

**BUILDING  
FASTER  
BETTER**

A guide to inclusive instant payment systems

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# EXECUTIVE SUMMARY

**T**ODAY, DIGITAL TECHNOLOGIES PROVIDE THE ON-RAMP FOR MANY PEOPLE in emerging markets to access and use financial services. Digital payments provide safe and efficient ways to send money home, receive or repay a loan on time, or buy goods from a merchant. M-PESA in Kenya, bKash in Bangladesh, and Movii in Colombia are just a few examples of the bank and non-bank products offering digital payments in emerging markets.

However, many of the payment services available to low-income customers have evolved as closed-loop systems, meaning they are not interoperable with the services of other providers. Systems that are interoperable improve customer value by allowing users to transact beyond their own network. They allow customers to send money to a friend using a different service, pay at a merchant acquired by another provider, or withdraw funds from an agent on a different network. In the absence of interoperability, customers often develop inconvenient and costly workarounds to make their transactions.

Interoperability also encourages competition by removing barriers to market entry for smaller providers. It may create economies of scale by reducing the need for individual providers to replicate distribution networks where financial access points already exist.

Instant payment systems—also known as fast, immediate, or rapid payment systems—facilitate the types of small-dollar, mobile payments most frequently used by low-income customers. Instant payment systems offer continuous, real-time availability, allowing for transactions between providers to be completed within seconds at any time of the day or night. Successful instant payment systems are characterized by clear oversight, effective scheme management, reliable switch operation, and timely settlement. Where these activities are well managed, they help to balance incentives and drive transactions at scale. While a central bank almost always performs payment system oversight, a variety of institutions can fill the other roles.

## Roles and actors for the instant payment system

Roles	Duties	Possible actors
Overseer	Promotes safe and efficient payments by monitoring and assessing payment systems and, where necessary, inducing change.	Central bank
Scheme manager	Manages scheme, including overall governance, rule writing, and setting strategic direction.	Private entity, Association/nonprofit, Central bank
Switch operator	Transmits payment instructions, calculates settlement positions, and does related operational activities.	Private entity, Association/nonprofit, Central Bank
Settlement agent	Moves final funds between licensed financial institutions.	Financial institution, Central bank

Bringing an instant payment system to life involves three phases:

- 1. Plan.** A champion identifies a problem or market failure in the existing payments ecosystem. A shared vision for improved interoperability is developed, including adequate buy-in from the right stakeholders in both the public and private sectors.
- 2. Design.** The interoperability solution is designed in a collaborative process with stakeholders. Key questions surrounding oversight, governance, economic incentives, and the operational model are answered.
- 3. Go to market.** The system goes live and becomes available to customers. An ongoing process is initiated to drive volumes and innovate.

This guide offers insights for policy makers, financial service providers, and other actors involved in driving interoperability in digital payments. It defines foundational concepts, delineates the four key roles in an instant payment system, and offers actionable insights on planning, designing, launching, and scaling an effective system.

## SECTION 1

# INTRODUCTION

**T**HIS GUIDE IS INTENDED TO BE A PRACTICAL TOOL for those pursuing interoperability in digital financial services. It focuses on instant payments—payments where the transmission of the payment message and the availability of final funds to the payee occur in near real time with continuous availability (24/7/365) (CPMI 2020). Instant payments often enable digital, mobile services that help poor people enter the world of formal financial services. As opposed to traditional batch systems, card systems, and large-value systems, instant payment systems typically involve a direct credit transfer, also referred to as a push payment, and use mobile as a channel. However, today’s instant payment systems continue to push the boundaries of this definition; specific exceptions are discussed throughout the Guide.

The first part of this Guide explores instant payment oversight and the key components of an instant payment system: scheme, switch, and settlement system.<sup>1</sup> It is important for readers to understand how these components are defined for the purposes of this Guide.

1. Many of the definitions referenced in this Guide are based on the Bank of International Settlements’ “Glossary,” updated 17 October 2016, <https://www.bis.org/cpmi/publ/d00b.htm>.

## The four key components



### OVERSIGHT

In their oversight role, central banks promote safe and efficient payments by monitoring and assessing payment systems and, where necessary, inducing change (BIS 2020). Payment legislation and regulation set the legal basis for oversight and provide the guardrails within which decisions about the instant payment system will be made.



### SCHEME

A scheme is a set of procedures, rules, and technical standards that govern the execution of payments (BIS 2020). Effective schemes are supported by clear ownership and governance, which ensure balanced economic incentives and define safe and reliable operational models. The governance, economic, and operational decisions made by scheme managers play a large role in determining whether the instant payment system is sustainable and drives transaction growth.



### SWITCH

A switch is a technology that enables safe and efficient transactions. Switch operators transmit, reconcile, confirm, and net transactions between participants (collectively, these functions make up the clearing function); submit instructions for real-time or deferred transfer of final funds (settlement initiation); and perform other operational functions, including managing disputes and monitoring for fraud.



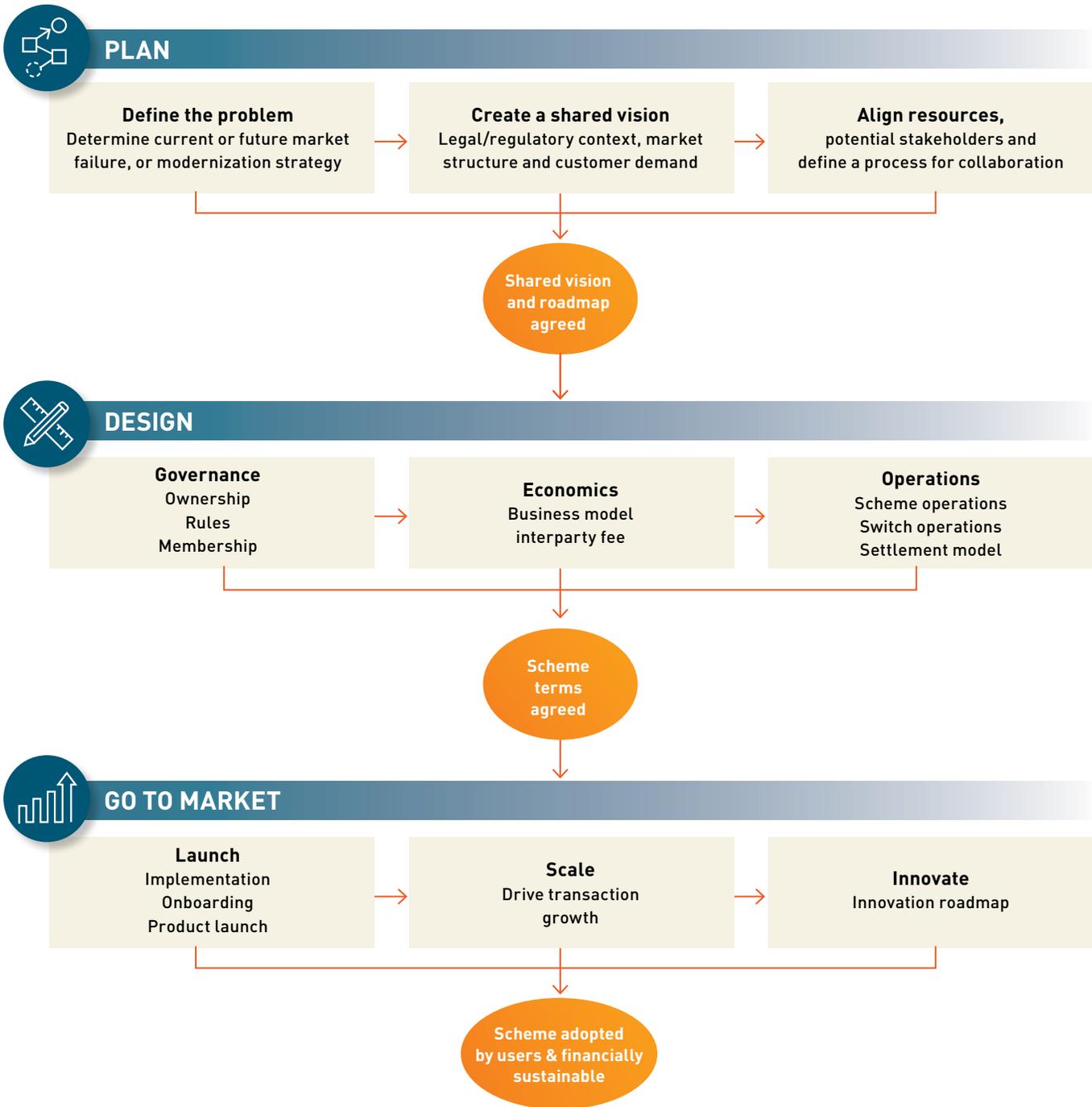
### SETTLEMENT

A settlement system is used to facilitate the discharge of an obligation on agreed terms (BIS 2020). Settlement provides the actual transfer of final funds to the receiving provider—which may happen before or after the customer considers the funds to have been received. Safe and efficient settlement is critical to the integrity of the payment system.

This Guide also covers the basic steps to achieving instant payment interoperability and provides tools to help in this regard. See Figure 1. The process for developing an instant payment system may be very different from country to

country and will depend on market context. This Guide presents a series of different approaches as illustrative examples from around the world.

FIGURE 1. A process for achieving instant payment interoperability



## Interoperability and customer value

Interoperability refers to the ability of different systems to work together. In the context of digital payments, interoperable services allow customers to transact beyond their own network. This might mean sending money to a friend who has an account with another provider, paying at a merchant acquired by another provider, or withdrawing funds from the agent of another provider.

Absent interoperability, customers create workarounds to transact that often are difficult and costly. Examples include maintaining accounts with several providers, using an agent to intermediate, and reverting to cash.

In addition to improving customer convenience, interoperability encourages competition by removing barriers to market entry for smaller providers. It also may create economies of scale by reducing the need for individual providers to replicate distribution networks where financial access points already exist (CPMI 2016b).



## Instant, faster, immediate, rapid—what does speed mean?

This Guide focuses on instant payments, which are also frequently referred to as “fast payments” or “real-time payments” (CPMI 2020). These payments are always digital, often use mobile as a channel, and frequently use the credit/push payment as an instrument. However, some instant payment systems support other channels and instruments, such as biometrics, cards, and debit-like services.<sup>2</sup>

Instant payments offer continuous, real-time availability to customers. Closed-loop (not interoperable) examples of products with these features include many of the solutions that act as on-ramps to formal financial services. Some examples include M-PESA in Kenya, bKash in Bangladesh, and Movii in Colombia. However, many of these products operate in silos. Instant payment systems introduce interoperability while maintaining the customer experience—continuous availability and real-time delivery of funds—that has allowed these products to effectively serve poor people.

By definition, all interoperable payments occur between two stores of value, or accounts. The accounts involved typically offer lower-value and higher-volume forms of payment and often are referred to as “retail accounts” or “transaction accounts” (CPMI 2016). These terms include both deposit accounts issued by banks and e-money accounts, which often are issued by nonbanks:

- **Deposit accounts.** Accounts held with a licensed bank or deposit-taking institution, such as Grameen Bank in Bangladesh and Barclays in the United Kingdom (CPMI 2016b).
- **E-money accounts.** Prepaid stores of value, often issued by a nonbank e-money issuer (EMI) such as M-PESA in Kenya and Alipay in China, with funds held in trust by a licensed bank (CPMI 2016b).

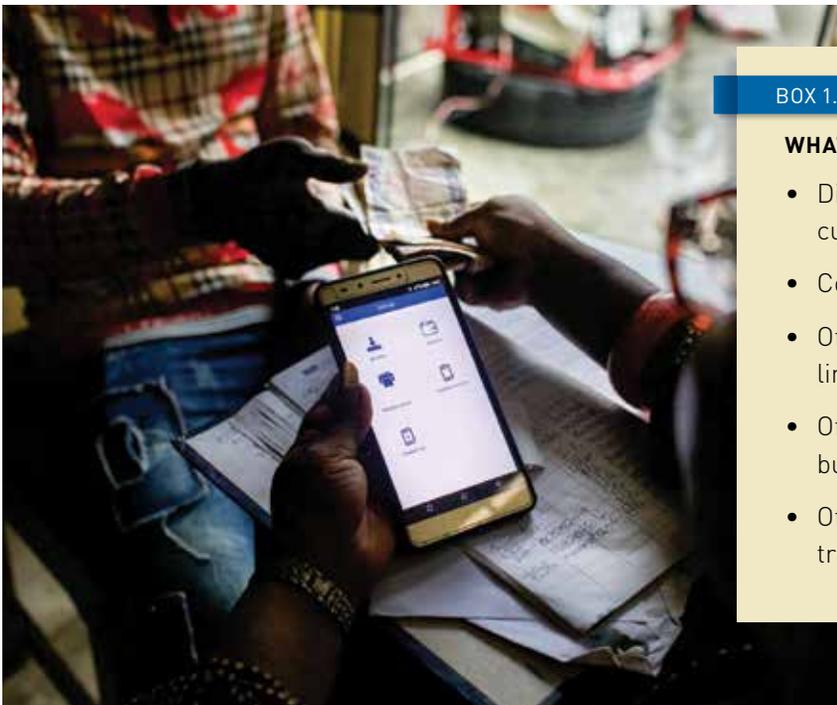


Photo: Temilade Adelaja, for CGAP via Communication for Development Ltd.

### BOX 1.

#### WHAT ARE INSTANT PAYMENTS?

- Digital payments with availability of customer funds in near real-time.
- Continuously available, all the time.
- Often use mobile as a channel, but not limited to mobile.
- Often use credit/push as an instrument, but also can use other instruments.
- Often lower-value, higher-volume transactions.

2. From a consumer perspective, debit cards offer real-time experience. However, funds through debit cards often are not available “immediately and with finality” to the payee/merchant (CPMI 2020).

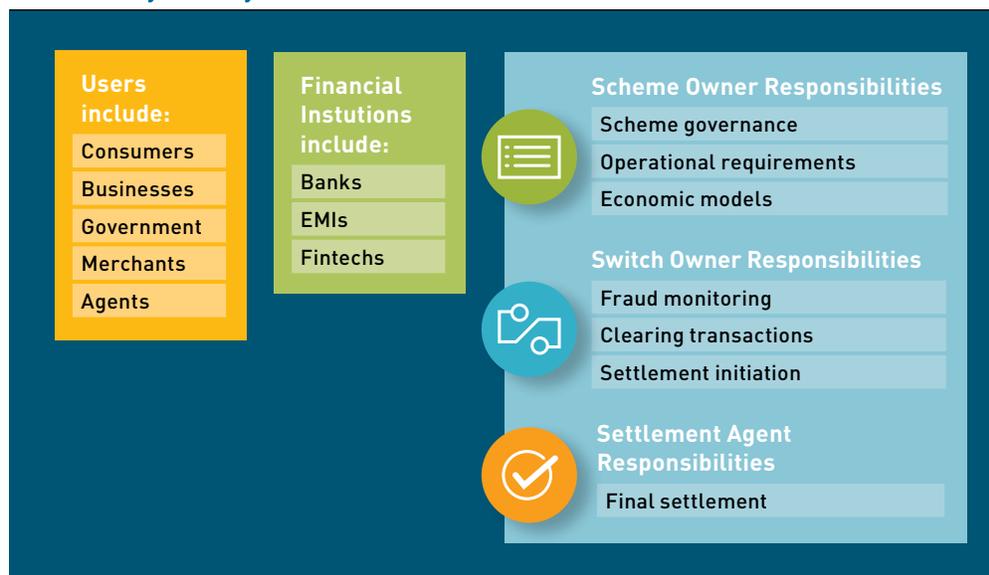
## What is a payment system?

A payment system is a set of instruments, procedures, and rules that are used to transfer funds between accounts held at participants (BIS 2020). It includes all the activities performed by the entity (or entities) to facilitate interoperability. See Figure 2.

A market often will have several payment systems that serve different types of transactions. Examples include card systems, batch/ACH systems, and the instant payment systems covered in this Guide. A market even may have several systems that cater to a similar set of transactions. Systems that serve similar roles might exist for reasons of ownership or fair participation or simply for historical reasons tied to how the market has developed. However, multiple systems with similar roles can present challenges in achieving network effects or obtaining market-level interoperability (CPMI 2016b).

While the fundamental role of a payment system remains enabling the transfer of funds between accounts, open banking and third-party payment initiation have expanded the role for institutions that do not hold customer funds. Services such as the Unified Payments Interface (UPI) in India are increasingly blurring the lines between the roles of account issuers and financial technology companies in a payment system.

FIGURE 2. **Payment system**





## What is a scheme?

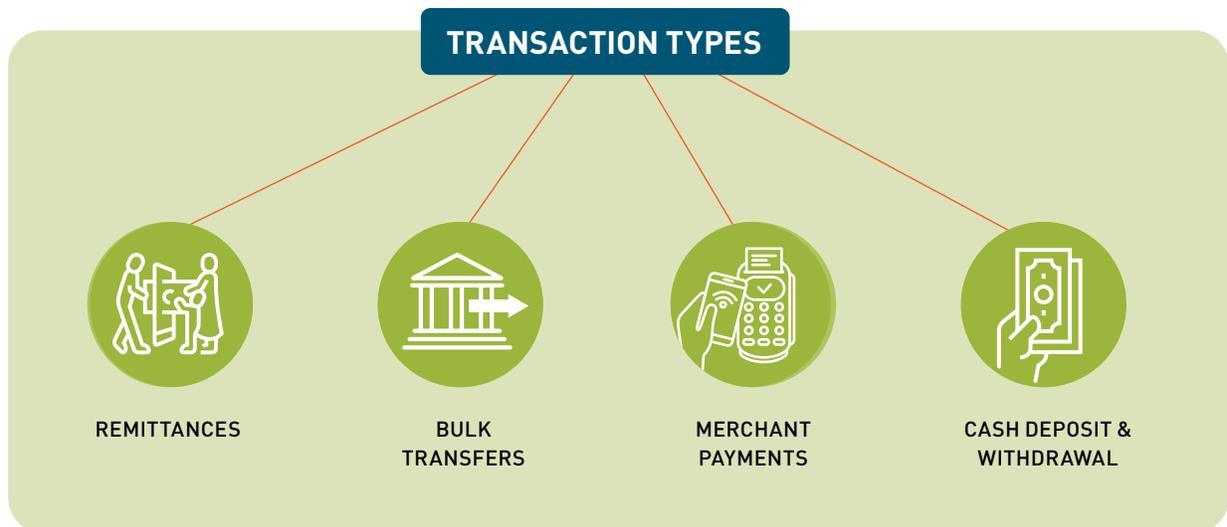
A scheme is a set of procedures, rules, and technical standards that govern how transactions are executed (CPMI 2016a). Scheme rules go beyond technical considerations. They define the terms for maintaining an effective payment system, including rules for how participants will work together, how economic incentives will be balanced, and how disputes will be managed.

The scheme manager is responsible for scheme governance—the relationships between owners, board of directors (or equivalent), management, participants, and other stakeholders. The scheme manager typically is the ultimate decision maker on scheme rules, subject to regulation and oversight, and sets the strategic direction for the scheme.

Participation, economic models, and operational requirements may differ by transaction type. As a result, the scheme manager may maintain separate scheme rules for different transaction types. Many instant payment systems initially have focused on

enabling remittance (person-to-person) transactions, but several transaction types can be supported, including the following:

- **Remittances.** Transfers between accounts owned by individuals, such as family members and friends, domestically or across borders.
- **Bulk transfers.** Transfers from a single sender to several recipients executed at a single time, such as for salary payments or government-run social welfare programs.
- **Merchant payments.** Transfers from an individual to a business account, such as for in-store purchases, e-commerce, bill payments, or payments to the government.
- **Cash deposit and withdrawal.** Transfers via an access point to add or remove funds from an account, such as with an agent.





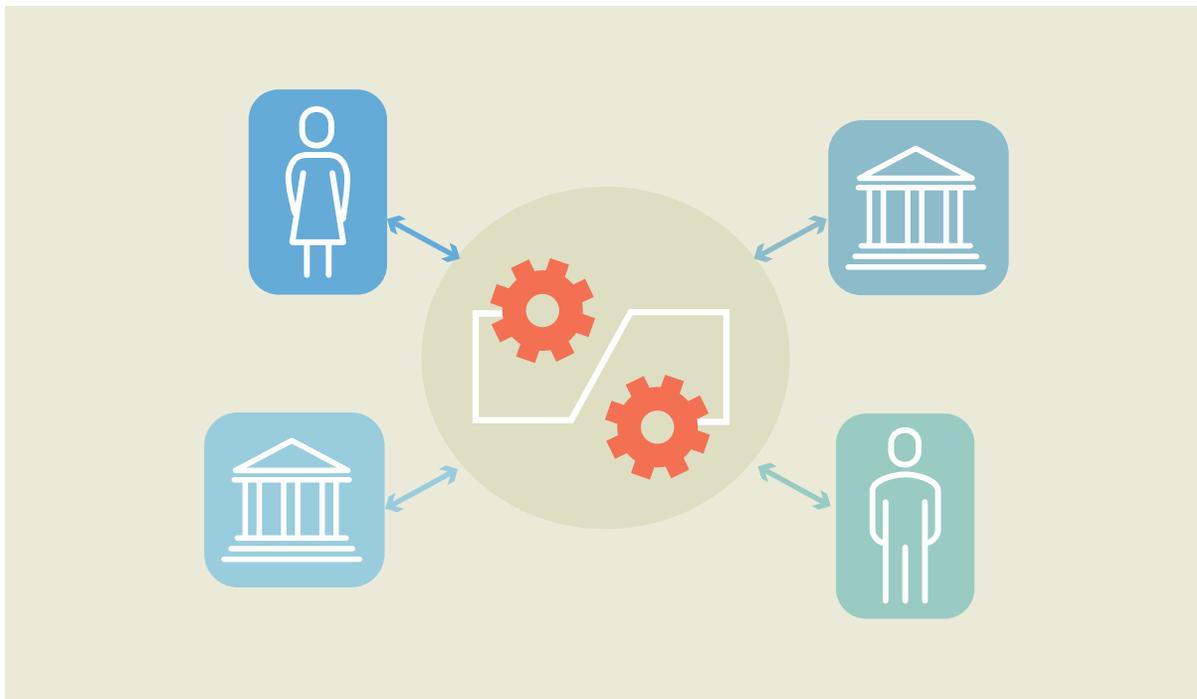
## What is a switch?

A switch is a technology that connects system participants and supports the passing of transaction data. Operators of this technology may be called switch operators, clearinghouses, hubs, payment system operators, and other similar terms. The term “switch operator” is used in this Guide to refer to the owner and operator of this technology, which may be the same as the scheme manager.

The duties of a switch operator involve transmitting, reconciling, confirming, and netting transactions between participants (collectively referred to as clearing), and submitting instructions for the transfer of final funds (settlement initiation). Typically, the switch operator also will offer a range of other services to the scheme. These may include payments addressing, dispute management, fraud monitoring, and anti-money laundering and combatting the financing of terrorism (AML/CFT) checks.

A payment system may use more than one switch operator. For example, SCT Inst, the regional payment system that supports the European Union, allows participants to route transactions through a variety of qualifying switch operators—thereby contributing to a competitive environment for switch pricing.<sup>3</sup> However, it also should be noted that multiple switches in a market have the potential to reduce the volumes on each individual switch, which may reduce economies of scale and increase unit costs.

A switch operator also may serve multiple payment systems, even those in different markets. For example, the switch operator in South Africa, BankservAfrica, provides domestic services in southern African countries and services cross-border instant payment transactions within the Southern African Development Community (SADC) region.



3. “Clearing and Settlement Mechanisms,” European Payments Council, <https://www.europeanpaymentscouncil.eu/what-we-do/sepa-payment-scheme-management/clearing-and-settlement-mechanisms>.



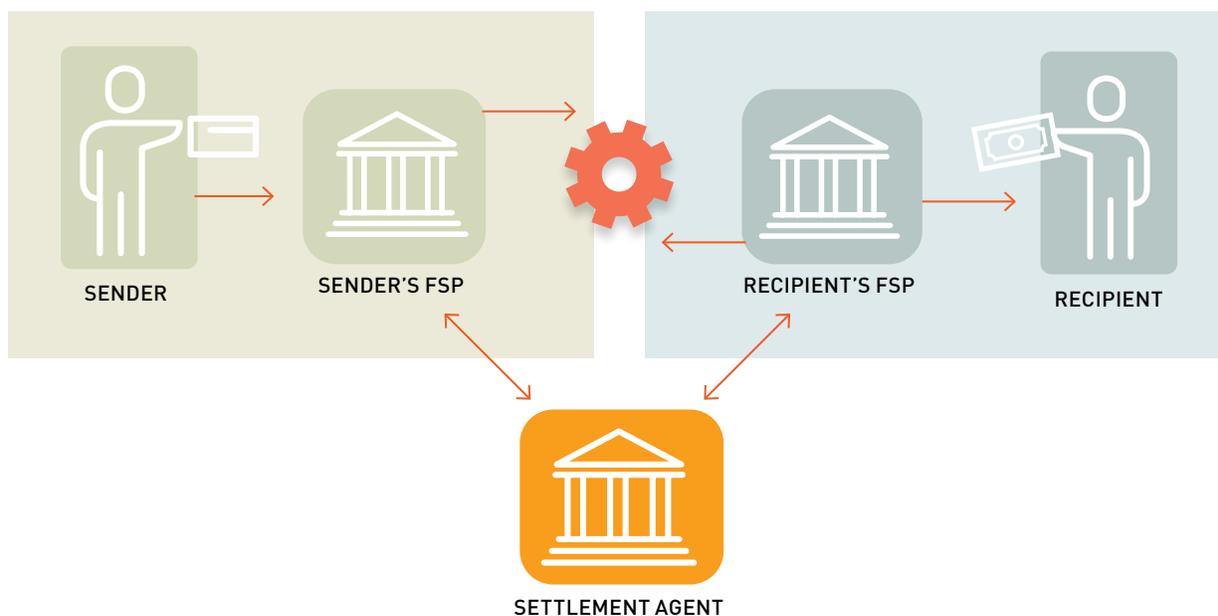
## What is settlement?

A settlement system facilitates the transfer of funds according to agreed terms (BIS 2020). Settlement provides the final transfer of funds to the receiving provider, which may happen before funds are considered received by the customer (a real-time settlement model) or after the funds are considered received by the customer (a deferred settlement model). A real-time settlement model is not required to make funds

available to the customer in real time. There are examples of successful instant payment systems using each of these models.

Settlement is performed by a settlement agent. Often, this is a central bank, but banks also may play this role, especially where there are indirect participants in the payment system.

### SETTLEMENT SYSTEM



## Roles and actors

TABLE 1. Roles and actors of the instant payment system

	DUTIES	POSSIBLE ACTORS
 <b>OVERSEER</b>	Promotes safe and efficient payments through monitoring and assessing payment systems and, where necessary, inducing change.	Central bank
 <b>SCHEME MANAGER</b>	Manages scheme, including overall governance, rule writing and setting strategic direction.	Private entity Association/nonprofit Central Bank
 <b>SWITCH OPERATOR</b>	Transmits payment instructions, calculates settlement positions, and does related operational activities.	Private entity Association/nonprofit Central Bank
 <b>SETTLEMENT AGENT</b>	Moves final funds between licensed financial institutions.	Financial institution Central bank

TABLE 2. Examples of roles and actors in an instant payment system

COUNTRY, SYSTEM	OVERSEER	SCHEME MANAGER	SWITCH OPERATOR	SETTLEMENT AGENT
<b>Mexico, Interbank Electronic Payment System (SPEI)</b>	Bank of Mexico (regulator)	Bank of Mexico (regulator)	Bank of Mexico (regulator)	Bank of Mexico (regulator)
<b>Singapore, Fast And Secure Transfers (FAST)</b>	Monetary Authority of Singapore (regulator)	Singapore Clearing House Association (not-for-profit association)	Network for Electronic Transfers (private, for-profit)	Monetary Authority of Singapore (regulator)
<b>United Kingdom, Faster Payments Service (FPS)</b>	Bank of England and Payment Systems Regulator (regulator)	Pay.UK Limited (not-for-profit corporation)	Pay.UK Limited (not-for-profit corporation)	Bank of England (regulator)
<b>Tanzania, EMI-led arrangement</b>	Central Bank of Tanzania (regulator)	No scheme ownership entity; multilateral agreement between EMIs	Bilateral arrangements between EMIs (no switch operator)	Bilateral arrangements between EMIs (financial institution)
<b>South Africa, Real-time Clearing (RTC)</b>	South African Reserve Bank (regulator)	Payment Association of South Africa (not-for-profit association)	BankservAfrica (private, for-profit)	South African Reserve Bank (regulator)



*Photo: Marco Simola,  
CGAP Photo Contest, 2009.*



## SECTION 2

# OVERSIGHT OF THE INSTANT PAYMENT SYSTEM

### Legal basis for oversight

Payment legislation, such as a payment act, often provides the legal basis for payment system formation and operation.<sup>4</sup> For example, India's 2007 National Payments Act describes the activities associated with payment system operation and provides the legal basis for an entity to manage retail payments. In this case, the entity must be majority owned by public sector banks.<sup>5</sup> In South Africa and Kenya, payment legislation gives the regulator power to delegate certain authorities to an industry payment association.

Payment legislation also can play a more active role in defining how interoperability will be achieved. In the European Union, legislation includes detailed operational rules and technical standards to be applied by the scheme manager, switch operator, and participants. However, the European Union is a dynamic, complex environment, and including rules and standards in legislation is not the norm.

### Role of the payment regulator

The regulator responsible for payment system oversight is likely to be the authority most heavily

involved in interoperability conversations—typically the central bank. The World Bank and Committee on Payments and Market Infrastructures (CPMI) define three key roles for the regulator that oversees retail payments in a given market: oversight, catalyst, and operational.

In markets where several regulators share responsibility for regulating payment institutions—such as telecommunications regulators in markets where mobile operators issue e-money—cooperation and collaboration between regulators is critical (AFI 2018). Regulators can use a wide range of tools to influence market actors and promote change. The broader retail payments strategy should drive the decision of which tools to use.<sup>6</sup>

### OVERSIGHT OF THE INSTANT PAYMENT SYSTEM

The regulator's role in oversight is to ensure that the payment system is safe and efficient (CPMI 2016a). Compared to large-value systems, instant payment systems typically pose fewer systemic risks. CPMI highlights a subset of market infrastructure risks as particularly relevant for instant payment systems.<sup>7</sup>

4. In this Guide, "legislation" refers to a set of binding rules issued by a legislative body, an executive body, or a regulatory authority; a legislation, depending on the issuing body, can be issued in the form of an act, law, bylaw, regulation, instruction, executive order, and a circular.

