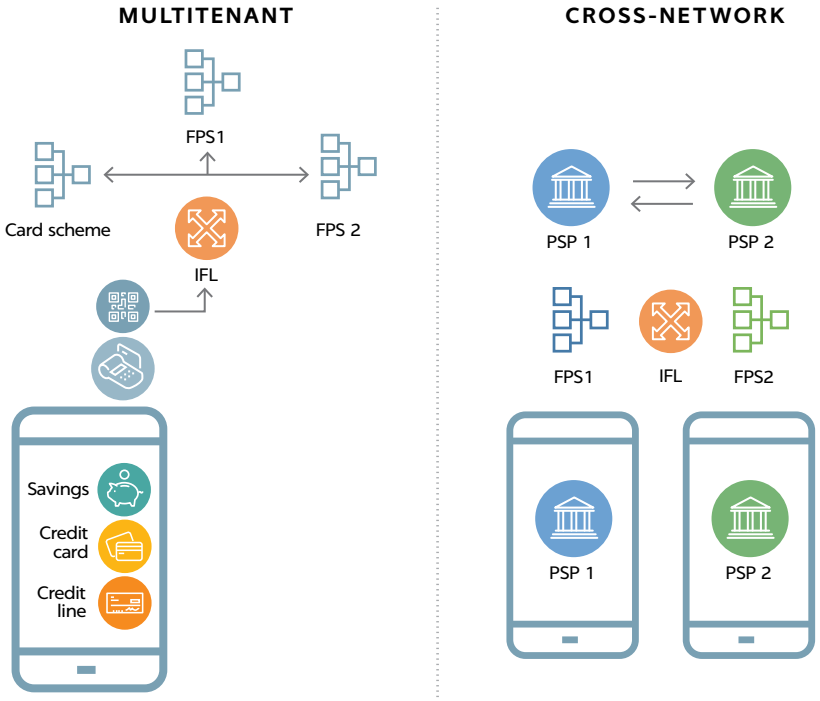


FIGURE 13 **Role of Interoperability facilitation layers in multitenant and cross-network models**



Multitenant QR infrastructure offers a practical and scalable path to interoperability in LAC's fragmented retail payments landscape. The most immediately viable option for enabling ecosystem-level interoperability in LAC may be a multitenant model that allows multiple payment schemes to coexist and interoperate through a shared access point. Singapore's SGQR+ offers a compelling example (see Box 6). Instead of treating QR codes as static identifiers tied to specific platforms, SGQR+ reframes them as dynamic, scheme-neutral access points, allowing merchants to display a single code while customers use any wallet, card, or app. This model minimizes onboarding friction, simplifies integration, and improves acceptance coverage, goals directly relevant to the LAC context.

Building ecosystem-level interoperability requires a holistic policy and infrastructure agenda that goes beyond technical integration. As part of this multistakeholder agenda:

i. Stakeholders should consider what governance structures are best placed to support the design and implementation of interoperability frameworks. For example, Colombia's Fast Payments Interoperability Committee is a standing consultative group prescribed by central bank regulations that helps in the development of technical standards, protocols, and procedures.

ii. Regulators should adopt a functional approach to payment service regulation, ensuring that risk-proportionate rules apply consistently across PSPs.

iii. Central bank overseers and system operators should promote fair and open access frameworks to payments infrastructure, enabling participation for a wide range of providers that meet the relevant risk-based requirements.

iv. Policy makers should promote alignment of risk-management standards, including authentication standards and fraud-management and incident-response protocols, among others.

v. All stakeholders have a role in user education to get the full benefit from interoperability, through targeted communication campaigns, clear labeling, intuitive user interfaces, and multilingual support, among others.

vi. To maximize the benefits of interoperable systems for their economies, governments should leverage FPS in public-sector use cases, such as social benefit disbursements, tax collection, fines, tolls, and public transportation.

vii. Finally, aligning domestic regulation with global standards such as ISO 20022 can also facilitate cross-border interoperability and foster regional financial integration.

The interoperability paradigm extends to the interaction between FPS and digital ID initiatives. Governments and civil registries are increasingly investing in the digitization

BOX 5 SGQR+ AS A MODEL FOR MULTITENANT INTEROPERABILITY

SGQR+ in Singapore demonstrates how a multitenant architecture can unify fragmented retail payment ecosystems. Rather than serving as a static format, the QR label functions as a dynamic gateway, embedding multiple payment payloads and routing transactions across schemes.

Key features include the following:

- *Unified merchant access:* A single QR label supports multiple wallets, FPS, and card-based payments, reducing onboarding and integration burdens.
- *Switch-based routing:* A central switch (for example, Liquid Group) dynamically routes transactions to the correct acquirer or issuer based on scheme and wallet logic.
- *Merchantcentric design:* Merchants interact with one acquirer and receive consolidated settlement, reporting, and support, regardless of the payment method used by the customer.
- *Scheme-level interoperability:* Commercial agreements and interoperability are managed at the scheme level, eliminating the need for bilateral integrations.
- *Embedded competition:* The model encourages competition among PSPs and wallets, while offering merchants and consumers seamless experiences at the POS.

of foundational ID systems, introducing verifiable credentials, digital ID cards, and e-KYC registries. However, these efforts are often developed in silos, with limited coordination between ID authorities and financial-sector policy makers. As a result, critical opportunities to use digital ID as a catalyst for financial access, particularly through FPS, as well as for building trust in digital payments through increased security, remain untapped. Without considering how digital ID can interface with account opening, authentication, and payment verification, LAC countries risk designing ID systems that are technically robust but financially disconnected.

Digital ID also has the potential to enhance interoperability and usability across multiple financial accounts and platforms. In many cases, LAC consumers may face fragmented access to payments, having to switch between apps, reauthenticate with each provider, and manage disconnected credentials to complete everyday transactions. By linking digital ID systems to payments infrastructure, users could authorize access to multiple accounts through a single interface, regardless of the institution. This would lower complexity, support new services like delegated bill payments, and expand merchant acceptance of digital payments. In short, coordinated digital ID and FPS strategies can unlock the next generation of inclusive finance in the region—making digital services more accessible, trusted, and relevant for all.

Despite an intense policy debate, there is limited research or experience on co-existence and interoperability of FPSs and retail central bank digital currencies (CBDCs).[35] This debate is centered on the question of how FPSs and retail CBDCs compare and interact with each other, and the timing and sequencing of reforms. LAC hosts two out of three live CBDCs in the world—Bahamas, Jamaica and Nigeria. Unlike Nigeria, Bahamas and Jamaica do not have an FPS. Based on the 2024 BIS Survey on CBCDs and crypto, 21 percent of central banks of emerging markets and developing economies (EMDEs) are piloting retail CBDCs.[36] In the LAC region, there were early "retail CBDC-like" experiments in Uruguay and Ecuador. More recently, the Eastern Caribbean Central Bank launched a pilot, which encountered technical issues; at the time of writing this report, the central bank has closed the pilot. The central bank of Peru also conducted a pilot with a telecommunication company to explore CBDC as a tool to expand access and usage of digital payments.[37] Like FPSs, these initiatives are often driven by the aim of enhancing financial inclusion, and of improving the safety and efficiency of domestic payments. Not only do FPSs and retail CBDCs share the same motivations, but they also share similar features, e.g., the ability to support instant and low-cost transfers for end users. Some central banks hence question the value of retail CBDCs if an FPS is already in place, and many see a case for building an FPS first.[38] As jurisdictions continue to explore and implement FPSs and retail CBDC systems, the compatibility and interoperability between both is likely to warrant further attention. This field of research remains relatively new and limited (see Box 7).

BOX 6 EXPLORING DIGITAL ID AND FPS INTEROPERABILITY

The World Bank is actively exploring new concepts and mechanisms to enhance interoperability between digital ID systems and FPS. This work aims to address persistent barriers around account access, fragmented user authentication, and the lack of secure, unified interactions across financial service providers. At the heart of this exploration are two emerging concepts: the Trusted Access and Credentialing Hub (TACH) and the Payments Identity Credential (PIC).

TACH acts as a back-end trust infrastructure that connects FPS, national ID systems, and financial institutions to validate ID attributes, manage credential issuance, and support real-time authentication. PIC, in turn, is a user-held digital credential that bundles key attributes—including ID, KYC status, and account metadata—enabling individuals to authenticate and authorize transactions across providers with minimal friction. Together, these components offer a scalable framework to link digital ID with payments in a consent-driven, privacy-preserving manner.

This approach is currently being refined through analytical work and early country engagements. It offers a path toward faster, more inclusive onboarding, improved confirmation of payee, seamless access to multiple accounts, and new services for underserved populations.

Source: Digital ID Meets Fast Payments: Enabling Trusted, Inclusive Fast Payments through Digital Identity, forthcoming.

BOX 7 OUTCOMES OF WORLD BANK INVESTIGATION OF INTEROPERABILITY BETWEEN CENTRAL BANK DIGITAL CURRENCY SYSTEMS AND FPSS

The interoperability between CBDC systems and other payment systems is essential to avoid fragmentation in the national payment system. For the CBDC to be used in a jurisdiction it should have the rails to be exchanged with existing payment instruments; otherwise, it would have limited practical value. Interoperability with other domestic payment infrastructures is a key challenge in CBDC design. CBDC interoperability with payment systems such as the RTGS system or an FPS and exchangeability with other forms of money (e.g., commercial bank money, e-money, and cash) are essential for a smooth end-to-end payment flow. Positioning the CBDC system correctly within an NPS is crucial for its successful implementation.

Three high-level scenarios for the interoperability of CBDC systems with other domestic payment systems were identified, as follows:

1. Interoperability between a wholesale CBDC (wCBDC) system and an RTGS system. This would be used mainly to buy and sell CBDC to PSPs.
2. Interoperability between retail payment systems and wCBDC, where the retail payment systems settle the net results in the wCBDC.

- Interoperability between FPS and retail CBDC systems, where users connected to the FPS through their PSPs would be able to transfer value to rCBDC users, with real-time settlement at the beneficiary account/wallet.

The experimentation proof of concepts focused on the second and third scenarios. The team experimented with a distributed ledger technology (DLT)-based CBDC system and the Mojaloop Foundation's open-source software, Mojaloop to simulate an FPS environment. The experimentation produced the following lessons learned:

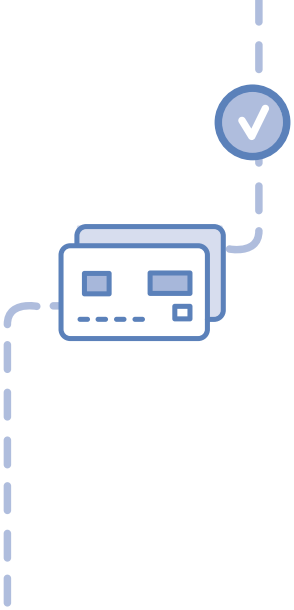
- Interoperability between FPS and CBDC systems may require using common components such as address resolution services.

continued

BOX 7, ***continued***

- The use of a bridge component to avail links among different payment systems could be very useful in isolating the logic of the transfer and the message format from individual systems, and shifting these functionalities to a dedicated module.
- Differing technical standards for payment message standards, API designs, etc., can lead to complexities in the services of the interlinking bridge.
- The open-source real-time payment system (Mojaloop) provided an effective way to simulate traditional retail payment systems. However, it can involve a steep learning curve to understand the infrastructure and run the set-up.
- If the CBDC system leverages programmability, it might enable interesting features on locking the funds and triggering settlement of successful funds transfer in traditional systems. While this approach has benefits in reducing counterparty risk, it could also introduce complexity and security tradeoffs.
- Smart contract-based CBDC designs can interoperate with traditional external systems through bridging oracle services, and by communicating messages and actions across different systems.
- While the interoperability bridge is technically feasible, it may introduce certain trust assumptions and require trusted third parties to operate the bridge connecting PSPs and users in two different payment systems. The central bank could best fit this position.

Source: World Bank. 2024. Interoperability Between Central Bank Digital Currency Systems and Fast Payment Systems: A Technical Perspective. Technology & Innovation Lab, *https://openknowledge.worldbank.org/server/api/core/bitstreams/a6f91b4c-32ee-4962-b51f-e164fb046f6c/content*



5 LEVERAGING FAST PAYMENTS TO SUPPORT INNOVATION AND DIGITAL FINANCIAL INCLUSION

Fast payments have the potential to drive innovation and accelerate digital financial inclusion. In LAC, this potential is still somewhat hindered by limited use cases and access channels. Furthermore, if risks are not properly managed, consumer trust may be undermined. This section discusses strategies to leverage fast payments to support greater innovation and digital financial inclusion while addressing key risks, such as fraud, and ensuring resilience. Section 4.1 focuses on expanding still-limited diversity of payment use cases, covering P2M payments, large-volume recurrent payments, and the integration of fast payments with open finance. Section 4.2 emphasizes access channels and initiation mechanisms aligned with users' needs and capabilities. Section 4.3 discusses strategies to protect FPS from fraud and ensure operational resilience.

5.1 EXPANDING USE CASES

Most FPSs in the region remain dominated by a single use case. P2P transactions are the most widely implemented use case across FPS in LAC-11. P2P transactions have been prioritized due to their lower complexity, market needs, and broad appeal. All 11 countries surveyed (see Section 2) support P2P transactions, reflecting the foundational role of this use case in driving early adoption. But, as of 2024, only a few countries (Argentina, Brazil, Peru, and Colombia) have deployed dedicated P2M functionality." Limited adoption of use cases beyond P2P in many countries signals a missed opportunity for broader ecosystem impact and risks cementing FPS as underpinning niche products, rather than foundational public infrastructure. For example, support for USSD and offline payment capabilities and integration with credit lines remain limited at the time of writing this report.

P2M payment use cases remain underdeveloped; only six FPS support them. P2M payments are critical for expanding the utility of fast payments for everyday transactions and can also help increase competition in the retail payments market. FPS in Argentina, Bolivia, Brazil, Chile, Colombia,[39] and Peru support P2M payments.

Use cases for G2P payments and person-to-government (P2G) payments are increasingly supported. In particular, G2P transfers are supported in seven countries, but with limited capabilities, mainly focused on disbursements such as vendor payments and salaries, with no significant integration of social-protection cash transfers and their usage, while only four countries support P2G payments, limiting the potential of FPS to streamline tax and bill collection.

Brazil's FPS offers the broadest set of use cases, while Argentina, Bolivia, and Chile support the four core use cases (P2P, P2M, G2P, and P2G). Brazil leads on use cases by supporting all four core use cases and business-to-business and government-to-government payments.[40] In contrast, Paraguay and the Dominican Republic show the narrowest coverage; their FPS focuses exclusively on P2P transactions and lacks integration for merchant or government payments. Argentina, Bolivia, and Chile each supports the four key use cases. Mexico and El Salvador provide limited cover-

age beyond P2P and G2P, while Costa Rica offers a slightly more expanded mix. In Colombia and Peru, both characterized by multiple FPS, the entry of new schemes encouraged use-case innovation.

While the survey focused on domestic use cases, it is important to note that, unlike FPS in other regions, LAC FPS do not currently support cross-border payments. LAC trades much less than other regions/countries with similar characteristics, particularly at the intraregional level (accounting for only 14 percent of its total goods trade), due to poor infrastructure, low quality of human capital, and inadequate governance.[41] World Bank data points to opportunities to reduce remittance costs—5.79 percent on average, almost double the United Nations Sustainable Development Targets and G20 goal of 3 percent—which could be extrapolated to payments to micro, small, and medium-sized enterprises.[42] Yet most countries have not yet considered FPS interlinking or engaged in a formal exercise to assess technical standardization and regulatory alignment requirements. They differ significantly in system design, messaging standards, alias-management models, and service levels; these differences can hinder interlinking/integration initiatives. Market structures dominated by incumbents and/or large platforms with presence across the region can also deter ambitious efforts to develop alternative arrangements. Nevertheless, there are nascent efforts to explore the feasibility of subregional platforms with fast payment capabilities (for example, CARICOM) and ongoing deliberations on improving long-standing multilateral initiatives (for example, Central America's and the Dominican Republic's Sistema de Interconexión de Pagos), while regional banks have made arrangements with *Pix* participants to enable *Pix* users to buy goods and services abroad with *Pix*. Person-to-Merchant Payments

P2M can drive the mainstreaming and maturity of FPS. Although P2P payments have been instrumental in bootstrapping FPS adoption, they represent only a fraction of the potential for scaling FPS. In most jurisdictions, the next logical step is expanding into P2M payments. Fast P2M payments can help reduce cash dependence at the POS, introduce competition in digital acceptance—traditionally dominated by card networks—and unlock FPS benefits for businesses, especially small merchants. Successful expansion into P2M requires a customized approach, recognizing that micro, small, medium, and large merchants have distinct needs, from QR-based acceptance to ERP-integrated systems.

FPS in LAC present a unique opportunity to streamline the digital payments acceptance ecosystem and lower costs for merchants. Based on the World Bank Enterprise Survey, in LAC the average proportion of sales made electronically by customers of businesses of all sizes is 69.4 percent, ranging from 77.8 percent for large businesses to 61.1 percent for small businesses. While below global average, the cost to receive the main type of electronic payment in LAC is 1.7 percent (of the value of the transaction), which is higher than South Asia, Europe and Central Asia, and North America.[43] Unlike traditional card schemes, which depend on multiple intermediaries, including issuers, acquirers and card networks, FPS enable direct account-to-account payments with fewer layers and lower costs. FPS enable merchants to receive payments instantly simply by displaying a QR code, without the need for a formal acquiring relationship. This streamlined model not only reduces fees and settlement times but also lowers barriers to entry for micro and small merchants, who are often excluded from the digital economy.

Some FPS implementations support P2M use cases by design, while others have adopted a gradual approach. Brazil's *Pix* and Colombia's Bre-B exemplify FPS designed with built-in P2M capabilities. *Pix*'s rollout included payment initiation through aliases, static and dynamic QR codes, and, eventually, third-party payment-initiation service providers. As a result, P2M transactions grew from 5.3 percent in 2020 to 34.9 percent of total transactions by 2024. Colombia's Bre-B, launching in September 2025, brings P2P and P2M transactions under an interoperable framework, overcoming fragmentation created by "specialized" schemes. On the other hand, Paraguay is pursuing a phased approach to use-case expansion. The Central Bank of Paraguay initially leveraged large card acquirers to support SPI P2M via QR codes, coupled with standardized QR formats to ensure interoperability. In a subsequent phase, the central bank envisages opening participation to fintechs for integrating merchants and developing a standalone QR code for SPI.

Aggregators and gateways can play a crucial role in enabling P2M payments through FPS in LAC. In countries like India and Thailand, account-servicing PSPs have integrated FPS such as UPI and PromptPay into merchant checkout flows, allowing consumers to pay instantly using digital wallets and QR codes. In contrast, many LAC countries rely more heavily on card-based acceptance infrastructure, such as POS terminals. By embedding FPS capabilities into aggregator APIs and gateway platforms, LAC can support

BOX 8 THE STRATEGIC IMPORTANCE OF THE P2M USE CASE FOR SMALL MERCHANTS: EVIDENCE FROM INDIA AND MALAYSIA

The P2M use case has emerged as a cornerstone of inclusive fast payment ecosystems, particularly for micro and small merchants. In India, UPI data from May 2025 reveals that 63 percent of all transactions were P2M, with a striking 86 percent of those valued under Re 500 ($5.78),[44] underscoring the relevance of low-ticket payments in everyday commerce. This volume reflects widespread merchant adoption and customer trust in QR-based, real-time payments, especially among informal vendors and street-level businesses.

Similarly, Malaysia's DuitNow QR system, launched in December 2018, demonstrates rapid P2M growth. By the end of 2024, the number of registered QR acceptance points had reached 2.6 million, and DuitNow QR transactions more than doubled in 2024, increasing from 360 million in 2023 to 870 million in 2024, with values growing to RM 31.1 billion ($7.3 billion). This success is driven by simplified onboarding, zero-fee policies for small merchants, and nationwide QR interoperability.

Together, these experiences highlight the P2M use case as a critical enabler of digital inclusion and merchant formalization. Low-cost, user-friendly, and interoperable, fast payment systems have the potential to unlock a wide base of merchants that traditional acquiring models fail to reach—particularly in underserved or cash-heavy economies.

Source: Author's elaboration based on public data.

real-time, low-cost P2M payments at scale, particularly benefiting micro and small merchants while promoting financial inclusion, reducing costs, and fostering competition.

FPS operators in LAC must carefully consider the design of merchant acceptance models, striking a balance between inclusivity and viability. Some markets may benefit from enabling direct merchant participation via lightweight QR code solutions and simplified onboarding, especially for micro-merchant and small-merchant segments, where acquirer networks are weak or prohibitively costly. In other contexts, working through existing acquiring infrastructure may be more practical, leveraging established functions and processes to drive scale. Ultimately, the choice between a fully "delayered" model or one that includes intermediaries should be guided by local market realities, digital readiness, and pricing dynamics. Ensuring that transaction costs remain low and predictable, regardless of the model, will be key to maintaining the financial inclusion benefits of FPS while supporting the long-term sustainability of merchant-facing services.

Different business sizes demand different FPS adoption strategies. Micro and small merchants benefit from alias-based and static QR payments, minimizing setup costs and technical requirements. Larger businesses require features such as dynamic QR codes, reconciliation tools, and system integration. For example, Brazil's early P2M growth was led by micro and small merchants using *Pix* Keys, while dynamic QR usage surged later among large retailers. Policy makers must ensure that payment-initiation tools suit each merchant profile to accelerate adoption.

Scaling P2M usage of FPS in LAC also requires simplifying user experience. One of the most promising approaches is the use of payment aliases (simple, memorable identifiers such as phone numbers or one-time codes) that replace cumbersome account details (see Box 9). While aliases are widely used in P2P contexts, their adoption for merchant payments remains limited. In particular, large retailers often lack workflows that support real-time alias-based payment flows. Enabling alias acceptance at the POS in these environments can dramatically expand FPS usage, especially when paired with SMS/USSD channels for underserved populations.

Merchant engagement and onboarding frameworks are essential to scale P2M payments. Governments and regulators must simplify merchant onboarding and include merchants in FPS governance. Brazil's *Pix* Forum includes merchants as stakeholders, shaping future product features and policies. Revising licensing, data requirements, and onboarding processes can reduce barriers for small merchants. Awareness campaigns and capacity building can

BOX 9 WORLD BANK EXPLORATION OF ADVANCED ALIAS-BASED P2M USE CASES

To support broader FPS adoption across merchant ecosystems, the World Bank is exploring next-generation use cases leveraging alias functionality. The following two innovations are under consideration:

- One-time-payment alias (OTP alias): A time-bound, transaction-specific code generated by the retailer and linked to the FPS directory. Customers—particularly those using feature phones—can input this alias via SMS or USSD to initiate payments. The FPS validates the alias, processes the transaction, and notifies both the retailer and the customer in real time, ensuring secure and low-friction checkout.
- Request-to-charge (RtC): A workflow where the merchant scans a customer's QR or receives an alias, then issues a real-time payment request through the FPS network. The user confirms the payment through their PSP interface (SMS, USSD, or app). This model improves accuracy, facilitates integration with ERP systems, and enables automated reconciliation.

Together, these use cases aim to foster inclusivity by reducing infrastructure requirements, enhancing user experience, and ensuring secure, real-time payments across both smartphones and basic mobile devices.

Source: Enabling Fast Payments at Large Retailers, FASTT, forthcoming.

help micro merchants understand the benefits of FPS and integrate into the formal economy.

P2M payments are a critical factor for shaping adoption and striking a balance between affordability and sustainability. FPS pricing policies have generally prioritized affordability and user uptake. In most countries—including Argentina, Bolivia, Brazil, Colombia, Paraguay, and Peru—P2P transactions are free for end users, although limits may apply, such as to the number or value of transactions. Zero-fee policies are often mandated through regulation or embedded in fast payment scheme rules, reflecting a deliberate strategy to support financial inclusion through affordability. However, in the absence of use-case, and pricing, diversification, PSPs may lack incentives for high-quality user interfaces and innovation. A careful balance is needed to incentivize innovation and sustainability while promoting adoption among underserved merchant segments. For example, Brazil prohibits charges for individuals but allows PSPs to charge businesses, keeping costs low by fostering competition. Argentina has capped merchant fees linked to business size. Regardless of the approach (see Box 10), pricing frameworks should be sensitive to context.

As FPS increase their share of P2M payments in LAC, governments face the urgent task of adapting fiscal frameworks. Unlike traditional card-based systems, FPS operate through simplified, real-time, account-to-account rails, offering low-cost acceptance channels such as static QR codes that are particularly attractive to small and informal merchants. This transformation has challenged legacy tax structures that were designed around traditional payment instruments and leveraged the multilayered card architecture for collection and reporting. As policy makers explore new approaches to taxation in a digital payment environment, there is a need to carefully weigh fiscal objectives against the inclusionary promise of FPS. Box 11 examines the risks and opportunities associated with extending tax withholding requirements to FPS transactions and to the FPS merchant ecosystem in LAC.

Large-Volume Recurrent Payments

Fast payment infrastructure offers a fit-for-purpose channel for integrating recurring high-frequency flows, such as government payments (for example, social-protection payments, taxes), bill payments, and public transportation payments. By tapping into these large-volume use cases, FPS operators can foster digital financial inclusion, diversify FPS volumes, and reinforce the public-utility nature of the network.

FPS remain underutilized as a digitalization strategy to enhance the efficiency and reach of government payments. FPS should be recognized as a core building block for modern G2P payment architecture in LAC, offering immediacy and transparency and enabling beneficiary choice (see Box 13). By supporting real-time, 24/7 disbursements, FPS allow governments to reach beneficiaries

BOX 10 POLICY APPROACHES TO FAST PAYMENT PRICING

End-user pricing for FPS varies widely across jurisdictions, influenced by public policy priorities, digital payment maturity, and competitive market dynamics. At one end of the spectrum, zero-fee models—such as UPI in India and CoDi in Mexico—treat FPS as public infrastructure to drive financial inclusion. Conversely, countries like the United States follow free pricing, allowing competition to shape costs. Hybrid models, such as Brazil's *Pix*, offer free P2P transactions whereas P2M fees are freely set through bilateral contracts between merchants and PSPs, promoting consumer uptake while preserving provider incentives, and relying on competitive pressure to keep merchant costs low. Tiered-pricing structures, like those in Nigeria and Costa Rica, set prices based on transaction value to balance affordability with long-term sustainability.

Zero-fee regimes carry risks: without revenue diversification—especially where cross-selling is restricted—specialized providers may face viability constraints. Innovative responses include bundling FPS with other paid services, offering value-added products, or digital onboarding strategies to lower operating costs.

Central banks play pivotal roles, both as regulators and FPS operators. Bank Negara Malaysia initially mandated zero-ringgit fees but later removed them to foster market-driven sustainability, with voluntary free models retained for micro merchants. In Europe, the regulator mandates price parity with standard credit transfers, promoting fairness.

Ultimately, pricing policy must be tailored, based on evidence, and reassessed regularly, especially in underserved areas where the wrong fee structure could limit access to essential payment services.

Source: Author's elaboration based on public information.

BOX 11 EMERGING ISSUES IN TAXATION OF FAST PAYMENTS

As FPS continue expanding their role in merchant transactions across LAC, tax authorities are reevaluating how these payments should be treated under existing fiscal frameworks. The rapid adoption of FPS for P2M transactions has outpaced the evolution of taxation policy, raising concerns about "tax asymmetry" between card-based and FPS-based payments. However, applying legacy tax models—such as value- added-tax withholding obligations—directly to FPS without recognizing their operational differences risks undermining financial inclusion and reinforcing informality among micro and small enterprises.

Withholding (also known as "split payments") is a tax-collection mechanism whereby a portion of the payment corresponding to the tax owed by the merchant is held (collected) by the financial institution and remitted to the government. As a result, the merchant settlement will be for the amount net of the withholding. Argentina, Colombia, and Costa Rica are examples of LAC countries that have applied or apply withholding/split payments; however, outside LAC, this model is uncommon.

When extended to FPS transactions, withholding can have unintended consequences. In general, withholding can act as a disincentive for the use of digital payments by increasing perceived costs for small merchants and consumers, ultimately pushing economic activity back into the informal, cash-based sector. Evidence shows that attempts to apply blanket withholding measures on banking and digital transactions have reduced formal financial engagement, increased cash in circulation, and discouraged deposit growth.[45] In this context, while extending the same requirements to FPS may appear to streamline compliance and avoid arbitrage, to the extent that FPSs are geared toward small-ticket transactions and merchant segments that are not served by traditional acceptance models, such extensions could significantly change the policy trade-offs between tax compliance, formalization, and digital payments.

Data sharing between financial service providers and tax authorities introduces further complexity. If not carefully designed, efforts to leverage FPS transaction data for tax compliance may erode confidence in dig-

continued

BOX 11, *continued*

ital financial services, particularly among underserved or vulnerable populations.

These risks highlight the critical importance of conducting a robust cost-benefit analysis before introducing or expanding tax obligations linked to FPS. Such analysis must go beyond revenue projections to include the administrative costs for tax authorities, the burden on small merchants, and the potential impact on digital payment adoption and financial inclusion. Without a clear understanding of these trade-offs, tax measures may not only fall short of their fiscal objectives but also reverse progress toward more inclusive, digitally enabled economies. The best use of government resources might be to lower the compliance burden for micro and small enterprises and to provide clear incentives for the adoption of electronic payment acceptance. Available data suggests that small firms often incur compliance burdens equivalent to 15 percent or more of their turnover and lengthy registration procedures.

In this context, the development of fast payment P2M use cases offers a powerful tool to onboard merchants and progressively support their formalization as transaction volumes and values increase. One promising approach is the use of transitional merchant categories, such as India's P2PM designation for low-volume sellers, which offer a temporary regulatory space with lighter compliance requirements. These models enable informal or emerging businesses to benefit from digital payments while avoiding the immediate obligations of full formalization. As businesses grow, they can transition into the formal tax net through predefined thresholds and reporting requirements. This staged integration helps preserve the financial inclusion gains enabled by FPS while supporting long-term revenue-mobilization goals.

Source: Author's elaboration.

instantly, even in emergencies or outside business hours, crucial for timely support in the face of economic shocks or natural disasters. Unlike traditional batch-based transfers, FPS also allow for real-time confirmation, improving auditability and trust. When paired with open-choice models, they empower recipients to select their preferred financial service provider, promoting competition and improving service quality. This use case is especially relevant for LAC, where fragmented delivery channels and delays often undermine the impact of social programs.

Integrating FPS into G2P schemes across LAC would require deliberate partnerships across government entities. In many LAC countries, government payments have been digitized to varying degrees, but integration with FPS remains limited. In Mexico, the focus has been largely on digitizing salary and vendor disbursements through SPEI, with limited reach into broader social-protection or subsidy schemes. Costa Rica presents a somewhat more expansive approach, with greater use of digital channels for multiple government payment types, which are disbursed via SINPE. However, across the region, central banks have yet to consistently position themselves as active champions of digitalizing government payment flows through FPS. This is delaying the adoption of real-time rails in areas such as social transfers. When embedded in a broader DPI, alongside digital ID systems, FPS can support advanced G2P delivery models. A more coordinated strategy, linking treasury departments, social-protection management information systems, e-government platforms, and FPS operators, will be essential to designing interoperable, user-oriented G2P delivery mechanisms anchored in real-time payments.

Further developing FPS use cases can help ensure that strategies for digitalizing government payments are effective in fostering digital financial inclusion. Where FPS enable interoperability, they allow recipients to access their transfers through any participating financial institution, digital wallet, or access point, reducing fragmentation and promoting user choice. However, ensuring that G2P transfers translate into financial empowerment and not just digital disbursement requires systems to provide functionality that supports real-world use, especially P2M payments, cash-out options, and effective complaint-handling mechanisms. Drawing on G2Px diagnostics, Box 13 summarizes key payment-design considerations that FPS-enabled G2P mechanisms should incorporate.

BOX 12 PROMOTING BENEFICIARIES' CHOICE THROUGH FPS OVERLAY SERVICE

FPS are well suited to promote beneficiary choice in social-protection payments, given their architecture of multiple interconnected participants and their support for alias-based transactions. Aliases, such as mobile numbers or national IDs, simplify the user experience and allow beneficiaries to receive payments through their preferred PSP without needing to share complex account details. However, for this choice to be meaningful, beneficiaries must have the ability to actively express their preference and link their alias to the program of their choice. An overlay service—managed and operated by the FPS operator—can serve this purpose by acting as a neutral layer that registers program metadata, enables alias-to-program linking, and ensures that PSPs access only data relevant to their enrolled programs. This creates an opportunity to leverage existing alias directories to support inclusive, interoperable, and usercentric ecosystems for social-protection payments.

The approach consists of onboarding social-program agencies into the overlay service and uploading program metadata into a shared registry managed by the FPS operator. Participating PSPs and digital access points (wallets, apps, and banking interfaces) can retrieve this information and display it to eligible users, who can then select the program(s) they wish to enroll in and link their alias accordingly. Once a choice is made, the alias and selected program are registered in the overlay service, and access is granted to the relevant program agency for validation and eligibility checks. Updates in alias status (for example, cancellation, suspension, or change) are reported back to the overlay service, which in turn triggers actions such as unlinking from programs or prompting beneficiaries to reexpress their choice. This design ensures transparency, maintains data integrity, and empowers beneficiaries to exercise meaningful control over how and through whom they receive their benefits.

BOX 13 KEY PAYMENT DESIGN CONSIDERATIONS FOR FPS-ENABLED G2P MECHANISMS

Based on country experiences and diagnostic work under the World Bank's G2Px initiative, it is possible to draw relevant lessons from the design of FPS to support G2P payments.

Interoperability is a critical requirement. Beneficiaries must be able to receive G2P payments into any account or digital wallet of their choice, allowing flexibility across types of financial service providers. Systems that enable this choice reinforce user agency and promote account usage.

Digital payments must also be supported by inclusive, low-friction access channels. Options like USSD, SMS, and agent-based services are critical for rural or digitally excluded populations. Integration with mobile phones, especially feature phones, was identified as a key enabler of access in various country cases. These offline channels must be user-friendly, allowing intuitive engagement with G2P programs without requiring high levels of digital literacy or constant connectivity.

A strong emphasis must also be placed on the user experience, particularly for women, elderly individuals, and people with disabilities. Systems must ensure that onboarding, payment receipt, and recourse mechanisms are adapted to diverse user needs. Further, proactive support, whether through help desks, local agents, or clear informational materials, greatly improves outcomes.

Transaction costs and payment certainty are crucial concerns. Beneficiaries must not bear undue costs to access their funds. The G2Px review found that cash-out fees, long travel distances to access points, or unclear deductions could erode the value of transfers. Furthermore, clear and timely user communication, especially real-time notifications of incoming payments, supports transparency and builds trust in digital channels.

Source: Author's elaboration.

Bill payments are a high-volume, recurring use case that can significantly boost the adoption and utility of FPS across LAC. Bill payments—such as utilities, telecommunications, and education fees—are part of users' everyday financial lives. Enabling real-time settlement of bills can reduce payment friction, enhance user control, and improve reconciliation for service providers. When embedded within FPS-enabled channels such as mobile apps, QR codes, or request-to-pay overlays, bill payments can become a key on-ramp for everyday digital payment usage (see Box 14). This is particularly relevant in LAC, where recurring payments and bill payments remain cash-based. Brazil's *Pix* Automatico supports preauthorized recurring payments and integrates with payment-initiation service providers' apps, enabling seamless debits while preserving payer control. Such overlays require ad hoc rule books, retry mechanisms, and fraud-protection protocols but are essential for the mainstreaming of FPS beyond single-use payments.

RTP is particularly well suited for the billing sector and large-volume payments, offering a transformative overlay that enhances the functionality and user experience of FPS. It allows a payee to send a structured payment request to a payer, who can then authorize the transaction in real time through their preferred channel, offering flexibility, control, and transparency to both parties (see Box 15). For individuals, this means greater clarity in payment obligations and the ability to manage funds more effectively. For businesses and governments, request to pay reduces payment errors, supports reconciliation, and encourages timely payments without requiring traditional invoicing or collections infrastructure. It can streamline utility payments, school fees, rent, and subscription services by converting passive invoices into immediate user-authorized transactions. Moreover, it enables efficient collections and real-time settlement in high-volume sectors, such as telecommunications, energy, and government services. In LAC, where informal payment practices and fragmented billing mechanisms still prevail, request to pay

BOX 14 INTEGRATING BILL PAYMENTS AND REQUEST TO PAY WITH FPS: LESSONS FOR LAC FROM THE INTERNATIONAL EXPERIENCE

Several countries have made significant strides in integrating bill payments into their fast payment ecosystems, often through request-to-pay overlays that improve transparency, control, and efficiency for both users and billers.

In Australia, the PayTo service enables real-time payment authorizations directly from a customer's bank account for recurring or one-off payments. Billers, including utilities and merchants, can initiate payment requests through secure digital channels, with consumers approving transactions via their banking app. This model enhances convenience while embedding consumer control and is likely to replace direct debit over time.

India provides a robust example through its integration of bill payments into the UPI framework. Platforms such as Bharat BillPay allow users to receive payment requests via mobile channels (QR codes or links), which they can fulfill instantly through UPI. This model is increasingly used by the government, telecom, and utility providers and shows how bill-pay ecosystems can scale nationally when supported by real-time, interoperable payment infrastructure.

In Jordan, the national aggregator eFAWATEER enables bill payment to multiple service providers, though it has not yet integrated with the country's FPS, Cliq. Instead, the gateway is linked with SANAD, a unified digital services portal used for accessing various public services. This demonstrates the potential to embed bill payments within broader e-government platforms while aligning them with FPS infrastructure over time.

For LAC, these models offer compelling insights. Leveraging FPS to support bill payments based on request-to-pay overlays can reduce cash reliance, simplify reconciliation, and increase the efficiency of collections for both public and private sectors. Integration with existing bill aggregators, agent networks, and government service portals—combined with trust mechanisms like preverification and alias-based payments—can help unlock FPS for daily high-volume use cases. A forthcoming technical note will explore these opportunities in detail.

Source: Author's elaboration.

BOX 15 TYPES OF REQUEST TO PAY AND USE CASES

Request-to-pay (RTP) services can take multiple forms, each suited to different payment needs:

- One-off RTP enables a payee to send a single payment request for a specific transaction. For example, an electrician completes a job and sends the client a one-time request, which the client approves to initiate a fast payment.
- Recurring RTP allows for scheduled payment requests over a defined period, such as monthly telecom bills or rent. Users can choose to approve each payment individually or authorize them all at once.
- Bulk RTP is designed for high-volume senders—like streaming services or utilities—that issue payment requests to many users at once. Each recipient still authorizes their individual payment, preserving control and transparency.

These modalities expand FPS functionality, offering flexible tools for individuals, businesses, and public services to manage real-time collections.

Source: Author's elaboration.

can bridge operational gaps while fostering digital financial habits, especially when linked to alias-based initiation and interoperable FPS frameworks.[46] Successful implementation will depend on inclusive design, strong consumer protection, and coordinated stakeholder engagement across banks, fintechs, merchants, and public agencies.

Embedding FPS within systems to collect transit fares can also cultivate everyday usage and raise digital payment literacy among a broader segment of the population. FPS can serve as an effective means to load value onto digital payment instruments for access to public transportation and can be integrated into open-loop ecosystems through QR and NFC capabilities. In Argentina, a recent reform of the public transit payment system (*Sistema Único de Boleto Electrónico*) opened the door to the use of a wide range of means of payment across the country's public transit infrastructure, in line with the principles of interoperability, innovation, and competition.[47] China and India are regarded as pioneers in the use of QR codes in public transportation (see Box 16). Nonetheless, the replicability of these experiences depends on FPS design maturity, including rapid payment authorization, high availability, and scalability. Furthermore, central banks, transport authorities, and transit operators should collaborate with FPS operators to design interoperable solutions tailored to local transit ecosystems. To enable FPS as the main transactional rail in public transportation, specific functionalities, such as offline payments, secure low-value transaction support, and instant authorization, must be developed and embedded; additionally, system

BOX 16 QR CODE PAYMENTS IN PUBLIC TRANSPORTATION: LESSONS FROM CHINA AND INDIA

The Shanghai Metro provides a compelling case of QR code integration into public transportation, showcasing how fast, convenient, and contactless fare collection can scale in high-density urban systems. Passengers generate QR codes via mobile wallets such as Alipay or UnionPay and scan them at turnstiles, eliminating the need for physical tickets or cash. This approach reduces friction and leverages China's broad adoption of mobile payments.

India's transport systems are also advancing fare solutions based on QR codes. In Kolkata, QR codes were introduced on select "Tech Zone" route buses, allowing passengers to scan static UPI QR codes for payment using their preferred app. Similarly, the Bangalore Metropolitan Transport Corporation implemented static UPI QR codes in buses, facilitating real-time fare payments without requiring proprietary apps or cards. These implementations highlight the effectiveness of low-cost, interoperable QR payment options in driving adoption across urban mobility networks.

Source: Author's elaboration.

reliability, user-friendly interfaces, and integration with technologies to collect transit fares are needed.

Open Finance

Open finance offers transformative potential for LAC by enabling individuals and businesses to access more customized and competitive financial services. By allowing authorized third parties to access consumer information held by financial institutions securely through standardized APIs, open finance can enhance customer empowerment and experience, affect competition in the financial sector, spur data-driven innovation, and improve financial inclusion.[48] In a region marked by low competition in the financial sector, high costs, and low trust in financial institutions,[49] open finance has the potential to create the conditions for a more contestable, transparent, and cost-effective financial services ecosystem. Its benefits extend not only to consumers but also to micro, small, and medium-sized enterprises and governments, by contributing to the lower cost of financing and enabling targeted financial support, respectively.

In the last few years, a growing number of LAC countries have accelerated policy reforms and adopted regulatory frameworks for open finance. Brazil has implemented a comprehensive four-phase open-finance road map that encompasses financial institution data (service channels, products, and services), customer data (including KYC and transactional data), and a wide range of services—from payment initiation to forwarding loan proposals and other services related to foreign exchange, investment, and insurance, among others. Chile enacted the Fintech Law in January 2023, establishing the open-finance system under the purview of the financial services regulator and has been working intensively to articulate a regulatory framework, with the support of the Open Finance System Forum. Mexico, despite a head start through its 2018 Fintech Law and secondary measures on open and aggregated data sharing, has experienced delays in operationalizing a framework for access to and use of transaction data, though recent events signal renewed momentum. Colombia had made initial strides with a voluntary open-finance model and later pivoted toward a financial-inclusion-driven, mandatory model. Other countries (for example, Peru, Uruguay) are at different stages of undertaking stakeholder consultations and developing regulatory proposals.

Payment-initiation capabilities are a natural convergence point between open finance and FPS. Through open-finance-enabled APIs, third-party providers such as fintechs, merchant platforms, or billing agents can initiate FPS transactions on behalf of users, streamlining digital commerce and bill payments. This can also enable new services like real-time request-to-pay flows and account-sweeping functionalities. Embedding payment initiation into FPS infrastructure can catalyze usage beyond P2P transfers and increase competition and user convenience, especially in e-commerce and physical merchant acceptance environments. Few countries (for example, Brazil, Chile,) have formalized and regulated PIS, paving the way for their integration within domestic FPS (for example, as a new type of participant). In fact, FPS can provide both a technical platform and a governance framework to orchestrate PIS, including by setting technical standards—for example, API specifications—and participation requirements. Brazil provides a clear example of synergy between open finance and FPS. A *Pix* transaction initiated via a payment-initiation service provider must comply with two sets of rules: (i) *Pix* rules, including QR codes, aliases, anti-fraud database access, scheme technical guidelines, transaction limits, and product specifications; and (ii) open-finance rules covering consent, authentication, confirmation, dispute resolution, and UX-specific requirements, among others.

The transaction data generated by FPS also becomes a critical asset within an open-finance ecosystem, offering insights into user behavior, cash-flow patterns, and payment preferences. When users consent to share their FPS-generated data, financial service providers can leverage it to offer more tailored products, such as dynamic credit lines for small merchants, automated savings tools, or liquidity support for gig workers. For this to be realized, LAC regulators must ensure that FPS operators and financial institutions adopt interoperable standards for data access while safeguarding user privacy. Combining the speed of FPS with the richness of transaction data can thus create a feedback loop of innovation and inclusion in the region. In several countries, concerns persist around data privacy and financial consumer protection, as well as cybersecurity; these concerns need to be addressed as a precondition for sound data-sharing frameworks.

The experience of Brazil suggests that a robust and interoperable FPS is an important factor, though not the only factor, in the adoption and scale-up of open finance. Payment initiation cannot thrive unless it is supported by instant, reliable, and user-friendly payment infrastructure. As LAC countries develop their open-finance strategies, the integration between open finance and FPS will be critical. Lessons from more mature markets, such as the United Kingdom, also highlight the importance of aligning technical performance, user experience, and governance mechanisms between these two pillars of digital finance. Other

BOX 17 OPEN BANKING AND FPS INTEGRATION CHALLENGES IN THE UNITED KINGDOM

The United Kingdom's Open Banking ecosystem, built around mandatory API-based data sharing among major banks, has spurred competition and innovation in financial services. However, its integration with the country's Faster Payment System has faced significant obstacles. Key challenges included fragmented payment-initiation experiences, inconsistent API performance across banks, and a lack of a unified payment-confirmation mechanism. These limitations have hampered the scalability of payments enabled by Open Banking, particularly in merchant and billing use cases. The lack of a standardized, frictionless user journey has restricted Open Banking's broader role as a competitive alternative to card networks. The United Kingdom's experience offers valuable lessons for LAC: regulatory mandates must be paired with coordinated technical implementation and usercentric design to unlock the full potential of FPS and Open Finance convergence.

Source: Author's elaboration based on *The Future Development of Open Banking in the UK* (February 2023).

indispensable elements of sound open finance ecosystems include robust consumer protection, data protection, and privacy framework to build consumer trust, generate positive customer experiences and outcomes, and foster adoption while minimizing potential harm.[50]

5.2 DIVERSIFYING ACCESS CHANNELS AND INITIATION MECHANISMS

The country review of access channels across FPS in LAC reveals notable patterns in channel deployment, though with some limitations. All FPS in the region offer mobile applications and internet banking as standard access channels. These channels are foundational yet tend to favor users with smartphones and reliable internet access. A recent study by Credicorp covering the countries Peru, Bolivia, Ecuador, Mexico, and Colombia highlights that barriers such as low digital literacy, limited trust in digital platforms, and infrastructure gaps, especially in rural and low-income areas, continue to hinder uptake. The study suggests that, while mobile penetration is high, access does not automatically translate into effective use, reinforcing the need for policies and services that are both inclusive and context-sensitive.[51] In this context, the fact that ATMs, agents, and POS channels remain generally underutilized, with only five, four, and four FPS systems supporting them, respectively, requires further attention from operators and policy makers. Brazil's *Pix* stands alone in offering a comprehensive mix of access channels, reflecting its commitment to scale, inclusion, and user convenience. In contrast, Mexico, Colombia, and Chile show relatively limited diversification beyond core digital channels, which may constrain broader adoption. El Salvador and the Dominican Republic show very limited support for access-channel diversification.

Despite growing smartphone penetration, large segments of the population in LAC, particularly in rural areas and among low-income users, continue to rely on basic mobile phones and limited data connectivity. Based on Findex 2025, 18 percent of adults report using mainly a basic text phone, and 10 percent do not own a smartphone due to cost. In this context, USSD emerges as a relevant access channel for extending the reach of FPS in LAC, particularly for low-income users. USSD enables real-time transactions through simple menu-based interfaces that do not require mobile data or apps, offering an inclusive and resilient tool to democratize digital payments. Solutions like Costa Rica's *SINPE Móvil* leverage SMS for FPS access. As several countries in Africa and South Asia have demonstrated (see Box 18), USSD can successfully support P2P, bill payments, and merchant collections, even in low-connectivity environments. For LAC, adopting USSD as a standard component of FPS access could significantly reduce exclusion, bridge the digital divide, and accelerate usage among those currently underserved by traditional digital channels.

Agent networks represent a critical access channel for expanding the reach and usability of FPS in LAC. With widespread physical presence and trust among underserved populations, agents can facilitate real-time transactions such as cash-in, cash-out, bill payments, and P2M transfers, even in low-connectivity or offline environments. Leveraging technologies like USSD and over-the-counter interfaces, agent-enabled FPS access can bridge digital gaps and promote financial inclusion across the region. In LAC,

BOX 18 EXPANDING FPS ACCESS VIA USSD FUNCTIONALITY

Nigeria's NIP, Africa's largest FPS, is fully accessible via USSD codes (for example, *737#, *966#), enabling users to perform P2P, P2M, and business transfers in real time without internet access. This channel extends financial inclusion by allowing users with basic feature phones to engage in digital payments.

Similarly, in Ghana, G-Money offers users the ability to dial *422# to send money, redeem vouchers, buy airtime, and pay bills via an FPS-linked mobile wallet, all through USSD. These experiences illustrate how USSD can effectively serve as a low-tech, high-impact channel for extending FPS access across underserved populations, providing a practical and replicable approach for LAC.

NIBSS, in collaboration with banks and mobile network operators, launched mCASH, a USSD-based merchant payment channel designed for micro and small enterprises. Merchants receive unique codes allowing customers to dial, for example, 402MerchantCode*Amount#, authenticate, and make instant payments, with both parties receiving immediate SMS confirmation. This solution enables real-time settlement without relying on costly POS terminals or internet connectivity, making it ideal for informal, low-capacity merchants. By enabling fast, reliable P2M transactions via basic phone technology, mCASH demonstrates a viable model for LAC regions where digital infrastructure and merchant digital readiness remain constrained.

only FPS in Costa Rica, Paraguay, and Peru support agent access channels. This feature is more commonly found in other geographies. For example, Pakistan has integrated their FPS, RAAST, with agent networks through over-the-counter banking services, while Nigeria's NIP ecosystem allows agents and small merchants to initiate and receive real-time payments using USSD and QR codes.

Multi-issuer wallets in LAC represent a growing ecosystem of digital payment tools, yet their integration with FPS remains limited and underleveraged. These wallets, often operated by fintechs, banks, or telecommunications and device providers, enable users to store and transact with funds across multiple financial institutions. While they are increasingly popular and accessible, most are not directly linked to FPS infrastructure, meaning that real-time interoperability across institutions remains constrained. In contrast, markets like Brazil and India have begun linking FPS rails with multi-issuer wallets, enabling seamless instant payments through platforms like Google Pay, Apple Pay, or native super apps.

QR code deployment in FPS across LAC reflects both potential and persistent fragmentation, with 10 of 16 systems supporting QR-based access yet facing challenges in scale and interoperability. Brazil's *Pix* exemplifies successful QR integration through multiple standardized modalities and wide ecosystem uptake. In contrast, Mexico's experience with CoDi illustrates key barriers: CoDi has struggled with merchant onboarding, limited user awareness, and fragmented acceptance infrastructure, leading to underwhelming adoption rates. Similarly, several other FPS in the region either lack QR functionality altogether, such as in Chile, Costa Rica, and the Dominican Republic, or have not integrated QR codes into interoperable merchant ecosystems. These gaps suggest that enabling QR access alone is insufficient; without shared standards, ecosystem coordination, and demand-side incentives, QR-based FPS usage is unlikely to scale meaningfully.

Many LAC countries have taken important steps by adopting global QR code standards, such as EMVCo, to facilitate broader adoption and technical alignment. However, standardizing the format of QR codes alone does not guarantee full interoperability. In practice, shared technical specifications must be paired with integration across multiple schemes, real-time transaction-clearing mechanisms, and coordinated governance to enable seamless payments across wallets, banks, and merchants. Without these layers, QR deployments risk becoming siloed, limiting network effects and merchant utility. The region's experience underscores the need to go beyond format harmonization and toward the creation of shared switching infrastructures and overlay services that ensure functional interoperability across platforms.

A growing number of countries are demonstrating how a single QR code can serve as a powerful access point to

multiple payment schemes, reducing fragmentation and enabling seamless consumer experiences. This model is particularly relevant for LAC, where QR-based payments are gaining ground but often remain siloed by issuer, wallet, or scheme. By using a unified, typically EMVCo-compliant QR format and linking it to a centralized directory or routing logic, users can scan one code and pay through their preferred app, while merchants receive funds via their chosen provider. For LAC, enabling FPS transactions through existing QR-based access points will require a strategic shift toward shared infrastructure, so that fast payments can be embedded into familiar merchant and government interfaces.

As FPS evolve across LAC, so must the access channels through which users interact with these systems. Expanding beyond QR codes, integrating NFC and offline payment capabilities into FPS architecture offers a powerful opportunity to broaden use cases, enhance user convenience, and improve resilience in low-connectivity environments (see Box 20). NFC allows users to initiate fast payments by simply tapping a card, phone, or wearable against a payment terminal, streamlining P2M transactions and enabling high-speed use cases like public transportation (see Section 4.1). Moreover, offline NFC payments can complete transactions even when devices are temporarily disconnected, with funds later synchronized through the FPS in near real time. This supports inclusive design by allowing underserved users to transact without constant internet access.

BOX 19 SINGAPORE'S UNIFIED QR: LINKING MULTIPLE SCHEMES THROUGH A SINGLE CODE

Singapore's SGQR initiative exemplifies the use of a single QR code to unify multiple payment schemes under one interface. Developed by the Monetary Authority of Singapore and the Payments Council, SGQR merges more than 27 payment options, ranging from bank apps to e-wallets, into one scannable code. While all participating providers adopted the EMVCo standard, the real breakthrough came from establishing centralized governance, directory services, and scheme-agnostic merchant registration. This allows any customer to pay any SGQR-registered merchant using their preferred payment provider, and it ensures that merchants need to display only one code. Importantly, Singapore's experience also highlights that technical standardization alone is insufficient: interoperability requires coordinated settlement processes, shared merchant registries, and scheme-neutral routing protocols to deliver a truly inclusive and seamless QR ecosystem.

BOX 20 EXPANDING ACCESS: NFC AND OFFLINE INNOVATION IN BRAZIL AND INDIA

Brazil: *Pix* Tap-to-Pay via NFC

Brazil recently launched *Pix por Aproximação,* an NFC-enabled method to initiate *Pix* payments. Developed by the *Banco Central do Brasil,* this system allows payment terminals to transmit *Pix* requests directly to users' Android phones via NFC, replacing the need for scanning QR codes. The experience mirrors contactless card payments; users simply tap their phone at the terminal to authorize a *Pix* transaction through their preferred app. The system is open, interoperable, and EMVCo-aligned and uses a new uniform resource identifier scheme embedded in the NFC payload. This approach enhances merchant integration, reduces transaction friction, and extends *Pix* usability to proximity contexts such as transit and retail environments.

India: UPI Lite for Offline Payments

India has addressed connectivity limitations through UPI Lite, a feature that enables offline FPS payments directly from locally stored wallets on users' devices. With a per-transaction cap of Re 500 (and daily cap of Re 2,000), UPI Lite allows users to make real-time payments without any internet connection, with balances preloaded from their bank account and later synchronized when the device reconnects. This model supports both P2P and P2M payments and is especially valuable in rural areas or environments with unreliable data access. With UPI Lite X, NFC functionality is further leveraged to enable contactless offline payments at POS devices, similar to Brazil's *Pix* NFC development. These innovations show how combining offline and NFC capabilities within FPS can expand real-time payment access, even in low-connectivity settings.

5.3 SECURING THE FUTURE OF FAST PAYMENTS

Fraud Mitigation

Fraud in digital finance is becoming increasingly sophisticated and cross-border in nature. Organized crime networks leverage advanced digital technologies to perpetrate fraudulent activities such as romance scams, impersonation schemes, and deceptive advertising. Utilizing AI, deepfake technologies, automated bots, and specialized fraud-as-a-service platforms, criminals rapidly create mule accounts, mask their locations, and exploit crypto assets to launder illicit funds. This evolution underscores the necessity for regulators and financial institutions to adopt robust and coordinated fraud-prevention strategies.

Payment fraud has manifested through diverse, evolving attack vectors. According to Visa's *2025 Global eCommerce Payments & Fraud Report,*[52] refund and policy abuse is the most common fraud attack reported by Latin American merchants, followed by first-party misuse, phishing, card testing, and real-time payment fraud. As FPS expand across LAC, so does their appeal to fraudsters. Emerging LAC FPS ecosystems have also experienced abuse of payment links and QR codes, the creation of synthetic identities, and misuse of refund and request-to-pay functionalities.[53] While individual losses may be small, the reputational damage to FPS operators, PSPs, and regulators can be substantial, particularly in jurisdictions where trust in digital finance remains fragile.

Data on fast payment fraud is not broadly available or comparable across jurisdictions. Only three of 11 central banks surveyed reported fraud data. Fraud volume and value patterns differ significantly across countries. Data availability (or the lack thereof) might indicate several issues—from low awareness of central banks/regulators or lack of sense of urgency to a misalignment with supervisory reporting, as well as coordination issues with other relevant authorities (for example, banking supervisors and consumer protection authorities) and regulatory gaps (see also below). These issues should be more thoroughly investigated and addressed on a timely basis with a view to making comprehensive fraud data available to central banks for monitoring and risk-planning purposes.

Countries' preparedness to manage fraud risks also varies considerably. The World Bank questionnaire covered (i) regulatory requirements addressed to PSPs; (ii) information-sharing arrangements; (iii) technology solutions at the FPS level; and (iv) standardized reporting and resolution. A summary of the key findings is provided below.

i. With few exceptions, PSPs across the region are not universally subject to comprehensive antifraud requirements. The most comprehensive requirements addressed to PSPs typically stem from FPS rules or regulations on electronic funds transfers. Some central banks rely on broader frameworks (for example, cybersecurity), whereas others report having no specific requirements.

ii. Most countries do not have fraud-information-sharing arrangements for fast payments—with some notable exceptions. The central bank of Brazil has developed an information-sharing platform for fraud related to *Pix* transactions and makes available to participants a dedicated API to consult fraud information on a 24/7 basis. In Mexico, SPEI rules require participants to put in place collaboration agreements to handle and resolve cases of unauthorized fraud. The central bank of Argentina requires FPS operators to collect information and share it with participants for use in their fraud-management systems.

iii. Besides Brazil's fraud-information-sharing platform, FPS operators have not implemented centralized fraud detection, risk scoring, or fund-tracking capabilities.

iv. As mentioned above, standardized fraud-reporting and resolution requirements, where they exist, are more likely to be covered in FPS rules.

Despite limited data availability, it is evident that there is room for improving fraud data and fraud-management frameworks across the region. Limited data, sparse mitigation efforts, and a lack of coordination across stakeholders may enable fraud schemes to grow faster and evolve. Fraud management requires a multipronged approach that leverages and exploits synergies between technology, scheme rules, regulation, and financial awareness. In particular, central banks could consider the following:

i. *Leveraging technology to improve fraud management.* Regulators and scheme managers should promote the adoption of advanced fraud-prevention tools, such as machine learning, device fingerprinting, and behavioral analytics. These advanced tools should build on and complement basic requirements (imposed through regulation and/or scheme rules) on multifactor authentication, minimum fraud-detection capabilities, transaction holds, and the like. Efforts by the *Banco Central do Brasil* to integrate these mandates into the *Pix* rule book offer a promising reference point for the rest of the region.

Furthermore, digital ID integration with FPS can enhance user protection and access. For example, embedding digital ID within FPS flows, particularly during onboarding and authentication, can reduce impersonation and enhance risk profiling.

ii. *Mandating dispute-resolution and compensation frameworks.*[54] Brazil's Special Reimbursement Mechanism (*Mecanismo Especial de Devolução*) allows for fund recovery in cases of fraud, contingent on evidence and fund availability. Recent upgrades mandate in-app request capabilities, and future iterations aim to track funds across institutions. These tools protect users while disincentivizing malicious activity and represent global best practices. Regulatory clarity on liability sharing and damage compensation, particularly for authorized push payment fraud, is critical to increase user trust and PSP incentives to invest in secure user experiences.

iii. *Implementing appropriate centralized fraud-management solutions.* These include analytics platforms powered by AI and machine learning for anomaly detection and real-time scoring, sectoral fraud repositories that consolidate information on high-risk actors, and multilateral information-sharing schemes that enable structured exchange of fraud intelligence. Coordinated fraud-response centers can drive joint action across institutions, including rapid freezes and traceability. The extent to which centralized tools are feasible and appropriate in each country context depends on several factors—from the FPS legal basis to technical capability and market structure—and the decision to implement such tools should be based on an open, transparent process. Implementation models range from voluntary, nonbinding tools—such as shared risk-analytics platforms, as seen in India's NPCI or Europe's EBA Clearing—to the compulsory use of centralized facilities, such as fraud-scoring systems managed by the FPS operator or industry or government body.

iv. *Forging alliances within and beyond the financial sector.* The international experience shows that effective responses to fraud risks require partnerships across different domains (for example, payments, AML/CFT, cybersecurity) within the financial sector and with other sectors—for example, with mobile network operators (to address SIM-swap fraud), digital platforms (to tackle social engineering), law enforcement, and consumer protection agencies. In Brazil, the *Pix* Forum's security working group coordinates across stakeholders to refine standards, share threat intelligence, and recommend system upgrades.

v. *Accompanying FPS rollout with education campaigns.* Users need to be informed about fraud risks, safe digital behaviors, and available protections. Central banks and PSPs should collaborate on awareness efforts, using accessible language and relatable scenarios. Fraud literacy increases resilience and reduces the likelihood of successful scams, reinforcing trust in the broader ecosystem.

Operational Resilience

Public trust in FPS depends not only on speed and efficiency but also on their resilience in the face of cyber threats. FPS are as vulnerable to cyber threats as traditional payment systems and other market infrastructures. In fact, the instant, 24/7 nature of FPS makes them especially susceptible to cyberattacks such as distributed denial-of-service attacks, ransomware, and data breaches. Core risks include disruption of critical services, compromise of alias directories, mobile channel fraud (for example, QR code tampering), and reputational damage resulting from data loss or unauthorized transactions. To manage these risks, FPS operators must implement cyber resilience frameworks based on international standards. This includes strong governance, proactive threat detection, secure integration practices, and continuous testing. Regulators should ensure that FPS are recognized as critical infrastructures and enforce mandatory incident-response protocols and minimum cybersecurity thresholds across all participants.

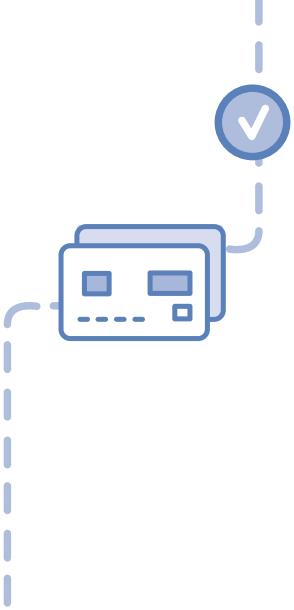
FPS resilience rests both on the strength of the central infrastructure and on the operational reliability of participating institutions. Ensuring continuous availability is not the responsibility of the FPS operator alone; it also depends on the preparedness and robustness of participating institutions. In Mexico, for example, a majority of SPEI 2023 incidents were attributed not to issues within participating institutions, such as configuration errors or delays in contingency activation. These incidents underscore the importance of shared accountability for resilience across the ecosystem. In Paraguay, the central bank publicly held private financial institutions responsible for recent service interruptions in FPS transfers, warning of possible sanctions due to breaches in operational timelines.

Scalability is a critical dimension of FPS operational risk management. Brazil's *Pix*, India's UPI, and Thailand's PromptPay are examples of systems that withstood increasing volumes of operations and complexity. India's UPI ecosystem now includes 673 participants, while Brazil's *Pix* has expanded to 905 institutions, of which 833 are nonbanks. In Thailand in 2024 alone, PromptPay processed over 24

billion transactions worth nearly 272 percent of Thailand's GDP. Mexico's SPEI illustrates that fast payment infrastructure is a long game, where scalability is increased over time through persistent institutional commitment. Launched in 2004 and extended to 24/7 in 2016, SPEI has grown from just over 229 million transactions in 2017 to more than 4.7 billion in 2024. This demonstrates that scaling a national FPS is not a one-time achievement but an ongoing strategic commitment that evolves with the ecosystem, requiring a continuous upgrade in operational competencies and institutional coordination. Infrastructure capacity must evolve alongside liquidity management, real-time risk monitoring, governance, and participant onboarding.

The governance models underpinning FPS that have demonstrated remarkable scalability reveal two viable paths. India's UPI and Thailand's PromptPay are operated by NPCI and NITMX, respectively. Both are private entities under regulatory oversight, allowing them to innovate rapidly and respond flexibly to market needs. In contrast, Brazil's *Pix* and Mexico's SPEI are directly operated by their central banks, reflecting an approach to infrastructure provision led by the public sector. Both models come with different institutional requirements. Private operators benefit from agility and market orientation but require robust governance frameworks to ensure inclusiveness, security, and public trust. Public operators may move more deliberately but can embed public policy goals more directly into system design. The common denominator across both approaches is the need for high institutional capacity, political will, and sustained investment to support complex ecosystems at scale.

Looking ahead, open-source technologies offer a promising path for developing flexible, cost-effective FPS, especially in resource-constrained environments, but require operators and overseers to assess pros and cons. By enabling access to source code and avoiding vendor lock-in, open-source solutions allow FPS operators to tailor platforms to local requirements and promote transparency through community-based development. Systems like Mojaloop demonstrate the feasibility of modular open-source FPS that support alias resolution, clearing, and fraud management while being extensible to diverse financial service providers. However, the use of open-source software introduces operational and cybersecurity risks that must be managed proactively. Operators need substantial in-house technical capacity or external integrator support to ensure proper implementation, maintenance, and ongoing security. While open-source models can reduce licensing costs, they may require higher long-term investments in customization, support, and risk mitigation. Regulators and operators should carefully assess institutional maturity, total cost of ownership, and the availability of robust support communities before adopting open-source FPS frameworks.



APPENDIX A
FPS DESIGN MATURITY INDEX

The FPS Design Maturity Index is a composite index calculated by aggregating the number of points achieved according to the following methodology:

COUNTRY	24/7 OPERATION	INSTANT AVAILABILITY OF FUNDS	NUMBER OF PARTICIPANT TYPES (BANKS, NON-BANKS)	PARTICIPATION SCHEME TYPE (DIRECT/INDIRECT)	ALL TYPES OF LICENSED NON-BANKS CAN PARTICIPATE DIRECTLY IN THE FPS	NUMBER OF ACCESS CHANNELS	NUMBER OF PAYMENT INSTRUMENTS	TYPES OF ALIASES SUPPORTED	TYPE OF USE CASES	TRANSACTION LIMITS SPECIFIED	TOTAL
Brazil	3	3	1	1	2	2	1	3	5	1	22
Argentina	3	3	1	1	0	2	2	1	5	1	19
Peru	3	3	1	1	2	2	1	3	3	0	19
Bolivia	3	3	1	0	2	2	2	0	4	1	18
Chile	3	3	1	1	2	1	2	0	4	0.5	17.5
Costa Rica	3	3	1	0	2	2	1	1	3	1	17
Mexico	3	3	1	1	2	1.5	1	1	2	1	16.5
Paraguay	3	3	1	1	0	1.5	2	3	1	1	16.5
El Salvador	0	0	1	0	2	1	2	2	5	1	14
Colombia	3	3	1	0	2	1.5	1	1	1	0	13.5
Dominican Republic	0	3	1	0	2	1	1	0	1	1	10

- 24/7 operation: Yes = 3 points, no = 0 points.
- Speed of availability of funds: Instant availability (less than eight seconds) = 3 points, otherwise = 0 points.
- Number of participant types (banks, nonbanks): Both = 1 point, only banks = 0 points.
- Participation scheme type (direct, indirect): Both = 1 point, only direct = 0 points.
- All types of licensed nonbanks can participate directly in the FPS: Yes = 2 points, no = 0 points.
- Number of access channels (mobile application, internet banking, QR codes, ATMs, agents, POS devices): More than four channels = 2 point, three or four channels = 1.5 points, fewer than three channels = 1 points.
- Number of payment instruments (credit transfer, direct debit, other): More than one = 2 point, only one = 1 points.
- Types of aliases supported (phone number, email address, national ID, corporate registration number, scheme-specific proxy identifier, other): More or equal to three = 3 points, two = 2 points, one =1 points, zero = 0 points).
- Type of use cases (P2P, P2M, G2P, P2G, other): 1 point for each use case, with a maximum score of 5 points.
- Transaction limits specified (no limits, limits): No limits = 1 point, high limit (more than US$500 per day) = 0.5 points, limits = 0 points.

The maximum score is 23. In the case of countries with multiple FPS, the most sophisticated FPS is included. The calculation of the score reflects the adherence of the system's instruments, rules and procedures to the criteria above, based on information provided by the participating central banks and other publicly available information.

ENDNOTES

1. See "Competition in Retail Banking Services in Latin America," World Bank, September 2020. https://documents1.worldbank.org/curated/en/804881599637618906/pdf/Competition-in-Retail-Banking-Services-in-Latin-America.pdf
2. See "Payment technology complementarities and their consequences on the banking sector: evidence from Brazil's *Pix**", BIS, December 2024. https://www.bis.org/publ/bppdf/bispap152_c.pdf
3. DPI is defined by the World Bank as shared digital resources that are designed for the public benefit and can be reused across sectors to avoid reinventing the wheel for each new digital service. Source: https://documents1.worldbank.org/curated/en/099031025172027713/pdf/P505739-84c5073b-9d40-4b83-a211-98b2263e87dd.pdf
4. https://openknowledge.worldbank.org/server/api/core/bitstreams/bb08d389-cfbf-4417-9415-b9f65ef5c1f4/content
5. The information for Colombia pre-dates the launch of Bre-B, Colombia's interoperable fast payment ecosystem. Accordingly, the analysis reflects the operations of Colombia's privately operated FPSs prior to the launch of Bre-B. Nevertheless, this report includes several references to Bre-B as a relevant central bank initiative to foster interoperability. Bre-B debuted on October 6, 2025, with the entry into operation of the central bank-operated centralized settlement infrastructure.
6. This work builds on the World Bank FASTT (Frictionless, Affordable, Safe, Timely Transactions) toolkit. See https://fastpayments.worldbank.org/
7. Excluding Brazil, each accountholder in LAC made 106.3 fast payments per year in 2024, compared to 6.1 in 2017.
8. It should be noted that high inflation and other macroeconomic pressures may drive users to adopt fast payments, as the need to transact quickly becomes critical to avoid loss of value in rapidly depreciating currencies. Additionally, the inconvenience and security risks of carrying large quantities of banknotes may further incentivize the shift toward digital payments. In the case of Argentina, it remains unclear to what extent the ongoing high inflation process has directly influenced the adoption of digital payments, including fast payments.
9. See "Fast payments and banking: Costa Rica's SINPE Móvil", BIS, December 2024. https://www.bis.org/publ/bppdf/bispap152_d_rh.pdf; "*Pix* is now the most used payment method in Brazil", BCB, March 2025. https://www.bcb.gov.br/en/pressdetail/2588/nota
10. Global Findex data is referenced throughout the report to facilitate cross-country comparisons of financial inclusion indicators. Financial sector authorities and national statistical agencies often collect and publish their own financial inclusion data, which may differ from Global Findex in methodology and results.
11. In many countries without a P2M functionality, fast payments may still be used for merchant payments even though merchants and their customers lack a full-fledged ecosystem or appropriate access channels, impairing user experience and potentially causing growth to stagnate. (For example, in some markets, customers initiate payments via manual bank transfers using account numbers, with no QR codes or integration at the POS.) The international experience shows that this state may not be sustainable over time, and more advanced fast payment markets have developed dedicated P2M functionality.
12. In this context, governance refers to the "relationships between owners, board of directors (or equivalent), management, and other relevant parties in a payment or other settlement system, including participants, authorities, and other stakeholders." Governance provides "the processes through which an organization sets its objectives, determines the means for achieving those objectives, and monitors performance against those objectives." Adapted from the Principles for Financial Market Infrastructures (PFMI) of the Committee on Payments and Market Infrastructures and the International Organization of Securities Commissions.
13. Fast payments are payments where the transmission of the payment message and the availability of final funds to the payee occur in real time or near real time and as near to 24/7 as possible.
14. For example, they would hold regular periodical informal meetings with the operators and, in some cases, participate as observers in board meetings.
15. According to the first World Bank Global Payment Systems Survey (GPSS), which was published in 2009, only very few central banks, such as those of Czechia and Saudi Arabia, were at the time offering a service similar to SPEI of *Banco de México*.
16. See "NPCI International and the Central Reserve Bank of Peru Partner to Develop UPI-Like Real-Time Payments System in Peru", NPCI International, June 2024. https://www.npci.org.in/PDF/npci/press-releases/2024/NIPL-Press-Release-NPCI-International-and-the-Central-Reserve-Bank-of-Peru-Partner-to-Develop-UPI-Like-Real-Time-Payments-System-in-Peru.pdf
17. See "Competition in Retail Banking Services in Latin America," World Bank, September 2020. https://documents1.worldbank.org/curated/en/804881599637618906/pdf/Competition-in-Retail-Banking-Services-in-Latin-America.pdf
18. The survey includes the Dominican Republic's *Pagos al Instante* and El Salvador's *Transfer365*. While *Pagos al Instante* and *Transfer365* meet the criteria for fast payments (enabling transmission of the payment message and availability of final funds to the payee in real time or near real time and operating as near to 24/7 as possible), they are not fully aligned with state-of-the-art FPS (see World Bank FASTT tracker, https://fastpayments.worldbank.org/global-tracker#block-homenav). In particular, *Pagos al Instante* operates 14 hours during weekdays and 16 hours during weekends and holidays. Regarding *Transfer365*, per its rule book, it operates 21

hours every day, while participants are granted up to three minutes to credit the payee. Despite these limitations, these efforts are noteworthy for the purposes of analyzing regional trends and are on a trajectory to become or evolve into full-fledged FPS.

19. Note that in countries with more than one FPS, the FPS with the highest volume in 2024 is used.
20. In Colombia, Visionamos is the FPS for the cooperative and solidarity sector and currently counts 165 participants. On the other hand, a majority of participants in Transfiya ACH Colombia and Redeban are banks.
21. To provide a like-to-like comparison between FPS and non-FPS digital payments, only centrally cleared transactions were considered for this indicator.
22. Taking into account not only FPS volume share of total digital payments but also the FPS share of the average digital payment value.
23. The Competitive Dominance Index (CDI) is calculated by multiplying fast payments per adult by fast payments as a share of total digital payments. This multiplication captures two complementary dimensions: the intensity of use (how frequently the average adult makes FPS transactions) and the relative dominance of FPS within the overall digital payments landscape. The resulting indicator highlights where FPS are not only widely adopted at the individual level but also central to the functioning of the broader payments ecosystem, allowing for a more complete picture of their competitive position across the national digital payments ecosystem and across countries.
24. For the purposes of this section, digital payments include FPS transactions, inter-PSP electronic fund transfers (traditional credit transfers and direct debits), card transactions (debit, credit, and prepaid), and e-money transfers between user accounts at different issuers. Intra-PSP transactions were excluded to enable the analysis of the impact of FPS on digital payments by comparing data at system level. The focus of this analysis is on trends.
25. See Arauzo, J., Franco, C. (2024), Fast payment systems and financial inclusion. Box extracted from chapter "Fast payments: design and adoption". BIS Quarterly Review March 2024. https://www.bis.org/publ/qtrpdf/r_qt2403z.htm
26. Including high-income economies like Chile and Uruguay.
27. See "Fast payments and banking: Costa Rica's SINPE Móvil", BIS, December 2024. https://www.bis.org/publ/bppdf/bispap152_d_rh.pdf; "*Pix* is now the most used payment method in Brazil", BCB, March 2025. https://www.bcb.gov.br/en/pressdetail/2588/nota
28. According to the PFMI, governance "provides the processes through which an organization sets its objectives, determines the means for achieving those objectives, and monitors performance against those objectives."
29. For example, in 2022 *Banco de la República* (Colombia) established the Payments System Forum (*Foro Sistema de Pagos*) to overcome misaligned incentives and interoperability challenges that hindered the development of fast payments through public-private collaboration. See "Banco de la República creó el Foro Sistema de Pagos", *Banco de la República de Colombia*, September 2022. https://www.banrep.gov.co/es/banco-republica-creo-foro-sistema-pagos. The *Banco Central de Reserva del Perú*, in its announcement of the agreement with NPCI to implement a UPI-like FPS, emphasizes financial inclusion and cash reduction. See "BCRP y Corporación Nacional de Pagos de la India firman acuerdo para implementar una plataforma de pagos minoristas en Perú", *Banco Central de Reserva del Perú*, June 2024. https://www.bcrp.gob.pe/docs/Transparencia/Notas-Informativas/2024/nota-informativa-2024-06-04.pdf.
30. See "Characteristics of the New Bre-B Instant Payments System," Box 4 in "Report of the Board of Directors to the Congress of Colombia", *Banco de la República de Colombia*, February 2025. https://repositorio.banrep.gov.co/server/api/core/bitstreams/d54366b5-4f33-465f-9b75-fbaefd8a1ec9/content.
31. These issues predate FPS and were first documented in "Balancing Cooperation and Competition in Retail Payment Systems", Financial Infrastructure Series, Payment Systems Policy and Research Policy Brief 47501, World Bank, November 2008. http://documents.worldbank.org/curated/en/180751468053710688.
32. See PFMI 3.2.7.
33. See "*Implementación e impacto de la Estrategia de Interoperabilidad de los Pagos Minoristas en el Perú*", *Banco Central de Reserva del Perú*, April 2024. https://www.bcrp.gob.pe/docs/Sistema-Pagos/articulos/estrategia-de-interoperabilidad-2024.pdf.
34. See "Interoperability in Retail Digital Payments", World Bank, forthcoming.
35. A CBDC has commonly been defined as a liability of (or a claim on) the central bank, denominated in the national unit of account that is different from balances in traditional reserve or settlement accounts. Two broad categories of CBDCs are generally distinguished: wholesale and retail. Wholesale CBDCs are specifically tailored for use by financial institutions and other eligible participants for the settlement of interbank transfers and other related large-value wholesale transactions and post-trade financial processes. Retail CBDCs are designed for access and use by individuals and businesses and can be used for a diversity of use cases.
36. See Illes et al., 2025, "Advancing in tandem - results of the 2024 BIS survey on central bank digital currencies and crypto", BIS Papers No 159, August 2025, https://www.bis.org/publ/bppdf/bispap159.htm
37. See Vega et al., 2025. "Design and implementation of Peru's retail central bank digital currency pilot," Journal of Payments Strategy & Systems, Henry Stewart Publications, vol. 19(2), pages 154-169, June.
38. See Aurazo et al., 2024, "Central bank digital currencies and fast payment systems: rivals or partners?", BIS Papers No. 151, December, https://www.bis.org/publ/bppdf/bispap151.pdf
39. P2M are supported by only one of Colombia's three FPS: Redeban Entre-Cuentas.

40. Use-case expansion must be realistic about systemic boundaries, as not all payment needs align with FPS design. Business-to-business payments, for instance, often require batch processing, authorization hierarchies, and high-value settlement features better suited to traditional transfer systems.
41. See Dimitris Drakopoulos, Yibin Mu, Dmitry Vasilyev, and Mauricio Villafuerte, "Cross-Border Payments Integration in Latin America and the Caribbean", IMF Working Papers WP/24/119, June 2024. https://doi.org/10.5089/9798400279584.001.
42. See "Remittance Prices Worldwide Quarterly", World Bank, December 2024. https://remittanceprices.worldbank.org/sites/default/files/rpw_main_report_and_annex_q424_13.pdf.
43. Source: World Bank Enterprise Surveys, www.enterprisesurveys.org.
44. Using the exchange rate of June 18, 2025, 1 Indian rupee equals $0.012.
45. See https://pjss.bzu.edu.pk/index.php/pjss/article/view/1498
46. According to Findex 2025, in LAC only 25 percent of adults made a utility payment using an account with a bank or financial institution.
47. See Decree 698/2024 (https://www.boletinoficial.gob.ar/detalleAviso/primera/311794/20240806).
48. See "Key Considerations for Open Finance", CGAP, BIS, IMF, UNSGSA, and World Bank, 2024. https://www.cgap.org/research/key-considerations-for-openfinance.
49. Based on Findex 2025, 57 percent and 11 percent of unbanked adults in LAC cite high costs and lack of trust, respectively, as a reason not to have a transaction account. LAC ranks first and second globally on cost and trust motivations, respectively.
50. See "Key Considerations for Open Finance", CGAP, BIS, IMF, UNSGSA, and World Bank, 2024. https://www.cgap.org/research/key-considerations-for-openfinance.
51. See "Índice de Inclusión Financiera de Credicorp 2024", Credicorp, August 2024. https://bancodeideascredicorp.com/assets/files/Ebook-Indice-de-Inclusion-Financiera-de-Credicorp-2024.pdf.
52. See "2025 Global eCommerce Payments & Fraud Report", Visa Acceptance Solutions, 2025. https://www.visaacceptance.com/en-us/insights/fraud-report.html
53. The World Bank FASTT focus note *Fraud Risks in Fast Payments* (October 2023) provides a comprehensive overview of fraud typologies and mitigation techniques in fast payments. The note is available at https://fastpayments.worldbank.org/sites/default/files/2023-10/Fraud%20in%20Fast%20Payments_Final.pdf.
54. See the forthcoming World Bank FASTT focus note "Dispute Resolution Mechanisms in Fast Payments".

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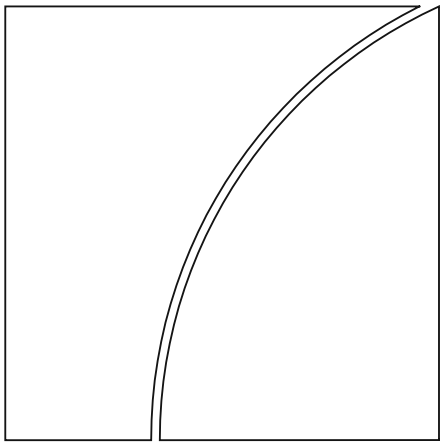
Enclosure 10



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Central bank digital currencies and fast payment systems: rivals or partners?

by José Aurazo, Holti Banka, Jon Frost, Anneke Kosse and Thomas Piveteau

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Central bank digital currencies and fast payment systems: rivals or partners?

José Aurazo, Holti Banka, Jon Frost, Anneke Kosse and Thomas Piveteau[1]

Abstract

Retail central bank digital currencies (CBDCs) and fast payment systems (FPS) share a number of similarities. Both allow for instant transactions for end users, can rely on underlying infrastructures operated by the central bank and can allow for an important role for private payment service providers (PSPs) to offer their services to end users. The key difference is that retail CBDCs are a new form of central bank money for the general public, while FPS to date allow end users to transfer private money (eg commercial bank money or electronic money). The paper analyses how retail CBDCs and FPS compare with each other and why some jurisdictions have opted for a retail CBDC, while others have chosen to introduce an FPS or both. Interviews with central banks in 14 jurisdictions around the world (at different stages of implementation of a retail CBDC and/or an FPS) show that some see a case for both to fulfil different policy goals and complement one another. The paper also compares emerging challenges and risks related to retail CBDCs and FPS. Our key conclusion is that the choice between a retail CBDC or an FPS, or both, is very contextual and will depend on the market features, ecosystem and degree of maturity and innovation of existing payment infrastructures in a country. Decisions regarding a retail CBDC, FPS or both involve important considerations regarding success factors, design choices and the role of central banks and the private sector.

Keywords: central bank digital currencies, fast payments, fast payment systems, digital payments, financial inclusion, fintech, interoperability, innovation.

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1. Introduction

To advance digital payments, promote innovation and enhance safety and efficiency in the financial sector, central banks have multiple tools at their disposal. One prominent option is to issue a retail central bank digital currency (CBDC), which is a digital liability of the central bank denominated in the national currency that households and firms can use for everyday transactions. Another is to build a retail fast payment system (FPS), which allows for the processing of retail payments and the availability of final funds of private money (eg commercial bank money or e-money) to the beneficiary in real time or near real time and as near as possible to 24 hours a day and seven days a week (24/7).

This paper explores two key questions: How do retail CBDCs and FPS compare with each other? Why have some jurisdictions opted for one of them while others are considering both? To answer these questions, we describe key similarities and differences between retail CBDCs and FPS, including functionalities, the role of central banks and other stakeholders, and risks and challenges. We take the characteristics and features of current FPS as a starting point for our comparison, while acknowledging that the functionalities and designs of FPS may also evolve over time. We also examine central banks' policy rationales for exploring and implementing either or both. To inform our analysis and discussion, we interviewed central bank staff in 14 jurisdictions.[2] These institutions are at different stages in terms of design, implementation and adoption of retail CBDCs and FPS. The interviews took place between December 2022 and February 2023. The sample of 14 central banks was selected in a way that covers a wide range of perspectives, from central banks that already have both a retail CBDC and an FPS, to those that have one of the two, to those that have neither (yet) (see Annex 1).

Currently, consumers and businesses in about 120 jurisdictions can make and/or receive fast payments through a domestic or regional FPS. These are operated by either central banks or private parties or as a public-private collaboration.[3] While some of these systems are still at an early stage of development, others have demonstrated impressive uptake after their launch. For instance, Pix onboarded more than 150 million individual and business users in Brazil in its first year of operation and is now used by over 90% of adults in the country. PromptPay registered around 63 million end users in Thailand in early 2022, representing more than 85% of the population.[4] As of March 2024, nearly 600 banks were live on UPI in India, with more than 13 billion transactions carried out using that infrastructure in a peak month.

Meanwhile, as of September 2024, three central banks have launched a live retail CBDC (in the Bahamas, Jamaica and Nigeria) for general use by households and

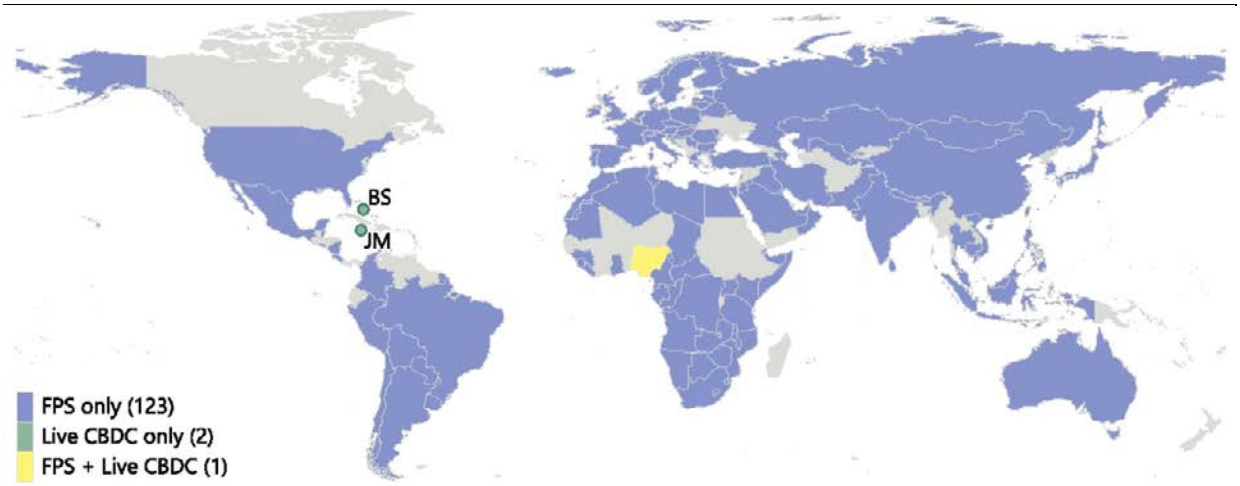
[2] The sample of interviewed central banks is diverse. It involves four jurisdictions in the Americas (The Bahamas, Brazil, Canada and Jamaica), four African jurisdictions (Ghana, Morocco, Nigeria and the Western African States), three jurisdictions in Europe (Denmark, the euro area and Switzerland), two jurisdictions in Asia (India and South Korea) and one jurisdiction in Oceania (New Zealand). A list of the acronyms used in this paper when referring to the individual central banks of these jurisdictions can be found in Annex 1.

[3] Note that many of the FPS still support relatively few use cases and only basic features. They may therefore require further development for wider uptake and use. See World Bank Fast Payments Global Tracker, fastpayments.worldbank.org.

[4] World Bank (2021).

businesses. Of these, Nigeria has implemented an FPS as well.[5] Adoption of these three retail CBDCs in terms of users as well as transactions has been relatively slow compared with the global uptake of FPS. In The Bahamas, roughly three years after the introduction, there were about 100,000 wallets in March 2023 (about 25% of the adult population), with about 200,000 transactions per month.[6] In Nigeria, there were about 900,000 wallets (0.5% of the population) one year after the launch.[7] Nevertheless, a BIS survey of central banks found that about a quarter of central banks were piloting a retail CBDC in 2023.[8] Graph 1 shows the status of retail CBDC projects and FPS around the world.

Retail CBDCs and FPS around the world[1, 2] Graph 1



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BS = The Bahamas; JM = Jamaica.

[1] As of the beginning of September 2024. Numbers in parentheses indicate the number of jurisdictions in each category. [2] FPS refers to access to at least one domestic or regional FPS.

Sources: Auer et al (2023); World Bank; central banks' websites; BIS.

There are key similarities between retail CBDCs and FPS. Both allow for instant (and usually low-cost) transfers for end users and can facilitate payment efficiency and interoperability.[9] Both can be built on infrastructures operated by the central bank with an important role for private payment service providers (PSPs), for example in the interaction with end users. Both can be designed to enhance access by

[5] Based on the updated data set on CBDC projects, speeches and search interest, as of March 2024, from Auer et al (2023). For further overviews of CBDC projects, see the CBDC tracker of Mikhalev et al at cbdctracker.org and the CBDC Tracker from the Atlantic Council at www.atlanticcouncil.org/cbdctracker.

[6] See Branch et al (2023).

[7] Ree (2023).

[8] See Di Iorio et al (2024).

[9] See Boar et al (2021) for a discussion of the benefits and trade-offs of interoperability between payment systems.

individuals, households and businesses to a range of competing and affordable financial services, thereby promoting financial inclusion.

The chief difference between retail CBDCs and FPS is that CBDCs allow users to pay each other using a direct claim on the central bank and are thus a form of central bank money – like cash. By contrast, FPS allow end users to transfer private money (eg commercial bank money or electronic money). Because CBDCs are central bank money, retail CBDC balances are not subject to bankruptcy risks. Depending on the specific design and the availability of safeguards to underpin private money (such as deposit guarantee schemes), retail CBDCs may have different implications than FPS in terms of disintermediation of private banks, eg in times of financial market stress or uncertainty.

We show that, in the view of about half of the interviewees, there can be reasons for both issuing a retail CBDC and establishing an FPS in the same jurisdiction. Counterparts mentioned programmable and offline payments and preserving a form of publicly issued money for the general public (avoiding currency substitution) as advantages of retail CBDCs. However, some noted that those features might also be seen in FPS in the future. Others noted that there could be advantages from having both systems in terms of consumer choice and redundancy. Some also mentioned that there may be benefits from accountability and transparency in welfare and social disbursements by the government. Yet this view was not universal. Some questioned the value of retail CBDCs if an FPS is already in place. In terms of timing, many saw a case for building an FPS first, with research and experiments in retail CBDCs occurring in parallel. Some discussed the potential to integrate the two in various ways in the future. There are important debates about the role of the central bank in each system, as well as the operational, financial and reputational risks of each and the technological and institutional safeguards needed to address these.

Our key conclusion is that the choice between issuing a retail CBDC or building an FPS, or doing both, is very contextual and will depend on the market features, ecosystem and implementation choices made in the past. While work on retail CBDCs is still in early stages and FPS are further evolving, we also conclude that there are useful lessons from experiences to date on design choices, the factors that contribute to the success of a retail CBDC and fast payments, and the role of the central bank and other stakeholders.

Our main contribution to the literature is to collect views on the question of how retail CBDCs and FPS compare and interact with each other, primarily from a policy perspective, based on in-depth interviews with central bank staff. Existing literature in this area is scarce and mainly based on hypothetical considerations. Using data from a BIS survey, Kosse and Mattei (2023) show that most central banks believe that, in principle (ie regardless of the design and availability of their existing or planned CBDC or FPS), there may be value in having both an FPS and a retail CBDC. This is not only because they believe that a retail CBDC has specific properties and may offer additional features, but also because having both could benefit the efficiency and resilience of the payments market. Wong and Maniff (2020) compare a retail CBDC system with existing types of payment systems and conclude that, depending on its actual design and features, a retail CBDC could provide value in certain areas. These include being a digital form of a bearer instrument, offering more cost-effective payment services, ensuring greater anonymity than current digital transactions and acting as a catalyst for greater innovation. Khiaonarong and Humphrey (2022) study the adoption of fast payments and the degree to which they have replaced other types of payments in 12 jurisdictions. They argue that if FPS allow for free person-to-

person (P2P) transactions between end users and a low-cost alternative for merchants, the adoption of a retail CBDC, if issued, may be importantly compromised, as the similarities with fast payments are too strong. They also note that fast payments have a first-mover advantage, which may hamper the demand for retail CBDCs. Recently, Patel et al (2024) discuss how CBDCs, FPS and e-money systems interact and can achieve central banks' objectives. They also explore what can drive the exploration of a CBDC and argue that this is strongly driven by jurisdiction-specific circumstances. We go beyond these studies by assessing in-depth specific features of retail CBDCs and FPS, including technical design and risk management implications. In many cases, we show that it is technically possible to build similar functionalities in both a retail CBDC system and an FPS. Yet in practice, there may be differences in the feasibility of providing these functionalities. Experience from different jurisdictions can be very helpful to inform the design of either initiative.

The remainder of this paper is organised as follows. Sections 2 and 3 give important definitions and a comparative analysis, respectively, of retail CBDC and fast payments (and retail CBDC systems and FPS). Section 4 draws on interviews with the staff of 14 central banks to analyse the rationale for exploring and implementing retail CBDC and FPS initiatives. Section 5 discusses technical functionalities and differences between the two, while section 6 addresses the role of the central bank and other stakeholders in each. Section 7 describes the risks and challenges of retail CBDCs and FPS. Section 8 puts forward key takeaways from the experience to date, and section 9 concludes.

2. Definitions

A clear definition of terms is of paramount importance to establish an accurate comparative analysis and avoid ambiguity between the two concepts. The following terminology is used consistently throughout this paper.

A CBDC has commonly been defined as a liability of (or a claim on) the central bank, denominated in the national unit of account that is different from balances in traditional reserve or settlement accounts.[10] Like today's forms of central bank money, a CBDC can co-exist with commercial bank money.[11] In this paper, we look at the features of a CBDC not only as a new type of central bank liability but also as a new system, which includes the infrastructure and rules (eg clearing, settlement and governance) underlying the transfer of the CBDC among system participants and end users. Two broad categories of CBDCs are generally distinguished: wholesale and retail. Wholesale CBDCs are specifically tailored for use by financial institutions and other eligible participants for the settlement of interbank transfers and other related large-value wholesale transactions and post-trade financial processes.[12] Retail CBDCs are designed for access and use by individuals and businesses and can be used for a diversity of use cases. Retail CBDCs have often been described as a digital alternative to cash issued by a central bank. Although references to wholesale CBDCs are made

[10] CPMI-MC (2018).

[11] See CPSS (2003) for a discussion on the role of central bank money and how it can coexist with commercial bank money.

[12] See BIS (2021).

when relevant, this paper focuses on retail CBDCs and retail CBDC systems for the comparative analysis with fast payments and FPS.

In this paper, we define an FPS as a system that encompasses the infrastructure, participating PSPs, end-user-facing services and underlying rules that govern the processing and delivery of fast payments.[13] Fast payments, also referred to as instant, real-time, immediate or rapid payments, are understood to be retail payments in commercial bank money or e-money that allow for the transmission of the transaction message and the availability of final funds to the beneficiary to occur in real time or near real time and as near as possible to 24 hours a day and seven days a week (24/7).[14] FPS can be owned and operated by central banks (eg Pix in Brazil), private entities (eg RTP in the United States) or both (eg Nigeria Inter-Bank Settlement System Instant Payments). While the final settlement of funds between the PSPs of the payer and payee could be done in both central bank and commercial bank money, the vast majority of systems settle in central bank money or in commercial bank money backed by central bank money.[15] Further, settlement can be done on a real-time and gross basis or be deferred and done on a net basis.

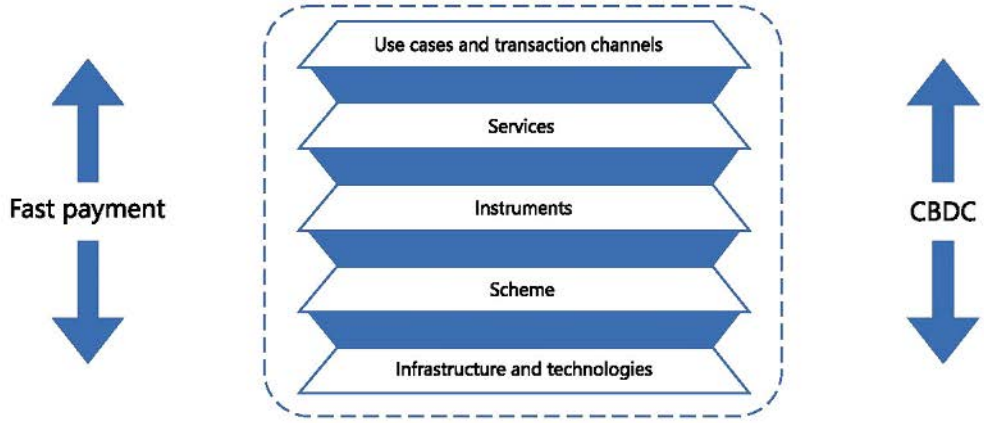
In this paper, we focus on differences and similarities across some of the main components/layers of retail CBDC systems and FPS (Graph 2). From a technical perspective, both retail CBDC systems and FPS consist of different modules that constitute the core underlying **infrastructure**, including the clearing and settlement component. Settlement could take place directly within the system or by connecting it to the jurisdictions' real-time gross settlement (RTGS) system. Both retail CBDC systems and FPS also comprise functional **technologies** and communication channels. The **scheme**, or rulebook, sets out the rules and standards governing the relationship between the participants of the system, the operator and other relevant parties, in compliance with the applicable regulatory framework. Payments are made with different payment **instruments**. Finally, they offer directly or facilitate the provision of basic and value added **services** such as aliases and proxy registries. They can cover a diversity of **use cases** (eg the types of needs covered such as person-to-person, person-to-business, person-to-government, business-to-business) and **transaction channels** (eg internet, unstructured supplementary service data (USSD), mobile apps, branches, agents, quick response (QR) codes). Different parties are involved in the good functioning of payments, including the operator, participating institutions, end users and the overseer. For the purpose of this paper, the above layers make up a **payment system** – regardless of whether it is an FPS or a retail CBDC system. Despite the many components and layers, the main comparison between retail CBDCs and FPS in this paper is made at the level of the instruments, services, scheme, infrastructure and system as a whole. When left uncharacterised (ie simply retail CBDC or fast payment), the context implies that we are referring to the instrument or service layer. Annex 2 gives an overview of the definitions used in this paper.

[13] The meaning of the term "fast payment systems" can vary based on the context in which it is used. It sometimes refers to only the infrastructure underlying the delivery of fast payments, its governing rules and participants (see CPMI (2016a, 2021)). Following Frost et al (2024), our interpretation is wider and includes the end user-facing services offered by multiple participants.

[14] CPMI (2016a).

[15] See CPMI (2021).

The components/layers of a payment system covered in this paper[1] Graph 2



[1] The components/layers presented here are not intended to be exhaustive and represent only a subset of what a payment system consists of.

Source: Authors' elaboration.

3. Key similarities and differences between retail CBDC and fast payments

Before delving into the drivers and motivations for central banks to launch a retail CBDC system, FPS or both, we provide a breakdown of similarities and differences between the two. We focus on the features where clear distinctions can be made. The degree to which individual retail CBDC systems and FPS truly compare eventually depends on their specific designs. There is a spectrum of retail CBDC system designs and a spectrum of FPS designs. This means that some retail CBDC payments may be more similar to fast payments than others and vice versa. Further, one has to acknowledge the dynamic and evolving nature of both, which means that similarities and differences across the two solutions can also change over time.

In general, there are three categories of transfer assets under which particular subcategories can be included: public/central bank money (eg cash, central bank reserves, wholesale CBDCs, retail CBDCs), private money (eg commercial bank deposits, e-money, wholesale digital tokens, potentially some stablecoins) and instruments that are not a liability of anyone (eg cryptoassets). As shown in Annex 3, the main difference between retail CBDC (systems) and fast payments (FPS) resides in the nature of the claim held by the end users on the issuer (ie the liability held by the end users being borne by either the central bank or a financial institution). Undoubtedly, depending on the availability and design of supporting infrastructures that ensure the redemption of commercial bank money at par,[16] this feature may have profound implications from a technical, financial, monetary and regulatory point of

[16] For instance, the distinction between central bank money (ie CBDCs) and commercial bank money (for FPS) in terms of the protection of end user balances may not be so stark in practice, if and when there is robust banking supervision and deposit insurance with a high limit.

view.[17] Another smaller difference resides in the underlying messaging standards, as an increasing number of FPS are adopting ISO 20022, while the three live retail CBDC systems to date mostly rely on proprietary standards.

Retail CBDCs and FPS present many similarities at the overall system level. For example, both innovations can support various overlay services. Retail CBDCs may open new prospects in terms of programmable payments and composability, but it is theoretically possible for these to also exist in FPS, for example if they are enhanced to process tokenised deposits.[18] Similarly, both generally rely on central bank money for the settlement of the resulting payment obligations between system participants.[19] Moreover, even though retail CBDC systems have often been associated with distributed ledger technology (DLT), both the live retail CBDCs and CBDC experiments to date show that this is not a necessary feature. At the same time, while most FPS to date rely on centralised technology, they can also be built on or incorporate DLT components.[20, 21]

A retail CBDC ecosystem involves a number of players, including the central bank (as catalyst, overseer, operator, issuer and settlement agent); private banks and potentially non-banks (as payment service providers); individuals and businesses (as users of payment services); and the government (both as a user of services and as a key player enacting relevant legislation to allow for retail CBDC issuance). An FPS ecosystem can look much the same, except for the type of money transferred between end users and some differences in the roles of the central bank and government (see Graph 3). (Section 5 goes into more depth on the role of the central bank in each initiative).

17 World Bank (2021b), Soderberg et al (2023).

18 Programmability allows for specific actions to be automatically executed when a set of predetermined and preprogrammed conditions are met. Composability means that many smart contracts covering multiple transactions and situations can be bundled together, like "money legos". See BIS (2022a).

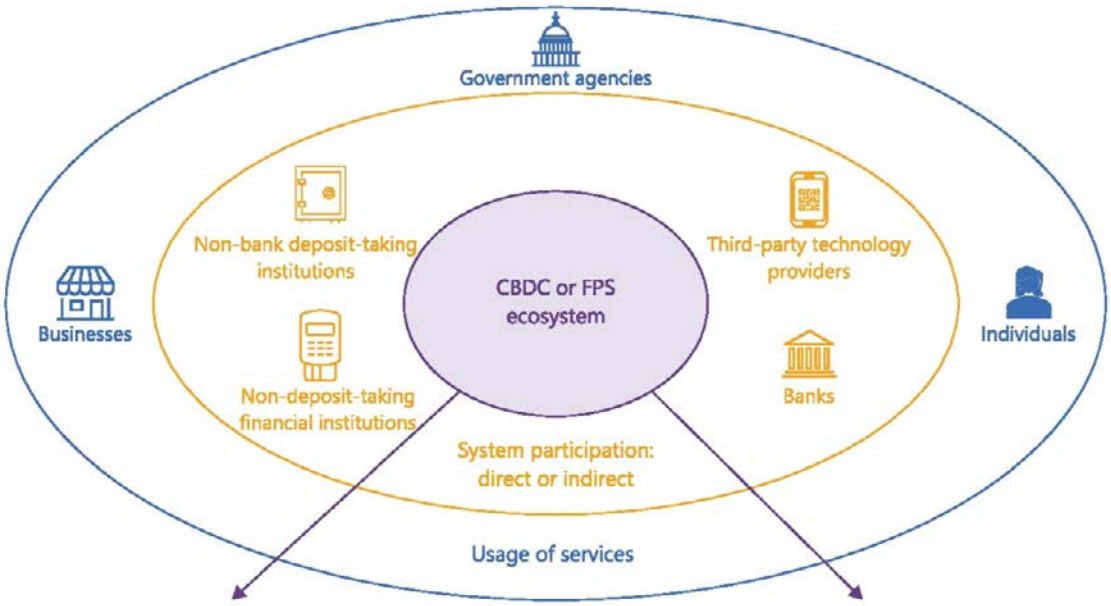
19 Although to date, many FPS have adopted deferred net settlement (DNS) in central bank money, this may change, as there is a trend towards the use of RTGS systems for interbank settlement of FPS and as central banks are increasingly considering extending the operating hours of their RTGS systems.

20 For instance, the Bakong system, a peer-to-peer fund transfer service in Cambodia, uses DLT (Hyperledger Iroha).

21 Both retail CBDC systems and FPS can be considered digital public infrastructures (DPIs). DPIs are interoperable, open and inclusive digital systems, supported by technology to enable the use and provision of essential, society-wide, public and private services (GPFI (2023)). DPIs can take different forms and generally cover three main areas: (i) digital identity, (ii) data exchange and (iii) digital payments. DPIs differ from other traditional digital and financial infrastructures by being more foundational and cross-cutting. FPS are generally cited as the typical example of a digital payment DPI – regardless of whether it is owned or operated by private entities. The reason for this is that FPS often leverage state-of-the-art technologies, support innovative use cases such as aliases, proxy registries or request-to-pay (RTP), and can enable individuals and businesses to access transaction accounts and services offered by both banks and non-banks. FPS can also foster enhanced workflows to provide public and private services (eg when combined with digital identities to facilitate government-to-person transactions). And they can make the opening and use of transaction accounts more attractive. Retail CBDC systems can also meet these criteria and therefore be qualified as a DPI as well.

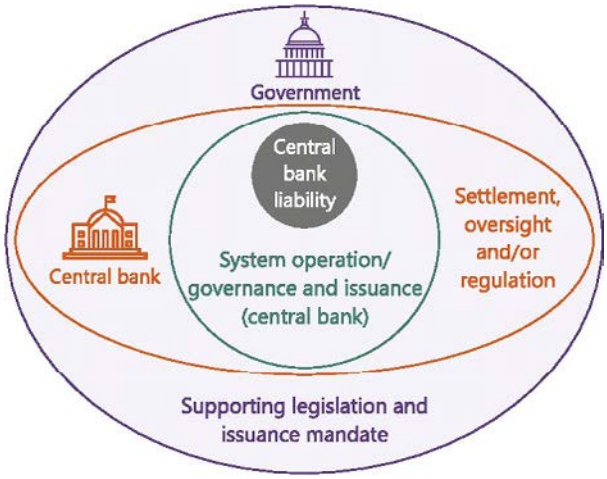
An ecosystem for retail CBDCs and FPS Graph 3

A. Many similarities…

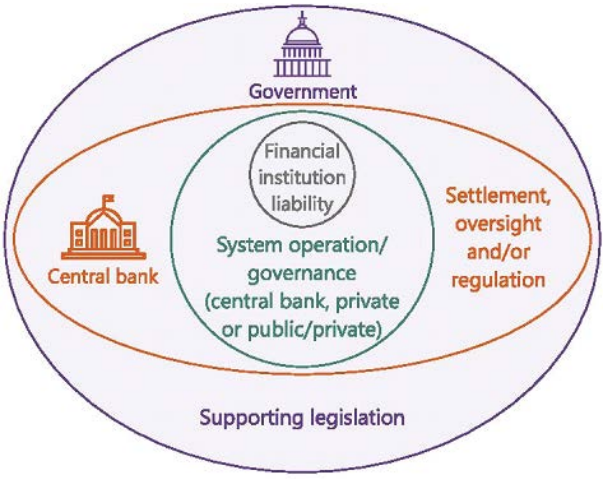


B. …with a different type of liability being transferred between end users

Retail CBDC ecosystem



FPS ecosystem



Source: Authors' elaboration.

Ultimately, on several dimensions, such as the applicable regulatory environment, the instantaneity and availability of the service and the potential use cases and transaction channels, retail CBDC systems and FPS are almost identical. For instance, both are able to support alias registries, and they could both support offline transactions (though there may be challenges as described in Section 5). As illustrated in the graph, both can allow non-banks to participate. Of course, both need to be smoothly integrated with existing financial market infrastructures (FMIs), such as other existing retail payment systems and RTGS systems.

4. Rationale for exploration and implementation

Common motivations and considerations

Despite their similarities, central banks may consider issuing a retail CBDC and implementing an FPS to support different policy goals. In this section, we discuss the insights gained from interviewing 14 central banks, in particular on the motivation for one or both initiatives.

The motivations for retail CBDCs and FPS are as varied as the policy mandates of central banks and local conditions of jurisdictions around the world. Yet there are commonalities. Overall, the most common motivations cited by central banks interviewed for issuing retail CBDCs are (i) increasing financial inclusion, (ii) improving cost efficiency and speed in current domestic payment systems, (iii) safeguarding financial stability, (iv) preserving the monetary anchor role of central bank money and (v) contributing to the safety and robustness of payments.[22] The key motivations mentioned by interviewees for building an FPS are (i) enhancing the speed of transactions, (ii) fostering the safety and efficiency of domestic and cross-border payment systems, (ii) increasing financial inclusion and (iii) promoting competition.[23]

Clearly, some goals overlap. Yet in the view of some interviewees, retail CBDCs could bring some features which are not feasible (at least, at this stage) or relatively difficult to implement with FPS, such as programmable payments, composability and enforcement of greater privacy for users. In addition, retail CBDCs may help to pursue other goals of central banks, such as safeguarding the use of the local currency over stablecoins or other cryptoassets. This is seen as one major goal by some of the interviewed central banks. The possibility of arranging interoperability between payment systems to enhance cross-border payments is also being considered by central banks but not as an immediate priority.. Finally, some central banks underscored risks that are unique to retail CBDCs, such as concerns of disintermediating private banks.

Several central banks that have issued live retail CBDCs or launched an FPS (or are exploring them) see the two as complements rather than substitutes. In the interviews with the the BCEAO, BoC, BoG, Bank of Jamaica (BoJ), Central Bank of Nigeria (CBN), ECB and RBI, it was noted that the two are expected to coexist rather than compete, because they can or would each serve different purposes or offer different benefits. Both are also seen as different in terms of the role they can play in the transaction chain. For instance, it was noted that in the euro area, the TARGET Instant Payment Settlement (TIPS) system is viewed more as an interbank infrastructure, whereas the digital euro would be an electronic means for retail payments. In any case, both would help to promote settlement in central bank money, though TIPS does it mostly in the interbank sphere.

The degree of complementarity between retail CBDC systems and FPS might change over time, depending on the technology used by both. Interviewees at the BoG noted that, as traditional payment systems have also started experimenting with new technologies, in the longer run there might be competition between a retail CBDC and fast payments. This would be particularly relevant if both were to use the same underlying technology.

[22] See Di Iorio et al (2024).

[23] World Bank (2021).

Still, some interviewees questioned the added value of retail CBDCs or were concerned that the potential added benefits of a retail CBDC system may be outweighed by the risks and costs of having multiple separate payment infrastructures. Out of the 14 central banks interviewed, six are still studying or do not see clear advantages to issuing a retail CBDC, at least for now. For instance, the BCB is assessing the issuance of a wholesale CBDC (Drex) rather than a retail CBDC, due to the success of its FPS (Pix) in terms of increasing financial inclusion.[24] The SNB is also investigating a wholesale CBDC and has piloted its use for settling market transactions on SDX.

Indeed, for central banks of some jurisdictions where access to transaction accounts is nearly universal, and where a well-developed FPS, an innovative and interoperable payments market and a deposit guarantee scheme are already in place, there are doubts about the value of a retail CBDC. Some respondents also noted that it is challenging to identify the tangible benefits of using retail CBDCs instead of fast payments from an end user's perspective. Interviewees at the BAM acknowledged a risk of retail CBDC payments cannibalising other initiatives that the banking sector has invested in and saw this as a reason to be cautious with retail CBDC. Still, several interviewees highlighted the promise of a wholesale CBDC, eg regarding programmable payments and composability. Depending on the technology used, a wholesale CBDC platform could be a way to bridge the traditional financial sector and the decentralised finance (DeFi) environment and offer an opportunity for innovation that goes beyond payments.

Timing and sequencing

Most central banks with whom we spoke have started with an FPS and are looking to see how a retail CBDC system could add value for end users and society, either by offering something new or by achieving the same objectives better. Some central banks decided to also issue or explore the issuance of a retail CBDC to increase financial inclusion, enhance end user access to central bank money (in digital form) and foster innovation. For others, launching a retail CBDC system in addition to an FPS would depend on the further evolution of cash and the need to provide alternative ways to guarantee access to central bank money. The increasing demand for crypto, the need for efficient cross-border payments and the need for instant funds availability for end users are also factors that central banks are taking into account in their exploration of a potential retail CBDC.

Interoperability between a retail CBDC system and FPS is possible but generally not of the highest priority for central banks, at least so far. Those central banks that are still in the initial exploratory stages of a retail CBDC generally consider interoperability with the FPS as something to consider once they have more clarity about the design and architecture of a retail CBDC system. Domestic interoperability between a retail CBDC system and FPS could take different forms. For instance, a retail CBDC could be issued using the FPS as the underlying infrastructure or vice versa. Interoperability could also mean that the FPS is used by financial institutions or end users to transfer money into (or out of) their retail CBDC wallets from their bank

[24] The Drex platform would also support private intermediaries (banks and non-banks) in offering their clients a privately issued retail version of Drex that would be backed with bank loans or a wholesale CBDC.

accounts. In Nigeria, such interoperability is achieved using an application programming interface (API) by the national central switch that functions as a hub.

Cross-border payment interoperability is a secondary priority for several of the interviewed central banks. The BoC interview, for instance, noted wanting to make sure that their work on a domestic retail CBDC at a minimum does not cause any barriers to cross-border payments. The RBI interview underlined the importance of cross-border interoperability not only with other retail CBDC systems but also with other more traditional payment systems, especially since not all jurisdictions may decide to issue a retail CBDC. Some central banks, while seeing opportunities for retail CBDC for cross-border payments, are taking more of a wait-and-see approach. Interviewees from The Bahamas noted that due to the existence of common international messaging standards such as ISO 20022, and the increasing number of prevailing FPS, interlinking FPS may be easier and more effective in enhancing the speed, efficiency, cost-effectiveness and accessibility of cross-border payments in the short run compared with achieving cross-border interoperability of different CBDC systems.

The potential to serve different purposes

Some central banks explicitly discussed the potential for retail CBDCs and fast payments to serve different purposes. One recurring argument was that it is important to ensure end user access to central bank money via a retail CBDC, as the payments landscape is becoming ever more digitalised. As the use and provision of cash services is declining, access to central bank money may be compromised. Moreover, there is an increasing demand for online payments (eg for online shopping) which cannot always be met with cash. Although the public may not be fully aware of the differences between commercial bank and central bank money, the fact that central bank money is a claim on the central bank and therefore always free from default risk may matter to them in periods of stress for some central banks. Also, central banks' work on a retail CBDC is in some cases partly motivated by the increasing popularity and risks of cryptoassets, as indicated in the interviews. A retail CBDC could help maintain trust in and access to central bank money, solidify the central bank's role as a monetary anchor and contribute to safeguarding monetary sovereignty and stability.

There were different views regarding the relationship of retail CBDCs with cash. In some jurisdictions, a retail CBDC is expected to reduce cash use. These counterparts noted that each year, the production and logistics of cash implies a considerable cost for central banks, commercial banks, security and transport companies and individuals and businesses. In these cases, a retail CBDC is seen as a potential tool to (partially) substitute for cash with the aim of reducing these costs. Moreover, to them, the current use of cash in the informal economy is seen as something that a retail CBDC could address when issued as a substitute for cash. For other jurisdictions, a retail CBDC is expected to coexist with cash. Several central banks see a retail CBDC as an additional option and do not intend to replace access to cash. This is because cash is still playing an important role for a large part of their population or for certain vulnerable groups, according to some of the central banks. It is also acknowledged that it is uncertain at this point whether a retail CBDC will be used as a substitute for cash or as a replacement of commercial bank money or both.

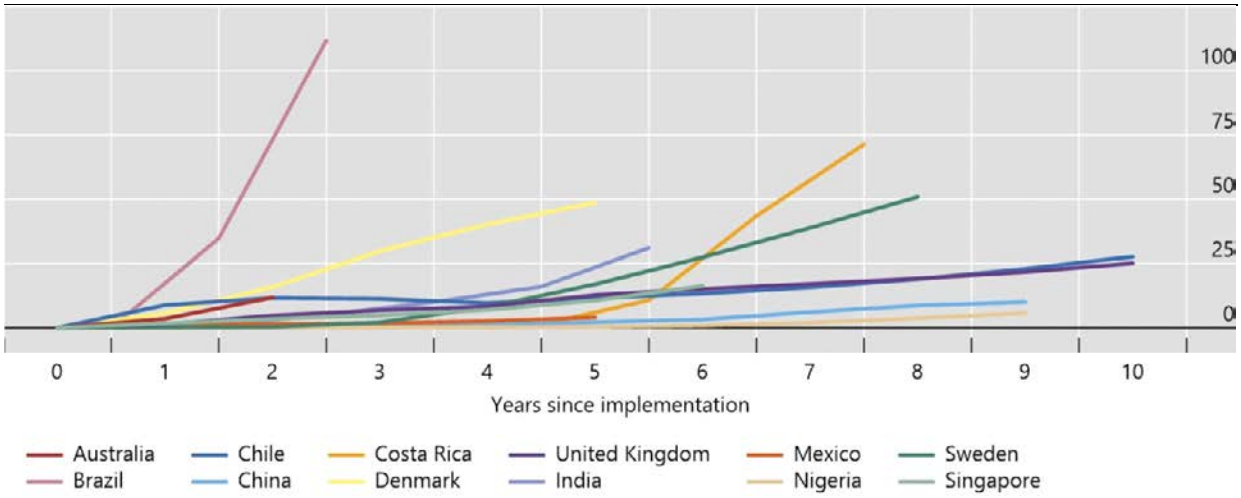
Greater consumer choice and financial inclusion

Some central banks considered that having both a retail CBDC and an FPS could increase consumer choice and offer (purposeful) redundancies. A retail CBDC is generally seen as a complement to other digital means of payment, such as credit and debit cards by some central banks. Allowing for greater user choice and enhancing the efficiency and resilience of the payment system were among the key motivations of the CBN to issue the eNaira, for instance. From a competition perspective, some central banks believe that increased user choice may promote efficiency and foster innovation. Moreover, by targeting use cases beyond those of current card payments, and by opening up the market to new actors, central banks feel that they may be able to reach people who do not have access to the financial system, promote financial inclusion and accelerate innovation.

Of course, the strength of this argument may depend on how widely adopted both fast payments and a retail CBDC will be. In practice, in some jurisdictions, fast payments have achieved mass adoption. It is estimated that over 90% of Brazilian adults use Pix, over 70% of Costa Rican adults use SINPE Móvil and at least 25% of Indian adults use UPI annually. This is reflected in a high number of transactions per capita in these systems (Graph 4). To date, the live retail CBDCs have not achieved this level of adoption.

Fast payments have become widely adopted in some jurisdictions

Number of transactions per capita per year — Graph 4



Sources: National sources; authors' calculations.

Finally, the relationship between retail CBDCs and FPS may be influenced by the level of financial inclusion in a jurisdiction. Financial inclusion has been cited by some central banks as one of the main reasons to issue a retail CBDC or to explore issuance. While both retail CBDCs and fast payments allow for low-cost and inclusive payment services for end users, some central banks see potential for retail CBDCs as a greenfield initiative to play a particularly important role. Indeed, recent research underscores how a retail CBDC system could be designed to address specific barriers to financial inclusion (Boakye-Adjei et al (2023)). In jurisdictions with a low level of financial inclusion, several central bank counterparts saw both retail CBDCs and fast

payments as having the potential to draw individuals and businesses into the financial system. Many noted that this would also need to be accompanied by complementary measures (eg public policies to reduce tax evasion and informality, efforts to promote financial literacy and legal and regulatory reforms). Functionalities like offline payments may be particularly important in settings with low levels of financial inclusion, a large, informal and cash-based economy, a diverse geography or limited connectivity to the internet and telecom services.

5. Functionalities

Both retail CBDC systems and FPS can allow for and support a wide range of technical functionalities, overlay services, use cases and transaction channels. Further, both can be built on common messaging standards such as ISO 20022, though there have been some FPS (eg SPEI in Mexico, UPI in India) and several retail CBDC systems (eg Sand Dollar, eNaira) that use proprietary standards. In addition, both could support APIs, which allow for the secure exchange of data between different entities and for new and customised overlay services to be integrated, such as request to pay or buy now, pay later.[25] APIs can aid interoperability and the open nature of the system. In addition, in both cases, it is technically possible to integrate banks and non-bank PSPs into the payment system, thus promoting objectives such as competition, innovation and potentially positive financial inclusion outcomes.

Offline payments, programmability, composability and tokenisation could be facilitated by retail CBDC systems

Certain functionalities such as offline payments are considered by some central banks to be easier to achieve with a retail CBDC system than with an FPS. Offline payments are transactions whereby the payer and/or payee do not need a connection to any ledger system (BIS (2023)). Hence, these payments can for example be made in the absence of internet or telecom connectivity. In such cases, it may be difficult to communicate with an FPS and update the ledger of the bank or PSP of both the payer and payee, though attempts have been made (eg UPI Lite X in India). Some counterparts noted that having a tokenised claim (similar to a stored value card) may be easier in a retail CBDC system than in an FPS, as the a CBDC could enable smoother solutions (eg where tokens are signed out by debiting a locally held offline balance). For instance, the BCB has explored offline payments for both a retail CBDC and fast payments but consider it easier from a technological perspective in a retail CBDC system.[26] In Ghana, the BoG is considering offline payments using wearable devices. In Nigeria, a few local and foreign solution providers are involved in the exploration of offline functionalities with the CBN regarding e-Naira. The exploration has now

[25] APIs enable a software application (eg a mobile phone app) to request a specific piece of data from one or more other software applications (eg a banking platform installed on a server in a bank's data centre), and for data transfer from the data providing application(s) back to the requester, provided the original request was valid (see BIS (2020, 2022b)). See CPMI (2022) for an overview of important trends in interlinking arrangements and API adoption by payment systems. For a discussion of buy now, pay later, see Cornelli et al (2023).

[26] The BCB counterparts also noted that this was not a key demand of the public in their case. This was again a reason to start with the wholesale CBDC pilot, rather than retail CBDC issuance in the near term.

advanced into the pilot stage.[27] Overall, for any offline capability to work, it needs to be based on principles such as privacy, security, interoperability and scalability.

Counterparts noted that retail CBDC systems can also bring new use cases based on programmability, composability and tokenisation. The interviewed central banks mentioned programmability as a unique feature for CBDCs, even for jurisdictions where the level of financial inclusion is high and the space for a retail CBDC appears to be small.[28] Whereas FPS could support programmability using two separate databases (one that records balances and one that contains the program logic), CBDC systems could be more efficient, as they can encompass and bring together both databases, thus unifying ledgers.

Some central banks, such as BoG, view a retail CBDC system as a means to ensure instant settlement among system participants, thus avoiding credit risk between them and challenges associated with prefunding.[29] While instant settlement can also be achieved in an FPS context, many FPS today are processing their payments on a deferred net basis.[30] With several countries moving toward RTGS systems that are open 24/7, the settlement model of their FPS could also switch toward real-time gross. Countries might even use the RTGS infrastructure itself to process retail fast payments in addition to traditional large-value payments.

FPS appear more promising to improve cross-border payments in the short term

There are also areas where an FPS may offer advantages over a retail CBDC system. First, given the nascent nature of retail CBDC systems to date, retail CBDCs may not be able to contribute to the short-term targets of the G20 cross-border payments programme.[31] By contrast, the proliferation of FPS globally provides opportunities to foster interlinkages between them to enhance cross-border payments. Interlinking FPS is one of the priorities for meeting the G20 targets of cheaper, faster, more accessible and more transparent cross-border retail payments and remittances, while maintaining their safety.[32] Various initiatives are currently under way to interlink FPS, such as the bilateral link between the FPS of Singapore (PayNow), Thailand (Promptpay), Singapore (PayNow) and India (UPI). Similarly, a pilot initiative spearheaded by the BIS Innovation Hub (Project Nexus) has shown promising signs on a larger scale. Nexus acts as a hub to which domestic FPS can connect to link with each other and facilitate cross-border fast payments.[33]

27 Lipis Advisors (2023).

28 Several central banks are considering approaches to support the digital representation of assets using a DLT system, which would support programmability and composability in CBDC systems (Aldasoro et al (2023)). Current experiments focus mainly on a wholesale rather than retail CBDC as a settlement asset for tokenised deposits and assets, allowing for real-time settlement of transactions.

29 Credit risk could also become relevant for end users of fast payment services to the extent it could lead to their financial institution or service provider becoming insolvent.

30 The deferred net basis refers to the settlement between PSPs. Regardless of the nature of this inter-PSP settlement, from an end user perspective, the funds are (usually) available in real time to the end user receiving the funds. For further details, see CPMI (2021) and World Bank (2021a).

31 See CPMI et al (2023).

32 See CPMI (2024).

33 BISIH (2024).

That said, retail CBDCs have the potential to improve cross-border payments in the long run.[34] Multiple central banks mentioned during the interviews that they are aware that retail CBDC systems can enhance cross-border payments, but that at this stage, their priority is to test and/or develop a domestic retail CBDC system first.

Options for domestic interoperability between FPS and retail CBDC systems seem feasible (but remain little explored so far)

How to achieve domestic interoperability between an FPS and a retail CBDC system is an open question. There may be efficiency gains or cost savings from building a retail CBDC system on top of an existing FPS (or vice versa). Central bank thinking around how to achieve such interoperability between a CBDC, FPS and other existing payment systems is still at a research stage. One alternative is to enable this through APIs, which would allow end users to transfer funds between retail CBDC accounts and bank or e-money accounts. Integration may also reduce the development costs of a new system for participants. For instance, a few central banks argued that ongoing developments for an FPS might reduce incentives for banks and non-banks to invest in a new retail CBDC infrastructure in the near future. Yet, central banks may want the two to have explicitly different rails. This could help to ensure redundancy (eg from a business continuity or cyber security perspective) and to serve different purposes and use cases.

When considering launching a retail CBDC system while already having an FPS, central banks have different options for interoperability and to avoid creating silos.[35] For instance, in the euro area, as indicated during the interview, the idea is to reuse as much as possible existing fast payments technical standards (including the QR code standards) for the digital euro. In this way, interoperability between an FPS and a retail CBDC system can be achieved at different layers of the system (as depicted earlier, in Graph 2). In the same vein, the BCB is exploring how to add new features to its existing Pix infrastructure and allow it to interoperate with existing or new payment solutions and systems.

It was noted that, if carefully designed and regulated, retail CBDC systems and FPS can indeed co-exist. They can help promote full digitalisation of payments by, on the one hand, reducing cash use and, on the other hand, maintaining the role of central bank money in the digital economy. They could be designed with different and complementary technical functionalities to reach universal access. For instance, the e-Naira supports transactions using the USSD technology used for text messages in Nigeria. e-Naira is therefore expected to be adopted by low-income people who use feature phones and thus far mainly pay with cash.

[34] CPMI et al (2022).

[35] In 2024, the World Bank published a paper which laid out options for the interoperability of FPS and retail CBDC systems, based on technology design experiments (World Bank (2024).

6. Role of central banks and the broader ecosystem

Both CBDCs and fast payments involve an important role for central banks

Central banks play an important role in maintaining the safety, integrity and efficiency of payment systems. In most jurisdictions, this role is formalised in the central banks' legal mandates. In many cases, both formal central bank laws and additional legislation or regulations govern the central banks' public policy objectives and instruments.

While the exact responsibilities in retail payments differ across jurisdictions, central banks are generally involved in payments in three ways: as system operators, as payment system overseers and/or regulators, and as catalysts of action in the payments sector. These three roles can also be identified when looking at the involvement of central banks in FPS and CBDC systems. As outlined in CPMI (2016a) and CPMI (2021), central banks' **operational role** in an FPS can range from providing final interbank settlement in the RTGS system to directly operating an FPS. In terms of the **oversight role** and/or **regulation**, there is considerable variation in central banks' mandates and powers, as well as in the scope and manner in which they are applied. In some jurisdictions, the central bank has formal regulatory oversight authority over retail payment systems, whereas in others, it depends on the prominence and designation of the payment system. As **catalysts**, central banks facilitate and support the achievement of market outcomes, for example through close cooperation with the private sector, research and analysis, cooperative relationships with regulators and other relevant public authorities, and their role in the public policy debate (eg on pricing for individuals and businesses). According to CPMI (2021), central banks have generally taken an active role providing the initial impetus for the launch of their FPS, eg by bringing together the relevant stakeholders or leading the project.

While many of the potential roles of central banks in CBDC systems can be similar to those for FPS, their involvement is generally more pivotal in the context of retail CBDCs. Not only is the central bank responsible for the issuance of the retail CBDC; in all jurisdictions having launched a retail CBDC so far, the central bank took on the operating role.

The distribution of roles between the central bank and other stakeholders varies depending on the implementation

Although central banks are generally driving the launch and operation of both retail CBDC systems and FPS, to date, central banks have been taking on very different responsibilities for each. Regarding FPS, both public and private sector ownership and operations are common. This often reflects the traditional role of central banks in other legacy retail payment infrastructures, eg automated clearing houses for cheques or credit transfers.[36] Some central banks have been very active and launched their own FPS. For instance, Pix is entirely owned and operated by the BCB, which has taken a prescriptive stance by defining a single brand, establishing precise scheme

[36] World Bank (2021a).

rules, mandating participation of large financial institutions and enforcing a transparent pricing strategy. In other cases, FPS are co-owned by the central bank and commercial banks or other private sector entities. For example, in Nigeria, NIBSS Instant Payment is owned and operated by the Nigeria Interbank Settlement System (NIBSS), which is a key financial institution providing clearing and settlement services and is jointly owned by CBN and all licensed banks. Governance and operational structures can evolve over time. Some central banks (BCB) have played an instrumental role in the definition of service requirements and front-end solutions for FPS. Besides financial service providers, other stakeholders play a key role in the functioning and adoption of fast payments, such as technical service providers responsible for processing high volumes of transactions or merchants and sub-acquirers on the acceptance side.[37]

While there are no known examples of CBDC systems owned by the private sector, central banks are engaging with third-party vendors and information technology (IT) companies for the development of the CBDC infrastructures. Nonetheless, the rest of the ecosystem also has a part to play – from merchants to banks and non-banks (see also Graph 3 above). In particular, the introduction of a two-tier system, where PSPs are responsible for onboarding, know your customer (KYC), custody of a retail CBDC and potentially other front-end services can help to mitigate disintermediation risks (see Section 7).

As is the case with any central-bank-operated payment system, central banks operating a retail CBDC or FPS system may face potential conflicts of interest when performing multiple functions, notably the roles of operator and overseer. The same applies today for central banks operating and overseeing their jurisdiction's RTGS system. In these instances, central banks generally have a clear functional and organisational separation between the two roles and separate lines of reporting.

The extent of a central bank's involvement and its roles will ultimately depend on public policy objectives and will be shaped by domestic market dynamics. In several jurisdictions, central banks decided to launch a retail CBDC or an FPS (or both) to compensate for the absence or slowness of private initiatives and to address market inefficiencies, such as lack of competition. In the European Union, the Eurosystem launched TIPS to foster fast payments interoperability within Europe despite the existence of other privately operated FPS which failed to provide pan-European reach. In Ghana, a retail CBDC is seen as a tool that would tackle limited access and high fees which are not addressed by GhIPSS Instant Pay (GIP), launched in 2015. In New Zealand, the private sector is responsible for the fast payments implementation, while CBDC falls into the parameter of the RBNZ. Although work on a retail CBDC is only exploratory at this stage, the RBNZ sees it as an additional incentive to move the industry forward on fast payments.

From this perspective, central banks also need to be aware of potential risks. For instance, a proactive approach by central banks to launching new payments infrastructures can spur a wait-and-see reaction from market participants and deter the private sector from innovating. It could also hinder the credibility of the central bank if an initially intended new central bank payments infrastructure is not eventually launched, or if its adoption remains limited. Both retail CBDCs and fast payments are widely considered digital public goods, which can justify central bank intervention on

[37] FPS toolkit, World Bank (2021).

aspects that are traditionally performed or determined by the market, such as the direct provision of services to end users and determining end user fees.

For both fast payments and retail CBDC, it is necessary to have a solid regulatory framework that grants clear mandates to the central bank. For instance, Article 172 (2) of the Treaty on the Functioning of the European Union entrusts the Eurosystem to promote the smooth operation of payment systems. In India, the Payment and Settlement Systems Act (2007) provides regulatory and oversight powers to the RBI regarding retail and wholesale payment systems. In Brazil, Law 12,865 of 2013 represented a landmark in the modernisation of retail payments and provided a basis for subsequent innovation. In line with this law, the BCB introduced a set of rules governing payment schemes and payment institutions, including the entry of non-banks into the market and the prohibition of exclusive bilateral agreements. Regulatory intervention may be generally more important for the introduction of a retail CBDC as it may require a modification of the status of legal tender.

Consultation with market players and end users as well as peer learning is beneficial before implementation

For both retail CBDC systems and FPS, interviews with central banks highlighted the need for an extensive consultation and preparation phase, regardless of the ownership structure. Most interviewed central banks have engaged in discussions with market participants. Such market consultations have entailed the creation of dedicated committees and working groups, as well as bilateral exchanges with market participants. For example, in 2018, the BCB created a working group on fast payments to foster the implementation process, which eventually became the "Pix Forum", with participation from around 200 institutions.

Consultations with end users have also been organised for retail CBDCs. The ECB has launched an extensive consultative process as part of the digital euro investigation phase, including the creation of dedicated structures for market discussions (eg Market Advisory Group) and focus groups targeting different profiles of potential end users. Ghana followed a similar route, which allowed authorities to pinpoint the demand for offline capabilities and the concerns regarding tax collection and informality. Besides this preparatory role in leading early market discussions, several central banks have set up and rolled out a communication strategy aiming to prompt rapid adoption after launch. This has been observed for both FPS and retail CBDCs. Interviews showed that external communication efforts by central banks often reflect their engagement in the operations of the system. For instance, BCB followed an innovative path by supporting uptake on various media, including social networks through partnerships with influencers.