5. Section 4 (2), 2007 National Payments Act, <https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/86706.pdf>.

6. See World Bank (2012) for more information on developing a comprehensive retail payments strategy.

7. More on the oversight role of a regulator can be found in CPMI (2016a) and World Bank (2010).

## Impact of instant payments on risk, as defined by CPMI

RISK <sup>a</sup>	HOW DOES THIS RISK DIFFER FOR INSTANT PAYMENTS?
<p><b>CREDIT RISK:</b> The risk that a participant is not able to meet its financial obligations.</p> <p>(Together with liquidity risk, also referred to as “settlement risk”)</p>	<p>Credit risk between participants can arise in an instant payment system, depending on the settlement model. Credit risk will not arise with real-time settlement but will arise where settlement is deferred. This risk can be managed through measures such as loss-sharing agreements and collateralization.</p> <p>Compared to other payment systems, instant payment systems are more likely to be irrevocable, meaning that participants are less likely to be able to block/recover funds from the customer if problems arise.</p>
<p><b>LIQUIDITY RISK:</b> The risk that a participant has insufficient funds to meet its financial obligations as they become due.</p> <p>(Together with credit risk, also referred to as “settlement risk”)</p>	<p>Regardless of settlement model, liquidity risk arises because participants require funds available to meet their settlement obligations as they become due. Where real-time settlement is used, liquidity needs will be continuous.</p> <p>Compared to other payment systems, instant payment systems are more likely to require this liquidity outside normal business hours.</p>
<p><b>LEGAL RISK:</b> The risk of the unexpected application of a law or regulation, usually resulting in a loss.</p>	<p>Clear legal frameworks, rules, and regulations are needed to appropriately allocate responsibilities between participants and customers in a transaction.</p> <p>Compared to other payment systems, the steps to manage legal risk may be similar, but meeting requirements may be more challenging given the real-time nature of the system.</p>
<p><b>OPERATIONAL RISK:</b> The risk that system/process deficiencies, human errors, management failures, or disruptions from external events result in service disruption.</p>	<p>There should be processes in place for addressing cyber-resilience, redundancy, and business continuity to support any payment system.</p> <p>Compared to other payment systems, operational issues in instant payment systems are more likely to be immediately noticeable to customers given the continuous availability. Continuous availability also can be more demanding on the system itself.</p>
<p><b>FRAUD RISK:</b> The risk of deliberate misconduct that exposes consumers or participants to loss.</p>	<p>Fraud prevention and detection measures are needed to reduce the risk of loss from deliberate misconduct.</p> <p>Compared to other payment systems, the speed (and often irrevocable nature) of instant payment systems means that there is a risk that fraud can be committed and that the funds may be withdrawn before the fraud is detected. Because instant payment transactions often are of lower value, transaction limits may help to limit risk.</p>
<p><b>REPUTATIONAL RISK:</b> The risk to reputation and confidence in financial products when the above risks are not effectively managed.</p>	<p>The reputational risks that affect participants or customers will be similar to that of other payment systems. However, expectations for an instant payment system to be continuously available with real-time transfer mean that smaller disruptions may have larger impacts on reputation.</p>

Source: CPMI, 2016a, Section 5.2.

a. CPMI, 2016a and 2016b, and CGAP definition based on instant payments context provided in CPMI reports.

## THE REGULATOR'S ROLE IN CATALYZING INSTANT PAYMENT SYSTEM DEVELOPMENT

A regulator may choose to encourage industry coordination where market participants do not coordinate on their own. For example, the regulator may initiate a discussion on interoperability or exert influence to change operating practices where existing systems fail to innovate or create a level playing field for market participants.

A regulator has many tools it can use to catalyze industry action—including both sticks and carrots, formal and informal. Central banks in several countries, including Australia, India, and the Philippines, have guided a conversation on interoperability by outlining strategic priorities through vision statements, payment system strategies, and other policy documents.

Some markets have issued more directive guidance. In Uganda, the central bank set a time-bound mandate that required EMIs to interoperate by a certain date. The industry responded by connecting first through an aggregator to meet the regulator's deadline and later established bilateral connections. However, time-bound mandates also risk an expedited process that may carry unintended and undesirable effects.

Policy makers in India used a variety of incentives to drive change. The central bank initially tasked the India Bankers Association to recruit banks willing to invest in the newly created not-for-profit National Payments Corporation of India (NPCI). It also transferred legacy technology to NPCI at cost, which provided NPCI with an early source of revenue from traditional payment streams (Cook and Raman 2019). Other parts of government supported NPCI by making the organization a key actor in the distribution of social protection payments (Aadhaar-based payments) and by promoting the BHIM app (UPI payments).<sup>8</sup>

However, incentives and subsidies may draw criticism if there are several retail payment systems in the market and if there is a perception that the regulator prefers one of them. India's central bank drew such criticism for their early support of NPCI.

Catalyzing action also may come from outside the central bank. In 1998, the United Kingdom's Chancellor of the Exchequer commissioned an independent report on competition and innovation in the banking industry. The resulting report (Cruikshank 2000) found that major banks limited competition to the detriment of consumers and small businesses. In response, the Payment Systems Task Force—a joint government–industry body—was created in 2004 as the first step toward what would become UK Faster Payments: a banking initiative to reduce payment times between customer accounts in different banks to as little as a few seconds.

The range of interventions that policy makers have pursued are as varied as the markets they oversee. Catalyzing industry action is an important public sector role, but the specific interventions depend heavily on market context. Regulators who have done this most effectively have generally used a combination of “sticks and carrots” to drive consensus rather than applying proscriptive mandates or other more directive guidance.

8. Aadhaar-based payments use the Aadhaar Payment Bridge (APB) System and Aadhaar Enabled Payment System (AePS) to allow account holders who have linked their Aadhaar ID to receive social protection payments and transact using biometric authentication. The BHIM app is a consumer channel available from NPCI and as a white-labeled technology to NPCI members.

## THE REGULATOR'S ROLE IN OPERATING THE INSTANT PAYMENT SYSTEM

In addition to catalyzing market action, some central banks have found it advantageous (or necessary) to become directly involved in owning and operating the instant payment system. Where regulators play an operational role, it often is because of context-specific constraints or opportunities. In Mexico, for example, the central bank considered the excess capacity on the real-time gross settlement (RTGS) system when it chose to act as switch operator (CPMI 2016a).

In Jordan, the National Payments Council and the Central Bank of Jordan (CBJ) took on ownership and operational roles, respectively, because interoperability of EMIs from the time of licensing was viewed as a strategic priority for the nascent e-money market. After the Jordan Mobile Payment (JoMoPay) switch was incubated at CBJ, scheme ownership and operation were transferred to a public-private entity, the Jordan Payments & Clearing Company (JoPACC), which is owned by Jordanian banks and the regulator.<sup>9</sup>

The issue of when to introduce interoperability into a market often is complicated and contentious. Some argue that requiring interoperability early in market development lays the foundation for inclusive growth. Others argue that enforcing interoperability too soon limits the incentive for providers to grow sustainable business models and distribution networks.

Some central banks choose to control the instant payment system through full or majority ownership in a separate entity. In Ghana, the scheme manager and switch operator, GhIPSS, is a wholly owned subsidiary of the Bank of Ghana. In Egypt, the Egyptian Banking Corporation is majority owned by the Bank of Egypt. In China, the regulator previously owned and operated the instant payment system for the country's banks, IBPS, and in 2018, it took majority ownership in a second entity, NetsUnion Clearing Corporation (NUCC), also called Wanglian. The new arrangement includes banks as well as the country's two largest EMIs, Tencent and Alipay (BIS 2019).

Regulator operation of the switching technology is sometimes rationalized on the basis that it offers better oversight through transaction monitoring, especially for non-bank EMIs who may not be held to the same supervision requirements as banks. However, transaction monitoring is possible without operating the switch, for example, through real-time access to the switch environment. Switch operation also should not be seen as replacing effective EMI supervision.<sup>10</sup>

A regulator should be cautious when deciding whether to operate scheme or switch services. Being both scheme manager (and/or switch operator) and oversight authority may create perceptions of anti-competitive treatment toward other services in the market. While regulator ownership and operation may expedite system development, it

### What does it mean for a regulator to “operate” the instant payment system?

	CIRCUMSTANCES	HOW REGULATOR OPERATES IPS
 SCHEME OWNER	A coordination failure in the market	Regulator manages rule-making process and other scheme governance activities
 SWITCH OPERATOR	A capacity failure in the market	Regulator owns and/or operates technology for clearing payments

9. NPC has no legal entity status. It was created in 1998 as a consultative body for collaboration between CBJ and the banking sector. JoPACC was incorporated in early 2017 by CBJ and the banks (45 percent of its shares are owned by CBJ and the remaining 55 percent are owned by the 25 licensed banks) to act as the legal successor of NPC and operate retail payment systems, including JoMoPay. JoPACC is a licensed payment system operator.

10. For more information on EMI supervision, see Dias and Staschen (2018).

also can introduce new challenges. Depending on the regulator's capacity and the process followed, regulator-driven projects may face challenges ensuring participants' commitment to success.

Regulators overseeing many of the most successful instant payment systems by transaction volumes (India, Australia, and the Philippines, among others) have focused on driving consensus among industry participants rather than on directly operating the scheme or switch.

## Competition, market conduct, and other regulatory involvement

The regulator overseeing the instant payment system should also consider impacts on competition and consumer protection. However, other regulatory bodies also may have a role to play on these issues, depending on the market.

It is important to involve competition authorities where there are restrictive membership criteria, interparty fees, or other pricing discussions. Independent market conduct authorities also may need to be involved when customer pricing or experience may be affected. Examples include Condusef in Mexico and the Financial Sector Conduct Authority in South Africa. In addition, regulators of cybersecurity or data protection may need to be involved depending on the system's operating model.

The scope of involvement from different regulators will depend on market context and the payment system's operating model. Where the central bank is heavily involved, the task may be as straightforward as ensuring coordination with public sector counterparts. Where the private sector is driving the project, ensuring regulatory compliance may require an in-depth exercise that involves the advice of legal counsel.



Photo: Thao Vu Xuan, CGAP Photo Contest, 2016.



Photo: Ahmed Suhal, CGAP Photo Contest, 2016.

## SECTION 3

# THE INSTANT PAYMENT SCHEME



**E**FFECTIVE SCHEMES REQUIRE CLEAR governance, balanced economic incentives, and safe and reliable operational models. While payment regulation and oversight set the guardrails within which a payment system operates, the governance, economic, and operational decisions made by scheme managers will play a large role in determining whether the arrangement is ultimately successful. See Figure 3.

FIGURE 3. **Components of an effective scheme**



This section explores each of three scheme components—governance, economics, and operations:

- **Scheme governance.** Scheme governance includes the relationships between owners, the board of directors (or equivalent), management, and other parties. Governance defines how decisions will be made and how operations will be managed. Fair and open governance works to create the environment necessary to ensure meaningful participation.
- **Scheme economics.** Scheme economics define the financial responsibilities and opportunities associated with interoperable transactions. Balanced scheme economics align incentives to drive customer use, create a level playing field for provider participation, and ensure continued innovation.
- **Scheme operations.** Scheme operations include managing issues in running a scheme—from securing office space and administrative support, to questions around marketing and branding services. If the scheme manager also is serving as the switch operator, a variety of decisions will need to be made on the technology solutions needed to carry out the clearing and settlement model.

## Scheme governance

Well-defined scheme governance is critical for effective interoperability, but the topic is sometimes overlooked in favor of a focus on technology. Good governance helps to clarify how decisions will be made. It defines relationships between owners, the board of directors (or equivalent), the scheme’s management, direct/indirect participants, and the broader market.

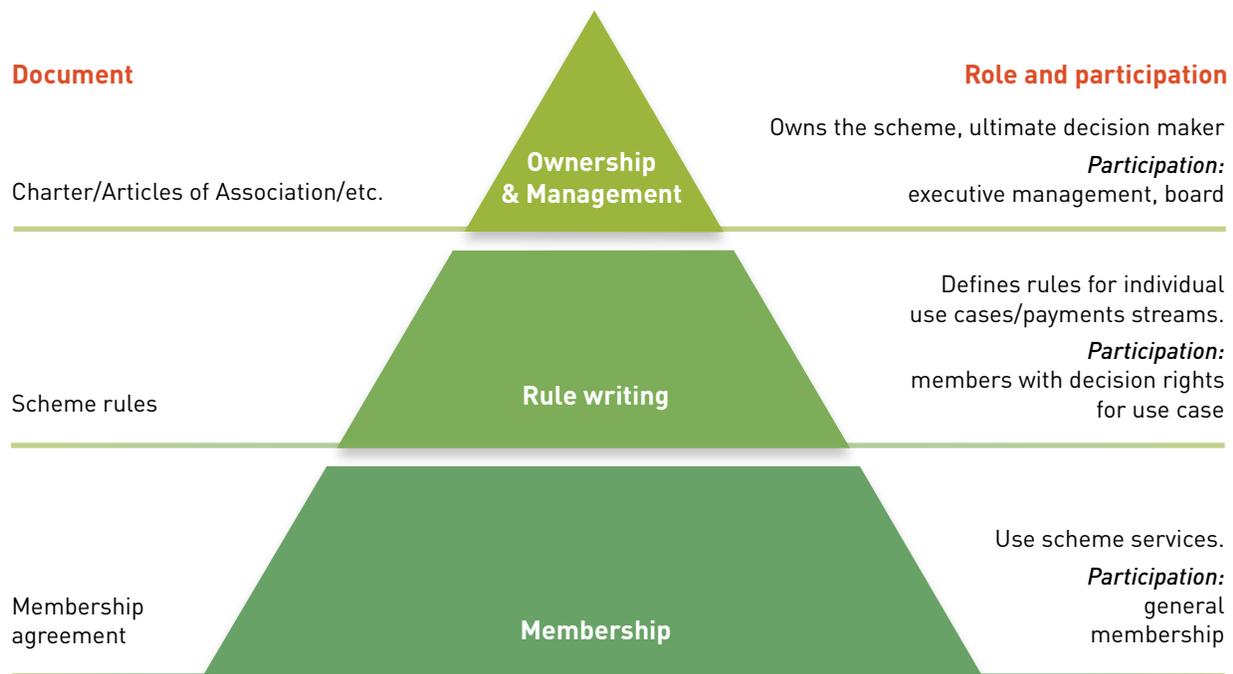
Fair and open governance helps ensure the scheme’s success by giving participants a voice in framing the terms of interoperability. These terms—often defined through scheme rules—include issues affecting the financial incentives of participation, the reliability of connection models, and other areas affecting whether participants will help make the system a success or work to undermine its goals.

The roles in the scheme—and its ability to self-supervise—will depend on local laws and regulations. Within the scheme, governance can be categorized on three different levels: scheme ownership and management, scheme rule writing, and scheme participation (or membership). See Figure 4.

### SCHEME OWNERSHIP AND MANAGEMENT

Although a variety of organizational structures are possible, privately held entities and public–private partnerships are the most common. These entities are created under a variety of legal structures depending on the jurisdiction and the intent of the scheme—for-profit or not-for-profit company, public or private, guaranteed or private limited, and so forth.

FIGURE 4. The three levels of scheme governance



As with many organizations, shareholders in these schemes can be from a variety of institutions, including the following:

- Financial institutions that participate in the scheme (as is the case in Australia, the United Kingdom, Sweden, Colombia, and Kenya).
- Individual investors or funds (as is the case in Argentina).
- Industry associations (as is the case in Denmark).
- Regulator (as is the case in Poland, Egypt, and Ghana).

The organization's charter, articles of association, or other inception documents typically will define the foundational aspects of governance, including board representation, membership application and termination procedures, and administrative arrangements, such as company seals.

Board representation may mirror shareholding or it may be separately defined. Independent directors can help ensure decisions are made in the public interest where schemes are owned by financial institutions (as is the case in India and Australia) or represent industry's interests where the regulator has a controlling stake (as is the case in Ghana).

There are a variety of other ownership structures. Some markets manage scheme governance through an industry association (as is the case in Japan, Singapore, and South Africa). Care should be taken to understand the responsibilities of the organization managing the scheme and to ensure incentives are aligned. In South Africa, scheme governance is managed by the Payments Association of South Africa (PASA). However, South Africa's regulator has expressed concern in recent years that PASA's "dual mandate" of promoting cooperation between members and self-governing

(based on delegated responsibilities from the regulator) may cause a conflict of interest (SARB 2018).

Some schemes are directly managed by the central bank with no separate legal entity, as was the case for JoMoPay in Jordan until January 2020. Direct management by the regulator may expedite the process of launching a new system. However, regulator management also may create new challenges. If industry participants do not feel they have sufficient input in rule-making—especially on operational models and economic incentives—they will be less likely to drive interoperable transactions.

Finally, certain markets rely only on a contractual agreement to define the rights and commitments of participants, without a separate legal entity (as is the case for e-money schemes in Kenya, Tanzania, Uganda, and Madagascar). A contractual agreement is another way to expedite launch as compared to a private entity, but it also presents new challenges. Contractual arrangements quickly become unwieldy as the number of participants grows, and these arrangements may lack the institutional commitment to continue to innovate once they are established.

The next page looks at organizational models in relation to the regulator's role in supporting system development.

The question of whether a scheme operates on a for-profit or cost-recovery basis is separate, but often related, to the question of legal entity. In many markets, the form of legal entity carries restrictions on how profits can be used (e.g., limited by guarantee, registered not-for-profit). However, some entities created under for-profit legal structures still may operate with a cost-recovery intent. Examples include public-private schemes in Egypt and Jordan.

## Regulator role and scheme organizational mode

	OVERSIGHT ONLY	CATALYST AND OVERSIGHT	CATALYST, OVERSIGHT, AND OPERATIONAL
The Regulator owned and operated <sup>a</sup>			China (PBC) <sup>b</sup> Jordan (CBJ)* Mexico (Banxico)
Public or Public/Private entity (majority regulator control)		Ghana (GhIPSS) Egypt (EBC) <sup>c</sup>	
Public/Private entity (minority regulator control)	Poland (KIR) <sup>d</sup>	Australia (NPPA) <sup>e</sup> China (NUCC) <sup>f</sup> Jordan (JoPACC)* Nigeria (NIBSS) <sup>g</sup>	
	Colombia (ACH Colombia) Kenya (IPSL) Pakistan (1Link) Poland (Blue Media) <sup>h</sup> Spain (SDPP) <sup>i</sup> Turkey (BKM) USA (Clearing House Payment Company)	Argentina (Prisma) <sup>j</sup> Denmark (Finance Denmark) <sup>k</sup> France (GIE Paylib Services) India (NPCI) Peru (PDP) <sup>l</sup> Philippines (PPMI) <sup>m</sup> Singapore (SCHA) South Africa (PASA) Sweden (Bankgirot) Switzerland (Twint AG) UK (PAY UK)	
No legal entity	Madagascar (EMIs) Tanzania (EMIs)	Kenya (EMIs) Uganda (EMIs)	

### Color code

Participants: banks and EMIs

\*The JoMoPay switch transitioned from being owned/operated by the regulator to being owned/operated by a public/private entity, JoPACC, in January 2020.

Participants: banks only OR EMIs only

- Schemes housed either at the regulator or in a company where the regulator has more than 50 percent of shares/ownership.
- Internet Banking Payment Settlement (IBPS) has handled interbank retail payment transactions via the internet since 2010 and is operated by the People's Bank of China (PBC) (CPMI 2016a).
- Egyptian Banking Company (ECB) operates the mobile interbank switch Ta7weel using Mastercard's technology. It is owned by the Central Bank of Egypt and the Ministry of Finance (54 percent of shares) and by 17 banks (46 percent of shares).
- KIR manages the instant payment scheme Express Elixir launched in Poland in 2012. It is owned by the regulator (34 percent) and banks (National Bank of Poland 2015).
- "The Company," New Payments Platform, <https://www.nppa.com.au/the-company/>.
- The Wanglian scheme started in 2018 and is run by NUCC. PBC and associated government institutions own 40 percent of NUCC, see "III. Big Tech in Finance: Opportunities and Risks," <https://www.bis.org/publ/arpdf/ar2019e3.pdf>.
- NIBSS Instant Payment (NIP) is the Nigerian instant payment scheme owned by NIBSS, a bank- and regulator-owned company. See "About," NIBSS, <https://nibss-plc.com.ng/company-overview/>.
- Blue Media S.A. manages the instant scheme BlueCash, which was launched in 2012. See National Bank of Poland, 2015.
- Sociedad de Procedimientos de Pago (SDPP) is a private entity (bank owned) that manages Bizum, the Spanish instant payment scheme. See "Breve Presentación," Sociedad de Procedimientos de Pago, <http://www.sdpp.es>.
- Prisma Medios de Pago owns the instant payment scheme PEI. See "Pagos Electrónicos Inmediatos," Banco Central de la Republica Argentina, <http://www.bcra.gov.ar/noticias/PEI.asp>.
- Finance Denmark is a business association for banks, mortgage institutions, asset management, securities trading, and investment funds in Denmark. It owns Strakclearing, the Danish retail instant payment system, which is operated by NETS. See "Clearing and Settlement of Retail Payments" Denmark's National Bank, [https://www.nationalbanken.dk/en/bankingandpayments/retail\\_payments/Pages/SETTLEMENT-OF-RETAIL-PAYMENTS.aspx](https://www.nationalbanken.dk/en/bankingandpayments/retail_payments/Pages/SETTLEMENT-OF-RETAIL-PAYMENTS.aspx).
- BIM is operated by PDP, a private operator. Ownership: ASBANC's nonprofit Center of Financial Studies (CEFI), 51 percent; EMIs, 49 percent. BIM operates on a cost-recovery base.
- Philippine Payments Management, Inc. (PPMI) owns several schemes including InstaPay. It is incorporated as a not-for-profit association. The regulator, BSP, has no ownership in PPMI.

## SCHEME RULE WRITING

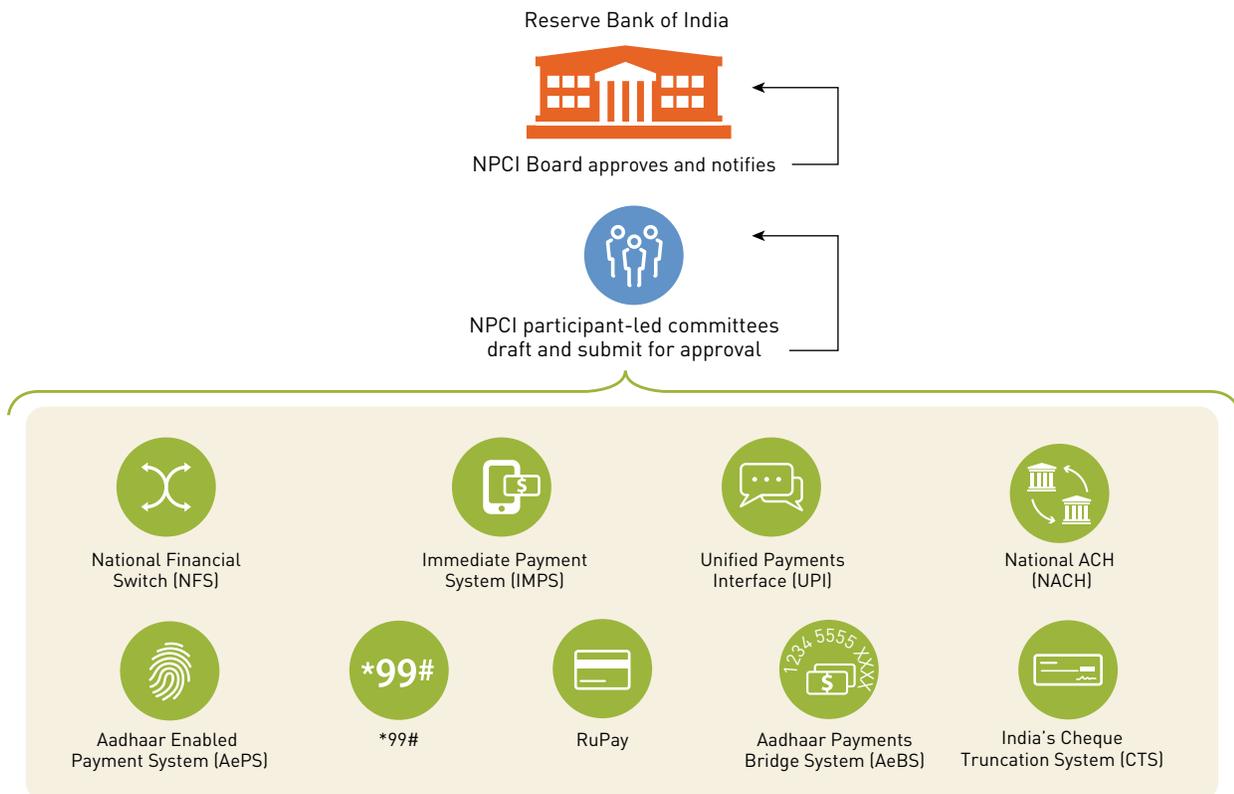
Scheme rules define the terms needed to safely and efficiently exchange payments. Although final decision-making often is left to scheme management, scheme participants may have a say in decision-making through rule-writing committees or similar forums.

Often, there are separate sets of rules for each service or transaction type, with committee membership comprising those participants who are expected to use the service (i.e., those who have “skin in the game”). For example—a bank participant who does not operate an agent network is less likely to participate in how rules are formed for interoperable agent networks.

Most schemes that successfully use participant committees for rule writing also make efforts to include a diversity of voices (small and large institutions, different licensing types) in the process. Typically, this is done on a representative basis. In a scheme with potentially hundreds of participants, hearing everyone’s voice becomes a challenge and the voice of the smallest participants can be drowned out.

In India, NPCI’s process for rule-making is an example of this participant-led approach. Although NPCI is bank-owned, rule-writing committees are composed of a representative sample of participants, such as payment banks, retail banks, prepaid payment instrument issuers (PPIs), and a combination of small and large institutions. Committee decisions are made on a consensus basis and presented to NPCI management for approval.<sup>11</sup> See Figure 5.

FIGURE 5. NPCI scheme rules development process



Source: Cook and Raman, 2019.

11. See “Board of Directors,” National Payments Corporation of India, <https://www.npci.org.in/board-of-directors>.

## Topics commonly covered in scheme rules

The type of rules agreed will depend on the needs of the scheme, and specific provisions can vary widely from one system to another. Some commonly included provisions in scheme rules are described below.

	TOPIC	DESCRIPTION
<b>Decision-making</b>	Membership criteria	Defines conditions for accepting new participants and membership termination.
	Voting rights and decision process	Defines which participants can participate in rule-making for which transaction types and what majority (simple/absolute) is needed to make decisions related to rules.
<b>Economics</b>	Interparty fees	Defines any potential interparty fees between participants to compensate possible economic imbalances.
	Liability and loss allocation	Defines participant liability in case of bankruptcy of a scheme participant. Loss allocation involves decisions on how losses will be allocated as the result of a loss that affects participants.
<b>Operations</b>	User experience	Defines the minimum common rules for user experience (e.g., name confirmation of recipient, fee disclosure before processing transaction, notifications, etc.). May define brand rules or customer service rules.
	Technical standards	Defines the technical standards to be used for the scheme.
	Quality of service and business continuity	Defines the quality of service required to protect the integrity of the payment system in terms of system availability, business continuity, procedures for disaster recovery, planned and unplanned outages, and incident responses.
	Monitoring and reporting	Defines reporting requirements of the scheme (e.g., to regulators).
	AML/CFT and fraud monitoring	Defines responsibilities of participants versus scheme responsibilities and possible audit powers of the scheme to verify compliance.
	Cybersecurity and compliance	Defines responsibilities for effective security management and capabilities to ensure that transactions are secure, reliable, and user data are protected against unauthorized disclosure, use, or modification.
	Clearing and settlement model	Defines the model for passing payment transactions and for settlement of funds between participants.
	Dispute resolution	Defines how disputes are identified and handled and how any possible loss is allocated.

## SCHEME MEMBERSHIP AND PARTICIPATION

The terminology used to describe full, formal, or “direct” participation differs between schemes. In some schemes, the term “membership” also is used. While there is no single rule, these terms generally refer to the group of participants who qualify for scheme membership and enter into a formal participation agreement with the scheme.

Members may include those who have rule-writing powers and voting rights, as well as those with no decision-making rights at all, depending on scheme gover-

nance. Eligibility criteria typically are established through the organization’s governing documents, and members often commit to the scheme via a formal agreement that defines, for example, membership conditions, rights, and termination criteria.

Table 3 includes some examples of how different types of participants engage in membership, rule writing, and ownership across schemes.

TABLE 3. **Participation in scheme governance, global examples**

COUNTRY (SCHEME NAME)	ROLE IN THE SCHEME			
	Ownership	Board composition	Scheme rule writing	Membership eligibility
Australia (NPP)	Banks, select nonbanks, and regulator are shareholders <sup>a</sup>	Shareholders, independent directors, and regulator	All members (who are also owners) take part in rule writing.	Licensed banks and EMIs <sup>b</sup>
China (NUCC/Wanglian)	Regulator and EMIs are shareholders. <sup>c</sup> Banks are not shareholders.	Shareholders, regulator, and other participants	Banks and EMIs do not take part in rule writing (regulator-led)	Licensed banks and EMIs
Colombia (Transfiya)	Banks are shareholders. EMIs are not shareholders.	Shareholders, independent directors	Management develops rules in consultation with participants.	Licensed banks and EMIs <sup>d</sup>
India (UPI)	Banks are shareholders. EMIs are not shareholders.	Shareholders, independent directors, and regulator	Member banks participate in rule-writing committees	Licensed banks <sup>e</sup>
Kenya (MNO-led EMIs)	No shareholders or board because there is no legal entity; governance is executed through a multilateral agreement.		EMI participants (signatories to agreement)	Licensed EMIs

a. See “The Company,” New Payments Platform, <https://www.nppa.com.au/the-company/>.

b. Participants that want to connect directly to NPP must hold an Exchange Settlement Account; account holders can be banks and EMIs. See “Accessing the Platform,” New Payments Platform, <https://nppa.com.au/accessing-the-platform/>.

c. The major stakeholders of NUCC, also known as Wanglian, are PBC and associated government institutes (40%), Tencent (9.6%), Alipay (9.6%), and other third-party payment platforms (40.8%). See “III. Big tech in Finance: Opportunities and Risks,” <https://www.bis.org/publ/arpdf/ar2019e3.pdf>.

d. SEDPES can be members of ACH Colombia since 2018.

e. As of publication, UPI membership remained limited to banks. However, the Immediate Payment Service (IMPS) is also open to licensed PPIs UPI allows for indirect non-bank participation.

## INDIRECT PARTICIPATION

Many instant payment systems also incorporate some form of indirect participation. Indirect participation can mean different things depending on context, but generally it refers to one or more of the following (see Figure 6):

- Whether a participant contracts directly with the scheme as a member.
- Whether a participant connects directly with the switch to pass transactions.
- Whether a participant settles transactions directly with the settlement agent.

Direct and/or indirect participation in scheme governance, switch connectivity, and settlement often happen in tandem. For example, Australia’s New Payments Platform (NPP) requires direct participants to hold an exchange settlement account at the Reserve Bank of Australia (RBA). They also need to become a shareholder in the legal entity that owns the scheme (NPPA 2019b). For this reason, as well as possible technical capacity and cost considerations, even a licensed bank with an exchange settlement account held at RBA may opt to become an indirect participant in the scheme.

Market context also can dictate the extent to which direct participation in one area affects direct participation in another area. For example, in Mexico where SPEI serves as both instant payment system and RTGS, direct participants in clearing necessarily also hold settlement accounts with the central bank. In India, EMIs are members of NPCI and connect directly to the Immediate Payments Service (IMPS), but historically EMIs have not connected directly to UPI.

Some participants who otherwise are “full members” may opt to connect indirectly to the switch for reasons related to technical capacity and capabilities. For example, Pesa-Link in Kenya includes several bank participants who are full members of the scheme and who hold settlement accounts with the designated settlement agent (the central bank), but connect to the switch indirectly through connections with other service providers.

If settlement occurs through the central bank’s RTGS system, as often is the case, then the central bank’s rules on who is entitled to hold central bank settlement accounts likely will apply. Many central banks limit the ability to hold settlement accounts to banks. However, there are exceptions. In Mexico, certain nonbank institu-

FIGURE 6. Indirect participation means different things in different contexts

 <b>OVERSIGHT</b>	<p>Oversight generally applies similarly to both direct and indirect participants.</p>
 <b>SCHEME</b>	<p>Does the organization contract directly with the scheme? Or, are agreements formed through another entity that holds a contractual relationship with the scheme?</p>
 <b>SWITCH</b>	<p>Does the organization directly integrate with the switch? Or, does it clear payments through another entity that has a connection to the switch?</p>
 <b>SETTLEMENT</b>	<p>Does the organization hold an account with the scheme’s designated settlement agent? Or, does it settle transactions through another entity that holds an account with the settlement agent?</p>

tions are permitted to hold settlement accounts with the central bank if they meet stringent operational and security criteria.<sup>12</sup> In Namibia, banks and nonbanks may hold settlement accounts with the central bank, but nonbanks must post additional collateral.

Indirect participation in any one of these areas does not necessarily preclude direct participation in another area, though requirements differ widely between schemes. Conversely, some instant payment systems fully disallow indirect participation—as is the case in Nigeria and Poland.<sup>13</sup> See Table 4.

TABLE 4. Participation in clearing and settlement, as presented by CPMI

COUNTRY	IMPLEMENTATION	BANKS				NON-BANKS <sup>a</sup>	
		Direct	Direct	Indirect	Indirect	Direct	Indirect
Participation in clearing		Direct	Indirect	Direct	Indirect	Indirect	Indirect
Participation in settlement		Direct	Indirect	Direct	Indirect	Indirect	Indirect
Korea	EBS	✓	✓	✓	✓	✓	✓
South Africa	RTC	✓					
Korea	CD/ATM System	✓	✓	✓	✓	✓	✓
United Kingdom	FPS	✓			✓	✓	✓
China	IBPS	✓			✓		
India	IMPS	✓			✓	✓	✓
Sweden	BiR/Swish	✓	✓			✓	
Turkey	BKM Express	✓					
Italy	Jiffy	✓	✓	✓	✓		✓
Singapore	FAST	✓					
Switzerland	Twint	✓					
Mexico	SPEI	✓					

a. For the purposes of this table, the term “banks” is used to refer to banks and other financial institutions that accept deposits. The term “non-banks” is used to refer to any entity involved in the provision of retail payment services whose main business is not related to taking deposits from the public and using these deposits to make loans.

Source: CPMI, 2016a.

12. By January 2014, some 44 nonbanks participated directly in SPEI comprising 17 broker-dealers, four foreign exchange firms, seven insurance companies, 11 microfinance and financial services firms, two pension fund managers, two investment fund managers, and a telecom. Combined, these participants represent 1.4 percent of SPEI’s volume, and 2.6 percent of the value settled through the system (CPMI 2014).

13. For more on the Poland example, see NBP (2015).

## Scheme economics

The economics of instant payment systems are similar to other payment systems. Customers (or merchants) pay transaction fees to participating FSPs, these participants pay scheme and switch fees to the organization(s) managing the payment system, and there may be interparty fee arrangements between participants. The following descriptions focus on the economics of credit/push payments, the most common form of payment supported by instant payment systems.

Customers, participants, scheme managers, and switch operators have their own economic incentives when it comes to interoperable payments. An economically sustainable scheme will ensure these incentives are aligned to drive the transaction volumes needed to achieve scale. Aligning incentives requires first understanding how incentives may differ between actors (see Table 5).

TABLE 5. Economic incentives of key actors in an instant payment system

	 <b>CUSTOMERS</b>	 <b>PARTICIPANTS</b>	  <b>SCHEME MANAGER/SWITCH OPERATOR</b>
<b>What do key actors want?</b>	A good customer experience marked by lower fees, improved usability, and instant transfer of funds.	Profits achieved by increasing customer use and limiting costs.	Revenue to cover costs, invest, and if for-profit, provide a return to owners.
<b>What do key actors earn and pay?</b>	Pay fees to participants to transact. May pay a higher price for interoperable transactions.	Earn fees from customers. Pay fees to the scheme manager and/or switch operator. Pay or earn interparty fees to/from other participants.	Earn fees from participants, based on use and/or participation.

### THREE QUESTIONS CAN HELP GUIDE DECISIONS INVOLVED IN SCHEME ECONOMICS:

- How might interoperability affect customer fees?
- How should interparty fees be applied to balance incentives?
- How should scheme and switch services be priced to participants?

#### 1 **How might interoperability affect customer fees?**

In a competitive market, customer transaction fees typically are independently set by providers unless regulation limits this ability. The scheme rarely plays a role in setting end-user pricing, though there are exceptions, such as in Jordan, Ghana, and Mexico. Where customer fees are set by the scheme, the regulator often is involved in the decision-making process.

Participants may decide to charge a higher customer fee for interoperable transactions, discriminating between the price of transactions on their own platform and those conducted off their platform. The participant's rationale for this price differentiation can vary and may include the following:

- **Cover costs.** They may want to recover the costs, such as scheme and switch fees, incurred in an interoperable transaction.
- **Compensate for lost revenue.** They may want to recover the opportunity cost of funds lost, such as the withdrawal fee a customer would have otherwise paid on their platform.

- **Strategically protect network.** Participants may seek to use higher off-net prices as an incentive to discourage interoperable transactions and keep customers on their network.

While charging a higher price for interoperable transfers may be a reasonable response in some scenarios, it often undermines the goal of the scheme as a whole, which is to maximize transaction volumes and provide a seamless experience to customers. As a result, some schemes, such as Tanzania's EMIs, have agreed restrictions on this type of price differentiation, but interparty fees may then be needed to balance incentives.



## 2 How should interparty fees be applied to balance incentives?

Interparty fees are paid between FSPs participating in the interoperable arrangement. The scheme manager, switch operator, and settlement agent do not earn anything from this fee. Also, the interparty fee is not a customer fee, though it may have implications (positive or negative) for the price ultimately paid by the customer.

Interparty fees generally are applied to balance some form of economic imbalance. Because customers can be charged transaction fees only where they hold an account, it is possible that one participant earns revenue from a transaction and the other incurs the cost.

For example, if a customer with an account provided by one participant withdraws funds from an agent of another

participant, then the participant that holds the account charges the customer fee, but the participant who owns the distribution network incurs the majority of the cost. In such a scenario, an interparty fee may be necessary to balance incentives.

While the descriptions and examples that follow are specific to instant payment systems, the principles generally are the same as those for other forms of payment, such as with card transactions.

The three interparty fee models are as follows:

1. **Sender pays.** Sending participant pays the receiving participant.
2. **Receiver pays.** Receiving participant pays the sending participant.
3. **No interparty fee.** Neither participant pays the other.

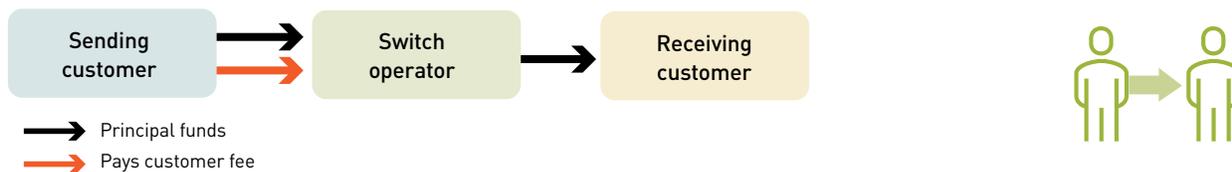


### REMITTANCES (PERSON TO PERSON)

Customer fees for person-to-person (P2P) transactions are most commonly applied to the sending participant. This includes only the fee for sending funds between two accounts, though in many cases a receiving cus-

tomers may need to pay a withdrawal fee as well. In a closed-loop environment, funds stay within the network and continue to circulate. See Figure 7.

FIGURE 7. Closed-loop P2P transaction

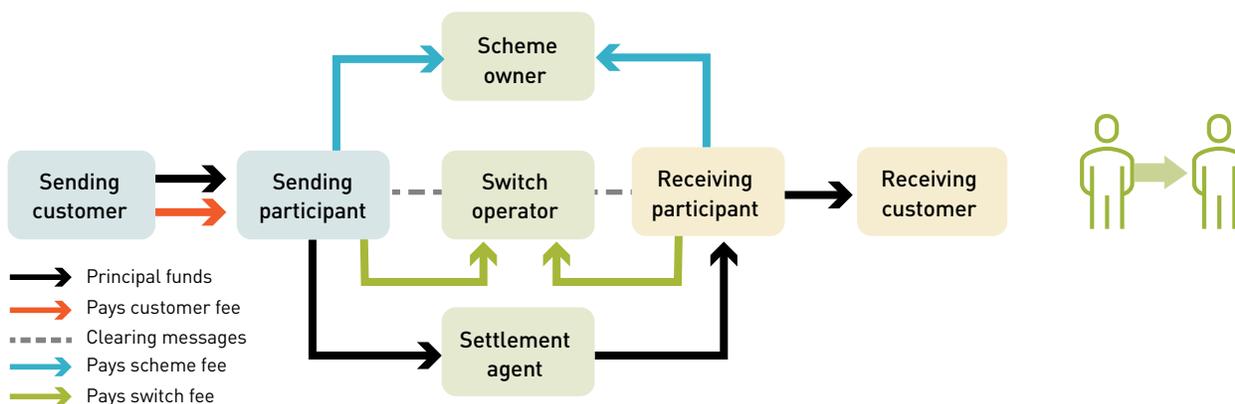


In an interoperable transaction, funds leave the sending participant's platform. For bank participants, this might mean lost revenue from intermediation of funds. For EMI participants, this might mean lost future transaction revenue from customer fees. See Figure 8.

transactions to compensate for lost future revenue. Some schemes even apply a "sender pays" interparty fee to these transactions, assuming that sending participants will charge a premium and view the interparty fee as a "revenue share" of that premium with the receiving participant. However, the effect of such a policy is to drive the price for an interoperable transaction even higher.

Absent any balancing mechanism, the sending participant generally will charge a higher price for off-net

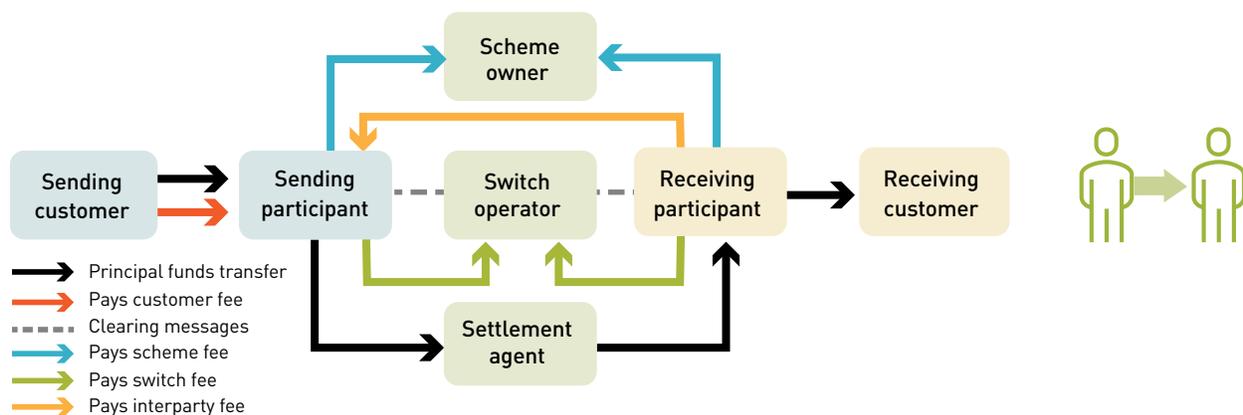
FIGURE 8. Interoperable P2P transaction with no interparty fee



Charging the customer a higher price for an interoperable transaction can work to balance incentives, but it also may undermine the scheme’s goal of optimizing customer experience and driving transaction volumes. As a result, some schemes have applied a “receiver pays”

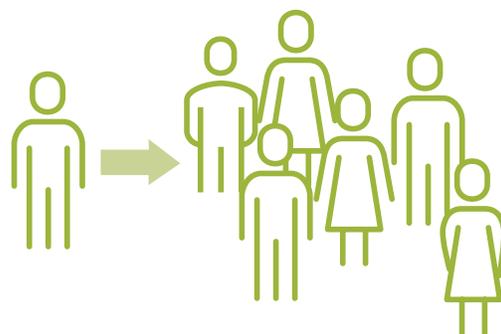
interparty fee instead to balance incentives between participants, while keeping off-net customer fees the same as on-net fees—that is, disallowing price discrimination. EMI-led schemes in Tanzania and Uganda use this model. See Figure 9.

FIGURE 9. Interoperable P2P transaction with “receiver pays” interparty fee



### BULK TRANSFERS

The economics of bulk payment transactions are similar to those of P2P transactions in that the sending customer generally pays the transaction fee. The rationale for choosing the interparty fee model often also is similar. However, fees for bulk transfers often are negotiated with the sending business. This should be taken into account when assessing the economic incentives for each participant and any possible role of an interparty fee.



## MERCHANT PAYMENTS

Transaction fees for merchant payments may be charged to the merchant, the paying customer, or both in a single transaction, for example, as in certain forms of bill payment transactions.

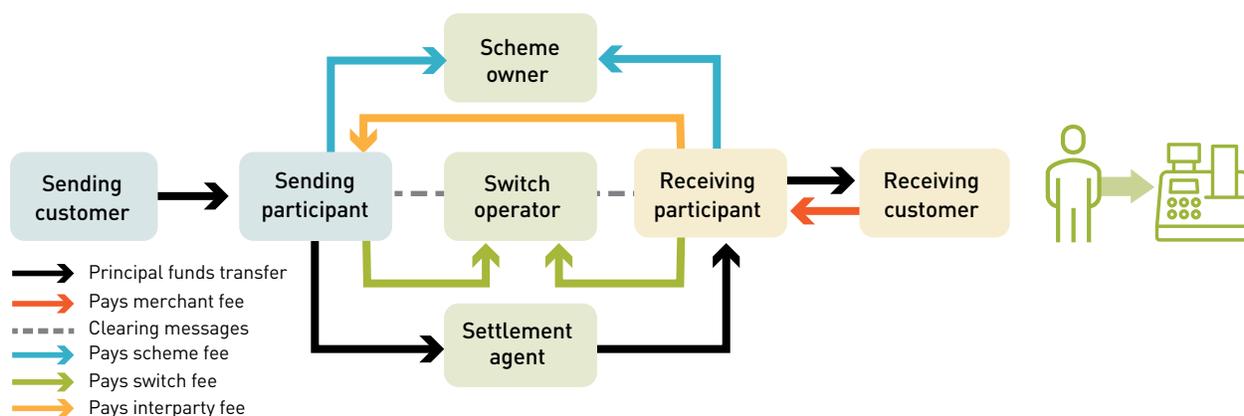
The appropriate interparty model depends on who is being charged—the customer or the merchant. Where customers are charged the transaction fee, the incentives and model options are similar to P2P transactions, with the exception that the receiving participant now has the added cost of maintaining the merchant network. This added acquiring cost may equalize incentives with the sending participant who is losing funds

from its platform, or even tilt the balance in favor of a sender-pays model, depending on the arrangement.

Where merchants are charged the fee, the participant holding the customer account may require an interparty fee to be paid by the participant who holds the merchant account and collects the fee—especially if the participant holding the customer account shares in direct costs, such as switching fees.

In a model where the merchant pays the transaction fee and both sending and receiving participants pay switching fees, the fee structures are likely to appear as shown in Figure 10.

**FIGURE 10. Interoperable merchant payment, with transaction fee paid by the merchant, and interparty fee applied to balance incentives**



## CASH DEPOSIT AND CASH WITHDRAWAL

Cash deposits and withdrawals for the accounts that support instant payments happen in several ways. In bank-led markets, this may happen primarily through branches or ATMs. The economic models are similar across access channels; however, this section focuses on agent networks, which often are used by services in developing markets.

For agent networks, a cash deposit typically is free to customers, while a fee is charged for cash withdrawal. In both cases, a commission is paid to the agent for performing the service. When the agent used for cash deposit transactions does not belong to the same par-

ticipant as the customer depositing the funds, then an imbalance can occur where the participant incurring the cost, such as the cost to maintain liquidity in the agent network, is not the participant receiving the future customer fee revenue. In these cases, an interparty fee likely is needed to balance incentives. See Figure 11.

For an interoperable cash withdrawal transaction, the incentives and balancing mechanism needed are the exact opposite. The imbalance is created when the participant holding the customer account collects a cash withdrawal fee, but a different participant incurs the cost of maintaining liquidity at the point of service. See Figure 12.

FIGURE 11. Interoperable agent cash deposit, with interparty fee applied to balance incentives

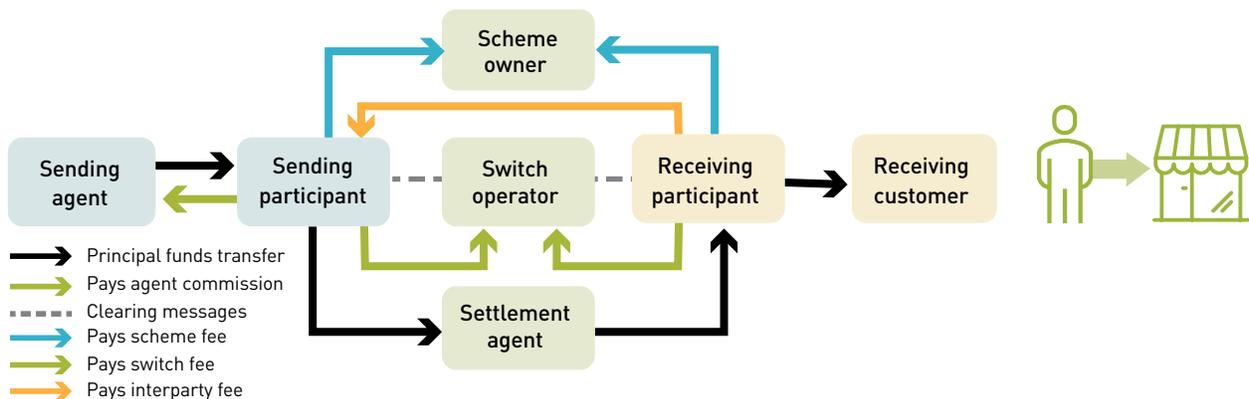
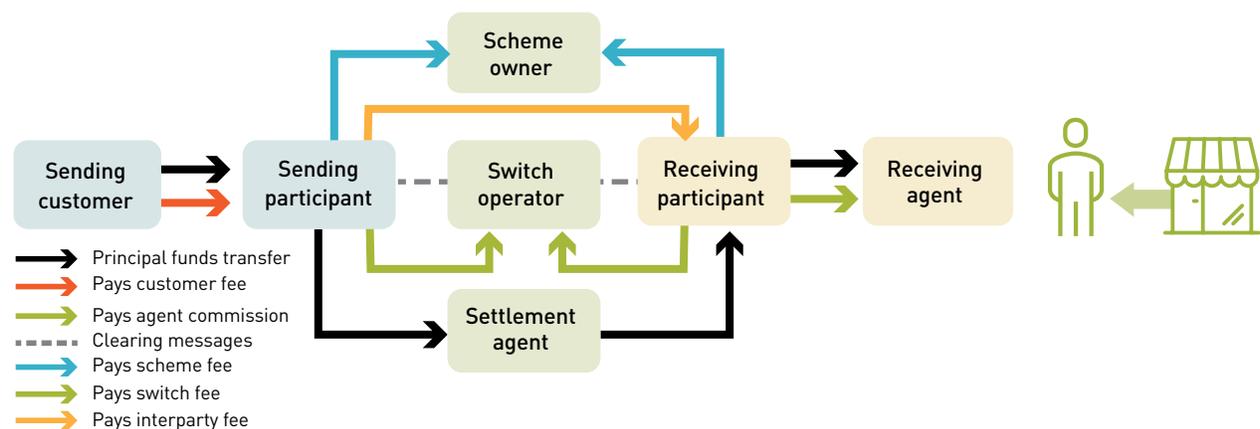


FIGURE 12. Interoperable agent cash withdrawal, with interparty fee applied to balance incentives



### PAYMENTS INVOLVING THE PUBLIC SECTOR

The incentives for public sector payments are similar to those of other transaction types. For example, government social protection payments generally apply the same logic as bulk transfers. Payments

from customers to the government such as for tax or utility bills are similar to merchant payments. The economic considerations for determining incentives within these transactions are similar as well.

### SETTING THE INTERPARTY FEE

The amount of the interparty fee should depend on scheme economics and the nature of the economic imbalance. Although fees can be based on costs incurred or revenue opportunities lost, ultimately, they must be set with the goal of creating a level playing field that promotes transaction growth and the best possible customer experience.

Interparty fees may draw the scrutiny of competition regulators if they are perceived as price fixing between competitors or acting to set an artificial price floor for customers. The process for determining an interparty fee should be carefully considered, and the relevant competition authorities should be consulted.

Interparty fees may be set **bilaterally** or **multilaterally**, and **symmetrically** or **asymmetrically**.

**A bilateral interparty fee** is agreed to between pairs of participants. This approach may address price-setting concerns for competition regulators. However, concerns about abuse of dominant market position in

price setting and the scalability of the arrangement may remain. Bilateral rate setting also can be used by current participants to “lock out” new entrants through extended negotiations or unfavorable terms.

**A multilateral interparty fee** is agreed to at the scheme level and is more scalable, but it may draw competition challenges related to price setting. Therefore, a multilateral interparty fee often requires regulator involvement or approval. Multilateral fees may be set by participants, the scheme, or a regulator. They also may be calculated by the scheme through a consistent method agreed to with the regulator. Each approach has benefits and limitations. They often balance participant priorities with the risk of challenge from competition authorities.

**Symmetry** in interparty fees refers to whether participants will pay each other the same fee. **Asymmetrical** fees may reward the largest networks or the widest distribution networks, but they also can exacerbate competitive imbalances in the market.

### 3 How should scheme and switch services be priced to participants?

For the scheme and switch to be financially sustainable, funding must cover both capital investments (upfront and ongoing) and operational expenses (fixed and variable). These costs may include scheme operations, switch operations, or both if the switch and scheme are managed by the same organization. Where there is a profit motive, generating returns for shareholders also will be considered.

Funding can be generated through (i) owner contributions, (ii) fixed (periodic) fees to participants, (iii) variable (per transaction) fees to participants, or (iv) some combination.

If costs are expected to be shared equally among participants, then a fixed fee per participant is the simplest option. If volumes already are high enough to recover costs at a reasonable price per transaction, then a variable fee based on the actual volume of each participant may be the best way to ensure costs are proportionately shared by use. If volumes are not yet high enough to support a reasonable cost per transaction, or if volumes are difficult to forecast, then a combination of fixed fees and variable fees may be appropriate.

Not-for-profit organizations likely will need to ensure cost recovery early on, and a fixed-fee model provides that certainty. These organizations may graduate to a variable fee model as the need to allocate costs between participants becomes more important than revenue certainty. An organization with a higher risk appetite may place more weight on variable fees, which have a higher revenue potential as transaction volumes grow, but also a greater potential for loss if they do not grow.

An advantage of fixed fees and owner capital contributions is that they can be invoiced to participants upfront to ensure a consistent cash flow. Variable fees that are based on actual volumes can be invoiced only in arrears—that is, the owner will need to budget cash flow more carefully.

Another aspect to consider is whether to charge participants based on both their incoming and outgoing volumes. If the goal is to split costs proportionately, then fixed fees and variable fees for both inflows and outflows should be considered to ensure that participants who send or receive more are not unfairly subsidizing the operations of other participants. In the United Kingdom, each participant’s inbound and outbound Faster Payments are added together, and the total is divided by two and then multiplied by the variable transaction fee. See Table 6 for the Faster Payments scheme full fee structure.

TABLE 6. U.K. Faster Payments scheme and switch fee structure

	FEE	FEE TYPE	AMOUNT
Switch fee	Support fee	Fixed	£ 805 per month
	Connectivity fee	Fixed	£ 8,859 per month
	On-boarding fee	Fixed	£ 68,000 per event
	Transaction fee	Variable	£ 0.012 per transaction
Scheme fee	Legal fee	Fixed	£ 750 per event
	Transaction fee	Variable	£ 0.013 per transaction

Source: Faster Payments, 2020.

### WHAT IS A REASONABLE VARIABLE FEE PER TRANSACTION TO CHARGE PARTICIPANTS FOR SCHEME/SWITCH SERVICES?

In cases where the switching fee is charged per transaction, the following questions may arise: What is a reasonable variable fee per transaction? What amount is high enough to support scheme and switch services, but also low enough to encourage participants to drive transaction volumes?

Unfortunately, there are no easy answers. The amount to charge for scheme and switch fees often depends on the model and the market. Models that operate on a cost-re-

covery basis use fees only as a mechanism for allocating costs to participants. In such cases, the focus may be better placed on the overall budget of the scheme. In a for-profit model, participants are more likely to be concerned that the owner is not making an excessive return at the cost of the market.

If variable fees are set too high, there is a risk that participants may increase customer fees, thereby stifling transaction growth. If interoperable transaction volumes are expected to be low at first, then fixed fees may be a better tool until volumes grow. See Table 7.

TABLE 7. Examples of scheme and switch fees

COUNTRY/REGION, INSTANT PAYMENT SYSTEM	SCHEME FEE		SWITCH FEE	
	Fixed	Variable	Fixed	Variable
Australia, NPP	Annual fee based on three-tier model using participant shareholding size <sup>a</sup>		(Included in scheme fees)	
SADC, TCIB	US\$1000 initial US\$100 renewal	US\$0.02 per transaction	(Included in scheme fees)	
SEPA, SCT Inst	EUR 215 annual		(Varies depending on the switch operator)	
UK, FPS		GBP 0.01269 per transaction	GBP 68,000 one-off GBP 9,664 monthly	GBP 0.01205 per transaction

a. This model is expected to be moving to an actual per transaction charge using monthly volumes.

Source: Faster Payments, 2020; "Payment Scheme Participation Fees," European Payments Council, <https://www.europeanpaymentscouncil.eu/what-we-do/be-involved/scheme-participation-fees>; and SADC Banking Association, 2019

## Understanding the provider business case

An FSP's views on interoperability will be informed by the expected impact on its business. Providers are likely to come to very different conclusions based on their business model, market position, and strategy. New interoperable transactions can increase transaction revenue, but they also may cannibalize revenue from other transaction types.

New administrative and operational expenses also may be introduced, such as staff to support additional operational responsibilities, marketing campaigns, or certification costs. However, some operational expenses may be absorbed into current staff duties or marketing budgets.

New participants likely also will incur costs of switch integration and changes to core systems. Most of this cost will be incurred when participants first connect, but expenses will continue as new services are added. Some common project costs include:

- Technical connection to the switch operator.
- Certification of the interfaces for each transaction type.
- Changes to the participant's systems and channels.
- Enhancing customer care, fraud monitoring, and staff training.

CGAP has created a tool to help e-money FSPs model the financial impact of interoperability on their business case, go to [Link to CGAP interoperability model to build a business case](#)

INTEROPERABILITY BUSINESS CASE	
+	New revenue generated
+/-	Product substitution
+/-	Indirect benefits
=	<b>Gross Margin</b>
-	New operational costs
=	<b>Net Profit</b>
/	New capital expense
=	ROI from interoperability

IMPACT ON GROSS MARGIN		
New margin generated	Product substitution	Indirect benefits
<p>New off-net transaction volumes, both incoming and outgoing, directly contribute to the bottom line:</p> <p><b>Customer fee</b></p> <p><i>minus</i> Scheme fee</p> <p><i>minus</i> Switch fee</p> <p><i>plus/minus</i> Interparty fee</p> <p><i>equals</i> New margin generated</p>	<p>New off-net transaction volumes, both incoming and outgoing, may be a substitute for on-net transactions.</p> <p>Some substitutions, such as fewer cash-in transactions, may result in more margin, while others, such as fewer cash-out transactions, may result in less margin.</p>	<p>A net receiver of funds may benefit from larger account balances. A net sender may experience the opposite.</p> <p>Interparty fees may be applied to correct these imbalances if they are perceived as harming the scheme's overall value proposition.</p>

## Scheme operations

For a scheme to operate effectively, it will need to manage several support services. Many of these services will be the same regardless of whether the scheme operates under a for-profit or cost-recovery business model and whether or not it operates the switching infrastructure.

Table 8 outlines some common support services for scheme operation. The operational considerations related to switching infrastructure are the topic of the next section.

**TABLE 8. Examples of support services performed by a scheme manager**

CATEGORY	DESCRIPTION	COST DRIVERS
Administrative activities	Creation and operation of the scheme ownership body.	Establishment costs Annual company fees Accountant and/or auditor fees ERP and payroll software Office rent, utilities, insurance Other general expenses
Engagement	Meetings with regulators, participants, and switch operators.	Staff salaries Travel costs Event hosting costs
Legal	Establishment of documents, contracts, and procurement services.	Staff salaries Legal services
Technical assistance	Specialist support for the development of scheme rules and other services.	Staff salaries External consultants
Compliance	Regulatory reporting, certification, and auditing.	Staff salaries Independent auditor and/or certification body
Marketing	Development of the scheme brand. Preparation of creative materials and production of media and marketing campaigns.	Staff salaries Brand and media agency Production and media costs

## SCHEME BRANDS AND TRADE NAMES

One of the most important operational decisions for a scheme is whether it will operate under a single brand. A single scheme brand creates common awareness and lets customers know where they can use the service. The latter is especially important for schemes that do not have universal participation from account issuers or acquirers in the market.

In practice, a scheme manager typically also will have an identity (a trade name) for its legal entity. There may be some awareness created through public relations activities for this trade name, but this often is separate from the scheme brand. Some examples of this include PesaLink by Integrated Payment Services Limited (IPSL) in Kenya, JoMoPay by JoPACC in Jordan, and PromptPay by National ITMX in Thailand. See Figure 13.

Instant payment brand names frequently are synonymous with the product. However, a separate brand name also may be more closely linked to an alias function, as is the case with PAYM in the United Kingdom or PayID in Australia, or linked to a particular channel, as is the case with CoDi for QR in Mexico and BharatQR for QR in India. See Figure 14.

The distinctions between these terms may be more evident when thinking about how customers will use them in practice. For example, someone asking a friend, “Can I send to your PayID?” or “Do you use PesaLink?” or “Does that merchant accept BharatQR?” Any formulation can work, the decision should be based on branding and strategy.