Overall, central banks interviewed indicated being more cautious regarding the issuance of retail CBDCs, given their novelty, indicating they have promising features but introduce uncertainty (BCEAO, SNB). By contrast, FPS are more well established from a technological and policy point of view and have passed the test of time. Most central banks interviewed have largely relied on peer learning and previous experiences for the design and implementation of their FPS. A similar phenomenon is progressively taking shape for retail CBDCs. For instance, BAM and BCEAO are monitoring developments in other jurisdictions and benefit from World Bank and International Monetary Fund technical assistance. As the number of live retail CBDCs

is still low, several central banks are following a second-mover strategy and waiting for other jurisdictions to pioneer the new way of paying and collect feedback.

7. Risks and challenges

Retail CBDCs and FPS represent two distinct approaches to modernising the traditional payments landscape. Each introduces specific risks and challenges. The Principles for Financial Market Infrastructures (PFMIs) issued by the Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO) highlight several categories of risks characterising systemically important FMIs. These risks may also arise in retail payment systems such as retail CBDC systems and FPS. These categories include systemic risk (when systemically important), legal risk, liquidity risk, general business risk and operational risk.[38] Box 1 gives an overview.

Although each of the risks listed in Box 1 is to some extent relevant to both FPS and retail CBDC systems, each type of system may have a different risk profile depending on its specific design and risk management framework. Generally speaking, while FPS may resemble other legacy payment systems through the integration of existing use cases and value added services, retail CBDC systems could constitute a more disruptive innovation and may introduce novel challenges. For fast payments, the extent of credit and liquidity risks will depend on the settlement model, with DNS currently the settlement model for many FPS.[39] Similarly, the cross-border functionality of some systems (such as India's UPI and Singapore's PayNow) can raise additional issues from a legal and operational perspective.

Retail CBDCs introduce several new challenges compared with FPS

As a direct claim on the central bank, retail CBDC balances are default-remote. Moreover, the CPMI-IOSCO guidance on the application of the PFMIs to central bank-operated FMIs would also be relevant to retail CBDC systems.[40] But in the view of the interviewees, new challenges – or at least more disruptive ones – could emerge with the introduction of retail CBDCs. Retail CBDCs are viewed by central banks as potentially riskier in certain respects, such as in terms of financial stability, transmission of monetary policy, resilience and cyber security, privacy and data protection, and disintermediation of the existing financial ecosystem. Interviewed central banks have differing views on these specific challenges and how to address them.

The main risk of retail CBDCs highlighted by interviewed central banks relates to the impact on the existing ecosystem and the potential disintermediation of market participants. The issuance of a retail CBDC inherently gives a prominent role to the central bank in the retail payments space. While the global consensus converges towards a two-tier distribution model to preserve the role of market participants, at least from an onboarding and custody perspective, the introduction of a retail CBDC

38 CPSS-IOSCO (2012).

39 See CPMI (2021).

40 See CPMI-IOSCO (2015).

Box 1: The risk categories covered in the PFMI are also relevant for retail CBDC systems and FPS

Systemic risk

Systemic risk may arise when a system becomes systemically important. In such a scenario, the inability of one or more participants to perform as expected could cause other participants to fail to meet their obligations. Subsequently, the system operator may be unable to complete full settlement or may take actions that would raise unexpected credit and liquidity exposures. Such knock-on effects could cause further disruptions and erode public confidence in the infrastructure, resulting in systemic risk for the market. In addition, payment systems, like other types of FMIs, may have complex interconnections and common participants, which can also transmit disruptions across the ecosystem and pose a source of systemic risk.

Credit risk

Credit risk is the risk that a counterparty, whether a participant or other entity, will be unable to fully meet its financial obligations when due or at any time in the future. In payment systems, credit risk arises for participating PSPs when the crediting of a payee account and the debiting of a payer account is instant, while the final settlement of the inter-PSP obligations takes place on a deferred basis.

Legal risk

Legal risk can arise from the unexpected application of a law or regulation, usually resulting in a loss. It can also refer to uncertainty in the application of a regulatory framework, rendering contracts illegal or unenforceable, or to the delay in the recovery of financial assets or freezing of positions due to legal procedures. These challenges are often more acute in a cross-border context, as different bodies and regulations can apply to a single transaction, activity or participant.

Liquidity risk

Liquidity risk refers to the risk of a counterparty not having enough funds to meet its financial obligations as expected, even if it can do so in the future. It includes situations where a seller does not receive payment on time and may need to borrow or liquidate assets to make other payments. Liquidity risk may also arise when a buyer does not receive timely delivery and may need to borrow the asset to fulfil its obligation. Liquidity problems can lead to systemic issues, especially during market closures or illiquid conditions.

General business risk

General business risk refers to the administration and operation of a system as a business enterprise, involving potential financial impairments due to declining revenues, increasing expenses and losses charged against capital. Such issues can stem from reputational consequences, poor business strategy, ineffective response to competition, losses in other business lines or other business factors. It can result in a disruption of business operations.

Operational risk

Operational risk refers to the risk of service reduction, deterioration or breakdown due to deficiencies in information systems, internal processes, human errors, management failures or external disruptions. Operational failures can cause delays, losses, liquidity issues and even systemic challenges, as well as hinder risk management measures. They can stem from internal and external sources and include processing errors, system outages, capacity issues, fraud and data loss.

could prompt changes in the demand for bank deposits and services. A quick and significant uptake could have consequences for lending, profitability and resilience. In addition, it could have longer-term implications in terms of crowding out private stakeholders, leading to weaker competition, lower quality of service and less innovation. From this perspective, central banks interviewed often mentioned that more research is needed.

Stemming from the risk of disintermediation, retail CBDCs' financial stability and monetary policy transmission risks have also been identified by interviewees as potential challenges. The issuance of a retail CBDC could have substantial market structure effects, foster sudden outflows from bank deposits to central bank money and undermine the ability of banks to provide credit and cope with financial stress. Similarly, retail CBDCs can entail wide-ranging monetary policy effects, both positive

and negative, depending on user uptake and interest-bearing features. Tools and policies can be implemented to mitigate these risks. Through pricing, eg decisions on fees and tiered remuneration, central banks can create incentives to use a retail CBDC as a means of payment but not as much as a store of value. Through quantity measures, central banks can limit the amount accessible to each economic agent, typically through a hard cap on wallet sizes or transactions in a certain period. For instance, for the euro area, discussion has focused on a potential maximum holding of digital euros. Multiple approaches can be combined: among central banks researching, piloting or having implemented a retail CBDC, a few envisage tiered interest rates, and several consider maximum amounts. Jurisdictions that have already issued a retail CBDC reported limited concern, due to the gradual uptake and the retail CBDC mainly substituting for cash instead of other digital payment methods. Overall, the impact of retail CBDCs on monetary policy remains little explored at present, but multiple central banks foresee minimal impact.

According to some central banks interviewed, the issuance of retail CBDCs has the potential to transform the way they operate and, from this perspective, can raise unprecedented operational and information security risks. These can include technological, cyber security and business continuity challenges, as well as third-party risks.[41] The introduction of new roles mechanically creates further points of failure and increases the technical and operational responsibility of the central bank. This may expose central banks to resource management constraints and potential reputational exposure in case of incidents. This challenge can be mitigated by proper risk management frameworks and taxonomies as well as appropriate technological choices, which makes the case for the early involvement of IT and risk management units in the experimentation process.

Another challenge highlighted by central banks relates to the articulation of privacy and consumer protection with anti-money laundering/countering the financing of terrorism (AML/CFT) and fraud rules. For some central banks, an initial ambition of retail CBDCs was to provide citizens with a digital form of central bank money, offering cash-like features and use cases (RBI). Recent experiments and projects have shown that retail CBDCs could perform this role from a technical perspective, enabling full anonymity and offline transactions. Yet some central banks have progressively discarded this option due to the need to comply with AML/CFT rules and to apply minimum safeguards in instances of fraud or error.[42] Full anonymity for a large share of transactions could make retail CBDCs attractive for illicit activities such as money laundering and terrorist financing. This would create a reputational risk for central banks, as they would not be entirely able to track and monitor these flows. Finding a balance between the objectives of privacy and countering illicit activities can be difficult, especially given populations' increasing awareness regarding privacy. Most central banks interviewed indicated that these topics are a top priority in the roll-out of a potential retail CBDC. Several of them are considering different levels of anonymity with respect to different parties and categories of transactions (for instance full anonymity for small-value transactions, eg The Bahamas). Similarly, the amount of data related to online retail CBDC payments available to the respective PSPs could be limited to what is necessary to perform services and consistent with what is required by regulation. Data available to the central bank could also be limited to what is necessary to perform critical tasks and

41 BIS (2023).

42 For further details, see BIS (2021) and ECB (2023).

could be pseudonymised, striking a balance between conflicting objectives and features.

The simultaneous or subsequent implementation of both initiatives raises additional challenges

From an operational perspective, additional risks can stem from the simultaneous or subsequent development and integration of a CBDC system and FPS. While retail CBDC systems and FPS have many common characteristics, differences in messaging standards and underlying technology can result in isolated and siloed technological developments. Among central banks that have launched or are assessing both options, several raised the point of ensuring the smooth technical interoperability of both systems within the existing payments landscape (CBN). Other central banks point out the necessity of having fully independent infrastructures, ensuring that if one system fails, the other serves as a backup (BoK). Moreover, projects relating to both systems are sometimes explored or developed by different teams (RBNZ). This can further accentuate the risk of coordination failure. This challenge is even more acute when both systems are launched at different times, which may result in legacy design features and implementation choices becoming a hurdle for achieving interoperability. In a number of jurisdictions, central banks have already implemented an FPS and are exploring different options for the smooth back-end integration with CBDCs.

In addition, multiple central banks acknowledged that resource and capacity constraints can arise from building and running two initiatives. BCB respondents mentioned staffing and allocating people to operations and product development as one of the main challenges for Pix. Similarly, the launch of JAM-DEX in Jamaica has been a resource-consuming project for the BoJ, involving a diversity of contributors with legal, financial and technological expertise. Thus, the interviewed central banks highlighted the need for a clear governance framework, both externally, to coordinate with market participants, and internally, to allocate tasks smoothly within the institution.

8. Key takeaways

While work on retail CBDCs and FPS is ongoing, it is possible to distil 12 takeaways in four main areas: complementarity or the relationship between retail CBDCs and FPS, success factors, design choices and the role of the central bank. Each are further elaborated on below. Note that these takeaways are the interpretations of the authors and not necessarily shared by all of the counterparts who were interviewed.

Complementarity/relationship between retail CBDCs and FPS

1. The choice between a retail CBDC or FPS, or both, is very contextual and will depend on the market features, ecosystem and implementation choices made in the past. In principle, both FPS and retail CBDC systems can support many of the same objectives. Yet, from a practical perspective, there are disproportionately more live FPS in the world. Many of these have achieved wide adoption and success. For a

jurisdiction that does not have a comprehensive and well-functioning payment ecosystem, and where resources are limited, it could make sense to focus on building an FPS first, given that it has been a proven solution in many jurisdictions and sometimes involves "just" upgrading the retail payment systems. For a jurisdiction that has an FPS but still faces gaps in inclusion and adoption, there are open questions about whether to upgrade the FPS with additional functionalities or to issue a retail CBDC with these features. Ultimately, depending on the objective, a jurisdiction would need to decide which path will lead to their intended objective in the most efficient and comprehensive way, without overburdening resources.

2. At least some of the central banks interviewed do see a role for both retail CBDCs and FPS. About half of the respondents noted a potential role for both. Yet here, too, rationales depend on context. For a jurisdiction that has an FPS but still has substantial gaps in financial inclusion, a retail CBDC system designed with inclusive features could offer further support in the pursuit of policy objectives for financial inclusion and payment efficiency. For a jurisdiction that already has an FPS and where financial inclusion is not a key issue, the purpose of a retail CBDC might go beyond payments and be associated more with monetary sovereignty or new functionalities. Notably, the degree of complementarity between a retail CBDC system and FPS might change over time, depending on the technology used by both. As payment systems are increasingly experimenting with new technologies, the differences between a retail CBDC system and FPS might eventually change and either facilitate their integration or make it harder.

Success factors

3. Success is more likely if the central bank is clear about the objective before embarking on the implementation journey. It is critical that central banks and other authorities fully understand the gaps that the particular system (retail CBDC or fast payment) is intended to fill and also learn from other implementations around the world to assess the potential for success. One recurring point in the interviews was that jurisdictions should avoid implementing a particular system just because of hype or "fear of missing out". Rather, they should base decisions on real needs, resource constraints and availability of payment systems in the jurisdiction. For all central banks interviewed, it was clear that communicating the policy objectives of that jurisdiction to stakeholders was a key area of ongoing work.

4. Involving all relevant stakeholders early in the process can help to get their buy-in. Both retail CBDCs and FPS can be framed in the context of a broader payment modernisation strategy. The catalysts of the process (central banks and other authorities) should clearly define the roles and responsibilities of different stakeholders. These may include consumer groups, merchant associations, government agencies, banks and non-bank payment service and infrastructure providers. If a national payments council already exists in a jurisdiction, it could be used as a conducive platform to bring together the relevant stakeholders in the context of the respective system implementation as well. For retail CBDC issuance, which may be a more resource intensive endeavour, it is important to have a large interdisciplinary project team to cover all different aspects, including risk management. Further, in the context of a retail CBDC, there may be a need for legal amendments to recognise the retail CBDC as a legal tender. Therefore, the political buy-in from the government and the legislative body might be as important as the technical buy-in for the project to move forward.

5. An effective communication strategy with end users is especially crucial. One could argue that end users (consumers and merchants) constitute the most critical set of stakeholders in a retail CBDC and fast payment ecosystem due to, in part, network externalities. Ultimately, they are the ones that will need to adopt and use the services offered by the respective systems, and adoption by one group reinforces that of the other. It is therefore important to understand their needs from the very beginning. This can be done with surveys and focus groups, cutting across a variety of individuals (eg by age, gender, ethnicity, rural vs urban) and businesses (eg by size, industry, physical vs online, informal vs formal). Many central banks that are currently working on a retail CBDC started involving end users only when moving from the research to the proof-of-concept stage.[43] It is important that they start doing so earlier in the design process to ensure a good understanding of needs and opportunities. Furthermore, in communicating with end users, gaining trust will be important, particularly for retail CBDCs, given their novelty. Retail CBDC features, such as privacy rules and programmability, may raise concerns with end users in terms of what it means for their funds and data. It is up to the system operator and system participants to explain the design choices in layman terms. They may need to clarify from the beginning any potential controversial areas as well as debunk any myths in order to alleviate concerns. Without full trust and transparency, the uptake and usage will be severely hit and put the success of the project at risk.

6. While both FPS and retail CBDCs can play a role in financial inclusion, complementary policies are still needed. No matter how well designed a retail CBDC system or FPS is, they are not a silver bullet and will not guarantee universal access to transaction accounts and usage of digital payments by themselves. Further enablers and catalysts will be needed, such as a robust and level playing field, a sound legal and regulatory framework, a robust and widespread financial and information and communication technology infrastructure, strong commitment by the public and private sector, financial education, design of transaction accounts tailored to the needs of different sociodemographic groups, a wide network of merchants that accept digital payments, and large payers and billers acting as an example (eg governments and utility companies). All of these are elements of the Payment Aspects of Financial Inclusion framework and remain relevant for the success of the systems.[44] In addition, some complementary public policies geared toward reducing tax evasion and labour informality may be necessary to foster adoption of fast payments and retail CBDCs as well as digital payments in general.

Design choices

7. For central banks considering both a retail CBDC system and an FPS, compatibility and interoperability are key. This is especially important if one of the systems is coming after the other. Interoperability would ensure that end users can easily add or withdraw funds to or from their retail CBDC wallets and seamlessly use CBDC balances to transfer funds to others, regardless of whether the recipients have a CBDC wallet or a traditional bank or e-money account. The ability to smoothly move money between both systems, as well as with existing payment instruments such as payment cards, will be important for the adoption and use, and hence the success, of each system. This could be aided by standardisation, for instance of aliases, proxy

[43] See Kosse and Mattei (2023).

[44] CPMI and World Bank (2016).

identifiers and QR codes. Similarly, standardisation and the use of messaging formats (such as ISO 20022) and open APIs would allow participants (ie PSPs) in the retail CBDC systems and FPS to develop additional end user services and facilitate compatibility between them.

8. Setting the price of payment services involves trade-offs. Interviewees noted that for both retail CBDCs and fast payments, it is critical to get the pricing for end users (individuals and businesses, including merchants) and PSPs "right". This means striking a balance to achieve fees that are affordable enough for end users of different socioeconomic and sociodemographic backgrounds, but also allowing PSPs some form of remuneration that gives them an incentive to innovate and build overlay services on top of the underlying infrastructure. There may be a need to set or cap prices (similar to the interchange caps on payment cards) to reach that balance. There are examples where regulators or central banks have determined that some use cases of fast payments or retail CBDC payments (such as P2P) should be free of charge, while other use cases (such as P2B) are subject to a fee cap. In other cases, P2B payments processed through an FPS have been mandated to also be free of charge, but this has impeded PSP uptake and their business model.

9. For either a retail CBDC or fast payments, operational resilience and cyber security are key. If either a retail CBDC or FPS is widely adopted, the underlying system will become systemically relevant and potentially a critical national infrastructure. Especially for retail CBDC systems building on newer and less tested technologies, it will be crucial that the system is resilient to both operational failures and cyber attacks. Outages and data breaches could harm end users and the economy and could have serious reputational risks for central banks and financial institutions. Interviewees were acutely aware of these risks and made clear that operational resilience and cyber security are a sine qua non for their work in this area.

10. Systems need to be designed to be future-proof and to accommodate further demands that may arise. Several central bank contacts flagged the need to ensure that a new retail CBDC system or FPS is designed to allow new use cases and overlay services in the future. These services include online and offline payments, remote and in-person payments, push and pull transactions, recurring and conditional payments and comprehensive fraud prevention safeguards, allowing for both banks and non-bank PSPs to offer services, and allowing for simplified KYC for vulnerable population segments. Some referred to the potential to design systems to better support cross-border payments – an aspect that was not always considered in the past design of domestic payment systems.

Role of the central bank

11. Central banks' work on fast payments and CBDCs is proceeding in line with their mandates and public policy objectives. In the context of an FPS, the central bank is often a catalyst of private initiatives, an overseer and regulator and potentially an operator of the infrastructure. In the context of a retail CBDC, the central bank is usually both the overseer and regulator of private PSPs offering retail CBDC services and the operator of the infrastructure. In either case, the central bank can rally the different stakeholders to promote public policy objectives such as financial inclusion, efficiency, financial stability and safety and robustness, among others.

12. Regardless of the operating model, it is important that there is an efficient and inclusive governance framework, for either system, to achieve buy-in by different market actors. The central bank can play an important role in this context, particularly

for FPS that are privately operated, eg by having an independent member on the board and being a system participant itself. As more central banks experiment with different governance arrangements for FPS and retail CBDC systems, there will be a larger menu of arrangements to choose from. In any case, and for either system, central banks play an important role by facilitating the final settlement between PSPs in central bank money.

9. Conclusion

The key questions we aimed to answer in this paper are: how are retail CBDC systems and FPS similar and different from one another, and why have some jurisdictions opted for one of them while others are considering both? Our key conclusion is that the choice between issuing a retail CBDC or building an FPS, or doing both, is very contextual and will depend on the market features, ecosystem and the degree of maturity and innovation of existing payment infrastructures in a jurisdiction. Interviews carried out with 14 central banks have highlighted a variety of different approaches. While some counterparts expressed reservations about retail CBDCs and the risk of disintermediation, others see a case for retail CBDCs and FPS to coexist and address different public policy objectives.

In principle, both retail CBDC and FPS initiatives can be designed to support key policy goals such as supporting payment speed, safety and efficiency, fostering competition and promoting financial inclusion. Functions like programmable and offline payments were discussed in the context of retail CBDCs, but they may be achievable with FPS as well. Regardless of the approach adopted, the central bank has a major role to play in either initiative. Before developing and launching a retail CBDC system, FPS or both, the central bank needs to define clear objectives and to rally all stakeholders early in the process. Once the systems are in place, the central bank can fulfil a variety of tasks depending on its operating model. The central bank generally also has a regulatory and oversight mandate to mitigate the risks posed by an FPS or retail CBDC. Even though these risks present several similarities, the novelty of retail CBDCs may introduce new challenges.

As jurisdictions continue to explore and implement FPS and retail CBDC systems, the compatibility and interoperability between both, domestically and across borders, is likely to receive further attention. Several experiments are currently assessing the technical feasibility of integrating retail CBDCs into the existing payment landscape, eg with RTGS and FPS, but this field of research remains relatively new. Interoperability between retail CBDC systems and FPS as well as other payment systems could be a paramount driver for future developments and potential coexistence between them.

References

Aldasoro, I, S Doerr, L Gambacorta, R Garratt and P Koo Wilkens (2023): "The tokenisation continuum", *BIS Bulletin*, no 72, April.

Auer, R, G Cornelli and J Frost (2023): "Rise of the central bank digital currencies", *International Journal of Central Banking*, vol 19, no 4, pp 185–214.

Bank for International Settlements (BIS) (2020) "Enabling open finance through APIs", report by the Consultative Group on Innovation and the Digital Economy, December.

——— (2021): "CBDCs: an opportunity for the monetary system", *BIS Annual Economic Report 2021*, chapter III, June, pp 65–95.

——— (2022a): "The future monetary system", *BIS Annual Economic Report 2022*, chapter III, June, pp 75–115.

_____ (2022b): "API standards for data sharing (account aggregator)", report by the Consultative Group on Innovation and the Digital Economy, October.

——— (2023): "Central bank digital currency (CBDC) information security and operational risks to central banks", report by the Consultative Group on Risk Management, November.

BIS Innovation Hub (BISIH) (2023): *Project Polaris Part 1: A handbook for offline payments with CBDC*, May.

——— (2024): "Project Nexus: enabling instant cross-border payments", November.

Boakye-Adjei, N, R Auer, H Banka, A Faragallah, J Frost, H Natarajan and J Prenio (2023): "Can central bank digital currencies help advance financial inclusion?", *Journal of Payments Strategy & Systems*, vol 17, no 4, pp 433–47.

Boar, C, S Claessens, A Kosse, R Leckow and T Rice (2021): "Interoperability between payment systems across borders", *BIS Bulletin*, no 49, December.

Branch, S, L Ward and A Wright (2023): "The evolution of SandDollar", *Intereconomics*, vol 58, no 4, pp 178–84.

Committee on Payment and Settlement Systems (CPSS) (2003): *The role of central bank money in payment systems*, August.

CPSS and Technical Committee of the International Organization of Securities Commissions (CPSS-IOSCO) (2012): "Principles for financial market infrastructures", *CPMI Papers*, no 101, April.

Committee on Payments and Market Infrastructures (CPMI) (2016a): "Fast payments – enhancing the speed and availability of retail payments", *CPMI Report*, no 154, November.

——— (2016b): *Glossary*, October.

_____ (2021): "Developments in retail fast payments and implications for RTGS systems", *CPMI Papers*, no 201, December.

_____ (2022): "Interlinking payment systems and the role of application programming interfaces: a framework for cross-border payments", report to the G20, *CPMI Papers*, July.

_____ (2024): "Linking fast payment systems across borders: considerations for governance and oversight", *CPMI Papers,* October.

CPMI, BISIH, International Monetary Fund (IMF) and World Bank (2022): *Options for access to and interoperability of CBDCs for cross-border payments*, report to the G20, July.

_____ (2023): *CPMI-BISIH-IMF-World Bank central bank conference: Paving the way for cross-border CBDC payments*, conference summary, October.

CPMI and Board of IOSCO (CPMI-IOSCO) (2015): "Application of the principles for financial market infrastructures to central bank FMIs", *CPMI Papers*, no 130, August.

CPMI and Markets Committee (CPMI-MC) (2018): "Central bank digital currencies", *CPMI, Markets Committee Papers*, no 174, March.

CPMI and World Bank Group (2016), "Payment aspects of financial inclusion", *CPMI Papers*, no 144, April.

Cornelli, G, L Gambacorta and L Pancotto (2023): "Buy now, pay later: a cross-country analysis", *BIS Quarterly Review*, December, pp 61–75.

Di Iorio, A, A Kosse and I Mattei (2024): "Embracing diversity, advancing together – results of the 2023 BIS survey on central bank digital currencies and crypto", *BIS Papers*, no 147, June.

European Central Bank (ECB) (2023): *A stocktake on the digital euro*, October.

Frost, J, P Koo Wilkens, A Kosse, V Shreeti and C Velásquez (2024): "Fast payments: design and adoption", *BIS Quarterly Review*, March, pp 31–44.

Global Partnership for Financial Inclusion (GPFI) (2023): *G20 policy recommendations for advancing financial inclusion and productivity gains through digital public infrastructure*, joint G20 report with the World Bank Group.

Khiaonarong, T and D Humphrey (2022): "Instant payments: regulatory innovation and payment substitution across countries", *IMF Working Paper*, no 2022/228, November.

Kosse, A and I Mattei (2023): "Making headway – results of the 2022 BIS survey on central bank digital currencies and crypto", *BIS Papers*, no 136, July.

Lipis Advisors (2023): *Enabling offline payments in an online world: a practical guide to an offline payment design*, March.

Patel, M, S Kasiyanto and A Reslow (2024): "Positioning central bank digital currency in the payments landscape", *IMF Fintech Notes,* no 2024/006, October.

Ree, J (2023): "Nigeria's eNaira, one year after", *IMF Working Papers*, no 2023/104, May.

Soderberg, G, J Kiff, H Tourpe, M Bechara, S Forte, K Kao, A Lannquist, T Sun and A Yohsinaga (2023): "How should central banks explore central bank digital currency?" *IMF Fintech Notes*, no 2023/008, September.

Wong, P and J L Maniff (2020): "Comparing means of payment: what role for a central bank digital currency?", *FEDS Notes*, August.

World Bank (2021a): *Considerations and lessons for the development and implementation of fast payment systems,* main report, September.

_____ (2021b): *Central bank digital currency – a payments perspective*, November.

_____ (2024): "Interoperability between central bank digital currency systems and fast payment systems: a technical perspective", Technology & Innovation Lab, June.

Annexes

Annex 1

List of central banks, their acronyms and the availability of a live retail CBDC and/or FPS

Table A.1

Jurisdiction	Central bank	Acronym	Live retail CBDC	Live FPS
Bahamas (The)	Central Bank of The Bahamas	CBB	**X**	
Brazil	Central Bank of Brazil	BCB		**X**
Canada	Bank of Canada	BoC		
Denmark	Danmarks Nationalbank	DNB		**X**
European Union	European Central Bank	ECB		**X**
Ghana	Bank of Ghana	BoG		**X**
India	Reserve Bank of India	RBI		**X**
Jamaica	Bank of Jamaica	BoJ	**X**	
Morocco	Bank Al-Maghrib	BAM		**X**
New Zealand	Reserve Bank of New Zealand	RBNZ		
Nigeria	Central Bank of Nigeria	CBN	**X**	**X**
South Korea	Bank of Korea	BoK		**X**
Switzerland	Swiss National Bank	SNB		**X**
West African Economic and Monetary Union	Central Bank of West African States	BCEAO		

Annex 2 Glossary

This annex provides the definitions of key terms used in the paper.

Central bank digital currency (CBDC): a form of digital money, denominated in the national unit of account, which is a direct liability of the central bank. CBDCs can be either retail (general purpose, for use by households and businesses) or wholesale (for use by financial institutions) (BIS (2021)). In this paper, we look at the features of CBDC not only as a new type of central bank liability but also as a new system, which includes the infrastructure and rules (eg clearing, settlement and governance) underlying the transfer of a CBDC among system participants and end users.

Deferred net settlement (DNS): a net settlement mechanism which settles on a net basis at the end of a predefined settlement cycle (CPMI (2016b)).

Fast payments: also referred to as instant, real-time, immediate or rapid payments, fast payments are retail payments in commercial bank money or e-money that allow for the transmission of the transaction message and the availability of final funds to the beneficiary to occur in real time or near real time and as near as possible to 24 hours a day and seven days a week (24/7) (CPMI (2021)).

Fast payment system (FPS): a payment system (see below) that processes fast payments (see above).

Interoperability: technical, semantic and business compatibility that enables a system to be used in conjunction with other systems. Interoperability allows PSPs from different (domestic or international) systems to make payments across systems without participating in multiple systems (Boar et al (2021)).

Offline payments: a transfer of funds whereby the payer and/or payee do not require a connection to any ledger system (BISIH (2023)).

Payment system: a system that encompasses the infrastructure, participating payment service providers (PSPs), end-user-facing services and underlying rules that govern the processing and delivery of payments (Frost et al (2024)).

Programmable payments: payments that are automatically executed, conditional upon preset criteria (Di Iorio et al (2024)).

Real-time gross settlement (RTGS): the settlement of payments, transfer instructions or other obligations in real time, individually and on a transaction-by-transaction basis (CPMI (2016b)).

Annex 3 Retail CBDC (systems) and fast payments (FPS): similarities and differences

How parameters compare between retail CBDC (and CBDC systems) and fast payments (and FPS)	Identical
	Similarities
	Major differences
	Radical differences

Parameters	Retail CBDC (systems)	Fast payments / FPS
	General	
Objectives	Financial inclusion, domestic and cross-border payment efficiency, monetary and fiscal policy tool, strengthening role of central bank money, lower cost for end users, digital alternative to cash transactions	Financial inclusion, domestic and cross-border payment efficiency, lower cost for end users, digital alternative to cash transactions
Operation	Public, public-private	Public, private, public-private
Overseer/regulator	Central bank	Central bank
	Properties	
Liability	Central bank	Financial institution
Crediting of payee account	Instant	Instant
Availability	Always on	Always on
	Usage and functionalities	
Offline capabilities	Yes	Yes
Use cases	P2P, P2B, B2B, P2G, G2P, B2G, G2B	P2P, P2B, B2B, P2G, G2P, B2G, G2B
Payment mechanism supported	Push and pull	Push and pull
Transaction channels supported	Internet, mobile, QR codes, physical branches/agents, NFC, agents	Internet, mobile, QR codes, physical branches/agents, NFC, agents
Alias capability	Yes	Yes
Overlay services	Programmability, self-custody, APIs	APIs; request to pay; buy now, pay later
	Settlement	
Settlement model	Real-time gross	Deferred net settlement, real-time gross
Settlement asset	Central bank money	Central bank money, commercial bank money
	Rules and regulatory	
Access for non-banks	No access, direct access, indirect access	No access, direct access, indirect access
Pricing model for end users	Free pricing, limits by regulator, free of charge for certain use cases	Free pricing, limits by regulator, free of charge for certain use cases
Pricing for PSPs	Fixed, variable, interchange	Fixed, variable, interchange
	Architecture	
Underlying technology	Centralised or decentralised	Usually centralised
Messaging standards	Proprietary	ISO 8583, ISO 20022, proprietary
Underlying infrastructure	New stand alone, using existing infrastructure	New stand alone, using existing infrastructures/systems

Enclosure 11

FOCUS NOTE

A PRACTITIONER'S GUIDE TO GOVERNANCE OF FAST PAYMENT SYSTEMS

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JULY 2025

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1 EXECUTIVE SUMMARY

Retail fast payments (also known as instant, real-time, immediate, or rapid payments) across payment service providers allow for immediate fund availability to beneficiaries and can be used on a 24/7/365 basis. As fast payment systems (FPS) evolve, they enable a diverse set of payment service providers, including banks and non-banks, and support a variety of payment instruments, use cases (domestic and cross-border), transaction channels, and overlay services.[1] The *"G20 Policy Recommendations for Advancing Financial Inclusion and Productivity Gains through Digital Public Infrastructure"* has identified FPS as one of the three digital public infrastructures (DPIs) in advancing financial inclusion. FPSs are proliferating worldwide in both advanced and emerging economies.[2]

Ensuring that FPSs are well-governed is becoming a key policy concern for central banks and economic policy makers worldwide, as it can significantly impact the financial health of a national economy. However, setting up the best possible governance framework can be challenging: the issues are complex and interdependent, the community of affected stakeholders is large and diverse, the technology evolves quickly, and no two financial ecosystems are exactly alike. Specialist help is likely to be needed.

Much has been written on general corporate governance, and there are other reports on governance issues related to retail payment systems and financial market infrastructures (FMIs).[3] However, there is no specific practical guidance on how to set up a governance framework for FPS. This guide is aimed at policy makers and system managers tasked with this challenge.

Section 2 provides a set of guidelines for establishing a governance framework for FPS, encompassing both the external framework and internal arrangements, which comprise 10 key elements. The suggested methodology is to develop a Governance Plan for the FPS that addresses these 10 key elements

in sequence, thereby creating a comprehensive and consistent design for the FPS's governance. The elements are the following:

1. Scope and mandate of the FPS
2. Stakeholder composition
3. Public policy objectives
4. Adherence to regulatory and oversight framework
5. Development of the Governance plan
6. Formal structure and ownership
7. The board
8. Scheme rules[4]
9. Transparency and public disclosure
10. Risk management

Section 3 provides the background and context, while section 4 elaborates the methodology in more detail, with section 5 referencing the relevant international standards. Sections 6 to 15 provide a closer look at each of the 10 elements, examining key questions that must be addressed when designing the governance framework and offering guidelines for each respective element. Governance frameworks of six FPS case studies of emerging markets and developing economies (EMDEs) are used as illustrative examples to indicate how external framework elements and internal arrangement elements have been addressed.[5] The report concludes with section 16.

2 GOVERNANCE GUIDELINES

Following is a complete set of the Governance Guidelines for the 10 key elements of FPS governance. For each element, the guidelines are supported by more detail in a separate section later in the guide.

ELEMENT 1
The Scope and Mandate of the FPS

The developers of a new FPS should develop a comprehensive Governance Plan, starting with a clear statement of the FPS scope and mandate that takes into account the interests of all stakeholders and supports relevant public interest considerations.

The scope and mandate should be articulated inclusively, highlighting desired community and economic benefits and balancing relevant public policy objectives with the common interests of system participants.

The FPS's financial objectives should be clearly articulated, published to the stakeholder community, and internalized by the board and management. If an FPS is intended to operate for profit, this should be explicitly stated, along with clarity on the safeguards to ensure it aligns with, rather than detracts from, public policy goals.

ELEMENT 2
Stakeholder Composition

An FPS's Governance Plan should include a "stakeholder map" with a broad and inclusive view of the FPS's stakeholder community, encompassing end-user beneficiaries, participants, and any other relevant stakeholders. In each case, stakeholder groups should be subdivided according to their ability to influence the FPS and their interests and priorities in relation to the FPS.

ELEMENT 3
Public Policy Objectives

The FPS Governance Plan should reference the public policy guidelines issued by the central bank and ensure that they align with these objectives.

ELEMENT 4
Adherence to Regulatory and Oversight Framework

National payments system legislation should clearly apply to the FPS. As part of preparing the Governance Plan for the FPS, applicable legislation should be reviewed by the FPS to identify and plan for

- licensing, authorization, or designation of FPSs, and
- other oversight and regulatory requirements, including those relevant authorities involved in matters such as

conducting regulations to support policy outcomes (consumer protection, fair and open markets, system interoperability, and so on).

If there are self-regulatory elements in the governance framework, their scope and authority must be clearly specified in the Governance Plan, as well as the manner in which public oversight of self-regulatory processes is to be achieved.

ELEMENT 5
Development of the Governance Plan

The FPS operator is responsible for developing and implementing the Governance Plan. The operator must possess professional competence to consider the interests of various stakeholders while pursuing public policy objectives. Where the central bank operates the FPS, it must engage with the relevant stakeholders.

An FPS development could also consider engaging professional, dedicated project management resources charged with formal planning, developing an information database, harnessing industry expertise, engaging and communicating with all stakeholders, and coordinating sound decision-making arrangements, if required.

The Governance Plan should facilitate extensive and continuous engagement with all stakeholders, particularly participants, throughout the FPS development phase to ensure a successful market launch through effective coordination.

Where governance arrangements are changing, those stakeholders whose interest or influence may be adversely affected should be identified and engaged. Where supervening public interest necessitates it, the central bank may need to exercise its authority to direct the change.

The transition from program governance to operational governance requires careful planning and clear articulation to affected stakeholders.

ELEMENT 6
Formal Structure and Ownership

The Governance Plan should propose a formal structure for the FPS, which

- enables and supports the scope and mandate,
- is legally sound and compliant with applicable laws,
- is widely supported by stakeholders, and
- includes the capability to adapt to future market evolution.

The FPS Governance Plan could consider using pre-existing governance arrangements for the FPS, such as an existing self-regulatory body or operator, which can enhance market engagement and reduce the time to market. However, arrangements that were appropriate for different kinds of systems—particularly those without the extended participation and retail characteristics of an FPS—may need modification to be appropriate for an FPS.

ELEMENT 7
The Board

An FPS Governance Plan needs to establish the board's composition and proceedings, including the scope and mandate, as well as the interests of owners. If an existing national operator is to house the FPS, this option involves considering whether the special needs of the FPS warrant changes to existing governance arrangements.

The FPS board should fairly reflect the ownership of the FPS, but it is also important to consider access to subject matter expertise, diversity of perspective, and external credibility by having independent directors.

Public interest and independent directors should be considered in addition to owner appointees, as they can be critical in mediating and managing competing stakeholder interests, including formal conflicts of interest.

FPSs are prone to potential conflicts of interest in several dimensions and need transparent, effective protocols for managing any conflicts.

The role of the chair is often a key appointment because the chair controls board processes and can, if necessary, mediate among divergent stakeholder interests. The Governance Plan should specify how the chair is to be appointed.

Under the chair's leadership, the board should establish clear criteria for director appointments, including those made by stakeholder owners, and a director performance review mechanism that has the support of stakeholder owners.

The Governance Plan should consider the optimal mix and composition of board committees to ensure efficient decision-making, taking into account both general corporate needs and specialized payment system requirements. Committees dealing with sensitive subject matter may need independent leadership, membership, or both.

ELEMENT 8
Scheme Rules

The Governance Plan for an FPS should provide for the establishment of a comprehensive set of scheme rules covering

- the rights and obligations of each participant as against each other and as against the operator in relation to fast payment activity,
- clear definition of different classes of participation and the ongoing requirements of each, and
- fast, fair dispute resolution, rules compliance procedures, and disciplinary proceedings.

The scheme rules should be administered by the board or a committee appointed for this purpose, ensuring that the views of participants and the central bank are taken into account in rulemaking for the FPS.

Consideration should be given to how the central bank will be engaged in rulemaking, including whether the oversight function needs to be proactively involved in proposed rule changes and whether a formal approval or nonobjection process is in place.

ELEMENT 9
Transparency and Public Disclosure

The Governance Plan for an FPS should factor in structured, regular governance disclosure by the operator, which may include scheme rules, ownership details, board constitution, and governance processes.

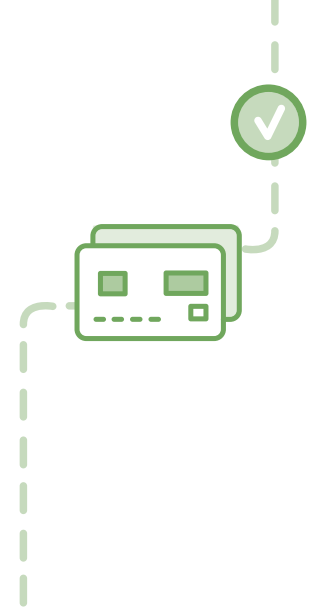
Using the stakeholder map (see Element 2), the Governance Plan should outline the mix of engagement models that will be employed to ensure that all stakeholders are part of an ongoing discussion with the FPS on issues relevant to them.

ELEMENT 10
Risk Management

The Governance Plan for an FPS should consider the need to promote the best possible management structure and corporate culture for addressing the special strategic and risk issues associated with an FPS. The ownership structure is relevant, but it should not dictate the organizational structure.

The management structure should explicitly consider the following:

- How to manage the diverse interests of multiple stakeholders with regard to the stakeholder map
- How to continuously balance public policy objectives with service to participants and their customers
- How the special risks associated with fast payment processing can be effectively integrated into operations management



3 BACKGROUND

The World Bank has been closely monitoring the development of FPSs by central banks and private sector players worldwide. This comprehensive study has resulted in a policy toolkit designed to guide countries and regions on the likely alternatives and models that could assist them in their policy and implementation choices when they embark on their FPS journeys. As FPSs grow and proliferate, they become more important both to increasing numbers of individuals and businesses and to the health of national economies. Getting their governance right becomes a key policy concern for central banks and economic policy makers.

Work on the FPS Toolkit is supported by the Gates Foundation under Project FASTT (Frictionless Affordable Safe Timely Transactions).

The toolkit and other relevant resources of Project FASTT can be found at fastpayments.worldbank.org and consist of the following components:

- The main report, "Considerations and Lessons for the Development and Implementation of Fast Payment Systems"
- Case studies of countries that have already implemented fast payments
- A set of short focus notes on specific technical topics related to fast payments

This note is part of the third component of the toolkit and aims to provide input on the governance of FPS. This topic is relevant given the increase in the number of countries adopting FPS worldwide and the significance that FPS typically have in terms of economic and public policy for the jurisdictions they serve. Ensuring that national FPSs are well run is rapidly becoming a key issue of national economic policy in emerging and developing economies (EMDEs).

Conversely, poorly run FPSs can cause multiple problems. Slow and inefficient decision-making can hinder the entire marketplace from implementing new technologies and improved processes. Lack of regard for public policy priorities can undermine government efforts to improve the economy; disregard for stakeholder interests can create frustrated, disengaged participants and low take-up of services.

The rapidly evolving world of FPSs presents a special governance challenge: the issues are complex and interdependent, and no two environments are alike. There is a wave of global development activity, particularly in EMDEs. Yet each jurisdiction has its own economic, policy, and often political concerns. In FPS, more than in other payment systems, different stakeholder groups like mobile money operators, digital wallet operators, remittance services, and social media platforms bring new and sometimes conflicting perspectives and interests.

This report is accordingly aimed at both policy makers and practitioners to enable them to address all issues pertaining to setting up a sound governance framework for the FPS consistent with the best international practices and standards while taking into account each jurisdiction's payments ecosystem. Noting that setting up a governance structure and its associated processes is a complex task, the guide provides a holistic perspective on the various steps

involved in this process. Accordingly, the external factors and internal arrangements that influence the governance framework are identified, and various elements under each of these respective heads are further broken down. Each element is discussed in detail, with key questions listed to guide policy makers and practitioners in ensuring that all relevant issues have been taken into account when devising a sound governance framework. To this end, the guide provides illustrations of select FPS governance frameworks drawing from six case studies. The guide accordingly should be read and understood from the wholistic perspective as it seeks to help the reader navigate the complexities involved in this process.

4 METHODOLOGY

An expansive view of the FPS governance framework includes both external and internal elements that affect FPS decision-making.[6] The 10 elements presented in this report distill the available international standards. The *external governance framework* comprises elements that have a substantial impact on decision-making, such as the make-up of the stakeholder community and the regulatory and public policy environment. These influence the *internal governance arrangements,* which comprise the structures and processes for FPS decision-making, particularly its board. A foundational linking element is the FPS's scope mandate, which describes why and for whom the FPS exists.

Although these governance elements are complex and interdependent, this guide responds to the challenge of setting up FPS governance by arranging the 10 elements in a way that can be addressed in sequence:

- First, the scope and mandate of the FPS.
- Second, four external elements:
  - Stakeholder composition
  - Public policy objectives
  - Adherence to the regulatory and oversight framework
  - Development of the governance plan
- Finally, five internal elements:
  - Formal structure and ownership
  - The board
  - Scheme rules
  - Transparency and public disclosure
  - Risk management

The international standards being referenced in the guide comprise the following: (a) G20/OECD *Principles of Corporate Governance* (OECD Principles);[7] (b) The CPSS-IOSCO *Principles for Financial Market Infrastructures* (PFMI);[8] (c) "Policy Recommendations for Advancing Financial inclusion and Productivity Gains through Digital Public Infrastructure" (DPI Guidelines);[9] and (d) the World Bank's "Governance of Retail Payment Systems: Keeping Pace with Changing Markets" (Keeping Pace Paper) in 2021.[10]

Each element is discussed in detail in subsequent sections, along with key questions to be addressed and references to the relevant international standards that underpin the respective element. The design issues pertaining to the element are drawn from the relevant case studies.[11] The specific governance guidelines for the particular element are provided.

5 ELEMENT 1
SCOPE AND MANDATE OF THE FPS

The scope and mandate of the FPS have a bearing on determining its governance arrangements. FPS may be set up by the public sector or the private sector or through a joint public and private sector collaboration. Depending on the type of ownership, the articles of association of the entity (operator of the FPS) will articulate the scope of activities, the services to be provided, and the communities to be served, which would constitute its mandate. A clear articulation of these lines is essential to designing the governance arrangements for a successful FPS development.

KEY QUESTIONS

The following questions may assist in articulating the scope and mandate:

- **Problem Statement:** What is the unmet need or problem the FPS intends to address? Who will benefit?
- **Core Purpose:** What are the explicit objectives for which an FPS has been established, and where is this expressed? Are there limits on its activities? Does the mandate acknowledge both public and private interests? Where are there any differences, and how are they resolved?
- **Financial Objectives:** Is the FPS privately or publicly funded? Do owners/investors expect it to generate a return on investment, and if so, over what time frame? Can it distribute profits? Must it be self-sustaining, and if so, does it merely need to cover operating costs, or must it also generate capital for future reinvestment?
- **Market Context:** What role does the FPS play in the economy and the value chain to end-users? Are there competing or substitutable services or platforms?
- **Jurisdictional Context:** Does the FPS operate only within one jurisdiction or across multiple jurisdictions? Are its services domestic or cross-border?

INTERNATIONAL STANDARDS

The PFMI highlights the importance of striking a balance between public interest objectives and those of relevant stakeholders. Principle 2, Key Consideration 1, says:

> An FMI should have objectives that place a high priority on the safety and efficiency of the FMI and explicitly support financial stability and other relevant public interest considerations.[12]

The DPI Guidelines approach the issue in Principle 2 by advocating for "well-designed" DPIs. Within the central theme of promoting productivity gains and financial inclusion, the guidelines recommend that public authorities adopt design and operational principles to ensure efficiency, inclusivity, resiliency, privacy, and security.[13] Principle 4 explicitly references the desirability for sound internal governance of DPIs to include an explicit objective to act in the public interest.[14]

In the Keeping Pace paper, Consideration 3 reinforces this by stating, "Appropriate public interests should be acknowledged, clearly defined and addressed."[15] The paper discusses

potential conflicts between public interest and corporate or community objectives, as well as the need to articulate goals clearly in a way that balances competing interests.

DESIGN ISSUES

Public versus Private Interests

The drive for the development of an FPS often comes from the national treasury or the central bank because, in EMDEs, FPSs are increasingly a focus for economic development. Therefore, consistent with the published guidance, public policy goals like economic development, digitization of the economy, promotion of a "cashlite" society, and financial inclusion will naturally be central to the development of an FPS. For example, in Poland, KIR's articulation of its strategic roles explicitly mentions its economic relevance for Poland; in Malawi, Natswitch's constituent documents explicitly restrict it from activities not in the common interest. For Ghana's Ghana Interbank Payments and Settlement Systems Limited (GhIPPS), central bank ownership amplifies public policy objectives in inclusive governance arrangements that seek to strike a balance with industry interests. In the case of Brazil's Pix, operation within the central bank means that strategy is explicitly framed as an extension of central bank policy.

But industry interests are also important. Payment service providers like banks, mobile money operators (MMOs), and social media platforms may be both owners and participants. As financial service providers operating in a competitive marketplace, they expect an FPS to be a service that extends or enhances their service offerings. Some FPSs are developed by industry-owned bodies whose focus is the collective interests of industry participants. The recent launch of PayShap by BankservAfrica in South Africa is an example. Accordingly, the mandate of the FPS will also need to take into account the legitimate common interests of participants, such as reduced operating costs and risks, increased market coverage, or an open, competitive marketplace.

Such participant common interests often align well with the broader public interest in providing better payment infrastructure for the economy, making it easier to balance public and common participant interests. However, tension between the two can arise. For example, when an FPS's owners—typically banks—have little interest in opening the FPS beyond the banking community and in encouraging diverse participation, that position can be a conflict with central economic policy interests like promoting competition and increasing financial inclusion.[16] The central bank may need to take a championing role in articulating the extended scope of the FPS. The World Bank's "Fast Payments Championing Handbook for Central Banks" provides practical guidance to central banks on how to lead FPS development initiatives.[17]

Most national FPSs make this balancing of public and participant common interests paramount. However, it is also possible that the FPS is set up as a commercial enterprise—that it must provide a return to investors. This commercial objective is assumed in most discussions of general corporate governance because it is the default state for the great majority of companies. Where it occurs in the special case of an FPS, however, it needs to be explicit in the scope and mandate, and the balancing of commercial interests, participant common interests, and public interests needs to be articulated. The economic significance and diverse stakeholder interests of an FPS can potentially create some design challenges in establishing its scope and mandate. These challenges relate principally to balancing public and participant interests.

Financial Objectives

Depending on the balance of stakeholder interests, it will usually be important to ensure that all stakeholders understand and agree on the financial objectives of the FPS and that these objectives are clearly articulated to the management team, which is charged with business planning and financial management. FPSs can be for-profit or not-for-profit but almost always generate their revenue on a "fee for service" basis. Following are some common configurations:

- A "pure" publicly owned model is one that relies on public financing, such as Brazil's Pix, for which the FPS's initial build was financed through the central bank's budget, and fees were charged by the central bank finance operations.
- A self-sustaining not-for-profit model is one in which a public or industry-owned entity recovers fees to cover both operating costs and provision for future reinvestment or expansion without an expectation of paying a return on investment to owners. Ghana's GhIPPS is a publicly owned example, and Poland's KIR provides an industry-owned example.
- A commercialized or for-profit model is one in which the operator is incentivized to grow and add new services by generating sufficient revenue for operations, future investment, and a return to investors. This model is still comparatively rare in FPSs. In South Africa, BankservAfrica's corporate constitution allows for the making of

profits and the distribution of dividends, although the strategic focus of the company today is on operational cost recovery and so is more aligned with the self-sustaining model.

Cross-Border Linkages

Special governance considerations arise when an FPS operates across multiple jurisdictions and is, therefore, subject to multiple legal and regulatory frameworks. The complexities of this model are beyond the scope of this general note.

However, the G20 has identified the governance and oversight of cross-border payment system interlinking arrangements—in particular of FPS—as a priority action in helping to achieve its 2027 cross-border payments targets. With a final report planned for the end of 2024, this will likely provide specialized guidance.[18]

GUIDELINES

1. The developers of a new FPS should develop a comprehensive Governance Plan, starting with a clear statement of the FPS scope and mandate that takes into account the interests of all stakeholders and supports relevant public interest considerations.
2. The scope and mandate should be articulated inclusively, highlighting desired community and economic benefits and balancing relevant public policy objectives with the common interests of system participants.
3. The FPS's financial objectives should be clearly articulated, published to the stakeholder community, and internalized by the board and management. If an FPS is intended to operate for profit, this should be explicitly stated, along with clarity on the safeguards to ensure it aligns with, rather than detracts from, public policy goals.

6 ELEMENT 2 STAKEHOLDER COMPOSITION

Every FPS serves a community of stakeholders, including payment service providers—banks, mobile operators, retailers, and fintechs. However, through them, the FPS also serves "end-users"—that is, the citizens and organizations that are customers of payment service providers. FPS developments should map the key stakeholder groups and understand their interest and priorities. They should also consider how the community is changing.

KEY QUESTIONS

Relevant questions to ask are the following:

- **Beneficiaries:** Who stands to gain from the FPS? Those who gain need to include end-user beneficiaries like citizens, businesses, and government authorities, as well as different groups of service providers who are likely to be system participants. How are different groups impacted? As with any network service, an FPS simultaneously delivers different benefits to different stakeholders. A complete stakeholder analysis of the FPS, including all beneficiary groups, is critical for good governance design.
- **Stakeholders Adversely Affected:** Who might oppose aspects of the FPS, and why? Intermediaries may lose business; alternative payment methods may experience competition or even displacement. A new FPS can have a large net positive effect for a community but still disadvantage specific groups. The FPS's success may depend as much on fairly addressing unintended disadvantages to existing stakeholders as on delivering overall net benefit.
- **Evolution:** Are there future stakeholders to consider as well? Many FPS services begin with a basic level of service and expand to reach new participants and end-users over time. If this can be anticipated in governance design, so much the better.[19]

INTERNATIONAL STANDARDS

Key Consideration 7 of Principle 2 in the PFMI states:

> The board should ensure that the FMI's design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public.[20]

The DPI Guidelines place emphasis on public/private communication and collaboration, including the need to reach all relevant stakeholders. Key Consideration 1.3 states:

> "Public and private sector coordination and collaboration can be helpful for the effective development and operation of DPIs, and could be considered [and] actively promoted across the DPI lifecycle." [21]

This guideline is reinforced by the observation that "Ensuring all relevant stakeholder voices are considered in the design and ongoing operations of DPIs is critical."[22]

The Keeping Pace paper points out that retail payment systems (including FPSs) are unusual in their economic reach, touching multiple parties in the broader economy: "A retail payment system needs to recognize and address the interests of all relevant stakeholders in its setup and in the manner in which it operates."[23]

DESIGN ISSUES

Banks versus Non-banks

In nearly all FPSs, including those set up or owned by central banks, banks are key stakeholders, as they use the FPS to deliver fast payment services to end-users. The governance arrangements need to be clear on how they are engaged. There can also be important subdivisions of interest among banks—large versus small, commercial versus community or publicly owned, domestic versus international, incumbent versus new entrant.

However, FPSs often also attract a community of participants beyond traditional banks. Globally, FPSs have led the way in integrating non-bank payment service providers such as MMOs, digital wallet providers, and social media platforms into the national payments infrastructure. Particularly in EMDEs, alternative providers have often proved more successful than banks at extending the payment system's reach into the financially underserved communities. An FPS governance design must recognize the different economic impacts and interests of these alternative players, how they will connect, and how they will be engaged in decision-making.

Typically, these communities of potential participants exhibit both competitive and cooperative characteristics. The FPS needs to ensure that its governance encourages cooperation on legitimate common interests (as identified in the scope and mandate) while ensuring individual participants' competitive interests do not dictate FPS decision-making. Board processes, including management of potential conflicts of interest, will be important, as discussed further.

End-User Stakeholders—Businesses and Consumers

FPSs need to recognize their end-user communities as the ultimate service beneficiaries, even though they are not typically owners or participants in the FPS. Here again, there are many different interest groups to identify: banked and underbanked citizens, government welfare recipients, foreign visitors, government authorities, large businesses and merchants, small and medium enterprises, microbusinesses and cash traders, and charitable and community groups.

Because the FPS governance will be setting strategy and directing activities that affect these groups, the range of interests needs to be understood.[24] The articulation of public policy for FPSs (discussed in the next section) may do some of the work, in that community interests are reflected in public policy.

Other Payment Services

Last, the FPS's relationship with alternatives, competitors, and substitutes needs to be considered. Larger payment service providers (such as big banks or leading mobile operators) may see their customer network as a competitive

BOX 1 REPRESENTATION OF STAKEHOLDER GROUPS IN CASE STUDY COUNTRIES

In Poland's KIR, which is the operator of the Elixir Express FPS, large banks are shareholders. They are directly represented on the board, but other banks are represented through shareholding and board representation by the banking association. In South Africa, BankservAfrica (operator of the PayShap FPS) has four large banks as shareholders. A number of smaller banks are shareholders in a representative company, Dandyshelf Pty Ltd, which is a shareholder of BankservAfrica. Each shareholder, including Dandyshelf, appoints a director to the board.

In Ghana, GhIPPS implemented a retail fast payment solution between bank accounts, then enhanced this service with a switch connecting MMO networks to enable wallet transfers across networks. In Egypt, EBC initially developed a connecting network for mobile wallets, then developed a bank account-to-account network later. In both cases, mobile wallet providers were not formally incorporated into the board, although they were engaged and consulted. In Malawi, Natswitch Instant EFT began as a bank-driven service, adding MMOs later. MMOs then became shareholders with board representation.

advantage which a new FPS will reduce; other retail payment systems (such as ACH and domestic and international card schemes) may see the FPS as a direct competitor.

The impact of this on FPS governance may, in part, depend on the structural relationship between the FPS and other payment systems. Many FPS operators, such as Ghana's GhIPPS, South Africa's BankservAfrica, and the Arab Republic of Egypt's Egyptian Banks Company for Technological Advancement (EBC), are also operators of national card schemes or bulk/ACH systems. In such cases, it will be important to ensure that the interests of FPS participants and their customers who are not also participants in affiliate retail payment systems are appropriately taken into account. In Brazil, where the central bank operates the Pix FPS as well as bulk credit and debit systems, the special interests of Pix participants are catered to in the Pix advisory forum.

GUIDELINE

1. An FPS's Governance Plan should include a "stakeholder map" with a broad and inclusive view of the FPS's stakeholder community, encompassing end-user beneficiaries, participants, and any other relevant stakeholders. In each case, stakeholder groups should be subdivided according to their ability to influence the FPS and their interests and priorities in relation to the FPS.

7 ELEMENT 3 PUBLIC POLICY OBJECTIVES

A clear balancing of public policy objectives is an important input to governance design. The public policy objective, for example, could include providing low-cost, safe, and efficient payments to end-users, which could be another public policy objective, along with promoting digital payments and enhancing financial inclusion. Other objectives could include promoting innovation and competition.

KEY QUESTIONS

Some relevant questions to ask are:

- **Payment System Objectives:** How does the FPS governance framework align with the public policy objectives outlined by the central bank?

INTERNATIONAL STANDARDS

PFMI Principle 2 requires an FMI "to place a high priority on the safety and efficiency of its operations and explicitly support financial stability and other relevant public interests." The concept of public interest is a broad one that could include, for example, fostering fair and efficient markets. [25]

The DPI Guidelines in Policy Recommendation 4 advocate promoting sound internal governance arrangements with the objective of acting in the public interest.[26]

The Keeping Pace paper includes Theme 3, which states that "the governance arrangements of a retail payment system shall recognize and support 'public interest considerations'" and indicates that these should be addressed.[27]

The Keeping Pace paper provides examples of public policy interests, which, among others, include enhancing competition and stimulating innovation, fostering market integration, expanding access and usage in the context of financial inclusion and particularly in developing and emerging markets, and balancing competition and cooperation to create (or preserve) a level playing field and ensure market contestability."[28]

DESIGN ISSUES

Public Policy Interests

The governance framework would benefit from a clear articulation of public policy interests by the regulator. In the six case studies under reference, the central banks have outlined their public policy interests.

- In Brazil in 2014, Banco Central do Brasil (BCB) invited industry participants to propose a new fast payment service as a way of addressing national reliance on cash. BCB's board adopted and publicized specific policy objectives for the exercise of its payment regulation powers, including financial inclusion, reduced paper usage, and the development of interoperable mobile and fast payment services.[29]
- In Ghana, in 2019, the Bank of Ghana (BoG) published its "Payments System Strategy (2019–2024)". The strategy includes a clear statement of overall vision and strategy, plus specific, time-framed responsibilities that are allocated to BoG, GhIPPS, other government bodies, and

the industry. The 2019 strategy is a successor to multiple coordinated public statements on the national payments strategy, including

- an earlier 2014 BoG strategy;
- a 2017 Digital Payments Roadmap prepared by the Ministry of Finance, "Toward a Cash-Lite Ghana";[30] and
- a 2018 National Financial Inclusion and Development Strategy 2018–2023, also prepared by the Ministry of Finance.[31]

- In 2013, the Reserve Bank of Malawi adopted a direct, practical approach to articulating policy requirements: a memorandum of understanding (MOU) between it and the Banking Association of Malawi acting on behalf of its members. The MOU records the importance of establishing the retail switch in furtherance of the public policy goal of increasing access to finance. The commercial banks commit to establishing the switch, and the MOU records that
  - Fair access to its services will be provided for new banks and appropriately regulated non-bank institutions.
  - The program will limit itself to switching and related services so as to avoid conflicts of interest.
  - The program will be open to new user shareholders with equal rights.
  - The program will be self-sustaining through service charges.

GUIDELINES

1. The FPS Governance Plan should take into account public policy guidance (issued, if any) and incorporate it into the governance design. Where explicit public policy guidance has not been publicly disclosed, the FPS operator should engage with the regulator.

8 ELEMENT 4
ADHERENCE TO THE REGULATORY AND OVERSIGHT FRAMEWORK

There can be a complex interdependence among regulation (the applicable legislative framework, including licensing or recognition regimes), oversight (the administration of the regulatory framework by an appropriately empowered authority), and governance. For example, the central bank may, for a given FPS, make regulations, grant a license, exercise oversight, or participate in governance, all of which makes the regulatory and oversight framework an important input to governance design choices.

KEY QUESTIONS

Relevant questions to ask are the following:

- **Regulatory Powers:** How does general financial legislation apply to the FPS? Is there separate payment systems legislation? How does it apply to the FPS?
- **Licensing/Recognition:** What is the licensing/approvals framework for the FPS?
- **Governance Compliance Obligations:** Are there ongoing compliance obligations relevant to governance, such as regular reporting, approval of office bearers, and stakeholder consultation? Are there specific oversight obligations, such as compliance with PFMI (or a subset of PFMI) or a formal risk management framework?
- **Regulatory Authorities:** Apart from adhering to the oversight and regulatory framework of the central bank, the FPS is subject to the regulatory powers of other authorities, such as the consumer protection and competition authorities. What rules apply?

INTERNATIONAL STANDARDS

The PFMI report and the Keeping Pace report stress that the governance arrangements of the FPS should be consistent with the oversight objectives of the central bank. The governance framework should have specific measures, for example, for promoting access to the FPS and enhancing financial inclusion while ensuring the safe and efficient functioning of the FPS. The governance framework should be flexible enough to accommodate and take on board the market catalyst interventions of the central bank. The DPI Guidelines in Recommendation 4 also highlight that the internal governance arrangements should adhere to the public interest. The governance arrangements should be reviewed periodically to ensure that they are fully aligned with the stated public policy objectives.

DESIGN ISSUES

Adherence to the Regulatory and Oversight Requirements

The governance framework should take into account the authorization and licensing requirements and any designation of systems by the central bank, including a framework for the comprehensive management of risks.

All six of the case study jurisdictions (Brazil, Poland, Malawi, Ghana, South Africa, and Egypt) have national payment systems legislation that applies to the domestic FPS. This legislation provides for the licensing, authorization, or designation of FPSs. In some cases, the regulatory and oversight framework also addresses issues related to consumer protection, fair and open markets, and system interoperability. Relevant examples are given in boxes 2 and 3.

Segregating Oversight Functions from Governance Functions in the Central Bank

Where the central bank is engaged in FPS decision-making and also exercises regulatory oversight, the central bank will be concerned with ensuring supervisory impartiality. In Egypt, Brazil, Ghana, and Poland, the central bank is involved in FPS's internal governance in some way. In each case, the central bank has protocols for segregating the parts of the central bank responsible for oversight and governance of the FPS:

- In Brazil, the regulatory and operational functions for Pix are in different directorates, with separate management reporting lines up to the board level.
- In Ghana, GhIPPS was established as a wholly owned subsidiary with a management team and board; the central bank appoints board representation. The Payment Systems Department of the central bank exercises independent oversight of GhIPPS, which ensures executive separation.
- In Poland, the central bank is a shareholder and its representative chairs the board, but, again, the management team is separate from and overseen by the central bank.

GUIDELINES

As part of preparing the Governance Plan for the FPS, applicable legislation should be reviewed to identify and plan for licensing, authorization, or designation of the FPS**.**

The Governance Plan of the FPS should reflect public policy objectives in terms of the role envisaged for the FPS and the market environment in which it will operate.

1. If the central bank is also involved in the direction or management of the FPS, care must be taken to segregate functions appropriately and articulate the segregated arrangements clearly to the marketplace.

BOX 2 GHANA'S LEGISLATIVE FRAMEWORK

In Ghana, the Payments Systems and Services Act 2019 applies to GhIPPS Instant Pay and provides for the following:

- A uniform application to banks, other deposit-taking institutions, electronic money issuers (including MMOs), payment service providers, and affiliates and agents of these organizations.
- A general grant of authority to the Bank of Ghana for all matters related to payments, clearing, and settlement systems, elaborated with detailed responsibilities such as
  - Safety and soundness of payment systems
  - Regulation of e-money business
  - Promotion of financial inclusion
  - Broad powers of policy formulation, licensing, and authorization
- Comprehensive compliance requirements for payment service providers (both bank and non-bank), including detailed governance requirements.
- Specialized authorization and compliance requirements for electronic money businesses, including a special license category of "dedicated electronic money issuer."
- Powers to operate or designate payment systems and to allow or prohibit access to payment systems.
- Comprehensive monitoring and oversight powers.

BOX 3 MALAWI'S AND ARAB REPUBLIC OF EGYPT'S INTEGRATED INFRASTRUCTURE APPROACHES

In 2017, the Reserve Bank of Malawi announced in the gazette the Interoperability (Interoperability of Retail Payment Systems) Directive, which requires banks, mobile operators, and all other payment service providers to continuously connect their network infrastructure to Malawi's FPS, Natswitch, and comply with Natswitch rules and standards.[32] There is an explicit prohibition on deploying a standalone or closed-loop system and a requirement to comply with Natswitch revenue sharing arrangements—in effect, interchange fees.[33] There are substantial monetary penalties for any non-compliance and an explicit allocation of responsibility to the board and senior management of each payment service provider to ensure compliance and to develop and implement a compliance policy.[34]

In Egypt, the regulatory framework for the national FPS is comprehensively provided by a set of "Rules Regulating Services for Instant Payment Network" issued by the Central Bank of Egypt (CBE) in October 2021. The rules build on more general regulation of financial transactions, in particular, the "Law Relating to Usage of Non-cash Payment Methods."[35]

The rules provide for the key governance aspects of the payment notification (IPN's) operation, including

- Designating EBC as an operator with appropriate powers of operational rulemaking, setting minimum access criteria, setting tariffs, and network risk management
- Setting minimum access and compliance criteria for banks to act as participants and to sponsor MMOs
- Criteria for third-party providers and fintechs to be given access
- Continuing obligations of all participants

9 ELEMENT 5
DEVELOPMENT OF THE GOVERNANCE PLAN

Establishing a new governance framework or modifying an existing one is a complex project that involves many stakeholders. Generally the project or program governance setting up an FPS evolves into the governance arrangement for the operations of the new FPS once it is launched. In this manner, the program governance often affects the design choices made for the FPS operational governance. In addition, necessary processes should be in place to review and modify the existing governance framework to reflect market ecosystem developments and any changes to the oversight and regulatory framework.

KEY QUESTIONS

Where a program for the development of FPS is initiated, the issues that need to be considered while putting in place a governance framework are explained in Elements 1-4. Where the existing governance framework is being reviewed to take into account new market developments or policy changes, the following questions need to be considered:

- **Changes to the FPS Governance Framework:** What is the role played by the FPS board in initiating the changes to the governance arrangements? How are resources assigned to spearhead changes to the governance arrangement? Is external expertise utilized in the process of review and change?
- **Stakeholder Engagement in Changes to the Governance Framework:** What is the process followed for consulting stakeholders? How is stakeholder consensus built up and commitment obtained?

INTERNATIONAL STANDARDS

Key Consideration 3 of Principle 2 of the PFMI underlines that the board should review both its overall performance and the performance of its board members on a regular basis. This review is intended to ensure that the governance arrangements continue to be clear and transparent and remain relevant and fit for purpose with the changing market developments while taking into account public interest consideration and stakeholders' interests. The DPI Guidelines in Recommendation 4 echo the need for the governance arrangements to be reviewed periodically. The Keeping Pace report indicates the need for governance arrangements to be reviewed regularly under Theme 5.2. The review of the governance arrangements would need to be undertaken in the context of structural changes to the market, to policy, or the institutional environment, as well as industry innovation.