FIGURE 13. Examples of scheme brands and trade names

SCHEME MANAGER/ COUNTRY	TRADE NAME	BRAND
IPSL/Kenya		
JoPACC/Jordan		
National ITMX/ Thailand		

FIGURE 14. Examples of scheme product brands for alias and QR codes

Examples of brand name for alias function		
Examples of brand name for channel (QR)		

## BALANCING PARTICIPANT COLLABORATION AND COMPETITION

The governance, economic, and operational decisions described over the preceding sections involve the “rules” of an instant payment system. The following section addresses another key area for collaboration: the connecting technology or “rails.” Schemes often do not offer products directly to consumers (for example, accounts and apps), rather, this is typically viewed as a space for participants to compete. See Figure 15.

However, there are some exceptions. Some schemes choose to offer their own products or channels, such as mCash from Nigerian Inter-bank Settlement System (NIBSS) in Nigeria or the BHIM app from NPCI in India. However, when the scheme moves too far into providing products or channels to customers, it runs the risk of being perceived as a competitor to the participants it intends to serve.

FIGURE 15. **Areas of competition and collaboration in instant payments**

Schemes define the rules and rails for the arrangement (collaboration space); while accounts and apps are generally left to commercial actors (competition space).

Source: BMGF, 2019.

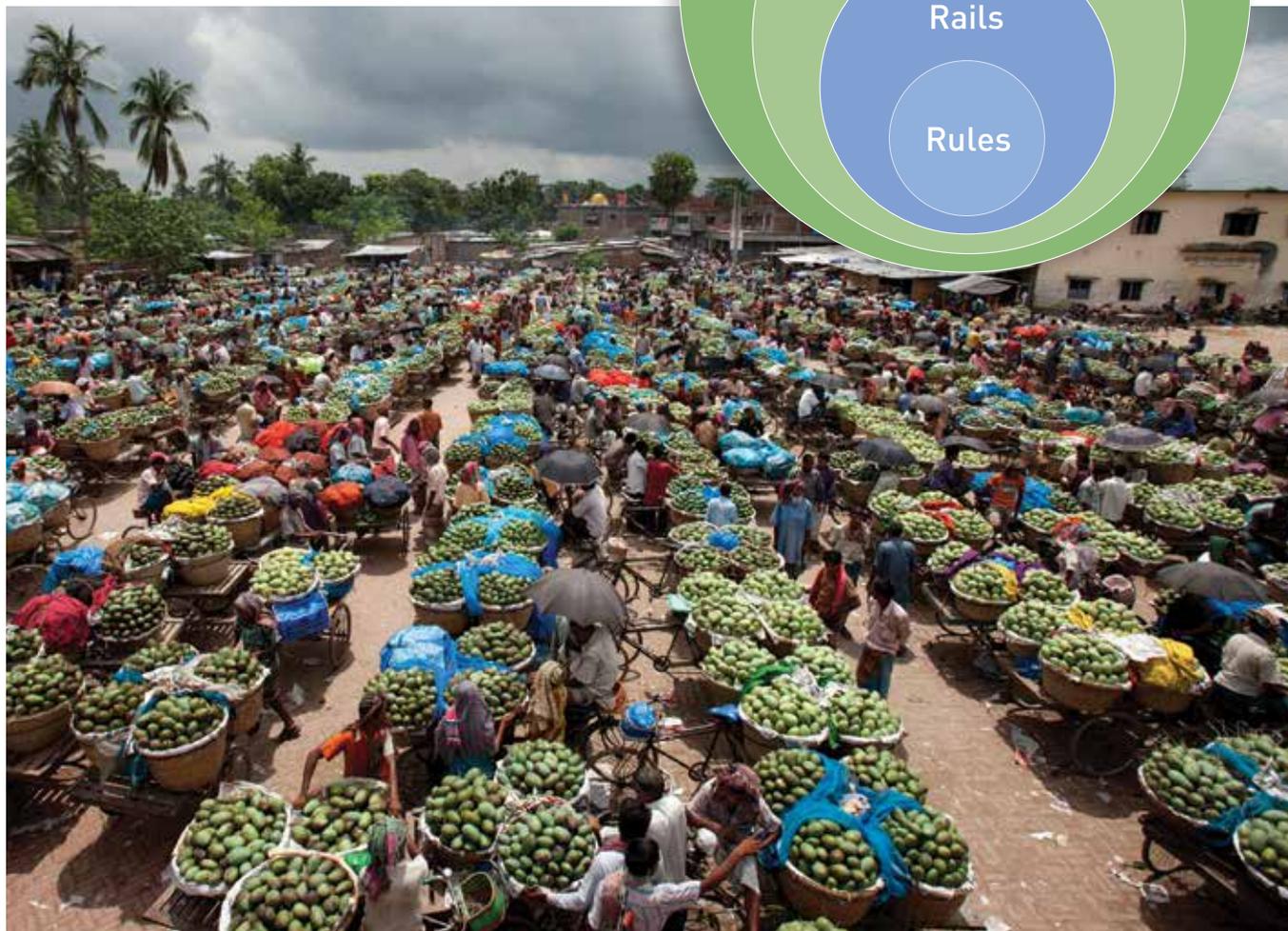
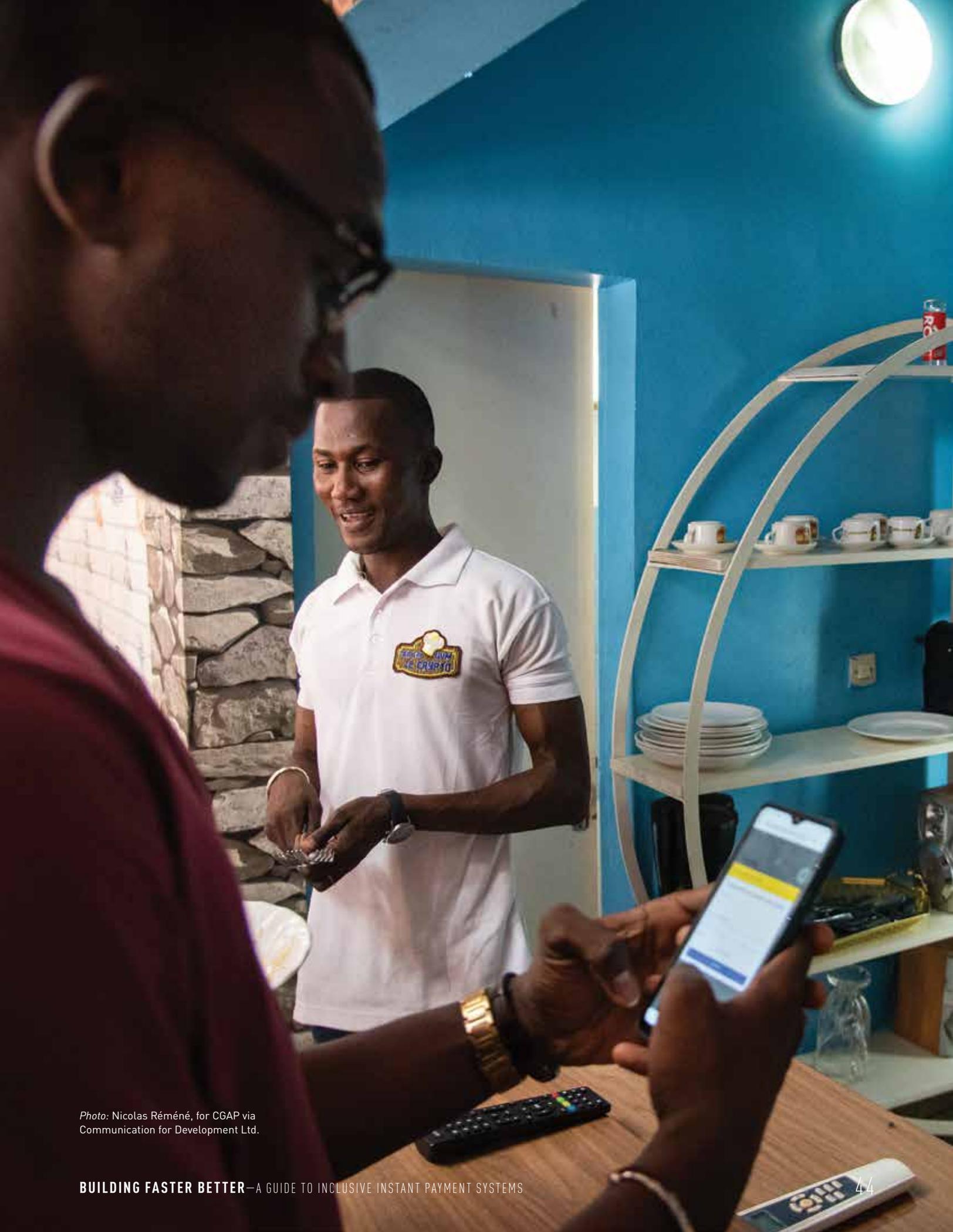


Photo: M. Yousuf Tushar. CGAP Photo Contest, 2011.



*Photo: Nicolas Rémené, for CGAP via Communication for Development Ltd.*



## SECTION 4

# INSTANT PAYMENT SWITCH

**E**FFECTIVE INSTANT PAYMENT SYSTEMS rely on efficient technology solutions, but technology should not drive the interoperability conversation. Rather, technology should be selected to meet the needs of the payment system as defined in scheme rules. As the needs of the scheme change, the operational model should be reassessed.

Any digital payment transaction involves at least the following five steps: payment initiation, authentication,

authorization, debiting funds, and crediting funds. These steps are shown in Figure 16 and Table 9 for a transaction that involves a single provider.

Interoperable transactions between payment system participants require additional steps to clear and settle funds (Le Sar and Porteous 2013). See Figure 17.

Depending on when settlement occurs (deferred or in real time), Step 7 in Figure 17 may be completed before or after funds are credited (Step 5). See Table 9.

FIGURE 16. Single FSP digital payment transaction



FIGURE 17. Interoperable digital payment transaction

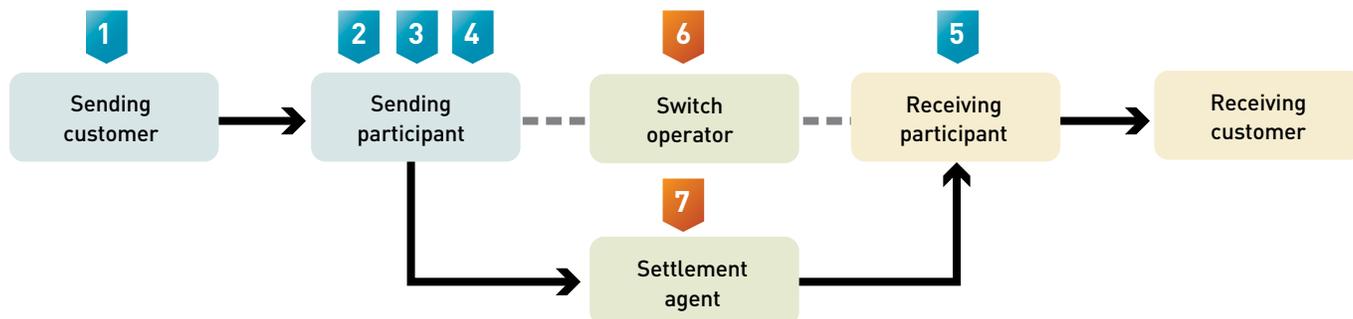


TABLE 9. Digital payment transaction steps

STEP	ACTION	DESCRIPTION	PAYMENT SYSTEM PARTICIPANT
1	Payment Initiation	Customer begins transaction using device.	Often the sending participant but also may involve a third-party initiating the payment.
2	Authentication	Customer confirms identity.	Often at the sending participant but could involve other entities such as ID authority.
3	Authorization	Customer and account issuer both grant permission to transfer funds.	Sending participant (sender's store of funds)
4	Debit funds	Funds are debited from the sending customer.	Sending participant (sender's store of funds)
5	Credit funds	Funds are credited to the receiving customer.	Receiving participant (receiver's store of funds).
<i>Interoperable transactions only</i>			
6	Clearing	Payment information is transmitted between participants. <sup>a</sup>	Switch operator
7	Settlement	The settlement agent transfers funds between participant settlement accounts.	Settlement agent

a. The procedures include a mechanism to calculate participants' bilateral and/or multilateral positions to facilitating the settlement of their obligations on a net or gross basis (CPSS 2003).

## PAYMENT INITIATION

Instant payment systems frequently focus on supporting what is called a “direct credit transfer” or “push payment” in which the sending customer initiates the transaction. Credit/push payments are preferred because they remove some of the risks and costs traditionally associated with “direct debits” or “pull payments,” where the receiving party initiates the transaction (BMGF 2015).

While credit/push payments often are irrevocable, systems that support revocable debit/pull payments must have greater capacity to reverse transactions and address fraud. A payment system likely will need to balance the cost reductions offered by irrevocable payments with the consumer protection and satisfaction this feature offers.

To initiate a credit/push payment, the sending customer must identify a recipient address (account or alias), open the channel (e.g., app or USSD interface), and enter transaction details. Several recent innovations have focused on improving this process for instant payments. Key among these are the rise of payment initiation service providers, the availability of “debit-like” forms of payment initiation,

the use of aliases, and the availability of QR codes in payment addressing.

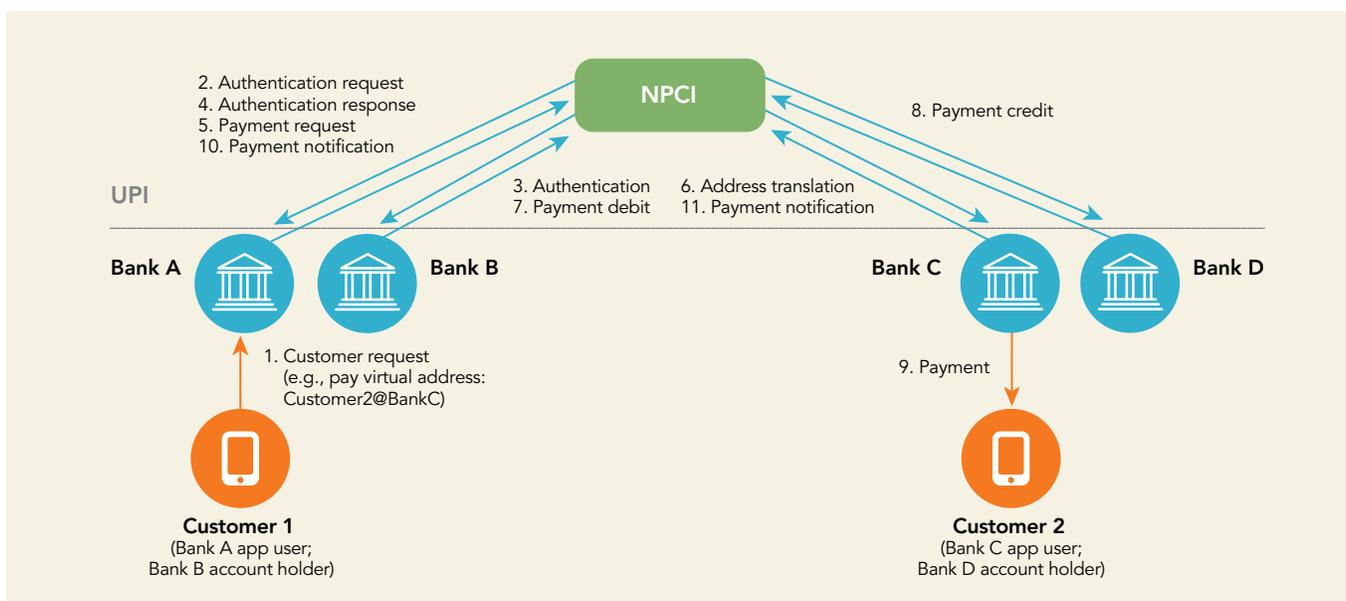
### **Payment initiation service providers**

Open banking and new models for instant payment system design increasingly are introducing the ability for third-party payment service providers to initiate payments on behalf of customers. For example, in India, UPI allows customers to use a channel other than the one provided by their account issuer to initiate a transaction (Manikandan 2019). See Figure 18.

Other examples include the United Kingdom and the European Union, where open banking and PSD2 regulations allow third-party payment initiation.

Third-party initiation services can be implemented in several different ways. While some such as UPI rely on API calls and responses for the payment initiator to perform transaction authentication and authorization in the background, others require customers to port to their account issuer's interface to provide credentials. While these model differences may appear small, the impact on customer experience, and ultimately adoption, can be large.

FIGURE 18. P2P transaction using the NPCI's UPI service in India, initiated through a third-party app



Source: Cook and Raman, 2019.

### ***“Debit-like” forms of payment initiation***

Some instant payment systems are developing services that allow credit/push payments to approximate the customer experience of debit/pull payments. A request to pay (RtP) service allows a merchant to digitally request that the customer initiate the payment. This takes some of the responsibility for initiating the transaction off of the customer and can reduce customer errors, such as entering the wrong address or amount of payment.

CoDi in Mexico is one example of an RtP service provided on top of an instant payment system (Díaz 2018). The merchant presents an electronic QR or NFC request to the customer via CoDi, which is then accepted by the sending customer, thus initiating a credit/push payment through the SPEI system.

### ***Use of alias***

Bank identification codes and account numbers can be difficult to remember and risky to share. To overcome these challenges, an increasing number of instant payment systems allow customers to use an alias to identify their accounts. An alias must be unique to the account that is receiving the

funds; it could be a phone number, business number, email address, or even a simple alphanumeric name.

An alias can be unique to a single provider or unique to the payment system. If it is unique only to the provider, as is the case of mobile numbers in Mexico, the customer also must identify the receiving institution. If the alias is unique to the payment system, the customer needs to know only the alias to address a payment, but the payment system must then either agree on standards for addresses, such as an IBAN or domain-style addresses as in India, or provide a centralized directory, such as Pathfinder for mobile numbers.

### ***QR codes***

QR codes store addressing and payment data to allow customers to initiate a payment simply by scanning a code from a mobile device (BMFG 2019). Often, this implies using a smartphone. QR codes can be presented by the merchant or by the customer; they are either static or dynamic. Singapore and Thailand were two early, successful examples of interoperable QR code standards for instant payments, but many other countries are intro-

ducing these standards at the payment system level (e.g., Jo-PACC in Jordan) or market level (e.g., NPCI and leading card schemes jointly in India).<sup>14,15,16</sup>

## PAYMENT AUTHENTICATION AND AUTHORIZATION

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). Authorization often refers specifically to the consent given by the account issuer (CPSS 2003). However, this also may include the customer granting permission for transfer (e.g., confirming transaction details).

Authentication may require using a second factor to provide a higher level of assurance in confirming identity. Two-factor authentication may include some combination of a username with PIN/password, one-time token, and/or the binding of a specific device to an account. The use of biometrics in sender authentication also is being increasingly adopted.

### **Use of biometrics**

As part of India's Aadhaar-based payment system for social protection payments, NPCI worked with India's identification authority to enable biometric authentication at the time of cash withdrawal. The Aadhaar Enabled Payment System allows customer biometrics to be encrypted and passed to the ID authority for authentication. NPCI acts only as a channel for these messages, and neither NPCI nor the banks view or store customer biometrics. See Figure 19.

### **Recipient name confirmations**

Some systems have adopted recipient name confirmation to help reduce errors and fraud that result in funds being sent

to the wrong account. Before authorization, the sending customer is prompted to confirm the registered name of the receiving customer before completing the transaction. NPP in Australia and the EMI service in Tanzania are examples of arrangements that have adopted this functionality.

## CLEARING

The switch operator's most important responsibility is to securely and reliably share transaction data between participants in the instant payment system.<sup>17</sup> Clearing transactions involves transmitting, as well as reconciling, confirming, and where relevant, netting transactions (CPSS 2003).

The switch operator is responsible for providing the settlement agent with an accurate accounting of funds owed between participants at the end of each settlement cycle. The information may be communicated for multiple transactions combined (netted) or for each individual transaction (gross). The switch determines the amount to be settled and implements the technical measures the scheme rules require to reduce settlement risk to agreed to levels.

The switch operator also may provide support services to help ensure the clearing process is secure and reliable. Examples of these services include the following:

- 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.

Either the scheme rules or the switch operator's own policies will determine the messaging protocol for communicating between participants and the switch. The most

14. "Singapore Quick Response Code (SGQR)," Monetary Authority of Singapore, <https://www.mas.gov.sg/development/e-payments/sgqr>.

15. Bank of Thailand. n.d. "Payment Systems: Standardized QR Code in Thailand." [https://www.bot.or.th/Thai/AboutBOT/Activities/event/Documents/ADBI\\_bancha.pdf](https://www.bot.or.th/Thai/AboutBOT/Activities/event/Documents/ADBI_bancha.pdf)

16. For more information on the considerations involved in QR codes, see BMGF (2018).

17. The payment is cleared (from the perspective of the payer) when the payer no longer has access to the funds and cleared (from the perspective of the payee) when they gain access to the funds (BMGF 2015).





*Photo: Tim Chambers, CGAP Photo Contest, 2016.*



## SECTION 5

# SETTLEMENT OF INSTANT PAYMENTS

**A** PAYMENT IS NOT CONSIDERED COMPLETE until settlement occurs. Settlement, the discharge of the monetary obligation between participants based on agreed terms, happens when actual funds are transferred between participants (CPSS 2003).

Settlement may happen before funds are considered received by the customer, such as in a real-time settlement model, or after the funds are considered received by the customer, as in a deferred settlement model. Settlement also may occur for each individual transaction (gross settlement) or for the net position across several transactions (net settlement). When the term “real-time gross settlement” is used, it refers to a model where each individual transaction is settled as it occurs.

Regardless of when settlement occurs, or whether transactions are netted, the risk of the receiving participant not getting paid is fully removed only after settlement—that is when there is no longer any settlement risk. Settlement is performed by the settlement agent, which is the institution that holds the settlement accounts for each participant. The settlement agent debits and credits participants according to the instructions from the switch operator.

There also are some arrangements where there is no settlement agent at all. In these cases, prefunded stores of value (called “nostro accounts”) held by the counterparty are debited as each transaction occurs. This model most often corresponds to bilateral technical arrangements for clear-

ing payments. It comes with several challenges because liquidity requirements are very high. Settlement becomes more costly and complex as the number of participants increases.

See Table 10 for a summary of settlement models.<sup>18</sup>

Central banks are commonly chosen as a settlement agent because they provide a low-risk settlement asset (reserves) and often already have mechanisms to counteract liquidity issues (CPMI 2016a). Table 11 provides examples of the actions a central bank might take to support the settlement of instant payments. These include the following:

- Taking a business-as-usual approach, where net positions are settled on RTGS during its current normal operating hours. An example is IMPS in India.
- Offering moderate support, where there is limited new functionality on the RTGS system outside of its normal operating hours, such as the blocking of dedicated funds to be used for instant payment settlement. An example is BIR in Sweden.
- Opening the RTGS to become a 24/7 settlement service or the implementation of a special settlement service dedicated to the instant payment system on a 24/7 basis. An example is NPP in Australia.
- Operating the instant payment system as a part of RTGS (both switch operator and settlement agent). An example is SPEI in Mexico.

18. For more information about settlement models for instant payment systems, see CPMI (2016a).

**TABLE 10. Settlement models for instant payment systems**

SETTLEMENT MODEL	FUNCTIONS	EXAMPLES
Bilateral prefunding	Funds are transferred as a lump sum to a ‘prefunded’ nostro account before any individual transaction occurs. Nostro accounts are debited on a gross basis as transactions are made.	EMI arrangements in Tanzania, Uganda, Kenya
Real-time settlement	Settlement happens for each transaction immediately before the receiving customer account is credited. Transactions are settled through a settlement agent in real-time as they are cleared by the switch, either on a gross basis or with a very short netting cycle before settlement. <sup>a</sup> Participants must maintain a settlement account with the settlement agent that holds sufficient liquidity to cover each transaction as it is made.	Sweden Mexico <sup>b</sup> Australia US (RTP) Thailand (PromptPay)
Deferred settlement	Settlement happens after the receiving customer accounts are credited. Transactions are settled through a settlement agent after they are cleared by the switch, most often on a multilateral netting basis according to a regular schedule. Participants must maintain a settlement account with the settlement agent with sufficient liquidity to cover funds needed at the time the settlement cycle is performed.	Multilateral Net: IMPS in India, Jiffy in Italy, EBS and CD/ATM System in Korea, FAST in Singapore, BKM Express in Turkey, Pesalink in Kenya, and FPS in the United Kingdom, many others. Bilateral Net: IBPS in China <sup>c</sup> Gross (using net liquidity): RTC in South Africa <sup>d</sup>

a. CPMI, 2016a.

b. SPEI in Mexico uses real-time settlement with a very short netting cycle.

c. In China the IBPS system employs a bilateral net settlement system in which participants’ positions are settled between every bilateral combination of participants.

d. In South Africa, transactions are settled on a gross/deferred basis. Funds are settled in gross to maintain traceability and assignment of liability in case of default but are processed in sequence on a deferred settlement cycle to take advantage of the benefits of net liquidity.

**TABLE 11. Scenarios for central bank support for settlement of instant payments, as defined by CPMI**

SCENARIO 1 “Business as usual”	SCENARIO 2 “Moderate support”	SCENARIO 3 “24/7 RTGS or special settlement services”	SCENARIO 4 “Central bank as fast payment system operator”
Settlement in central bank money is only possible during the RTGS system opening times.  In fast payment systems with deferred settlement, settlement cycles will likely be restricted to business hours during weekdays; payments might be rejected if binding net debit limits are reached, as participants will not be able to access additional liquidity.  In fast payment systems with real-time settlement, this scenario would require settlement in commercial bank money during the off-hours	Limited functionalities are available to support the settlement of fast payments beyond normal business hours.	Real-time settlement in central bank money is possible on a 24/7 basis. Additional liquidity can be provided at all times.  Can support both deferred or real-time fast payment systems.	
		Does not necessarily entail the development of a new system, but requires a significant adaptation of the RTGS system or a specialized settlement system.  Building a new system is a possibility.	Requires a significant adaptation of the RTGS system and the development (or significant adaptation) of a separate clearing infrastructure.  Building a new system is a possibility.

Source: CPMI, 2016a.

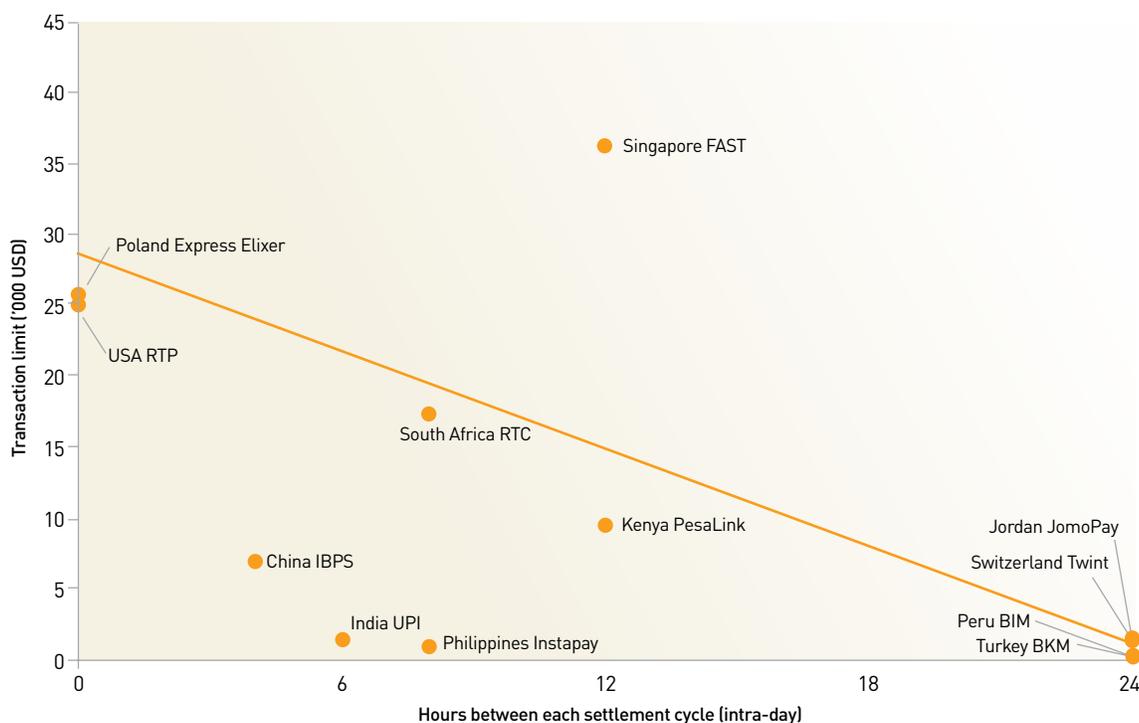
A deferred settlement model for instant payments is possible in any of these scenarios. A real-time settlement model for instant payments, with all settlement occurring through the RTGS system, is possible only where the RTGS system is made available on a 24/7 basis. However, separate arrangements also can be made for settlement outside RTGS operating hours, such as using a financial institution as an additional settlement agent.

Real-time settlement removes credit risk to the receiving participant, but real-time settlement carries greater liquidity risk and there is exposure to insolvency if the settlement agent is another bank. Deferred settlement arrangements carry credit risk because the final settlement is performed only after the funds have been credited to the receiving customer's account, but they also carry less liquidity risk because the demands on participant capital occur less often and with the benefit of netting.

Some measures to further reduce settlement risk in a deferred settlement model include the following:

- Net debit position caps on one or more participants (e.g., India [CPMI 2016a]).
- Loss-sharing agreements between surviving participants in the event of insolvency of one participant (e.g., Korea EBS [CPMI 2016a]).
- Full or partial collateralization of maximum debit positions with securities or cash (e.g., Singapore FAST [CPMI 2016a]).
- More frequent settlement windows, including increasing the operating hours of the RTGS system used for net settlement (see examples in Figure 20).
- Limits on customer transaction value (see examples in Figure 20).

FIGURE 20. Settlement frequency by maximum transaction value



Note: Jordan's maximum transaction limit depends on the transaction type. The figure above shows the maximum transaction limit for local withdrawals, purchase, and bill payment. Philippines settlement occurs three times a day, but only during weekdays. Some schemes do not impose transaction limits and leave it to the discretion of participants to do so (e.g., Sweden BiR, Japan Zengin Data Telecommunication System, Italy Jiffy, Mexico SPEI, etc.).

## E-MONEY AND SETTLEMENT (IMPACT OF TRUST ACCOUNTS)

EMIs typically must maintain a one-to-one ratio between the amount of e-money created on their platform and the amount maintained within a trust account at a licensed deposit-taking institution, such as a bank. This requirement will affect settlement operations.

Similar to bank participants, an EMI in an instant payment system typically will prefund a settlement account held with the settlement agent. The value of the settlement account acts as a net debit cap for sending outgoing transactions—that is, it is the maximum value an e-money participant can send in net outgoing transactions. This is again similar to a bank participant.

However, e-money participants also must prefund their own trust account (and e-money platform) so that they have enough e-money in their system to support new incoming transactions as they are received. While funds may be received into a settlement account in real time (as in a real-time settlement model) or after some amount of time (as in a deferred settlement model), the increase in e-money must correspond to an increase to the trust account balance to maintain the one-to-one ratio between e-money and funds held in trust.