DESIGN ISSUES

Changes to the Existing FPS Governance Framework

The changes to the existing governance framework should be carried out by the board of the FPS system, taking into

consideration relevant market developments and policy changes. These would include, for example, changes to the risk management framework, the introduction of new products and services, and changes to access and participation requirements.

In EMDEs, the central bank, as an overseer in its catalyst function, is often the driving force for changes to the existing governance framework of the FPS system to enable it to continue to meet public interest considerations, including any regulatory policy changes. In cases where the central bank itself is the operator of the FPS, it should have the necessary processes and procedures in place to effect and reflect the changes in its governance arrangements. In Brazil, the central bank was the final decision-maker as it is the operator of Pix and in the case of South Africa, the central bank, in its role as overseer, was an observer. In Poland, the central bank chaired the supervisory board of KIR (FPS operator), with leading banks represented on the board, which enabled extensive stakeholder engagement and commitment to changes to the governance framework with the central bank guiding the process.

Evolution of Governance Arrangements

Changing governance arrangements that have already been established can be extremely challenging unless the change is purely procedural because, by definition, a material change in governance implies a change in relative power or influence over decision-making among different stakeholders. For example, adding new owners or directors to an FPS may dilute the voting power of existing owners or directors. Unsurprisingly, the stakeholders who are negatively impacted by the change have little or no incentive to support change, even where it is clearly in the public interest. In FPSs, which often have diverse participation and stakeholder communities, this can be especially difficult—attempts to change governance arrangements may exacerbate already diverse stakeholder views and interests.

It is possible to "future-proof" the governance arrangements by including provisions that allow governance to evolve with the market. For example, the constitution of the FPS board could provide that any participant initiating more than, say, 5 percent of FPS transactions is entitled to appoint a director. The effect of such a provision is to ensure that the board of the FPS remains reflective of the participant community as it changes over time.

Otherwise, the influence of the central bank may be needed to drive governance change when it is needed. In Malawi, the central bank signed an MOU with the banking association, leaving direction and management to the industry but within tight guidelines in the MOU and supporting legislation. Initially, all commercial banks could appoint a director. When the evolution of Natswitch's services meant that the major MMOs would become customers of Natswitch alongside banks, the central bank had the influence to ensure the MMOs could also become part-owners and join the Natswitch board, even though this had the effect of diluting the voting power of banks.

In South Africa, the industry development program for PayShap was administered by an external consulting firm as program manager, reporting to a special purpose committee (SPC) of industry representatives. As the launch date approached, a new PayShap scheme was intended to provide ongoing governance through a scheme governing council. However, due to a combination of adoption challenges among participants and delays in finalizing the scheme arrangements, the SPC and the scheme governance coexisted for a significant period.

GUIDELINES

1. The transition from program governance to operational governance needs to be carefully planned and clearly articulated to affected stakeholders.
2. The board of the FPS should be responsible for developing and implementing the governance plan and making necessary changes to the existing governance framework based on relevant market developments and policy changes.
3. The board should have adequate resources earmarked for carrying out the necessary changes to the existing governance arrangements. External expertise, when required, should also be used to obtain objective, independent views after fair consideration of relevant information and developments.
4. Consultation with stakeholders should be carried out to build up consensus on the changes to the governance arrangement and to obtain stakeholder commitment and buy-in for the revisions.
5. The role of the central bank as an overseer would influence the changes to the existing governance arrangements. Where the central bank itself is the operator of the FPS, the governance arrangements should have processes and procedures for stakeholder consultation and buy-in when changes to the governance arrangements are being considered.

10 ELEMENT 6 FORMAL STRUCTURE AND OWNERSHIP

FPSs may be owned and operated by a central bank or by the private sector. FPS may also operate as a for-profit or not-for-profit entity. Depending on the FPS ownership structure and organizational form, there should be appropriate governance arrangements that define the structure under which the board and the management operate.

KEY QUESTIONS

The following are useful questions to ask:

- **Corporate Form/Legal Status:** Is the FPS composed of one organization or several with contributing roles? If so, how are any conflicts of interest and outsourcing issues addressed in the governance arrangements? Are the governance arrangements of the FPS adequate to ensure that the decisions of affiliated organizations are not detrimental to the FPS?
- **Ownership Structure:** Is the FPS owned by the private sector or the public sector, or is it owned jointly by the private and public sectors?
- **Plenary: Powers and Process:** What powers and rights should the owners have? How do they appoint or elect the board? What other powers do they have in a general or plenary meeting? How are voting rights allocated? Do the owners have reserved powers over key corporate decisions?
- **Special Status or Powers:** Does the FPS enjoy any special status under local law, for example, exemptions from competition laws or tax-free status? Why are these needed?

INTERNATIONAL STANDARDS

Depending on the ownership structure, the FPS could be subjected to authorization and licensing requirements as indicated in Principle 1 of the PFMI.[36] Further, the ownership structure and the legal form have implications for other aspects of governance as laid down in Principle 2 of the PFMI. For example,[37]

- An FPS that is part of a larger organization should manage any potential conflicts of interest that may arise between the parent entity and the FPS.
- An FPS that is, or is part of, a for-profit entity should place particular emphasis on managing income generation activities with public policy objectives.
- An FPS that also carries on other activities with a different risk profile (potentially higher risk profile) needs to consider separation of functions and other measures against risk contagion.
- If a central bank is the owner and operator of an FPS and is also the overseer, it needs to consider how to best address any potential conflicts of interest that may arise between these two functions.

The Keeping Pace paper points out the relevance of legal form to rights and responsibilities of ownership and control:

> "The legal form of a payment system will also usually reflect the overall aims of the undertaking and define obligations and objectives under which it operates. The legal form stipulates whether a company is for profit—for example, whether it can pay dividends to shareholders. Legal forms also determine the kind of status shareholders or members have in the undertaking. National legal forms influence who has control and how easy it is (or not) to alter the structure of power and membership. In addition, the chosen legal form also determines the liability of the entity and its participants."[38]

The Keeping Pace paper observes that legal form is limited by the choices available under national law but may also be limited by the national law of payment systems, such as licensing requirements.[39] The paper identifies key issues such as the involvement of the public authority (for example, through central bank shareholding), the need for representation from the payments community, and the need for commercial investment.[40]

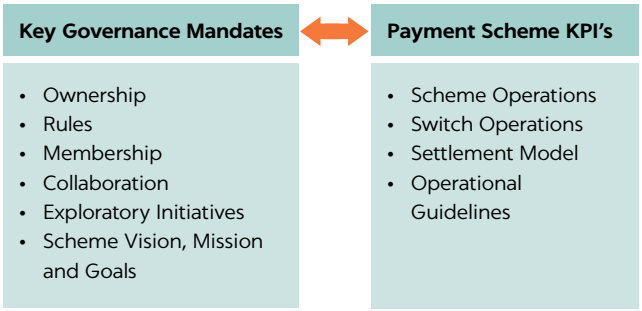
The World Bank has also published a focus note on scheme rules for FPS, which includes a discussion of scheme governance arrangements.[41] Discussing central bank-owned FPS, the focus note advises:

> "Upon setting up of the FPS, the central bank needs to decide either to take control of the scheme governance arrangement or to delegate it to a dedicated entity under its broad supervision. The regulatory and legal frameworks should be applied in a consistent manner to other payment and clearing systems but can be amended to the FPS context."[42]

The focus note includes a discussion of the advantages and disadvantages of separating scheme governance from scheme operations. The note provides a useful categorization of the two sets of functions as shown in figure 1:
The note states further:

> "Whether the governance and operational entities are kept separate or together is a decision that needs to be made by a country's relevant financial sector authority (or authorities), keeping in mind such factors as the country's overarching payment landscape, the strategy undertaken by the central bank, and the level of institutionalization required for multiple payment frameworks."[43]

FIGURE 1 Separation Model of Scheme Governance and Operation



Source: World Bank, "Focus Note: Scheme Rules in Fast Payments" (Part of the World Bank Fast Payments Toolkit, World Bank, Washington, DC, 2022), 33, https://fastpayments.worldbank.org/sites/default/files/2022-03/Scheme%20Rules_Final_0.pdf.

Note: KPI = key performance indicator

DESIGN ISSUES

In developing the governance plan for an FPS, the choice of legal and ownership structures are the major decisions to be taken after determining the scope and mandate.

Existing national operators

In five of six cases (Egypt, Ghana, Malawi, Poland, and South Africa), the FPS is one of multiple payment systems that are the responsibility of a national operator.[44] This configuration is common for FPSs, which have typically been established later than other national systems like bulk credit or debit systems and national card systems. The same board and management processes and resources are also used for FPS governance, which, on the one hand, could rationalize operating costs. On the other hand, this could also pose challenges based on the mandate of the board across different verticals. FPSs may need to compete for strategic attention, resources, and focus with other systems as they typically have different service sets (like central addressing services and specialized arrangements for real-time settlement) and different participation communities (especially non-banks like MMOs). Another challenge that needs to be addressed in the case of a common board is the likelihood of significant participant shareholders, such as large banks, exercising a greater role in decision-making in board deliberations, as can be seen in the South African and Polish examples, where large banks active across multiple payment types have significant influence.

The legal form and ownership structure would need to take into account public policy priorities where there has been a historical preference for private sector initiatives. The payments community invested in FPS solutions, as wit-

nessed in the cases of Malawi, Poland, and South Africa. Policy objectives such as digitization of the economy, financial inclusion, and central bank experience and expertise in operating payment systems would result in the public sector (central bank or national treasury) taking up sole ownership or a majority stake in the FPS. Brazil, Egypt, and Ghana took the latter approach.

Central banks often find it necessary to lead FPS development, but as infrastructures mature, there may be value in stepping back from leadership and oversight roles**.** In Ghana, earlier proposals for an industry-led FPS did not gather industry support, leading the central bank to undertake its own development. More recently (and with the success of the operator, GhIPPS), there are proposals to re-engage participants in shareholding in GhIPPS. In Malawi, the central bank's difficulties with public ownership led it to step away from ownership and the direction of Natswitch, insisting that the industry take responsibility.

The pros and cons of using the existing governance arrangements of the national operator should be carefully weighed so that the new service is not burdened with an inappropriate governance structure. The case in Malawi is an illustrative example of this. An earlier attempt to establish a government-owned FPS operator (called Malswitch) struggled for support from commercial banks. Natswitch, an industry-owned FPS operator subject to formal oversight by the central bank, eventually superseded it.

Scheme versus Operator?

Separation of scheme governance and scheme operations is less common in EMDEs and in FPSs generally. The governance implications will depend on how any separation of the two functions is proposed to be implemented. In South Africa, the separation of functions between a self-regulatory body and an operator, each with legal relationships with participants, results in separate decision-making structures, which together make up the governance arrangements for the payments system.

Ownership Structures

Alternatives extend along a spectrum, from full central bank control and ownership to full industry ownership and control, with many variations in between. The six cases studied can be ordered along that spectrum, as shown in figure 2.

The models exhibit the following:

- Integrated division of a central bank (Brazil's Pix)
- Wholly owned subsidiary of a central bank, with corporatized management (Ghana's GIP/MMI)
- Majority central bank ownership with some bank representation (Egypt's IPN)
- Industry-owned mutual firm with some central bank ownership and direction (Poland's Express Elixir)

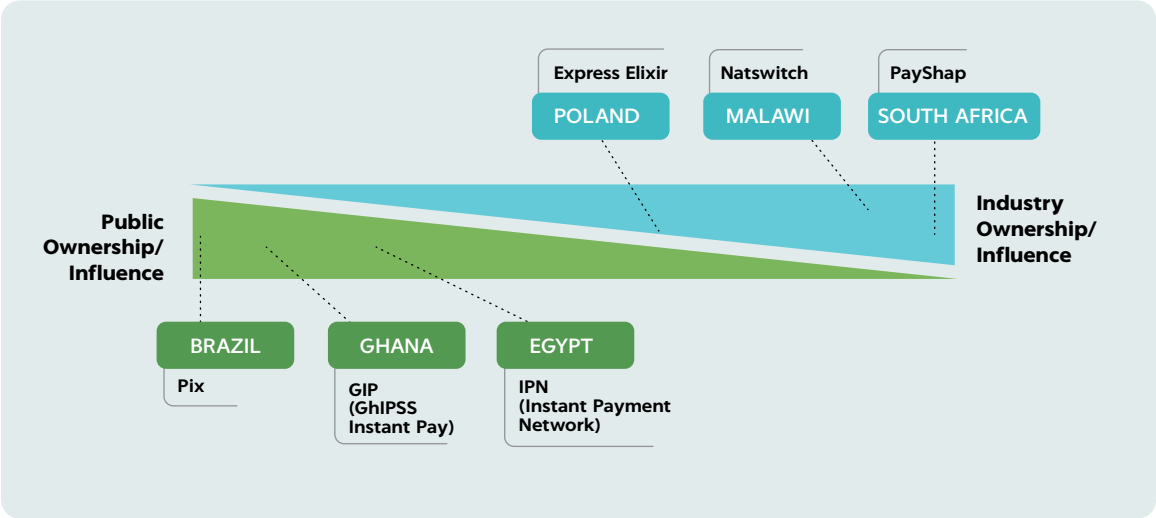
BOX 4 FORMAL STRUCTURE OF SOUTH AFRICA'S PAYSHAP

The evolution of PayShap's governance structure demonstrates the extent to which it must reflect preexisting local governance habits and practices or risk a lack of credibility in the community it serves. In South Africa's case, there appear to be three elements:

- A long history of community cooperation and self-reliance led to a strong preference for community ownership and direction.
- The unusual historical split of functions and powers between a self-regulatory system "manager" (PASA) and an industry-owned system operator (BankservAfrica) meant that decision-making tended to be split across two different industry-operated organizations for each payment system.
- The long success of banks in delivering payment services to financially included parts of the community meant that, in practice, banks would dominate decision-making, even though there is a significant community underserved by banks and many nonbank providers.

The result has been (subject to future regulatory reforms) that even though PayShap was a new service with a new purpose-built governance structure (a PayShap scheme with its own governing council), it also needed to recreate the "split" governance structure of other South African payment systems, with both PASA and BankservAfrica having governance responsibilities as well.

FIGURE 2 **FPS Ownership Spectrum**



Source: Original figure for this report.

- Industry-owned mutual firm with formal agreements establishing central bank rights (Malawi's Instant EFT)
- Quasi-mutual with semicommercial mandate (South Africa's PayShap)

Malawi, Poland, and South Africa used different approaches that each exhibit elements of mutuality that provide owner participants with the levers to influence decision-making. Because owner participants have "skin in the game," they remain committed to supporting the success of the FPS. For example, in Malawi, the central bank strategically committed to industry ownership of the national payments operator so as to maximize prospects that banks and, later, MMOs would support it. The MOU signed with the Banking Association provided that banks be equal shareholders in Natswitch.

However, a major challenge in mutual ownership structures is how to keep them fairly representative as the marketplace evolves. Small banks merge or grow to become big banks; new banks enter the market; MMOs or other nonbank service providers emerge and grow to prominence, and so on. If the logic of mutuality is for ownership to reflect or represent participation, such market evolutions have to be reflected in ownership. If this does not happen, the quality of decision-making may suffer over time because incumbents continue to have a large influence even when newcomers make up a large and increasing part of the market. To overcome such instances, the central bank usually exercises its influence to motivate changes in existing ownership structures. For example, in each of the cases of Malawi, Poland, and South Africa, the central bank influenced the ownership structure of the national payments operator to ensure that the structure is aligned with system participation.

GUIDELINES

1. The Governance Plan should propose a formal structure for the FPS, which
   - enables and supports the scope and mandate;
   - is legally sound and compliant with applicable laws;
   - is representative of the stakeholders, and
   - includes the capability to adapt to future market evolution.
2. The FPS Governance Plan could consider using pre-existing governance arrangements for the FPS, such as an existing self-regulatory body or operator, which can increase market engagement and reduce the time to market. However, arrangements that were appropriate for different kinds of systems—particularly those without the extended participation and retail characteristics of an FPS—may need modification to be appropriate for an FPS.

11 ELEMENT 7 THE BOARD

The board of the FPS is the apex decision-making body responsible for the governance arrangements. The constitutional role, responsibilities, and functioning of the board are of paramount importance to the safe and efficient functioning of the FPS.

KEY QUESTIONS

Relevant design questions are

- **Composition and Size of the Board:** How should the board be constituted with regard to the scope and mandate and the ownership structure? What should the size of the board be?
- **Director Selection:** What are the eligibility criteria for directors? How are directors elected, appointed, or selected? Do directors represent stakeholders, and are there term limits? Are there any independent or non-executive directors? How are potential conflicts of interest managed?
- **Committees:** Has the board constituted any committees for audit, risk management, and any other relevant areas? Can these committees obtain independent external advice?
- **Board Functioning and Performance:** How does the board monitor the performance of the management and implementation of board decisions? How is the performance of the board, individual directors, and committees assessed and reviewed? Does the board have a structured, periodic review process?

INTERNATIONAL STANDARDS

The OECD Principles set out the substantial body of best practices that have been developed in the context of public companies, particularly listed companies. The core governance principle (Principle V) is

> "The corporate governance framework should ensure the strategic guidance of the company, the effective monitoring of management by the board, and the board's accountability to the company and the shareholders."[45]

The board, therefore, is the fiduciary overseer of management on behalf of owners. The OECD Principles elaborate on the fiduciary role of the board in terms of ethical standards, duties of care and loyalty, fair treatment of shareholders, and avoidance of conflicts of interest. They also discuss the board's core functions, including setting and reviewing corporate strategy, risk management, financial oversight, reviewing management performance and reward, and communicating with shareholders, regulators, and the public.

The principles also emphasize the board's ability to exercise objective, independent judgment on corporate affairs.[46] One aspect of this is the role of "independent" directors. This concept typically relates to the ability to exercise independent judgment after fair consideration of all relevant information and views and without undue influence from

executives or other parties or interests. Principal VE.1 recommends:

> V.E.1. Boards should consider assigning a sufficient number of independent board members capable of exercising independent judgement to tasks where there is a potential for conflicts of interest.[47]

Another aspect of exercising objective judgment is the use of specialist delegates to assist the board. Principle VE.2 recommends:

> V.E.2. Boards should consider setting up specialised committees to support the full board in performing its functions, in particular the audit committee—or equivalent body—for overseeing disclosure, internal controls and audit-related matters. Other committees, such as remuneration, nomination or risk management, may provide support to the board depending upon the company's size, structure, complexity and risk profile. Their mandate, composition and working procedures should be well defined and disclosed by the board which retains full responsibility for the decisions taken.[48]

Finally, under this heading, the importance of board self-assessment is made clear:

> V.E.4. Boards should regularly carry out evaluations to appraise their performance and assess whether they possess the right mix of background and competences, including with respect to gender and other forms of diversity.[49]

Key Considerations 3, 4, and 6 of Principle 2 Governance of the PFMI guides the roles and responsibilities of the board.

> **KC 3.** The roles and responsibilities of an FMI's board of directors (or equivalent) should be clearly specified, and there should be documented procedures for its functioning, including procedures to identify, address, and manage member conflicts of interest. The board should review both its overall performance and the performance of its individual board members regularly.
>
> **KC 4.** The board should contain suitable members with the appropriate skills and incentives to fulfill its multiple roles. This typically requires the inclusion of non-executive board member(s).
>
> **KC 6.** The board should establish a clear, documented risk-management framework that includes the FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements should ensure that the risk-management and internal control functions have sufficient authority, independence, resources, and access to the board.[50]

The Keeping Pace paper applies this guidance to retail payment systems. Aspects that arise for special consideration include these:

- **Managing Conflicts of Interest:**[51] The diversity of stakeholders and the likelihood of directors representing certain constituencies (central bank, large individual participants, groups of participants, and so on) make careful, transparent conflict management important: "All conflicts of interest shall be declared or identified, recorded, and mitigated in a transparent manner."[52]
- **Responsibility and Accountability of the Board:**[53] This includes rules of director appointment, documenting the unique responsibilities of the board, setting strategic direction, appointment of senior executives, and establishment of specialist committees appropriate for the system.
- **Qualifications and Performance Assessment of Board Members:**[54] The distinct qualifications required to serve on a payment system board should be recorded and used in assessing proposed appointments and in reviewing director performance. Once members are appointed, there should be periodic assessments of the collective performance of the board and the board members individually. Theme 5.6 also requires the board to "Anticipate changes to skills and qualifications of the board and senior management."[55]
- **The Role of Independent Directors:**[56] They can play a central role in reducing and addressing conflicts of interest. "Independence" must be not only from the interests of the FPS operator itself but also from the interests of owners, participants, or both.

On the subject of board committees, the Keeping Pace paper points out the value of using special purpose committees to resolve two kinds of common dilemmas for retail payment systems:

- Consultative committees can be used to ensure a wide range of stakeholder interests is taken into account in decision-making and
- Issues that might otherwise trigger conflicts of interest among stakeholders (such as pricing and product development) can be assigned to special-purpose committees for attention.[57]

DESIGN ISSUES

Board Composition

In a publicly owned FPS, the composition of the board is determined by the central bank statute. Where the FPS is a private sector initiative or a joint public and private sector initiative, each shareholder or group of shareholders would likely have the right to appoint a director. The composition of the board could include the following:

- **Public interest directors,** usually senior officers of the central bank or other government authority
- **Participant directors,** affiliated with a participant owner or group of participant owners
- **Independent directors,** appointed for their particular skills or qualifications and without affiliation to the organization or its owners
- **Management/executive directors,** such as the chief executive of the FPS or other senior executives.

Some examples from the six case studies illustrate the multiplicity of possible board compositions:

- In Egypt, Ghana, and Poland, the central bank is either the sole or a majority owner and uses that power to appoint senior officers of the central bank and, in some cases, other public officials as directors.
- In Malawi, Poland, and South Africa, banks are shareholders with the right to appoint a director, typically a senior executive of the bank, which brings a depth of payment expertise to the board but also requires careful management of potential conflicts of interest.
- Poland's KIR and South Africa's BankservAfrica are bank-owned operators that have a mechanism for smaller participants to be collectively represented in shareholding and on the board alongside large banks that appoint their own directors. At KIR, this role is performed by the banking association, and at BankservAfrica, a special corporate vehicle is owned collectively by smaller participants who have the right to appoint a director.
- In Egypt and Ghana, the central bank (as sole or majority shareholder) also uses its powers to appoint independent directors, chosen for their skills and credibility.
- In South Africa, the board itself appoints a minority of independent directors to sit alongside owner-appointed directors, bringing different perspectives and skills to the board.
- In Egypt, Ghana, and South Africa, the chief executive of the FPS operator is a director. In Poland, KIR follows the European practice of having both a non-executive Supervisory Board and a separate Executive Board.

Qualification of Directors and Assessment

The FPS board has limited influence over the selection of directors and relies on owners to nominate or appoint directors as laid down in the board charter. For instance, the board charter could specify the qualifications and expertise requirements for being appointed as a director of the board. In addition policies and procedures should be put in place for regular reviews of the performance of the board of each individual director.

Conflicts of Interest and Independent Directors

As the Keeping Pace paper notes, governance arrangements in retail payment systems are more prone to conflicts of interest because of the nature of the business and its potential impact on society, as well as the diverse types of users involved in a retail payment system. In the case of the FPS, there are multiple stakeholders, including the banking community, mobile network operators, and end-users—individuals and businesses. Where directors are appointed from these groups, the risk of conflict between the corporate interests of the FPS and the interests of the particular stakeholder group is likely to arise, and this should be balanced by taking public interest considerations into view. Accordingly,

- **Directors appointed by regulators need to manage any potential conflict of interest between public policy goals and the interests of the FPS.** These measures should also assist directors appointed by regulators in meeting the fiduciary obligation to avoid conflicts—such directors should be segregated from oversight activities.
- **Directors appointed by participants are at risk of conflicting with the FPS and the participant's interests.** FPS participants are collaborators in governing the FPS but competitors in their businesses. Successful FPSs devise effective ways to manage divergent interests. So, for example,
  - Malawi's Natswitch has a board charter that provides for the declaration and management of conflicts of interest at the board level among representative directors.
  - A clear, agreed definition of the common interest being served by the FPS helps manage debates that might otherwise be affected by self-interest. KIR in

Poland includes a clear statement of corporate objectives in its published strategy, tied back to the public interest and the common interest of the banking community.

- Especially in major strategic debates (new classes of participants, new services), the central bank often plays a key role as a trusted, neutral party among competitors, which may have a structural element (as in Ghana and Poland, where the central bank chairs the board) but is also often an informal, influencing role. In Malawi, the central bank used its influence under an MOU with the banking association to ensure MNOs were added as participants and part owners alongside banks.

Independent directors can bring a nonaligned perspective to controversial issues. Public interest directors can often play a similar role since the overall public interest and the corporate interests of a national FPS will often be in close alignment. On occasion, these two groups may be the only directors able to act on a particular decision. An example might be the fee structure to be applied to transactions where non-independent directors have a clear conflict of interest.

Board Procedure and the Role of the Chair

The Board of the FPS should have a strategic vision and plan to address the interests of all stakeholders, keeping in view the larger public policy considerations. The board can achieve this fine balance through the following measures:

- Management to submit credible persuasive proposals to the board that take into account but transcend sectional stakeholder interests;
- Sound board procedures that ensure all relevant information is provided, divergent views are aired and discussed with reasonable time for decision-making; and
- A credible, neutral chair who is able to shepherd the board debate to an actionable decision.

The case studies provide examples of the role played by the chair in the board of the FPS:

- In Poland, the central bank representative chairs the board and is able to mediate among participant owners.
- In South Africa, the chair is an independent professional director with stature in the business community. Once again, this can supply credibility and authority, plus the ability to mediate among participants.
- In Egypt, the chair of EBC is an executive role held by the chief executive, which means the person is highly knowledgeable and credibly neutral between participants (although not independent of the FPS itself).

Board Committees

As outlined in Principle 2 of the PFMI, the board's committees are constituted for areas such as auditing, risk management, and compensation. An operator of an FPS is also likely to need similar board committees for those areas. Among the case studies, both KIR in Poland and BankservAfrica in South Africa are examples of organizations with lengthy histories and well-developed committee structures broadly conforming to the model.

Effective use of independent directors and committee delegation can overcome many of the potential conflicts of interest that arise in FPS operators. It is common practice in general corporate governance to have sensitive review committees like audit, risk management, and performance reviews led by independent directors, often composed of a majority of independent directors. In the specific case of an FPS, the diverse stakeholder community can make for complex conflicts when corporate decisions affect different interest groups differently. The use of independent directors and board committees can also help manage these conflicts. South Africa's PayShap has its own scheme board drawn from participants, with specific delegated powers from the BankservAfrica board.

In public-owned FPSs, rather than having specific committees of the board, there could be other bodies assisting the board.

- In Ghana, the Payment Systems Advisory Council is set up under the statute and advises the Bank of Ghana on payment system matters. PSAC has formed five working groups of industry participants to assist in its work. The groups include representatives of GhIPPS, MMOs, merchants, consumers, payment service providers, fintechs, and third-party providers.
- In Brazil, the central bank-led working group expanded into the large body that eventually became the Pix Forum—around 200 organizations. Specialized working groups provide expert input on specific issues, such as business, technical, messaging, and security.

Re-use of an Existing National Operator

If (as is often the case) a new FPS is to be housed in an existing national payments operator,[58] the designers should carefully consider whether adjustments could be made to the existing governance arrangements to better serve the specialized needs of the FPS. In such cases, the following issues would need to be considered:

1. **Should board membership be expanded to accommodate new types of participants?** In Malawi, when the country's two leading MMOs were added to the participant community, the mutual philosophy established under an MOU between the central bank and the bankers associated led to the MMOs becoming shareholders in Natswitch and acquiring the right to appoint directors.
2. **Should the board set up a subcommittee, advisory board, or other supporting body with a specific focus on the FPS?** In South Africa, BankservAfrica established a new, specialized PayShap Scheme, including its own Scheme Governance Council comprising representatives of PayShap participants. However, the ultimate decision-making body remained the BankservAfrica board.
3. **Is there a need to adapt board processes to ensure focus on the particular challenges of the FPS, especially at critical times?** For example, in Brazil, as the launch of Pix approached, the BCB Board of Governors held separate weekly Pix meetings.

GUIDELINES

1. An FPS Governance Plan needs to establish the board's composition and proceedings, including the scope and mandate, as well as the interests of owners, If an existing national operator is to house the FPS, this option involves considering whether the special needs of the FPS warrant changes to existing governance arrangements.
2. The FPS board should fairly reflect the ownership of the FPS, but it is also important to consider access to subject matter expertise, diversity of perspective, and external credibility by having independent directors.
3. In cases of conflict of interest in several dimensions, there needs to be transparent and effective protocols for managing the conflicts.
4. The role of the chair is often a key appointment because the chair controls board processes and can, if necessary, mediate among divergent stakeholder interests. The Governance Plan should specify how the chair is to be appointed.
5. The Governance Plan should consider the optimal mix and composition of board committees to ensure efficient decision-making, taking into account both general corporate needs and specialized payment-system requirements. Committees dealing with sensitive subject matter may need independent leadership, membership, or both.

12 ELEMENT 8 SCHEME RULES

The World Bank report "Scheme Rules in Fast Payments" defines scheme rules as rules that govern the interactions between a retail payment system operator and the system's (direct and indirect) participants and, in some ways, also the interactions between participants and the end-users.[59] Scheme rules specify the minimum requirement framework applicable to all members for operating while upholding the safety, security, soundness, integrity, and interoperability of the retail payment system. They are key components of the overall governance arrangements and have a direct operational impact on the overall aims of owners, stakeholders, and policymakers. They are applicable to FPS as well.

KEY QUESTIONS

The following questions can be considered:

- **The Legal Framework:** What is the legal basis for the scheme rules of the FPS? How are participant rights and obligations articulated? Role of the central bank in approving scheme rules.
- **Participation and Access Criteria:** What are the access criteria for participation in the FPS? Are there different classes of participation, for example, direct and indirect participants?
- **Dispute Resolution:** How are disputes among participants resolved? Are there formal procedures, and are there appeal rights?
- **Compliance and Enforcement:** How is compliance with ongoing FPS requirements ensured? Are there disciplinary procedures, and what sanctions for noncompliance exist?

INTERNATIONAL STANDARDS

The PFMI requirement for a well-founded legal basis for FPS activities has already been discussed.[60] Principle 1's Key Considerations 2 and 4 are as follows:[61]

2. An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.
4. An FMI should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the FMI under such rules and procedures will not be voided, reversed, or subject to stays.

Principle 23 focuses on the transparency of scheme rules for the benefit of participants, requiring

> "An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed."[62]

The Keeping Pace paper explores mechanisms by which scheme rules are created, including the possibility of separation of processing, operations, and control (that is, rules administration) into separate units or even separate legal entities.[63] Other factors highlighted include legal and regulatory considerations.[64]

The World Bank has also published specific guidance on scheme rules for FPSs, dividing them into individual components addressing specific areas (figure 3).

DESIGN ISSUES

Scheme Rules Framework

A key FPS governance design issue is how to set up clear, comprehensive, legally enforceable scheme rules. There are usually four standard components:

1. **Scheme rules,** set by the FPS operator, apply to all participants and set out their key business and legal obligations and rights against each other and the operator; the central bank should approve scheme rules.
2. **Access agreements** are standard form contracts that are separately executed between each participant and the FPS operator.[65] The contract specifies the participation type of the services to be accessed and binds the participant to comply with the scheme rules;
3. **Technical requirements** such as messaging and security standards, procedure manuals, and technical specifications deal with practical and operational aspects of the system. They are referenced in and derive binding authority from the scheme rules.
4. **Settlement arrangements** support the final movement of funds for fast payments through the national settlement infrastructure (RTGS).[66] Normally, each FPS participant will either be a member of the RTGS or will have an arrangement with a bank or other entity that manages fund movements on its behalf.

In this way, the economic and legal relationships of all participants are governed by a web of contracts among all participants, the FPS operator, and major service providers. Many FPS follow this general model, whether they are participant-owned (such as KIR, operator of Express Elixir in Poland) or central bank-owned (such as GhIPPS in Ghana).

The degree to which these elements are bundled together or kept separate will reflect local variations in service provision. The simplest model is for each participant to have an access agreement with the FPS operator, which binds them to the scheme rules and technical requirements and membership of the national RTGS.

A variation on this theme arises when the scheme rules administration and the technical operation are separated into different entities. In the case of South Africa, each participant has several contractual relationships for FPS: one with a scheme company for the scheme rules and one with an operator for operational processing, including compliance with technical requirements.

The South African example integrates delegated regulatory authority with contractual arrangements to create the rule framework. In other countries, the close involvement of the central bank in the FPS means that regulatory authority may also be used to bind participants more directly. For example:

- In Brazil, bank licensing powers were used to require all large banks to participate in Pix. Although this affected only 39 of more than 700 participants, it instantly created a critical mass of participation because of the large numbers of accountholders at large banks.
- In Malawi, a central bank directive requires banks, mobile operators, and all other payment service providers to continuously connect their network infrastructure to

FIGURE 3 **Key Components of Scheme Rules**

Source: World Bank, "*Focus Note: Scheme Rules in Fast Payments*" *(Part of the World Bank Fast Payments Toolkit, World Bank,* Washington, DC, 2022), 6, https://fastpayments.worldbank.org/sites/default/files/2022-03/Scheme%20Rules_Final_0.pdf.

BOX 5 ***THE PAYSHAP* FRAMEWORK *IN SOUTH AFRICA***

South Africa has an unusual rule structure for its domestic payment systems, reflecting the delegation of regulatory power to a self-regulatory industry association, PASA, separate from the operator, BankservAfrica. There are layered agreements and rulesets:

- PASA has established a regulatory management committee for PayShap (the Rapid Payments Payment Clearing House Participants Group; PCH PG) and a set of Rapid Payments Clearing Rules, including entry and participation criteria. All banks and other participants wanting to offer fast payments are required to become members of PASA.
- PayShap participants must also sign a master services agreement (MSA) with BankservAfrica, which includes an annexure of terms and conditions specific to PayShap. The MSA binds the participant to comply with operating rules for each payment system, covering technical requirements and processing arrangements.
- PayShap also has the PayShap Scheme, which covers matters like marketing, service delivery, and business development. The scheme comprises a scheme constitution, scheme rules and procedures, a PayShap governance charter, and a governance council. PayShap participants are bound under their MSAs to comply not only with PayShap operating rules but also with scheme rules.

Natswitch and comply with Natswitch rules and standards, including revenue sharing.[67] The directive also places strict requirements on Natswitch to set and enforce business, operational, and technical requirements.[68]

- In Egypt, a set of "Rules Regulating Services for Instant Payment Network" was issued by the central bank in October 2021.[69] The rules provide for the key governance aspects of the IPN's operation, including
  - Designating EBC as an operator with appropriate powers of operational rulemaking, setting minimum access criteria, setting tariffs, and network risk management.
  - Setting minimum access and compliance criteria for banks and MMOs to act as participants.
  - Criteria for third-party providers and fintechs to be given access.
  - Continuing obligations of all participants.

These examples highlight the regulatory role played by central banks.

Classes of Participation

An FPS's participants may have different business models and different service needs from the FPS, and they may also present different risks to be managed by the FPS. A commercial bank, a mutual savings bank, an MMO, a retailer, and a fintech company may serve different kinds of end-users, have different licensed or authorized activities, and different degrees of prudential and other oversight, yet the success of the FPS may depend on them interacting with each other through the FPS so that fast payments can flow freely among those end-users.

One way FPSs can manage these challenges is by establishing different classes of participation so that rights and responsibilities under the rules apply to participants in a way appropriate to their particular circumstances (including the risks involved). As noted in the PFMI, this may take the form of a tiered participation arrangement under which indirect participants are "sponsored" by (use the services of) direct participants. But many other configurations are possible. For example, a non-bank participant (such as an MMO) may be a direct participant (in the sense that the MMO can access the system directly to initiate fast payments and is directly subject to the scheme rules) yet be required to use the services of a bank settlement agent to settle net payment obligations, because the MMO does not have access to the RTGS system which provides settlement facilities to the FPS.

Different classes of participation may encourage greater participation in the FPS, increasing its reach in the community and enhancing its economies of scale. For example, a participant (such as a small bank or a fintech company) may choose to become an indirect participant due to the high costs of direct participation.

If different classes of participation are introduced, care must be taken to ensure that access criteria and applica-

tion of rules are clear, objectively based, and fair. In practice, this can sometimes involve difficult policy judgments. If a new class of participants is proposed with a different status under the rules, existing classes may see this as an undesirable increase in competition and be inclined to resist. For example, in Malawi, the intervention of the Reserve Bank of Malawi was required to ensure the admission of MMOs to the FPS. Therefore, it took the form of an Interoperability Directive issued in 2017.

Dispute Resolution, Compliance and Enforcement

Scheme rules have mechanisms for addressing end-user transaction-related disputes, usually occurring because of fraud, authorization errors, or processing errors. These guidelines include the delineation of roles, responsibilities, and liability allocation that reasonably protects end customers against losses related to fraud or errors and adheres to applicable laws or regulations. Scheme rules accordingly mandate participants to adhere to predefined dispute-resolution guidelines to resolve disputes on transactions that had been processed earlier.

Scheme rules also cover dispute resolution between and among participants or between participants and the operator. Given the wider range of participants and business models typically involved in FPS relative to, say, card payments, this can be challenging.

If the FPS operator forms the view that noncompliance has occurred, the scheme rules will usually provide for sanctions to be imposed. These may be moral (such as public censure), financial (such as a fine or penalty), or more serious, such as suspension or termination of access. Fairness requires that if the FPS operator imposes a penalty, the participant has an opportunity to challenge the finding. This challenge leads to a disciplinary procedure much like the dispute resolution procedure previously described.

GUIDELINES

5. The Governance Plan for an FPS should provide for the establishment of a comprehensive set of scheme rules covering
   - the rights and obligations of each participant as against each other and as against the operator in relation to fast payment activity,
   - clear definition of different classes of participation and the ongoing requirements of each, and
   - fast, fair dispute resolution, rules compliance procedures, and disciplinary proceedings.
6. The scheme rules should be administered by the board or a committee appointed for the purpose, ensuring that the views of participants and the central bank are taken into account in rulemaking for the FPS.
7. Consideration should be given to how the central bank will be engaged in rulemaking, including whether the oversight function needs to be proactively involved in proposed rule changes and whether a formal approval or nonobjection process is in place.

13 ELEMENT 9 TRANSPARENCY AND PUBLIC DISCLOSURE

The FPS operator should engage with all relevant stakeholders in a structured manner on all issues of relevance and seek their input in the decision-making process in a manner that appropriately reflects the legitimate interests of the stakeholders. All major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public. Examples include, among others, scheme rules, ownership structure, board constitution, and governance processes.

KEY QUESTIONS

The following questions are relevant:

- **Structured Engagement with Stakeholders:** How are stakeholders consulted? What is the periodicity of such engagements? How do stakeholders contribute to decision-making?
- **Transparency and Disclosure:** How are major decisions disclosed to relevant stakeholders and the public? For example, are scheme rules, ownership structure, board constitution, and governance processes transparently disclosed?

INTERNATIONAL STANDARDS

Engagement and Consultation

In general principles of corporate governance,[70] there is no particular assumption about gathering stakeholder views as part of the decision-making process since the board is solely responsible to the shareholders for general corporate performance and must decide what information to gather in discharging that responsibility.

Stakeholder engagement and consultation are, however, embedded in the governance framework in the case of FMIs. PFMI Key Consideration 7 of Principle 2 Governance highlights the need to take into account stakeholder views:

> "The board should ensure that the FMI's design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public."[71]

The diversity of stakeholder interest requires clear procedures for "identifying and appropriately managing the diversity of stakeholder views and any conflicts of interest between stakeholders and the FMI."[72]

The Keeping Pace paper emphasizes effective stakeholders involvement in retail payment system decision-making. The paper elaborates:

> "Effective involvement of relevant stakeholders is an essential element of a retail payment system's governance. Mechanisms should be in place within the governance arrangements to support the involvement of stakeholders. In close combination with transparency mechanisms, stakeholder involvement can help to ensure that the board is aware of, and appropriately considers, the interests and input from relevant stakeholders in its decision-making." [73]

The paper reiterates the importance of ongoing consultation as a tool for promoting sound decision-making that reflects the legitimate interests of stakeholders.

Disclosure

General corporate governance principles emphasize proper disclosure of information, reflecting the importance for listed companies in managing the flow of information that could affect the share price:

> "The corporate governance framework should ensure that timely and accurate disclosure is made on all material matters regarding the corporation, including the financial situation, performance, sustainability, ownership, and governance of the company." [74]

In the context of FMIs, the emphasis is on the disclosure of rules, key procedures, and market data, as spelled out in Principle 23 of the PFMI report.

> **"Principle 23: Disclosure of rules, key procedures, and market data**
> An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed.[75]

Theme 8 of the Keeping Pace paper states that: "Governance arrangements must be transparent." The principle encourages the publication of a wide range of information:

- Ownership and individual share(s) of ownership
- Bylaws or equivalent articles of association or incorporation
- Composition of the board, including the criteria and methods for their selection, election, or appointment
- Rules and procedures of the board of directors
- Board committees, their composition, and remit
- Details regarding the decision-making process, including obligations to seek input through consultations
- Access and participation forms and criteria, including any conditions regarding access
- Scheme rules and procedures for the interaction between payment system users
- Pricing, including the pricing principles[76]

DESIGN ISSUES

Consultation

FPSs have special stakeholder engagement needs and challenges in managing the range and diversity of stakeholders, including end-users. There are typically five ways that can be used in combination to engage and consult with stakeholders. These include

1. Relying on public policy processes to ensure the interests of all relevant stakeholders are taken into account;
2. Placing stakeholder representatives in key positions (that is, as owners, directors, or committee members) in the decision-making process of the board;
3. Establishing advisory or consultative forums to allow stakeholders who are not part of formal decision-making to raise issues and provide expertise;
4. Conducting formal public consultation (such as publishing white papers) and inviting public feedback and comments; and
5. Using business-oriented market research techniques (surveys, focus groups, test marketing, and so on) to test specific proposals.

Public policymaking

Both Egypt (see box 6) and Ghana (see box 7) use the levers of public policymaking to subsume the FPS engagement process within its larger fold.

BOX 6 EGYPT'S NATIONAL PAYMENTS COUNCIL

Egypt's NPC is established under statute, chaired by the president of the republic, and comprises senior government ministers beginning with the prime minister. All key infrastructure developments—such as the establishment of the Meeza national card and other payment directives—were explicitly authorized by the NPC. They form part of a broad, multiyear, whole-of-government program called the "Less Cash Transformation Network".[77]

BOX 7 GHANA'S NATIONAL PAYMENTS ADVISORY COMMITTEE AND NATIONAL PAYMENTS STRATEGY

The Payments System Advisory Committee is established under statute and advises on all payments and clearing-related matters.[78] PSAC is chaired by the central bank governor and includes senior representatives from government departments and authorities as well as relevant industry representative bodies like the Bankers Association.[79] PSAC has formed five working groups of industry participants to assist in its work. The groups include representatives of mobile network operators, merchants, consumers, payment service providers, fintechs, and third-party providers. PSAC meets at least twice a year.

In 2019, BoG published its "Payments System Strategy (2019-2024)." The strategy includes a clear statement of overall vision and strategy plus specific, time-framed responsibilities that are allocated to BoG, GhIPPS, other government bodies, and the industry.

In the case of Brazil, proposals by the central bank for industry-led FPS development struggled with implementation, even when the banking community had the opportunity to have a guiding role, which led the central bank to take a leading role while continuing to engage with the industry to take into account its needs and interests and gather industry buy-in to enable a successful implementation of the FPS.

Participatory Decision-Making

The second method of stakeholder participation in decision-making is used extensively in participant-owned organizations, including Poland's KIR, South Africa's BankservAfrica, and Malawi's Natswitch (as discussed previously in the sections on ownership and the composition of the board). However, where there are numerous and diverse stakeholders, composite representation could be used where a board member represents an entire community (such as the Polish Banking Association representing smaller Polish banks on KIR's board).

Advisory Forums

Advisory forums can be used to give representation to a wide community of different stakeholders and to help them utilize their technical expertise. To lend credibility to the process, the advisory forum meetings should be held on a regular basis. Key issues need to be presented and discussed. In addition, the FPS operator should demonstrate that the views expressed in the advisory forums have been properly examined and considered, even if they have not been adopted for implementation. Brazil's Pix Forum is an example of a successful advisory forum. Deriving originally from an informal working group of banks and other industry participants, the Pix Forum now comprises around 200 organizations and meets regularly under the chairmanship of the central bank.[80] The forum guides major design decisions through multiple working committees.

Public Consultations

Public consultation can be an effective tool to reach a wider audience, especially when a major structural change is being advocated, such as a proposed new fast payment system. An example is South Africa's modernization of payments, which eventually led to PayShap. PayShap began in 2017 with a public concept paper and a series of industry-open forums to explore the implications.[81]

Market Research

Some operators adopt market research techniques drawn from the private sector, which can be very effective for identifying the industry, community, and customer benefits of a proposed new service or a service enhancement. Such an approach tends to be associated with a more corporate approach to management, regardless of ownership structure. Ghana, Poland, and South Africa used market research.

Disclosure

Addressing challenges of transparency and disclosure is valid for FPSs, as is the case for other retail payment systems. However, there appears to be no standard practice to address the same based on the six case studies:

- One operator (KIR in Poland) publishes its operating rules; one operator (EBC in Egypt) has the scheme rules published to participants by its regulator; the other four operators do not publish rulebooks.

- In two cases (Poland and South Africa), the operator provides public governance disclosures in relation to shareholdings, board appointment rights, board decision processes, and other aspects of internal governance in annual reports.
- The other four provide limited information about board membership on a website.

GUIDELINES

1. The Governance Plan for an FPS should factor in structured, regular governance disclosure by the operator, which may include scheme rules, ownership details, board constitution, and governance processes.
2. Using the stakeholder map (see Element 2), the Governance Plan should outline the mix of engagement models that will be employed to ensure that all stakeholders are part of an ongoing discussion with the FPS on issues relevant to them.

14 ELEMENT 10 RISK MANAGEMENT

The board should establish a clear, documented risk management framework that includes the risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. The management of the FPS should have the appropriate experience, mix of skills, and integrity necessary to discharge their responsibilities for effective risk management as per the documented risk management framework laid down by the Board for the smooth and efficient functioning of the FPS.

KEY QUESTIONS

The following questions are relevant:

- **Role of the Board:** How does the Board establish and oversee the risk management function and material risk decisions, including addressing decision making in crises and emergencies? How does the Board ensure that the risk management and internal control functions have sufficient authority, independence, resources, and access to the board? Is there an independent risk committee of the board? How does the board appoint skilled risk management personnel and review their performance?
- **Role of Management:** Does management have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the implementation of risk management functions? Do the risk management personnel have sufficient independence, authority, resources, and access to the board to ensure that the operations of the FPS are consistent with the risk management framework set by the board? International Standards

In general corporate governance, while the board has ultimate responsibility for corporate performance, operational responsibility along with risk management is delegated to a management team, which may be configured in different ways depending on the jurisdiction. The OECD/G20 Principles summarize the main management functions where the board and management need to interact:[82]

- Reviewing and guiding corporate strategy, major plans of action, annual budgets, and business plans; setting performance objectives; monitoring implementation and corporate performance; and overseeing major capital expenditures, acquisitions, and divestitures.
- Reviewing and assessing risk management policies and procedures.
- Selecting, overseeing, and monitoring the performance of key executives, and, when necessary, replacing them and overseeing succession planning.

However, these general principles say little about how the management team contributes to good decision-making. In fact, the management team is tasked with the responsibility of making decisions about day-to-day operations within the strategy, policy, and budgetary guidelines set by the board. Management also has significant practical influence and contribution to the decision-making of the board on strategy, policy, and budget.

The PFMI guides the roles and responsibilities of the Board and Management. KC 6 of P2 of PFMI states:

> "The board should establish a clear, documented risk-management framework that includes the FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements should ensure that the risk management and internal control functions have sufficient authority, independence, resources, and access to the board."[83]

In addition, KC 5 of P2 outlines the role of management in implementing the risk management policy laid down by the board.

> "The roles and responsibilities of management should be clearly specified. An FMI's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI."[84]

Further, KC 1 of P3 states the importance of having a framework for the comprehensive management of risks:

> "An FMI should have risk-management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are borne by the FMI. Risk-management frameworks should be subject to periodic review."[85]

The Keeping Pace paper draws attention to the respective roles played by the board and management:

> "[The board] is responsible for setting objectives, establishing the risk-management framework, monitoring performance, and hiring senior management and must as a collective possess the relevant skills and qualifications for being able to undertake the different and changing responsibilities."[86]
>
> The board is also responsible for making sure that senior management continues to have the appropriate skills and experience for conducting its different roles and responsibilities. Maintaining the right skills and qualifications of senior management as the retail payment market and technology develops should be a goal when hiring senior management and evaluating their performance.[87]

There is also guidance on the importance of a sound risk management framework:

> "Managing and mitigating different types of risks is the most integral and prominent part of the operations of any payment system . . . A comprehensive risk-management framework needs to be put in place and kept up to date in order to manage the different types of risks appropriately.[88]

DESIGN ISSUES

Risk management governance of the FPS

The risk management governance of the FPS assumes critical importance as FPSs operate on a 24/7 basis and provide for real-time availability of funds to the payee. These features of FPS, therefore, demand specialized risk management skills in both the board and management, as they are ultimately responsible for managing the risks. The board's role should be to determine an appropriate level of aggregate risk tolerance and capacity for the FPS. The board should be composed of suitable members with an appropriate mix of skills, including strategic and relevant technical skills) and experience. The management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FPS. Taken together, the board and senior management should establish policies, procedures, and controls that are consistent with the laid down risk tolerance and capacity of the FPS. The risk policies, procedures, and controls should address all relevant risks, including legal, credit, liquidity, general business, and operational risks, and should cover routine and non-routine events. This framework for the comprehensive management of risks should be reviewed and updated periodically and shared with the relevant authorities.

It is important to note that the board lays down the overall risk policy framework. It is the role of the management to implement the policy through a set of processes to mitigate the risks and ensure the safe and efficient functioning of the FPS. The management team of an FPS must, therefore, have strong risk management skills and expertise, including the ability to identify and manage a wide range of risks, including operational risk, on a daily basis and should cover both routine and nonroutine events. More recently, it has become common for FPS to have dedicated risk teams led by a chief risk officer. The risk management team's role is not only to manage the entire range of risks but also to establish a framework for identifying, monitoring, and reporting evolving risks to the senior management and the board. To this end, the risk management team should have sufficient skilled resources. Inputs provided by the team and senior management will feed into the overall framework for the comprehensive management of risks, which will be

approved by the board's risk committee (where available) or by the larger board itself.

Regardless of ownership structure, most FPS operators have a distinct board and management structure focused on providing national payments infrastructure as their principal business. In 5 of the 6 cases studied (Egypt's EBC, Ghana's GhIPPS, Malawi's Natswitch, Poland's KIR, and South Africa's BankservAfrica), the FPS is operated by a special purpose national payments system operator with its own board and management structure which is fit for purpose with adequate resources for risk management governance, which provides a basis for synergies between FPS and other national payment infrastructure and reflects FPS's special strategic and risk management challenges.

The sixth case study is Brazil's Pix, which Banco Central operates in Brazil (see box 8).

GUIDELINES

1. The Governance Plan for an FPS should consider the need to promote the best possible management structure and corporate culture for addressing the special strategic and risk issues associated with an FPS. The ownership structure is relevant, but it should not dictate the organizational structure.
2. The board of the FPS should lay down a documented risk management framework.

BOX 8 PIX'S RISK MANAGEMENT GOVERNANCE STRUCTURE

Pix has enjoyed success since its launch at the end of 2020. It has been developed and is operated as an integrated service within Banco Central do Brasil, with risk management, business, technical, rulemaking, and other functions distributed within the central bank, which may be related to a strong historical culture of payment system development within BCB. It is rather unique as even where FPSs are owned by the public sector, a separate governance structure for payment systems is more usual. It remains to be seen whether this structure will continue into the future or whether BCB may choose to explore other policy options.

15 GOVERNANCE IMPLICATIONS FOR CROSS-BORDER FPS

With the proliferation of FPSs in many jurisdictions across the globe and the trend toward greater interoperability at the technical level, the opportunities to foster interlinking FPSs have grown. The CPMI report "Linking Fast Payment Systems across Borders: Governance and Oversight" notes that determining a workable governance arrangement could be more challenging considering the multijurisdictional, cross-border, or cross-currency nature of such interlinking arrangements.[89] The report focuses on the governance of the FPS interlinking arrangement itself and not that of individual component FPSs. It discusses the main decisions to be taken by operators in developing the governance approach for FPS interlinking arrangements with respect to bilateral links and the hub and spoke model. These decisions include questions on the legal setup, ownership, operational structure, governing body type, and stakeholder engagement.

The report notes that the scope of governance arrangement depends on the type of the interlinking model. In the bilateral model, the governance arrangements apply to the relationship between the two component FPSs. The governance arrangement will deal with collective decision-making aspects, including risk-related decisions, and is limited to the cross-border operations supported by the interlinking FPS arrangement. The governance arrangement for a hub and spoke model applies to the relationship between the component FPSs and the hub and the internal governance arrangement for the hub itself, where such a hub is a separate entity.

The report provides a toolkit for relevant stakeholders to establish the governance for the FPS interlinking arrangement. It sets out the key decisions to be taken in developing the governance arrangement. The process starts with the identification of the partner FPSs, followed by a planning phase. In the planning phase, the partner FPSs will need to agree on the common objectives for the interlinking arrangement. Common objectives could cover which market segments and use cases would be served, whether this would be a for-profit model or a cost recovery model, and whether there are plans for future expansion into additional markets. Distilling these objectives into guiding considerations during the planning phase would enable the component FPSs and other relevant stakeholders to make decisions on the governance framework. The guiding considerations include the following:

- Ensuring neutrality in decision-making and a level playing field between the parties involved, with conflicts of interest being properly identified and managed
- Flexibility in decision-making, noting that interlinking arrangements will operate in an intrinsically dynamic environment, and its governance structure must enable it to adapt
- Inclusivity of all relevant stakeholders—participants, operators, and owners—and inclusion of other payment systems and end-users so that the concerns of different stakeholders are addressed in a way that is effective and compatible with the robust long-term strategy for the interlinking arrangement
- Scalability to address future expansion into other use cases or corridors

- Ensuring business viability by defining whether the interlinking arrangement will be based on a for-profit model or will work on a cost recovery basis

The likely evolution of the central bank's role during the life cycle of the interlinking arrangement would need to be recognized by the governance arrangement of a privately operated interlinking arrangement. For instance, the central bank could potentially be actively involved in the initial design of the arrangement, provide initial financial and human resources (in some cases), and transition to a less direct role (such as a focus on oversight) when the interlinking arrangement matures and becomes self-sustaining.

The objectives and guiding considerations would influence the choice of the interlinking arrangement—that is, either a bilateral link or a hub and spoke model.

In the next stage of the design phase, issues related to the legal setup, ownership structure, and operational aspects should be addressed, including the following:

- **Legal Setup:** This would include examining whether contractual arrangements between the involved FPSs would suffice versus creating a new legal entity. The bilateral contracts and agreements between the two component FPSs of a bilateral link can have different degrees of formality. A multilateral hub and spoke arrangement will typically involve the establishment of a separate legal entity. Where an interlinking arrangement may require the establishment of a separate legal entity, selecting the home jurisdiction requires careful evaluation because the home jurisdiction determines the legal and regulatory framework under which the legal entity operates, covering aspects including consumer protection, anti-money laundering/countering the financing of terrorism, data privacy, and oversight and supervision requirements.
- **Ownership Structure and Management:** These would be determined by the objectives of the arrangement, including whether it will be a for-profit venture. Further, public or private ownership (or a mix thereof) of the interlinking arrangement will depend on the ownership of the component FPSs (where one or more of the component FPSs are themselves publicly owned), and some level of public sector ownership of the link is likely. Public sector ownership of the interlinking arrangement is unlikely if the component FPSs are privately owned. Ownership arrangements could also evolve, for instance, when bilateral link arrangements might grow into a hub and spoke model, or in other instances when an interlinking arrangement could become a profit-seeking venture in the steady state or it might want to raise funds to expand further. Accordingly, periodic reviews of the ownership structure could prove to be useful to identify whether changes are needed.
- **Governance Structure of the Interlinking Arrangement:** This structure could vary according to the type of the link. Whereas a separate legal entity has been created, as in the case of a hub and spoke model, the home jurisdiction will have (legal) requirements for members of the board of directors. The responsibilities and accountabilities of the board should be clearly documented and should be assessed regularly in terms of their appropriateness and effectiveness. On the other hand, a more informal and lighter governance arrangement could be adopted when there is a bilateral link between two domestic FPSs. In addition, a clear separation of roles between overseer and operator in central bank–owned interlinking arrangements should be put in place to avoid any potential conflicts of interest.
- **Comprehensive Risk Management Framework:** This is an essential component of the governance arrangement. Typically, the risk management framework should outline the respective roles and responsibilities of the board and management, as well as risk policies and procedures to be followed with a dedicated independent risk management function and structure. Whether it is a bilateral link or hub and spoke model, all of the aspects will require some form of coordination and agreement between the FPSs of the different jurisdictions that already have their respective risk management frameworks in place.
- **Stakeholder Engagement:** Mechanisms need to be put in place as part of the FPS interlinking arrangements. These mechanisms can include broad stakeholder representation on the board of directors and board committees (such as including non-shareholders) or in user committees and public consultation processes.

16 CONCLUSION

This guide aims to provide practical guidance on how to set up a governance framework for an FPS, considering the distinct and unique role being played by FPSs in the national payments system. This guide is aimed at policy makers and system managers tasked with the challenge of setting up a governance framework. The guide highlights a series of elements (both external and internal) that should be taken into account when setting up an effective fit-for-purpose governance framework for the FPS. The 10 elements outlined in the guide are distilled from the relevant international standards.

An effective governance framework is built by

1. properly identifying the environment, particularly the stakeholders' requirements;
2. accurately characterizing the scope and mandate of the FPS, having regard to not only the present but also a strategic futuristic vision; and
3. applying these considerations to develop a "fit for purpose" design.

There are many moving parts and a complex interplay between external framework elements—such as the stakeholder community, the public policy objectives of the regulator, and the oversight requirements—and internal arrangements—such as the formal legal structure and ownership, the structure and processes of the board, scheme rules, stakeholder engagement, and risk management. A single pass through the elements may not be enough; there are feedback loops, trade-offs, and differing stakeholder opinions to consider. However, the pathway suggested in this guide serves as a yardstick for measuring progress and enabling the development of a governance design that is optimized to the needs of the proposed FPS and its market environment.

Finally, good governance is organic; it is continuously evolving. As environment, scope, and mandate change, so must the design.

17 ACKNOWLEDGMENTS

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ENDNOTES

1. Committee on Payments and Market Infrastructures (CPMI), *Fast Payments: Enhancing the Speed and Availability of Retail Payments* (Basel, Switzerland: Bank for International Settlements, 2016), 6, https://www.bis.org/cpmi/publ/d154.pdf; World Bank, *Considerations and Lessons for the Development and Implementation of Fast Payment Systems, Main Report* (*Part of the World Bank Fast Payments Toolkit,* Washington, DC: World Bank, 2021), 1–2, https://fastpayments.worldbank.org/sites/default/files/2021-11/Fast%20Payment%20Flagship_Final_Nov%201.pdf.
2. G20 Global Partnership for Financial Inclusion, "*Policy Recommendations for Advancing Financial Inclusion and Productivity Gains through Digital Public Infrastructure"* (World Bank, Washington, DC, 2023), https://openknowledge.worldbank.org/entities/publication/b8d6b107-3e97-41be-886d-1c46ee906042.
3. World Bank, "*Focus Note: Scheme Rules in Fast Payments" (Part of the World Bank Fast Payments Toolkit, World Bank,* Washington, DC, 2022), https://fastpayments.worldbank.org/sites/default/files/2022-03/Scheme%20Rules_Final_0.pdf.
4. World Bank. "*Focus Note: Scheme Rules in Fast Payments."*
5. The countries are Brazil, Arab Republic of Egypt, Ghana, Malawi, Poland, and South Africa. The case studies appear in full in the appendix.
6. World Bank, *Considerations and Lessons for the Development and Implementation of Fast Payment Systems.*
7. Organisation for Economic Co-operation and Development (OECD), "G20/OECD Principles of Corporate Governance 2023" (OECD Publishing, Paris, 2023), www.oecd-ilibrary.org/governance/g20-oecd-principles-of-corporate-governance-2023_ed750b30-en.
8. Committee on Payment and Settlement Systems (CPSS) and International Organization of Securities Commissions (IOSCO), *Principles for Financial Market Infrastructures* (Basel, Switzerland: Bank for International Settlements, 2012), Principle 2. https://www.bis.org/cpmi/publ/d101.htm.
9. G20 Global Partnership for Financial Inclusion. "*Policy Recommendations for Advancing Financial Inclusion and Productivity Gains through Digital Public Infrastructure.*"
10. World Bank, "*Governance of Retail Payment Systems: Keeping Pace with Changing Markets"* (World Bank, Washington, DC, 2021), https://documents1.worldbank.org/curated/en/539601630306074694/pdf/Governance-of-Retail-Payment-Systems-Keeping-Pace-with-Changing-Markets.pdf.
11. The six case studies of FPS in EMDEs are Pix in Brazil; The Instant Payment Network (IPN) in Arab Republic of Egypt; GhIPPS Instant Pay (GIP) in Ghana; Instant EFT in Malawi; PayShap in South Africa; and Express Elixir in Poland.
12. CPSS and IOSCO, *Principles for Financial Market Infrastructures*, 26.
13. G20 Global Partnership for Financial Inclusion, "*Policy Recommendations for Advancing Financial Inclusion and Productivity Gains through Digital Public Infrastructure."*
14. G20 Global Partnership for Financial Inclusion, "*Policy Recommendations for Advancing Financial Inclusion and Productivity Gains through Digital Public Infrastructure."*
15. World Bank, "*Governance of Retail Payment Systems: Keeping Pace with Changing Markets,"* 2.
16. The issue of extending access to new categories of service providers is discussed flater in this report.
17. World Bank, "*Focus Note: A Fast Payments Championing Handbook for Central Banks" (World Bank,* Washington, DC, 2024). https://fastpayments.worldbank.org/sites/default/files/2024-06/FPS%20Championing%20Handbook_Final%20June%202024.pdf.
18. Committee on Payments and Market Infrastructures (CPMI), *Linking Fast Payment Systems across Borders: Considerations for Governance and Oversight—Interim Report to the G20* (Basel, Switzerland: Bank for International Settlements, 2023), https://www.bis.org/cpmi/publ/d219.pdf.
19. The issue of governance evolution is addressed further in section 8.
20. CPSS and IOSCO, *Principles for Financial Market Infrastructures, 26.*
21. G20 Global Partnership for Financial Inclusion, "*Policy Recommendations for Advancing Financial Inclusion*," 38–39.
22. G20 Global Partnership for Financial Inclusion, "*Policy Recommendations for Advancing Financial Inclusion*," 61 (annex C).
23. World Bank, "*Governance of Retail Payment Systems*," sec. 4.7, 41.
24. Engagement models for various interest groups are discussed further in element 9.
25. CPSS and IOSCO, *Principles for Financial Market Infrastructures*, para. 3.2.2.
26. G20 Global Partnership for Financial Inclusion, "*Policy Recommendations for Advancing Financial Inclusion*," 39.
27. World Bank, "*Governance of Retail Payment Systems," 47.*
28. World Bank, "*Governance of Retail Payment Systems,"* 18.
29. Banco Central do Brasil, *Brazilian Payments System Oversight Report 2013* (Brasília: Banco Central do Brasil, 2014), https://www.bcb.gov.br/content/financialstability/paymentssystem_docs/Payments-System-Oversight-Report/Brazilian-Payments-System-Oversight-Report-2013.pdf.
30. Ministry of Finance, Republic of Ghana, "Toward a Cash-Lite Ghana: Building an Inclusive Digital Payments Ecosystem, Digital Payments *Roadmap"* (Ministry of Finance, Accra, 2019), https://mofep.gov.gh/sites/default/files/acts/Ghana_Cashlite_Roadmap.pdf.
31. Ministry of Finance, Ghana, "*National Financial Inclu-*

sion and Development Strategy (NFIDS) 2018–2023," accessed May 28, 2025, https://mofep.gov.gh/sites/default/files/acts/NFIDs_Report.pdf.
32. Interoperability Directive, S6.
33. Inoperability Directive, Ss6(7) and 7.
34. Interoperability Directive, S5.
35. Arab Republic of Egypt, *Law Relating to Usage of Non-cash Payment Methods*, Law No. 18 of 2019.
36. CPSS and IOSCO, *Principles for Financial Market Infrastructures, Principle 1, 22*.
37. CPSS and IOSCO, *Principles for Financial Market Infrastructures,* 27–28 at paras 3.2.5–3.2.7.
38. World Bank, "*Governance of Retail Payment Systems,*" 27.
39. World Bank, "*Governance of Retail Payment Systems,*" 26.
40. World Bank, "*Governance of Retail Payment Systems,*" 27.
41. World Bank, "*Focus Note: Scheme Rules in Fast Payments*," sec. 6, 28–33.
42. World Bank, "*Focus Note: Scheme Rules in Fast Payments*," sec. 6, 29.
43. World Bank, "*Focus Note: Scheme Rules in Fast Payments*," 33.
44. Francesco Pianese, "The Runaway Success of Pix in Brazil," *The Banker*, 2022, https://www.thebanker.com/World/Americas/Brazil/The-runaway-success-of-Pix-in-Brazil.
45. OECD, "Principles of Corporate Governance," 34.
46. OECD, "Principles of Corporate Governance," 39.
47. OECD, "Principles of Corporate Governance," 40.
48. OECD, "Principles of Corporate Governance," 41.
49. OECD, "Principles of Corporate Governance," 42.
50. CPSS and IOSCO, *Principles for Financial Market Infrastructures*, 26.
51. World Bank, "*Governance of Retail Payment Systems*," S.4.4, 38–39.
52. World Bank, "*Governance of Retail Payment Systems*," S 5.7, 51.
53. World Bank, "*Governance of Retail Payment Systems,*" S 4.5, 39–40.
54. World Bank, "*Governance of Retail Payment Systems"*, S 4.6, 41.
55. World Bank, "*Governance of Retail Payment Systems,*" S 5.6, 49–50.
56. World Bank, "*Governance of Retail Payment Systems," S 4.8, 42–43.*
57. World Bank, "*Governance of Retail Payment Systems*," 42.
58. This is a decision in relation to "Legal Structure and Ownership."
59. World Bank, "*Focus Note: Scheme Rules in Fast Payments*."
60. CPSS and IOSCO, *Principles for Financial Market Infrastructures*, section 1.
61. CPSS and IOSCO, *Principles for Financial Market Infrastructures*, 21.
62. CPSS and IOSCO, *Principles for Financial Market Infrastructures*, 121.
63. See "Scheme versus Operator" in section 10 of this report.
64. World Bank, "*Governance of Retail Payment Systems*," 36.
65. In this context, the "operator" is the scheme administrator, the keeper of the scheme rules.
66. Real Time Gross Settlement System.
67. "*Payment Systems (Interoperability of Retail Payment Systems) Directive*." NatSwitch, Namibia.
68. Interoperability Directive, S 10-11, NatSwitch, Namibia.
69. Central Bank of Egypt, "Rules Regulating Services for Instant Payment Network," 2021.
70. Such as OECD, "Principles of Corporate Governance.
71. CPSS and IOSCO, *Principles for Financial Market Infrastructures*, Principle 2, Key Consideration 7, 26.
72. CPSS and IOSCO, *Principles for Financial Market Infrastructures*, para. 3.2.18, 31.
73. World Bank, "*Governance of Retail Payment Systems*," Theme 4, sec. 5.4, 47–48.
74. OECD, "*Principles of Corporate Governance*," 27.
75. CPSS and IOSCO, *Principles for Financial Market Infrastructures*, 121.
76. World Bank, *Governance of Retail Payment Systems*, sec. 5.8, 51–52.
77. Central Bank of Egypt. "National Payments Council (NPC)," last updated March 23, 2023, https://www.cbe.org.eg/en/payment-systems-and-services/national-payments-council-npc.
78. Republic of Ghana, *Payments Systems and Services Act, 2019*, §§ 4–6.
79. BFA Global, "*Synthesis and Benchmarking of Instant Payment Schemes, No. 2: Ghana*," 2022, 12, https://bfaglobal.com/our-work/optimizing-interoperability/.
80. Banco Central do Brasil, "Central Bank's Role," *Banco Central do Brasil*, last modified May 28, 2025, https://www.bcb.gov.br/en/financialstability/pixcentralbanks-role.
81. PASA, "Modernisation Research," *PASA*, https://pasa.org.za/resources/modernisation/.
82. OECD, "Principles of Corporate Governance," Principle VD, 36–39.
83. CPSS and IOSCO, *Principles for Financial Market Infrastructures*, 158.
84. CPSS and IOSCO, *Principles for Financial Market Infrastructures*, 158.
85. CPSS and IOSCO, *Principles for Financial Market Infrastructures*, 159.
86. World Bank, "*Governance of Retail Payment Systems*," sec. 5.6, 50.
87. World Bank, "*Governance of Retail Payment Systems*," sec. 5.6, 50.
88. World Bank, "*Governance of Retail Payment Systems*," sec. 4.9, 43.
89. Committee on Payments and Market Infrastructures (CPMI), "*Linking Fast Payment Systems across Borders: Governance and Oversight"* (Basel, Switzerland: Bank for International Settlements, October 2024), https://www.bis.org/cpmi/publ/d223.pdf.

APPENDICES
CASE STUDIES

APPENDIX A

BRAZIL CASE STUDY (PIX)

PIX GOVERNANCE: KEY LESSONS

- Pix is a Brazilian FPS that has enjoyed rapid growth since its launch in late 2020. It stands as an example of how a central bank can fully internalize conceptualization, feasibility, design, build, launch, operation, and governance for a national FPS and achieve success.
- Banco Central do Brasil (BCB) built the FPS as an entirely in-house development—a rare and notable achievement. This note explores some possible lessons that can be drawn from BCB's work:
  - **Full internalization ensured control of execution.** Doing everything in-house allowed BCB to apply existing governance structures, set the pace and direction of market innovation, and coordinate regulatory, technical, and operational elements.
  - **A small team of committed managers was critical.** The proposal for Pix was conceived and pursued through the commitment of a small team of BCB managers, who were involved at every step. BCB's governance and culture enabled this "bottom-up" effort.
  - **There was always an executive sponsor.** In BCB's structure, executive deputy governors (DGs), along with the governor, make up the board. They are independently appointed to defined areas of responsibility, and they control the resources they need. For Pix, progress depended on the continuous support of the responsible DG.
  - **Stakeholder engagement was extensive.** BCB established industry working groups and forums as needed at each stage of the project, allowing extensive, ongoing two-way exchanges within the industry.
  - **The governing body provided clear policy direction and oversight.** BCB's board set clear policy goals early, but thereafter its role was to enable rather than lead: it monitored, approved, provided strategic guidance, and resolved disputes as required.
  - **Project and operational resources were internally reallocated, not externally acquired.** Consistent with its culture, BCB harnessed internal resources as needed for the project, without external assistance. This took advantage of in-house specialized skills, simplified project administration, and improved strategic coordination.
- As Pix evolves, there is room to consider whether governance reform could improve market responsiveness and continuous innovation into the future. A wide range of models are possible, from simple process reforms to more complex structural changes. In a rapidly evolving strategic landscape, governance review may help build on initial success.

INTRODUCTION TO PIX

Overview

Brazil's Pix system for real-time retail payments has enjoyed stunning success since its launch in 2020.[1] It brings together banks and non-bank service providers in a 24/7 payments service with instant (pre-funded) settlements and a centralized register of unique aliases or "keys" for payment.

The service comprises two operating platforms, both accessible via API interfaces:

- The Transaction Accounts Identifier Directory (DICT)—a database that links "keys" and users' account information to allow payment to convenient, unique identifiers such as mobile numbers;
- The Instant Payments System (SPI)—a real-time gross settlement (RTGS) infrastructure designed for high-volume, low-value payments that settles transactions between participating organizations in a few seconds.

Pix is a fast payment scheme featuring a widely recognized retail brand, a rule book (which includes minimum requirements for retail products and services using Pix), and a compliance framework for participants. The scheme is designed to ensure a consistent customer experience for all users. Participants are charged low transaction fees on a cost-reimbursement basis, and retail use of the system by individuals is free (commercial users can be charged for business usage). Participation is mandatory for larger financial institutions.[2]

In terms of central bank involvement in provision of FPS, Pix is a relative outlier.[3] The system was conceived and developed entirely in-house by staff of BCB. Today, the Pix system and payment scheme are operated and administered by in-house BCB resources using internally developed software, an in-house operations and service desk, and a rule book set and administered by BCB. Industry consultation is managed through the Pix Forum, which comprises more than 200 industry representatives, but BCB retains full decision-making authority. The governing body is the Board of Governors of BCB.

As of October 2022, the system was processing in excess of 2 billion transactions per month with 135 million registered users out of a population of 213 million people.[4] The approach taken during design, build, test, launch, and initial operation was very successful, resulting in Pix rapidly becoming the preferred method for person-to-person and consumer payments in Brazil.[5]

Pix is, therefore, an instructive example of how a central bank—typically an organization of careful deliberation and risk minimization—can act boldly and with agility to deliver highly successful retail payments infrastructure. This case study explores how the governance arrangements at BCB operated to deliver this outcome.

Institutional, Regulatory, and Policy Context

In 1964, the Brazilian Banking Law[6] created both BCB and the National Monetary Council (CMN), Brazil's highest macroeconomic and financial policy body. Under this institutional framework, BCB is the national monetary, regulatory, and supervisory authority, operating under broad policy guidelines (for example, monetary policy targets) issued by the CMN. The CMN now comprises three members: the Minister of Finance, the Minister of Budget and Planning, and the Governor of BCB.[7]

BCB has possessed explicit powers to regulate the payments system and all payment schemes since 2013. It must do so under guidelines established by the CMN. The law prescribes an institutional focus on interoperability, financial inclusion, and the use of mobile telecommunications.[8]

In 2021, BCB's constitutional underpinnings were updated. It was given structural autonomy from the federal administration to pursue its core policy objective of price stability, including fostering the stability and efficiency of the financial system.[9]

The Board of Governors of BCB has evolved and expanded over the years. Now, under the 2021 law, it is established as consisting of the governor and eight DGs, all appointed directly by the president of Brazil for up to two fixed four-year terms. Appointments are subject to a public nomination and consultation process. The board members serve as executives rather than independent directors, and each is appointed to a directorate responsible for a specific area of activity. These are designated by public-delegated legislation based on decisions of the CMN.[10] This concentric organizational structure means that each DG has a relatively high degree of autonomy within their designated areas of responsibility, subject to the policy guidelines established by the CMN.[11] In turn, each DG's directorate tends to have its own priorities and protocols, at least for day-to-day operations.

Large projects require collaboration across multiple directorates to achieve the desired objectives. BCB uses an annual budget and planning cycle, with the opportunity for each directorate to nominate strategic projects for the year, which are then approved by BCB's board. BCB uses a formal project methodology of the "waterfall" variety for interdisciplinary projects, and there are protocols for strategic projects that prescribe a formal budgeting and reporting framework and an internal steering committee. The formal protocols are supported by extensive informal collaboration

across directorates. Further, human resource needs for projects are usually met by internal reallocation.

GOVERNANCE EVOLUTION OF PIX

Prehistory: Seeking Industry Engagement

In 2013, following the grant of regulatory responsibility for payments systems,[12] BCB invited industry participants to propose a new fast payments service as a way of addressing national reliance on cash. It did so through industry consultation meetings and bank publications. BCB's board adopted and publicized specific policy objectives for exercise of its payments regulation powers. In 2013, its Payment System Oversight Report articulated the following general policy goals:[13]

- Financial inclusion through payments
- Reduced usage of paper instruments
- Wider usage and interoperability for mobile payments
- Creation of fast payment services with broad interoperability across diverse providers

In the course of extended industry discussions and consultations, several industry proposals emerged, but they were of a limited participation or closed-loop nature. After nearly five years, there was little progress toward a broad and open model.[14]

Developing the Proposal

At the beginning of 2018, staff in the Department of Banking Operations and Payments System (Deban), part of the Monetary Policy Directorate (Dipom), proposed a radical solution: a BCB-developed and -operated, open-access FPS. This was the first time BCB had considered retail payment operations. The proposal for a feasibility study won the support of the DG Dipom and was adopted as a strategic project. During 2018, staff within Deban developed the proposal, using around six existing departmental staff. A working group of industry participants was formed and met regularly, chaired and administered by Deban staff. This exploratory work was not separately funded or resourced but rather relied on the proposing staff to find time as part of their day-to-day duties.

This work culminated in a submission to the board by the DG on December 20, 2018. The submission proposed a set of short but clear "Guidelines for the Brazilian Instant Payments Ecosystem." The board duly approved, as announced in a communiqué issued the next day.[15] These general guidelines established the key features for what became Pix, although the design evolved significantly thereafter. For example, within Pix, indirect and non-bank participation is provided for, as is real-time "prefunded" settlement; but the guidelines are silent on payments addressing and do not specify the retail scheme elements of Pix such as branding and use of business rules to control the customer experience.

Design, Build, and Launch

Following the approval, a major project commenced to design, build, test, and launch the new FPS. This eventually involved up to 40 information technology (IT) staff—all allocated from existing internal resources. This option reflects BCB's depth of skills in IT development as a result of previous development projects. The project also gathered support from multiple other directorates within BCB, using only existing internal resources.

In early 2019, reorganization and reappointment of the BCB board roles by the federal administration led to an extensive reorganization of BCB departments. The strategic project was reallocated to a newly appointed DG, who needed to be brought up to speed. The new project champion was the DG for Licensing and Resolution (Diorf).

The reorganization also had the unintended result that many members of the project management team were reallocated across five different directorates, with different responsibilities. However, the individual staff that had conceived of the project remained personally committed, despite reallocation of roles and responsibilities, and continued to work collaboratively on the project.

During 2019, the project expanded and multiple different units within BCB became involved. A number of strategic and design-related debates arose among different departments. For example, the original proposers of the new service advocated for the development of a full retail scheme, with branding, business rules, and a focus on consistent end-user experience. Other staff saw the FPS as infrastructure, with presentation to the end user left largely to market participants. This was a key strategic debate that affected many aspects of the system design.

The concentric organizational structure meant that strategic issues, as described previously, could only be resolved at a relatively senior level—either between DGs or by the board. The project gradually assumed increased importance at board level, and the board became more involved in oversight and strategic direction-setting. During 2019, the board considered and resolved several of these strategic debates. In particular, the board resolved the "scheme or infrastructure" strategic issue in favor of establishing a full retail scheme.

Consistent with this, the board adopted other key recommendations of management:

- Regulatory licensing powers were used to require all large banks to participate. Although this affected only 39 of more that 700 participants, it instantly created a critical mass of participation because of the large number of accountholders at the large banks.
- A set of business rules was established and, after launch, administered by BCB, governing not only the operation of the infrastructure but also the way participants may offer the service, so as to ensure a seamless, consistent customer experience across all participant services.
- The board resolved to regulate Pix's end-user pricing to promote BCB's public policy objectives. Consumers cannot be charged by providers for a Pix payment. Commercial users, those receiving more than 30 payments a month, can be charged a commercial fee. This struck a good balance between maximizing user uptake and leaving enough commercial incentive for participants to compete and to offer profitable services.

Industry consultation intensified as the project's size and momentum increased. The BCB-led working group expanded into the large body that eventually became the Pix Forum, made up of around 200 organizations. There were specialized working groups to provide expert input on specific issues, such as business, technical, messaging, and security. The consultation program was led and administered by staff within Decem, part of the Diorf Directorate.

The project made rapid progress in 2019 and 2020. As indicated, the project became the leading strategic development as the launch date approached, and separate weekly board meetings operated as the peak decision-making body for Pix. Pix was formally launched in November 2020.

PIX TODAY

Currently, responsibilities for different aspects of Pix (including technical, operational, regulatory, and business development) are distributed among the eight BCB directorates. Business responsibility currently resides in the Directorate of Licensing and Resolution (Diorf) under its DG. Within Diorf, the Department of Competition and Financial Market Structure (Decem) is one of three departments. The executive responsible for Pix is the deputy head of Decem. He leads a team of around 23 people, responsible for participant engagement, operations desk, business development, and strategy.[16]

Technical support for the underlying systems, DICT and SPI, is provided by a team of approximately eight technology staff within BCB's Department of Information Technology (Deinf), within the Directorate of Administration. The board of BCB remains the overall governance body for Pix, with Pix-related matters being included in the board's scheduled meetings. The Pix Forum remains active, providing feedback on new proposals and emerging issues and risks. BCB management retains motivational responsibility for future evolution.

In this way, BCB has brought to bear its mature operational culture and structures to the operation and future development of the new service.

Governance Lessons

A generation of management theorists have argued that modern organizations need to be transformed along "agile" lines in order to innovate. It has been suggested that innovative companies have the following:[17]

- Flat organization structures, relying on empowerment of small units and lateral collaboration
- Organizational flexibility, rapidly deploying dedicated task teams to drive innovation projects in a collaborative, open environment
- Customer-focused structures and decision-making
- Processes to gather large amounts of market data to drive rigorous decision-making

However, the governance history of Pix, as summarized previously, suggests that innovative "agility" can also be achieved within mature, relatively hierarchical public structures, such as that of BCB. BCB is organized around the eight DG directorates, supported by formal departmental structures with well-defined roles. Strategy is focused on the articulation and execution of policy objectives, and market engagement and data collection in the payments system are largely focused on financial institutions.

Some observations follow on the governance factors that contributed to the remarkable systemic innovations achieved through Pix.

Full internalization ensured control of execution

The fully internalized approach to governance allowed BCB a remarkably high degree of direct control over the project, and over its future evolution. When FPSs are built and operated by market participants, a central bank always has significant influence: it has regulatory power and often has significant persuasive influence, given its central policy role. But it cannot usually dictate the pace or path of development, nor all the design details. BCB itself experienced this situation from 2013 until the decision to develop internally was made in 2018.

Fully internalized design, build, and operation overcomes the problem, as long as the central bank has the in-house resources to execute effectively—which BCB has demonstrated in the case of Pix.

A small team of committed managers was critical

Throughout the entire Pix development, from initial conception to full operation, the team of no more than six individual managers within BCB provided the commitment and passion to drive the project forward. This small group had the advantage of tenured employment within BCB; yet in the earlier stages of evolution, the members had formal roles unrelated to Pix and had to work on the Pix concept in addition to those roles. Because of fixed budgets and strict human resource management protocols, BCB did not have a culture of flexible reallocation or adjustment of the headcount for shifting strategic priorities.

BCB's organizational structure underwent change during the period of Pix's development, but for reasons unrelated to the imperatives of the project itself. It could be argued that the restructure in early 2019 actually made progress on Pix more difficult in the short term by reallocating key staff across several different departments with different core responsibilities.

Nevertheless, the governance and culture of BCB enabled the development precisely because it gave expert staff the scope and support to pursue their own passion for the development. This allowed the project to be driven "bottom-up" but also provided strategic support and endorsement when required. The staff who conceived of the original idea were able to

- make their strategic case for initial feasibility work; then, having demonstrated feasibility;
- secure designation of a strategic development project; and
- during development, secure directional guidance from BCB's board as required.

BCB's structure enabled the focus and commitment of a small core team to drive and deliver an agile and innovative solution guided by BCB's public policy objectives, with the BCB board providing oversight and support as required.

There was always an executive sponsor

From conception to operation, Pix governance was integrated into general BCB structures. There was no segregated Pix development team, and there is no "general manager for Pix" or "Pix department." Business leadership was and is located within a department that itself has a range of other responsibilities; operational, technical, regulatory and administrative resources were distributed across multiple departments with diverse other responsibilities.

That said, BCB governance provided a clear path for bottom-up project effort to secure strategic endorsement and direction from the board—including internal dispute resolution when required. Within BCB's concentric structure, the governance link was a DG sitting at the board table as an executive sponsor. In 2018, the DG for monetary policy sponsored the initial feasibility work and secured board strategic approval for the development. In 2019, a different DG, for licensing and resolution, had responsibility for the development, including increasing board focus on what became a major strategic project. When needed, key strategic issues were taken to and resolved by the board, and through board endorsement, resources needed from other directorates of BCB could be obtained. The key was DG sponsorship coupled with endorsement by the larger BCB board, which ensured buy-in for the project development.

The sponsor DG, as indicated earlier, is an independently appointed member of the Board of Governors, with well-defined responsibilities and a separate departmental budget and resources. Notwithstanding this, board endorsement of the project enabled the engagement and the support of other resources within BCB as needed. This contributed to the success of the project.

Stakeholder engagement was extensive

The Pix project and ongoing operations show a marked commitment to continuous stakeholder engagement, even though industry participants did not have any ownership or decision-making rights. From the feasibility stage onward, BCB staff actively engaged with a wide range of industry participants, with regular consultative meetings administered and chaired by BCB managers. In the development phase, participant engagement intensified through multiple task-specific working groups. Since its launch, the Pix Forum has continued to provide a meaningful engagement platform.

Throughout, engagement has been two-sided: BCB has conscientiously brought its thinking at each stage to the community and improved it based on feedback; participants have felt that they have an opportunity to raise concerns and issues, which will be taken into account, recognizing that the final decision on any issue always rests with BCB.

Anecdotally, industry participants have generally been happy with this level of engagement. For them, as long as issues can be raised and are properly considered, they are content for BCB to take final responsibility, given its public policy orientation and structural neutrality.

One factor in the general acceptance of BCB's role was its management of perceived conflicts of interest. BCB ensured careful policy transparency, combined with open service design.[18] BCB's rationale for action was clearly and persuasively stated to the market through extensive consultation. Then, through careful design of the service, BCB demonstrated open access to all service providers, bank and nonbank alike, and plenty of scope for competitive activity by participants.

The governing body provided clear policy direction and oversight

As far back as the creation of new direct regulatory powers over payments in 2013, BCB was articulating the relevant policy priorities.[19] This provided a clear strategic problem statement for the Pix development. But the solution itself was provided bottom-up by a core group of managers, rather than through a top-down direction. For its part, the board of BCB provided a place for ongoing review, strategic endorsement (leading to resource allocation), and, where necessary, resolution of strategic debates and issues.

Project and operational resources were internally reallocated, not externally acquired

As described, BCB has an annual budget cycle, a relatively fixed organizational structure and strict procurement and human resource protocols. This created an organizational preference for reallocating internal resources to execute strategic projects, rather than buying or hiring in from outside. For the Pix project to succeed, this meant reallocation of management staff with diverse skills to design, develop, test, and launch the operations of Pix with relevant rules.

Board decisions and prioritization enabled strategic cooperation across directorates. The need to utilize internal resources from multiple directorates meant extensive lateral interaction among teams occurred informally, coordinated by the core team of managers involved. This was underpinned by formal project management protocols with regular formal reporting to an internal steering committee.

The board also approved adopting the retail scheme approach with a national retail brand for the service to give it a strong market presence, and a comprehensive retail scheme rule book including minimum standards for consumer interfaces.

The reliance on internal resources had significant governance benefits during the development project:

- Project administration was simplified by more immediate and direct access to staff and resources, without the delay and complexity of procurement.
- All project resources worked within, and deeply understood, BCB's organizational culture and operational protocols.
- Strategic coordination was facilitated by the ability to resolve directional debates once and for all at the DG or board level.

PIX GOVERNANCE: FUTURE CHALLENGES

In the future, the governance structure of Pix would need to be highly responsive to market evolution and innovations. The strategic landscape for payments is changing fast, not just in Brazil but the world over with new network technologies and social change enabling new payment alternatives, from mobile money through social media wallets to stablecoins.

A future review of Pix's current governance might consider whether better incentives and pathways for innovation are needed. Currently, much of the responsibility to drive Pix forward falls on the same small team of managers who originally promoted the concept. No doubt much can be achieved, but there is room to consider whether a differently structured management team would be better equipped to sustain market-oriented innovation. The Pix Forum can be a source of ideas and advice, but motivational responsibility rests solely with BCB management, subject to general strategic oversight from BCB's board, which itself has a much broader strategic focus.

A range of governance reforms could be considered, starting with relatively simple process reforms:

- BCB board could establish a Pix subcommittee, to increase top-line focus on Pix governance.
- A published, regularly renewed Pix strategy road map would spur debate and increase transparency.
- An annual strategy event focused on Pix could bring together the board, representatives of the industry drawn from the Pix Forum and management to create a more inclusive framework for articulating Pix strategy.

More complex structural reforms might also be considered, taking a lead from other jurisdictions:

- Corporatization of Pix's management structure—for example, appointment of a Pix CEO reporting to a special purpose board, with a financial mandate to become self-sustainable;

- Inviting industry participation in governance through industry representation in a new governance body distinct from, albeit subordinate to, the BCB board;
- Inviting industry participation in ownership, for example, by incorporating the Pix scheme and establishing participant mutual ownership.

Many other possibilities and variations exist. There is no immediate pressure for such reforms, given recent rapid growth. However, with some timely thinking now, BCB has an opportunity to establish a long-term governance framework that will enable Pix to build on this success.

ENDNOTES

1. Barbara Pianese, "The Runaway Success of PIX in Brazil," *The Banker,* October 12, 2022, https://www.thebanker.com/World/Americas/Brazil/The-runaway-success-of-Pix-in-Brazil.
2. Banks with more than 500,000 active customer accounts.
3. World Bank survey data indicates that central banks operate retail payment switches in only about 15 percent of cases. Even fewer would do so without a main technology vendor or integration partner. World Bank Group, "Governance of Retail Payment Systems: Keeping Pace with Changing Markets," June 2021, 30, https://openknowledge.worldbank.org/handle/10986/36210.
4. Pianese, "The Runaway Success of PIX in Brazil."
5. Further details of the service and its operation can be found in the World Bank Fast Payments Toolkit Case Study: Brazil, https://fastpayments.worldbank.org/sites/default/files/2022-05/Brazil_Pix_Case_Study_May_2022_0.pdf.
6. Law No. 4,595 of 1964.
7. See BCB, "National Monetary Council," https://www.bcb.gov.br/en/about/cmnen. The current organogram is reproduced in appendix A, at https://www.bcb.gov.br/en/about/orgchart.
8. Law 12,865 of 2013, available at https://www.bcb.gov.br/Pom/Spb/Ing/InstitucionalAspects/Law12865.pdf.
9. Complementary Law No. 179 of 2021, available at https://www.bcb.gov.br/content/about/legislation_norms_docs/complementary_law_179_24february2021.pdf.
10. "Historical Composition of the Board of Governors," Banco Central do Brasil, https://www.bcb.gov.br/content/about/compositionBoardGovernors/composition_BCB_structure_en.pdf.
11. The concentric structure is neatly illustrated in appendix A, which reproduces BCB's published organogram, available at https://www.bcb.gov.br/en/about/orgchart.
12. Law 12,865 of 2013.
13. Banco Central do Brasil, "Brazilian Payments System Oversight Report 2013," https://www.bcb.gov.br/content/financialstability/paymentssystem_docs/Payments-System-Oversight-Report/Brazilian-Payments-System-Oversight-Report-2013.pdf.
14. Breno Lobo and Carlos Eduardo Brandt, "Pix: The Brazilian Fast Payments Scheme," *Journal of Payments Strategy & Systems* 15, no. 4 (2021): 369.
15. See Communiqué 32,927 of 2018, available at https://www.bcb.gov.br/content/financialstability/Communiques_ps_docs/Communique_32927.pdf.
16. See further, appendix A—BCB's organogram.
17. The literature on "agile" corporate leadership and organization is extensive. See, for example, "The Fashion for Agile Management Is Spreading," *The Economist*, July 5, 2018, available at https://www.economist.com/business/2018/07/05/the-fashion-for-agile-management-is-spreading.
18. See, for example, Communiqué 32,927 of 2018.
19. Banco Central do Brasil, "Brazilian Payments System Oversight Report 2013," 21–24.

APPENDIX B

POLAND CASE STUDY (EXPRESS ELIXIR)

EXPRESS ELIXIR GOVERNANCE: KEY LESSONS

- Express Elixir (EE) is the fast payments service of Krajowa Izba Rozliczeniowa SA (KIR), the bank-owned national payments clearinghouse of Poland. It was one of the earliest FPSs, having been launched in 2012, and evolved to be a highly successful addition to the Polish market. The governance authority is the Supervisory Board of KIR, consisting of representatives from 10 commercial banks plus the central bank, Narodowy Bank Polski (NBP), and Zwiazek Bankow Polskich (ZBP), the banking association. Regulatory oversight is also provided by NBP using the Polish law and the *Principles for Financial Market Infrastructures* (PFMI) and the Eurosystem's oversight framework.
- This structure is a successful example of mutual-style banking-community governance of payments infrastructure, with extensive central bank involvement. Some key lessons are the following:
  - **A trusted, quasi-mutual operator was the venue for balancing public and private interests and building industry collaboration.** KIR is long-established and bank-directed, with decision-making reflecting the interests of major bank users, thereby incentivizing their engagement in the new service. Equally, NBP's dual role as overseer and governance participant helped ensure its support.
  - **The regulator provided support to an important industry infrastructure while managing potential conflicts of interest as board member and as overseer.** NBP exercised a formal role by being closely engaged in governance decision-making so as to ensure that the strategic developments served the public interest. It was also the overseer of the payment system, effectively managing any potential conflicts of interest.
  - **Professional management played a key role in success.** EE was conceived, developed, and managed as a self-sustaining commercial service by an integrated, professional management team. As part of this, management provided valuable mediation among multiple different stakeholder interests.
- EE's successful governance model has not evolved in line with the global trend toward greater non-bank and end-user participation in governance. This could be attributed to the particular characteristics of the Polish market.

INTRODUCTION TO EXPRESS ELIXIR

Overview and Market Context

EE was one of the first in the global wave of real-time payment systems, launching only a few years after the United Kingdom's Faster Payments.[1] The system provides instant transfers between bank accounts using the ISO 20022 mes-

sage standard. Settlement occurs in the SORBNET2 real-time gross settlement system operated by the central bank, NBP, using a pre-funded clearing account, ensuring that payments can be posted to payee accounts within a few seconds.

EE was launched in 2012 by KIR, the bank-owned payments clearing operator for Polish banks. KIR already operated Elixir, Poland's bulk interbank credit and debit payments service, and a number of other services. Unlike similar services elsewhere in Europe, Elixir already had three intraday settlement cycles. However, EE was conceived and developed in a rapidly evolving and competitive financial services market, with significant bank exploration of new services as well as fintech activity.

For example, in 2012, two Polish entrepreneurs with a history of web-based innovation launched the Blue Cash Payment System (BC) through their company Blue Media.[2] The system relied on a combination of correspondent accounts operated at each participating bank and integration with bank and merchant payment systems to deliver point-of-service (POS) payments from bank accounts and a real-time interbank payments system at a time when such services were rare. The system attracted participation from a number of banks and developed critical mass within a few years.

In 2013, a group of six Polish banks formed Polski Standard Płatności, Polish Payment Standard (PPS), as a joint technology utility for payment services. Their service, Blik, offered in-store mobile payments from accounts at participating banks.[3] In 2015, PPS added a person-to-person fast mobile payment service, using mobile phone numbers as addresses and using EE for fast payment execution. Blik has become a major contributor of volume to EE.

Around the same time in 2015, regulatory action changed the risk profile and therefore the attractiveness of real-time services. The action prohibited use of fast payments for identification purposes, a practice which was then common in Poland.[4] As a result, a number of banks which had previously resisted joining EE for risk reasons then became participants.

From 2016 onward, the combined effect of increased consumer convenience through the Blik mobile addressing service and a safer risk environment for banks led to rapid growth in volumes. Figure 1 illustrates the relative performance of EE and BC between 2012 and 2022, showing both volumes and values.[5] Until late 2016, BC processed more volume than EE and grew faster; but from then on, EE rapidly outstripped the commercial service. In 2022, EE processed 227.5 million fast payments, over 16 times the volume in BC. EE has become the standard way to make person-to-person payments in Poland.[6]

Regulatory and Policy Context

From the 1990s onward, NBP oversaw the emergence of the Polish national economy from an era of state ownership and central planning into a modern market economy with a floating currency. By an act of 1997,[7] NBP was established as the central bank with responsibility for the national currency and powers to organize payments in Poland. By an act of 2001,[8] the president of NBP was given power of approval over Polish payment systems other than those operated by NBP.

NBP's primary objective is to ensure the efficient and safe functioning of the payment system.[9] In performing its payment system oversight policy, NBP is guided by the rule of transparency, developed on the basis of the Polish law, and also applies international standards, PFMI, and the Eurosystem Oversight Framework.

Institutional Context

The operator of EE is KIR, Poland's national payments clearinghouse. KIR was established in 1992 to provide interbank clearing services for Poland's emerging commercial banking sector and is one of the regulated payments operators recognized by NBP.

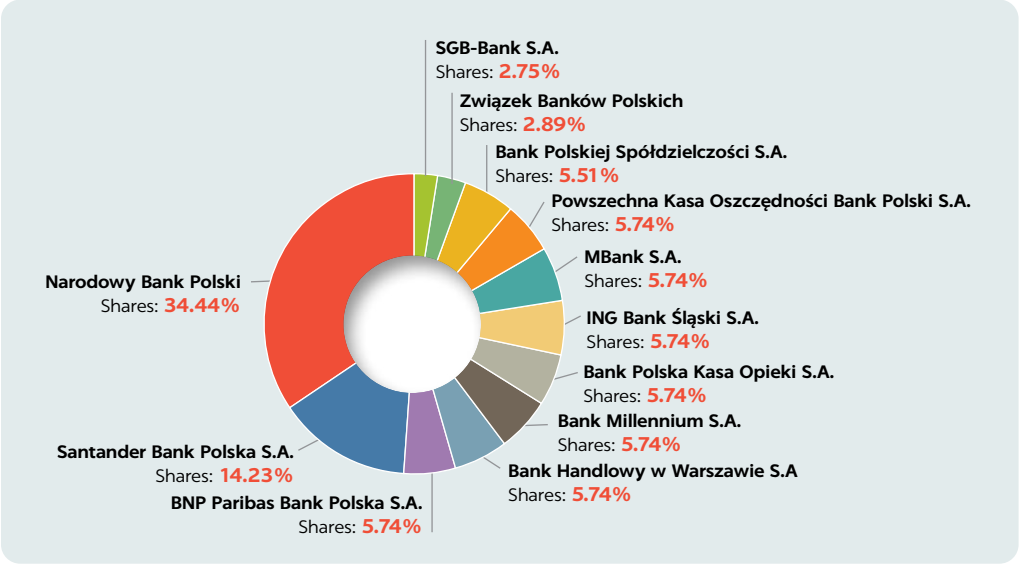
KIR's mandate is described in its published strategy 2023–2025 in terms that focus on the delivery of value to its key stakeholder community, the Polish banking sector. It also recognizes its important public economic role:

> KIR is a key entity of the Polish payment system, . . . We actively support the Polish banking sector in the use of new technologies and open banking. . . . We support the digitization of the economy, ensuring the quality, reliability and security of digital services. The new strategy of KIR for 2023–2025 . . . is a continuation of the consistent strengthening of the position of KIR as an important entity in the infrastructure of the Polish payment system.[10]

In addition, NBP is a major shareholder alongside leading commercial banks, and currently chairs the supervisory board of the company. The company's current shareholders are as illustrated in figure B.1.

KIR started life with 16 bank shareholders; current shareholdings reflect the evolution of the Polish banking marketplace with mergers and some bank withdrawals from the market. NBP's large shareholding arose from the need to even the levels of commercial banks and rebalance the shareholding, rather than from original design. The Banking Association, Zwiazek Bankow Polskich (ZBP), has a small share, and its deputy CEO currently serves as deputy chair. Each shareholder appoints a director to serve on the supervisory board, and each director has an equal

FIGURE B1 Shareholding in KIR



Source: KIR website, accessed June 2023.

vote. NBP has more than one-third of the shares on issue and chairs the board.

Constitutionally, KIR is quasi-mutual—while not all participants are shareholders, ownership and direction are clearly oriented toward the collective interest of the banking community, tempered by the presence of the public policy maker in all deliberations. Banks not directly represented on the supervisory board are explicitly represented by ZBP, the banking association. Where a proposal may affect the status of the company's regulatory compliance, the approval of NBP as regulator may also need to be sought.

Day-to-day management of the company is vested in a full-time executive management board, which currently has three members, a president and two vice presidents. The management board is responsible for preparing strategic proposals, budgets, and other matters calling for supervisory board decisions, and submitting these to the supervisory board. KIR has an integrated approach to service management; each management board member has a portfolio of management responsibilities, which are arranged functionally rather than by product. Thus, the responsibility to manage the EE service falls on the Settlement Department, which reports to the president; but the service is also supported by the IT department, the operations center, legal and financial services, and so on. Around 10 staff members are directly involved in management of EE, with support from many other units.

In order to promote long-term sustainability and organizational efficiency, KIR's management approach is commercial in outlook, although some services with a significant public interest component are provided at cost. This is a pragmatic response to a competitive market environment, where KIR has no special legal or regulatory status relative to other licensed payment providers, notwithstanding its close association with NBP.

GOVERNANCE EVOLUTION OF EXPRESS ELIXIR

Genesis

After 2005, when the Elixir service was launched and paper payments clearing declined, KIR began consulting with its owner-user community on possible service extensions that might benefit them. It operated a user group called the "Elixir Club," open to representatives of all banks engaged in using KIR services, with a membership of around 50. The idea of a fast account-to-account payments service was extensively discussed, leading to an informal consensus among the larger banks to develop such a service. In 2011, KIR formalized the emerging consensus by conducting a survey among Polish banks, collecting their views on the proposed service. With this endorsement, a business case proposal was put to the supervisory board and was approved.

KIR management then conducted a market tender to select a service provider to develop the new service—at that time, there were no off-the-shelf products for fast

account-to-account services, and KIR selected a software development house to build the new service. It was also necessary to formally seek NBP oversight approval and develop a rule book to provide the commercial and legal framework.

The new service, EE, was conceived as an offering to all banks that would operate on commercial principles—transaction fees would be set to deliver a future return on capital invested. At around the same time, the BC service began engaging banks and developing integration with bank and merchant systems. While not a primary driver of the KIR development, the existence of a potential commercial alternative acted as a spur to complete and launch the service.

The EE service ultimately launched in 2012, with support from major bank shareholders of KIR. The supervisory board provided continued support to the development of the service and the director representatives acted as points for coordinating bank preparation and KIR service development.

Market Developments

Before 2010, in the Polish banking market several attempts were made to create a mobile payment system based on KIR, while at that time, due to technical reasons, two general agreements were needed. One of them was an agreement between most banks (which was initially possible), and it was also necessary to reach an agreement with telecommunications operators, which finally failed. As a consequence, in 2013 several banks agreed and created the PPS based on the existing mobile payment solution developed by the largest Polish commercial bank (PKO BP), operationally launched in 2015. It was assumed that this would be a common solution, but it was decided to start with a few of the largest Polish banks in order to speed up decision-making and implementation processes, which was particularly important at the beginning of this new product.

From inception, the intent of PPS was to use EE as the infrastructure for the Blik fast payments service. The opportunity to collaborate with Blik was suggested by the common bank shareholders of KIR, and management conducted a strategic review and prepared a business case for the supervisory board. With five of Blik's six shareholders on the board, its support was secured. In this way, a market initiative developed by banks for their own commercial purposes was taken up, standardized, and enabled for the entire community by KIR's infrastructure. The results demonstrate the value of the development.

GOVERNANCE LESSONS

A trusted, quasi-mutual operator was the venue for balancing public and private interests and building industry collaboration

KIR was an experienced, community-oriented operator that had built trust with the banking community through a long history of infrastructure delivery and operation, and trust with the public authorities through the governance involvement of NBP. In this way, it was uniquely placed to balance and build a market consensus integrating NBP's desire to promote modern payments infrastructure, the collective interest of the banking industry in network utilities, and finally the private, commercial interests of individual banks. Like many mutual and quasi-mutual clearinghouses, KIR sat at the intersection of public and private interests.

KIR is not a "strict" mutual company, in the sense that owners and users are distinct but overlapping groups. Nevertheless, corporate strategy, board membership, and deliberative proceedings all reflected the identification and pursuit of community interests rather than a pure corporate-commercial outlook. The supervisory board was chaired by NBP but driven by majority decisions of the leading banks, each bringing their own perspective on common interest. This created an effective mix of incentives for collaboration. Individual banks had sufficient investment—both as owners and heavy users of KIR's services—to work collaboratively on the EE development.

This governance structure maximized the likelihood that the EE development would respond to the common business needs of the Polish banking sector. In addition, and as a consequence, it maximized the likelihood that leading Polish banks would commit to and support the EE development through adaptations to their own back-office systems and customer service offerings. A specific instance of the reciprocal commitment can be seen in the use by PPS (a utility service provider for six banks) of EE transaction services for Blik.

Equally, the engagement of NBP not only as regulator but also governance participant ensured ongoing trust and confidence from the key public stakeholder. KIR, as the only automated clearinghouse (ACH) in Poland operating under the Polish banking law and owned by banks, met all the conditions of being a service provider for Blik via EE. It was done with the full approval of the NBP allowing the central bank to influence and to shape developments as necessary and to allow control and direction to remain with the banking industry.

The regulator provided informal support to an important industry infrastructure while managing potential conflicts of interest

As a central bank, NBP had a formal oversight role that required it to be impartial between competing non-public payment system operators. This is consistent with a basic economic orientation in Poland toward open, competitive markets. This responsibility was discharged through the formal authorization process for all payment system operators by the president of NBP within the NBP's oversight framework, using international standards such as PFMI to assess operators and ensure minimum standards of efficiency, reliability, safety, and transparency. The policy documentation of NBP displays a recognition of the public importance of such privately owned structures.

At the same time, as outlined previously, NBP had extensive formal involvement in the governance of KIR, which despite its quasi-mutual structure and community outlook, was in a regulatory sense just one of several alternative infrastructures. This direct engagement of NBP in KIR's governance framework facilitated the development of new payments infrastructure with critical mass and wide community usage.

The potential conflict of interest emanating from participating in the governance arrangement of KIR and as an overseer was managed by NBP through an internal separation of roles for officers charged with oversight, and those involved in KIR governance.

Second, pursuit of both roles requires continuous exercise of judgment to strike the right balance between ensuring new payments infrastructure rapidly attains critical mass while not stifling competitive market innovation and the development of new services. In the early, expansionary days of EE's development, NBP's engagement allowed KIR and the banks to rapidly develop beneficial new national infrastructure. But this development has the potential risk of impeding the competitive development of non-bank solutions. As the market evolves, there may be the need to consider a wider community of interests across technology companies, start-ups, and other organizations. This is explored further under "Future Challenges."

Professional management played a key role in success

In identifying and balancing the competing interests that arise from the critical industry role of FPSs, the importance of professional management can often be overlooked. In the case of KIR, the existence of the management board highlights the dual role of management. As in all organizations, management must intelligently execute strategy set by the supervisory board; but in industry mutuals like KIR, there is an additional, more challenging mediation function which can manifest in three ways:

- Management must support the strategy formulation process, bringing a perspective independent of all other stakeholders and impartially focused on the success of the company. This is especially valuable where, as in the case of KIR, there are no nonexecutive independent directors to provide an independent perspective.
- Management may need to shape and articulate the strategic debate to maximize prospects of a "best fit" consensus among the community of users and owners, each of which has its own vision of industry evolution.
- Management may have to help mediate between commercially oriented desires of participants and public policy expectations of the regulator, again seeking a best fit outcome.

It appears that the evolution of EE benefited from these kinds of support. In addition, KIR's management displayed a market-oriented professionalism in supporting the stakeholders and the supervisory board. The management board prepared strategy papers, a business case, a project plan including a competitive tender procurement and business rules formulation. The review of compliance with PFMI shows a well-developed risk management framework.[11]

The management team also showed responsiveness to market developments, such as adaptation to support the Blik service from 2015 onward.

FUTURE CHALLENGES

KIR's governance approach for EE has clearly been well-calibrated to the needs of the Polish market and so has achieved critical mass as a fast payment service. It has also displayed the capacity to improve services over time in response to market needs.

However, notwithstanding rapid evolution of financial technology services in Poland, there seems to have been little market pressure for governance structures to be more inclusive of end users and indirect participants. This is to be contrasted with significant evolution in this direction in world best practice, and in other broadly comparable jurisdictions. This best practice trend can be traced back to PFMI Principle 2, Key Consideration 7, which advocates "reflect[ing] appropriately the legitimate interests of [the infrastructure's] direct and indirect participants and other relevant stakeholders."[12]

The World Bank's guidance states:

> It has not always been possible within existing governance arrangements to resolve tensions between the interests of new entrants and incumbents. Some systems required encouragement or direct intervention by oversight authorities to embrace change and implement new services and models of operations. This has included measures to amend legislation and regulation as well as the application of soft power or moral suasion to the banking and payments community.[13]

This has not happened in Poland. In explaining the relative lack of pressure for governance change in Poland, some Polish participants make the argument that, from a relatively early time, the Polish market embraced an open banking approach consistent with the intent of PSD2.[14] The argument is that this form of openness gave non-bank participants sufficient access to payments infrastructure, such that there was little demand for greater participation in infrastructure governance.

As financial technology evolution drives new players and more market change, and as EE increases its reach in the Polish market, it remains to be seen whether the historically successful bank-driven governance structure will experience pressure for change to reflect broader stakeholder interests.

ENDNOTES

1. Further details on Express Elixir's services and operations can be found in the World Bank Fast Payments Toolkit, Case Study: Poland, https://fastpayments.worldbank.org/sites/default/files/2021-09/World_Bank_FPS_Poland_Express_Elixir_Case_Study.pdf.
2. Marcin Adamczyk, "Poland Is a Leader in Instant Payments," *Blue Media*, January 15, 2017, https://blue-media.pl/baza-wiedzy/badania-i-raporty/polska-przoduje-w-platnosciach-natychmiastowych.
3. Blik's in-store and online services compete directly with credit and debit card payments, which are operated in Poland by the international schemes and are heavily used by Polish consumers.
4. In the absence of a national digital identity system, citizens would send and receive small amounts using the early fast payment services in order to establish the correct destination for a later, more substantial payment. This insecure practice in turn attracted various kinds of fraudulent activity.
5. In figure 1, the columns indicate value in billions of PLN using the left-hand scale; the lines indicate millions of transactions on the right-hand scale, which is logarithmic (base 10). This more clearly shows the relative performance of the two systems over time.
6. Constitution of the Republic of Poland, Article 227, adopted April 2, 1997, https://www.sejm.gov.pl/prawo/konst/angielski/kon1.htm.
7. "The Act on Narodowy Bank Polski of 29 August 1997," Journal of Laws of 2022, item 2025, https://nbp.pl/wp-content/uploads/2022/10/the_act_on_the_nbp.pdf.
8. "Act of 24 August 2001 on Settlement Finality in Payment and Securities Settlement Systems and the Rules of Oversight of These Systems," Official Journal of 25 October 2001, https://nbp.pl/wp-content/uploads/2023/01/ACT-on-Settlement-Finality-in-Payment-and-Securities-Settlement-Systems.pdf.
9. Narodowy Bank Polski, "Payment System Oversight Policy," October 2019, https://nbp.pl/wp-content/uploads/2023/01/payment-system-oversight-policy-Oct-2019.pdf.
10. Available (in Polish) at https://www.kir.pl/o-kir/strategia-kir; translated using Google Translate.
11. CPMI, "Principles for Financial Market Infrastructures".
12. Committee on Payment and Settlement Systems (CPSS) and International Organization of Securities Commissions (IOSCO), ***Principles for Financial Market Infrastructures*** (Basel, Switzerland: Bank for International Settlements, 2012), 158, https://www.bis.org/cpmi/publ/d101.htm.
13. CPMI, "Principles for Financial Market Infrastructures".
14. European Central Bank, "The Revised Payment Services Directive (PSD2) and the Transition to Stronger Payments Security," March 2018, https://www.ecb.europa.eu/paym/intro/mip-online/2018/html/1803_revisedpsd.en.html.

APPENDIX C

MALAWI CASE STUDY (NATSWITCH)

NATSWITCH: KEY LESSONS

- National Switch Limited (Natswitch) is Malawi's industry-owned, publicly funded central retail payments switch, supporting "any-to-any" fast payments between mobile wallets on two mobile networks and accounts at nine commercial banks.
- The growth of mobile money supported by government-mandated interoperability with bank accounts has significantly increased digital financial inclusion, as shown by World Bank Findex data.
- Malawi's regulatory framework, administered by the Reserve Bank of Malawi (RBM), directly mandates interoperability through Natswitch and is supported by business licensing regulation that requires retail businesses to offer digital payment alternatives to customers.
- Although it has direct regulatory support and public funding, Natswitch is owned and directed by its major customers, with no formal governance participation by RBM. However, public funding is structured as a loan by RBM to Natswitch and is guaranteed by the commercial banks through their association; the banks have made commitments to ensure Natswitch pursues only publicly beneficial activities.
- The following observations can be made:
  - **A clear legal framework supports effective national payments policy.** Although Malawi had a draft National Payments System Bill (the Act) as early as 2002, it was not enacted until 2016. In the interim, an RBM-sponsored smart-card solution struggled for industry adoption, and mobile wallets grew rapidly as separate networks under regulatory guidelines. As soon as the Act was passed, RBM was able to shape the market to promote industry-wide implementation and universal interoperability.
  - **There are many ways of balancing public and private interests.** In response to difficulties with Malswitch, an early smart-card solution, RBM adopted an explicit policy of not owning retail payment networks. Instead, RBM left ownership and direction to a mutual structure created by commercial banks, but it ensured public policy goals were pursued through a memorandum of understanding (MOU) with the Bankers Association of Malawi (BAM) and specific regulatory requirements combined with "soft" influence in decision-making.
  - **Market incentives are usually an important factor in driving industry coordination.** Malawi's commercial banks united to reach an agreement on the formation of Natswitch, when only a few years before, a retail switch had struggled for critical mass. However in the interim, mobile wallets had grown rapidly in Malawi and posed a new competitive threat to retail banking.
  - **Mutual structures are often challenged by a diversity of business models.** The initial formation of Natswitch by commercial banks coordinating through BAM was rapid and successful. However, when the time came to add mobile network operators to the mix, there was

a substantial delay, which was ultimately resolved by direct regulation.

- As more diverse businesses (such as fintechs, remittance companies, retailers, and so on) seek access to Natswitch services, governance tensions may continue to emerge. One possible response is to "design in" a formal onboarding process that covers allocation of governance rights as well as usage rights for all new participants. Such a response could help to future-proof Natswitch against disruption caused by divergent user interests, and many models are available for doing so.

INTRODUCTION TO NATSWITCH

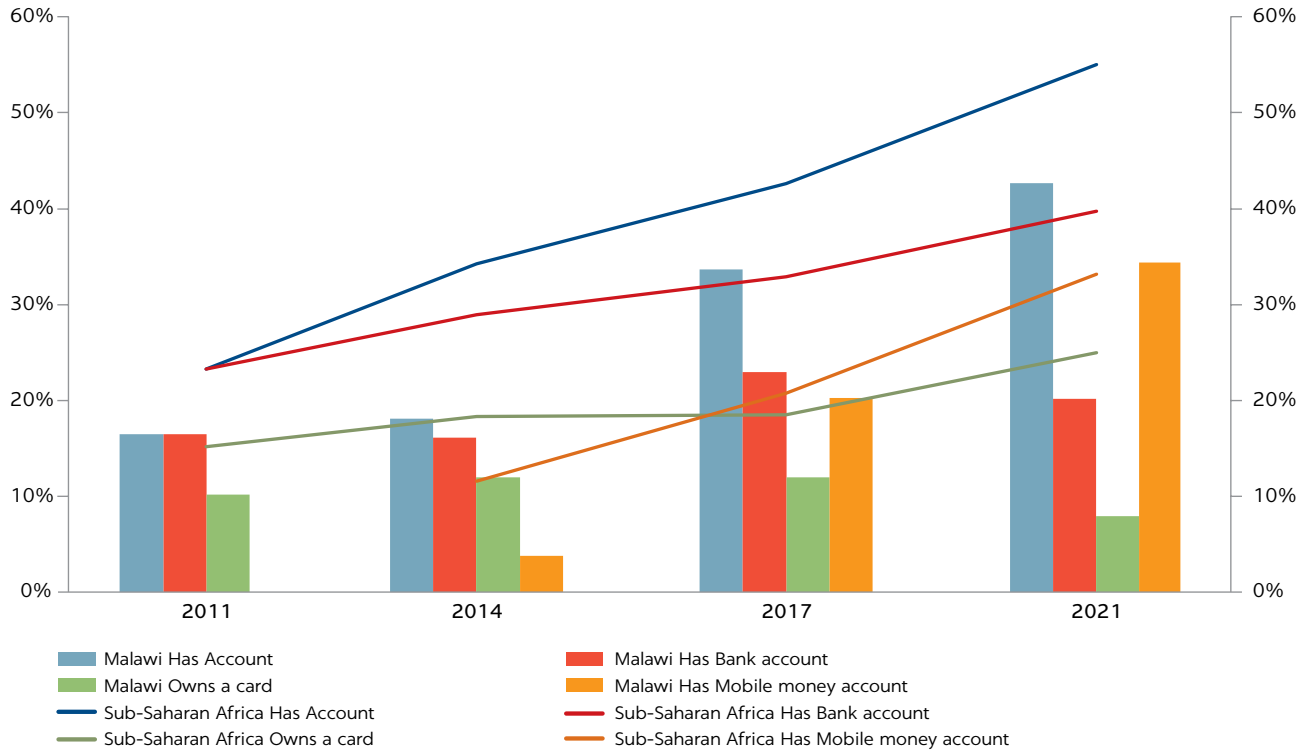
Overview and Market Context

As stated, Natswitch is Malawi's industry-owned central payments switch. It commenced operations in 2015, offering card ATM and point-of-sale (POS) switching among Malawi's commercial banks. Natswitch supported interoperability between Malawi's two mobile money operators starting in 2017. In December 2022, Natswitch began providing an "any-to-any" fast payments service, supporting fast payments between all bank accounts and wallets at Malawi's nine commercial banks and two mobile operators.

Malawi has made significant progress on financial inclusion. As in many African jurisdictions, Malawi has seen an explosion of mobile money use as more advanced mobile phones and supporting data networks become widely available. From 2014 to 2021, wallet ownership grew from 4 to 34 percent of the adult population, according to World Bank's Global Findex survey. During the same period, bank account ownership increased from 16 to 20 percent. Not only has mobile wallet ownership now easily surpassed bank account and payment card ownership, but Malawi's wallet ownership is on par with Sub-Saharan African peer countries, having lagged well behind a decade ago. Figure C.1 provides details.

Natswitch's interoperability services add value to all these products by allowing anyone to pay anyone. Recent data suggest that the proportion of fast payments that pass through the switch is still small relative to all fast payments,[1] but its existence drives increased competition in the marketplace by allowing all service providers, large and small, to leverage the same national network in providing competitive payment services. This system reinforces and extends the benefits of financial inclusion already being delivered by mobile money.

FIGURE C.1. Account and Card Ownership, Malawi versus Sub-Saharan Africa



Source: Original figure for this report based on data from World Bank Findex 2021.

REGULATORY AND POLICY CONTEXT

Under the Payment Systems Act 2016 (PS Act), RBM has general powers of oversight, licensing, authorization, and regulation of payments systems and the power to establish and operate settlement systems and payment systems.[2] It must do so to "promote the soundness, safety and efficiency, integrity and reliability of payment, clearing and settlement systems in Malawi."[3] Any payment system or service operating in Malawi requires a license or authorization from RBM.[4]

Constituted under its own legislation,[5] RBM is an independent government-owned body with the twin goals of price and financial stability.[6] RBM's board of directors is appointed directly by the president and comprises the governor, deputy governors, the secretary to the treasury, and five other members. The board must always maintain a majority of financially expert nonexecutive directors.[7]

Payment systems policy is administered by the Payment Systems Department of RBM. Consultation with industry is provided through the National Policy Council, an advisory body chaired and administered by RBM that includes representation from the Ministry of Finance, commercial banks, and Natswitch.

RBM has used its formal regulatory powers to promote digitization and payments interoperability. In the process, it has designated Natswitch as the sole national interoperability hub. In 2017, RBM announced the Payment Systems (Interoperability of Retail Payment Systems) Directive (the Interoperability Directive), which requires banks, mobile operators, and all other payment service providers to continuously connect their network infrastructure to Natswitch and comply with Natswitch rules and standards.[8] An explicit prohibition on deploying a stand-alone or closed-loop system was issued by RBM, along with a requirement to comply with Natswitch revenue sharing arrangements—in effect, interchange fees.[9] RBM also instituted substantial monetary penalties for any noncompliance, as well as an explicit allocation of responsibility to the board and senior management of each payment service provider to develop and implement a policy to ensure compliance.[10]

Interestingly, the Interoperability Directive also places strict requirements on Natswitch:[11]

- Set and enforce business, operational, and technical requirements.
- Ensure it has the technical and business capability onboard all service providers as per the directive.
- Comply with the RBM's other directives and pronouncements.

Again, there are financial penalties for failure to comply.

This integration requirement is extended into the retail market by the Business Licensing (Deployment and Usage of Electronic Payment Channels) Regulations, passed in 2019 but brought into full effect in 2022. The regulations require all licensed businesses in Malawi to deploy and use at least one electronic payment channel—in practice, one or more of card POS devices, mobile money wallets, or bank fast payments. This requirement, coupled with extensive community education through a National Taskforce on Electronic Payments,[12] was designed to fast-track digital payments in Malawi.

INSTITUTIONAL CONTEXT

Natswitch was created as a Malawian private company in 2015 with 11 members of BAM—the nation's commercial banks—as founding shareholders. Subsequently in 2017, the two national mobile network operators (MNOs) became equal shareholders with the banks, so that the shareholding base now consists of 13 equal shareholders. However, there is no formal requirement for users to be shareholders, and as Natswitch's services expand, new customers will not automatically become shareholders.

Although the Malawian banking community provided initial seed capital, the bulk of capital required to develop Malawi's central retail switch was provided as financial assistance from the World Bank to the government of Malawi under a Financial Sector Technical Assistance Project (FSTAP). The program has been administered by the RBM. In 2014, RBM and BAM (acting on behalf of the commercial banks) signed an MOU under which FSTAP funds were provided as an interest-bearing loan, enabling the banking community to sign the technology supply contract for the national retail switch.

The MOU records the importance of establishing the retail switch in furtherance of the public policy goal of increasing access to finance. Participating commercial banks make the following commitments:

- Incorporation and physical establishment of Natswitch
- Establishment and execution of an agreed business plan for Natswitch
- A collective guarantee of loan repayment

The MOU explicitly recognizes Natswitch's mutual nature and states that:

- its shareholders would essentially be its customers,
- fair access to its services will be provided for new banks and appropriately regulated non-bank institutions,

- it will limit itself to switching and related services so as to avoid conflicts of interest,
- it will be open to new user shareholders with equal rights, and
- otherwise, it will be self-sustaining through service charges.

The board of Natswitch consists of the senior executives of a major payment service provider and user of Natswitch's network services. A chief executive officer reports to the board and, in recognition of the special role of RBM under the MOU, also has a "dotted line" reporting relationship with the Payment Systems Department of RBM. In practice, there is close consultation with RBM on strategy and business planning.

Natswitch has made available to the community its operating guidelines,[13] which set out Natswitch's rules of operation. The operating guidelines specify membership of Natswitch to include "affiliates of Bankers Association of Malawi (BAM), all MNOs, and every other financial service provider who issues out, acquires electronic funds, cards and or are involved in electronic funds transfers." All are legally bound.[14]

Natswitch services are clearly positioned as a long-term strategic initiative delivering essential components of an effective national economy, as well as cost efficiencies and economies of scale for members.[15] The guidelines note that payment service providers are obligated to become members and set out the criteria and responsibilities for membership, as well as a penalty framework for noncompliance.

The board is recognized as the ultimate authority for Natswitch operations, and the guidelines also recognize the need to cooperate with RBM and other authorities "to enhance coordination of policy development and implementation."[16]

GOVERNANCE EVOLUTION OF NATSWITCH

Natswitch represents a relatively unusual (by global standards) balance of public and private interests in the national FPS. Malawi arrived at this configuration through its own history and experience. This section briefly records two contributing historical elements—the first attempt at a national smart-card system and the process for admission of MNOs to full membership in Natswitch.

MALSWITCH

The Malawi Switch Centre was Malawi's initial vehicle for centralized payments processing and was established as a separate government-owned and controlled company in 2002 as Malswitch Limited. It administered Malawi's first real-time gross settlement (RTGS) and check-clearing services until their replacements in 2014 with new services operated by RBM.[17]

An additional service developed by Malswitch was an early FPS—a smart-card fast payment solution. RBM's 2008 NPS Vision and Strategy establishes a goal of developing a business plan for Malswitch to achieve "viability" by 2011; a project for its privatization is also proposed.[18]

The smart-card service struggled for acceptance and engagement by Malawi's commercial banks, possibly because it included card issuance and card acceptance services, which would in part have competed with commercial bank offerings. Four banks became members and offered the solution to customers, but this was insufficient to attain critical mass, and the service never attracted large volumes.[19] From 2012 onward, the proposal to use FTSAP funds to develop a domestic card and fast payment switch (ultimately, Natswitch) dominated the industry's attention. Malswitch was terminated by the time Natswitch commenced operations in late 2014.

ENGAGING MOBILE OPERATORS

From 2012 onward, Malawi began to experience the explosion in mobile money usage that has become a familiar story in many African countries. Because mobile money builds on telecommunications infrastructure being deployed for core mobile services to a large retail community, such services do not usually require unique, separate investment in the central infrastructure—switching is predominantly done within each MNO network. However, interoperability between MNOs and between mobile networks and the banking industry are critical for long-term economic development, as was clearly recognized by the RBM/BAM MOU.

Although they had not been parties to the original MOU, in 2017, the two national MNOs were persuaded to connect to Natswitch, supporting an initial wallet-to-wallet interoperability service. Connectivity with mobile money was envisaged as an important element of the new switch from inception in 2014,[20] but the governance framework for this took some time to be developed. The 2017 Interoperability Directive (see "Regulatory and Policy Context" section) had the effect of legally requiring MNOs to connect, and also of

legally requiring Natswitch to enable connection, making it impossible for any existing shareholder to object. Consistent with the mutual orientation of Natswitch, this eventually led to the MNOs joining as equal shareholders with their own chief executives as directors on the board.

GOVERNANCE LESSONS

An interesting aspect of Malawi's experience is the effect of the unsuccessful attempt to create a national FPS through Malswitch. The failure of Malswitch presents the opportunity to consider what governance changes were made after its termination and how these contributed to later success via Natswitch.

In Natswitch's private mutual structure supported by an MOU with BAM, there is a clear intent to ensure maximum engagement from the commercial banking community. In exchange for commitments to build, operate, and govern Natswitch in accordance with RBM policies, public development funding was made available to support collective development by the banks.

A CLEAR LEGAL FRAMEWORK SUPPORTS EFFECTIVE NATIONAL PAYMENTS POLICY

Malawi's 2008 NPS Vision and Strategy establishes a strategy of strengthening the legal framework for payments,[21] principally through the enactment of the Payment Systems Act, which had existed as a draft as early as 2002.[22] In the interim, RBM had regulated payment systems in exercise of original general jurisdiction under its own act. So, for example, MNOs were regulated through guidelines published in 2011.[23]

In the years before the PS Act was implemented, RBM had sought to influence industry developments through direct intervention. The Malswitch development of a smart card service is a prime example. The result of this approach was that mobile services grew rapidly but experienced imperfect interoperability with the banking system; at the same time, the government-owned service struggled for adoption in the absence of a clear regulatory framework and business incentive for the banks.

The PS Act ultimately became law in 2016, leading to rapid structural changes in Malawian retail payments. The Act was followed quickly in 2017 by e-money regulations, the Interoperability Directive, and in 2019 by the Electronic Payment regulations. This comprehensive legal framework provided a clear, strong basis for the establishment of Natswitch as the nexus for retail payment interoperability, as described above.

Once the legal and regulatory framework was fully developed, governance and oversight of national retail payments became much more effective.

THERE ARE MANY WAYS OF BALANCING PUBLIC AND PRIVATE INTERESTS

It seems clear that the lack of success of the Malswitch smart card service had an enduring effect on public policy toward governance of national payments infrastructure. The 2008 NPS Vision and Strategy presents a clear policy preference for banks and other stakeholders to own—and therefore take risk and responsibility for—non-systemically important systems, leaving RBM to focus on oversight.[24]

When RBM secured international development aid for a retail switch, RBM had public money to spend on national payments. RBM took the relatively unusual step of channeling that funding into a switch vehicle 100 percent owned by private interests—initially, commercial banks—which became Natswitch. Developing and implementing Natswitch carries out the policy imperative of the Vision and Strategy, which was for RBM to restrict itself to oversight of retail systems. However, it also raises questions about ensuring accountability, protecting against unjust enrichment of the banking sector, and increased risk of misuse of public funds.

The Bank's response was not to take an ownership stake in Natswitch, or even to accept a governance role on the board—both of which are common solutions in other countries. Instead, RBM developed a carefully crafted governance framework that used both regulatory and commercial checks and balances to ensure public money was well spent and delivered the desired outcomes. That framework included:

- Committing to a comprehensive governance structure through the MOU by the entire banking sector
- Structuring public funding as an interest-bearing loan from RBM guaranteed by the banks and recallable in the future, giving RBM financial influence over future switch decision-making
- Limiting the scope of activities of the switch to noncommercial activities with public policy benefits
- Enforcing a direct regulatory requirement for interoperability backed by financial penalties, binding on all stakeholders including Natswitch itself[25]
- Engaging with RBM through ongoing "dotted line" management reporting

By these means, RBM secured commercial bank assumption of responsibility and also ensured public policy goals are pursued. Natswitch is an unusual balancing of the interests, but it has proved an effective one.

MARKET INCENTIVES ARE USUALLY AN IMPORTANT FACTOR IN DRIVING INDUSTRY COORDINATION

Much of the effectiveness of the governance structure for Natswitch's mobile FPS services derives from the MOU with BAM, signed by all commercial banks. This high level of industry coordination took place before there was any regulatory imperative to do so, and it stands in sharp contrast to the partial and ultimately unsuccessful engagement in the predecessor system, Malswitch.

No doubt, developing a more effective policy and governance approach by RBM was important, as documented above. But the change in market circumstances is also significant. In the early 2000s, when Malswitch began offering services, mobile money did not exist to provide a competitive alternative to bank-driven digital payment services. By 2014, when the commitment to support Natswitch was secured, mobile money had become a significant threat to bank-owned retail payment systems. According to RBM data, bank-based mobile and internet payment transactions increased by 25 percent to 9.1 million in 2014, but in the same period, MNO-led mobile payment transactions grew by 141 percent, to 48 million.[26] The writing was already on the wall.

Therefore, it seems reasonable to surmise that by 2014, the desire of commercial banks to coordinate on national digital payments infrastructure to support their digital payment services acquired new urgency. Although fast payment interoperability and mobile money were always envisaged as within scope, it is likely to have enhanced effective coordination to commence Natswitch's development solely with the engagement of the commercial banks through their association. This group was economically aligned and incentivized to make rapid progress.

MUTUAL STRUCTURES ARE OFTEN CHALLENGED BY THE DIVERSITY OF BUSINESS MODELS

The downside of building a community with closely aligned business interests is that it can be hard to bring in new and diverse participants when the time comes to do so. This was the situation faced by the owners of Natswitch from 2015 onward. Having implemented national card switching within 12 months of formation of the company, Natswitch was encouraged by RBM to move on to the fast payments phase of the development agenda, starting with an interoperability switch between the two mobile money operators (MMOs).

Notwithstanding that this had always been explicit in RBM's vision and the MOU with banks, it took two years and direct regulatory intervention to achieve it. This took the form of the Interoperability Directive, previously discussed. At the same time this negotiation took place, individual banks and MMOs were establishing and offering bilateral commercial access agreements to allow payments between mobile wallets and bank accounts. However, the commercial implications of these arrangements ran counter to the interoperability vision of the RBM agenda. This dynamic may explain why full account/wallet interoperability was not achieved until the end of 2022, eight years after the original vision was articulated.

FUTURE CHALLENGES

The success of Natswitch in creating integrated FPS for the nation has enabled Natswitch to develop a substantial "order book" of adjacent public policy–driven projects. These include a national government e-payment gateway for both revenue collection and social funds disbursement as well as cross-border integrations.

Going forward, it may be of use to the community to have a clearer articulation of payment-systems strategy. This clarification could come from RBM through an update to the NPS Strategy and Vision, which is now 15 years old.[27] It could also come from Natswitch itself as an articulation of switch strategy, since there has not been a published statement of strategy to date.

As Natswitch's service set expands, the diversity of its participants also will inevitably increase. Already, several non-bank organizations licensed to initiate digital payments are connected, with many more likely to come.

Such growth creates an ongoing governance challenge, since with each new class of participant the divergence of interests between participants, and between participants and shareholder owners, increases. The first occasion this happened—the connection of MMOs to a bank-driven governance—an appropriate solution was negotiated. But without a well-defined pathway for integrating new participants into its governance framework, each new addition will present a new and potentially unanticipated negotiation challenge.

The public policy desire for open access and interoperability has been clearly expressed. But as the participant community broadens, there is a risk of creating new classes of participants whose interests are not sufficiently considered in decision-making. It may be impractical to renegotiate the MOU each time a new class of participant is onboarded.

A mechanism to manage the challenges of expansion could take several forms. For example, an advisory council for nonowner participants could be established, giving new participants a voice in Natswitch decision-making. New strategic proposals could be tested with the council before board decisions are made. In addition, the constitution of the company could be amended to provide that a new participant be offered the option of becoming members of the company (with attached rights and responsibilities), or of remaining a nonowner participant. This approach would need to define fair qualifications to trigger the offer, a well-defined process, and a clear statement of the rights and responsibilities involved.

Such structures may improve decision-making over time and help to avoid future governance challenges.