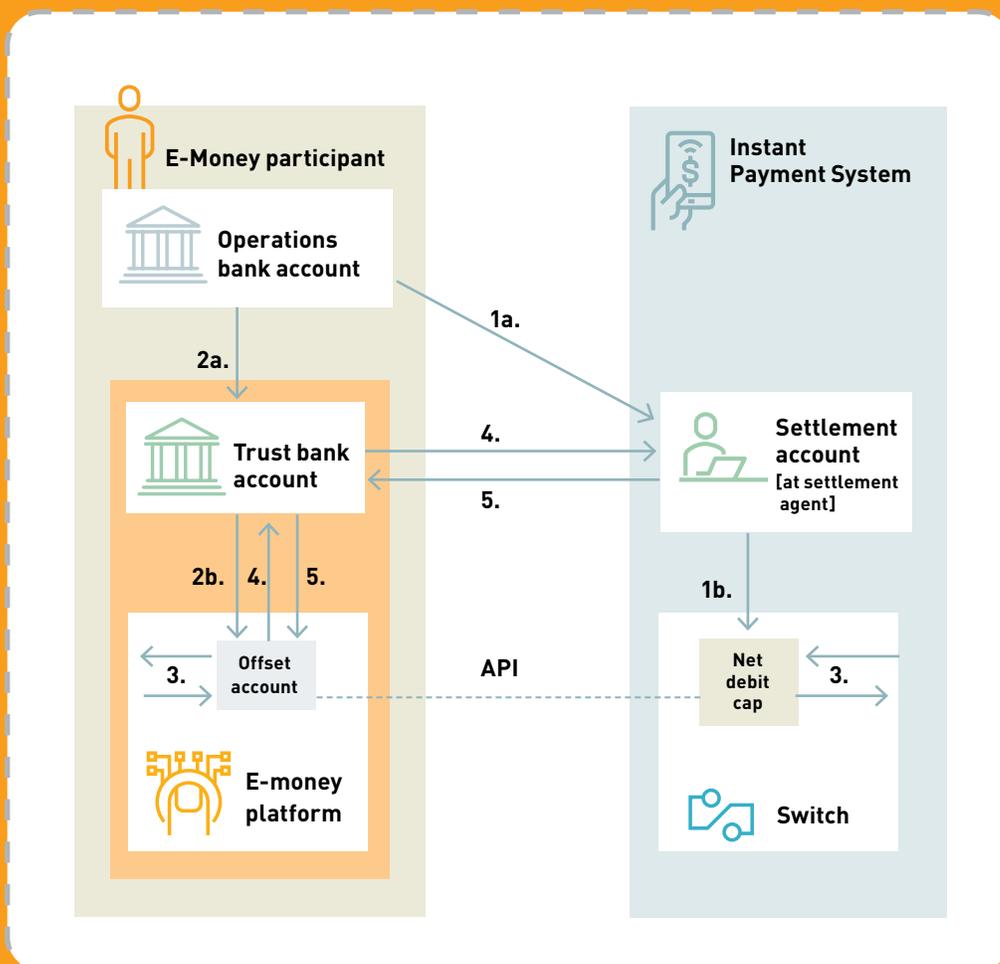
Because of this dual prefunding requirement, e-money participants in an instant payment system remain at a

relative economic disadvantage as compared to bank participants. However, this disadvantage may be mitigated, for example, by considering some portion of the funds held with the settlement agent as trust account balances or allowing trust account balances to temporarily not equal e-money, with a guarantee that the trust will be brought back into alignment as part of the settlement process. Note that these solutions will be subject to the e-money regulation in a given market.

Fortunately, outgoing transactions also will be occurring during this time. So, the amount of the prefunded balance in the trust account needs to accommodate only the expected net inflow of transactions—the value of new e-money needed on the platform to address inflow and outflow inconsistencies throughout the day. The total value of the prefund works as the net credit cap for incoming transactions. See Figure 21.

In bilateral prefunding arrangements (no settlement agent), e-money participants often can prefund the counterparty's platform by depositing their own funds into the trust account of the receiving participant. This amount is then created as e-money on the counterparty's e-money platform to allow funds to be credited to the recipient. However, as discussed in the previous section, bilateral prefunding models require prefunding separate accounts with each counterparty, which poses even larger scalability and cost challenges.

FIGURE 21. E-money settlement model, with settlement agent



1. Prefund settlement account held by switch
  - a. E-money participant prefunds its settlement account with its own collateral.
  - b. Switch adjusts net debit cap to reflect settlement account balance. This is the maximum net debit position the participant can reach for net outgoing transactions.
2. Prefund own trust account and e-money offset account
  - a. E-money participant prefunds its trust account with its own cash collateral.
  - b. E-money participant creates new e-money and puts it into the switch offset account. This is the maximum net credit position the participant can reach for net incoming transactions.
3. Transactions incoming and outgoing between sending and receiving customers.
4. If settlement account balance has decreased (net sender position), e-money participant deletes e-money from the offset account and transfers the same from the trust account to the settlement account.
5. If settlement account balance has increased (net receiver position), e-money participant creates e-money, adds this e-money to the offset account, and transfers from the settlement account to the trust account.



*Photo: Thao Vu Xuan, CGAP Photo Contest, 2016.*

## SECTION 6

# INSTANT PAYMENT SYSTEMS ACROSS NATIONAL BORDERS

**M**ANY OF THE SAME PRINCIPLES ADDRESSED in the previous sections apply for oversight, scheme management, switch operation, and settlement for instant payment systems operating across national borders. However, when several legal/regulatory jurisdictions and currencies are involved, the system becomes more complicated.

This section highlights some of the unique traits of cross-border payment systems. There are only a few examples of live multicountry instant payment systems—those few examples include systems in Southern African Development Community (SADC) and in the Single Euro Payments Area (SEPA). Earlier-stage conversations for regional instant payment systems are ongoing in West Africa, East Africa, Southeast Asia, and other regions.

More often, retail payments across borders rely on bilateral agreements. While some of these arrangements may operate in real time, they typically lack the common rules, governance, and oversight of systems discussed in this Guide. Instead, the focus here is on the types of multilateral arrangements found in SADC and SEPA.

SADC includes 16 member states that adopted the SADC Treaty in 1992 to formalize cooperation in a legally binding arrangement.<sup>19</sup> See Figure 22. In 2019, SADC launched a regional instant payment system for small-value payments called Transfers Cleared on an Immediate Basis (TCIB).

SEPA is an economic bloc comprising 36 countries inside and outside the Euro area. See Figure 23. Within SEPA, the instant payment system called Instant Credit Transfers (SCT Inst) was introduced in 2017.

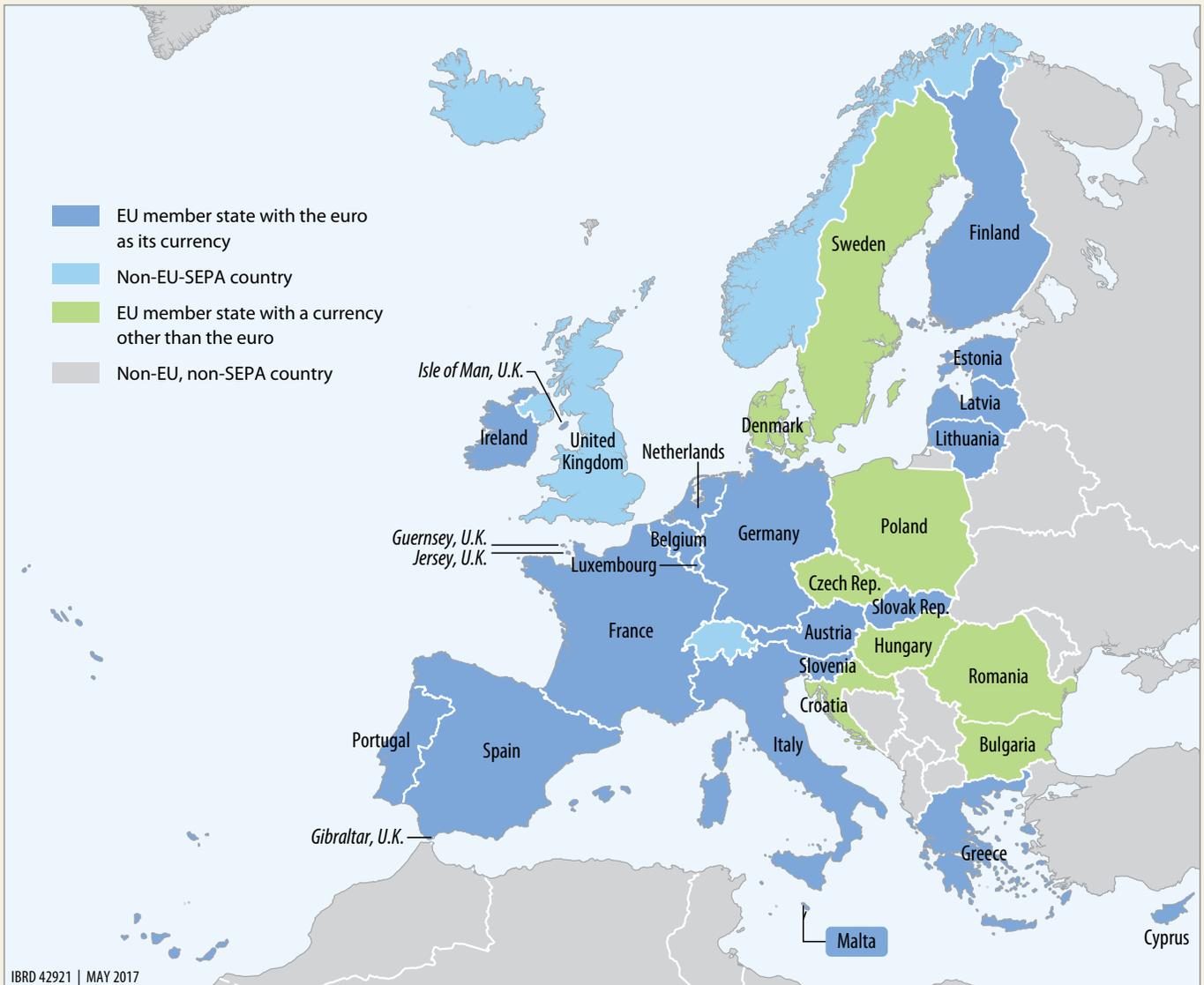
19. “SADC Overview,” Southern African Development Community, <https://www.sadc.int/about-sadc/overview/>.

FIGURE 22. Map of SADC



Source: "SADC Overview," Southern African Development Community, <https://www.sadc.int/about-sadc/overview/>.

FIGURE 23. **Map of SEPA**



Source: "Single Euro Payments Area (SEPA)," European Central Bank, <https://www.ecb.europa.eu/paym/integration/retail/sepa/html/index.en.html>.

TABLE 12. TCIB and SCT Inst: Comparing roles and actors

	ROLE	SADC; TCIB	SEPA; SCT INST
 OVERSIGHT	Regulatory framework for regional payments oversight	MoU between SADC Central Banks	Revised Payment Services Directive (PSD2) <sup>a</sup> ; Cross-Border Payments Regulation <sup>b</sup> ; SEPA Regulation <sup>c</sup>
	Regional payments oversight	Payment System Oversight Committee (PSOC)	European Central Bank (ECB)
 SCHEME	Scheme ownership/management	SADC Payment Systems Management Board (PSMB), created by SADC Bankers Association, which also serves as secretariat	European Payments Council (EPC), created by banking industry as regional industry body
	Scheme rules development	TCIB committees	SCT Inst committees
	Scheme membership	Banks and EMIs	Banks and EMIs
 SWITCH	Switch ownership/operation	Scheme rules provide for multiple clearing operators, currently only one has been approved by PSMB/PSOC: Bankserv Africa, in South Africa	Approximately 33 operators approved, including regulator-operated and private solutions
 SETTLEMENT	Settlement system ownership/operation	SADC-RTGS system, owned by Committee of Central Bank Governors and hosted/operated by South African Reserve Bank	TARGET2 system, owned and operated by ECB
	Currency	ZAR	EUR

a. "Payment services (PSD 2)—Directive (EU) 2015/2366, European Commission, [https://ec.europa.eu/info/law/payment-services-psd-2-directive-eu-2015-2366\\_en](https://ec.europa.eu/info/law/payment-services-psd-2-directive-eu-2015-2366_en).

b. "Cross-Border Payments—Regulation (EC) No 924/2009," European Commission, [https://ec.europa.eu/info/law/cross-border-payments-regulation-ec-no-924-2009\\_en](https://ec.europa.eu/info/law/cross-border-payments-regulation-ec-no-924-2009_en).

c. "Single Euro Payments Area Regulation," European Union, <https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:32012R0260>.

## OVERSIGHT

Payment system oversight in SADC and SEPA have major differences. European Union member states have entered into a binding legal union that includes regional legislative and executive bodies, the European Parliament, Council of the European Union, and European Commission. E.U. legislation supersedes national legislation, and E.U. legislation on payments provides a common framework and basis for payments oversight through the European Central Bank.

In contrast, SADC has no regional parliament, no supranational regional legislation, and no single regional central bank. Cooperation between SADC member states is formalized through protocols.<sup>20</sup> For payments, decisions on regional issues are made by the SADC Committee of Central Bank Governors, which comprises the governors of the central bank of each member state and is formalized through a memorandum of understanding (MoU) between the central banks.

## SCHEME GOVERNANCE, ECONOMICS, AND OPERATIONS

Despite significant oversight differences in SEPA and SADC, the schemes have a similar governance approach. Both are owned by a nonprofit industry body. The SADC Bankers Association houses PSMB, a bank-led participant body that is tasked with managing scheme rules. The European Payments Council (EPC), led by banks and nonbanks, performs a similar role in Europe.<sup>21</sup> In both schemes, a separate participant assembly, including nonbanks, acts as a forum for providing feedback on the rule-writing process.

Where currencies are the same across national borders, there is little difference in the economic principles of domestic and cross-border systems. However, foreign exchange adds another layer of cost and complexity, and this is relevant for both SADC and SEPA. SADC member states have different currencies, and the SEPA region includes non-Euro countries.

In SEPA, customers with non-Euro accounts are able to make transactions, but if a payment is being sent from a non-Euro account, the conversion to Euro must be done by the sending institution, and participants are free to set their own foreign exchange rates (EPC 2019b). Conversely, if the recipient account is denominated in a currency other than Euro, the receiving institution will perform the exchange. In the case of SADC, the end user can choose the currency of the transaction and either the sending or receiving institution can manage the foreign exchange.

When deciding interparty fees, foreign exchange can obscure the customer perceptions of price and, therefore, the rationale for the fee. In addition, it may be more complicated to comply with competition policy when several regulators are involved. Both factors should be considered when discussing interparty rates. The complexity of negotiating interparty rates in a cross-currency context is part of the reason why SADC opted to launch without an interparty rate on transactions. Interparty fees are similarly not applied in SEPA.

SADC and SEPA systems operate on a cost-recovery basis rather than a for-profit basis. TCIB and SCT Inst earn fee revenue to support operations through an annual scheme participation fee.<sup>22</sup> SADC also charges a low per-transaction fee and a one-time joining fee for the TCIB Participant Association (SADC Banking Association 2019). While switching fees are included in scheme fees paid in SADC, participants in SEPA pay a separate switching fee to the switch operator through which they route the transaction, as there are several switch operators available for use.

20. "SADC Protocols," Southern African Development Community, <https://www.sadc.int/about-sadc/overview/sa-protocols/>.

21. The board of EPC includes both banks and nonbanks. See EPC (2019a).

22. "Payment Scheme Participation Fees," European Payments Council, <https://www.europeanpaymentscouncil.eu/what-we-do/be-involved/scheme-participation-fees>.

## CLEARING AND SETTLEMENT OF TRANSACTIONS

Technical connectivity often is the easiest part of interoperability to resolve, and this remains true for cross-border payments. There are several options for payment systems operating across borders: a single regional infrastructure may be developed; multiple national solutions might be connected; or participants may be allowed to select from several qualified switch operators.

SADC and SEPA rely on competitive switching environments and a governance framework that allows them to endorse several qualified switch operators. In SADC, the central bank oversight committee endorses criteria for establishing regional switch operators. However, BankServAfrica, which is owned by bank participants in the scheme, currently is the only approved operator. In SEPA, switch operators who would like to be added to the list of SEPA Clearing and Settlement Mechanisms must comply with the scheme rules and EPC guidelines. Participants of SCT Inst can choose from among 33 different switch operators, which may be national central banks or other entities.<sup>23</sup> See Figure 24.

In SADC, settlement occurs through SADC RTGS, which is hosted by the South African Reserve Bank. In SEPA, settlement occurs through TARGET services, which are operated by the Eurosystem and comprises ECB and national central banks in the region. SEPA transactions are settled in Euro, and SADC transactions are

settled in South African Rand.<sup>24</sup> SADC plans to introduce settlement for other regional currencies over time.

Developing an instant payment system across borders relies on many of the same principles outlined for the national examples in this Guide, but it is necessarily more complex. In practice, only the SADC and SEPA initiatives have launched.

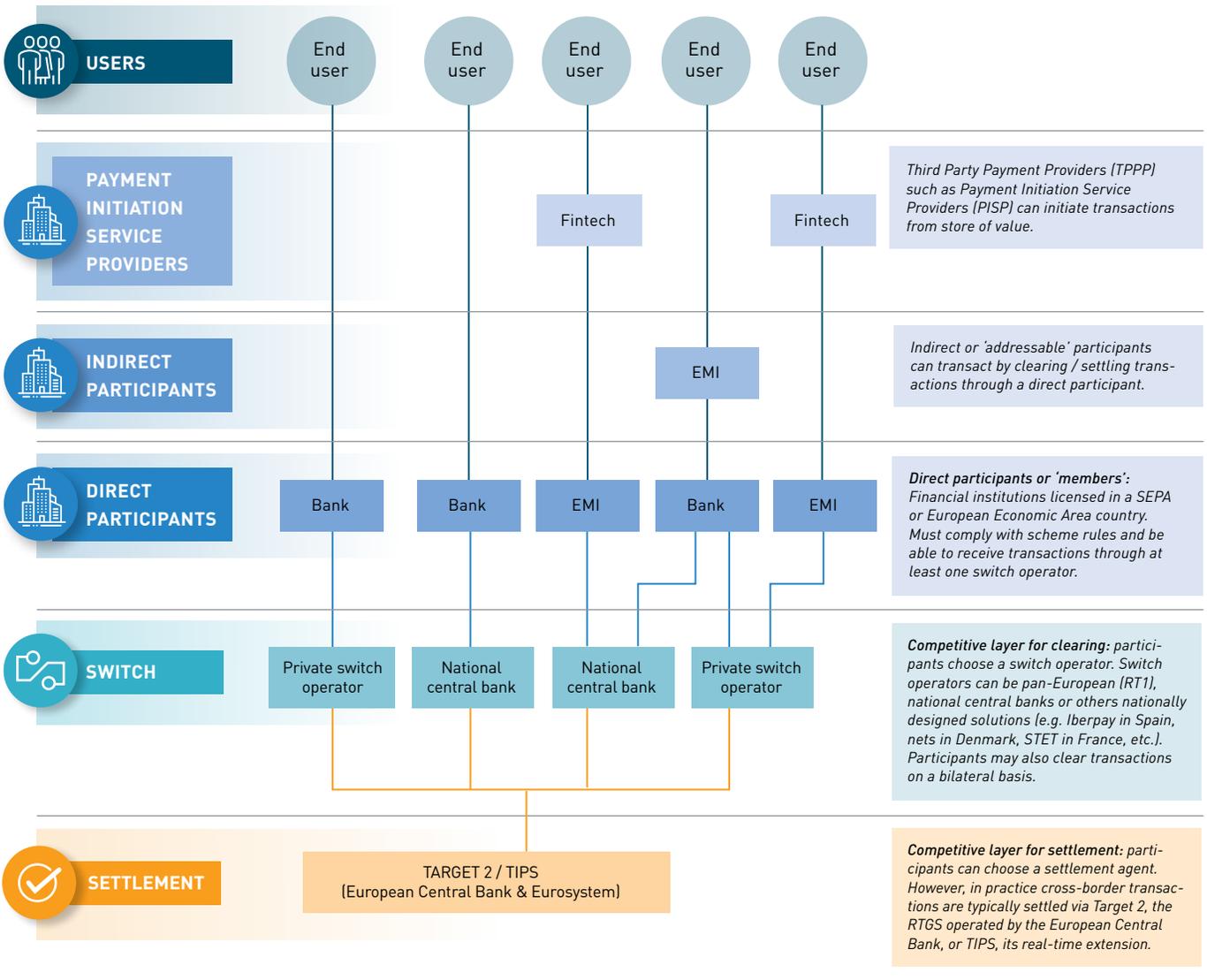
The SCT Inst system presents a model for regional payments integration. It benefits from significant regional political and economic integration. Regional legislative bodies were formed, and regional regulators already had taken other steps toward a common legal framework by the time SCT Inst launched in 2017. SADC is an example of a collaborative process between regulators and industry without some of the steps toward regional integration taken in the European Union.

Both systems demonstrate effective collaboration between public and private sectors, regulators acting as catalysts for change, and inclusive decision-making with scheme participants. While governance in each case is largely driven by bank participants (reflective of the payment markets within these regions), both arrangements have taken steps to open to a wider variety of actors through consultative governance. Both also illustrate an open and competitive switching environment while maintaining the safety and security of transactions.

23. “Clearing and Settlement Mechanisms,” European Payments Council, <https://www.europeanpaymentscouncil.eu/what-we-do/sepa-payment-scheme-management/clearing-and-settlement-mechanisms>.

24. “Alignment with the World Bank Guidelines for the Successful Regional Integration of Financial Infrastructures,” Regional Payment Framework, <https://regionalpaymentframework.com/alignment-with-the-guidelines-for-the-successful-regional-integration-of-financial-infrastructures/>

FIGURE 24. SEPA Instant Credit Transfer (SCT Inst)





*Photo: Tony Karumba, for CGAP via Communication for Development Ltd.*

## SECTION 7

# BRINGING THE INSTANT PAYMENT SYSTEM TO LIFE

**T**HIS SECTION FOCUSES ON HOW TO ACHIEVE effective interoperability in an instant payment system. Each market is unique, and project approaches should be tailored to market context. Some projects are extensions of other payment systems while others are new systems. Some projects are industry initiatives while others are led by regulators. Despite these differences, a few common process steps can be identified. These are illustrated in Figure 25. The steps include the following:

- **Plan.** A champion identifies a problem or “market failure” where improved interoperability is an expected solution. A shared vision is developed to solve that problem and includes adequate buy-in from the right stakeholders in both the public and private sectors.
- **Design.** The interoperability solution is designed in a collaborative process with stakeholders. Key questions surrounding oversight, governance, economic incentives, and the operational model are answered.
- **Go to market.** The service goes live and becomes available to customers. An ongoing process is initiated to expand scheme services and continue to drive volumes and innovate.



### PLAN

Consensus around the problem and the proposed solution is critical. Participants, regulators, and others with a stake in the success of a scheme need to buy into the plan. Once a common understanding of the problem is agreed, a plan to solve that problem—a shared vision and roadmap—can help ensure clarity and focus throughout the project.

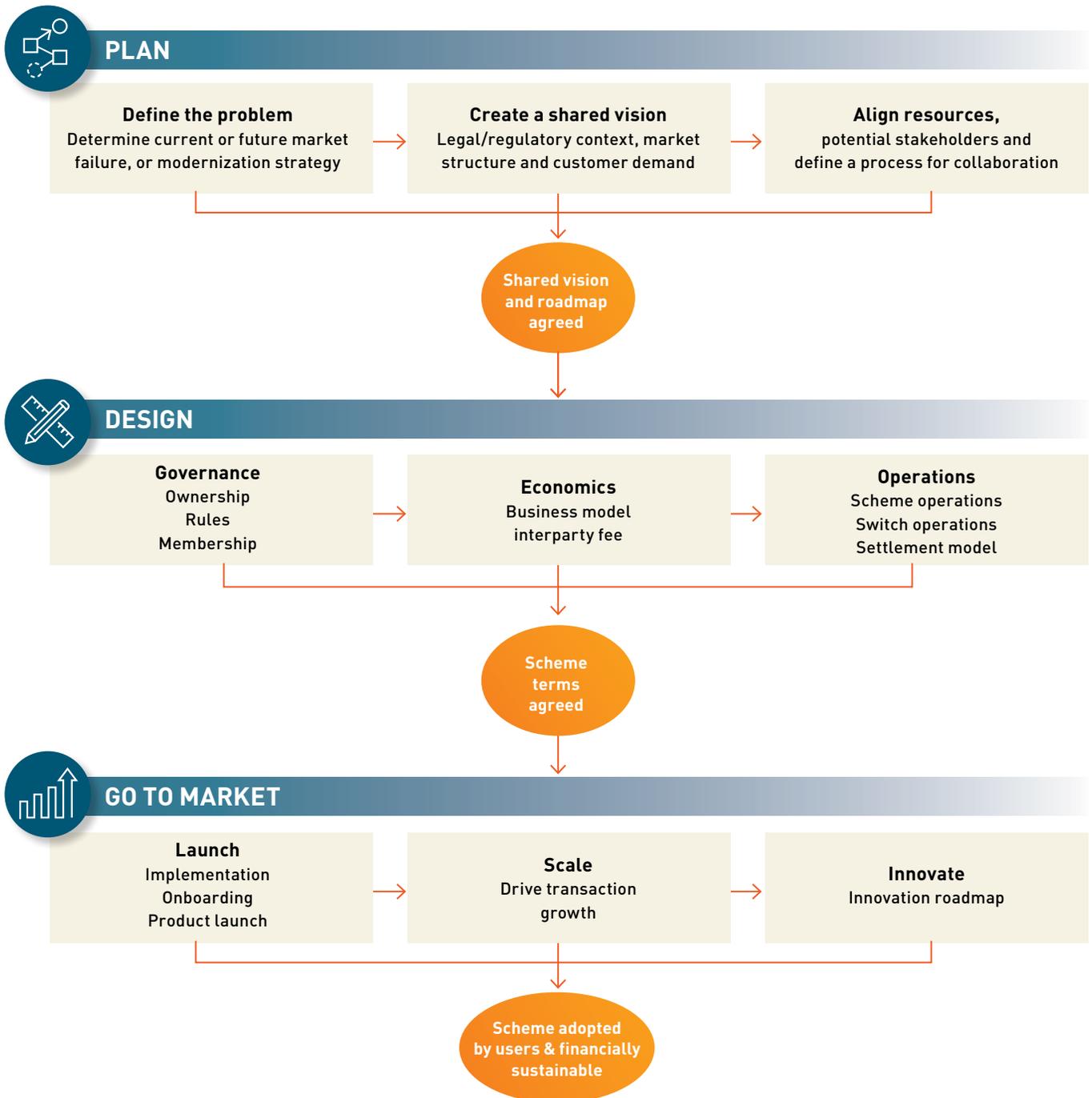
### DEFINE THE PROBLEM

Defining the problem means answering the questions: Why should we pursue interoperability? Why now?

Instant payment systems are developed for many reasons, including improved competition, innovation, and financial inclusion. Where market competition or innovation are drivers for change, the government or regulator often plays the role of catalyst, such as in the United Kingdom, Australia, and the Philippines. In other cases, an industry association or system operator may champion reform.

Sometimes the problem is obvious—and sometimes research helps build the case. In the United Kingdom, the Chancellor of the Exchequer commissioned an independent report on competition and innovation in the banking industry. The results, through the Cruickshank report (2000), drove the reform agenda on instant payments. In Tanzania, the International Finance Corporation (IFC) conducted market research to identify the nature of the challenges facing the payment market and how interoperability might address those challenges.

FIGURE 25. A process for achieving instant payment interoperability



## KEY QUESTIONS TO ASK . . .

### . . . when defining the problem:

- ▶ Do we understand the nature of the problem?
- ▶ What are the likely drivers of this market failure? Do we know how to test our assumptions?
- ▶ Is interoperability the right solution at this time to address the market failure identified?

Market research may help to clarify the nature of the problem and the solution needed. This research may include:

- **Market demand for interoperability.** Understand customer needs and market demand, either from market surveys or from proxies for customer demand, such as over-the-counter transactions and multiple account ownership.
- **Payment market assessment.** Understand what digital payments products are offered in the market and how providers connect today, if at all. What infrastructure is already in the market? Is a new solution needed? Or can current solutions be adapted to help solve the problem?

## CREATE A SHARED VISION

A shared vision and roadmap often emerges once the problem is established and the solution is identified as improved interoperability. The question of who needs to buy into this vision will vary widely depending on context. In an established for-profit scheme, this might mean first convincing shareholders and investors. In a regulator-led effort, the group of stakeholders might be a wider cross-section of market participants.

In almost any scenario, early-stage buy-in from both the public and private sectors is critical. In an industry-led process, engagement helps ensure adequate regulatory approvals. In a regulator-initiated process, engagement helps ensure participant commitment.

Developing a clear vision and roadmap often means better understanding the market and is likely to include assessing some or all of the following areas:

- **Priorities of market participants.** Understand the incentives for market participants. Are both banks and EMIs active in the market? How are these actors positioned competitively—including in terms of market share, customer profile, and geographical presence of distribution networks? In short, think critically about how market participants are positioned to work together (or not) in solving the problem.
- **Other prospective initiatives.** Find out who else is looking at the same problem. How should those stakeholders be engaged in this process? What is likely to happen if those actors are not engaged effectively?
- **Legislation and regulation.** How are current legislation and regulation affecting the market? Are certain model options not possible in the current context? Which authorities need to be involved in reviewing and/or approving the proposed plan?

By the end of this phase, stakeholders should have agreed to a process—answering the question of how stakeholders will work together to make the vision a reality. The project roadmap is one tool for outlining the steps needed. It is likely to include high-level timing, stakeholder roles, and intermediate goals for the project.

## KEY QUESTIONS TO ASK . . .

### . . . when creating a shared vision:

- ▶ Who are the right stakeholders for this project? Are they fully committed to a shared vision?
- ▶ How do market factors affect the shape of the proposed solution?
- ▶ What will be the process for getting from a shared vision to a live solution?

## ALIGNING RESOURCES

There is likely to be a clear champion at this stage. It would be the person or entity that has outlined a vision and galvanized stakeholders. Does this champion have the ability to lead competitors to work together? If not, independent facilitation may be needed. Development partners, such as IFC in Tanzania, and other independent market actors, have acted as neutral, trusted parties to broker discussions between stakeholders with different incentives.

Separately, project leaders should think about the types of technical expertise needed for the project. This might mean expanding capacity (e.g., NPCI in India hiring new in-house expertise), hiring a firm for consultation (e.g., KPMG for NPP in Australia), or bringing on experts as temporary consultants (e.g., consultants contracted by FSDU in Uganda).

The expertise sought should be relevant to market context and project need. It may include expertise in the areas of legal/regulatory, business models, governance/rule-writing, and specific technical areas, such as foreign exchange, settlement, or payments addressing standards.

### KEY QUESTIONS TO ASK . . .

#### . . . when aligning resources:

- ▶ Who has the moral authority to help competitors work together?
- ▶ Do we have the right expertise to ensure the scheme design will take the right approach based on international best practices?