ENDNOTES

1. In Q1 2023, the switched volume was 0.5 percent of total mobile money payments See Reserve Bank of Malawi (RBM), "National Payments Systems Report First Quarter 2023," 2023, https://www.rbm.mw/PaymentSystems/.
2. Laws.Africa, "Malawi Payment Systems Act," ch. 74:01, part II, sec. 4, 2025, https://malawilii.org/akn/mw/act/2016/15/eng@2017-12-31.
3. PS Act, Part II, s4(a).
4. PS Act, Ch. 74:01, Part III, sec.12.
5. Now, the Reserve Bank of Malawi Act 2018, Part IV, sec. 44, https://malawilaws.com/MalawiGnpdf1/GN%2019%20of%202018.pdf.
6. RBM Act, Part II, sec.4.
7. RBM Act, Part II, sec. 7.
8. Bank of Malawi Payment Systems (Interoperability of Payment Systems) Directive 2017.
9. Interoperability Directive, secs. 6(7) and 7.
10. Interoperability Directive, sec. 5.
11. Interoperability Directive, secs.10–11.
12. Referenced in a speech given by the director of RBM's National Payment Systems Department at the launch of the community campaigns, August 16, 2022, https://www.rbm.mw/PaymentSystems/.
13. RBM, "Operating Guidelines for Natswitch Limited," last reviewed July 2020, available on the RBM website, https://www.rbm.mw/Dynamic/SearchResult/.
14. Operating Guidelines, sec.1.4, 6.
15. Operating Guidelines, sec. 2.1.
16. Operating Guidelines, secs. 4.2 and 4.3.
17. See, generally, RBM's "National Payment Systems Annual Report 2014," 2015, especially sec. 1.2 and appendix 1.
18. See *RBM, 2008, Malawi National Payment System Vision and Strategy 2009–2013.*
19. See RBM, *Malawi Strategy.*
20. See RBM, "National Payment Systems Annual Report 2014," (n. 16) at sec. 2.2.3.
21. *See* RBM, *Strategy*.
22. S. Madise, "Payment Systems and Mobile Money in Malawi: Towards Financial Inclusion and Financial Integrity," January 2014, sec. 3.2, https://www.researchgate.net/publication/269631135_Payment_Systems_and_Mobile_Money_in_Malawi_Towards_Financial_Inclusion_and_Financial_Integrity.
23. Under sec. 4(e) of the Reserve Bank of Malawi Act 1989. The current equivalent is sec. 24(f), Reserve Bank of Malawi Act 2018.
24. RBM, *Strategy.*
25. The Interoperability Directive, as discussed earlier.
26. RBM, National Payment Systems Annual Report 2014, secs. 3.2.3 and 3.2.4.
27. Industry interviews suggest RBM is working on a new payments strategy document.

APPENDIX D

GHANA CASE STUDY (GIP)

GHIPPS INSTANT PAY: KEY LESSONS

- Ghana's success in digital financial inclusion has been reviewed and analyzed repeatedly. Ghana Interbank Payments and Settlement Systems Limited (GhIPPS), a wholly owned subsidiary of the Bank of Ghana (BoG), has developed an extensive suite of retail payments systems including GhIPPS Instant Pay (GIP) and Mobile Money Interoperability (MMI), which provide "any-to-any" fast payments among bank accounts and mobile wallets. Digital financial inclusion has doubled to nearly 70 percent in 10 years using this system.
- Ghana enjoys a modern, open payments regulatory framework and clear policy and strategy environment; BoG plays a central role with responsibility for regulation, oversight, and payments industry strategy.
- GhIPPS is operationally distinct from BoG but is linked at the board level.
- GhIPPS utilizes a commercial approach in providing high-quality service delivery across the payments community.
- Regarding governance, the following observations can be made:
  - **Separation of functions can have multiple benefits.** Use of a subsidiary as the operator has managed potential conflicts and provides for effective focus in regulation, strategy, and market service delivery.
  - **Clear, practical policy communication is important.** Ghana regularly publishes its payments policy and strategy, promoting consistency and market alignment.
  - **Good governance allows for economic incentives.** BoG's approach is to understand market forces and seek practical solutions rather than force regulatory outcomes.
  - **Consult, consult, consult.** BoG has extensive formal and informal consultation mechanisms, including a statutory Payment System Advisory Committee.
  - **Good governance is dynamic and empirical.** The governance framework has evolved over time, applying lessons based on experience.
- A strategic debate on industry ownership of GhIPPS has been flagged. Given the vibrant, diverse competitive marketplace, finding the right model may prove challenging.

INTRODUCTION TO GHIPPS INSTANT PAY

Overview and Market Context

Ghana is a much-studied success story for digital financial inclusion.[1] Figure 1 shows that growth in account ownership in the last 10 years has easily outstripped the Sub-Saharan average, driven by remarkable growth in mobile money wallets. Today, six in 10 Ghanaian adults own a digital wallet.

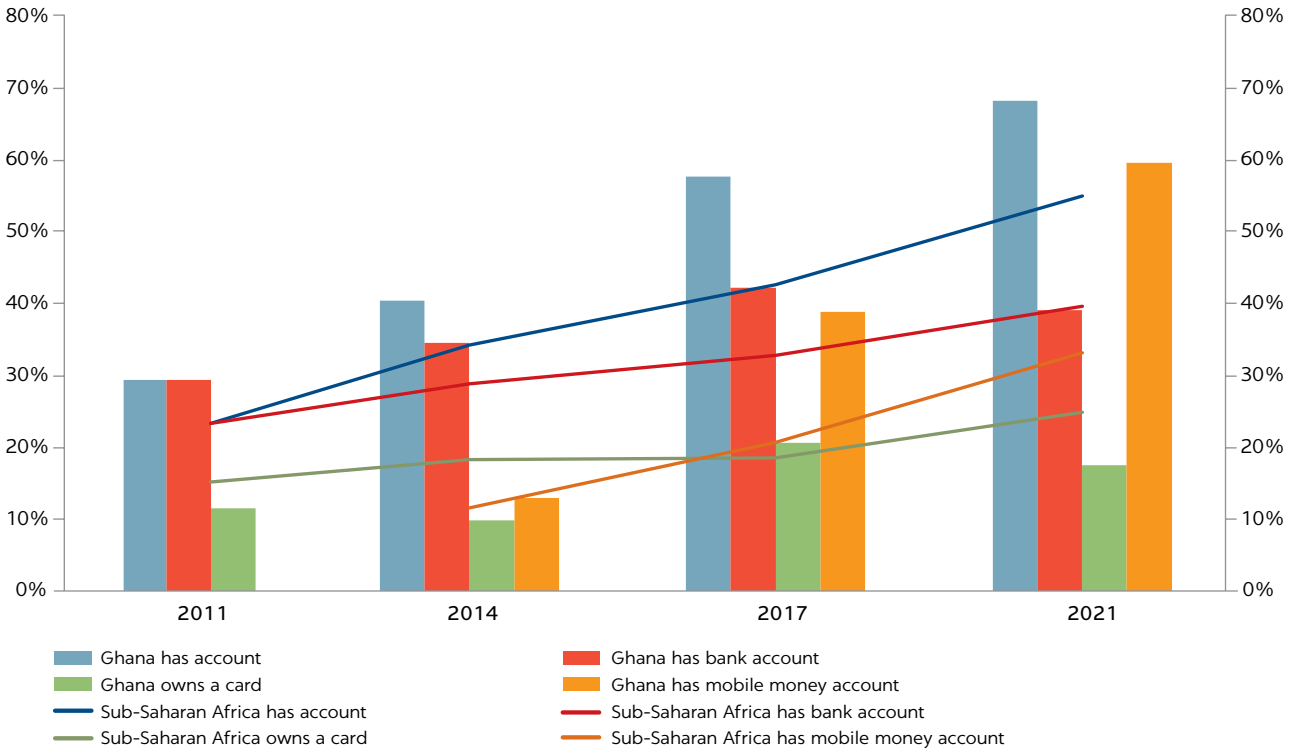
Interestingly, over the same period both bank account and payment card ownership appear to have plateaued.

One aspect of Ghana's success story is progressive development of a rich menu of retail payment alternatives paired with vibrant market competition across 23 banks, three mobile network operators (MNOs), and hundreds of other regulated financial institutions. The product mix includes the following:[2]

- A national stored-value biometric smart card, the E-zwich card, usable in dedicated terminals and in hybrid point-of-sale (POS) devices and ATMs
- A national scheme, the Europay, Mastercard, and Visa (EMV) card (Named for its originators, EMV is a standard and secured payments method designed to prevent fraud by embedding computer chips in debit and credit cards.)
- The Gh-link card, usable in POS devices and ATMs alongside international scheme cards
- GIP, a real-time interbank account-to-account credit transfer service
- Proxy Pay (alias addressing) and Request To Pay (bill payment) services built on the GIP service
- MMI, which links GIP with MNO networks to allow "any-to-any" fast transfers among mobile wallets, bank accounts, and card accounts
- A universal national quick response (QR) service, GhQR, which allows payment in store or online from a bank account, mobile wallet, or payment card using a QR code scanned or generated by a customer's phone
- A national mobile wallet product, GhanaPay, allowing banks and other financial institutions to provide a mobile money service
- A range of corporate and merchant services designed to support convenient use by citizens of the listed services

All these products were developed and are supported by GhIPPS, which operates real-time transaction processing for card transactions and fast payments. Net interbank settlement takes place through Ghana's real-time gross settlement (RTGS) system, GIS, which is operated by BoG. All of Ghana's payment services organizations are interconnected through GhIPPS, either directly or indirectly, through sponsoring banks.

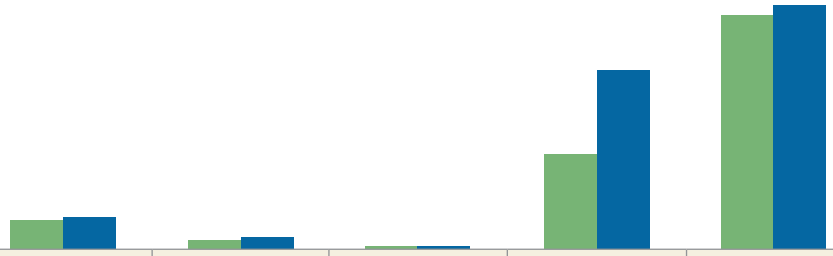
FIGURE D.1. Account and Card Ownership, Ghana versus Sub-Saharan Africa, 2011–21



Source: Original figure for this report based on World Bank Findex 2021.

FIGURE D.2 Comparative Volumes of Major Products

Comparative analysis for transaction volume in quarter one 2022 and 2023



	Clearing house	e-zwich	gh-link	GIP	MMI	GhanaPay
2022	4,008,322	1,060,295	213,250	13,725,332	34,412,872	
2023	4,296,999	1,664,944	259,213	26,328,692	35,675,841	101,561

Source: GhIPPs 2023 Q1 Industry Performance Report.

Figure D.2 gives a sense of relative significance of GhIPPS products. Although GIP is growing rapidly, MMI (which supports wallet-to-wallet fast payments across MNOs) is the largest product. This reflects the dominance of mobile money in overall payments activity. In 2022, there were over 5 billion mobile money transactions.[3]

REGULATORY AND POLICY CONTEXT

Ghana has a comprehensive, progressive payments regulatory framework. The Payments Systems and Services Act of 2019 (PSS Act) has the following notable features:

- Uniform application to banks, other deposit-taking institutions, electronic money issuers (including MNOs), payment service providers, and affiliates and agents of these organizations
- Authority of BoG for all matters related to payments, clearing and settlement systems, elaborated with detailed responsibilities such as
  - Safety and soundness of payments systems
  - Regulation of e-money business
  - Promotion of financial inclusion
  - Broad powers of policy formulation, licensing, and authorization
- Establishment of a Payment Systems Advisory Committee (PSAC) to advise BoG on payment matters
- Comprehensive compliance requirements for payment service providers (both bank and non-bank) including detailed governance requirements
- Specialized authorization and compliance requirements for electronic money businesses, including a special license category of "dedicated electronic-money issuer"
- Powers to operate or designate payment systems and to allow or prohibit access to payment systems
- Comprehensive monitoring and oversight powers

The public policy maker, regulator, and overseer for payments in Ghana is the BoG, established under the Bank of Ghana Act, 2002. BoG is also the principal payments strategy formulator, as shown by its published "Payments System Strategy (2019–2024)."[4] As stated on the BoG website, the payments system objectives are clear and comprehensive:

The development of payment and settlement systems in Ghana has been premised on the following key objectives:

- To prevent and or contain risks in payment, clearing and settlement systems;
- To establish a robust oversight and regulatory regime for the payment and settlement systems;
- To bring efficiency to fiscal operations of the Ghana Government
- To deepen financial intermediation;
- To discourage the use of cash for transactions while encouraging the use of non-paper based instrument;
- To promote financial inclusion without risking the safety and soundness of the banking system; and
- To develop an integrated electronic payment infrastructure that will enhance interoperability of payment and securities infrastructures.[5]

BoG's governing body is the board of directors,[6] which consists of the governor, who is also the chairman, two deputy governors, and 10 nonexecutive directors. The board is appointed by the president of the Republic of Ghana, in consultation with the Council of State. The governor and the two deputy governors are appointed for a term of four years. The nonexecutive directors hold office for three years.

As mentioned, BoG is supported by the PSAC, which advises on all payments and clearing related matters.[7] Chaired by the governor, PSAC includes senior representatives from the National information Technology Agency and the Ministry of Finance, as well as six other members selected by the BoG. Currently, these include representatives of GhIPSS, the Securities and Exchange Commission Ghana Chamber of Telecommunications, Ghana Association of Bankers, the Association of Ghana Industries, and a consumer group.[8] To assist in its work PSAC has formed five working groups of industry participants. These groups include representatives of mobile network operators, merchants, consumers, payment service providers, fintechs, and third-party providers. PSAC meets at least twice per year.

In 2019, shortly after passage of the PSS Act, BoG published its "Payments System Strategy (2019–2024)." Relevant to this report, the strategy includes a clear statement of overall vision and strategy plus specific, time-framed responsibilities that are allocated to BoG, GhIPPS, other government bodies, and to industry. The 2019 strategy is a successor to multiple coordinated public statements on national payments strategy, including

- An earlier 2014 BoG strategy, (the 2019 strategy includes a review of progress under previous strategy)
- A 2017 Digital Payments Roadmap prepared by the Ministry of Finance, "Toward a Cash-Lite Ghana"[9]
- A 2018 National Financial Inclusion and Development Strategy 2018–2023, also prepared by the Ministry of Finance[10]

Institutional Context

As indicated, GIP and MMI (Ghana's two main fast payment services) are operated by GhIPPS, a wholly owned, not-for-profit subsidiary of BoG, established in 2007. GhIPPS is a designated payment system infrastructure and clearing house under sections 48 and 70 of the PSS Act, and thus GhIPPS is subject to oversight by BoG.

Participation in GIP and MMI is determined under the PSS Act, which gives BoG broad powers to grant and withdraw participation rights. Terms of Participation are established under scheme rules and a Service Level Agreement (though these are not published).

A board of directors is GhIPPS' governing body, chaired by the BoG governor, and including the first deputy governor of BoG and the GhIPPS chief executive officer (CEO), together with six external directors. Currently, they include Ghana's deputy minister of finance, the president of the Ghana Association of Banks and four independent directors with relevant experience.

The CEO leads an executive team that is functionally independent from BoG, with its own product marketing, technology, operational, and administrative support functions. This team also operates its own systems and technology, relying on BoG for RTGS settlement.

While overall national payments strategy and policy is the purview of BoG's Payment Systems Department, GhIPPS develops, designs, markets and delivers its own services and presents to the market as a distinct market service provider, as indicated above. For example, GhIPPS invests significantly in public promotion of payment services, as indicated by the joint promotion with the banks association of the new GhanaPay bank wallet (which uses GIP).

GhIPPS' commercial approach to product development is further illustrated by a quarterly industry newsletter, the "GhIPPS Update." Using the Q1 2023 newsletter as an example,[11] there is extensive promotional material aimed at banks and other payment service providers to encourage take-up of GhIPPS services, including:

- Leveraging GhanaPay to drive revenue generation
- Mobile money agent prospecting opportunities
- Public experience fairs promoting the GhQR code product

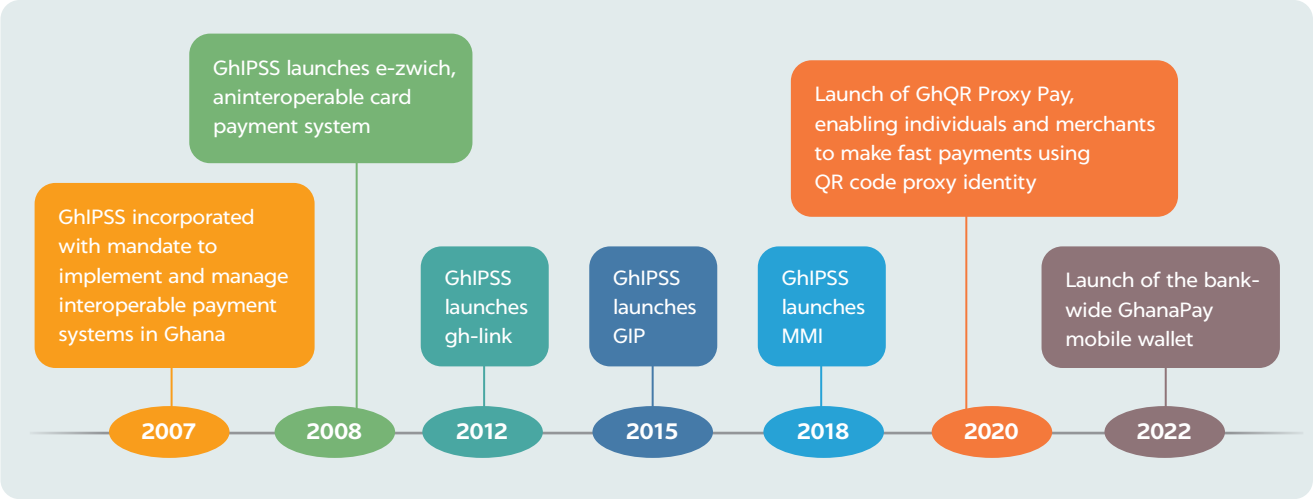
Such wholesale marketing is usually not associated with a central bank brand.

GOVERNANCE EVOLUTION OF GHIPPS INSTANT PAYMENTS

The evolution of the current RPI governance framework in Ghana has taken more than 15 years. The Bank has displayed a willingness to adapt to market circumstances and to review and change direction when a governance approach has not delivered the anticipated results.

Figure 3 provides a timeline of major developments, which helps contextualize the discussion.

FIGURE D.3 Timeline of Major GhIPPS RPI Developments



Source: AfricaNenda 2022 (cited Note 1)

Early Days: Engaging Banks in E-zwich

Although BoG's original intention was to invite commercial banks to participate in building national infrastructure, early consultations were not encouraging.[12] In 2007, BoG set up its own infrastructure company, GhIPPS, and began work on the initial service, e-zwich, the focus of which was to increase electronic payments, even in offline contexts such as rural settlements. However, industry consultation was limited, and the solution did not provide strong commercial incentives for banks to invest, partly because it required significant investment in terminal networks.[13]

Instead, BoG issued a formal mandate in 2008 to the banks to join the new system. Banks were reluctant, and usage was slow to develop.[14] Banks remained slow to invest in the necessary infrastructure for some years.

Apart from a lack of commercial incentives, an additional contributory factor may have been that commercial banks perceived GhIPPS as unfairly competing with industry products and creating a conflict of interest for BoG as the regulator.[15]

Kick-starting Mobile Money: Betting on the Banks

Meanwhile, mobile money was beginning to emerge as an exciting new possibility, thanks to m-Pesa in Kenya. With Ghana's first mobile money service already in commercial development, BoG was determined to respond quickly. In 2008, BoG published "Guidelines for Branchless Banking," positioning mobile money as a channel for commercial banks to offer new services to the underbanked. An MNO required at least three bank partners as responsible entities for a mobile money service to enhance interoperability and involvement of prudentially regulated entities.[16] A governance side-effect of this approach was that the MNO was the bank's agent, possessing no direct regulatory or consultative relationship with BoG and no ability to advocate for different regulatory treatment.[17]

Early results were discouraging. Mobile money developed relatively slowly in Ghana, hampered by costly chains of intermediaries and by controlling banks with little incentive to invest in growth.[18]

In 2011, BoG embarked on a review and redevelopment of mobile money regulation, starting with detailed consultation with MNOs. This led to the Electronic Money Issuers Guidelines in 2015, which allowed an MNO to establish a dedicated subsidiary to be directly licensed by BoG to offer mobile money. This policy change "stimulated massive investments in the ecosystem by telecommunication companies and resulted in impressive growth in mobile money accounts."[19]

In hindsight, the policy change was a resounding success in financial inclusion and economic growth terms. But before implementation, it had to withstand a last-ditch attempt by banks to prevent the creation of independent mobile money operators. BoG was obliged to mediate between industry participants on this controversial policy change.[20]

Establishing the Consultative Framework

Fortunately, BoG learned from experience. Outcomes such as the two evolutions summarized above encouraged a more consultative, flexible, and market-focused approach to policy formation and regulation. In formal terms, this beneficial approach was evidenced in

- Regular consultation on and publication of payments strategy, starting in 2014.[21]
- Structures for ongoing market engagement on policy and new developments through the PSAC structure of a peak council with five industry working groups. Established in 2019, PSAC was replaced an earlier advisory body with a similar structure.

GOVERNANCE LESSONS

Separation of Functions Can Have Multiple Benefits

When an RPI is wholly owned by the central bank, there are a couple of ways to organize: as an internal department of the central bank or as an autonomous commercial entity.

As stated, GhIPPs was established as a wholly owned subsidiary of the BoG and has its own board (with some common membership with BoG), its own executive, its own finances, its own functional divisions, and its own information technology. Nonetheless, BoG retains regulatory and supervisory responsibilities over GhIPPS and the industry and also sets national payments strategy. In effect, BoG sets the high-level strategic expectation for GhIPPs and assesses the results, leaving execution to GhIPPS.

This particular configuration has offered multiple benefits:

- Potential regulatory conflicts are transparently managed; GhIPPS is supervised by the Office of Payments Oversight within BoG as a designated payment system.
- GhIPPS has developed a distinct and relatively entrepreneurial culture, with high standards of service delivery, its own relations with market participants, and a marketing focus.
- National payments strategy remains well focused and coordinated.
- GhIPPS has the benefit of its own focused governing body, with a clear remit for design, development, and delivery of payments system services.

Clear, Practical Policy Communication Is Important

The successful development of fast payments infrastructure in Ghana rested on well-considered public declarations of policy, backed up by actionable plans.

A well-reasoned, published policy promotes industry understanding and support and also promotes consistent application across regulators and other government bodies.

Good Governance Makes Allowance for Economic Incentives

As the section on "Governance Evolution" recounts, early attempts to use regulatory mandate without incentive alignment struggled for success. Later efforts took more time to understand the market dynamics at play and how to adapt them in support of policy goals, rather than simply impose a desired outcome.[22]

Consult, Consult, Consult

Both BoG's and GhiPPS's experiences outline the benefits of extensive formal and informal market consultation. These include

- Presence of individuals with extensive market experience on BoG and GhIPPS governance bodies
- Establishment of PSAC, with its industry working groups
- Regular informal interactions on strategy and product development matters

Good Governance is Dynamic and Empirical.

Ghana has taken some time to evolve into its current governance configuration. At the establishment of GhIPPS, BoG explored the potential to set up an industry-owned national operator, but it could not secure bank commitment. The early development phase of national infrastructure may have placed too much emphasis on carrying out public policy using regulatory mandates, with later phases focusing more on consultation, aligning market incentives, and market-oriented service provision through GhIPPS.

It is likely that this consultative engagement approach will continue. The 2019 Strategy document includes a proposal to "[e]xplore the possibility of Payment Service Providers' ownership of the processing infrastructure (i.e. GhIPSS)."[23] Public comments suggest a preferred structure could involve conversion of GhIPPS to some form of mutual, perhaps with a residual stake held by BoG.[24]

FUTURE CHALLENGES

The central role of GhIPPS in Ghanaian payments is well-established. However, BoG's 2019 strategy outlines a challenging agenda of future projects, especially in regard to the growing fintech ecosystem and cross-border infrastructure linkages. In governance terms, Ghana appears to have arrived over time at an effective mix of public ownership and direction combined with extensive consultation and

market awareness. As technology continues to evolve (the regulation of crypto currency and discussion of a possible central bank digital currency), this flexibility will continue to be tested.

The recurring theme of industry ownership of infrastructure provides a challenging and potentially disruptive counterpoint. The idea of giving industry "skin in the game" is logical and aligned with global practice, but as participant business models diversify, the devil is very much in the details. Ownership conversations are always challenging because they affect future allocations of strategic influence and strategic risk in relation to the payments system among participants, with long term consequences.

In 2007, at the beginning of the mobile-money revolution, it was possible to explore the idea of a mutual of commercial banks, with confidence that those organizations would find significant common interest; pursuing this mutuality represented the main bulk of industry activity. Fast forward to 2023, and the outlines of industry ownership are much less clear. Mobile network operators now dominate banks in retail volume terms but have a very different strategic outlook. Remittance companies and aggregators are also highly active, yet have different interests. Still other fintechs have even more diverse interests from central infrastructure. Modern Ghanaian payments law allows a diverse community to have access to the payment system. But how all these various and sometimes competing interests can be fairly represented in ownership allocations remains unclear. A thousand models are possible, but it does not seem likely that any one model will garner universal approval.

At the same time, a controversial change might disrupt GhIPPS service delivery and market confidence. This means the industry conversation on GhIPPS ownership needs to be approached with care—carefully reasoned proposals need extensive consultation. The balanced governance, which has seen so much progress, should also be acknowledged and protected.

NOTES

1. Further details on GhIPPS's fast payment services and operation can be found in AfricaNenda, "The State of Instant and Inclusive Payment Systems in Africa: SIIPS 2022 Case Study—GhIPPS Instant Pay" (AfricaNenda, Nairobi, Kenya, 2022), https://www.africanenda.org/uploads/files/EN_SIIPS_Casestudy_GhIPSS_HQ.pdf. Also see, for example, Max Mattern and Claudia McKay, "Building Inclusive Payment Ecosystems in Tanzania and Ghana" (Focus Note 110, CGAP, Washington, DC), https://www.cgap.org/sites/default/files/Focus-Note-Building-Inclusive-Payment-Ecosystems-June-2018.pdf; and BFA Global, "Synthesis and Benchmarking of Instant Payment Schemes," No.2, Ghana, 2022 12, https://bfaglobal.com/our-work/optimizing-interoperability/.
2. The service descriptions are drawn from the GhIPPS website, https://www.ghipss.net/index.php#.
3. Bank of Ghana, *Annual Report and Financial Statements 2022* (Accra, BoG, 2023), 33, https://www.bog.gov.gh/annual_report/annual-report-2022/.
4. Bank of Ghana, "Payment Systems Strategy, 2019–2024" (BoG, Accra, 2019), https://www.bog.gov.gh/wp-content/uploads/2022/01/National-Payment-Systems-Strategic-Plan-2019-to-2024-2.pdf.
5. Bank of Ghana, "Overview of Payment Systems in Ghana," n.d., https://www.bog.gov.gh/banking-and-payments-system/overview-of-payment-systems-in-ghana/.
6. Bank of Ghana, "Governance of the Bank," n.d., https://www.bog.gov.gh/governance/.
7. Payment Systems and Services Act 2019, secs.4–6, https://ghalii.org/akn/gh/act/2019/987/eng/.
8. BFA Global, "Synthesis and Benchmarking of Instant Payment Schemes."
9. Ministry of Finance, Republic of Ghana, "Toward a Cash-Lite Ghana: Building an Inclusive Digital Payments Ecosystem, Digital Payments Roadmap" (Ministry of Finance, Accra, 2017), https://mofep.gov.gh/sites/default/files/acts/Ghana_Cashlite_Roadmap.pdf.
10. Ministry of Finance, Republic of Ghana, "National Financial Inclusion and Development Strategy (NFIDS), 2018–2023" (Ministry of Finance, Accra, 2018), https://mofep.gov.gh/sites/default/files/acts/NFIDs_Report.pdf.
11. Available at: https://www.ghipss.net/index.php/publications/external-newsletters.
12. AfricaNenda, "The State of Instant and Inclusive Payment Systems in Africa," 2.
13. BFA Global, "Synthesis and Benchmarking of Instant Payment Schemes," 9.
14. Mattern and McKay "Building Inclusive Payment Ecosystems in Tanzania and Ghana," box 11, 25.
15. Mattern and McKay, "Building Inclusive Payment Ecosystems in Tanzania and Ghana."
16. BFA Global, "Synthesis and Benchmarking of Instant Payment Schemes," 19.
17. BFA Global, "Synthesis and Benchmarking of Instant Payment Schemes," 20.
18. BFA Global, "Synthesis and Benchmarking of Instant Payment Schemes," 20.
19. Bank of Ghana, "The Evolution of Bank of Ghana Policies on the Ghanaian Payment System," 2022, 4, https://www.bog.gov.gh/wp-content/uploads/2022/03/The-Evolution-of-Bank-of-Ghana-Policies-on-the-Ghanaian-Payment-System-1.pdf.
20. BFA Global, "Synthesis and Benchmarking of Instant Payment Schemes," 21–22.

21. Bank of Ghana, "2014 Strategic Payment Systems Roadmap," cited in Bank of Ghana, "Payment Systems Strategy."
22. BFA Global, "Synthesis and Benchmarking of Instant Payment Schemes," 22.
23. Bank of Ghana, "Payment Systems Strategy, 2019–2024," 6.
24. Interview with Archie Hesse, GhIPSS CEO, at *Marcopolis,* April 11, 2018, https://marcopolis.net/ghipss-archie-hesse-discusses-payment-system-infrastructures-in-ghana.htm.

APPENDIX E

SOUTH AFRICA CASE STUDY (PAYSHAP)

PAYSHAP GOVERNANCE: KEY LESSONS

- PayShap is South Africa's next generation FPS, offering 24/7 real-time retail payments, and, in 2024, it implemented the request to pay in an open, flexible environment using either mobile phone number proxy addressing or account numbers. PayShap was launched by BankservAfrica, the bank-owned South African payments clearinghouse, in early 2023.
- Oversight of PayShap rests with the South African Reserve Bank (SARB), but the governance framework includes industry self-regulation through the Payment Association of South Africa, which performs a system management role. BankservAfrica has a direct contractual relationship with participants and maintains its own operating and technical requirements. A new PayShap scheme has also been set up with its own Scheme Council and Scheme Rules focused on ensuring a consistent end-user experience.
- At the time of writing this case study, key aspects of governance are still evolving, including proposals for legislative change, policy proposals from the SARB, and extensive industry debate. This situation provides an opportunity to explore the evolution of the governance design as it takes place. A few key observations on PayShap's governance journey can be made:
  - **Governance structures owe much to market circumstances and history.** PayShap's relatively complex governance framework has two drivers: the evolution over many years of a distinctive local practice of payment system governance and the emergence of a different policy approach in recent years.
  - **Governance is a moving target.** Legislative reform with major governance implications was announced in 2018 and is still pending. PayShap has had to develop interim structures with an eye to future transition as the legislative framework changes, without unnecessarily delaying rollout of an important new payment service.
  - **Is it possible to have too much stakeholder engagement?** There are five governance structures with some responsibility for PayShap governance. Four include representatives of BankservAfrica's four largest shareholder banks. From the perspective of stakeholder engagement, this certainly ensures strong alignment and input from key players in decision-making. However, the combination of multiple decision-making bodies, each typically with different bank representation, makes for a complex path for any major strategic decision. A risk of delay arises from this complexity, and the relative influence of banks and other stakeholders is worth considering.
- Consideration could be given to reducing these risks and improving governance clarity through a collaboration mechanism, such as a PayShap coordination protocol.

If this were widely accepted and regulator-endorsed, it could improve coordination among multiple decision-making bodies.

INTRODUCTION TO PAYSHAP GOVERNANCE

Overview and Market Context

PayShap is South Africa's next-generation FPS,[1] offering 24/7 real-time retail payments. In 2024, "request to pay" was implemented in an open, flexible environment using either mobile phone number proxy addressing or account numbers. It is designed as the backbone for modern credit-push payments and, importantly it is designed to provide affordable, inclusive digital payments to support South Africa's developing economy.

PayShap launched in March 2023 after four years in design, development, and testing (figure E.1). At the time of writing, 10 banks have joined the scheme with several more planning to join.

South Africa has, by global standards, a sophisticated interbank payments system, and PayShap joins an already crowded retail payments marketplace. Card payments are common, with 60 percent of the population having a credit or debit card.[2] There are bulk net-deferred credit and debit payment services; there is also a widely used homegrown retail account debit service called DebiCheck—a consumer debit instrument that allows for real-time authentication of a debit order mandate.

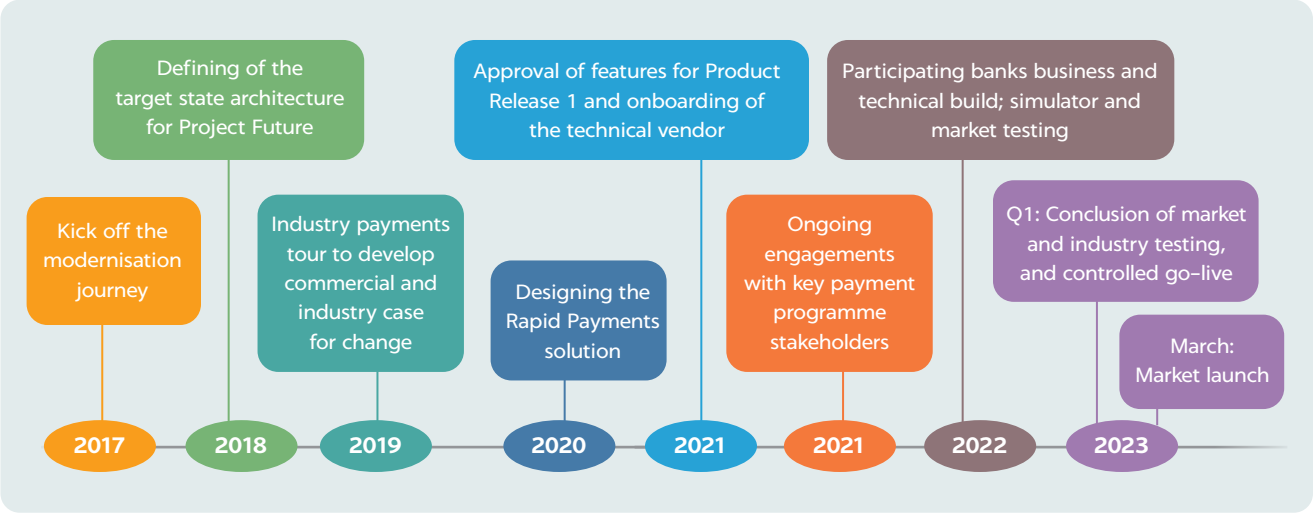
Since 2006, South Africa has had a fast account-to-account credit payment service called Real-Time Clearing (RTC), marketed by banks under a range of names. RTC was historically marketed and priced as a premium fast payment service, but a recent increase in competition among banks has seen rapid growth in this product, even during PayShap's launch. At the time of writing this case study, RTC and PayShap coexist in the South African market as separate services; the future evolution of this relationship is not yet clear.

The PayShap operator is BankservAfrica, the bank-owned payments clearinghouse, which is the oldest and largest in Africa and the main supplier of payments infrastructure in South Africa. The regulatory framework is provided by the Payment Association of South Africa (PASA), a payment self-regulatory body, subject to oversight by the SARB.

In addition to bank-driven services, national supermarket chains offer a range of consumer finance services effectively outside the banking system, including point-to-point payments. Remittance services supply domestic and cross-border payment options for specific payment corridors. Mobile money has yet to make a significant impact in South Africa, despite repeated attempts.

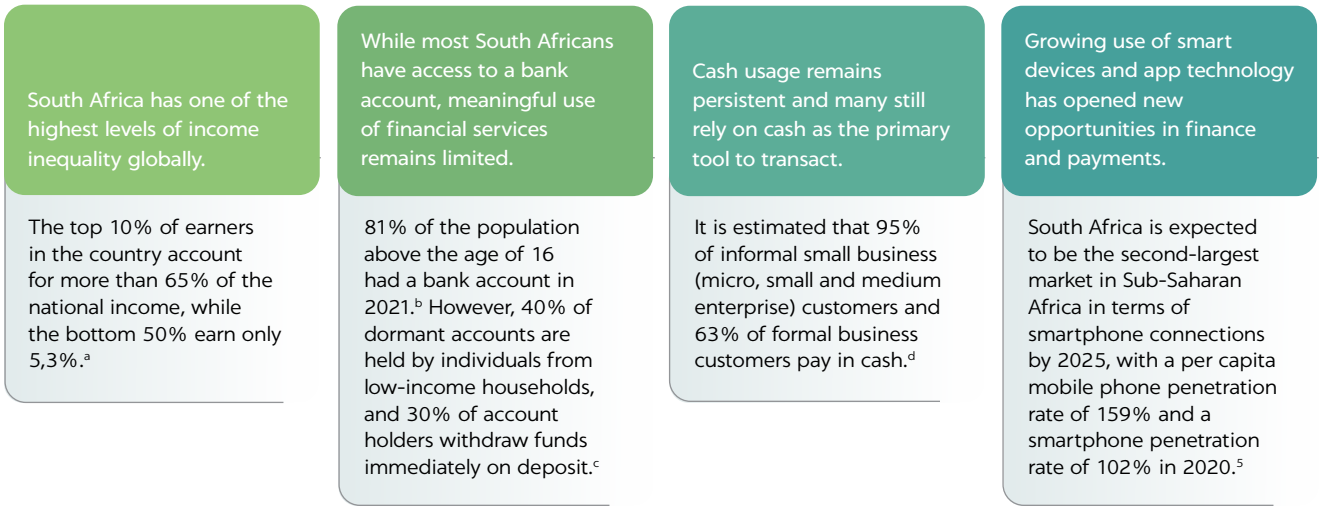
Notwithstanding the wide range of digital payment alternatives mentioned, social inequality is relatively high, unbanked communities are common, and cash is still heavily used. Figure E.2 shows a snapshot view provided by PASA.

FIGURE E.1 The PayShap Journey



Source: South Africa Reserve Bank, "National Payment System Department Regulatory and Oversight Report: 1 April 2022–31 March 2023,"(South Africa Reserve Bank, Pretoria, 2024), 7, https://www.resbank.co.za/content/dam/sarb/what-we-do/payments-and-settlements/regulation-oversight-and-supervision/regulatory-and-oversight-reports/NPSD%20Regulatory%20and%20Oversight%20Report%202022-2023.pdf.

FIGURE E.2 **PASA's 2022 Payments Snapshot**



Source: Payments Association of South Africa (PASA), "PASA Integrated Report 2022" (PASA, Parktown, 2023), 34, *https://pasa.org.za/wp-content/uploads/2023/06/PASA_IAR_2022.pdf.*

a. "World Inequality Report 2022", World Inequality Lab.
b. FinMark Trust "South Africa Data Portal" and "FinScope South Africa Consumer 2021 Results—Webinar".
c. Financial Sector Conduct Authority, Financial Sector Outlook Study 2022 and "FinScope South Africa Consumer 2021 Results—Webinar".
d. International Finance Corporation (2020) "The MSME Voice".
e. Authors' calculations from "An overview of developments in South Africa's payments industry", Journal of Payments Strategy & Systems (Volume 16:3), June 2022.

Developmental Context

Following South Africa's early foray into real-time payments through the RTC service, the ambition to build a more flexible, more inclusive next-generation fast payment system was under discussion for several years. In 2017, payment modernization research was commissioned jointly by PASA and BankservAfrica, identifying the potential economic and social value of an open real-time service. In 2018, PASA undertook Project Future to develop a target design for such a system, and BankservAfrica launched the Rapid Payments Program (RPP) to develop the service.

RPP developed formal program governance. Interested banks signed a build agreement with BankservAfrica that contained some engagement and resource commitments and enabled them to participate in design, technology selection, business development, build, test, and launch phases. The RPP was administered by an external project management firm and governed by the Special Purpose Committee (SPC) of bank representatives, with observer participation from the SARB and PASA.

PayShap launched in March 2023, with operational management passing to separate governance arrangements (described later) while the SPC continues to administer the development project as new participants come onstream and extra functionality is brought online. It is likely that, following rollout of further functionality, the project will transition to full operation and the SPC will disband.

POLICY, REGULATORY, AND OVERSIGHT CONTEXT

The SARB has jurisdiction over payment systems and infrastructure under section 10 of the SARB Act 90 of 1989, as amended. It carries out its responsibilities through the National Payment System Department (NPSD), reporting to a deputy governor who is a member of the board of directors of the SARB. In order for the NPSD to achieve the policy and regulatory objectives of promoting the effectiveness, integrity, safety, efficiency, and stability of the NPS, the NPSD executes its regulatory responsibility through the development of policies and issuance of legally binding directives under the NPS Act 78 of 1998, as amended. The NPSD also periodically issues nonbinding position and information papers to affirm and clarify its policy position on specific payment system issues.[3]

In discharge of its oversight responsibilities over payment systems, the SARB regularly conducts assessments of systemically important financial market infrastructures under the CPMI-IOSCO *Principles for Financial Market Infrastructures* (PFMI). BankservAfrica is one of four such financial market infrastructures (FMIs) identified by the SARB.[4]

Further, in May 2023, the SARB established a Supervision Unit within its Oversight and Supervision Division in a move to clearly delineate its supervisory objectives, responsibilities, resources, tools, and processes from its oversight objectives. The main objective of the Supervision Unit is to ensure that supervised persons and entities in the NPS continue to deliver payment services in a responsible, efficient, safe, and resilient manner.[5] Those entities include BankservAfrica as the operator of multiple payment systems, including PayShap.

Under the NPS Act, only banks and designated clearing system participants may participate in payment clearing and settlement systems. The NPS Act provides for the recognition of a self-regulatory payment system management body (PSMB), established with the objectives of organizing, managing, and regulating the participation of its members in the payment system.[6] The PSMB model was explicitly self-regulatory in intent.[7] The PSMB may recommend participation criteria for all South African payment systems, subject to approval of the PSMB's criteria by the SARB.

Since 1999, the PSMB has been PASA, a nonprofit association of clearing banks,[8] which historically provided the self-regulatory framework for South African payment systems, including PayShap. PASA's clearinghouse participation criteria have the effect that only PASA members can clear and settle payments in a clearing system.

PASA organizes, manages, and regulates its members' activities within the South African payment system and collaborates closely with the SARB, contributing to the regulation and management of clearing and settlement systems.[9] The PASA Constitution recognizes the SARB's mandate as the public oversight body for payments.

PASA's governance body is the PASA Council, comprising:[10]

- four representatives of larger banks;
- three more representatives collectively representing smaller banks;
- five independent nonexecutive councilors;
- the chief executive officer (CEO); and
- an ex-officio councilor appointed by the SARB.

The chair and deputy chair are independent nonexecutive councilors.

PASA's responsibilities are discharged through PASA Structures—groupings of member bank representatives focused on specific clearing systems. In 2022, PASA established a Payment Clearing House (PCH) Participant Group as the management committee for a new Rapid Payments clearing system. The clearing system is governed under a PCH Participant Group Constitution and a set of Rapid Payments Clearing Rules including participation criteria.

Any organization that wants to participate in PayShap must be a member of PASA and join the Rapid Payments PCH by executing a PCH Agreement. The Rapid Payments PCH at PASA has appointed BankservAfrica as the Payment System Operator (PSO) for the clearing system. The Rapid Payments PCH Clearing Rules provide for the efficient processing of PayShap payment obligations among clearing members. This includes the orchestration of settlement through the SARB's real-time gross settlement system, the South African Multiple Option Settlement (SAMOS) system.

INSTITUTIONAL CONTEXT

BankservAfrica's central role as the bank-owned operator of South African payments infrastructure goes back 50 years, to a time before any formal regulatory framework existed. The prime movers in payments infrastructure were the leading commercial banks of the day. By the early 1970s, central clearing of paper instruments had been established, followed in the early 1980s by central clearing of card payments. This tradition of industry-led automation and centralization was reinforced in 2006, when BankservAfrica became one of the first national operators in the world to launch an account-to-account fast payments system: RTC.

BankservAfrica's ownership structure reflects its industry origins. It has four leading South African banks as major shareholders, each with 23.125 percent of shares. A fifth composite shareholder called Dandyshelf holds the remaining 7.5 percent. Dandyshelf was created in consultation with the SARB in 1999 and exists to reflect the interests of other system participants. It currently has seven bank shareholders. In this sense, BankservAfrica can be regarded as participant owned, although there is no formal relationship between shareholding and usage of BankservAfrica's services; a few large participants are shareholders, a few more participants have indirect interest through Dandyshelf, and other participants fall into neither category. BankservAfrica's financial structure is that of a commercial organization funding its activities through usage charges, although consistent with its collaborative, community-based origins, it aims for finan-

cial sustainability rather than profit maximization and does not typically pay dividends to shareholders.[11]

The shareholding structure drives decision-making. All five shareholders are entitled to appoint a director to the board, and the board itself appoints up to five independent, nonexecutive directors (currently four are appointed) with two executive directors: the chief executive officer and the chief financial officer. The company describes the governance outcome as follows:

> [O]ur shareholder-appointed . . . directors strengthen our role as a mutual and ensure our sustainability as a utility in the industry. Our independent non-executive directors…ensure our activities and processes advance the core interests of the broader payment system and act in the public interest. Every director acknowledges that their primary fiduciary duty is to the company.[12]

Under the Constitution, the CEO is responsible for day-to-day management of the company and, for that purpose, has appointed an executive committee of senior staff (ExCo).

Users of BankservAfrica's payment system services sign a master services agreement (MSA) with BankservAfrica, which establishes the legal relationship between them and includes an annexure of terms and conditions specific to each payment system accessed by the participant. In the case of PayShap, Annexure A16 is required. In turn, the MSA binds the participant to comply with operating rules for each payment system. These relate to matters such as technical requirements and processing arrangements.

PayShap has an additional governance framework, also administered by BankservAfrica: the PayShap Scheme. It is designed to deliver a consistent end-user experience, covering matters like marketing, service delivery, and business development. This is a significant change in approach for BankservAfrica from a utility industry service provider to an end-user service promoter. BankservAfrica characterizes the Scheme as providing

> a viable legal construct to enforce mutually-beneficial behaviours among participating members, and to provide a direct mechanism for participating members to influence and direct the desirable growth and evolution of their services. … it enables us to ensure that customers of our customers have a consistent market experience when using payments products.[13]

The scheme comprises a Scheme Constitution, Scheme Rules and Procedures, a PayShap Governance Charter, and a governance council, to be appointed by BankservAfrica's ExCo. The 10 current participants of the PayShap service are bound under BankservAfrica's contractual arrangements to comply not only with PayShap operating rules, but also with the scheme rules.

The proposed Scheme Governance Council consists of a representative appointed by each PayShap participant, alongside BankservAfrica representatives appointed by the ExCo.[14] Both PASA and the SARB have ex-officio representatives. The chairman is an independent, nonexecutive appointment and has the capacity to refer matters before council to the BankservAfrica ExCo for decision-making, exercising "reasonable discretion." In effect, therefore, the council directs PayShap scheme activities subject to escalation and reporting to the ExCo and, through it, ultimately the BankservAfrica Board.

A GOVERNANCE SNAPSHOT

The current and planned PayShap governance arrangements are presented in figure E.3. A participant in PayShap will be

- bound by two distinct membership agreements;
- subject to three sets of rules or requirements; and
- subject to governance decision-making from, potentially, five bodies.

It should be noted that the governance arrangements are still evolving, and these may also undergo a transition consequent to the legal and regulatory changes. The current arrangements involve an unusual number of decision-making steps and extensive community participation for any major proposal.

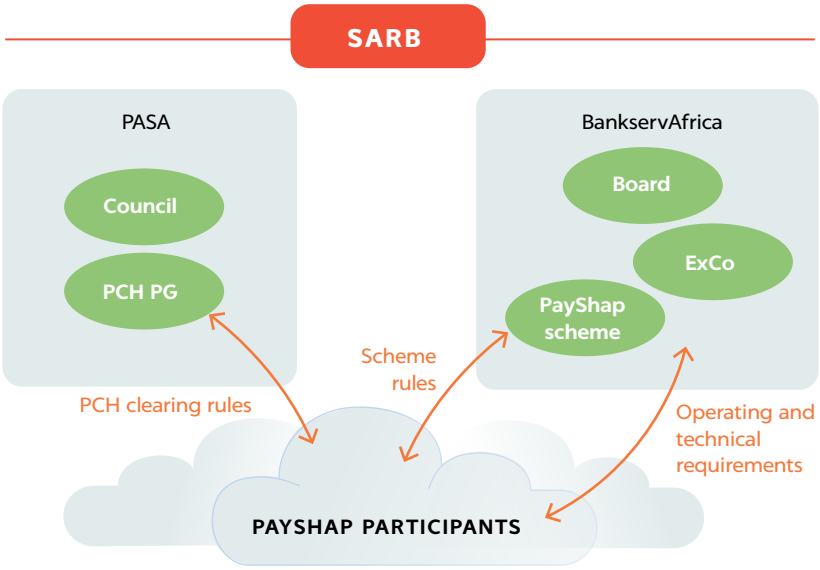
GOVERNANCE EVOLUTION OF PAYSHAP

Self-regulation versus Public Regulation

The PSMB model for payments self-regulation established under the NPS Act[15] came under sustained criticism in South Africa from around 2015 onward, culminating in a 2018 review, which proposed its removal from the NPS Act.[16] The concerns raised included the following:

- Ineffective management of the conflict between the competing interests of members on one hand, and management in the interest of the system as a whole on the other hand;
- Lack of legislative clarity on the appropriate regulatory and governance structures; and
- The perceived slow pace of regulatory reform and service innovation.[17]

FIGURE E.3 **Governance Snapshot of PayShap in mid-2023.**



Source: Original figure for this report.

The proposed replacement framework focuses on a clarified role and mandate for the SARB as the regulator, overseer, and supervisor of the NPS, including the removal of recognition of the PSMB self-regulatory body. In effect, PASA's responsibility for regulatory management of payment systems would fall back to the SARB. The legislative amendments to bring this about were in progress at the time of writing.[18]

There has been extensive industry debate led by PASA about the need for and the potential responsibilities of a new payment industry body (PIB) once PASA's self-regulatory responsibilities fall away. In November 2022, PASA presented to the SARB a detailed design report on a future PIB. The report offers an exhaustive analysis of possible industry body functions and proposes an extensive role and framework for a future industry-led PIB in the governance of payment systems. Significantly, the design proposed would include a delegated "two tier" regulatory mandate, based on guidance from the SARB:

PILLAR I: Membership of the PIB as a licensing condition

All entities which require licensing for their payments activities will be required to be members in good standing of a PIB. This gives the PIB the ability to manage middle-mile interoperability across all parties and, further, to enforce the PIB rules and technical standards.

PILLAR II: Licensing of the PIB

The PIB itself will be licensed by the SARB to perform key functions, including writing rules, which will supersede scheme and operator rules, if required. The PIB will also manage the risks associated with interoperability. The SARB will oversee the PIB activities.[19]

Note that this design preserves for PASA's existing powers to make its own payment system rules. The SARB has indicated that it has "no objection" to PASA's PIB proposal.[20]

As described, PayShap is currently subject to a set of clearing rules administered by PASA through a PCH Participant Group. If the new PIB design is adopted, it is likely that the PASA component of the governance diagram in figure E.3 will be replaced by a new self-regulatory body—the PIB—that has mandatory powers to, among other things, enforce compliance with interoperability rules that operate alongside the scheme and operator rules within BankservAfrica's sphere.

SCHEME RULES AND PAYMENT OPERATORS

Another consequence of the PSMB model is that rulemaking, which is recognized and enforceable under the NPS Act, can take place only through PASA structures; the NPS Act has no framework for rulemaking by operators like BankservAfrica. The SARB has indicated that this means domestic operators like BankservAfrica do not have the power to set and enforce their own operating rules.[21] It has been suggested that this may not fully comply with principles 1 and 23 of the PFMI, which require a clear, sound, transparent, and enforceable legal basis for payment systems, and to have clear and comprehensive rules and procedures.[22]

The proposed changes to South Africa's national payment systems legislation would address this. They would remove recognition of a PSMB, including its self-regulatory rulemaking functions. The SARB would license schemes and operators for payment systems, including the PayShap Scheme and BankservAfrica as its operator. In turn, the Scheme and Operator would have greater rights and responsibilities to establish and enforce their own rules governing the operation of PayShap and the activities of participants. They

would be required to publicly disclose rules and monitor compliance. The SARB would have appropriate powers to review Scheme and Operator Rules.[23]

It was at least partly in anticipation of this legislative change that BankservAfrica established the PayShap Scheme framework.

BANKS AND NON-BANKS

Local and international reviews of South African payments regulation have repeatedly expressed concern over the bank-centric nature of payments regulation and governance and the lack of inclusiveness.[24] In its work on future evolution of the South African payments system, the SARB has recognized that technology-driven structural change is bringing new players and new products, and that maintaining international competitiveness requires the opening up of payment systems to new services and new business models.[25]

Some progress has already been made under the existing governance model. Four of PASA's 35 members are non-bank "designated participants," and PASA administers a regulatory framework for 88 "system operators" and 298 "third party payment processors" (each category denoting an entity providing payment-related services).[26] In relation to PayShap, so far the only members are banks, and no non-bank entities are directly represented in its governance structures. PASA also operates consultative stakeholder forums that include non-bank stakeholders.[27]

Nevertheless, the proposed new regulation is intended to go further. The SARB's proposals include access for non-banks to be able to clear payments in retail payment streams, including PayShap, and also to settle payments in the national RTGS system, SAMOS.[28]

GOVERNANCE LESSONS

Governance structures owe as much to history and culture as to good decision-making

The complex evolution of PayShap's governance demonstrates the extent to which governance is a real-world exercise. It must reflect preexisting local governance habits and practices, or risk lacking credibility in the community it serves. In South Africa's case, there appear to be three elements to this:

- A long history of community cooperation and self-reliance encouraged governance choices involving community ownership and direction.
- The unusual split of functions and powers in earlier South African payment systems between a self-regulatory system manager (PASA) and a quasi-mutual system operator (BankservAfrica) meant that PayShap decision-making would need to be similarly split across two organizations.
- South Africa has a developing economy with a developed financial system. This has given rise to an influential banking community serving a large part of the community, alongside a significant, underserved community with a distinct, historically cash-based economy.

The result for PayShap governance has been something of a hybrid structure, mixing old with new. For both regulatory and cultural reasons, PayShap's governance structure had to fit into the South African historical model, splitting decision-making between PASA and BankservAfrica, with the banking community having the dominant voice in both cases. BankservAfrica itself was looking to change this model, partly in response to proposed changes to the regulatory framework. This led to the creation of a new scheme governance structure, as outlined in this case study. However, this has, in practice, led to a three-way split in the governance structure between a scheme manager, a self-regulatory manager, and an operator, each with its own relationship with each participant and its own powers over aspects of PayShap's strategy and operations.

GOVERNANCE IS A MOVING TARGET

Regulatory reform with significant governance implications has been on the agenda in South Africa throughout the conception, design, build, and launch phases of PayShap.[29] This has complicated governance design significantly. In order to launch in early 2023, PayShap adopted a governance structure that relied on an existing self-regulatory model for governance through PASA, even though the public regulator had, in 2018, announced its intention to do away with this model.

Similarly, BankservAfrica has known since 2018 that coming legislative reform would require it to establish its own operational rules and governance framework under direct public oversight. Yet it has been unable to fully implement a compliant framework without changes to the law.

HOW MUCH STAKEHOLDER ENGAGEMENT IS TOO MUCH?

As noted, there are five different structures involved in PayShap governance. Four of these feature a significant number of direct representatives of the participant community,[30] all of which are currently commercial banks. This is to be expected in a market where, for historical and regulatory reasons, banks are the principal suppliers of payment services to businesses and consumers. There are proposals for broader access, resulting from a number of reviews arguing in favor of it.

It is worth considering how well the current PayShap arrangements support a high level of stakeholder engagement. It is clear that current arrangements ensure a high degree of alignment and consensus among the bank participant community for any strategic decision-making. As a proposal makes its way through the decision-making structures, bank representatives have multiple opportunities to scrutinize, amend, and ultimately support the proposal.

There is, however, room to question the capacity for rapid and market-responsive decision-making, particularly where a proposal is controversial in the banking community. Then, any one bank participant who believes it is adversely affected has multiple opportunities to delay or divert the proposal. Extensive stakeholder engagement is inherently desirable, yet there is room to consider whether there is a need to mitigate against this risk of delay.

As a related aspect, it is also worth considering whether the large influence of some commercial banks in decision-making provides a balanced perspective. PASA has non-bank stakeholder forums which address, among other things, aspects of PayShap.[31] But the relative degree to which commercial banks are involved might be seen to reinforce the concerns summarized earlier about a lack of inclusiveness.[32] The inclusion of independent directors in decision-making bodies is a way to mitigate these concerns, as is the case with the PASA Council and the BankservAfrica Board. Nevertheless, consideration might be given to enhancing the roles and responsibilities of non-bank stakeholder forums as part of PayShap decision-making.

FUTURE OPPORTUNITIES

Current arrangements spread decision-making responsibility across multiple bodies, with the potential for jurisdictional disputes and a lack of clarity among them. In nearly every other FPS, one body, a scheme council or board, has decision primacy over each service—the rights and responsibilities to its stakeholders to set the service strategy and direct its execution. Many parties may be involved in operations and development, but there is usually little doubt as to where the ultimate decision power lies. In PayShap, this may not be clear to everyone.

Nevertheless, several of the structures in question have evolved over many years and have a proven track record of delivery. They are widely understood in the South African industry and used every day across multiple systems. They are currently operating at a time when the future legislative framework is by no means certain. Structural reform in these circumstances is challenging.

A clear published and jointly adopted PayShap Coordination Protocol could address many of the issues raised. It could:

- clarify roles and responsibilities;
- establish joint strategic priorities for the PayShap service such as a migration-coexistence path for PayShap with RTC and other services, a process and timetable for the inclusion of fintech communities, and so on;
- be formally endorsed by the SARB Board, SPC, BankservAfrica Board, PASA Council, PCH Participant Group, Scheme Council, and (potentially) PIB Board;
- be debated and reviewed periodically;
- specify coordination and engagement activities; and
- describe the preferred evolution of governance as the law changes.

A well-written Coordination Protocol could put practical flesh on the bones of industry collaboration. It could go a long way to increasing confidence in the future governance of PayShap and thereby contribute to its future success.

NOTES

1. Further details of PayShap can be found at https://www.payshap.co.za/#/home.
2. World Bank, "Global Findex 2021," 2021 https://www.worldbank.org/en/publication/globalfindex/Data.
3. "South African Reserve Bank, "Oversight and Supervision," accessed July 2024, https://www.resbank.co.za/en/home/what-we-do/payments-and-settlements/regulation-oversight-and-supervision.
4. South African Reserve Bank, "National Payment System Department Regulatory and Oversight Report: 1 April 2023–31 March 2024" (South Africa Reserve Bank, Pretoria, 2024), 15, https://www.resbank.co.za/content/dam/sarb/what-we-do/payments-and-settlements/regulation-oversight-and-supervision/regulatory-and-oversight-reports/NPS%20Regulatory%20and%20Oversight%20Report%202023.pdf.

5. "South African Reserve Bank, "National Payment System Department Regulatory and Oversight Report," 16.
6. South African Reserve Bank, "Review of the National Payment System Act 78 of 1998" (Policy paper, SARB, Pretoria, September 2018), 12, https://www.treasury.gov.za/publications/other/NPS%20Act%20Review%20Policy%20Paper%20-%20final%20version%20-%2013%20September%202018.pdf.
7. South African Reserve Bank, "Review of NPS Act 78 of 1998," 3, 36.
8. Apart from licensed banks and government banking organizations, a few specialist non-bank organizations are also members for specific purposes. Diners Club is a member in order to offer Diners Club cards in South Africa, and since 2022, non-bank card acquirers began joining as Designated Clearing System Participants.
9. Payments Association of South Africa, "Payments Association of South Africa Integrated Report 2023," (PASA, Johannesburg, 2024), 14, https://pasa.org.za/wp-content/uploads/2024/07/PASA-IR-2024_FINAL_COMPRESSED.pdf.
10. See PASA website at https://pasa.org.za/about-us/structure/council-new/, accessed June 2024.
11. BankservAfrica, "BankservAfrica Business Report 2022" (BankservAfrica, Johannesburg, 2023), 51.
12. BankservAfrica, "Business Report 2022," 46.
13. BankservAfrica, "Business Report 2022," 25.
14. At the time of writing, the updated Governance Charter for PayShap had not yet been finalized with participants. The description relates to the most recent discussion draft version.
15. See "Policy, Regulatory, and Oversight Context" section.
16. South African Reserve Bank, "Review of NPS Act 78 of 1998," 43.
17. South African Reserve Bank, "Review of NPS Act 78 of 1998," 37–38.
18. South African Reserve Bank, "National Payment System Department Regulatory and Oversight Report," 9.
19. Payments Association of South Africa, "Payments Industry Body," 2025, 75, https://pasa.org.za/payments-industry-body/.
20. Payments Association of South Africa, "Payments Industry Body," accessed June 2024.
21. In practice, BankservAfrica does make "rules," in the sense that it establishes both operational and scheme requirements, which are contractually binding for PayShap participants.
22. South African Reserve Bank, "Review of NPS Act 78 of 1998," 43–44.
23. South African Reserve Bank, "Review of NPS Act 78 of 1998," 44.
24. South African Reserve Bank, "Review of NPS Act 78 of 1998," 47–48.
25. South African Reserve Bank, "Vision 2025: National Payment System Framework and Strategy," 2018, 3.
26. Payments Association of South Africa, "PASA Integrated Report 2023," 16.
27. Payments Association of South Africa, "Committees and Forums: Regulatory Forums," accessed June 2024, https://pasa.org.za/about-us/structure/forums/.
28. South African Reserve Bank, "Review of NPS Act 78 of 1998,", 47–51.
29. One reason for the long delays involved was undoubtedly the intervention of the COVID-19 pandemic from 2020 onward.
30. The exception is BankservAfrica's ExCo, which consists of company executives.
31. Payments Association of South Africa, "Regulatory Forums," accessed June 2024.
32. See the "Banks and Non-banks" section.

APPENDIX F

ARAB REPUBLIC OF EGYPT CASE STUDY (IPN)

IPN GOVERNANCE: KEY LESSONS

The Egyptian Banks Company for Technological Advancement (EBC) is the domestic payments system operator for the Arab Republic of Egypt. It has progressively developed a suite of retail digital payments infrastructure including Meeza Digital (2017) for instant payments interoperability of mobile wallets and the fast Payment Network (IPN), launched in 2022, for fast payments interoperability across bank accounts as well as with mobile wallets. The regulatory authority responsible for Egyptian payments is the Central Bank of Egypt (CBE), which, in 2017 led the establishment of the National Payments Council (NPC), a cross-government payment policy body with top-level governmental membership.

CBE is the majority owner of EBC, and a majority of EBC's board is aligned with CBE or other government authorities. In effect, EBC is the execution arm for national payment system policy.

The following observations can be made in relation to FPS governance in Egypt:

- **The regulatory framework shapes the marketplace.** CBE has issued specific rules for IPN, which designate EBC as operator and set access criteria and ongoing obligations for participation. This direct regulatory support ensures IPN's central role in Egyptian retail digital payments.
- **Effective policy coordination assists progress.** Egypt's NPC provides a clear framework for coordinating and prioritizing national payments policy on a whole-of-government basis.
- **FPS governance is determined by national operator governance.** The use of a preexisting national payments operator (EBC) to develop Meeza Digital and IPN had obvious and substantial benefits in terms of CBE's governance involvement, development expertise, culture, and operational track record. However, this means governance arrangements for the new FPSs are de facto those of the operator, and it is worth considering whether those arrangements are well-adapted for this new purpose.
- **Separation of functions can have multiple benefits.** EBC's governance strikes an effective balance between alignment with public policy imperatives established by CBE and significant autonomy in terms of operational design, delivery, and execution.
- **Banks and non-bank providers can coexist in a bank-centric regulatory framework.** Egypt has a bank-led oversight and regulation model: non-bank wallet providers (such as mobile money operators) must be sponsored by a bank. Non-bank providers appear to have no formal role in FPS governance, but this does not seem to have impeded their adoption of the FPSs, perhaps because of the public policy-oriented leadership of EBC.

Finally, the case study makes the suggestion that, in terms of governance transparency and stakeholder engagement, EBC's arrangements may not align very well with global published guidance on governance practices. This may be an area for further consideration as the services develop.

INTRODUCTION TO THE INSTANT PAYMENT NETWORK

Overview and Market Context

The EBC is the domestic payments system operator for Egypt. Established in 1995 to build and operate interbank network infrastructure and facilitate government payment processing, EBC has an extensive history of digital payments innovation for retail and government payments, including the following (figure F.1):

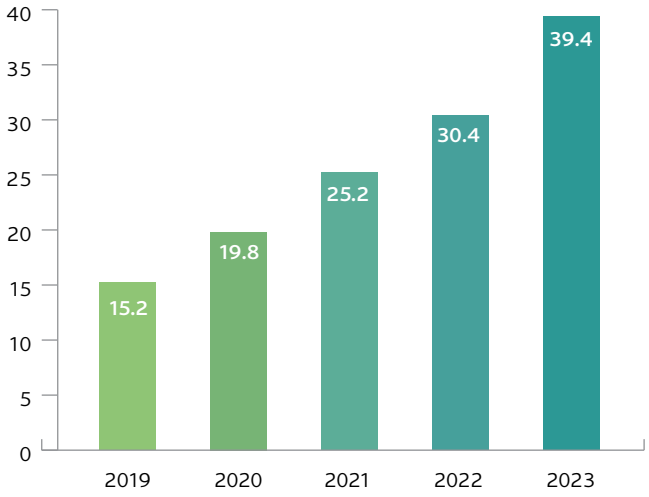
- 1997: 123 Shared Cash Interbank ATM network;
- 2010: National interbank ACH;
- 2017: Interoperable network for mobile wallets (subsequently "Meeza Digital");
- 2018: Meeza national payment scheme for branded domestic debit and prepaid cards;
- 2022: IPN, providing interoperability across bank accounts and mobile wallets and enabling third-party connectivity using open APIs;
- 2022: The InstaPay application, an overlay service of the IPN, allowing access to multiple bank accounts.

Egypt has historically been heavily cash-based, with relatively low penetration of international scheme cards. Recent years have seen the adoption of a national financial inclusion strategy and rapid growth in the financial inclusion rate. According to CBE published data, the inclusion rate (adults with a transaction account, wallet, or prepaid card) has reached 70.7 percent across a population of 66.4 million citizens. This represents an increase of 174 percent since 2016.[1]

Like many African markets, digital financial inclusion has involved rapid growth in mobile wallets, although the creation of a national debit and prepaid card scheme by EBC in 2018 led to rapid expansion in card usage. Although Egypt has a bank-led regulatory model, there is healthy market competition for non-bank mobile wallet services, which gain access to national infrastructure through bank sponsorship.

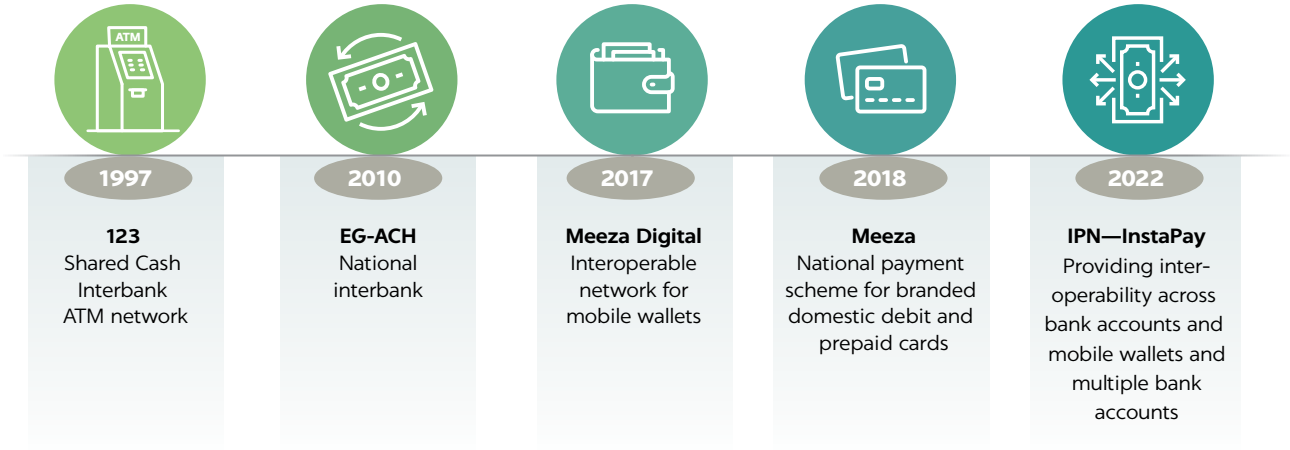
The recent establishment of the IPN as an open API-based network for universal payments interoperability marks

FIGURE F.2 Growth in Egyptian Mobile Wallets, 2019–23



Source: Central Bank of Egypt, "Financial Inclusion and Payment Systems and Services Indicators: December 2023," 2024, https://www.cbe.org.eg/-/media/project/cbe/page-content/rich-text/financial-inclusion/infograph_financial-inclusion-and-payment-systems-indicators-english-final---dec,-d-,2023.pdf.

FIGURE F.1 Digital Payments Timeline



Source: Original figure for this report.

a critical milestone for Egypt. The IPN is designed to provide open, fair, competitive access to Egyptian payments in order to maximize innovation and efficiency on a stable, well-regulated, and publicly supported basic network. The InstaPay application, which is provided by EBC, supports multiple bank accounts and is designed to be the first of multiple overlay services using the IPN.

POLICY CONTEXT

The regulatory authority responsible for Egyptian payments is the CBE, established under the Central Bank and Banking System Law 194 of 2020 (the 2020 Law).[2] The CBE identifies the soundness and efficiency of payments as a key competency, along with developing frameworks to reduce the physical use of money. CBE is administered under its own statute, originally promulgated by a presidential decree in 2004,[3] but it is now recognized under the 2020 Law. The statute gives CBE explicit power to supervise the national payments system under Article (6)H. Administration of these powers is the responsibility of the Payments Systems and Services unit of CBE, which reports through the Banking Operations Directorate to the deputy governor for monetary stability (figure F.3).

Since 2017, levels of activity in payments regulation have increased markedly, with a stream of laws, regulations, and government-sponsored initiatives.[4] As indicated, this appears to have supported significant network growth and increased financial inclusion. It appears that a key driver was the establishment in 2017 of an NPC. The NPC was initially established by presidential decree,[5] but it now derives authority from Article 50 of the 2020 Law. The national seniority of the NPC membership underlines the public policy importance in Egypt of payments system development as a means of increasing financial inclusion.

With an NPC consisting of the most senior government ministers, Egypt's government can both demonstrate and carry out its commitment to payment system initiatives. Key infrastructure developments summarized in the "Overview and Market Context" section, including the establishment of the Meeza scheme and other directives, were explicitly authorized by the NPC. They form part of a broad, multiyear, whole-of-government program called the Less Cash Transformation Network. The scope of the program is summarized in figure F.4.

FIGURE F.3 Members of the National Payments Council (NPC)

Chairman of the National Payments Council

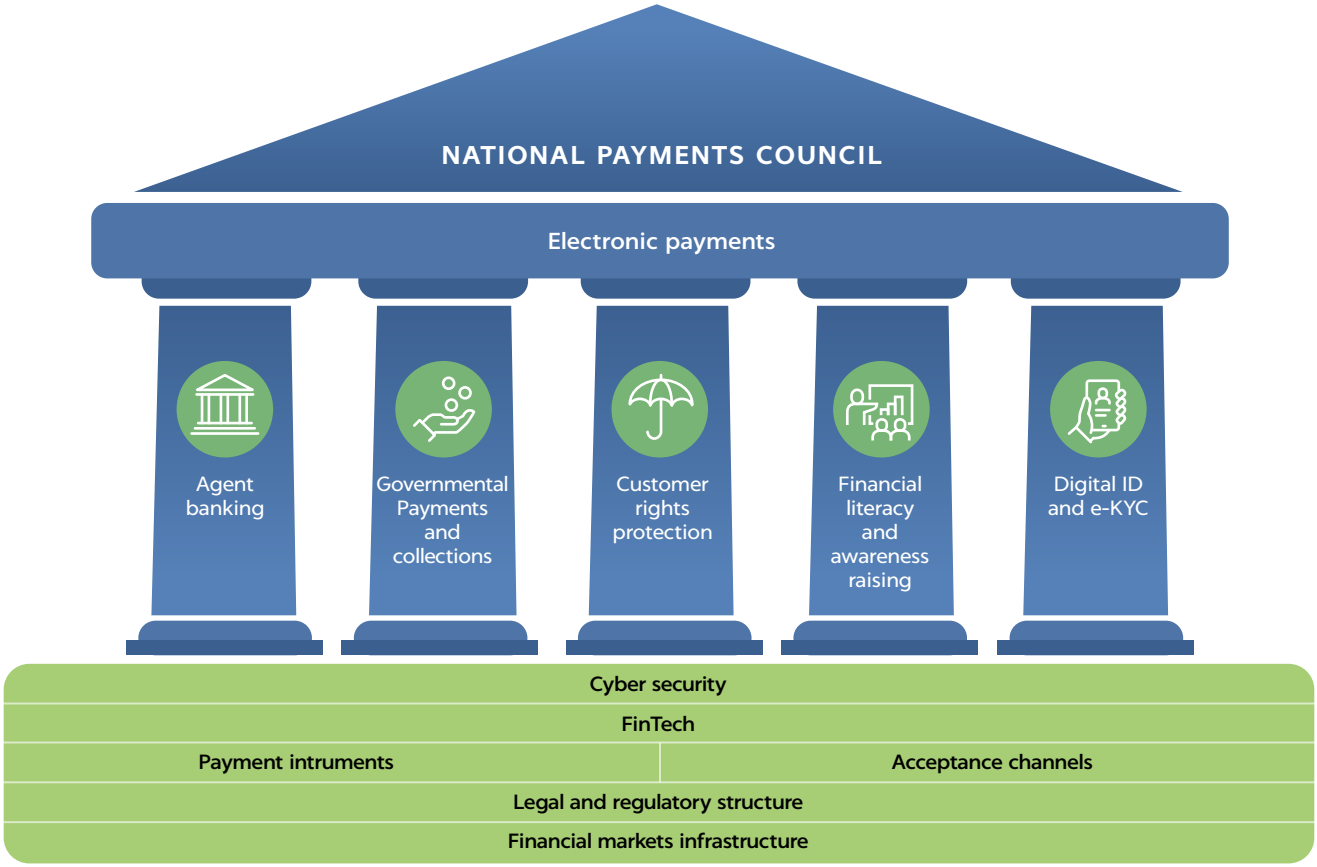
His Excellency, The President of Egypt

Members

- The Prime Minister, and chairs NPC meeting in case of NPC Chairman absence.
- Central Bank of Egypt Governor
- Minister of Defense and Military Production
- Minister of Planning and Economic Development
- Minister of Interior
- Minister of Communications and Information Technology
- Minister of Justice
- Minister of Finance
- Director of General Intelligence
- Chairman of the Administrative Control Authority
- Deputy Governor of the Central Bank of Egypt for Banking Stability
- Deputy Governor of the Central Bank of Egypt responsible for Payment Systems
- Executive Chairman of The Financial Regulatory Authority
- Chairman of the Board of Trustees of the Money Laundering and Terrorist Financing Combating Unit
- Chairman of the Board of Directors of a bank
- Sub-Governor or Assistant Sub-Governor of the Central Bank of Egypt responsible for Payment Systems
- Legal Advisor
- Council Rapporteur

Source: Central Bank of Egypt, "An Overview of The National Payments Council," www.cbe.org.eg/en/payment-systems-and-services/national-payments-council-npc.

FIGURE F.4 The Arab Republic of Egypt's Less Cash Transformation Framework



Source: Central Bank of Egypt, "An Overview of The National Payments Council," www.cbe.org.eg/en/payment-systems-and-services/national-payments-council-npc.

REGULATORY CONTEXT

The strong policy guidance provided by NPC and CBE for payments innovation is reflected in clear regulatory frameworks. In the case of the IPN, the regulatory framework is comprehensively provided by the set of Rules Regulating Services for Instant Payment Network, issued by CBE in October 2021. The rules build on more general regulation of financial transactions, in particular the "Law Relating to Usage of Non-cash Payment Methods."[6]

The rules provide for the key governance aspects of the IPN's operation, including the following:

- Designating EBC as operator with appropriate powers of operational rulemaking, setting minimum access criteria, setting tariffs, and network risk management;
- Setting minimum access and compliance criteria for banks to act as participants;
- Criteria for third-party providers such as mobile money operators (MMOs) and fintechs to be given access; and
- Continuing obligations of all participants.

INSTITUTIONAL CONTEXT

If the NPC is the principal strategy-setting body for Egyptian payments, the execution arm is EBC. CBE is the majority owner[7] and appoints five of the 10 directors on the board, including the chairman.[8] Two more directors are appointed from the National Investment Bank, which is government owned. There are two directors from leading commercial banks (both under government ownership), and an executive chairman/CEO. Details of minority shareholdings are not public, but by interference from director representation, the government of Egypt is the ultimate controller of most of the shares.

EBC's strategic orientation reflects the close relationship with the central bank. Although EBC is structured as an Egyptian private company and has its own management team and financial resources, strategic developments are subject to close oversight by CBE, with developments directed by the NPC and EBC's role mandated by central bank regulation. Perhaps as a consequence of this, EBC publishes little in the way of corporate governance information. There is no separate annual report or other corporate reporting, no published strategy or business plan, and no financial information available.

EBC does not appear to have formal standing arrangements for consultation with industry stakeholders but nevertheless retains close relationships with network participants, including Egypt's banks and mobile network operators. EBC regularly engages in consultation and market research on proposed new services. Final decision-making remains a matter for the board, subject to central bank oversight.

GOVERNANCE LESSONS

The regulatory framework shapes the marketplace

As previously described, the regulatory framework provides the required certainty within which the market can prosper, and also makes clear the level of government support for the FPS. A key element of this in Egypt is the explicit designation of EBC as the operator of a national FPS under rules made by CBE as the authorizing central bank. Access arrangements (and compliance obligations) for banks and non-bank providers are similarly clear. The Egyptian law does not require banks (or others) to connect to IPN or Meeza Digital, as is the case in some other judications.[9] Also, the law does not specifically prevent another network from developing in competition. However, the designation and the specific access and compliance obligations have the effect of ensuring all major payment wallet providers connect to Meeza Digital and all banks with large retail footprints connect to the IPN.

This is important for the success of the network services: For FPSs, as for all network services, the utility of the service to each end user is maximized when the service reaches the highest possible percentage of all potential users. By issuing specific rules for the IPN, CBE has provided the most supportive possible environment for it.

Effective policy coordination assists progress

Egypt's NPC provides a clear framework for coordinating and prioritizing national payments policy on a whole-of-government basis. Such policy councils are part of national payments policy and strategy formulation in many developing countries because a well-developed non-cash payments system is seen as an enabler of economic development. What makes the Egyptian example relatively unusual is the seniority of the council members. This provides great confidence that policy priorities adopted by the council will be supported across the spectrum of government authorities and agencies.

FPS governance is determined by national operator governance

As in many developing economies, the policy imperative for developing new FPS services in Egypt came from CBE as the central bank. However, the job of actually developing them fell to a national payments operator that was already in existence: EBC. This has obvious and substantial benefits. EBC had already developed management and technical expertise relevant to the role and a culture of systemic innovation to build on. It had established contacts with key industry participants and an operational track record that gave confidence in its ability to deliver. Given the existing close strategic and policy alignment between CBE and EBC, this was the obvious choice with substantial net benefits.

However, when this occurs, there are also some other factors to consider. The new FPS inherits the governance structure of the existing operator. It is desirable to consider whether the governance needs of the FPS are different enough from those of other services provided by the operator as to necessitate different arrangements. For example, in Egypt multiple non-bank service providers need to be connected to the Meeza and IPN systems through bank sponsorship, creating a new stakeholder category. How this was handled in the case of EBC is discussed further in the section, "Banks and non-bank providers can coexist in a bank-centric regulatory framework."

Separation of functions can have multiple benefits

When an FPS is wholly owned by the central bank, there are multiple possible degrees of organizational separation from the bank itself. The FPS could be operated by an internal department of the central bank, under the direct control of the central bank's management structure and its board or council;[10] but, at the other end of the spectrum, it could be a functionally autonomous commercial entity whose shares are owned by the central bank. No doubt the decision will be informed by history, culture, and policy priorities.

The governance of EBC strikes its own particular balance on this spectrum. The government owns a majority of the shares through various authorities, and it also contributes the majority of directors. High-level strategic goals, like increasing financial inclusion and reducing cash usage,

are set by the central bank.[11] However, in pursuit of those goals, EBC's management operates with significant autonomy to develop market-responsive services. EBC operates as a financially self-sustaining service provider, undertaking its own market research, service design, provider selection, and implementation. EBC appears to have used this degree of independence to its advantage in the delivery of attractive and widely used services.

Banks and non-bank providers can coexist in a bank-centric regulatory framework

FPSs, more than other digital payment systems, involve non-bank providers because of the economic alignment of digital payment wallets with mobile phones (hence "mobile money") and social media platforms in many jurisdictions. Egypt is no exception, with active and successful non-bank wallet providers. This can cause governance tensions in many jurisdictions. Where banks have (or are perceived to have) greater influence over system decision-making than other stakeholders, this situation can reduce support among non-bank providers for the system's services. It may also reduce the quality of decision-making, to the extent that the interests of some stakeholders are not adequately taken into account.

Egypt has a bank-led oversight and regulation model: payment services must be offered or sponsored by banks, and the regulatory framework is geared to oversight through bank licensing and supervision. Non-bank wallet providers must be sponsored by a bank. Further, mobile operators and other non-bank wallet providers appear to have no formal role in the governance of EBC, even though it provides important infrastructure for them, and the use of EBC's Meeza Digital network for wallets has grown rapidly.

Nevertheless, the absence of structured engagement for wallet providers in decision-making does not seem to have impeded the development of the IPN and Meeza Digital. This may be because

- EBC is perceived as generally serving the broader public interest through the strategic direction set by CBE;
- EBC engages in market-oriented service development, consulting with potential participants as needed; and
- Decision-making is not unduly influenced by other stakeholder groups, so there is no perceived risk of bias.

It is not always necessary for every stakeholder group to participate in decision-making, as long as the public perceives the process as focused on the public interest and free from bias.

FUTURE CHALLENGES

The ongoing success of EBC's FPS development program is undeniable. Yet there are aspects of its governance that appear not to align very well with global best practices. These fall into two main areas: governance transparency and stakeholder engagement.

As to governance transparency, general principles of corporate governance usually emphasize the desirability of timely disclosure of "all material matters regarding the corporation, including the financial situation, performance, sustainability, ownership, and governance of the company."[12] When these general principles are applied to payment systems, including FPSs, there is a particular focus on disclosure of business or operating rules, fees and charges, and decision-making processes, on the basis that these matters are highly relevant to FPS participants as they connect to the system and develop payment services for citizens and businesses. This can be seen in the leading international guidance, the *Principles for Financial Market Infrastructures* (PFMI),[13] and also in the World Bank's specialized guidance on governance of payment systems, the "Keeping Pace" paper.[14]

As noted, in the case of EBC, there is no published annual report or published book of operating rules which would align with global guidance. The material available on the EBC website is relatively limited in relation to these matters. As Meeza Digital and IPN take a larger and larger role in the Egyptian marketplace, it may be worth considering whether disclosures aligned with global guidance would improve market efficiency and perhaps encourage greater investment in Egyptian digital payment services.

As to stakeholder engagement, global guidance applicable to FPSs also advocates for structured stakeholder engagement in FPS decision-making. This, too, can be seen in the PFMI[15] and "Keeping Pace" paper.[16] The underlying logic is that FPSs, like other kinds of financial market infrastructure, have a central role in the economies they serve. This means that decisions affecting aspects of their operation can affect a wide range of stakeholders, including both system participants and their customers, and they can do so in ways that are hard to predict. Therefore, having stakeholder input should improve decision-making and may also increase levels of support and commitment for the FPS from participants.

In the case of the IPN and Meeza, while it appears that both CBE and EBC undertake market research when considering new developments, it does not appear that there are structured arrangements for stakeholder engagement that are common in other jurisdictions, such as board represen-

tation, advisory committees, or user forums. As the IPN and Meeza Digital become increasingly important in the economic life of Egypt, it may be that some arrangements of this kind would improve the quality of decision-making over the medium to long term.

It should be emphasized that these matters are challenges of success: the rapid growth of Meeza Digital and the IPN are a testament to the success of CBE and EBC in contributing to Egypt's economic development through reduced cash usage and increased financial inclusion.

NOTES

1. Central Bank of Egypt, "Financial Inclusion Indicators: December 2023," 2024, https://www.cbe.org.eg/-/media/project/cbe/page-content/rich-text/financial-inclusion/financial-inclusion-indicators--2023-en-v5.pdf.
2. For more information on regulatory context, see the CBE website at https://www.cbe.org.eg/en/about-cbe.
3. Presidential Decree No. 64 of 2004.
4. For a summary, see Central Bank of Egypt, "An Overview of The National Payments Council," www.cbe.org.eg/en/payment-systems-and-services/national-payments-council-npc.
5. Presidential Decree No. 89 of 2017.
6. "Law Relating to Usage of Non-cash Payment Methods," Law No. 18 of 2019.
7. William Cook, Dylan Lennox, and Souraya Sbieh, "Building Faster Better: A Guide to Inclusive Instant Payment Systems" (Consultant Group to Assist the Poor, Washington, DC, January 2021), 18.
8. See the EBC website at https://www.egyptianbanks.com/about-us/.
9. For example, in Malawi, the national payments law requires banks to connect to Natswitch; in Brazil, large banks are obliged to connect to Pix.
10. This is the case in Brazil in relation to the Pix system.
11. See, for example, CBE's "Financial Inclusion Strategy," available at https://www.cbe.org.eg/en/financial-inclusion/financial-inclusion-strategy.
12. Organisation for Economic Co-operation and Development, "G20/OECD Principles of Corporate Governance," September 11, 2023, 27, www.oecd-ilibrary.org/governance/g20-oecd-principles-of-corporate-governance-2023_ed750b30-en.
13. Bank for International Settlements (BIS) and International Organisation of Securities Commissions (IOSCO), "Principles for Financial Market Infrastructures," April 2012, 121, https://www.bis.org/cpmi/publ/d101.htm.
14. World Bank Group, "Governance of Retail Payment Systems: Keeping Pace with Changing Markets," June 2021, 51–52, https://documents1.worldbank.org/curated/en/539601630306074694/pdf/Governance-of-Retail-Payment-Systems-Keeping-Pace-with-Changing-Markets.pdf.
15. BIS and IOSCO, "Principles for Financial Market Infrastructures," 26.
16. World Bank Group, "Governance of Retail Payment Systems," 47–48.

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Enclosure 12

TECHNICAL NOTE

DISPUTE-RESOLUTION MECHANISMS IN FAST PAYMENTS

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SEPTEMBER 2025

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1 EXECUTIVE SUMMARY

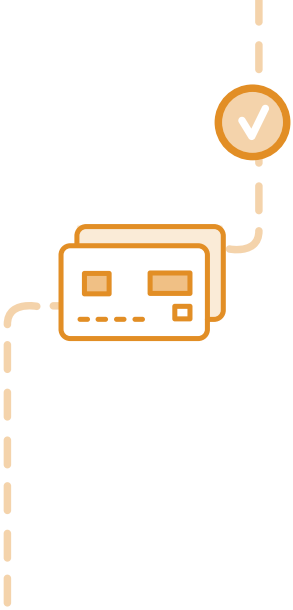
The global proliferation of fast payment systems has transformed retail payment landscapes by enabling instant clearing and round-the-clock availability. While this advancement enhances efficiency and supports financial inclusion, it also introduces novel challenges—particularly regarding the resolution of disputes arising from fraudulent, erroneous, or contested transactions.

This technical note offers a structured examination of dispute-resolution mechanisms in fast payment systems, drawing on diverse global experiences to provide jurisdictions with policy guidance. It identifies the unique features of fast payment systems—such as irrevocability, finality of settlement, and real-time execution—that complicate traditional dispute-handling frameworks. These features increase exposure to operational and consumer risk while compressing the time window for fraud detection, recourse, and fund recovery.

The note distinguishes between different types of disputes, including those between end users (for example, payer-payee disputes) and between system participants (for example, conflicts between operators of payment service providers), and outlines core causes, such as fraud based on social engineering, nondelivery of goods or services, and technical or user errors. It further maps a taxonomy of dispute-resolution mechanisms across three levels of implementation: legal and regulatory mechanisms, scheme-level rules, and market-based or industry initiatives.

Country examples—including those from Australia, Bahrain, Brazil, India, Mexico, Poland, South Africa, the United Kingdom, and the United States—demonstrate a wide spectrum of institutional and technological arrangements. These examples range from centralized, regulator-led mechanisms with consumer-reimbursement mandates, to more decentralized industry codes and voluntary redress models. Despite heterogeneity, common principles emerge: legal clarity, scheme alignment, robust end-user recourse, and layered fraud-prevention strategies.

The note concludes with a set of good practices emphasizing the need for standardized and transparent processes, the integration of legal and scheme-level tools, proactive fraud monitoring, and stakeholder coordination. It stresses the importance of contextual tailoring while encouraging cross-jurisdictional learning. The findings aim to support policy makers and operators of fast payment systems in establishing dispute-resolution mechanisms that preserve trust, reduce systemic vulnerabilities, and uphold consumer protection in the fast-paced environment of real-time payments.

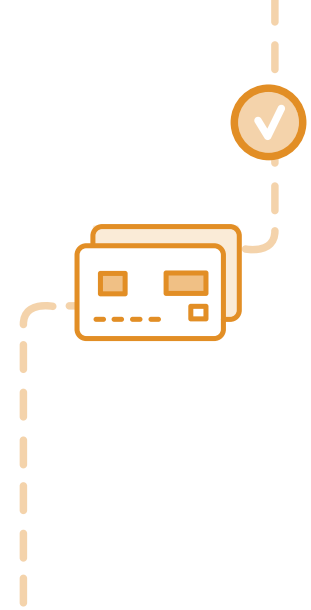


2 SETTING THE CONTEXT

The World Bank has been monitoring closely the development of fast payment systems (FPS) by central banks and private players across the globe. This comprehensive study has resulted in a policy toolkit. The toolkit was designed to guide countries and regions on the likely alternatives and models that could assist them in their policy and implementation choices when they embark on their FPS journeys. Work on the FPS Toolkit was supported by the Bill and Melinda Gates Foundation. The toolkit can be found at fastpayments.worldbank.org and consists of the following components:

- The main report, *Considerations and Lessons for the Development and Implementation of Fast Payment Systems*
- Case studies of countries that have already implemented fast payments
- A set of short focus notes on specific technical topics related to fast payments

This note is part of the third component of the toolkit and aims to provide inputs and guidance to policy makers on fast payment dispute-resolution mechanisms (DRMs) and best practices. As fast payments continue to mature in markets, it is important for country authorities seeking to introduce/foster fast payments in their jurisdiction to grasp the components and key focus areas for setting up FPS.



3 BACKGROUND

Fast payments are becoming the new norm in the global payment scene. While person-to-person and wallet funding transactions may have been their primary use case in the past, today fast payments are gradually being applied for many additional use cases, including bill pay and payouts. This growth in fast payments makes actors increasingly prone to wider types of nonstandard situations, such as those in which the actors of the payment disagree upon the payment execution and even if payments are due at all, which can cause disputes. In addition, disputes often occur at higher layers in the payment transaction, such as when the holder of the debited card or account raises concerns over the very authorization of the transaction. Disputes are growing over time in greater numbers.

Indeed, dispute resolution does not exist in a vacuum; rather, it is part of a broader financial consumer-protection toolkit that includes disclosure practices, fair treatment, and effective supervision. The World Bank has published extensively on these topics, bringing out specific guides on creating overarching consumer-protection frameworks,[1] good practices for managing disputes between payment service providers (PSPs),[2] consumer-protection risk assessments,[3] and surveys on consumer protection and financial inclusion. For the context of this paper, we specifically address DRMs within FPS.[4]

Fast payments are transactions in which the payment message is transmitted, and the final funds are made available to the payee in real time or near real time. In addition, FPS facilitating such transactions are expected to operate 24 hours a day, seven days a week, with little to no downtime. The real-time nature of transactions and the availability of funds to payees present unique challenges in handling disputes and user complaints. Disputes in FPS commonly arise from fraudulent payments, nonreceipt of goods or services, and erroneous transactions. With an increased velocity of payment flow, rectifying a dispute after a completed transaction through a refund or a chargeback is problematic because funds move much quicker than the erroneous payments can be detected, hence recovering fraudulent payments is tougher. Moreover, in most jurisdictions, fast payments are final and irrevocable.

In certain markets, frameworks are in place for dispute management. (See box 1.) These requirements range from light-touch models consisting of guidelines, to more robust models with an actual DRM in place. Usually, rules specify the instances in which the payer is entitled to a refund for unauthorized transactions and who bears the fraud risk (for example, the payer's or the payee's financial institution or the customer—for example, in cases of gross negligence, which is the test used in many product/service agreements to establish the threshold for customer liability for payments losses).

BOX 1 INTERNATIONAL STANDARD ON COMPLAINT HANDLING AND REDRESS

The G20/OECD High-Level Principles on Financial Consumer Protection are the international standard for comprehensive and effective financial consumer protection frameworks. The FCP Principles were endorsed by G20 leaders, adopted by OECD governments, and included in the Financial Stability Board's Compendium of Standards. The FCP Principles are designed to be applicable to all countries and economies. Principle 12 addresses complaint handling and redress:

> Jurisdictions should ensure that consumers have access to adequate complaints handling and redress mechanisms that are accessible, affordable, independent, fair, accountable, timely and efficient. Technology may be leveraged to facilitate the effective design of these mechanisms, which should not impose unreasonable cost, delays or burdens on consumers. The needs of consumers, including those experiencing vulnerability, should be considered when designing and publicising complaints handling and redress mechanisms.
>
> In accordance with the above, financial services providers and intermediaries should have in place mechanisms for complaints handling and redress. Such mechanisms should allow providers to monitor and address systemic issues and support improved financial consumer outcomes.
>
> Recourse to an independent redress process should be available to address complaints that are not efficiently resolved via the financial services providers' and intermediaries' internal dispute resolution mechanisms. At a minimum, aggregate information with respect to complaints and their resolutions should be made public. Information relating to consumer complaints should be available to oversight bodies to support their supervisory or enforcement functions.

Policy makers and regulators should refer to the FCP Principles when designing and implementing mechanisms to resolve disputes related to fast payments.

Source: Recommendation of the Council on High-Level Principles on Financial Consumer Protection, OECD/LEGAL/0394, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0394

3.1 OVERVIEW OF DISPUTE RESOLUTION IN FAST PAYMENTS

A dispute arising in a payment transaction can be defined as a conflict in which one party involved in the transaction contests its execution. The claim may be that the transaction was unauthorized, made in error by the payee, included technical errors, was wrongly executed, or was fraudulent. Customer disputes appear related to most, if not all, types of retail payments. How such disputes are managed depends on the particular retail payment instrument used and the associated financial regulations and scheme rules. Some frameworks contain detailed grounds for raising a dispute and procedures for dealing with such disputes, including through arbitration, whereas other payment schemes have basic specifications regarding disputes or no rules at all in this regard.[5]

While disputes may arise between all the different participants of a payment transaction, the most common are

- Between the payer and its PSP;
- Between the payer and the payee;
- Between the payee and its PSP; and
- Between the participants of fast payment systems (two or more FPS).

The nature of disputes in fast payments is different from the nature of customer disputes in the following ways:[6]

- Disputes between the PSP participants of an FPS are different from customer/user disputes. Disputes between system participants may nevertheless also affect users, as the PSPs will cooperate to be able to offer different payment services to their individual customers/users.
- Disputes between PSPs will typically arise about a participant's compliance with the rules of the payment system and relevant payment schemes. Lack of compliance with the relevant scheme rules by one participant may generate customer complaints, causing a spillover effect to other PSPs and their customers, thus affecting the general operations of a payment system.

TABLE 1 **Title?**

TYPE OF DISPUTE	PARTIES TO THE DISPUTE
Customer-initiated disputes	Between the payer and its PSP Between the payer and the payee Between the payee and its PSP
Dispute between system participants	Between PSPs and the system operator Between the participants of a fast payment system (two or more PSPs)
Dispute between system participants and third parties	Between PSPs/operator and a third party (for example, a centralized alias directory)

- Dispute resolution in fast payments is critical due to the instant nature of these transactions. Because immediate fund transfers leave little room for error correction, swift and effective dispute resolution is essential to mitigate financial loss to the end user. This ensures that users have confidence in the system, knowing that any issues will be promptly addressed.[7]

These can be broadly categorized into customer-initiated disputes and disputes between payment system participants. Disputes between end users, such as customers and merchants or two individuals conducting person-to-person payments, typically involve issues such as product returns, unauthorized transactions, payment errors, or fraud, such as in cases of scams organized by criminals. Disputes between payment system participants often involve operational and settlement issues, or compliance with scheme rules. Resolving related procedures requires detailed investigation and coordination between the involved entities.

In the case of a disputed transaction between a merchant and a customer, the merchant may choose to refund the transaction amount partially or to fully refund the transaction amount to the customer, if the merchant agrees with the customer's claim. Alternatively, the payer may request that its PSP raise a dispute claim or a chargeback through the payment system used for conducting the transaction. This may result in a refund to the payer, depending on the type of dispute and the outcome of the dispute process. Whether and how to approach a transaction dispute between a merchant and a customer depends on the market in which a particular FPS operates, the level of maturity, the relevant legal and regulatory framework, and the scheme rules (for example, reporting cutoff times for claims, requirements associated with documentation to be presented, and so on). Moreover, the availability and the arrangements of a dispute-management system can significantly influence behavior in case of fraud. While practices regarding dispute resolution for transactions between a merchant and a customer differ and change over time, the past four years have seen significant changes due to the COVID-19 pandemic. The following patterns have emerged from these changes:[8]

- A general increase in the number of disputes across industries, due to the growing number of e-commerce payments following social distancing and stay-at-home requirements, as the level of disagreements between the parties is higher in these transactions than in in-person transactions.
- An overall increase in the amounts claimed, resulting from disputes pertaining to specific sectors or products: cancellations of vacations, air travel, purchases of larger consumer goods, and the like.

The increased speed of fast payments also increases the risk of loss due to fraud and unauthorized transactions by limiting the time for checks by sending PSPs, and for realization of error by the sender, and lessening the ability to recall funds before fraudsters receive and send away from the receiving account. Robust DRMs are necessary to quickly identify the dispute and associated stakeholders, investigate the dispute, and resolve these disputes, thereby protecting users and maintaining the integrity of the payment system. Compliance with regulatory requirements for consumer protection further underscores the importance of these mechanisms. Effective dispute resolution is vital for maintaining customer trust in FPS, and it is a key component in the commercial value proposition of the payment instrument. By promptly addressing disputes, PSPs can enhance customer satisfaction and overall losses of the industry.

3.2 CORE ASPECTS OF DISPUTE RESOLUTION FOR DISPUTES BETWEEN PAYER AND PAYEE

Dispute resolution consists of several steps. Its process begins with the customer raising an issue following the payment settlement. The customer or participant files a dispute

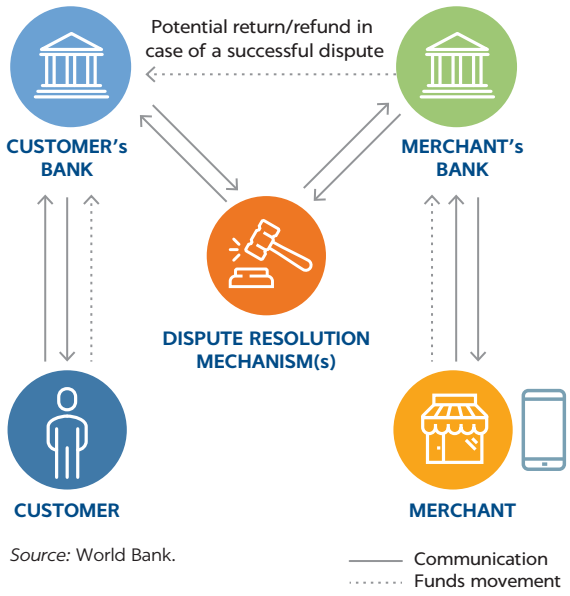
through designated channels, providing necessary details and documentation either directly or through their PSP. Information regarding dispute-resolution procedures should be clear, transparent, and accessible through different channels to ensure that disputes are captured accurately.

Following this, the investigation procedures begin, during which the payer's PSP examines the dispute's validity. This involves verifying transaction details, assessing evidence, and adhering to regulatory and procedural guidelines. A thorough investigation is essential for determining the appropriate course of action and ensuring a fair resolution, though it depends greatly on the extent of market-conduct regulations and scheme rules.

The process ends with the dispute resolution. The outcome of the investigation is communicated to the involved parties, and corrective actions are implemented. This may include reversing transactions, issuing refunds, or other remedial measures. Dispute resolution may look different for different use cases of payment. However, effective and rapid resolution is essential, as it addresses the specific dispute while also helping maintain trust in the payment system by resolving issues efficiently and fairly.[9] In addition, dispute resolution flags the weaknesses of products/services, policies, and procedures for both the PSPs and regulators involved.

Disputes for other use cases have a very similar flow. Thus, the payer and payee could be replaced with other agents, such as other customers, businesses, and even governments.

FIGURE 1 **General Customer Dispute-Resolution Flow Example for Person-to-Business Payment**



Source: World Bank.

3.3 CAUSES OF DISPUTES IN PAYMENTS

3.3.1. Fraudulent Payments (Authorized or Unauthorized)

Fraudulent transactions can be categorized into authorized and unauthorized fraud.[10] Authorized fraud, also known as authorized push payment (APP) fraud, involves fraudsters deceiving victims into willingly making payments to them.[11]This fraud often uses social-engineering tactics, such as setting up fake websites of legitimate businesses or digitally impersonating users' financial institutions or their loved ones. Even though the customer authorizes the payment, it is made under false pretenses. Allocating the responsibility and liability between PSPs and their customers and thus resolving these disputes is complex, since the customer willingly made the payment, and the question becomes whether the PSP was in a position to identify and prevent the fraud in the first place.

Unauthorized fraud occurs when transactions are made without the customer's consent or knowledge, typically involving stolen payment credentials or hacked accounts.[12] This type of fraud poses significant risks to both customers and financial institutions, leading to substantial financial losses and eroding trust in the payment system. Effective dispute resolution for unauthorized transactions requires rapid detection, investigation, and remediation, including reversing fraudulent transactions and enhancing security measures to prevent future incidents.

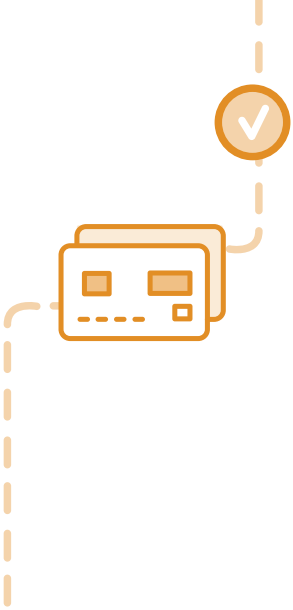
3.3.2 Nonreceipt of Goods or Services

Nonreceipt of goods or services is a common cause of payment disputes. This issue occurs when customers pay for products or services that are not as ordered, not delivered within the expected time frame, or are not delivered at all. These types of payment disputes are particularly relevant to e-commerce, where nondelivery and delivery dissatisfaction remain high. Customers typically seek refunds or replacements, leading to disputes with merchants. As fast payments ensure immediate availability of funds for the merchant, the delivery of services takes place following the posting of funds, leaving room for malicious attempts from fraudulent businesses not to comply with their end of the transaction. Mistakes in logistics and delivery services might also lead to such issues unintentionally. The resolution process for nonreceipt of goods or services involves verifying the customer's claim, which may require proof of purchase, shipment tracking, and communication with the merchant. Through the dispute process, PSPs may assist customers to receive the goods or services for which they paid or to

receive appropriate compensation, though often the customers need to act on their own behalf through customer-protection agencies. PSPs may also support merchants and prevent chargeback fraud (that is, when customers claim not to receive purchases even though goods have been appropriately delivered).[13]

3.3.3 Erroneous Transactions

Erroneous payments are another source of disputes. Errors can occur for various reasons, including human mistakes, such as entering incorrect payment amounts or recipient details, and technical issues in the payment system that may arise due to cyberattacks or malfunctions at FPS or associated directory services or in participant PSP systems. Such payments can result in overpayments, underpayments, or payments sent to unintended recipients. Resolving these disputes involves identifying and rectifying the error, which may include reversing the incorrect transaction and processing the correct one. PSPs must implement robust systems to detect and correct errors swiftly, supported by the payment system. This includes automated verification processes, real-time monitoring, and clear guidelines for customers to report discrepancies, as well as set frameworks by the scheme or system operator related to liabilities and the resolution mechanism.



4 UNIQUE ASPECTS OF DISPUTE RESOLUTION IN FAST PAYMENTS

4.1 CORE FEATURES OF IRREVOCABILITY AND SETTLEMENT FINALITY

Irrevocability can be defined as the point in time from which a payment order transmitted by a sending PSP and received by the FPS cannot be revoked by the sending PSP or any other third parties. The Committee on Payments and Market Infrastructures defines final settlement as the irrevocable and unconditional transfer of an asset or financial instrument, or the discharge of an obligation by the financial market infrastructure or its participants in accordance with the terms of the underlying contract. Final settlement is a legally defined moment.[14] This finality of settlement defines the moment in the settlement process at which the settlement becomes final and complete and when the settlement process and transfer of funds cannot be unwound by the participants or third parties. The finality of settlement ensures that transactions made over a payment scheme are complete. The irrevocable nature of the transaction and finality of the settlement are essential requirements for an FPS to honor the real-time crediting characteristics.[15, 16]

The rules regarding irrevocability and finality of posting to end-user accounts ensure clarity and predictability for end users of the FPS regarding attributes such as the availability of funds. The payment system and scheme rules must also describe whether they are binding only for participants or also for third parties who work together with participants related to the use of the FPS. Rule details define whether they are sufficient to confer full legal certainty to all parties involved. Therefore, these principles should be reinforced by appropriate legal or regulatory provisions that recognize essential concepts for the operation of payment systems. To assure legal certainty and minimize systemic risk in a payment system, in many jurisdictions the principles associated with irrevocability and settlement finality are typically regulated in a payment system's law, payment services law, or central bank law. In some jurisdictions, these legal protections may be granted solely to systemically important payment systems, but they can also be extended to other payment systems as well.[17, 18]

4.2 CHALLENGES IN FRAUD DETECTION AND PREVALENCE OF SOCIAL ENGINEERING/PHISHING

While the immediate availability of funds to the payee presents certain challenges to fraud prevention, it may increase fast payment transactions' attractiveness to fraudsters, because they can quickly dispose of funds received through a fraudulent transaction. This makes it difficult to recover or trace funds that are distributed to multiple mule accounts minutes after the initial transaction. Applying appropriate means for authenticating the user who initiates a fast payment will assist in reducing the risk of fraud and fraud-related disputes. Customers can be authenticated through procedures mandating the use of two-factor authentication as a minimum, verifying and confirming that users are who they claim to be and are permitted to initiate and authorize the fast payment transaction. In many jurisdictions, the customer-authentication methods and standards applied to other means of payment are also used for authentication in FPS.

While requirements for such strong customer authentication, such as the European Union's Strong Customer Authentication (SCA) rules introduced in 2019 in the revised Payment Services Directive,[19] can mitigate fraud, they do not address the issue of social-engineering attacks/APP fraud.[20]APP describes scenarios where fraudsters manipulate their victims to unknowingly volunteer sensitive information or to make payments to them. APP is a growing issue globally. In the United Kingdom, APP fraud accounted for losses of about £240 million ($303 million) in the first half of 2023.[21] In Brazil, social-engineering attacks associated with Pix, the country's fast payment system, resulted in losses of about R$1.75 billion ($320 million).[22]

To combat APP fraud cases, fraud-mitigation techniques such as the deployment of FPS overlay services for confirmation of payees and stringent customer due diligence and know-your-customer checks need to be performed while onboarding new end users.

4.3 END USERS HAVE STRONG EXPECTATIONS FOR RECOURSE

End users have high expectations when it comes to recourse related to payment disputes. Aside from their basic requirements for general fairness, many users are accustomed to

BOX 2 DISPUTE RESOLUTION IN CARD PAYMENTS

Over the past decades, international card schemes have developed comprehensive processes for managing disputes that support a wide range of dispute types and a global geographical footprint. In card payments, a cardholder files a chargeback when a dispute cannot be directly resolved with the merchant. In the event of a chargeback, the cardholder approaches its issuer to help address the dispute with a request to have the payment transaction reversed or charged back, fully or partially.[23]

When the issuer accepts the cardholder's request, the issuer will "charge back" the transaction to the acquirer, giving the specific reason code describing the reason for the chargeback, effectively reversing the original payment. The issuer will receive the amount disputed as part of the clearing and settlement process. If the dispute is deemed valid, the acquirer will debit the disputed transaction amount from the merchant's account. The acquirer must generally cover the loss if there are no funds in the merchant's account to cover the disputed amount. Large-scale examples of this situation occurred when airlines or travel agencies went bankrupt and ceased operations. In case of disagreement, the acquirer may further query the transaction to determine the validity of the dispute and may represent a claim for payment to the issuer and receive the funds automatically as part of the clearing and settlement process. In case of a continued dispute, the issuer is entitled to ask for arbitration, managed by the network operator/payment scheme to settle the dispute. The whole chargeback process is automated and is supported by a parallel system to exchange such documents as customer-dispute letters and transaction charge slips. The chargeback reason codes cover a diverse set of disputes, ranging from fraud to quality disputes and covering situations in which the cardholder disputes having initiated a payment, the cardholder has initiated a payment but never received the goods or services, or the goods or services received were incomplete or faulty.[24,25]

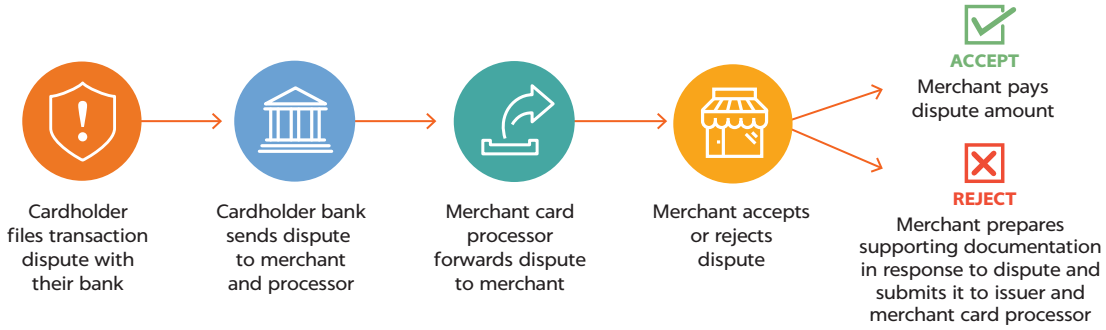
Reason codes used are highlighted below:

- Merchant failed to get an authorization or authentication.
- Merchant failed to obtain card imprint (electronic or manual).
- Merchant accepted an expired card.
- Cardholder claims that they did not receive the goods, or the goods were not up to the customer's expectations as per the terms of the sale.
- Cardholder has no recollection of what a charge in their transaction statement[26] relates to.
- Cardholder claims that they did not authorize the purchase and their card was stolen or used fraudulently.
- Error on the part of the merchant, such as duplicate billing, incorrect amount billed, or a refund that was promised but never received.[27]

legacy payment systems equipped with well-established and reliable resolution mechanisms, such as the dispute framework of international card schemes. End users, therefore, expect similar quality in this regard when it comes to fast payments as well. To meet these expectations, it is essential for FPS to offer robust and effective dispute-resolution processes. This is particularly important if FPS aim to expand into use cases traditionally covered by cards, such as e-commerce payments, ATM withdrawals, and other similar transactions.

FPS schemes may lack the comprehensive dispute-resolution frameworks that characterize some legacy payment systems. Due to the immediate nature of fast transactions and the rapid development of related technologies, several challenges arise when implementing DRMs. These include a lack of time both for error detection and for intervention by PSPs and the central infrastructure to manage disputes in a direct and organic manner. In addition, the standardization and implementation of DRMs are hindered by the introduction of new data standards and initiation, authorization, and authentication methods, and by the need to educate stakeholders on these innovations.

FIGURE 2 **Card Payment Dispute-Resolution Flow**[28]

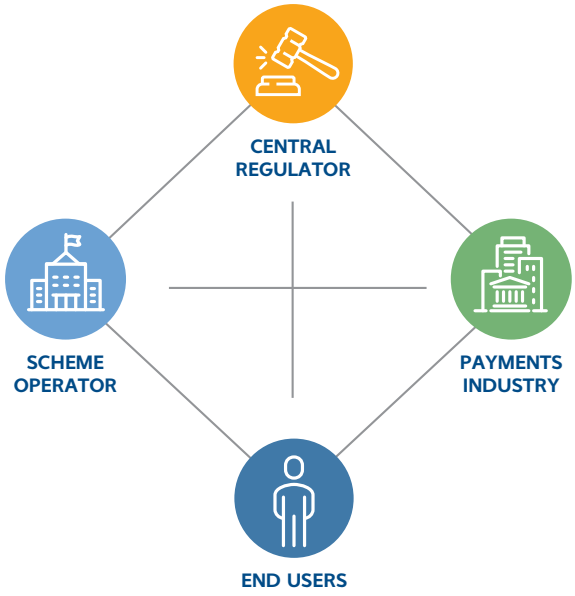


5 DISPUTE-RESOLUTION MECHANISMS FOR FPS

DRMs vary by country but are usually similar in terms of the affected parties and the distribution of responsibilities and liabilities. PSPs are generally the contact point for the collection of customer complaints from their end users, and they act on their behalf in the inter-participant space. Few payment systems and schemes have also made available a dedicated tool or body for end users to raise customer complaints directly. In addition, alternative DRMs may be established nationally or by the system operator to deal with disputes that may arise between PSPs and payment service users concerning their rights and obligations established by law. FPS are no different, with varying levels of customer protection, liabilities, and technological advancements by markets.

One can differentiate between three types of DRMs based on their implementing agent: legal and regulatory mechanisms that are implemented by a central regulator; scheme-level rules that the scheme operator implements; and industry initiatives, which are implemented by a group of stakeholders that partake in the broader domestic payment industry, such as the PSPs and their clients, as well as agreements between FPS operators and external parties such as alias-directory operators, payment initiators, and account aggregators. Often a combination of these three types of mechanisms is implemented.

FIGURE 3 Stakeholders in Dispute-Resolution Mechanisms



Source: Author's elaboration

5.1 LEGAL AND REGULATORY MECHANISMS

Public authorities and regulators play an important role in establishing relevant DRMs by issuing guidelines and engaging in dialogue with the stakeholders. Central banks are often the owners and operators of different retail payment systems,[29] including FPS (for example, Pix in Brazil).[30] Thus, they often take the responsibility to develop the DRMs themselves. In other cases, they still have to create the legal and regulatory frameworks under which disputes can be lodged and resolved.

Depending on the jurisdiction, the legal and regulatory framework applicable to payment services may contain rules governing certain types of disputes, covering, for example,

dispute rights and refund rights under different conditions. In that respect, the existing legislation regarding payment services and consumer protection will directly or indirectly influence the establishment of DRMs either through direct mandates or by the imposition of certain obligations on PSPs and market operators to put certain procedures in place to comply. In some instances, PSPs may be legally required to provide unconditional refunds to certain types of disputed transactions—for instance, if a legal provision designates the PSP of the sender as responsible for it.[31]

5.2 SCHEME-LEVEL MECHANISMS

DRMs included in the payment scheme can be essential for sustaining the integrity and reliability of FPS, even in the presence of legal or regulatory mechanisms for dispute resolution. Scheme-level DRMs, when aligned with the regulatory and legal mechanisms, complement the creation of a clear and holistic DRM. Scheme-level mechanisms are governed by rules and procedures established by the payment scheme operator. Such rules and procedures outline the requirements for participants when disputes arise and highlight their responsibilities and actions during procedures.[32]

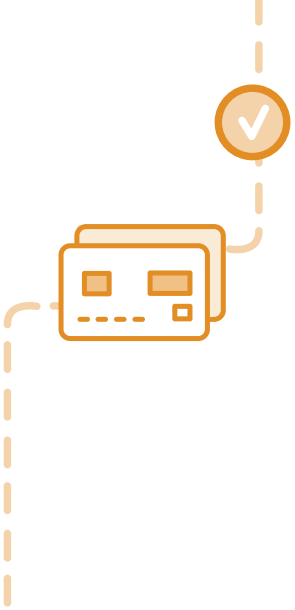
The scheme operator typically provides specific reporting channels for disputes. These channels facilitate the efficient submission and tracking of dispute cases, ensuring that issues are documented and addressed in an orderly manner. Clear guidelines on how to use these reporting channels are crucial for participants to navigate the dispute-resolution process effectively. Disputes related to participants' noncompliance with rules are most often addressed by the scheme or a mandated body. For instance, issues related to SEPA Inst scheme compliance are handled by the Dispute Resolution Committee of the European Payments Council, which accepts formal complaints from the council and its participants. In some markets, the scheme operator also offers specific assistance for end users to raise complaints, but this is most often not the case. A rare example comes from the Unified Payments Interface (UPI) of the National Payments Corporation of India (NPCI). The NPCI created a channel embedded in all participating PSPs and third-party service providers' apps called the Dispute Redressal Mechanism, for end users to directly raise complaints about specific UPI transactions regardless of the nature of the dispute (that is, fraudulent or erroneous payments).[33,34] This layer of redress may help incentivize certain hesitant populations to adopt FPS and, as such, further the goals of financial inclusion. This method also has the added benefit of setting standards for basic consumer protections for the payment ecosystem as a whole.

Another way fast payment schemes can promote more efficient and transparent dispute-resolution processes is by providing end users with digital receipts for their transactions. These offer a convenient and prompt way for participants to validate the transactions of their customers. Payment scheme operators can mandate that their participants offer this service to end users. The main benefits from a dispute-resolution perspective are faster recognition of errors or malicious activities and the sharing of accurate payment data across all parties of a transaction. The latter would greatly reduce confusion when a dispute is initiated. A good example of this comes from Mexico, where the Banco de México introduced the Electronic Payment Receipt (*Comprobante Electrónico de Pago,* CEP) service for its SPEI real-time payment system. The CEP is issued by the central bank and includes all the information sent to the SPEI system by the receiving bank to confirm the payment. End users can access the CEP to check the completion of a payment.[35] This method may prove beneficial in allowing PSPs to create a statement of facts pertaining to the transaction as they begin an investigation.

5.3 INDUSTRY INITIATIVES FOR DISPUTE RESOLUTION

Public regulatory bodies in some markets are less inclined than regulators in other markets to intervene in market movements. Moreover, scheme operators may address the issue of disputes only partially or not at all in the scheme rules.[36,37] Where there is a more decentralized approach to financial regulation, industry stakeholders need to take steps to protect their customers as well as the integrity of the industry. Often, central authorities facilitate the creation of industry standards whose adoption by PSPs is voluntary. Dispute resolution in fast payments is often covered in industry initiatives when regulators and scheme-level rules are insufficient to address the relevant issues. However, it may also be the case that some regulatory authorities have not developed dispute resolution because there are preexisting schemes established and run by market participants.

These usually cover appropriate business ethics, customer relations, and the reduction of fraud and errors made by customers and payment system participants. Numerous examples are available globally, including the ePayments Code of Australia, the Code of Banking Practice in South Africa, and the Contingent Reimbursement Model Code in the United Kingdom.



6 COUNTRY EXAMPLES

The complexity and variety of DRMs in FPS can be seen in this section, which offers several examples from specific markets, highlighting the different dispute-resolution frameworks.

6.1 AUSTRALIA

Australia's fast payment system, the New Payments Platform (NPP), is operated by NPP Australia Ltd. (NPPA), a public company that operates on a cost-recovery basis and is owned by 13 stakeholders, including the Reserve Bank of Australia. The platform's regulations provide a detailed mechanism for internal dispute resolution between any department of the NPP and/or one or more of its participants. The regulations include the following:[38]

- *Definition of dispute:* Defined are the different parties between which a dispute can arise and which disputes are eligible to be referred for resolution.
- *Commencement of proceedings:* The regulations detail the different scenarios under which dispute-resolution proceedings may be commenced by either NPPA or the aggrieved participant (including submembers).
- *Resolution of disputes:* The regulations state that a dispute can be referred, for resolution, to either the NPP Operating Committee, the NPP Board, or directly for arbitration. In addition, the rules set out the various criteria and conditions for the same.
- *Fees and costs:* Numerous fees and costs are associated with dispute resolution; these are detailed in the regulations. NPPA is to be reimbursed for all costs and expenses it incurs in the resolution of a dispute.
- NPPA is protected from liability in case of any loss that arises from participant insolvency.

In terms of customer-initiated disputes and any complaints related to NPP transactions, the first point of contact for a customer is the customer's PSP.

- If an account has been compromised or funds have been taken from a user's account without their authorization, the user is required to contact their financial institution immediately.
- If the user thinks someone has fraudulently used their information to create a PayID, the user should contact their bank immediately, and the bank will help launch an investigation.

In 2011, the Australian Securities and Investment Commission released the ePayments Code, which is a voluntary code of conduct for banks, nonbanks, credit unions, and building societies. It sets out the rules for, among other things, determining liability for mistaken or unauthorized electronic payments in Australia. The commission last updated the code in 2022. It covers all electronic consumer transactions, including ATM, electronic funds transfers at points of sale, and credit card transactions; online payments; internet and mobile banking; and BPAY. Since June 2022, the ePayments Code has covered the NPP as well.[39,40] Requirements for the subscribers of the code include the following:

- Bearing liability for unauthorized payments from hacked accounts of their customers
- Bearing liability for unauthorized payments using debit cards of their customers that did not require a PIN or signature
- Assisting their customers in recovering funds sent mistakenly to the wrong recipient

In addition, the Australian Financial Complaints Authority also independently assists consumers and small businesses in initiating and resolving complaints about financial institutions when customers find that their banks do not act according to the ePayments Code.[41]

6.2 BAHRAIN

Bahrain's fast payment system, Fawri+, is operated by the BENEFIT Company, authorized by the Central Bank of Bahrain. BENEFIT as an operator provides customer service and has a call center to register customer complaints. Customers are required to report any errors or discrepancies to their financial institution, and disputes are handled on a case-by-case basis bilaterally between PSPs. The company states that liability lies solely with the customer for any losses sustained when the customer discloses their authorization credentials to third parties when initiating a fast payment in the BenefitPay app. The company keeps records of all transactions that can be used as material evidence, and by using their service, customers waive all rights to dispute the validity of this data.[42,43,44]

6.3 BRAZIL

The Banco Central do Brasil (BCB) launched the country's only fast payment system, SPI, in November 2020. SPI is the core infrastructure for the alias-based payment scheme Pix.[45] Customers can raise disputes to their PSPs related to Pix transactions and to the BCB regarding issues with PSPs. Customers can seek instructions in a specific dispute-redress manual. The transaction-reversal process and customer-complaint support include the following:[46]

- A Pix "return" functionality that the recipient of a wrong payment must agree to go through. This functionality supports the resolution of issues related to clerical errors. The funds can be returned partially or in full. There is a special refund mechanism, which was introduced in November 2021, through which a payer can request a refund.
- A warning given when a Pix transaction is unsuccessful, highlighting the reason for the transaction failure. As soon as the situation that caused the error is sorted, the initiation of the transaction can be attempted again.[47]
- If a customer identifies fraudulent activities related to their account, the relevant PSP must evaluate the situation and decide whether to reimburse the customer.
- The BCB provides a series of recommendations to avoid fraud and user-generated errors.[48]
- Within 45 days from the occurrence that motivated the complaint, a consumer can register a complaint against a Pix participant using the "Contact Us" function from the central bank; the customer must provide supporting documents and evidence via the Digital Protocol of the BCB.[49] The following are examples of commercial disputes: receipt of a product that was different from specifications, cancellation of an event or reservation, and dissatisfaction with the product, among others.
- Disputes between customers and participants must be solved in the judiciary system if an agreement is not reached in the context of the Pix redress procedures.

Pix's dispute-redress manual also includes the following rules related to disputes between Pix participants:[50]

- The BCB is responsible for any final decision on any dispute that emerges between participants.
- The principles of legality, finality, motivation, reasonableness, proportionality, morality, ample defense, adversarial procedure, legal security, and efficiency guide the conduct of the BCB's work in the dispute-redress process.
- It is the BCB's responsibility to ensure that Pix is not used for any criminal economic activity through the regular supervision of Pix participants and transactions.
- Pix participants can raise concerns related to any of the above-mentioned principles; however, they must try to resolve issues with a fellow participant before requesting intervention from the BCB. After the registration through the Digital Protocol, the BCB sends the request for a resolution to the other party. Then, the 15-day period starts for the parties to sign a conciliatory agreement, ending the dispute in question. If no agreement is reached, the dispute-resolution committee established by the BCB will decide and communicate the dispute decision within 40 calendar days (extendable for an equal period). The decision can be appealed by the parties involved.

6.4 INDIA

The NPCI was founded in 2008 as a joint initiative between the Reserve Bank of India and the Indian Banks' Association. The NPCI operates the low-value real-time payment system Immediate Payment Service (IMPS), as well as the real-time overlay service, the UPI. The NPCI addresses the dispute-handling issue for both systems.[51,52]

For the IMPS, a dedicated system for dispute redress and resolution was created for interbank disputes. It dictates that all customer complaints between PSPs must be resolved within three days. Therefore, PSPs are required to have a separate operations team to handle inter-PSP and customer complaints.[53]

For the UPI, the NPCI also set out procedures for dispute resolution. The customer must first raise their concerns with their PSP in their banking app, either by selecting a transaction from their history or by using a transaction reference or ID number. This service is called the Dispute Redressal Mechanism and must be facilitated by all PSPs. The transacting parties' banks are required to assist the parties in resolving the issue at hand. In case of a complaint between a customer and a merchant, the acquiring bank must take up the issue with the merchant.[54]

If end users are not satisfied with the results of the dispute-resolution procedures, they can approach the banking ombudsman and/or the ombudsman for digital complaints, depending on the case.

6.5 MEXICO

In Mexico, the SPEI system processes fast payments supported by two overlay services: Codi and DiMo. CoDi, a mobile app, launched in 2019, while DiMo, a service facilitating payments without the need for a bank account, debuted in 2023.[55]

Banco de México has published guidelines to prevent the occurrence of both interbank and end-user disputes. The following guidelines apply to disputes between system participants:[56]

- Besides agreeing to system rules, participants are required to enter into a collaboration agreement to protect end users. This works as a resolution mechanism for transfers that, according to the sender, were not initiated by the sender.
- All guidelines related to disputes and compensation of damages are included in the SPEI operating rules and/or participant agreements.
- SPEI assigns digital signatures to each transaction, ensuring the authenticity of all payment information used to settle disputes.
- In addition, participants are connected to SPEI through a private encrypted network, and all payment orders sent by the participants are presigned and saved here. This fosters transparency and acts as a mechanism to avoid interbank disputes.

Similarly, the guidelines specify the following end-customer mechanism to prevent and resolve disputes:

- SPEI follows strong customer-authentication standards. Participants are required to maintain records of customer authorization for every transaction. In case of any dispute between participants and customers, an authorization record needs to be presented by the participant.
- Participants are liable to refund their customers in case no authorization record exists for a particular transaction.
- Payments through SPEI are final and irrevocable. Customers are liable for payment orders when there is a record of the authorization.
- The CEP is an electronic voucher or document issued by Banco de México to guarantee the completion of a payment. The CEP is generated with the information that the receiving bank sends to SPEI as confirmation of the payment deposit.
- Banco de México has introduced the SPEI Information Module (MI-SPEI), which enables customers to monitor the status of payments by means of a tracking number provided by their bank.[57]

6.6 POLAND

Poland has multiple FPS, but the most notable is the Express Elixir. Disputes between participants will most often be resolved by the financial ombudsman. Regarding customer disputes, Express Elixir participants are encouraged to formulate their dispute-resolution and customer-complaint procedures to ensure fair redress. Customers are encouraged to raise complaints first with their financial institutions. Disputing parties also have the option to avail legal remedy under the Polish Chamber of Commerce if the guidelines stipulated by the participants do not provide for impartial redress of disputes and complaints.[58,59]

Blik, a fast payment service that is settled partially on the Express Elixir system, has the following additional liability allocation between participants and users:[60]

- Blik and its participants should be liable only for their own failures related to processing transactions. Hence, they are not liable, for instance, for a merchant not delivering goods or services adequately to a customer.
- Financial institutions, however, are liable for payments initiated by their customers in bad faith or because of a crime, including unauthorized actions by third parties. This means participants are liable for fraudulent activities allowed from their end.
- Participants ought to carry out activities to reduce the risk to their customers and fellow participants arising from criminal activities.

6.7 SOUTH AFRICA

The Real-Time Clearing system and Payshap, South Africa's two FPS, have been operational since 2006 and 2023, respectively. Both are operated by PayInc, with public and private stake.[61]

There is no central or scheme-level regulation related to fast payment dispute resolution. End users are responsible for all authorized erroneous payments, and neither the sending nor the receiving financial institution can be held liable for any losses incurred related to these transactions. Customers are expected to reach out to their financial institutions for support related to disputes.

These are governed by the market's own Code of Banking Practice, which is a voluntary code stating the minimum standards of providing services for banks. The code was released in 2012 and is signed by all members of the Banking Association of South Africa. It covers several topics related to banking services and focuses on the promotion of fairness, transparency, and confidence in the banking system. Among other things, it sets out the minimum requirements for banks to assist their customers in check, card, and bank payment disputes.[62]

The decision to return funds to the sending user lies with the beneficiary of the erroneous payment; their financial institutions are able to facilitate only dispute-resolution procedures. If the beneficiary of erroneous payments is not willing to send back the related funds, the end user can still turn to common-law procedures outside of the payment scheme and claim unjustified enrichment. Their bank is inclined to provide the necessary documents to help their case. Customers can also raise concerns to the ombudsman of banking services if they realize their financial institution has not acted according to the code concerning a payment dispute.[63,64]

6.8 UNITED KINGDOM

The United Kingdom's FPS infrastructure, the Faster Payments System, was launched in 2008 and is operated by Pay.UK. It is subject to oversight from the Payment Systems Regulator (PSR). In the case of an unauthorized transaction, the customer must report it to the financial institution first, which then has two days to investigate. If the banks are unable to provide a solution for the dispute, the customer can report the situation to the Financial Ombudsman Service at the PSR. Disputes between institutional participants in the system are handled directly by the PSR or by public courts.[65]

All FPS transactions have a unique identifier that enables easy tracking of payments. Issues can arise when a customer sends a duplicate file that may have the same transaction details but has a different ID, which might miss automated duplicate checks of the payment system. To solve this type of issue, a bank error recovery process has been designed and specific guidelines have been issued, so that banks can cooperate to solve the erroneous payments. These guidelines indicate defined timelines to return the refunds to the originating bank.[66]

If an erroneous transaction goes through, the beneficiary can initiate a payment back to the originator to return the funds. In such cases, the sender's and receiver's banks can advise their customers based on the details available in the payment identifier.

To tackle fraud-related disputes, in 2018 the PSR set up an independent steering group consisting of industry and consumer representatives to create the Contingent Reimbursement Model Code (CRM).[67] The code was released in 2019 and can be signed voluntarily by PSPs and aims to limit both the number of incidents and the impact of APP scams. It stands as reassurance for consumers that they will be reimbursed after suffering an APP fraud, given that they have acted adequately (that is, that they took certain steps to protect themselves).[68] As discussed previously, APP fraud is a growing problem in the United Kingdom concerning fast payments, and the CRM aims to address this issue. The CRM covers only payments made within the United Kingdom from accounts of individuals, micro-enterprises, and small charities. Signatory institutions commit to

- Educating their customers on the threat of APP scams;
- Taking extra steps to identify higher-risk payments and customers, and protecting them against APP fraud;
- Warning customers of potential scams;
- Acting promptly upon APP incidents;

- Taking steps to stop fraudsters from opening bank accounts; and
- Partially or fully reimbursing customers under some circumstances when they fall victim to APP scams.

Recently, concerns about the fairness of the reimbursement policy have been raised by British banks, which claim that other entities that are used to facilitate APP fraud, such as telcos, internet service providers, and social media companies, should also share liability.[69]

6.9 UNITED STATES

Two FPS are operating in the United States: The Clearing House's Real Time Payment (RTP) system and the Federal Reserve's FedNow system. Both systems are subject to central regulation related to liabilities and error-resolution responsibilities of payers and PSPs, including Regulation E and the Uniform Commercial Code Article 4A.[70,71]

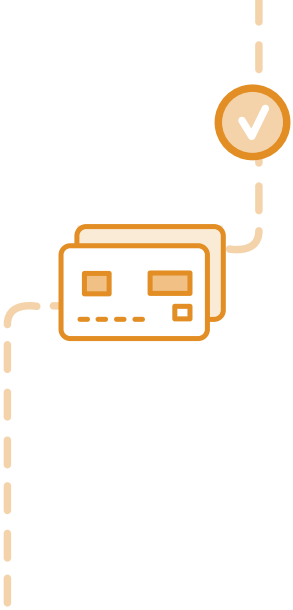
These require end users to give oral and (upon request) written notice of an erroneous payment 60/90 days after receiving confirmation of the payment. PSPs are expected to perform the following steps after receiving a payment dispute from their customers according to Regulation E:[72]

- Promptly investigate the allegation of the error.
- Complete the investigation within 10 business days.
- Report the findings within three business days of completing the investigation.
- Correct the error within one business day after determining that an error was made.
- Sending institutions must provide provisional funds to their customers if the institutions cannot complete the investigation within 10 days.
- Under Article 4A of the Uniform Commercial Code, receiving institutions are required to correct errors they make.[73]

RTP operating rules incorporate existing laws that set forth a well-established framework regarding banks' liability for unauthorized transactions from their customers' accounts, as well as specific requirements regarding the resolution of errors from consumer accounts. This structure simplifies the account-holding financial institution's dispute-investigation processes and minimizes the need for a detailed set of interbank dispute-resolution rules.[74]

Both the RTP and FedNow provide participants a specific nonpayment messaging option as a mechanism to send and respond to requests for the return of funds, for any reason, including unauthorized or erroneous fast payments. Neither The Clearing House nor the Federal Reserve is liable at all regarding any dispute between participants over erroneous or unauthorized transactions. Such a determination is left to the participants, including through any available dispute-resolution and/or judicial process. They are also not liable for any fraud-related disputes. [75,76]

There are no centralized guidelines for resolution of customer complaints. Both the RTP and FedNow have rules to obligate the sending PSPs to put in place policies and procedures for handling customer claims for unauthorized transfers and funds sent in error. Disputes and exception scenarios are addressed by additional messages, such as requests for information and requests for the return of funds. Receiving PSPs must have policies and procedures to respond to requests to reclaim funds sent in error.