## DESIGN

The design phase seeks to answer key questions around how the system will be structured, including decisions on governance, economic, and operational models. These decisions are made within the guardrails set by legal/regulatory oversight, and they play a significant role in determining whether the system will meet the goals defined at the project's outset.

The starting point for design can be very different between projects. For example, a project by a group of banks operating a card or ACH switch may have already addressed legal and governance questions, as was the case in Colombia, India, and Ghana. If a new solution is being proposed by a regulator or group of industry participants, a new legal entity may need to be formed, as was the case in Jordan, Kenya, and Peru.

In any event, it is important for the design process to involve participants in an open, consultative process. The decisions made in the design phase will have significant impact on whether market participants remain committed to project success.

## SETTING DESIGN PRINCIPLES

A succinct list of design principles can be useful in guiding decision-making. For example, questions may include the following:

- Is the model intended to make a profit or only cover costs?
- What qualifies participants to have a say in decision-making?
- What types of participants should be directly involved rather than indirectly involved, or not involved at all, in the scheme?

The Bill & Melinda Gates Foundation's Level 1 Project design principles are a potential starting point for pro-poor decision-making in scheme design (BMGF 2019). The principles are not intended as a checklist, they are intended to serve as a basis from which to establish principles that matter most for stakeholders in a given project.

## Level 1 Design Principles, developed by Bill & Melinda Gates Foundation

**Open loop.** A scheme should be open to any licensed provider, as opposed to closed-loop schemes, where membership is restricted to some providers (e.g., restricted to large ones).

**Participant governed.** The scheme has a democratic governance structure, where participants are given equal ownership opportunities.

**Not-for-loss/cost-recovery-plus-investment.** A cost-recovery model with an additional set of funds to cover the investments required to operate the scheme. This does not mean participants connecting to the scheme cannot make profit. However, lowest possible cost to the end user should be a key aim.

**Real time.** A scheme that clears transactions continuously as opposed to processing transactions per batch.

**Regulation.** The scheme is regulated by financial regulator and operates in national fiat money.

**Push payments.** In a push payment, the payer initiates the payment order, and the payee is credited (e.g. ACH payroll transactions), as opposed to pull payments, where the payee initiates the payment order (e.g., checks), which carry more risk (risk of transaction being rejected, risk of fraud, etc.).

**Irrevocable.** Once a transaction has been made from the payer to the payee, it cannot be reversed. Irrevocability is key to keeping transaction costs low.

**Same-day settlement.** Transactions are settled intra-day, in near real time, as opposed to deferred settlement to the next day or to the next business day. Same-day settlement is one way of limiting credit risks.

**Shared fraud detection.** Participants jointly invest in a shared fraud management system, collaboratively design and implement it, leading to cost efficiencies. Sharing data between participants allows more fraud cases to be detected, thereby limiting fraud for all.

**Transparency of fees.** To ensure customer protection and customer confidence in the scheme, L1P advocates fee transparency within a larger framework including transparency on rights and responsibilities of consumers, including customers with limited literacy.

**Tiered accounts.** Tiered accounts (and tiered KYC) allow customers with different risk profiles to access the scheme with different sets of conditions. It ensures larger access to the scheme while limiting risks for providers.

**Use cases.** The system should enable key customer use cases to achieve scale, leveraging the same underlying payment order and settlement protocols.

**Collateralization.** To mitigate liquidity risks, or the risk that one participant in the scheme cannot meet its obligations towards other participants, collateral accounts are used.

Source: BMGF, 2019.

## GOVERNANCE

Is there already a long-term, legal home for the arrangement? If not, how will this legal home be determined?

If the arrangement is being incubated within another organization or is starting as an informal agreement between participants, what is the plan for transitioning to a more permanent home with formal scheme governance? This plan should be developed early in the process and be clear to all stakeholders so that they can plan appropriately.

There should be a clearly documented approach on how to make decisions and how members will participate in those decisions. Requirements for membership (direct participation) similarly must be established. For arrangements developed or heavily influenced by the regulator, are certain market actors required to be members? If the scheme rules allow indirect participation, what are the mechanisms for oversight over those participants?

The scheme manager ultimately will be responsible for deciding which services members will be required to use and which are optional. Are participants required to pass both on-net and off-net transactions through the system? Is there a requirement to send all transactions through the system, or is it required only have the capability to receive? Which transaction types will be covered? The answers to these questions can have significant impact on transaction volumes and participant buy-in.

### KEY QUESTIONS ON GOVERNANCE

- ▶ What is the long-term ownership structure for the scheme? If the scheme is not already in its long-term home, is there a clear plan for transitioning to that structure?
- ▶ Who will have authority for scheme decision-making, and what role will participants play in informing that process?
- ▶ What are the qualifications for members (direct participants) in the scheme?

## ECONOMICS

What are the expected costs and funding sources? How will a sustainable funding model be developed? Will fees be fixed per participant, variable based on transaction, or some combination? What is a reasonable projection of volumes for calculating fee revenue?

In most cases, end-user pricing is left to the market, but some schemes limit the ability of participants to discriminate in price between off-net and on-net transactions—prohibiting participants from charging more for transactions to another platform.

Regardless of customer fee restrictions, consider the economic incentives for participants to drive transactions. If there are no appropriate incentives to promote use, what might be the cause of this imbalance? Is an interparty fee the right solution to balance those incentives? And if so, how should it be applied?

### KEY QUESTIONS ON ECONOMICS

- ▶ What is the economic model for the scheme? How will cash flows be generated to support the solution?
- ▶ How will interoperability affect customer fees?
- ▶ Are interparty fees needed to balance incentives?

## OPERATIONS

What support services are needed to manage operations? Will there be a common brand? What clearing and settlement models will support the instant payment system?

The scheme manager will need to decide who will own and/or operate the switch. Some scheme managers focus only on scheme governance and allow participants to form separate agreements for transaction switching. For example, in South Africa, PASA acts as scheme manager and Bankserv acts as switch operator.

If the scheme manager is serving as the switch operator, will the technology be purchased, leased, built from open source standards, or contracted to a service provider? Some systems, such as UK Faster Payments, contract with participants for both scheme and switch services, but fully outsource switching operations to a service provider. Others like NPCI in India have purchased source code from vendors and made their own modifications. Still others like the Tanzania Instant Payment System in Tanzania are developing their own, entirely new solutions based on open source technology (Mojaloop).

Owning infrastructure may provide more flexibility and eliminate dependence on a single vendor, but the approach requires more resources. The chosen switching infrastructure should meet standards defined through scheme rules in areas such as data security, interface availability, uptime, business continuity and disaster recovery, inci-

dent response, and support. It also must be able to deliver within the expected project timelines.

A settlement model must be agreed to, as should the contingencies in the event of a participant's failure to settle, including the controls needed to minimize settlement risk. If both EMIs and banks are settlement participants, trust fund economics also will need to be considered.

All of these decisions come together at the level of the customer experience. The scheme should consider implications for payment initiation, addressing, consumer protection measures such as name verification, and the scope of any shared dispute, fraud, and AML/CFT services.

## TOOLS AND RESOURCES

*Recommended resources on instant payment governance:*

**“Partnership for Financial Inclusion: Interoperability”** — IFC’s insights on its work on interoperability in Tanzania

**“Digital Financial Systems That Benefit Everyone”** —The LIP Initiative of the Bill & Melinda Gates Foundation

Recommended tool for how to build a business case for an interoperability model: Resource: <https://www.cgap.org/sites/default/files/2020-11/11-2020-CGAP-Interoperability-Model-with-IMT.xlsx>

Learn more about switch model tools. <https://www.cgap.org/sites/default/files/2020-11/11-2020-CGAP-Switch-Toolkit.xlsm>

### KEY QUESTIONS ON OPERATIONS

- ▶ Who drives the brand in the market and, if multiple actors, how are messages/incentives aligned?
- ▶ How will clearing and settlement models be organized, and which participants will be able to clear and/or settle directly?
- ▶ What is the common user experience in the scheme, and what services or requirements are necessary to ensure the experience is reliable and consistent?



## GO TO MARKET

The launch phase can vary considerably in complexity and time. If a new switch is being implemented, it may take more than a year to connect participants. The switch will be the largest capital investment and will contribute the most to ongoing operational costs. However, the effort and costs incurred by participants also should be considered because they may need to make significant investments to connect to a new arrangement (Lipis Advisors 2016).

The scheme manager will need to decide whether to launch the system only when all participants are technically and operationally ready or to launch it when a critical mass of participants (even perhaps only two) are ready to go live.

Once a launch date is estimated, what is the go-to-market plan for the service? How will marketing campaigns be managed? How will participants be onboarded? After launch, performance should be closely tracked. Are transactions growing in the way expected? If not, why?

Where scale is not being achieved, other steps in the process may need to be revisited and key questions reassessed. Are participants not committed in the way anticipated? Are there areas where incentives are not aligned or where the operational model is not providing the best customer experience possible? The remedies for a failure to scale will be as diverse as the diagnoses.

If/when services are running smoothly, what's next?

The most successful instant payment systems drive innovation on an ongoing basis. Ongoing service expansion is necessary to remain relevant in a fast-moving global payments landscape. Expanded membership networks, connections to other payment systems, the addition of different transaction types, or the launch of new scheme products, are all potential ways for instant payment systems to grow and mature.

### KEY QUESTIONS ON GO TO MARKET

- ▶ Are services running as expected? If not, what needs to change?
- ▶ Once initial services are operating effectively, what is next on the roadmap?



Photo: Nurul Aidin, CGAP Photo Contest, 2013.

# CASE STUDIES

## IN INSTANT PAYMENTS



**T**HERE IS NO SINGLE PATH TO SUCCESS with interoperability. A successful solution in one market might not work in a different one. However, the experiences of existing instant payment systems can help illustrate different approaches to process and design.

In this section, we look at examples of how different markets have approached instant payment systems and have

arrived at different results. The cased studies refer to systems from Australia, India, Jordan, Mexico, Peru, the Philippines, and Tanzania. These cases were selected because they represent a variety of models and approaches. They fall into three groups: new instant payment systems, expanded support of existing systems, and unique approaches to instant payment systems. See Table 13 and Table 14.

## NEW INSTANT PAYMENT SYSTEMS

**Australia, NPP.** An industry-led approach to a new system for instant payments, where the regulator acted as a catalyst to encourage industry action. A new industry-owned not-for-profit entity was formed, with the regulator holding a minority stake. The system adopted a unique distributed architecture with no central switch and settles through a new real-time facility operated by the regulator.

**Philippines, InstaPay.** An industry-led approach to a new system for instant payments, where the regulator acted as a catalyst but also played a more direct role in facilitation and governance. A new industry-led payment association was formed to manage aspects of governance not defined by the regulator. A separate switch operator was designated. Settlement is performed on a deferred-net basis through the real-time gross settlement (RTGS) system operated by the regulator.

**Jordan, JoMoPay.** A regulator-led approach to a new system, where the regulator acted to develop the solution, manage scheme governance, and operate the switch. The regulator later transferred these activities to a newly created bank-owned entity in which the regulator has a minority stake. Both before and after the system handover, transactions are passed through the JoMoPay switch with settlement on a deferred-net basis through the RTGS system operated by the regulator.

## ADDING INSTANT CAPABILITIES TO EXISTING PAYMENT SYSTEMS

**India, UPI.** An existing, industry-owned operator that expanded capacity to provide instant payments. NPCI, the industry-owned entity managing retail payment systems in India, began with card operations but soon moved into supporting instant payments through IMPS and later UPI. NPCI used existing technology assets to support UPI, but soon invested in new switching technology. Settlement occurs on a deferred-net basis through the RTGS system operated by the regulator.

**Mexico, SPEI.** An existing, regulator-managed system that expanded capacity to provide instant payments. SPEI is the regulator-owned RTGS system in Mexico, which also supports retail payments. Over a series of upgrades from 2005 to 2015, the regulator added near real-time functionality and continuous availability to the retail transactions supported by SPEI. Settlement occurs in near real time on the same system in small batches.

## UNIQUE APPROACHES TO INSTANT PAYMENTS

**Tanzania, MNO-led e-money arrangement.** An industry-led approach where mobile network operator (MNO) led electronic money issuers (EMIs) developed a new multi-lateral arrangement. Terms were defined in a set of shared scheme rules, but no separate legal entity was formed. Bilateral technical connections enable clearing of transactions, and prefunded positions on counterparty platforms enable settlement.

**Peru, Bim.** An industry-led approach to a new arrangement, where a group of FSPs agreed to co-invest and share a single mobile wallet platform. No separate technical arrangements are required for clearing. Settlement occurs on a deferred-net basis on the RTGS system operated by the regulator.

TABLE 13. **Scheme governance model and approach to project process**

TYPE	INDUSTRY-LED	REGULATOR-LED
New legal entity formed to manage instant payments	Australia (NPP) Philippines (InstaPay) Peru (Bim)	Jordan (JoMoPay)
Existing legal entity expanded services	India (UPI)	Mexico (SPEI)
No legal entity (multilateral agreement)	Tanzania (MNO scheme)	

TABLE 14. **Clearing and settlement model**

ARRANGEMENT	REAL-TIME SETTLEMENT	DEFERRED SETTLEMENT	PREFUNDED ACCOUNTS FOR SETTLEMENT
RTGS system for clearing	Mexico (SPEI)		
Instant payment switch for clearing		India (UPI) Philippines (InstaPay) Jordan (JoMoPay)	
Shared wallet platform		Peru (Bim)	
Bilateral technical connections	Australia (NPP)		Tanzania (MNO scheme)

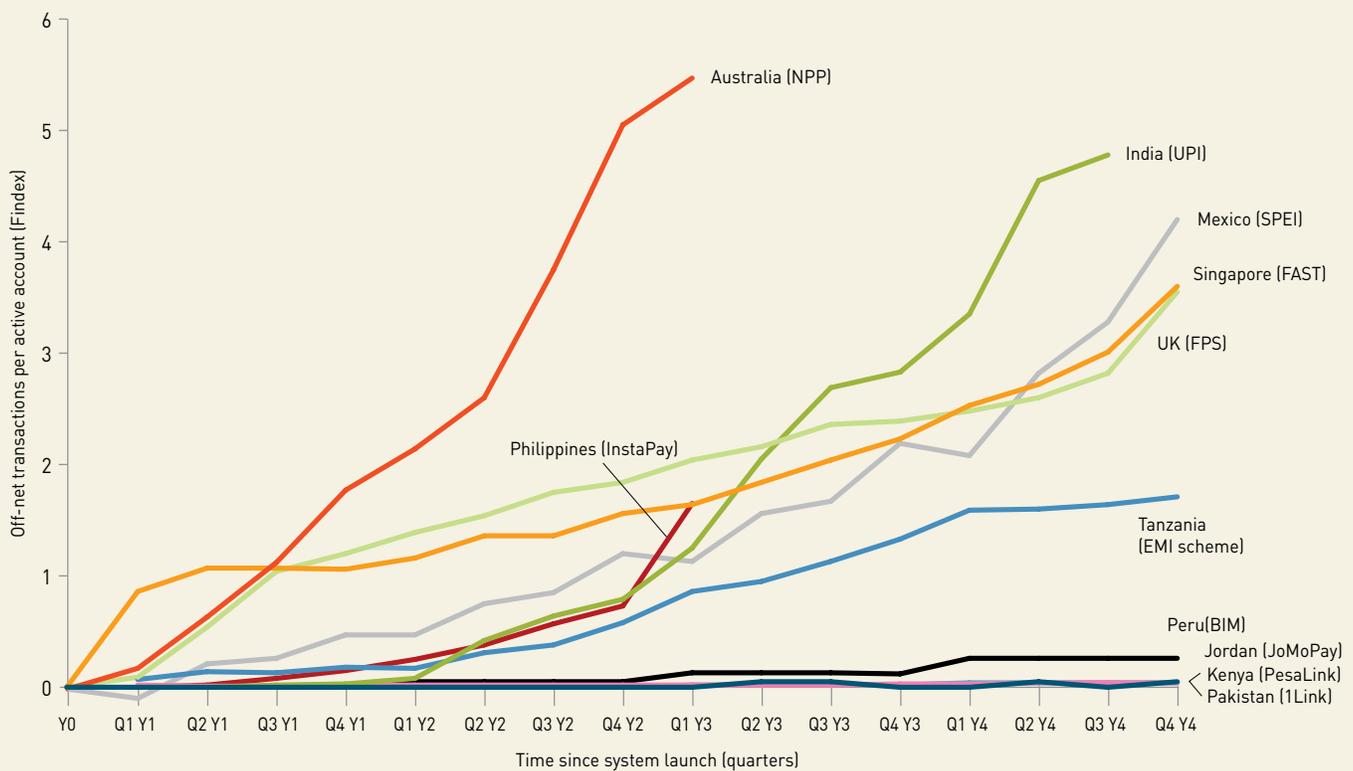
Figure 26 shows off-net transaction volumes (i.e., uptake of interoperability) relative to accounts over the first four years of system operation in various markets. It includes the systems presented in this Guide, as well as other markets for comparison.

Each market has experiences that are slightly different from that of the others, and many factors have affected uptake. For example, while the use of JoMoPay in Jordan remains low compared to its peers, it serves a wallet

market that has itself not yet gained significant traction. While NPP in Australia grew quickly compared to peers, some of this volume was driven by legacy payment streams transitioned to the new technology.

These facts are not so much caveats to the stories of these systems as they are fundamental to their stories. The circumstances, models, and approaches that contributed to the uptake (or lack of uptake) of different systems are explored in the following case studies.

FIGURE 26. Instant payment system transaction volumes (interoperable transactions) across countries



Note: Mexico shows new volumes only from the time SPEI began offering near real-time and continuously available payments in 2015.  
 Source: Population: UN database. Accounts: Global Findex Database 2017 (Demirgüç-Kunt et al. 2018). Australia: "Payments Data," RBA, <https://www.rba.gov.au/payments-and-infrastructure/resources/payments-data.html>. India: "UPI Product Statistics," NPCI, <https://www.npci.org.in/product-statistics/upi-product-statistics>. Jordan: JoPACC, 2020. Kenya: "Cheques & EFTs," Central Bank of Kenya, <https://www.centralbank.go.ke/national-payments-system/automated-clearing-house/cheques-efts/>; Mexico: "SPEI Transfers by Amount Operated (CF620)," Economic Information System, <https://www.banxico.org.mx/SielInternet/consultarDirectorioInternetAction.do?accion=consultarCuadro&idCuadro=CF620&locale=en>. Pakistan: "Access to Finance in Pakistan, Key Indicators," SBP, <http://www.sbp.org.pk/publications/acd/branchless.htm>. Philippines: BSP, 2020. Singapore: MAS retail payment statistics. Tanzania: BoT statistics. United Kingdom: Pay.UK, 2020.

# AUSTRALIA

Australia’s New Payments Platform (NPP) was launched in 2018 in a process that included the Reserve Bank of Australia (RBA) and Australia’s banking sector. The system is managed by NPP Australia Ltd (NPPA), a not-for-profit entity with 13 shareholders—12 industry participants and the regulator. The system has adopted a distributed architecture for clearing that is based on SWIFT messaging with no central switch. Settlement occurs in real time with RBA serving as the settlement agent.

TABLE 15. **The NPP model**

ROLE	FUNCTION	NEW PAYMENTS PLATFORM
 <b>OVERSIGHT</b>	Regulatory framework for payments oversight	Reserve Bank Act 1959, and the Payment Systems and Netting Act 1998
	Payments oversight body	Reserve Bank of Australia (RBA)
 <b>SCHEME</b>	Scheme ownership/management	NPPA; owned by 10 banks, 2 nonbanks, and the regulator, with regulator and independent directors on board
	Scheme rules development	NPPA management, in consultation with participants
	Scheme membership	Banks and EMIs
 <b>SWITCH</b>	Switch ownership/operation	N/A—participants connect through bilateral connections enabled through SWIFT messaging
 <b>SETTLEMENT</b>	Settlement system ownership/operation	Fast Settlement Service, owned and operated by RBA

## Process

In 2010, RBA began a strategic review of the Australian payments system in response to growing evidence that Australia was falling behind its peers in retail payment services (RBA 2019). The objective of the review was to identify areas for improvement and innovation within the Australian payment system.

Published in 2012, the review identified gaps that were expected to become problematic in the following years (RBA 2012a). It highlighted an inability of the payment industry to effectively cooperate under the current model and suggested that this failure could be an impediment to offering the best service possible to customers and businesses.

RBA proposed to address the challenge together with industry. One of the early steps was to define a series of strategic objectives for the Australian payment system (RBA 2012a). These objectives included real-time payments with same-day settlement, low-value payments available 24/7/365, simplified payment addressing, and improved information with payments.

The Real-Time Payments Committee (RTPC) was created to convene industry stakeholders to propose a path forward to the regulator. One of RTPC's key recommendations was to create a new instant payment system—NPP (Richards 2018). RBA accepted the proposal in 2013, and the public and private sectors began working together toward the new system.

The industry working group contracted KPMG to establish a project program office and to help create a new legal entity. Early tasks included project planning, tender management, and defining business requirements for the platform. By 2014, the 12 bank participants and RBA agreed to jointly fund the new entity. They became the initial shareholders of NPPA.

NPP was officially launched to the public early in 2018. NPPA and participants used a marketing campaign that was created to introduce the platform's addressing service,

PayID. Advertisements aired across several media channels.<sup>25</sup> The initial campaign materials included the logos of all participants, but when the initial marketing campaign ended, participants were expected to market the service on their own to their customers.

By early 2020, approximately 90 banks, credit unions, building societies, and fintechs had connected to NPP—either directly or indirectly—to provide instant payment services to their customers. Today, more than 67 million accounts are connected through NPP (estimated at about 90 percent of all accounts).

Transactions have grown, and based on volumes, NPP has quickly become a global success case. Part of NPP's aggressive growth in volumes was driven by banks migrating their existing ACH volumes from other systems. This allowed participating banks to provide a better customer experience and presented an opportunity to retire older infrastructure.

One key change in strategy after launch involved NPP's approach to overlay services. These services provide additional user functionality, such as in payment initiation or addressing, but they leverage NPP for payments. While an open market for third-party overlay services was initially introduced, NPPA later began to manage more of these services centrally. It realized that while an ecosystem approach encouraged innovation, it also limited the utility of some services that needed universal participation to ensure consistent experience and network effects.

NPPA has continued to make enhancements, including through new QR code standards, consent- and mandate-based services, and third-party payment initiation. NPP, while still a relatively new system, appears to be well-positioned to scale and innovate.

25. See "PayID: Simple as" and other PayID video advertisements at <https://www.youtube.com/watch?v=Kh0Kq2PddE4>.

## Scheme

### GOVERNANCE

NPP is owned by 10 Australian banks, two nonbank payment service providers (who offer access to other EMIs and nonmember banks), and the regulator. To help ensure fair and open decision-making, three of the 13 board seats are reserved for independent directors. And one of these three seats is for the chair (NPP 2019a). The regulator has a permanent presence on the board (RBA and NPPA 2019). Unlike other payment organizations in Australia, the voting rights of board members are equal and are not proportionate to shares held.

Financial institutions are not required to participate in NPP. However, only NPPA shareholders are allowed to

directly participate in clearing and settlement. To avoid unfair treatment of nonshareholders, NPP's constitution requires that shareholders must "facilitate fair access to the NPP as mutually owned utility infrastructure" (NPPA 2019b). This has resulted in an access framework that provides for different indirect participation options for nonshareholders, including banks and nonbanks (NPP 2018).

### ECONOMICS

NPPA recovers costs by charging participants switching fees. These fees are charged equally to both sending and receiving participants. The charge is applied through a fixed annual fee, which is allocated based on a three-tier model that considers number of shares held. There are plans to migrate to an actual per transaction charge using monthly volumes. Indirectly connected participating organizations—nonshareholders—are charged fees by their sponsoring direct participant under competitively established commercial contracts, without prescription by NPPA.

NPPA does not apply any restrictions on end-user fees, and there is no interparty fee agreed between participants.

### OPERATIONS

Direct participants connect to NPP via distributed payment gateways to clear and settle payments. This distributed system has no central switch and relies on SWIFT messaging to exchange transaction data between institutions. See Figure 27. However, NPPA operates a central addressing service that allows customers to use a phone number, email address, or business registration number to register an alias called PayID.

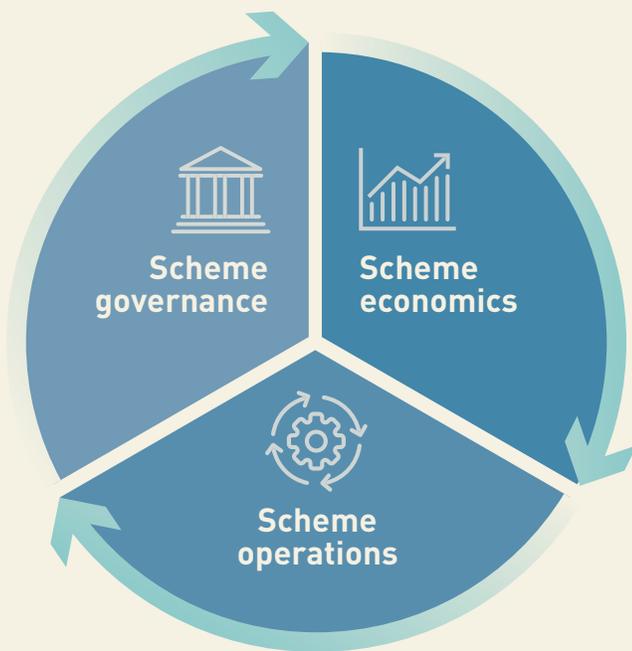
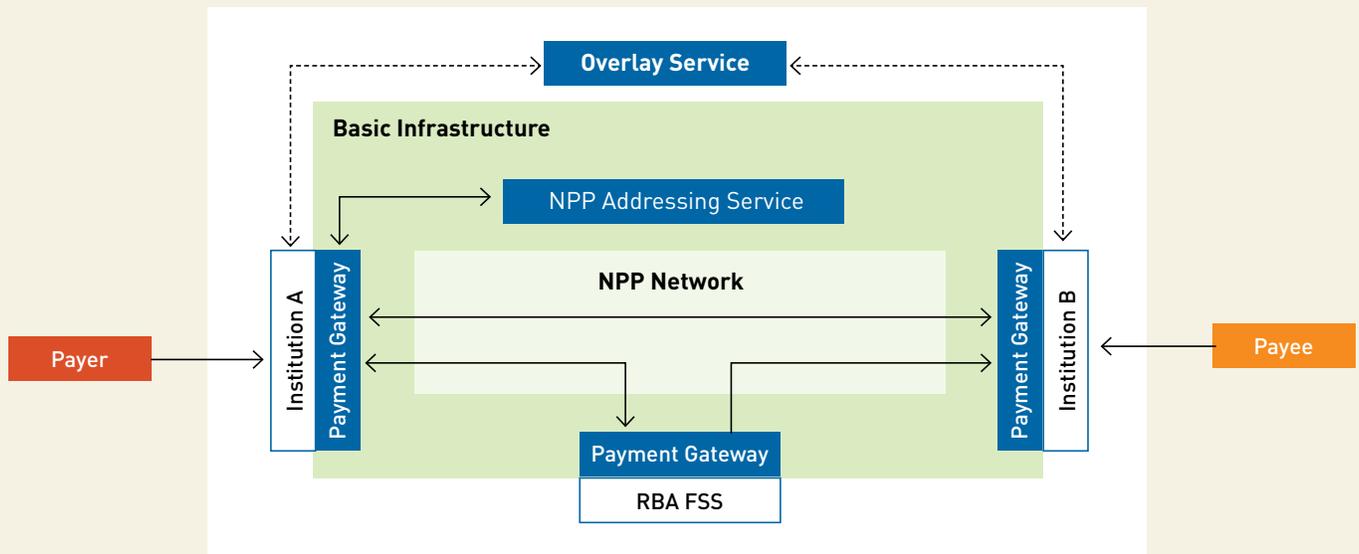


FIGURE 27. **NPP operational architecture**



Source: RBA, 2019.

The system is designed to have a competitive ecosystem of overlay services. However, many key overlay services are centrally managed by NPPA.

In parallel, RBA developed a new settlement service called Fast Settlement Service (FSS) to enable real-time gross settlement on a 24/7 basis. FSS is separate from the country’s RTGS system, but it uses central bank reserves as collateral for liquidity. These reserves are segregated from banks’ main reserve accounts at RBA, but when normal RTGS operations are closed, reserves are available for NPP settlement.

**WHICH OTHER SCHEMES FOLLOWED THE NPP APPROACH?**

While NPP’s technical architecture—connecting participants through a distributed network rather than a centralized switch—remains fairly unique, the collaborative process between public and private sectors is similar to the experience of many of the most successful instant payment systems. Pay.UK in the United Kingdom, NPCI in India, and Singapore Clearing House Association (SCHA) in Singapore, among others, include a public sector actor playing the role of a catalyst to drive industry action supported by strong regulatory oversight.

# INDIA

The National Payments Corporation of India (NPCI), a bank-owned not-for-profit, first introduced instant payments in 2010 with Immediate Payments Service (IMPS). However, many of the most recognized features of real-time payments in India today—simplified addressing, interoperability with non-banks, third-party payment initiation—were the result of NPCI’s development of the Unified Payments Interface (UPI). UPI is a separate system launched in 2016. It initially leveraged technologies already in place, but NPCI soon invested in a new, separate infrastructure to support UPI. Settlement is performed on a deferred net basis through the RTGS system operated by the Reserve Bank of India (RBI).

TABLE 16. **The NPCI model**

ROLE	FUNCTION	UNIFIED PAYMENTS INTERFACE (UPI)
 <b>OVERSIGHT</b>	Regulatory framework for payments oversight	National Payments Act, 2007
	Payments oversight body	Reserve Bank of India (RBI)
 <b>SCHEME</b>	Scheme ownership/management	NPCI; owned by India’s largest banks, with independent directors on board
	Scheme rules development	UPI participant committees
	Scheme membership	Banks and EMIs
 <b>SWITCH</b>	Switch ownership/operation	UPI switch, owned and operated by NPCI
 <b>SETTLEMENT</b>	Settlement system ownership/operation	RTGS system, owned and operated by RBI

## Process

In the late 1990s, most retail payment systems were operated by the regulator, RBI. However, senior RBI executives began asking how far the country's systems were from global standards (Reddy 1996; 1997). An incremental process of policy reform aimed at improving these services would span much of the next decade.

In 2000, RBI formed the Advisory Group on Payment and Settlement Systems to explore these issues. Findings documented in the Advisory Group's report and later in RBI's Vision Document for 2005–2008 noted that “it is only in very few countries that central banks operate retail payment systems.” Plans were made to move nonsystemically important systems outside the regulator, in part to drive improved innovation and efficiency (RBI 1998; 2000; 2005).

The 2007 Payments Act provided the legal basis for a new entity, NPCI, to manage retail payments. The Payments Act requires that the majority of NPCI owners be public sector banks. Hence, while NPCI is an industry-owned entity, six of the 10 initial shareholders were public sector banks (RBI 2007).

Membership and participation in NPCI was voluntary from the start—banks and nonbanks are not required to connect. As such, RBI took a series of actions to support and build the credibility of NPCI. RBI transferred the NFS ATM switch to NPCI at cost, provided discounted office space early on, and later promoted the BHIM app as a national solution, all of which helped NPCI achieve scale.