7 GOOD PRACTICES

The various types of disputes, their causes, and the numerous stakeholders involved in the payment industry necessitate carefully crafted resolution mechanisms to satisfy end users, PSPs, and the regulator's goals. While this can be achieved in some erroneous payment cases, it becomes more difficult when fund transfers have been driven by malicious intent, such as authorized and unauthorized fraud. This section will highlight the best practices globally.

7.1 CREATE STANDARDIZED AND TRANSPARENT PROCESSES

The most important aspects of dispute resolution in fast payments are standardized and transparent processes that all stakeholders understand. Uniformly applied and clearly stated rules across all participants ensure consistency and predictability, building trust in the payment system and enhancing its overall efficiency. Rules and regulations should include clarity related to liabilities, documentation, and communication of payment information, as well as timelines for end users and financial institutions for initiating and conducting investigations and resolving disputes. These will minimize confusion, delays, and the use of public courts for issues related to fast payments that should be handled within the framework of the industry. Clarity is also important when multiple different resolution mechanisms are in place, provided by different entities. It should be clear for all parties of a specific payment which rules are relevant for their case, what their liabilities are, and to whom they have to turn for support. Additionally, it is crucial that this information is not only transparent, exhaustive, and clear but also easily accessible in a convenient way for all system participants, including the end users, such as through both in-branch services and online or mobile banking platforms.

From this perspective, detailed rules from a regulator that are stated in law—for example, the BCB's regulations for Pix—are effective, as they avoid ambiguity better than codes of conduct that do not clearly define the exact procedures for dispute resolution. This method comes with the potential cost of losing flexibility in future dispute cases that are not directly addressed by the enshrined laws.

7.2 PROVIDE MECHANISMS FOR DISPUTES AMONG PARTICIPANTS AS WELL AS FOR END USERS

Depending on the parties involved and the cause of the issue, there can be several different types of disputes, and regulators and other stakeholders need to make sure that they provide DRMs for all of them. If clear legal frameworks for dispute resolution are absent, it is incumbent upon the organization operating the FPS to seek a clearly defined legal framework from the regulator and the legislature.

Scheme rules must clearly define how to share liabilities and handle disputes among the scheme participants. They should facilitate direct communication, negotiation, and arbitration between participants to maintain operational efficiency. Scheme rules also gain from alignment with partner multilateral agreements for future use cases collaborating across jurisdictions.

For end-user complaints, accessible and clear channels should be provided to report issues and seek redress. Educating end users about their liabilities, rights, and the means to resolve issues is the responsibility of the regulator and their financial institutions, as is often stated in industry codes of conduct. Accessibility is of the utmost importance, as different customers have different capabilities to make their cases. Therefore, a suite of dispute-reporting mechanisms, such as online portals, customer service hotlines, and dedicated support personnel, should all be utilized to help customers, ideally in an orchestrated way that allows simplified information sharing across involved authorities (police), if any, and the financial participants. Furthermore, these channels must provide an opportunity for end users to adequately submit complaints and disputes against other users, financial institutions, and the payment system as well.

The realization of an orchestrated process could take place via a centralized or distributed system, powered by the PSPs. Such a set of processes would need to be able to capture and manage data associated with the transaction record in different formats (for example, pictures, formal digitized documents). Ideally, it should be integrated with the financial service providers and have a stepped process for the different stages of handling complaints, notifying the involved parts. Enablement of convenient and prompt communication between involved parties (payer, payee, PSPs) can strongly influence the swift resolution of the complaint, as it enhances the sharing of information required to define a resolution of the dispute. A successful example of how a feature can reduce disputes is available for card payments in relation to e-commerce purchases. For example, various service providers, such as Ethoca and Verifi, help manage chargebacks and internal dispute project-management flows while also acting as early warning systems to banks for chargebacks. Ethoca and Verifi achieve this by offering services to increase the communication between the transaction participants and thus reduce the number of disputes or increase the speed with which these are resolved. The data shared includes, for example, the information associated with the order, such as the purchase date, items bought, merchant information, the device used to order, tracking information, or the fact that a payer is disputing the transaction (in such a case, the merchant might avoid completing the order shipping).

7.3 FOCUS ON FRAUD PREVENTION AND DETECTION

While erroneous payments and inter-participant issues are part of fast payments, by far the biggest challenge FPS faces is fraud. Once a fraudulent fast payment has been processed, it is hard to recover and can be distributed and withdrawn quickly, often before the malicious activity has been detected. It is also important to note that liability for fraud among the system participants can be difficult to define, regardless of whether the payment was authorized or unauthorized by the affected end users.[77] Therefore, DRMs must be the last resort for handling fraud, and industry stakeholders must prioritize fraud prevention and management tools to prevent fraudulent payments from being processed and/or to recover funds in case such payments go through. These can be part of the central infrastructure or the scheme rules, or they can be offered as overlay/value-added services.

Fraud prevention should always start by educating end users, both customers and businesses, on the types of malicious activities they should anticipate and how to recognize and handle them. Following this, using account and transaction data, central infrastructures and participants can work together to share data and detect fraud even if a customer might not realize it. This could include a comprehensive database of known fraudulent accounts and patterns that is shared with the industry.

The FPS operator plays a central role as a pivot in monitoring transactions, dispute trends at a systemic level, and fraud, ensuring stability and trust within the payment ecosystem. By analyzing dispute patterns, the FPS operator can proactively identify participants who generate disproportionately high levels of disputes, investigate the issues prompting the financial service providers to implement corrective measures, and enhance their operational practices. Moreover, the operator is strategically positioned to conduct detailed root-cause analyses to uncover underlying factors contributing to disputes, such as system vulnerabilities, merchant practices, or procedural inefficiencies, and recommend targeted improvements. Additionally, by offering centralized fraud-management services, the FPS operator can strengthen the system's resilience by rapidly detecting and mitigating fraudulent activities, safeguarding participants, and maintaining overall confidence in the payment infrastructure. Activities such as information sharing across the national community of financial service providers are essential to strengthening the PSPs' officer ability to promptly monitor and address issues identified elsewhere in the market.

Lastly, customer-authentication and payee-verification tools should be implemented pre-implementation to prevent fraud. In addition, general warnings should be given to customers to ensure that they are making appropriate payments.

7.4 IMPLEMENT A COMBINATION OF DIFFERENT TOOLS (LEGAL AND SCHEME-LEVEL) TO COVER THE VARIOUS ASPECTS OF DISPUTE RESOLUTION

For effective dispute resolution in fast payments, integrating legal and scheme-level tools is essential. The tools of regulatory authorities establish the structure of enforceable rules that dictate dispute resolution and participants' conduct. These are operating within a consumer-protection framework that can be specific for the financial sector or cover consumers more broadly in their economic interaction with businesses. These include laws and standards that define the rights and obligations of end users, system participants, third parties, and the system/scheme operator itself. They ensure a consistent and legally binding approach to disputes. Legal frameworks also facilitate the cooperation of all parties with law enforcement, enabling the prosecution of fraudulent individuals and noncompliant parties. Providing some sort of legal framework is vital for parties to feel safer using fast payments and to discourage malicious activities.

At the same time, scheme-level tools should provide practical and operational measures tailored to specific payment systems, such as rules and procedures for processing transactions, handling fraud, and resolving disputes between parties. Moreover, they can govern the implementation of technological solutions by scheme participants, including automated fraud-detection systems and real-time transaction monitoring, as well as secure communication channels for reporting and resolving disputes for both end users and participants. Additionally, schemes can require internal controls and participant agreements to ensure efficient and unambiguous dispute handling.

The interplay between the processes and tools, consumer-protection measures and the scheme rules, is of utmost importance, as the design and the operational implementation of the scheme rules can largely facilitate the appropriate handling of the disputes and ultimately results in consumer protection. In case of unresolved disputes, schemes can also allow system participants to avail a resolution from a well-regulated independent external DRM, like an ombudsman. By integrating scheme rules into the broader legal framework applied to the payment market, scheme operators can facilitate a comprehensive structure for dispute handling, covering all aspects of dispute handling.

One of the aspects of greater interest is handling disputes related to APP fraud. As observed in the country examples, the British regulator not only established a mandatory reimbursement regime under certain circumstances for this type of fraud but also mandated the implementation of the confirmation-of-payee service, to increase transaction security. Moreover, in the European Union, the payment service regulation that is under development has draft provisions aimed at shifting liability for APP fraud from the consumer to the PSPs.

In light of novel regulatory approaches to protecting consumers, it is further relevant for the financial sector to establish practices that can prevent, or at least reduce, APP fraud. Among these, confirmation of payee and payment verification are definitely among the most relevant, jointly with consumer-education activities. Moreover, introducing strong customer authentication or else friction in the transaction—for example, in the form of an acknowledgment of text that informs about the risks of the transaction—are viable practices adopted by PSPs. Nevertheless, these strategies can become more effective when the industry players at large (including PSPs, operators, authorities, and, eventually, the telecom service providers) collaborate in sharing information and developing processes to identify and address fraud.

7.5 CONSIDER THE ROLE OF DIFFERENT PRICING STRUCTURES IN THE SUSTAINABILITY OF DISPUTE-RESOLUTION MECHANISMS

FPS transactions are often priced at or near zero to promote uptake, especially in the early phases of rollout or in systems aimed at financial inclusion. This design supports user adoption but may limit revenue for PSPs and operators, raising questions about how to fund ancillary services such as DRMs. DRMs impose real operational and technical costs, such as investigation time, inter-PSP coordination, fraud analytics, customer support staffing, documentation systems, and the like. If pricing models do not account for DRM costs, the quality and responsiveness of dispute handling may suffer over time, particularly as transaction volumes rise or fraud vectors grow more complex.

Schemes should consider a balance between inclusive pricing and sustainability, for example:

- Cross-subsidization via value-added services.
- Modest transaction fees.

- Tiered service levels (for example, standard vs. enhanced recourse).
- Some countries (such as India and Brazil) offset this challenge via public subsidies.
- Transparent communication about the cost and funding of DRM services can help manage user expectations and support broader system trust.
- Long-term sustainability requires pricing models that reflect the full-service stack of FPS, including dispute handling, not just message routing and settlement.

Doing so will enable all players to communicate both with each other and with their end users about costs and DRMs and to provide leading services cost-affordably for end users.

7.6 BALANCE DATA COLLECTION FOR ANALYTICS WITH PRIVACY AND ECOSYSTEM ACCOUNTABILITY IN DISPUTE-RESOLUTION MECHANISMS

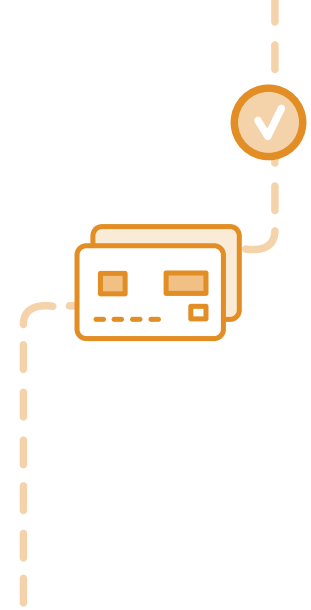
Comprehensive real-time data collection is foundational to effective DRM design and execution. Without timely access to granular transaction data, disputes cannot be properly investigated or resolved. FPS require data to be captured at multiple points in the transaction life cycle: initiation, authentication, routing, settlement, confirmation, and post-transaction actions (for example, refunds and reversals).

Key data elements that support DRMs include the following:

- Timestamps
- Transaction IDs
- Sender/receiver aliases and account metadata
- Authentication method used
- Device/browser/IP information
- Confirmation-of-payee outcomes
- Error/failure codes and resolution timestamps
- Communications history with users

Standardized digital receipts (for example, Mexico's CEP) and interoperable data formats (such as ISO 20022) enable faster and more accurate dispute processing. Data centralization or sharing models (for example, fraud registries or shared investigation platforms) can help PSPs identify recurring issues or bad actors across the system. In addition, real-time access to data facilitates early detection of fraud and system errors, improving the likelihood of resolution before financial loss is permanent.

Privacy and data-protection concerns must be balanced, particularly where dispute investigation requires PSPs to share customer or transactional information across entities or with regulators. Dispute-resolution analytics can inform system-wide improvements by identifying common failure points, PSP-specific issues, or new fraud patterns without necessarily sharing sensitive customer-specific data. FPS operators can use dispute data to establish performance benchmarks for all participants and to hold PSPs accountable for delay or non-resolution. Designing DRM-supportive data infrastructure early in FPS development is often more effective and less costly than retrofitting systems after adoption.



8 CONCLUSION

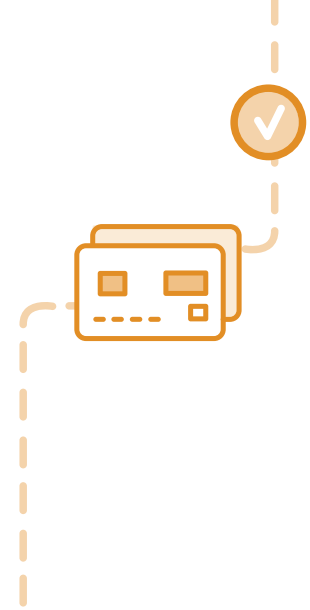
DRMs are important means to protect customers in the event of fraudulent or erroneous transactions. The presence of a robust and efficient dispute-handling mechanism can foster consumer protection and support the safe and smooth operation of a payment system, therefore increasing trust and facilitating user adoption of particular payment methods. A fast payment theoretically cannot be reversed given that such transactions are conceptually final and irrevocable. Nevertheless, a disputed fast payment transaction can, in appropriate instances, result in a refund or a return payment, depending on the DRM and outcome of the process.

Whether and how DRMs are established will depend on the system and scheme operators and the legal frameworks present in the markets they serve. In all instances, the individual PSP needs to be capable of handling complaints from its end users, especially concerning fraud or misdirected payments. To support PSPs, guidelines can be issued regarding how to handle exceptions and certain disputes to enhance the cooperation between the involved parties. The guidelines can be supplemented with more formal complaint-handling procedures. A formal FPS dispute-resolution framework or system can be framed on aspects of other existing DRMs regarding payments, such as the chargeback schemes and processes for cards. While DRMs regarding fast payments may be very limited in scope initially or solely based on market guidance, a more detailed dispute-resolution framework may be required once an FPS matures and more diverse use cases and payment instruments are supported.

A well-regulated, robust, external DRM tailored to FPS can provide consumers with a reliable, independent avenue to address issues such as unauthorized transactions, delays, or system malfunctions that are not adequately resolved by providers. Providing an external independent avenue for dispute resolution would enhance consumer protection and trust in FPS by offering a transparent, impartial process for resolving disputes.

The approach taken regarding dispute resolution should be driven by clearly defined policy objectives and in consultation with relevant stakeholders, including regulators, consumer associations, and other relevant bodies, in addition to PSP and FPS representatives. Public authorities, including central banks, can play an important role by initiating discussions with market participants, issuing guidelines, and establishing relevant DRMs regarding fast payments, both scheme-driven and within individual providers.

As different markets across the globe have different levels of financial literacy, types of fraud, and payment cultures, dispute handling differs among them as well. This adds an additional layer of complexity to defining the clear-cut best practices for how dispute handling should be addressed within the overall fast payment infrastructures. Stakeholders should observe comparable markets and consider which aspects of their dispute-resolution frameworks could be applied to their own FPS, to develop DRMs and create a comprehensive structure protecting all parties involved.



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ENDNOTES

1. https://openknowledge.worldbank.org/entities/publication/ff9c9482-5ffe-5c98-b6f3-5b97eeab5ed1
2. https://documents1.worldbank.org/curated/en/773561567617284450/pdf/Complaints-Handling-within-Financial-Service-Providers-Principles-Practices-and-Regulatory-Approaches-Technical-Note.pdf
3. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/515771621921739154/consumer-risks-in-fintech-new-manifestations-of-consumer-risks-and-emerging-regulatory-approaches-policy-research-paper
4. https://www.worldbank.org/en/topic/financialinclusion/brief/ficpsurvey
5. https://fastpayments.worldbank.org/sites/default/files/2021-11/Fast%20Payment%20Flagship_Final_Nov%201.pdf
6. https://www.fisglobal.com/en/insights/merchant-solutions-worldpay/article/understanding-and-managing-disputes-amid-covid-19
7. https://fastpayments.worldbank.org/sites/default/files/2022-03/Scheme%20Rules_Final_0.pdf
8. https://www.fisglobal.com/en/insights/merchant-solutions-worldpay/article/understanding-and-managing-disputes-amid-covid-19
9. https://fastpayments.worldbank.org/sites/default/files/2021-10/Consumer_Protection_Final.pdf
10. https://stripe.com/en-de/resources/more/payment-fraud-101
11. https://www.aciworldwide.com/app-fraud
12. https://www.canada.ca/en/financial-consumer-agency/services/resolving-unauthorized-transaction.html
13. https://www.accc.gov.au/consumers/buying-products-and-services/not-receiving-products-or-services-that-are-paid-for
14. https://www.bis.org/cpmi/publ/d101a.pdf
15. https://www.frbservices.org/financial-services/fednow/instant-payments-education/whats-in-a-name.html
16. https://www.fsa.go.jp/frtc/nenpou/2006a/11e.pdf
17. https://www.frbservices.org/financial-services/fednow/instant-payments-education/whats-in-a-name.html
18. https://www.fsa.go.jp/frtc/nenpou/2006a/11e.pdf
19. The revised Payment Services Directive was released in 2015. According to its provisions, the European Union released the SCA Regulation in 2018, which entered into force in 2019.
20. https://finance.ec.europa.eu/publications/strong-customer-authentication-requirement-psd2-comes-force_en
21. https://www.ukfinance.org.uk/news-and-insight/press-release/criminals-steal-over-half-billion-pounds-and-nearly-80-cent-app
22. https://www.reuters.com/article/idUSL8N37Z4E1/
23. https://chargebacks911.com/history-chargebacks/
24. https://bd.visa.com/dam/VCOM/global/support-legal/documents/merchants-dispute-management-guidelines.pdf
25. https://bd.visa.com/dam/VCOM/global/support-legal/documents/merchants-dispute-management-guidelines.pdf
26. Bank statement for debit transactions. Credit card statement for credit card transactions.
27. https://bd.visa.com/dam/VCOM/global/support-legal/documents/merchants-dispute-management-guidelines.pdf
28. https://commission.europa.eu/document/download/3b971d58-4627-4e33-b5a0-968222e44893_en?filename=chargeback_report_revised.pdf
29. Variations exist. For example, some retail payment systems are co-owned by banks, such as with the ACH Network in the United States and the European Payments Council's role in the Single Euro Payments Area in the European Union.
30. https://www.bcb.gov.br/en/financialstability/pixcentralbanksrole
31. https://fastpayments.worldbank.org/sites/default/files/2021-10/Consumer_Protection_Final.pdf
32. https://fastpayments.worldbank.org/sites/default/files/2022-03/Scheme%20Rules_Final_0.pdf
33. https://www.npci.org.in/what-we-do/upi/dispute-redressal-mechanism
34. https://www.europeanpaymentscouncil.eu/sites/default/files/kb/file/2023-06/EPC150-19%20Approved%20Dispute%20Resolution%20Committee%20Mandate%20v2.0.pdf
35. https://www.banxico.org.mx/services/interbanking-electronic-payme.html
36. For example, many central banks and supervisory authorities play no role in handling customer disputes—these are handled exclusively within individual financial service providers or PSPs or through alternative dispute-resolution/ombudsmen schemes.
37. Of course, central banks and supervisory authorities play no role in handling customer disputes. These are handled exclusively within individual financial service providers or PSPs or through alternative dispute-resolution/ombudsmen schemes.
38. https://nppa.com.au/wp-content/uploads/2021/07/NPP-Regulations-v9.0-public-version-.pdf
39. https://asic.gov.au/regulatory-resources/financial-services/epayments-code/
40. https://insight.thomsonreuters.com.au/legal/posts/asics-updated-epayments-code-now-covers-new-payments-platform
41. https://www.afca.org.au/make-a-complaint/banking/banking-deposits-and-payments-products-and-issues
42. https://benefit.bh/Personal/benefitpay/terms-and-conditions
43. https://fastpayments.worldbank.org/sites/default/files/2021-10/World_Bank_FPS_Bahrain_Fawri%2B_Case_Study.pdf
44. https://www.cbb.gov.bh/payment-settlement/
45. https://www.bcb.gov.br/en/financialstability/pix_en

46. https://fastpayments.worldbank.org/sites/default/files/2022-07/WorldBank_FPS_Brazil_%20Pix_Case_study.pdf
47. An important but underappreciated area of dispute resolution is between a payer and their PSP, such as when a payer attempts to pay and their transaction is not cleared. Having reasonable communication and redress mechanisms in this situation is helpful and encompasses one of the numerous types of dispute resolution seen in payments.
48. https://www.bcb.gov.br/en/about/faq
49. https://www.bcb.gov.br/acessoinformacao/protocolodigital
50. https://fastpayments.worldbank.org/sites/default/files/2022-07/WorldBank_FPS_Brazil_%20Pix_Case_study.pdf
51. https://www.npci.org.in/
52. https://www.rbi.org.in/scripts/FS_Overview.aspx?fn=9
53. https://fastpayments.worldbank.org/sites/default/files/2021-10/World_Bank_FPS_India_IMPS_and_UPI_Case_Study.pdf
54. https://fastpayments.worldbank.org/sites/default/files/2021-10/World_Bank_FPS_India_IMPS_and_UPI_Case_Study.pdf
55. https://download.pwc.com/mx/archivo/2023/202308-sistemas-de-pago-instantaneos.pdf
56. https://fastpayments.worldbank.org/sites/default/files/2021-09/World_Bank_FPS_Mexico_SPEI_Case_Study.pdf
57. https://www.banxico.org.mx/services/spei_-information-module-tran.html
58. https://nbp.pl/wp-content/uploads/2023/04/Payment-system-in-Poland-2019.pdf
59. https://fastpayments.worldbank.org/sites/default/files/2021-09/World_Bank_FPS_Poland_Express_Elixir_Case_Study.pdf
60. https://blik.com/en/documentation
61. https://www.bankservafrica.com/website/services/real-time-clearing
62. https://www.banking.org.za/wp-content/uploads/2019/04/Code-of-Banking-Practice-2012.pdf
63. https://nationalgovernment.co.za/units/view/450/ombudsman-for-banking-services
64. https://pasa.org.za/about-payments/faq/
65. https://www.psr.org.uk/how-we-regulate/complaints-and-disputes/
66. https://fastpayments.worldbank.org/sites/default/files/2021-09/World_Bank_FPS_UK_FPS_Case_Study.pdf
67. https://www.psr.org.uk/our-work/app-scams/the-contingent-reimbursement-model-crm-code/
68. https://www.lendingstandardsboard.org.uk/wp-content/uploads/2022/01/Information-for-customers-CRM.pdf
69. https://www.politico.eu/article/british-banks-want-big-tech-to-pay-up-when-people-are-scammed-online/#:~:text=In%202022%2C%20banks%20which%20are,already%20been%20delayed%20six%20months.
70. https://www.federalreserve.gov/boarddocs/supmanual/cch/efta.pdf
71. https://www.uniformlaws.org/acts/ucc
72. https://www.federalreserve.gov/boarddocs/supmanual/cch/efta.pdf
73. https://www.uniformlaws.org/acts/ucc
74. https://fastpayments.worldbank.org/sites/default/files/2021-09/World_Bank_FPS_UK_FPS_Case_Study.pdf
75. https://www.neachgroup.com/Portals/0/Users/002/02/2/4_18_22_RTP%20Operating%20Rules%20effective%2004_18_22.pdf
76. https://www.frbservices.org/binaries/content/assets/crsocms/resources/rules-regulations/fednow-operating-procedures-september-2023.pdf
77. One of the reasons authorization does not have as much weight in determining liability among participants is that it may be difficult to assess what is authorized. For instance, APP frauds may also be related to poor onboarding policies by the PSP of the fraudster/payee, and it may be difficult to assess whether this involves their responsibility for the disputed payment transaction.

WORLD BANK GROUP

Enclosure 13

Retail digital florin for inclusive resilience – A case study for Aruba

Rynall Kock

November 2025

Disclaimer

The views expressed in this presentation are those of the author and do not represent necessarily the perspective of the Centrale Bank van Aruba.

Presentation Outline

Introduction

Risks and benefits

Policy recommendations

This presentation is based on Chapter 4 of "Governing from the future, leading with inclusion: Policies, prospects, and pathways for Aruba 2040" by the CBA (2024). Authored by Rynall Kock.

An introduction to a retail digital florin

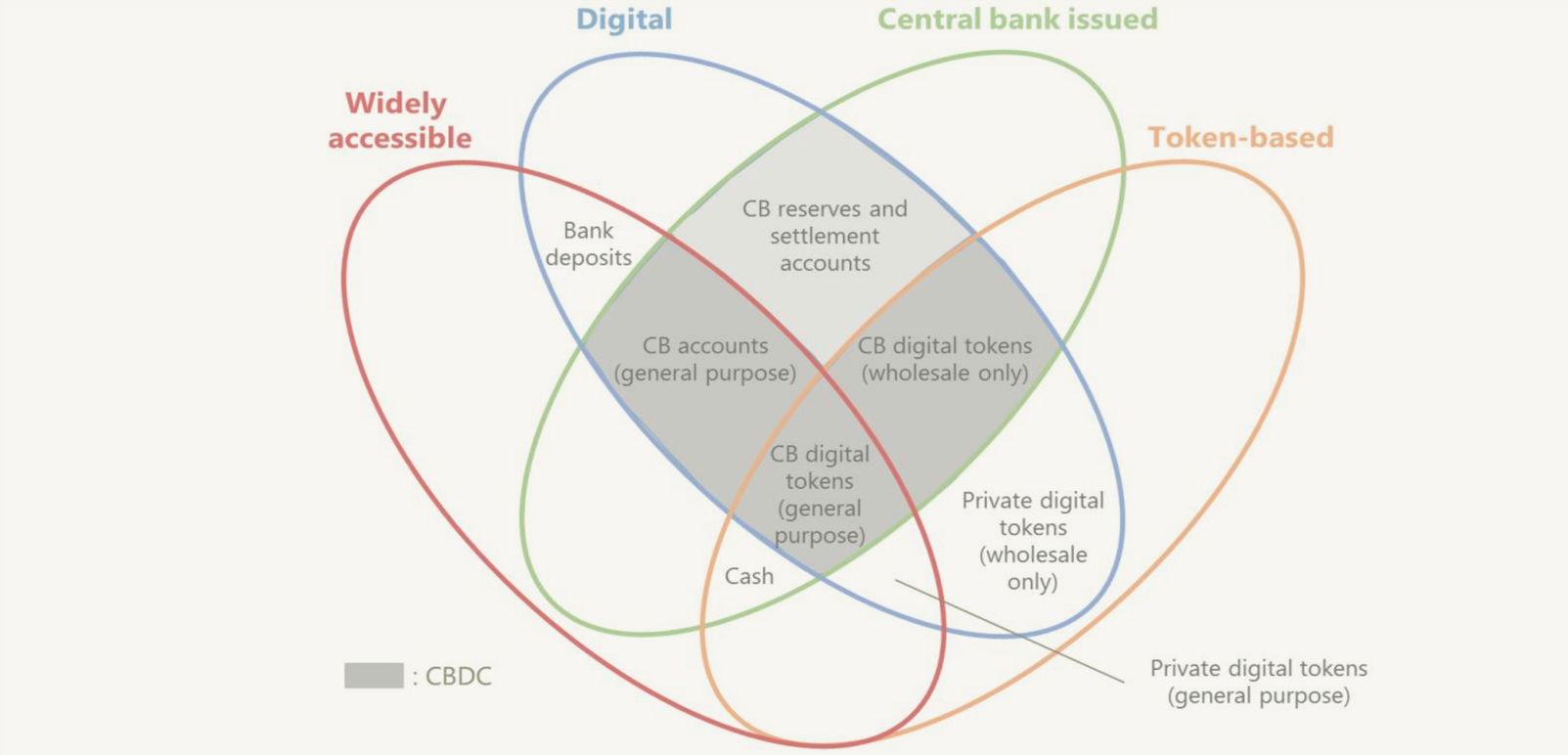
A natural starting point is to explain **what** a retail digital florin is.

The retail digital florin is a specific type of central bank digital currency (CBDC).

1. What is a (central bank) digital currency?
2. How is it different from Bitcoin or other cryptocurrencies?
3. What about the "retail" part?

The taxonomy of money summarizes a retail digital florin.

- A retail digital florin *is* digital (blue), issued by a central bank issued (green), and widely accessible (red).
- It *can* be token-based or account; this relates to the verification method of transactions.



Source: BIS (2017)

Account versus token-based retail digital florin

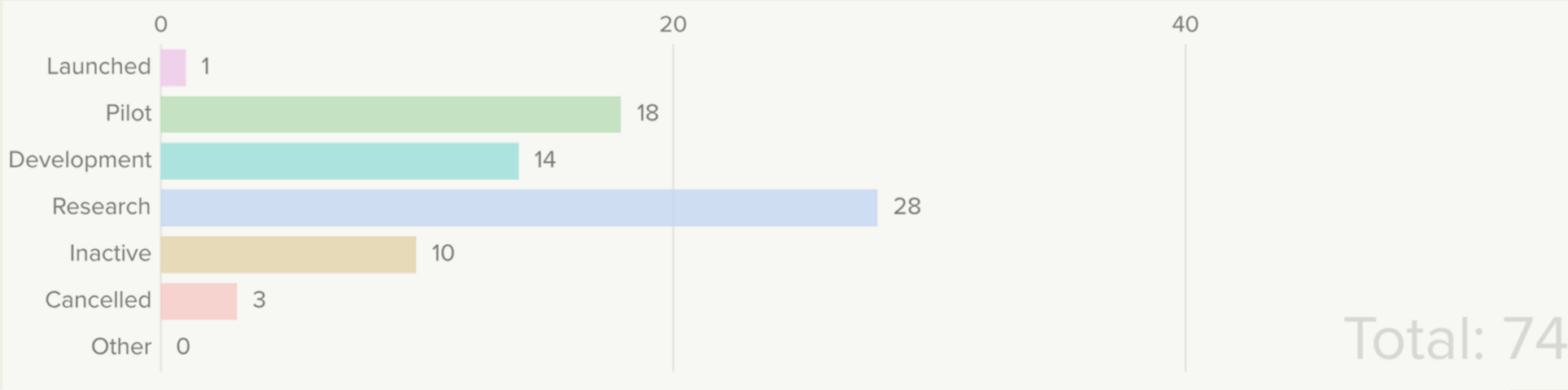
Imagine I send a friend Afl. 10.

- Account-based: The host of retail digital accounts *verifies* my identity and account balance. The transfer is just a ledger entry. Similar to an online bank transfer.
- Token-based: Each digital florin exists as a token cryptographically signed by the central bank. Authorized parties *verify* the authenticity of the 10 digital florin tokens. Digital ownership of the tokens is transferred. Analogous to me handing over a bill of Afl. 10 to my friend.

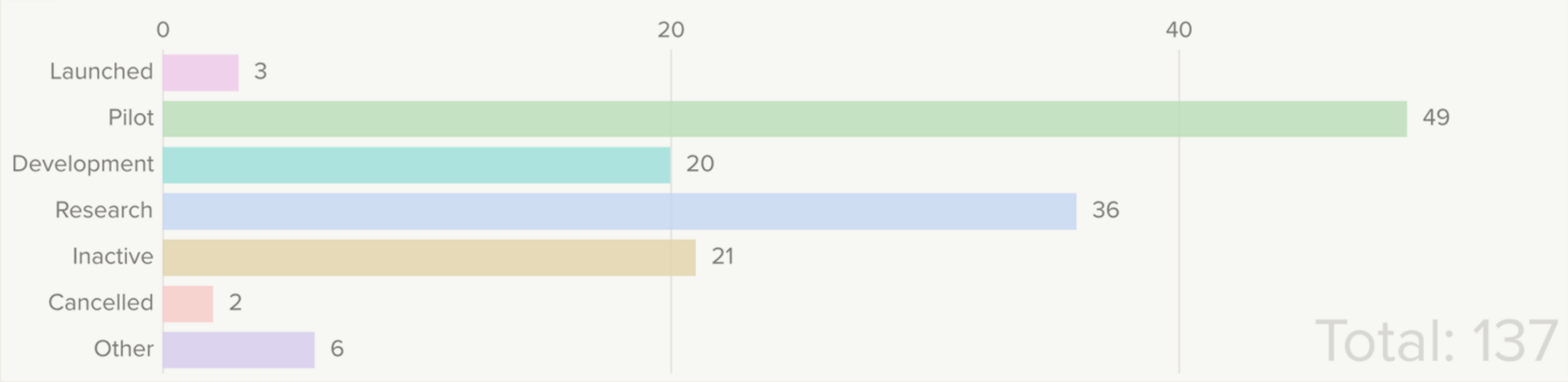
We now know the "what", what about the "why"?

Part of the why: central banks are increasingly involved with CBDCs.

April 2021



July 2025



Source: Atlantic Council (2025)

Central banks are paying attention to CBDCs, and understandably so.

CBDCs may affect four areas relevant to central banks

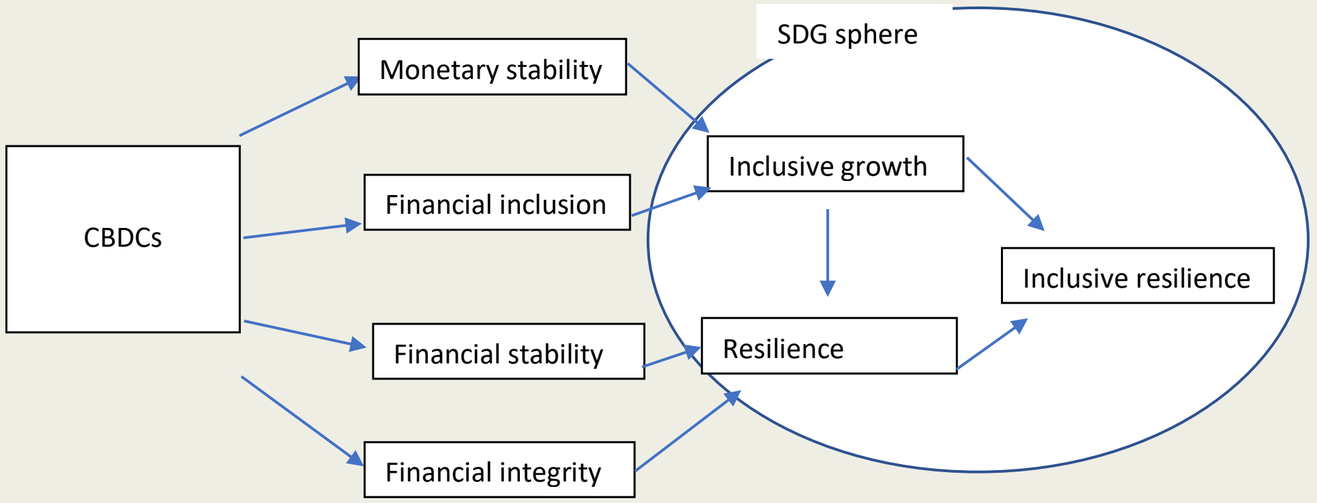
I. Monetary stability
II. Financial stability
III. Financial inclusion
IV. Financial integrity

In addition, wide adoption of cryptocurrencies may threaten monetary and financial stability, so central banks need to at least explore an attractive alternative.

These four areas are tightly connected to inclusive resilience.

Inclusive resilience: the ability to withstand and adapt to shocks, thereby supporting economic growth for all social groups.

- Reflects topics of inclusive growth and resilience



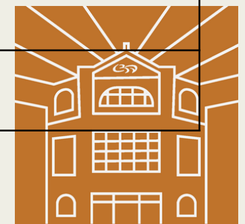
Source: Kock (2024)

So how can CBDCs impact central banks?

Dimension of inclusive resilience	Risk	Source
Financial stability	Commercial bank disintermediation	BIS (2018)
	Worsened bank runs	BIS (2021a)
	Cybersecurity risks	FED (2022)
Monetary stability	Commercial bank disintermediation	FED (2022)

So how can CBDCs impact central banks?

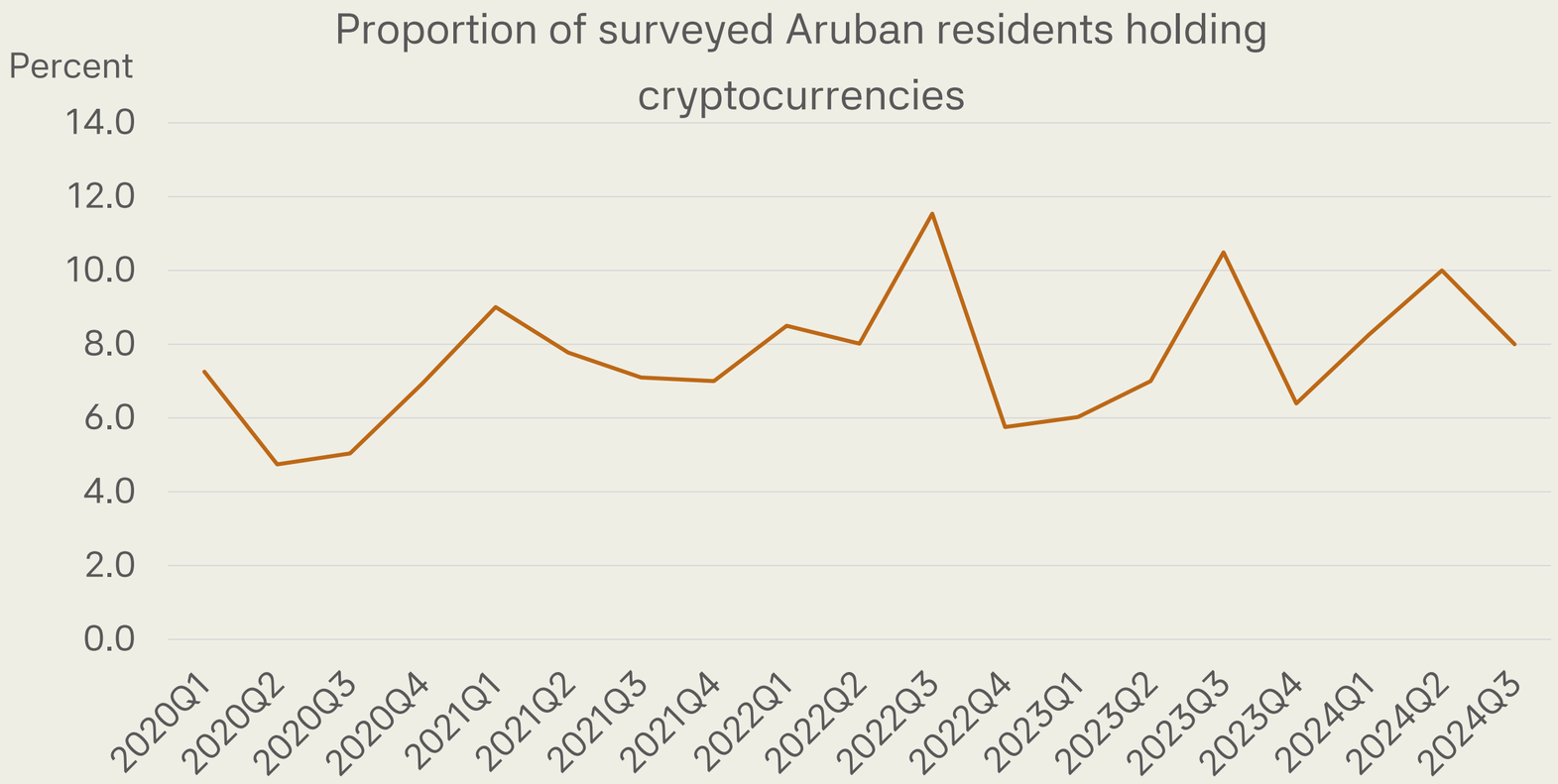
Dimension of inclusive resilience	Benefits	Source
Financial stability	Retail CBDC is a competitor for crypto	Kosse and Mattei (2022)
	Retail CBDC benefits cashless economies	Riksbank (2022)
	Payment resilience	BoC (2022)
Monetary stability	Retail CBDC is a competitor for crypto	BIS (2021)
Financial inclusion	The transition from unbanked to banked	Barontini and Holden (2019)
	Cheaper and faster payments	Mancini-Griffoli et al. (2018)
	Adaptability to dynamic consumer needs	BIS (2022a)
Financial integrity	Reduce ill effects of cash usage	CBOB (2019)



Local case: the effects of a retail digital florin (1)

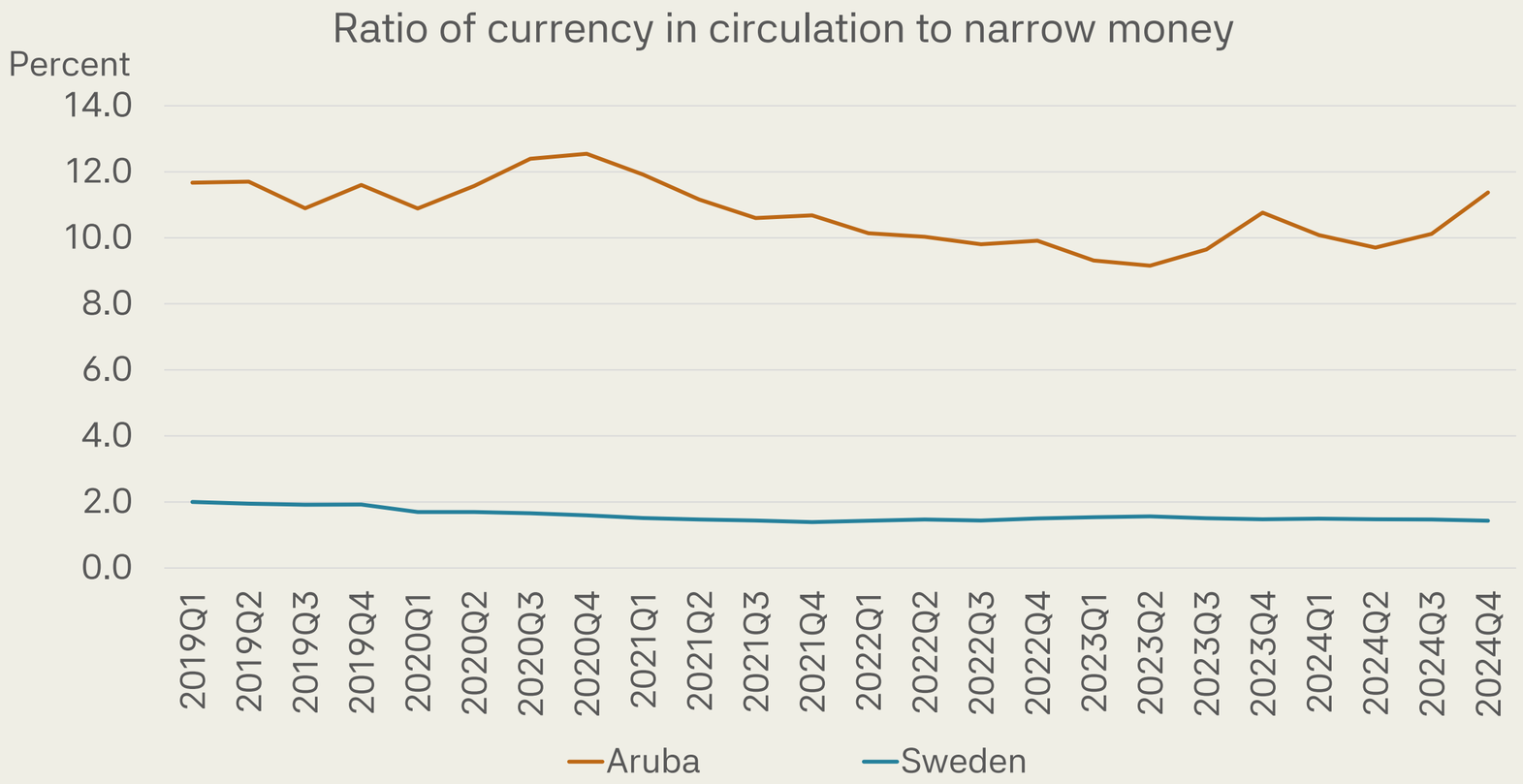
Dimension of inclusive resilience	**Impact** / **Likelihood**	Small	Medium	Large
Financial stability	Unlikely			1. A digital florin would compete with crypto. 2. A digital florin would benefit a cashless economy. 1. Commercial bank disintermediation. *Subject to caps on holdings. Holdings must also not bear interest* . 2. Worsened bank runs. *Subject to caps on holdings. Holdings must also not bear interest* .
	Possible		Payment resilience, *although dependent on offline features.* Cybersecurity risks exist; *thus, privacy policies are key.*	
	Likely			
Monetary stability	Unlikely			A digital florin would compete with crypto. Commercial bank disintermediation. *Subject to caps on holdings. Holdings must also not bear interest* .
	Possible			
	Likely			

Cryptocurrency adoption is not widespread in Aruba; weakens argument for a retail digital florin



Source: CBA Consumer Confidence Survey

Cash is still king in Aruba; puts doubt on urgency of a retail digital florin



Source: CBA and Sveriges Riksbank

Local case: the effects of a retail digital florin (2)

Dimension of inclusive resilience	**Impact** / **Likelihood**	Small	Medium	Large
Financial inclusion	Unlikely			
	Possible		1. The transition from unbanked to banked. *Requirements: permissioned DLT, offline features, and privacy recognition.* 2. Adaptability to dynamic consumer needs. *Prerequisite: indirect or hybrid CBDC.*	Cheaper and faster payments. Domestic, no. Cross-border, yes, but significant conflicting risk loom.
	Likely			
Financial integrity	Unlikely			
	Possible		Reduce ill effects of cash usage. *Enabler: tiered account in which different KYC and privacy standards apply.*	
	Likely			

The local panorama suggests these policy recommendations (1):

Design recommendations

i. Offline features for payment resilience
i. Permissioned distributed ledger technology (for smart contracts)
ii. Some extent of privacy
iii. One-to-one conversion between commercial banks deposits and the digital florin
iv. Low costs when transferring funds (CBA, 2018)
v. Three-tiered know-your-customer (KYC) model
vi. Decentralize the customer-facing duties
vii. Cap on (non-interest bearing) digital florin holdings

The local panorama suggests these policy recommendations (2):

Enabling conditions:

1. Broaden innovation capacity
1. Provide innovation complementarities
2. Introduce remedies for market failures specific to R&D
3. Collaboration between the government, CBA, universities and the private sector. Initiatives such as the National Council of Economic Advisors may prove useful here.

The local panorama suggests these policy recommendations (3):

Implementation recommendations

minimum design criteria, alternatives, set-up costs

digital florin a legal tender

Aruban Payments System Directive, consumer financial protection laws, e-Commerce (legal framework)

enabling conditions

public awareness and marketing

Aruba digital citizenship and e-Government (legal framework)

innovation complementarities, National Council of Economic Advisors, remedies for market failures

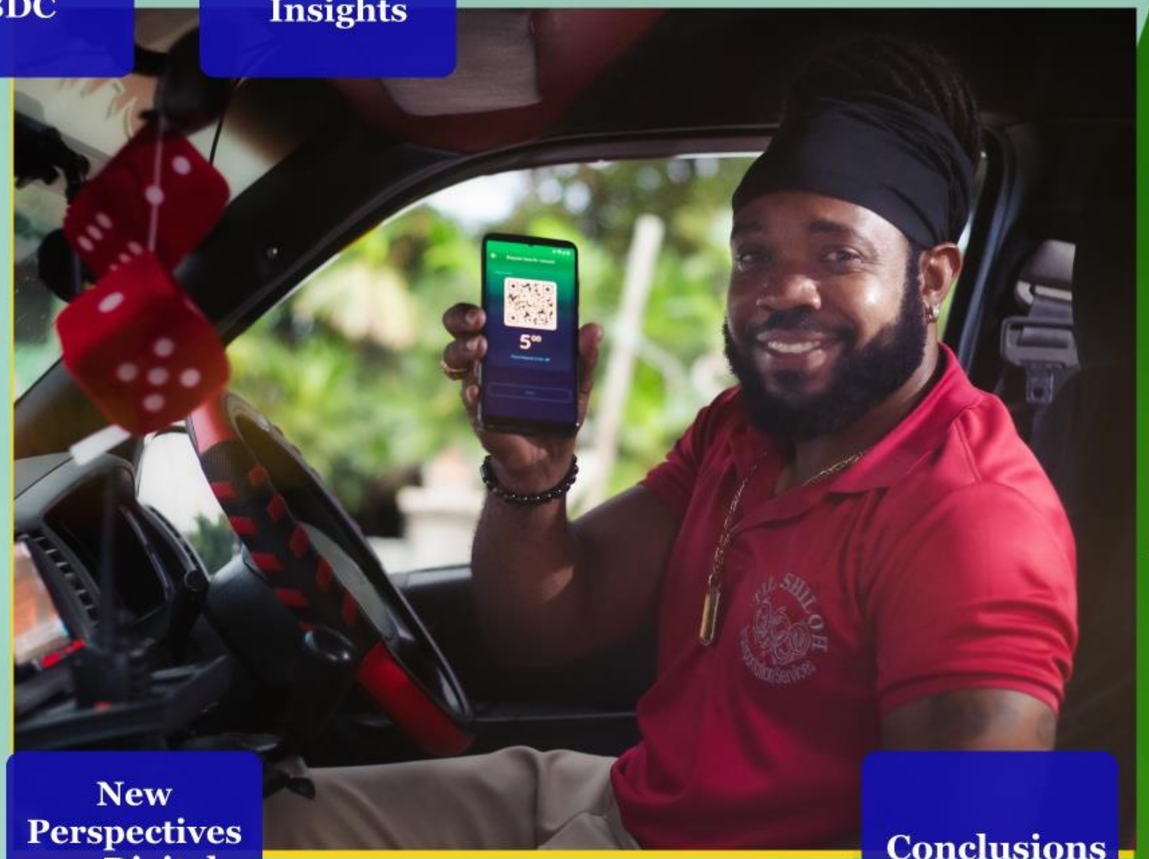
enabling conditions

Thank you

Enclosure 14

First Movers in CBDC

DCash Pilot Insights



New Perspectives on Digital Money

Conclusions

Inside The Eastern Caribbean Central Bank's CBDC Pilot: Key Insights, Outcomes and Lessons for the Future of Digital Money

Foro di Pago Nacional, Centrale Bank Van Aruba
Aruba
November 13, 2025

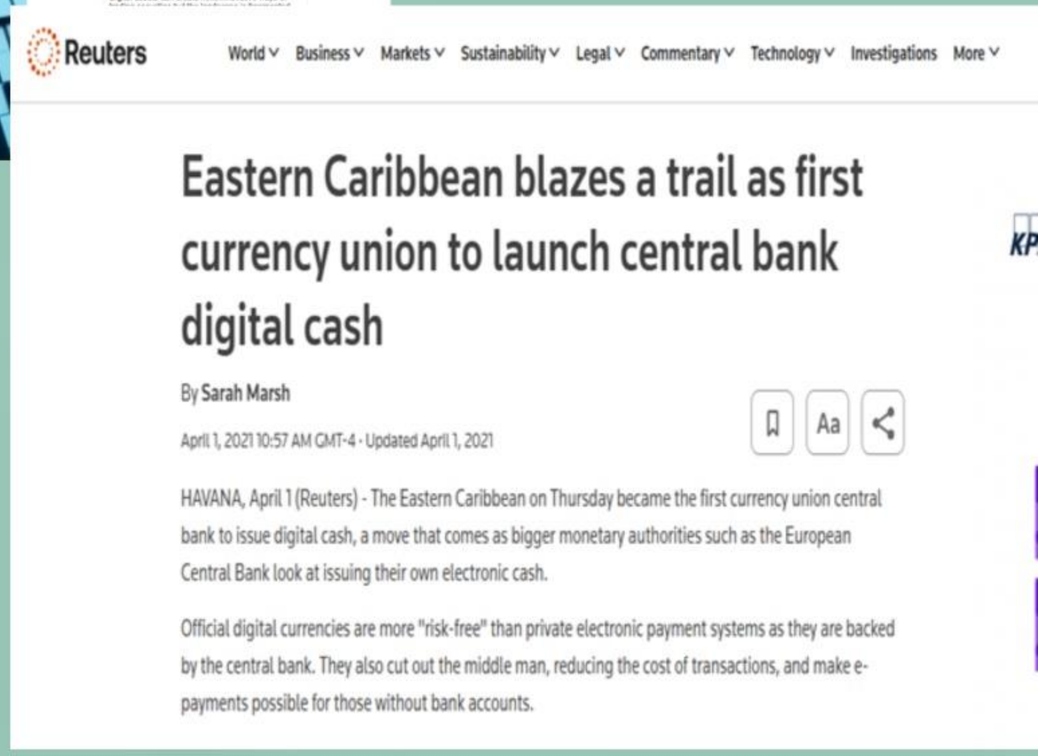
Presented by: Karina A. Johnson, LLM, MSc.
ECCB

DCash: A Pilot With Global Implications

ECCB
Monetary authority and regulator for 8 countries.

DCash Pilot

- ECCB's Payment System Modernisation
- Satisfy money's core functions: transfer, store and unit of account .
- Direct Liability on the Central Bank



Pioneering in Uncharted Waters

Building DCash: ECCB Vision

· Secure, sovereign, digital version of the EC currency

· Operates alongside physical cash and other current payment instruments

· Alternative retail payment channel to cash, cheques, debit cards and wire transfers within ECCU

2019-2020

Requirements gathering, planning, design, development and testing over twelve months

2021

Live deployment in Antigua & Barbuda, Grenada, St. Kitts & Nevis, and Saint Lucia

2022-2023

Rollout to remaining ECCU countries. Temporary outage; services restoration, system upgrade. Marketing partner onboarded

2024

Pilot wind-down of operations and technical infrastructure. Redemptions by participants

Building DCash: Key Attributes

- Legal Tender; solely issued and redeemed by ECCB
- Wallet-Based Payments
- No Transaction Fees
- Distributed Ledger Technology

ECCB: topmost certificate authority issuing and revoking network and transitional access to deposit taking financial institutions as well as other approved non-bank financial institutions.

DCash ecosystem: ECCB, Commercial Banks, Credit Unions, Non-bank Financial Institutions, Merchants, Consumers and a private permissioned blockchain network.

Building DCash: Risk Landscape

Unauthorised Distribution

Controlled Distribution

Limited to Financial Institution Treasury Wallets

Unauthorised Minting

Hardened Infrastructure
Controlled Hardware Access
Minting Validation
Encrypted Operations

Bank Operations and Payment Systems Disruption

No ECCB IT Integration

No Payment System Link

System Unavailability

Hardware Redundancy
2ndary Minting System

System Continuity
DDoS Protection

Distribution, Lessons Learned and Insights

How DCash Was Implemented

Wallet Types

- Registered (via FIs)
- Value-Based (via agents, under-banked)
- Merchant wallets

Merchant Onboarding

- FI partnerships
- Business bank account required
- Top value props: no fees, real-time settlement, generous wallet tiers

Omni-channel Public Campaign

- Customised Content
- Security-focused Messaging
- High-touch engagement

Adoption and Feedback

- < 400 merchants
- 21 FI, incl 11 Credit Unions
- $2.5m DCash in Circulation
- 2 VBW for every 1 RBW

Lessons from the Field

Operational

- Resilience + offline access essential for reliability
- 24/7 systems need 24/7 capacity and support

Technological

- Interoperability must be designed in, not added later.
- Scalability and cybersecurity underpin trust

Governance

- Sovereign oversight is non-negotiable for integrity
- Policy vision must guide technology, not the reverse

Legal & Regulatory

- CBDC as Money, not Token
- Legal Tender Status adds Legitimacy

Adoption

- Inclusion beyond regulatory easing; requires literacy, devices, and trust
- 2-sided markets, incentives on both sides, *merchant readiness

Stakeholder Engagement

- Engagement is ongoing
- Feedback strengthens design

Legal & Regulatory

- CBDC as Money, not Token
- Legal Tender Status adds Legitimacy

Governance

- Sovereign oversight is non-negotiable for integrity
- Policy vision must guide technology, not the reverse

Insights From the Pilot

Adoption is Not Automatic – Mixed reactions from institutions and the public; hands-on engagement helps drive understanding and uptake.

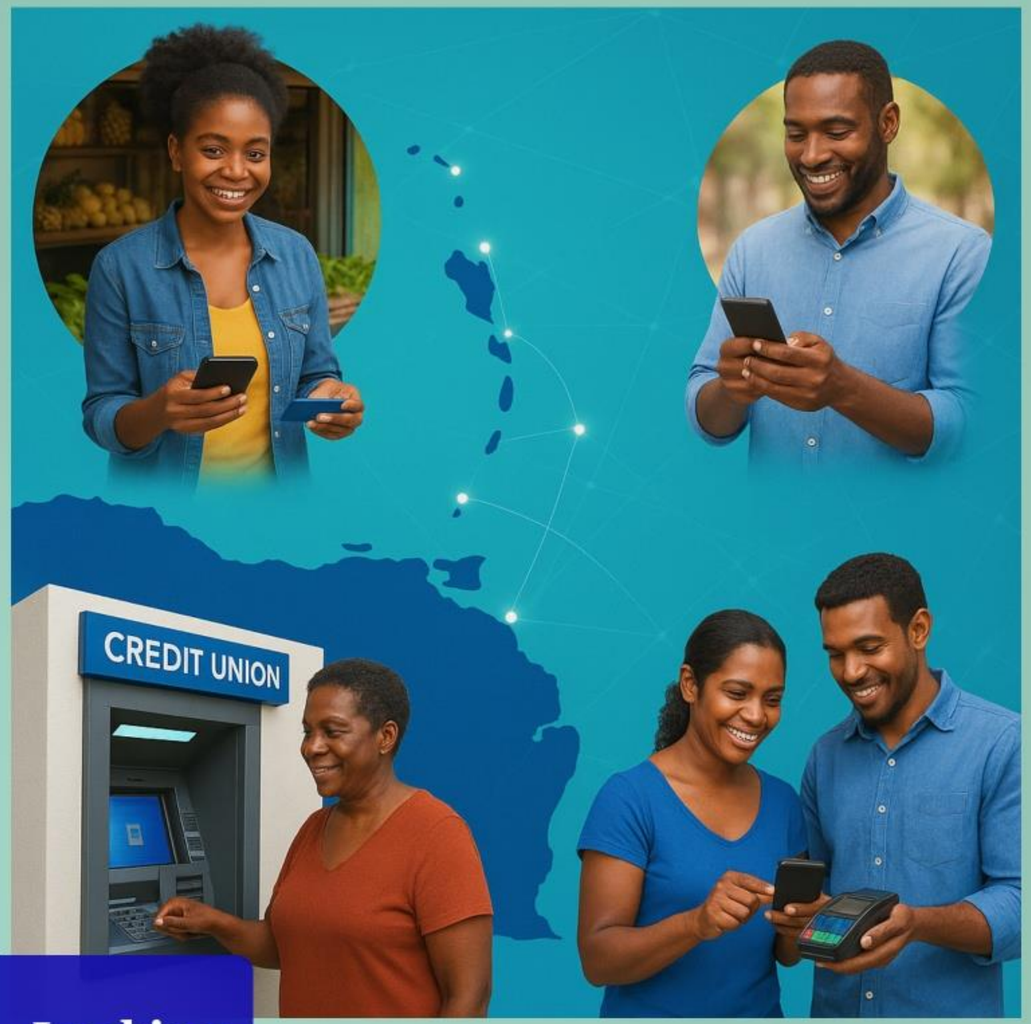
Prioritise Ease – Simplified wallets and automated onboarding double user adoption compared to conventional processes.

Integration is Key – DCash works best when connected to existing payment systems to avoid fragmented experiences.

Be Prepared – Contingency systems are essential to maintain operations and customer trust during disruptions.

Ecosystems are Essential – Digital finance success depends on value for all participants: consumers, businesses, financial institutions, and governments.

New Perspectives on CBDCs and Digital Money



Looking Forward

The Future of Central Bank Digital Money

- Central Bank credibility remains anchor of trust
- CBDC Trust = (Clear Policy + Strong Privacy+ Risk Oversight) X Resilience
- Striking the Balance

- Regulatory Innovation Through Collaborative Sandbox Testing

01 Central Banks can lead, not merely regulate, the evolution of digital finance

02 Modular Systems Design + Core Ownership boosts Innovation and Control

03 CBDC trust relies on clear policy, strong privacy, risk oversight, and resilience

04 The future of money is plural; DCs must be interoperable by design

Recommendations

1. **Investigate Opportunities in Digital Currency**
   Delaying engagement risks following global rules instead of shaping them, jeopardising monetary sovereignty and strategic positioning.

2. **Policy Clarity**
   Regional and financial system resilience, consumer protection, preserving monetary sovereignty, digital financial inclusion.

3. **High Impact Use Cases**
   Begin with a narrow scope, optimising for high return use cases. Whether as a CBDC or tokenised deposits, it cannot be everything to everyone all at once.

4. **System Security**
   Harden the system to protect against malicious activity, such as cyber attacks, fraud, data breaches, unauthorised access.

5. **Reliability and Resilience**
   Build for high availability and strengthen operational reliability, including automatic failover to back up environment, including offline and low connectivity functionalities aligned with the realities of our region.

6. **Share Timely, Factual Disclosures**
   Clear, accurate and accessible information can repel misinformation and speculation.

Thank You for Your Attention

Open for Questions & Discussion

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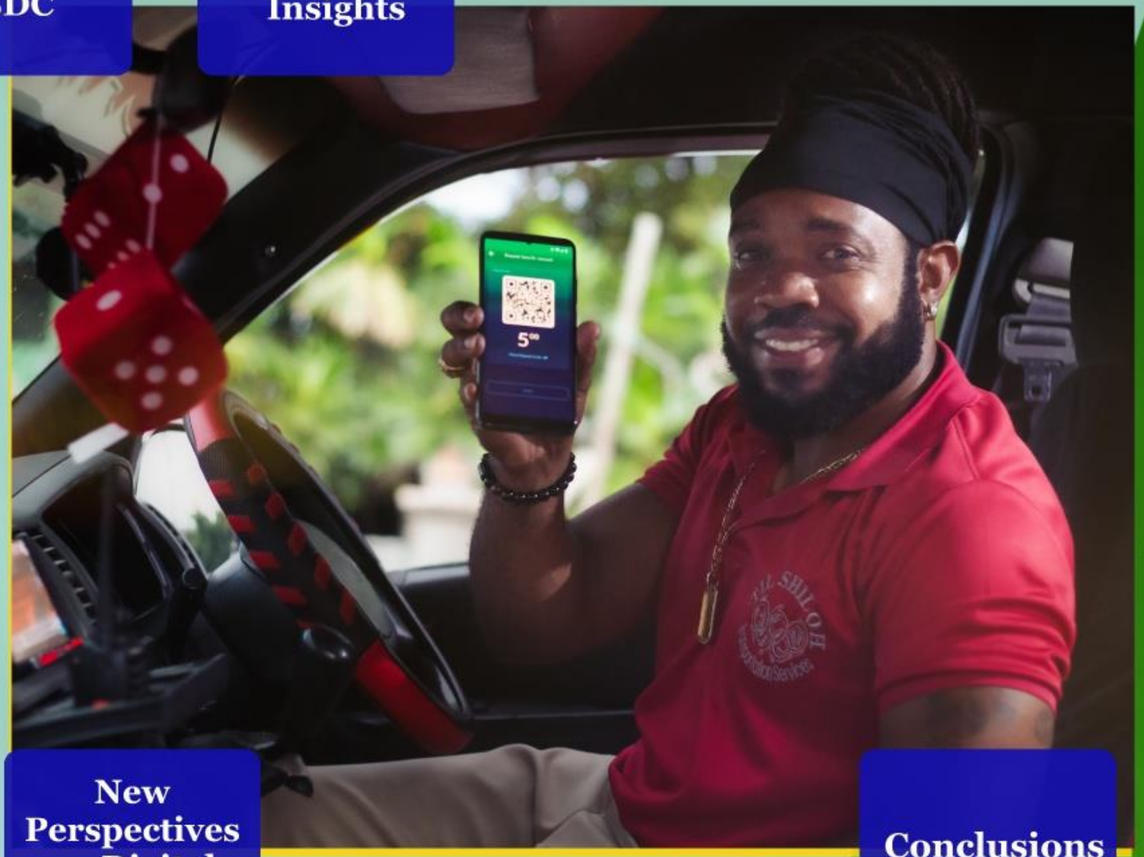
First Movers in CBDC

DCash Pilot Insights



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VAN ARUBA

Closing remarks by Mrs. Miriam M. Gonzalez, Executive Director of the Centrale Bank van Aruba and Chair of the "Foro di Pago Nacional", at the third "Foro di Pago Nacional" Conference organized by the CBA on November 13, 2025, at the Ballroom of the Ritz Carlton Aruba.

Ladies and gentlemen, as we have come to the end of this conference, "Driving the Future of Payments," I want to express my heartfelt gratitude to each one of you for the energy and insights you have brought to our conference today. This is what drives innovation in payments forward, also in our community. I am inspired by the enthusiasm everyone here has shown toward making payments more modern, accessible, inclusive, and secure.

Digital currencies and innovative payment technologies are reshaping the future of payments and finance, enhancing digital financial inclusion, and impacting economic growth. Securing access to these digital systems is essential for inclusive development, enabling broader participation in the global digital economy.

As we wrap up this conference, let's carry forward the insights and conversations we've shared today, with the intention of continuing to engage and collaborate. Collaboration is key to advancing meaningful solutions, and the connections we build play a vital role in shaping the future landscape of payments. Each one of us has a pivotal part to play in shaping a payment environment that prioritizes both inclusivity and security. The Foro di Pago Nacional (FPN) is a perfect vehicle to enable this development in Aruba.

During our Foro conference of last year, we discussed the topics of scams and fraud in payments both in Aruba and abroad. Based on the outcomes of that conference and the working group sessions held earlier this year, we recognize the need to launch a

targeted campaign against scams and fraud. In this regard, we are planning to hold focused in-person sessions among elderly individuals about how to identify and protect themselves from such threats. These sessions will be organized next year. In addition, we plan to launch a social media campaign to raise awareness across the community about the most common scams and fraud risks related to payments today.

To all our stakeholders of the FPN: We thank you again for your participation and we invite you to participate in our upcoming working group sessions which will be held in April next year. You will receive our invitation in due course.

I would like to extend a special thank you to our keynote speakers for their exceptional contributions to today's conference. Even though Mrs. Chimienti couldn't be present today, she greatly contributed remotely with a very interesting presentation, for which we thank her. Mrs. Karina Johnson, Mrs. Penelope Tromp-Gomez, and Mr. Rynall Kock, please join me on stage to accept a small token of appreciation.

And last, but not least, my heartfelt thanks goes to all my colleagues at the CBA who have worked hard to make this conference a huge success.

Thank you.