While NPCI began with core payment services, such as ATM transaction switching, to bring sustainable revenue, it soon moved into interbank instant payments. IMPS launched as a product for banks in 2010. However, because it relied on a Mobile Money ID—a unique identifier for account addressing—IMPS was underused in the market.

In 2013, Raghuram Rajan became India's first central bank governor who had extensive experience outside the country. At RBI he advocated for the types of faster payment solutions he had seen in other markets. At the same time, NPCI was searching for ways to make its growing list of products (including IMPS) fit together better. With strong buy in from the regulator, NPCI began looking for a solution to these challenges.

The NPCI team traveled to other markets, such as the United Kingdom, that had already started to introduce instant payment systems. NPCI worked with iSPIRT, an open source volunteer developer community, to define and develop UPI. UPI introduced the features commonly associated with instant payments today in India—interoperable payments between any device, alias-based addressing, and the ability for third-party payments initiators to ride on NPCI rails.

Today, NPCI has more than 1,400 banks as members. Around 160 of these are on UPI. Although this is a small percentage of total number of participants, these banks serve over 95 percent of the country's account holders. More are coming online all the time.

NPCI continues to expand participation and aggressively drive system innovation by releasing products at a pace of more than one per year. It benefited from India's large base of technology expertise, regulator support, and a civic technology movement, but it also planned appropriately and committed to a culture of innovation. More than 60 NPCI developers sit in Bangalore alongside iSPIRT to support NPCI products and to help design the next generation of products.

However, India also is a rapidly evolving market with a dynamic legal and regulatory environment. Changing interpretations of the role Aadhaar IDs can play in service delivery, regulatory changes on topics such as pricing, and the competitive positioning of NPCI, among other issues, continue to shape NPCI.

## Scheme

### GOVERNANCE

The NPCI ownership model, which began with 10 shareholder banks, has grown to 56 bank shareholders. Board seats include six seats allocated to the original promoter banks and four seats allocated to other shareholders on a rotational basis.

Scheme rules are defined by product-level steering committees composed of participating institutions. These include representatives of both NPCI shareholders and nonshareholder participants. While EMIs participate directly for purposes of IMPS, they have initially accessed UPI only indirectly through agreements with bank participants. Discussions are ongoing on allowing EMIs direct access to UPI.

### ECONOMICS

NPCI recovers costs through a switching fee for each transaction. Support from the regulator in the form of subsidized start-up capital (i.e., NFS switching infrastruc-

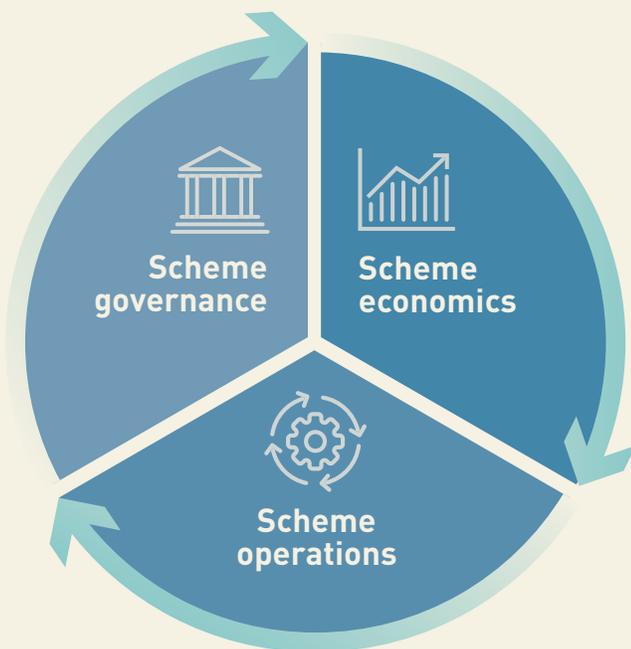
ture transferred at cost) gave NPCI early financial sustainability. In addition, NPCI used some resources from participant banks and shared space with the association of bankers early on.

Interchange rates are set by NPCI, subject to RBI policies on retail payments pricing. These terms have changed several times since the launch of UPI. Transactions generally carry a small interchange or no interchange, depending on transaction type.

### OPERATIONS

UPI allows financial providers to separate authentication and authorization messages. This enables third-party payments to be initiated without requiring customers to port to their financial institution for authentication. UPI also introduced interoperable payment addressing, meaning that users can send between bank account numbers, mobile numbers, and virtual payment addresses.

UPI initially relied on the core infrastructure that supported other NPCI products, but NPCI soon procured a dedicated switching technology to support UPI. As with other NPCI products, UPI transactions are settled on a deferred-net basis through the RTGS system owned and operated by RBI.



#### WHICH OTHER SCHEMES FOLLOW THE NPCI APPROACH?

The formation of NPCI—catalyzed by a regulator and executed by industry as a not-for-profit entity—followed a common global process. The preceding case study on Australia offers more information on this model.

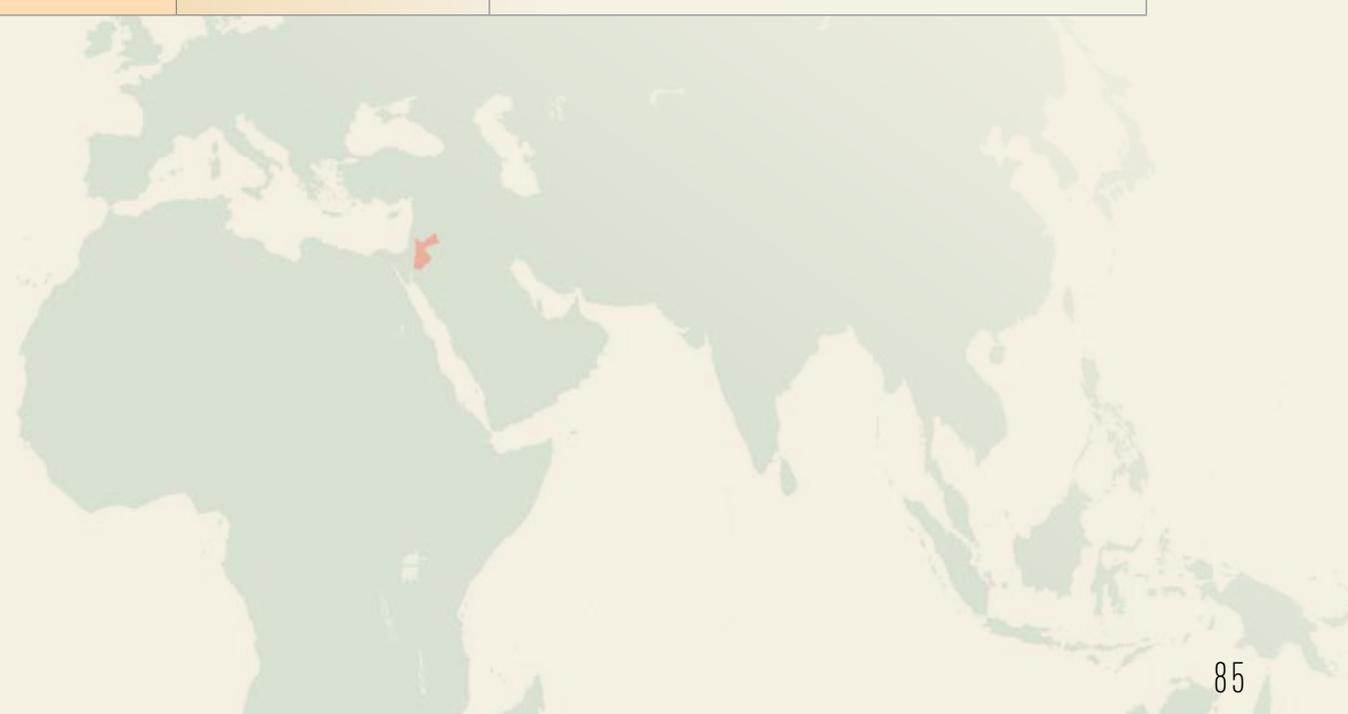
However, NPCI's model for achieving multichannel, near-universal interoperability through UPI remains relatively unique. While some schemes have incorporated overlay services—as is the case in Australia and Mexico—UPI's architecture and approach to adoption (a voluntary scheme service promoted by government and civic sponsors) is unique among those examples.

# JORDAN

Jordan Mobile Payment (JoMoPay) is an instant payment system developed and initially operated by the Central Bank of Jordan (CBJ). It provides wallet interoperability and serves EMIs and banks that issue e-money wallets. All wallet providers were initially mandated to connect and pass both on-net and off-net transactions through JoMoPay. Ownership and operation of JoMoPay were later transferred to a separate public/private entity, the Jordan Payments and Clearing Company (JoPACC).

TABLE 17. **The JoMoPay model**

ROLE	FUNCTION	JOMOPAY
 OVERSIGHT	Regulatory framework for payments oversight	Electronic Transactions Law; Central Bank Law
	Payments oversight body	Central Bank of Jordan (CBJ)
 SCHEME	Scheme ownership/management	Initially owned by NPC and managed by CBJ Later, transitioned to Jo-PACC; owned by banks and the regulator, with representation from each on the board
	Scheme rules development	Initially, CBJ, in consultation with participants Later, Jo-PACC management, in consultation with participants
	Scheme membership	Banks and EMIs
 SWITCH	Switch ownership/operation	Initially owned by NPC and operated by CBJ Later owned and operated by Jo-PACC
 SETTLEMENT	Settlement system ownership/operation	RTGS system, owned and operated by CBJ



## Process

CBJ opened e-money issuance to telecommunications companies via a circular in 2010.<sup>26</sup> Two of the major MNOs in Jordan, Orange and Zain, subsequently launched e-money services—Orange Money and e-Mal, respectively—but the products failed to gain traction. By 2012, the National Payments Council (NPC) and CBJ recognized that the wallet market was not growing at the pace desired, and they began to explore additional policy action.

Following a period of industry consultation, NPC and CBJ developed a more comprehensive framework for authorizing e-money services. The framework included better guidelines for agent management, structures for trust accounts backing e-money, and a requirement for interoperability. The ability to transact across networks was viewed as a key part of the value proposition for e-money wallets—the market would grow as a holistic, interoperable environment from the start.

NPC and CBJ began work on the switching technology in parallel to their work on the revised guidance for e-money issuance. By the end of 2012, NPC issued a Request for Proposal (RFP) to procure the switching technology. The winning bidder, ProgressSoft, offered the switch free as a gift to the Kingdom of Jordan. The infrastructure would be implemented over the next two years and completed in June 2014.

After the new Instructions were issued in 2013, Orange and Zain withdrew their e-money products from the market.<sup>27</sup> Orange opted not to continue in the e-money business. Instead, it adopted a wait-and-see strategy to assess how the new interoperability requirements would play out in the market. Zain would eventually relaunch its product, but several technology changes were needed to connect to JoMoPay.

It would be another two years before the first two e-money products under the new licensing regime—Zain Cash and Mahfazti—would go live. Several other EMIs soon joined the market, including non-MNO products from fintechs such as Dinarak and Aya.

However, the new arrangement faced several operational and governance challenges. For example, the regulator was unable to provide 24/7 technical support. In addition, because only one wallet per SIM card was allowed, some banks automatically registered customers, which prevented them from signing up for the new EMI products.

While universal interoperability was technically enabled, there were only a few use cases. Merchant networks had not yet scaled, and agent interoperability—a contentious issue with participants—was not enforced. CBJ understood that participants may choose not to invest in the still limited agent network if they perceived a “first mover disadvantage” in enforced interoperability.

As part of the NPC and CBJ roadmap, the operation and management of the system was eventually transferred to JoPACC in January 2020. JoPACC, a newly created public/private entity developed to manage retail payments in Jordan, was majority owned by Jordan’s banks with a minority stake held by CBJ.

Adoption of wallets initially remained limited under JoPACC. However, operational support for JoMoPay soon began to improve, with JoPACC providing participants 24/7 technical support and initiating a series of other projects, such as QR standardization, eKYC services, and data-sharing facilities, aimed at driving market development.

In addition, JoPACC is developing a new switching infrastructure to enable instant transfers between all types of accounts—including bank accounts and mobile wallets.

As of mid-2020, Orange had reentered the market, six years after its exit, and wallets had started to scale in part because of the response to the COVID-19 crisis. While agent networks still are limited and the long-term uptake of wallets remains to be seen, arrangements to support instant payment interoperability appear to be on a path of continuous improvement. See Table 17.

26. While data from 2010 are not available, Findex data from 2014 show approximately 25 percent account penetration (Demirgüç-Kunt et al. 2018).

27. Article 3 of the 2013 Instructions requested both off-net and on-net transactions to go through the JoMoPay switch. See “Mobile Payment Instructions of 2013, amended pursuant to the Instructions of 2017 which were amended according to the Board of Directors’ Decision No. (116/2017) dated 1st June 2017,” CBJ, <http://www.cbj.gov.jo/EchoBusV3.0/SystemAssets/24ab593c-e6da-4247-9a6c-7644b996d2f2.pdf>.

## Scheme

### GOVERNANCE

Initially, NPC owned JoMoPay and other retail payment systems in the country, with CBJ serving as its contracting party. While all RFPs were announced by NPC and all contracts and purchases were in its name, all were signed and executed by CBJ acting on behalf of NPC. Following launch, CBJ issued some scheme rules in the form of regulation (in consultation with industry), but key areas such as dispute management and interchange policy were not initially addressed.

The system primarily was designed to meet the needs of the EMI market, but banks that wished to offer mobile wallets also could connect. Bank-issued wallets would be interoperable with EMI wallets on the same terms but would not be interoperable with other bank accounts.

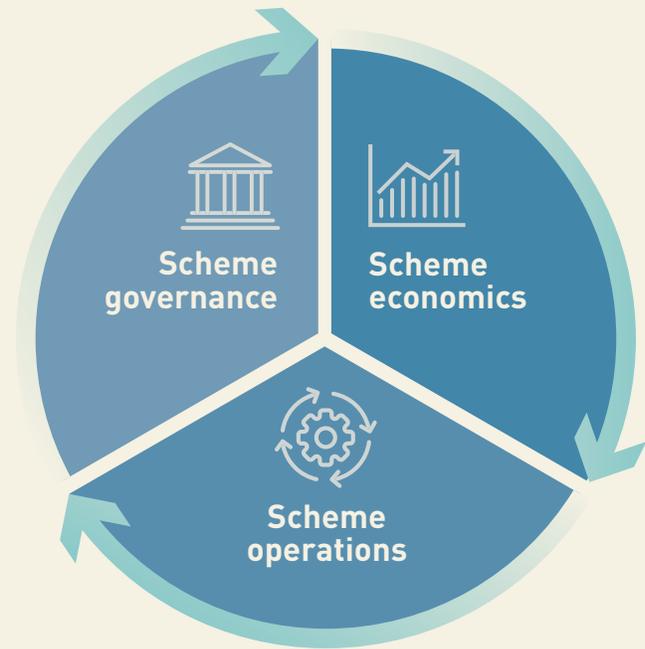
JoPACC makes scheme rules in consultation with industry. While JoPACC is majority owned by Jordan's banks, the regulator maintains a share (and board seats) to help ensure equitable treatment of all participants, bank and EMI.

### ECONOMICS

Initially, CBJ did not charge participants a fee for switching. It opted not to apply switching fees for at least the first two years of operation, making the service free to participants to encourage scale early on. Other economic arrangements such as interparty fees were not defined.

Following the move to JoPACC, transactions on JoMoPay remain free, subsidized initially by bank shareholders. A fee was intended to be introduced in early 2020, but the move was postponed due to the COVID-19 crisis. However, participants pay an annual membership fee and one-time connection fees.

JoPACC also is involved in setting retail transaction fees for its products. The merchant discount rate for JoMoPay merchant payments is 1 percent for all participants,



and there is no interparty fee. While this offers a strong incentive to build acquiring networks, issuers do not benefit from customer transactions performed at merchants (unlike, e.g., most card-acquiring models).

### OPERATIONS

JoMoPay uses a centralized directory with phone numbers as the addressing system. A technical limitation of one account registration per SIM card caused early challenges, and an upgrade was not immediately available. While the switching technology for JoMoPay was provided free by ProgressSoft and CBJ owned the source code, the regulator did not have the in-house capacity to make these types of upgrades, meaning that technology changes needed to be separately negotiated with the vendor.

The limitation of JoMoPay to wallet accounts also meant that full interoperability between bank accounts and EMIs could not be immediately achieved. These challenges—combined with the desire to move to ISO20022 standards—have prompted JoPACC to develop a new instant payment system.

Transactions are settled on a deferred-net basis through the RTGS system maintained by CBJ.

### WHICH OTHER SCHEMES FOLLOW THE JOMOPAY APPROACH?

The Jordan model of incubating a new instant payment system inside the regulator remains fairly unique. However, it is becoming more popular with new projects led by regulators in markets such as Tanzania and Pakistan.

The governance structure of JoPACC, which eventually took over ownership and operation of JoMoPay, is similar to that of several other global models. Other examples of shared industry and regulator ownership of an instant payment system include markets in Australia, Egypt, and Nigeria.

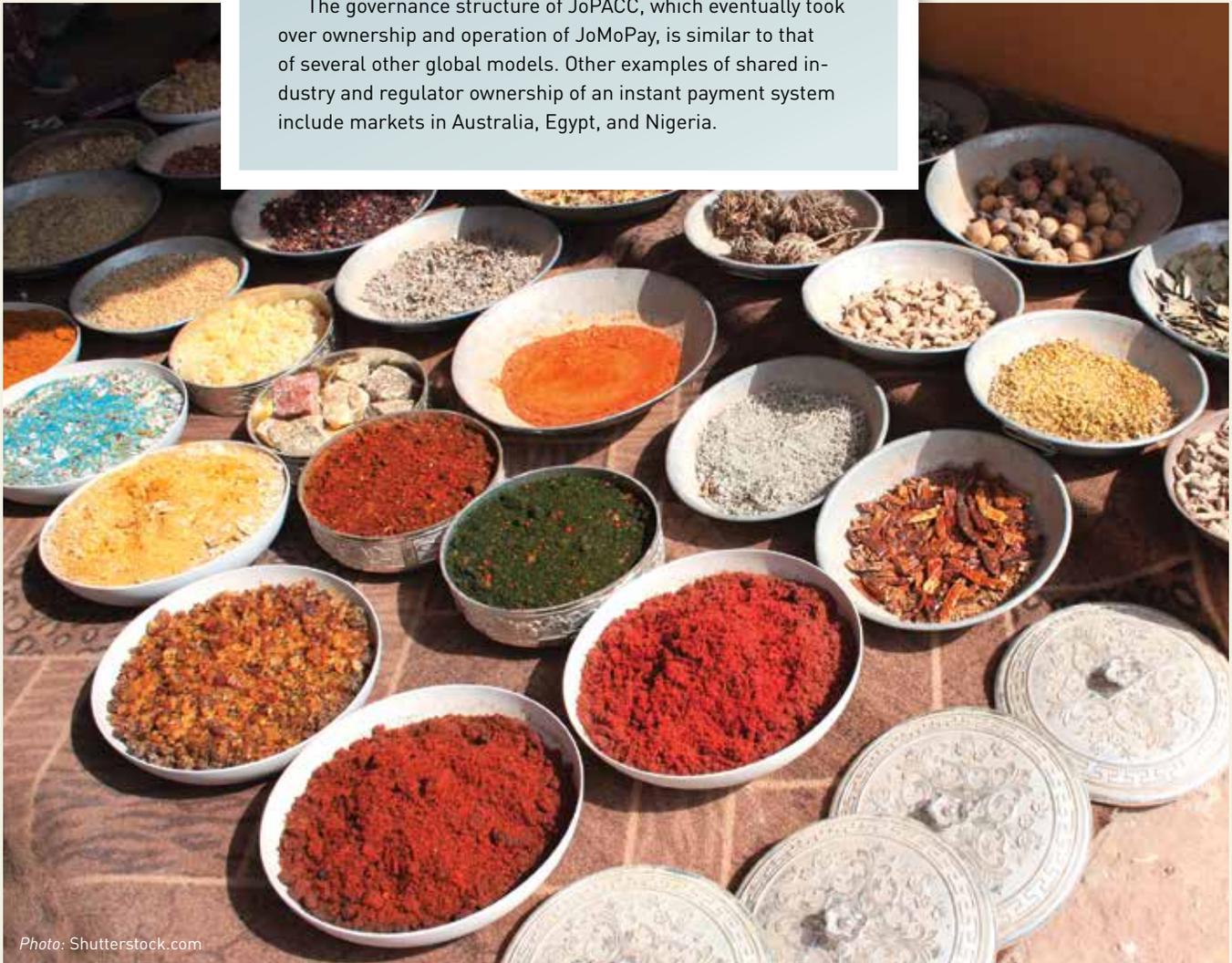


Photo: Shutterstock.com

# MEXICO

In 2004, the Central Bank of Mexico (Banco de Mexico or Banxico) launched a new RTGS system called SPEI. From inception, SPEI catered to small-dollar retail transactions as well as large-value settlement services, but retail transactions initially were not offered immediately or continuously. Over the next decade, SPEI would undergo a series of upgrades to add instant payment functionality. It is one of a few instant payment systems in the world where retail transactions are conducted directly on an RTGS system that is owned and operated by the regulator.

TABLE 18. **The SPEI model**

ROLE	FUNCTION	INTERBANK ELECTRONIC PAYMENT SYSTEM (SPEI)
 <b>OVERSIGHT</b>	Regulatory framework for payments oversight	Bank of Mexico Law (1993) Payments Systems Law (2002)
	Payments oversight body	Banxico
 <b>SCHEME</b>	Scheme ownership/management	Owned and managed by Banxico
	Scheme rules development	Banxico, in consultation with participants
	Scheme membership	Banks and approved nonbanks
 <b>SWITCH</b>	Switch ownership/operation	SPEI, owned and operated by Banxico
 <b>SETTLEMENT</b>	Settlement system ownership/operation	SPEI, owned and operated by Banxico



## Process

SPEI already had been supporting interbank retail transactions for about six years when Banxico sought to make these payment near real time in 2011. The upgrades brought the clearing window for transactions performed on the RTGS to less than 60 seconds. SPEI transactions are settled in real time on the same system, and all banks in Mexico are required to participate in the arrangement.

By 2016, SPEI was supporting healthy volumes of small-value payments between banks, cleared and settled in near real time (Díaz 2018). However, services still were available only during RTGS operating hours (21/7/365). Also, some banks had started to promote closed-loop instant payment services. This meant that customers faced an inconsistent experience with payments sometimes credited immediately to the receiver's account and sometimes delayed depending on the sending and receiving institutions and the time of day.

Banxico embarked on another upgrade to SPEI, this time to improve the consistency in customer experience by providing continuously available services. In November 2016, Banxico moved 24/7/365 availability for RTGS with settlement cycles every three seconds or 300 transactions (reduced from every 20 seconds), whichever comes first (BIS 2016b).

When SPEI was created, small-value retail payments were handled through RTGS because credit and push payments were not heavily used, and therefore they were considered to have a lower risk. However, as mobile payments scaled over the first decade of SPEI's operation, the risks presented by operating retail transactions on the RTGS had to be revisited.

While some licensed and unlicensed nonbanks still directly connect to SPEI, they must follow strict rules to manage risk. Nonbanks are required to hold reserves with the central bank and adopt cyber compliance measures at a level similar to that of banks. While direct participation in SPEI is theoretically possible for a wide variety of nonbank entities, in practical terms, it is possible only for a few large entities that are willing to invest the time and resources to meet the appropriately aggressive risk-management requirements.

STP is one example of an SPEI nonbank participant. It acts as a payment aggregator and settlement service for smaller financial institutions that want to connect indirectly to SPEI. SPEI rules dictate the measures that indirect participants should have in place, but it is up to the sponsoring participant—in this case, STP—to supervise their activities.

While P2P services through SPEI continued to scale after the 2016 upgrade, the central bank found that other digital transaction types, including QR acceptance, were not as well positioned to scale. A new product—CoDi—was launched in September 2019 in an attempt to address this gap.

CoDi is a request-to-pay overlay service in which merchants contracted by SPEI participants or registered nonparticipants can request payment from a customer through QR code, NFC, or web interface. The transaction is then conducted over SPEI rails for clearing and settlement. All banks must provide CoDi to their customers, and the rules are defined by the central bank. Nonbanks that do not participate in SPEI can participate in CoDi through a structured onboarding process that allows them to register to initiate payment requests.

Although retail volumes via SPEI continue to grow, CoDi remains underused. The prohibition on customer, merchant, and interparty fees for the use of CoDi makes the participant business model unclear. Also, the requirements to hold a bank account and own a smartphone have resulted in a solution that may be narrowly useful outside of wealthier banked consumers. And finally, some have criticized the user experience of an operational model that requires those initiating transactions to be redirected to their bank's interface for authentication.

Challenges with CoDi aside, SPEI represents a unique and successful model for scaling instant payments with real-time settlement. With appropriate sensitivity to the new risks that this approach introduces, the regulator has successfully opened the large-value system to small-value retail transactions and, over time, increased operational support for instant payments with real-time settlement on a single system. See Table 18.

# Scheme

## GOVERNANCE

All banks in Mexico are required to connect to SPEI and receive transactions. The question of EMI access to services historically has been less relevant in Mexico as a bank-led market, but since 2018, licensing frameworks allow two types of EMI institutions—Instituciones de Financiamiento Colectivo (IFCs) and Instituciones de Fondos de Pago Electrónico (IFPEs). Nonbanks are able to connect to SPEI, but they are not required to do so, and they would have to meet strict risk management requirements.

The rules for SPEI are set by Banxico, with input from industry through working groups. The regulator also has been proactive in developing functionality, such as a transaction tracking service and an electronic receipt system for dispute resolution, to address customer and participant needs.

## ECONOMICS

Each participant pays an annual fee to cover operating costs. The amount of the fee is based on a three-year rolling average of transaction volumes. Hence, transaction

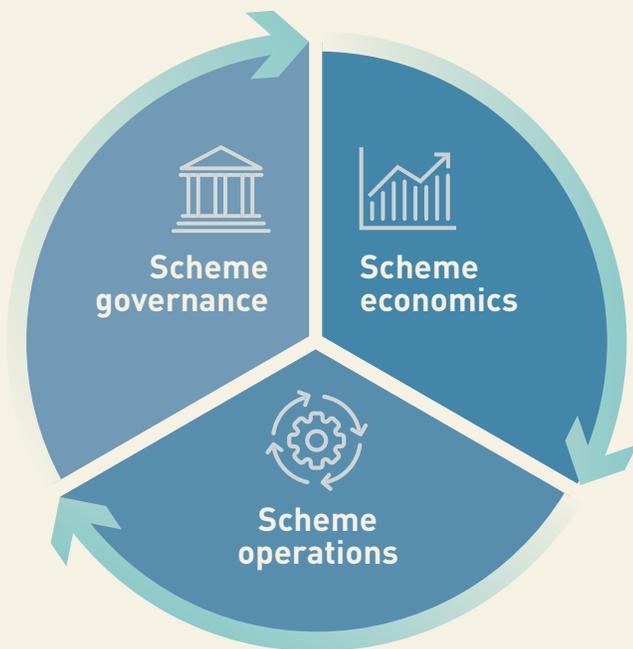
volumes directly affect fees charged to scheme participants, but the rolling average provides revenue consistency for both Banxico and participants. There is no interparty fee, and banks are permitted to set their own prices for sending transactions. The banks must register all customer fees with Banxico (Banco de Mexico 2017).

In the case of CoDi, however, Banxico has taken the additional step of prohibiting user transaction fees or interchange.

## OPERATIONS

Payments addressing relies on the CLABE numbering system—a unique bank account identifier set at the system level. In recent years, phone numbers have been introduced as an alias for addressing; however, the phone number is unique only at the participant level, meaning that the sender also must select the recipient bank name when sending payments to a phone number.

Transactions through SPEI are cleared and settled in real time. The CoDi overlay service has helped to introduce newer and more innovative payment features on SPEI—including third-party payment initiation and QR codes.



### WHICH OTHER SCHEMES FOLLOW THE SPEI APPROACH?

Mexico’s use of its RTGS system for instant payments remains fairly uncommon. Some regulators, for example, in Sweden and Australia, have introduced settlement system reforms to better support real-time settlement of instant payments but, in these cases, transaction clearing still occurs separately. Other regulators, such as CBJ in Jordan, have acted to develop and manage the instant payment system, but clearing is managed separately from the RTGS.

One likely reason that fewer markets have taken this approach is that operating small-value transactions on a systemically important payment system requires limiting participation to institutions who have made a high level of investment in risk management and cybersecurity.

# PERU

*Billetera Móvil* (Bim) was launched in 2016 as an industry initiative supported by the regulator. Bim was created, led, and controlled by the banking industry through the Peruvian Banking Association (ASBANC). Bim includes participants from inside and outside the banking sector. The system has a unique design that features a single e-money platform to centralize wallet creation and management.

TABLE 19. **The Bim model**

ROLE	FUNCTION	BILLETERA MOVIL (BIM)
 <b>OVERSIGHT</b>	Regulatory framework for payments oversight	Law of the Payment Systems and Securities Settlement
	Payments oversight body	Central Reserve Bank of Peru (BCRP)
 <b>SCHEME</b>	Scheme ownership/management	PDP, owned by the Peruvian bankers' association and Peru's banks
	Scheme rules development	PDP, in consultation with participants
	Scheme membership	EMIs
 <b>SWITCH</b>	Switch ownership/operation	Owned and operated by PDP
 <b>SETTLEMENT</b>	Settlement system ownership/operation	RTGS system, owned and operated by BCRP

## Process

The idea for Bim dates back to the introduction of e-money services in Peru. In 2011, only 20 percent of Peruvians over the age of 15 had a bank account, while more than 50 percent of the population were mobile phone subscribers (Demirgüç-Kunt et al. 2018).<sup>28</sup> E-money services were seen as a way to expand access. In 2013, Law N.29985 for Electronic Money was passed. It allowed banks and licensed nonbanks to offer financial services by issuing e-money.

ASBANC was involved in the initial drafting of the e-money law and proposed a technical solution that would allow new EMIs to operate from a single e-money platform. Sharing a platform would ensure interoperability from the start because all transactions would effectively be on the network and would reduce the upfront investment by EMIs to build their own platform.

In 2013, ASBANC members signed an MoU to launch the project and began engaging external partners, including microfinance institutions, savings and loan institutions, MNOs, and the country's largest public bank, *Banco de la Nación*.<sup>29</sup>

In 2014, the Office for the Electronic Money Project was formed in ASBANC to lead the scheme design and define rules for transactions between wallets, wallet creation, and wallet management on the centralized platform. Participants effectively would share a single closed-loop wallet ecosystem, complete with an interoperable agent network.

ASBANC contracted Ericsson to provide the wallet platform. While the platform centralized wallet creation and management, EMIs would remain separately licensed and would have their own trust accounts.

By 2015, a limited liability company called *Pagos Digitales Peruanos* (PDP) was created as a not-for-profit entity

within ASBANC, and it became the main shareholder with 51 percent of shares. The remaining shares were split equally among 33 financial institutions, mostly banks and microfinance institutions (Diaz and Conde 2017).<sup>30</sup> Although most mobile operators, such as Claro, Entel, and Movistar, were partners at launch, they are not shareholders and would not formally participate in decision-making.

Because membership in PDP is voluntary, other entities that chose to manage their own platforms could go to market, but their systems would not interoperate with Bim wallets. Similarly, bank accounts would not be fully interoperable with Bim wallets, though customers are able to top up their Bim wallet from internet banking or a bank-provided app (Arnfield 2017).

PDP launched in 2016 with services such as remittances, deposits, withdrawals, and airtime top-ups. These were followed by bill payments and simplified tax payments for microbusinesses (Arnfield 2017). Its USSD channel was launched first and was available through three of the four MNOs in the country, with access to the channel negotiated by PDP.

However, the number of transactions did not increase as expected in the years following launch (Diaz and Conde 2017). Several factors may have contributed to these challenges, but key among them was distribution. Distribution quickly became a bottleneck for the system's expansion because participants did not have a strong incentive to grow agent networks in areas that were not already serviced by bank agents (Diaz and Conde 2017).

By 2018, Bim had around 600,000 active customers who used the service a little less than once a month, on average. In 2018, the fourth mobile operator, Bitel, also joined. However, support for USSD services was soon discontinued because the cost of offering the service was more than the revenues generated from Bim wallets.

28. GSMA Intelligence database, 2020, <https://www.gsmainelligence.com>.

29. Modelo Peru: Accelerating Financial Inclusion by Upscaling the Use of Mobile Money," PDP, 2019, <https://pagosdigitalesperuanos.pe/modelo-peru/>. Modelo Peru: Accelerating Financial Inclusion by Upscaling the Use of Mobile Money," PDP, 2019, <https://pagosdigitalesperuanos.pe/modelo-peru/>.

30. For a full list of shareholders see "Modelo Peru: Accelerating Financial Inclusion by Upscaling the Use of Mobile Money," PDP, 2019, <https://pagosdigitalesperuanos.pe/modelo-peru/>.

Meanwhile, other EMIs launched their own closed-loop solutions apart from Bim. Peru’s newest EMIs have adopted models driven by prepaid cards that carry the brands of international. In 2020, the microfinance institution Compartamos purchased a 51 percent share of PDP and more changes appear to be on the way. At the same time, Peru is exploring the development of a more traditional instant payment system that would address interoperability between accounts, including those held with banks. See Table 19.

## Scheme

### GOVERNANCE

PDP was initially majority owned by the Peruvian banking association, with a minority stake held by other financial institutions in the country. The PDP board comprised representatives from these organizations. Decision-making on rules was handled by PDP management in consultation with participants. Governance is likely to change following the recent sale of PDP to a group of leading microfinance institutions, one of which is Compartamos.

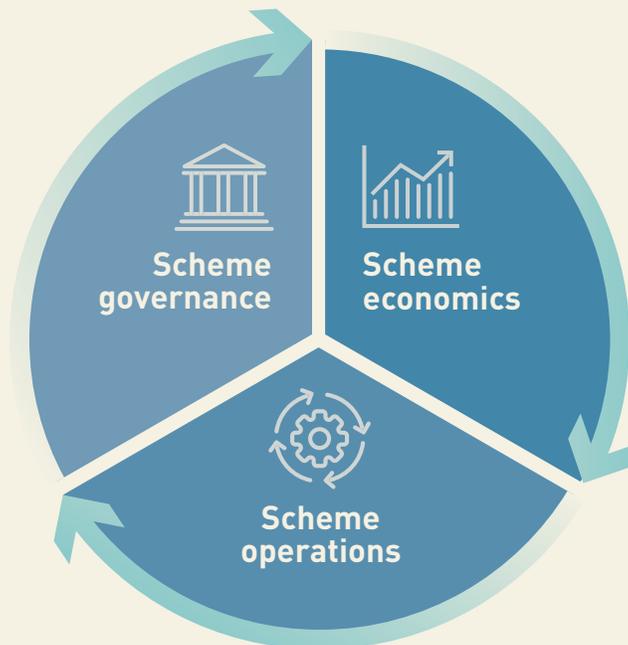
### ECONOMICS

Bim transactions—except for cash-out and bill payments—are free for end users.<sup>31</sup> An interchange is defined between participants for agent interoperability but not for other transaction types (Benson and Vadivelalagan 2017). PDP manages the Bim brand for participants and coordinates commercial efforts and marketing campaigns for the scheme; some campaigns also were led by participants.

### OPERATIONS

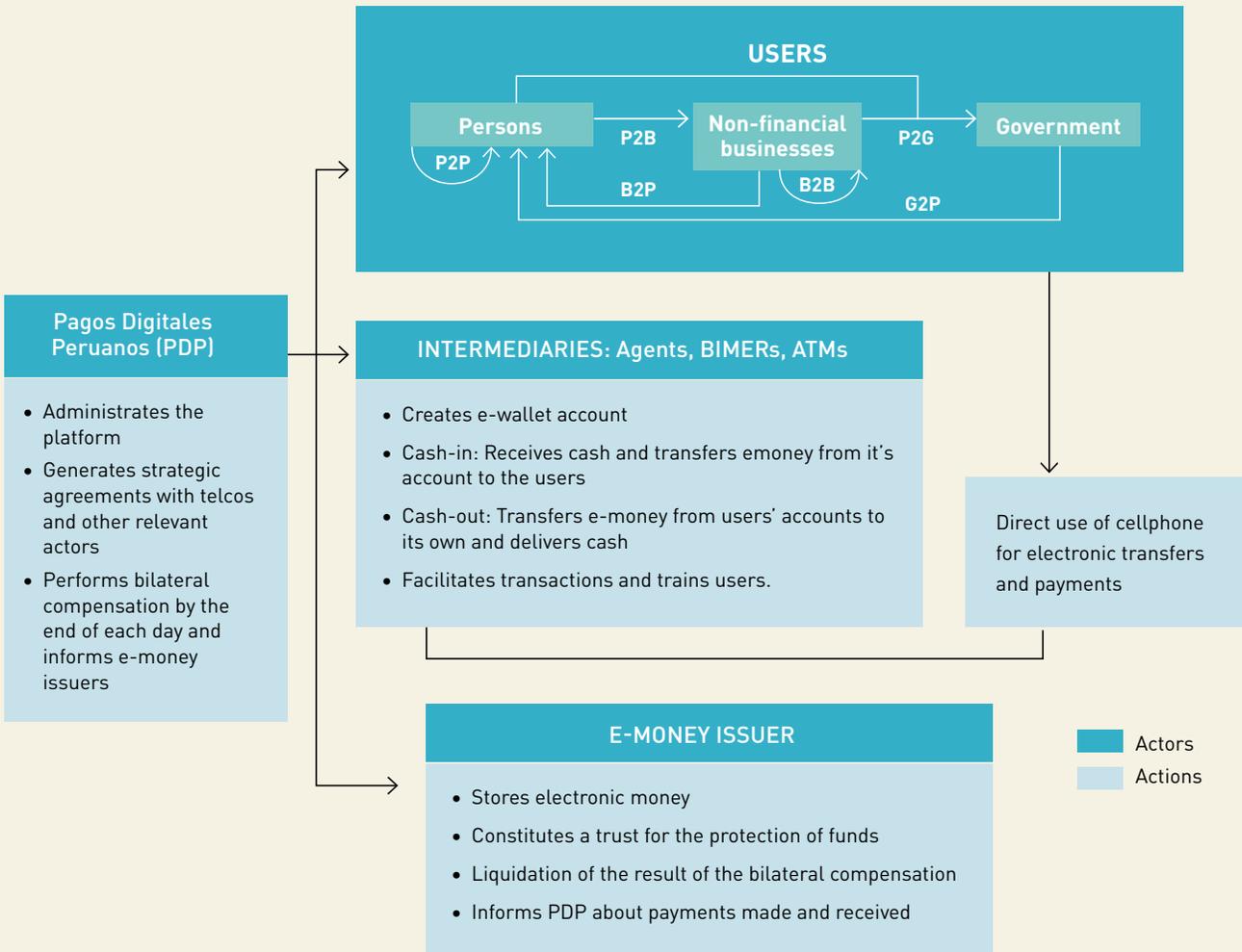
Payments, e-money creation, account management, and other related services are managed centrally as a shared service provided by PDP. Addressing for Bim is based on phone number and is centrally managed by the scheme. Settlement is performed on a deferred net basis through the RTGS system operated by the regulator.

The responsibilities of Bim actors (before PDP’s sale) are shown in Table 19.



31. BBVA Continental and Banco de la Nación, <https://mibim.pe/tu-billetera-movil/cuanto-cuesta-usar-bim/>.

FIGURE 28. Responsibilities of actors in the Bim system



Source: IFC, 2018.

### WHICH OTHER SCHEMES FOLLOW THE BIM APPROACH?

The Peru model of operating a centralized wallet platform has been used in a few other markets, including Ecuador and Sudan. However, in both examples, the model was approached at regulator direction rather than as a private sector initiative.

In 2014, the Central Bank of Ecuador became the only authorized EMI and the operator of the only permitted e-money platform in the country. Similarly, in Sudan, e-money was authorized in 2017 with

a requirement that EMIs hold funds in a centralized wallet platform managed by the national switch. Both regulators soon pivoted away from the centralized EMI model after experiencing limited uptake.

In 2017, authorities in Ecuador ordered remaining funds in the e-money system to be transferred to banks or credit unions, effectively ending the project. In 2020, Sudan began the process of removing the requirement for EMIs to participate in the centralized platform.

# PHILIPPINES

The Central Bank of the Philippines—Bangko Sentral ng Pilipinas (BSP)—played a key role in launching the country’s instant payment system, InstaPay, in 2018. BSP facilitated the process, defined key requirements, and mandated participation of supervised entities—both banks and EMIs. However, much of the scheme decision-making is managed by Philippine Payments Management, Inc. (PPMI), an industry association formed in 2017. PPMI appointed a private company, BancNet, to act as the switch operator.

TABLE 20. **The InstaPay model**

ROLE	FUNCTION	INSTAPAY
 <b>OVERSIGHT</b>	Regulatory framework for payments oversight	The National Payment Systems Act (2018) <sup>a</sup> The New Central Bank Act (1993) <sup>b</sup>
	Payments oversight body	Bangko Sentral ng Pilipinas (BSP)
 <b>SCHEME</b>	Scheme ownership/management	Philippine Payments Management, Inc. (PPMI) (industry association)
	Scheme rules development	PPMI or BSP, depending on the area of governance
	Scheme membership	Banks and EMIs
 <b>SWITCH</b>	Switch ownership/operation	BancNet
 <b>SETTLEMENT</b>	Settlement system ownership/operation	PhilPaSS system, owned and operated by BSP

a. Republic of the Philippines, Republic Act No. 111271, The National Payments System Act, <https://www.officialgazette.gov.ph/downloads/2018/10oct/20181030-RA-11127-RRD.pdf>.

b. Republic of the Philippines, Republic Act No. 7653, The New Central Bank Act, [http://www.bsp.gov.ph/downloads/regs/New\\_Central\\_Bank\\_Act.pdf](http://www.bsp.gov.ph/downloads/regs/New_Central_Bank_Act.pdf)

## Process

A 2015 country diagnostic report found that “despite some important advances in electronic payments systems over the past two decades, the Philippines remains a “heavily paper-dependent [i.e., cash and check] society” (Hokans 2019). Only 1 percent of an estimated 2.5 million payments a month were being made electronically. The diagnostic also showed that there was almost no effective interoperability between financial institutions, with interbank transfers representing less than 1 percent of all ATM, POS, and mobile-initiated transactions.

The report led BSP to conclude that change was needed, particularly considering the high rate of digital adoption in the country—100 percent mobile penetration with high data use. It set priorities for reform through the National Retail Payments Strategy (NRPS). It targeted a digital payment rate of 20 percent by 2020 and created a vision for modernizing retail payment systems.

The project began in 2015 and interoperability, including between banks and EMIs, was a key objective. BSP established a committee to create a governance framework that would include participants from the banking sector, EMIs, and BSP. BSP outlined the decisions of this committee in its Resolution No. 1855 and Circular 980 of 2017.<sup>32</sup> Two ACH systems would be established: PESONet, a batch electronic fund transfer (EFT) system, and InstaPay, a real time low-value EFT credit instant payment system.

PPMI was created in 2017. Although it makes some rules for InstaPay, other rules are set by the regulator. The governance model is a clear indication that while industry has a hand in decision-making, the regulator continues to have an active voice in setting the system’s direction.

The NRPS framework allows for a single switch operator to be appointed for each payment system. BancNet was appointed for both the PESONet and InstaPay systems. InstaPay carries its own brand, but this was only minimally advertised by BSP through initial consumer education materials that included a video campaign and an explanatory InstaPay Fact Sheet. Participants are primarily responsible for marketing the service.<sup>33,34</sup>

A 2019 follow-up study found that “the interoperability mandated by NRPS has increased competition in the financial services industry and encouraged innovation. The NRPS helped level the playing field among PSPs as new entrants could now offer an improved experience to the consumers and force the incumbent banks to innovate and improve their payment services” (Ngodup Massally et al. 2019).

While the process was more heavily regulator driven than some other models, InstaPay has helped to rapidly expand the number of payment options available to customers and increase digital transactions to 10 percent by volume and 20 percent by value of all payments over just a few years. In November 2019, the governor of BSP noted the strong progress and extended BSP’s own ambitious target to reach 50 percent by value by the end of 2023 (Agcaoili 2019).

Now, BSP and PPMI are working on several innovations to accelerate growth, including launching a national QR code standard. The Philippine Government also has led by example: it has become the most digitized stakeholder in the ecosystem, with 64 percent of all government transactions carried out digitally.<sup>35</sup> The recently launched government electronic payments facility (EGov Pay) is expected to further increase uptake of the InstaPay system.<sup>36</sup> See Table 20 for a brief overview of the InstaPay model.

32. Bangko Sentral ng Pilipinas, Regulations, Circular No.980, Adoption of National Retail Payment System (NRPS) Framework, Series of 2017, Issued 11 June 2017, <http://www.bsp.gov.ph/regulations/regulations.asp?id=3881>.

33. “Transfer Funds via InstaPay,” BPI, <https://www.bpi.com.ph/bank/services/transfer-funds/instapay>.

34. “What Is InstaPay?” PayMaya, 19 December 2019, <https://www.paymaya.com/support/transactions-help/add-money/instapay>.

35. Hokans 2019.

36. Agcaoili 2019.

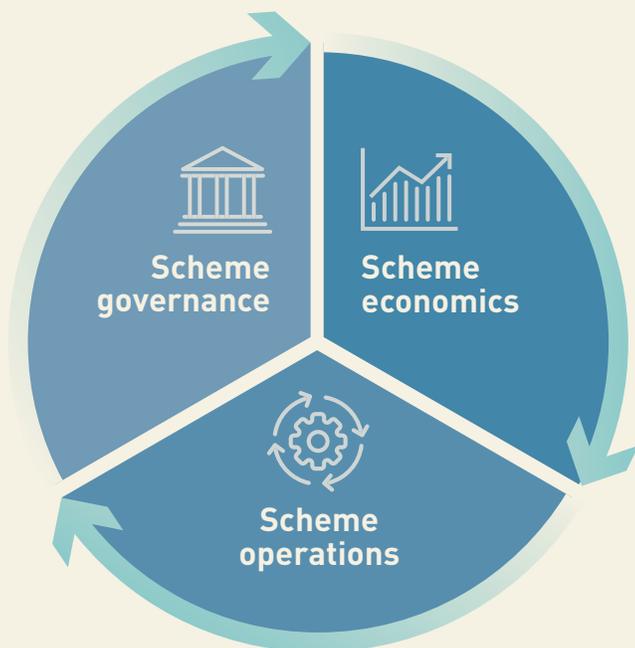
## Scheme

### GOVERNANCE

The InstaPay system is formally managed by PPMI, which is a not-for-profit association with board representation based on clearing volume. To ensure fair representation, additional seats are reserved for two rural banks, an EMI, and two independent directors. BSP does not have a seat on the board.

However, BSP retains an active role in setting the direction of the system by issuing guidance through various circulars and memorandums covering topics that include clearing requirements (e.g., maximum time permitted to credit recipient's account), settlement arrangements (e.g., collateral funding requirements), and pricing (e.g., prohibition on charging the recipient for InstaPay transactions).

All supervised financial institutions are required to connect to and receive transactions on both systems, and only these systems would be permitted for transactions. No bilateral or other alternative connections are allowed for credit and push payments between institutions.



### ECONOMICS

Scheme rules do not specify consumer prices but do stipulate that the receiving customer must never be charged. They also require that prices be set on “reasonable and fair market-based pricing models” and be lower than over-the-counter transactions. There is no interparty fee, and the only fees paid by participants are to BancNet for transaction clearing.

### OPERATIONS

Addressing on InstaPay is based on account number at the institution level. Therefore, senders must identify both the receiving institution and the account number into which the payment will be directed.

Clearing occurs through the InstaPay switch maintained by BancNet, with settlement performed on a deferred net basis. Settlement accounts are held on the PhilPaSS system (the RTGS service in Philippines) only by those InstaPay participants that are allowed to hold a demand deposit account with BSP. This means that only banks can be direct settlement participants in InstaPay, while nonbanks, including EMIs, require a bank as a settlement sponsor even if they are direct clearing participants in InstaPay.

#### WHICH OTHER SCHEMES FOLLOW THE INSTAPAY APPROACH?

In some ways, the process followed by the Philippines is similar to many of the other models that have been successful worldwide. As in markets such as Australia, the United Kingdom, and India, the regulator was the catalyst to action, and it then maintained strong oversight over an industry-led process. However, the actual governance structure—of an industry association formed of members taking on aspects of self-governance and contracting a separate entity to act as the switch operator—is more similar to the association-led models in markets like South Africa and Singapore.

In the Philippines, however, the regulator took on a larger role than seen in most of these examples. BSP convened participants, required participation, and required transactions to pass through the switch. It allowed for an industry-led approach, but within carefully defined parameters.

# TANZANIA

In 2015, EMIs in Tanzania came together to create an industry-led arrangement for interoperability. The process, facilitated by IFC, involved MNO-led EMIs entering into a multilateral agreement that defined scheme rules. No separate entity was designated to manage the scheme, and the four EMIs in Tanzania negotiated separate bilateral interparty fee agreements. Technical connections between participants were achieved through bilateral API connections and settlement through prefunded accounts on counterparty platforms.

TABLE 21. **The MNO-led EMI model**

ROLE	FUNCTION	MNO-LED EMI ARRANGEMENT
 <b>OVERSIGHT</b>	Regulatory framework for payments oversight	The National Payment Systems Act (2015); The Bank of Tanzania Act (2006)
	Payments oversight body	Bank of Tanzania (BOT)
 <b>SCHEME</b>	Scheme ownership/management	N/A—Arrangement was formed through a multilateral agreement between participants, no separate legal entity
	Scheme rules development	EMI-led participants, with facilitation by IFC
	Scheme membership	EMIs
 <b>SWITCH</b>	Switch ownership/operation	N/A—technical connections through bilateral API connections
 <b>SETTLEMENT</b>	Settlement system ownership/operation	Prefunded accounts on counterparty platforms

## Process

By 2011, EMIs in Tanzania recognized a demand for wallet-to-wallet transactions between providers. Many customers maintained several accounts or used token-based, over-the-counter transactions to perform transactions between providers (IFC 2015). Three of the country's four EMIs were competitively positioned. Collectively, they held 5 million active accounts and each had strengths in different geographies that complemented those of the others. The market appeared primed for interoperability.

In late 2012, IFC held conversations to assess stakeholder willingness to collaborate on a solution. The industry appeared to be receptive, and after a subsequent discussion with the regulator, IFC set up the first meeting. With support from the Bill & Melinda Gates Foundation (BMGF) and the Financial Sector Deepening Trust of Tanzania, IFC convened industry stakeholders in September 2013 to outline proposed objectives and determine a path forward.

Absent a dedicated EMI industry body to drive the process, it was agreed that IFC would be a neutral facilitator in a voluntary, industry-led process toward mobile money interoperability. Additional expertise was brought in—consultants who were experts on legal and regulatory issues, payment systems, and other related topics. Legal and regulatory research, a competition policy review, a review of current payment infrastructure, and a study of market demand were conducted. These studies tested the hypotheses about the market structure and helped inform the model created by participants.

Next, a series of workshops were held in which participants agreed that scheme services would be voluntary and start by offering person-to-person (P2P) services. Agreements were partially driven by Tigo, who was a strong champion of the scheme from the beginning. While the IFC process created the conditions for a collaborative approach, Tigo's vision and persistence helped to drive the overall agenda and ensured focus on the end objectives.

By September 2014, the four major EMI participants agreed to a set of scheme rules to govern the arrangement (Musa, Niehaus, and Warioba 2015). Participants opted not to invest in a separate legal entity to manage the scheme. Instead, the scheme would be governed through a set of common rules that were approved by participants.

The EMIs Airtel, Tigo, Vodacom, and Zantel launched the scheme in 2015. IFC coordinated an investment to advertise the scheme through a centralized marketing campaign called Taifa Moja (“one nation” in Swahili). Each participant EMI, however, kept its own brand and was free to market the product as it wished.

Within two years of launch, the service appeared to be an overwhelming success, with 30 percent of all P2P transactions occurring off net. However, the arrangement was not without challenges. Vodacom, the largest EMI in the market, opted not to sign the multilateral scheme agreement and participated only through bilateral contracts with each EMI, using the scheme rules as an annex. This meant that it was a participant but was not fully subject to the scheme's terms. Also, bilateral technical connections and separate interparty fee agreements created a potential barrier to new entrants. Participants could delay signing commercial agreements or technical integration if they wanted to entrench their strategic position in the scheme.

A lightweight governance and operational structure enabled the quick launch of interoperable P2P transactions in the market. However, absent a formal ownership body, there was no strong convening mechanism for industry to build on early success. No further transaction types or products were released after the 2014 agreement.

Three years later, the regulator began to pursue the mandate of a new solution that includes both banks and nonbanks—the Tanzania Instant Payment System (TIPS). TIPS is under development, but it plans to launch with a new switching infrastructure owned and operated by the regulator. How the EMI arrangement will fit into this solution remains to be seen. See Table 21 for a brief overview of Tanzania's MNO-led EMI model.

## Scheme

### GOVERNANCE

No legal entity manages the arrangement between Tanzania's EMIs. Instead, terms were agreed through a common set of scheme rules signed by participants. Membership is voluntary but limited to e-money institutions. To be eligible for membership, institutions must have permission to operate from both the Bank of Tanzania and Tanzania's telecommunications regulator, the Tanzania Communications Regulatory Authority.

### ECONOMICS

No switching fees are paid by participants. Instead, each provider manages the costs of maintaining its own bilateral technical connections.

The scheme rules prohibit price discrimination between on-net and off-net transactions. Rather than charging sending customers an additional fee for off-net transactions, incentives are balanced through an interparty fee paid from the receiving provider to the sending provider in an amount roughly equal to the amount of the agent commission paid for a cash-in transaction.

The terms of the interparty rates are agreed bilaterally between scheme participants through separate commercial agreements.

### OPERATIONS

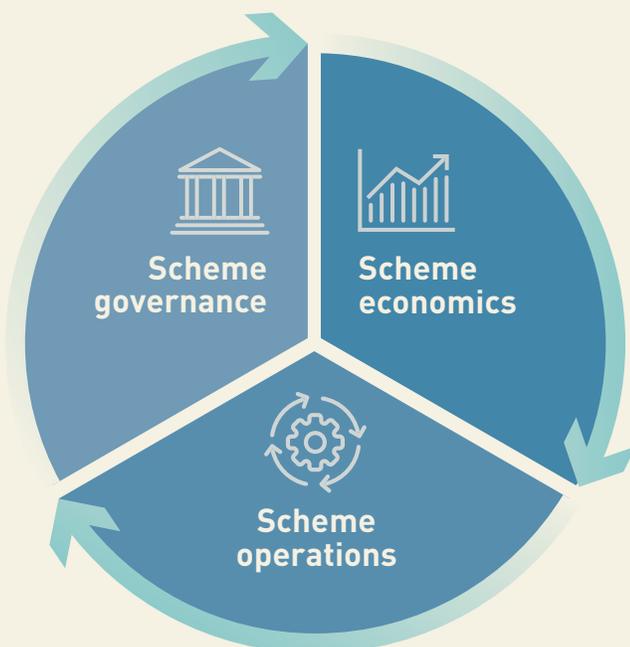
Addressing is based on mobile phone numbers as is the case with closed-loop products. Most of the participants established separate menu options (USSD or app) to make transfers to other providers. A sending customer likely will be required to know that the recipient has a different provider and to identify that provider to appropriately address the payment.

Clearing is performed through bilateral connections between participants. Settlement is similarly managed bilaterally with prefunded accounts maintained on each counterparty's platform. While participants understood that bilateral clearing and settlement arrangements would be costlier in the long run, the arrangement was viewed as a way to quickly launch and scale with a small number of participants.

#### WHICH OTHER SCHEMES FOLLOW THE MNO-LED EMI APPROACH?

Tanzania's industry-led approach for formalizing an agreement among participants absent a formal governance structure or central switching technology is used in several markets in Africa (e.g., EMI-led schemes in Kenya, Uganda, and Madagascar). However, as is happening in Tanzania, regulators in many of these markets are revisiting the decisions made by industry.

There also are examples of industry-led arrangements with more formal governance structures and their own switching technology. In these cases, the schemes may be for profit or not for profit and driven by investors or industry. Examples include PesaLink in Kenya, ACH Colombia in Colombia, and 1Link in Pakistan. In all these examples, however, regulators subsequently have taken actions to revisit the decisions made and question whether the arrangements are best placed to serve the market in its entirety.



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# GLOSSARY

- Authentication:** Methods used to verify the origin of a message or to verify identity, and to confirm that a message has not been modified or replaced in transit.<sup>a</sup>
- Authorization:** The approval or consent given by a participant (or a third party acting on behalf of that participant) to conduct a transaction, for example, transfer funds.<sup>a</sup>
- Clearing:** The process of transmitting, reconciling and, in some cases, confirming transactions before to settlement, potentially including the netting of transactions and the establishment of final positions for settlement.<sup>a</sup>
- Electronic money issuer (EMI):** A regulated entity dedicated to issuing e-money or similar stored-value accounts, as opposed to a traditional “bank” allowed to intermediate and leverage customer deposits.<sup>b</sup>
- Deposit (bank) account:** An account held with banks or other authorized deposit-taking financial institutions that can be used for making and receiving payments. Such accounts are known in some countries as current accounts, checking accounts, or other similar terms.<sup>c</sup>
- Digital payment** (also, “funds transfer” or “payment transaction”): The payer’s transfer of funds through digital means to the payee. A digital payment begins with payer/payee initiation and is considered complete once final funds have been received by the payee.
- E-money account:** A prepaid account that can be offered by banks and other authorized deposit-taking financial institutions as well as by nondeposit-taking payment service providers such as mobile network operators.<sup>c</sup>
- Indirect participant:** An entity that does not have direct access to the payment system services and is typically not directly bound by scheme rules, but whose transactions are cleared, settled, or recorded through a direct participant. An indirect participant often has a bilateral agreement with a direct participant.<sup>a</sup>
- Instant payments:** 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, around the clock, 365 days a year.<sup>c</sup>
- Interoperability:** The technical or legal compatibility that enables a system or mechanism to be used in conjunction with other systems or mechanisms. Interoperability allows participants in different systems to conduct, clear, and settle payments or financial transactions across systems without participating in multiple systems.<sup>a</sup>
- Interparty fee** (also referred to as “interchange fee”): Fees paid between participants to balance economic incentives in a transaction. The scheme manager, switch operator, and settlement agent do not earn this fee. Also, an interparty fee is not a customer fee, though it may have implications (positive or negative) for the price paid by the customer.
- Off-net transaction:** A transaction between accounts held with two different providers.
- On-net transaction:** A transaction between accounts held with the same provider.
- Oversight:** A central bank function whereby the objectives of safety and efficiency are promoted by monitoring existing and planned payment, clearing, settlement, and related arrangements, assessing them against these objectives and, where necessary, inducing change.<sup>a</sup>

a. Definition adapted from the BIS Glossary. For full definitions of this and other payment terms, see “Glossary,” Bank for International Settlements, updated 17 October 2016, <https://www.bis.org/cpmi/publ/d00b.htm>.

b. Definition adapted from “Payment Aspects of Financial Inclusion.” For full definitions of this and other payment terms, see CPMI (2016b).

c. An EMI can be a nonbank (an entity that does not intermediate deposits collected from the public) or a bank that is specialized in e-money issuing and not permitted to lend, such as payment banks in India, niche banks in Mexico, and payment service banks in Nigeria. However, EMIs do not include models where customer deposits are held in traditional deposit accounts, even if they are accessed through agents or digital channels such as mobile phones (e.g., branchless banking providers in Pakistan). See Dias and Staschen (2018).

**Participant** (also referred to as “member” or “direct participant”): Generally, an entity who has direct access to the payment system and is bound by scheme rules, with transactions cleared, settled, and recorded through the payment system. A payment system may have different classes of participants related to specific characteristics or obligations.<sup>a</sup>

**Payment system:** A set of instruments, procedures, and rules for the transfer of funds between or among participants. The system includes the participants and the entity operating the arrangement (e.g., scheme manager, switch operator).<sup>a</sup>

**Scheme:** A scheme is a set of procedures, rules, and technical standards that govern how transactions are executed (CPMI 2016a). Scheme rules define the terms for maintaining an effective payment system, including rules for how participants will work together, how economic incentives will be balanced, and how disputes will be managed.

**Scheme manager:** The scheme manager is the actor/entity responsible for scheme governance—the relationships between owners, board of directors (or equivalent), management, participants, and other stakeholders. The scheme manager typically is the ultimate decision maker on scheme rules, subject to regulation and oversight, and sets the strategic direction for the scheme.

**Settlement:** The discharge of an obligation in accordance with the terms of the underlying contract.<sup>a</sup>

**Settlement, deferred net:** A settlement mechanism that settles on a net basis at the end of a predefined settlement cycle. Settlement positions are considered netted when obligations are offset between or among participants, thereby reducing the number and value of payments to be settled.<sup>a</sup>

**Settlement, real-time gross:** A settlement mechanism in which the settlement of obligations occurs individually on a transaction-by-transaction basis for full value as they occur.<sup>a</sup>

**Settlement agent:** An entity that manages the settlement process, often the central bank.<sup>a</sup>

**Switch:** A switch is a technology that connects system participants and supports the passing of transaction data, and often, calculating settlement positions.

**Switch operator:** The owner/operator of the technical infrastructure for processing transactions in line with requirements defined in scheme rules. The duties of a switch operator involve transmitting, reconciling, confirming, and netting transactions between participants (collectively referred to as clearing) and submitting instructions for the transfer of final funds (settlement initiation). The switch operator also may offer other services such as fraud monitoring or directory services.

**Transaction account:** An account held with a bank or other authorized and/or regulated service provider (including a nonbank) that can be used to make and receive payments. Transaction accounts can be further differentiated into deposit accounts and e-money accounts.<sup>c</sup>



