



FOCUS NOTE

THE FUTURE OF FAST PAYMENTS



OCTOBER 2023

FINANCE, COMPETITIVENESS & INNOVATION GLOBAL PRACTICE

Payment Systems Development Group

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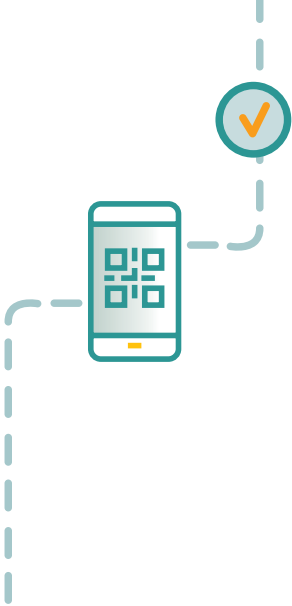
1 SETTING THE CONTEXT

The World Bank has been monitoring closely the developments of fast payment systems (FPS) by central banks and private players across the globe. This comprehensive study of FPS implementations has resulted in a policy toolkit.¹ The toolkit was designed to guide countries and regions on the likely alternatives and models that could assist them in their policy and implementation choices when they embark on their FPS journeys. Work on the FPS Toolkit is supported by the Bill & Melinda Gates Foundation under Project FASTT (Frictionless Affordable Safe Timely Transactions). The toolkit and other relevant resources of Project FASTT can be found at fastpayments.worldbank.org and consists of the following components:

1. The main report *Considerations and Lessons for the Development and Implementation of Fast Payment Systems*
2. Case studies of countries that have already implemented fast payments
3. A set of short focus notes on specific technical topics related to fast payments

This note is part of the third component of the toolkit. It aims to provide inputs on the future of fast payments. It is imperative to understand the key trends and the emerging future of fast payments more broadly, to help create a more inclusive and holistic fast payment ecosystem that can adapt to the changing needs and circumstances of the market and users, as well as to ongoing globalization and technological advancements.





2 BACKGROUND

Fast payments are becoming a standard feature of modern payment ecosystems. Consumers and businesses increasingly expect to be able to transfer and access money between accounts and institutions across the domestic economy, and now also internationally, in real or nearly real time and around the clock. Low-cost ubiquitous internet connectivity and computing power, and the sophistication of client interfaces, such as mobile phone apps, have transitioned a wide range of commercial and social activity online and accentuated the demand for real-time banking and payment services aligned with this new environment. In this regard, the global real-time payment market is expected to grow at a compound annual growth rate of 35.5 percent from 2023 to 2030.² The Asia-Pacific Region has so far dominated this market, with a share of 38 percent in 2020.

Where based on incumbent systems, fast payments may entail not just technical but also structural changes to the organization, commercial strategy, and governance of operators and payment service providers (PSPs). Some FPS are established as greenfield institutions, but the majority of FPS have evolved as new initiatives or systems built within existing institutions. The adoption of an FPS is often motivated by PSPs trying to fulfill new demands from market participants in the real economy for new service types, quality, and access. In some jurisdictions, non-bank PSPs, such as mobile money PSPs, have made inroads but are often constrained by lack of interoperability within the mobile money ecosystem and with the broader financial sector. Responding to these market changes, FPS operators often aim at integrating new types of members and partic-

ipants or supporting technical providers, or they alter other aspects of their governance.

The major end-user advantages of fast payments are convenience, speed, and cost. The clearest benefit of fast payments from an end user's perspective is the ability to complete payments quickly, wherever and whenever necessary, providing almost immediate access to funds. The direct savings in cost and time are usually significant. There are also qualitative advantages in terms of user experience and customization. Together, these features of fast payments have immediate benefits for payees and payers.

FPS often provide new services and ancillary functions that differentiate themselves from other existing payment systems. FPS operators still serve many of the same segments and user groups addressed by incumbent systems, but competition has induced them to integrate the advantages of modern FPS into new products that motivate uptake and usage. New functions to enhance usability and security or allow for the design of more bespoke payment services have also emerged as FPS ecosystems mature and become more sophisticated.

FPS implementation approaches and ecosystem-development strategies vary across markets. Individual fast payment arrangements often require new or amended functionalities—for instance, to verify accounts in real time, enable new third-party payment initiation, and enhance management of standing orders. While some FPS provide these value-added services themselves, others rely on an expanded ecosystem of more specialized payment and technical overlay service providers that build on the underlying network and functionality.

Policy makers welcome the pro-competitive effects that reductions in the costs and delays of interbank fund transfers can have. In many markets, domestic payment systems have upgraded low-value retail infrastructure and arrangements to enhance access and accelerate payment cycles; in other markets, new systems and arrangements have been established. Across the world, most countries are pursuing the development of faster, more accessible, yet secure and efficient retail payment systems.

Dynamic effects are also unleashed by the advent of FPS. The evolution of payment services and adaptation to change have often been slowed by the highly integrated and regulated networks through which they operate. Fast payments have indirectly enhanced the agility of the sector, led to more unbundling of services, and enabled their reconfiguration in ways that tap into economies of scope and scale within and beyond the financial sector. Indeed, fast payments represent a structural change that, in coordination with other innovations, such as digital ID, will force the payment industry to redefine the concept of payments and reassess the range of possibilities for financial services.

2.1 FPS EVOLUTION WORLDWIDE

Real-time payment capabilities and systems have been around for some time. Several large-value payment systems have operated in real time for decades, and almost all countries have at least one system of this kind currently in operation. However, these real-time payment systems were typically designed to serve banks and generally are available only to them and, in some cases, a few other financial institutions.

The digital economy and commercial innovations unleashed by the internet have steadily enabled and driven demand for interactive, digital, near real-time functionality and access to funds. Expanding real-time payment capabilities to bank customers has also become more economically viable in recent years. As a result, the deployment of real-time payments for end customers has notably accelerated, and the availability of the systems that process such payments—that is, FPS—has been extended to nearly around the clock. Some FPS implementations build upon existing ACH/RTGS systems. But others, such as the New Payment Platform in Australia, have been established as entirely new stand-alone systems, both technically and from an organizational perspective. As of June 2023, according to World Bank research, about 100 jurisdictions already had a live FPS. Many more have plans to implement in the near future.

2.2 ECOSYSTEM CONSTITUENTS

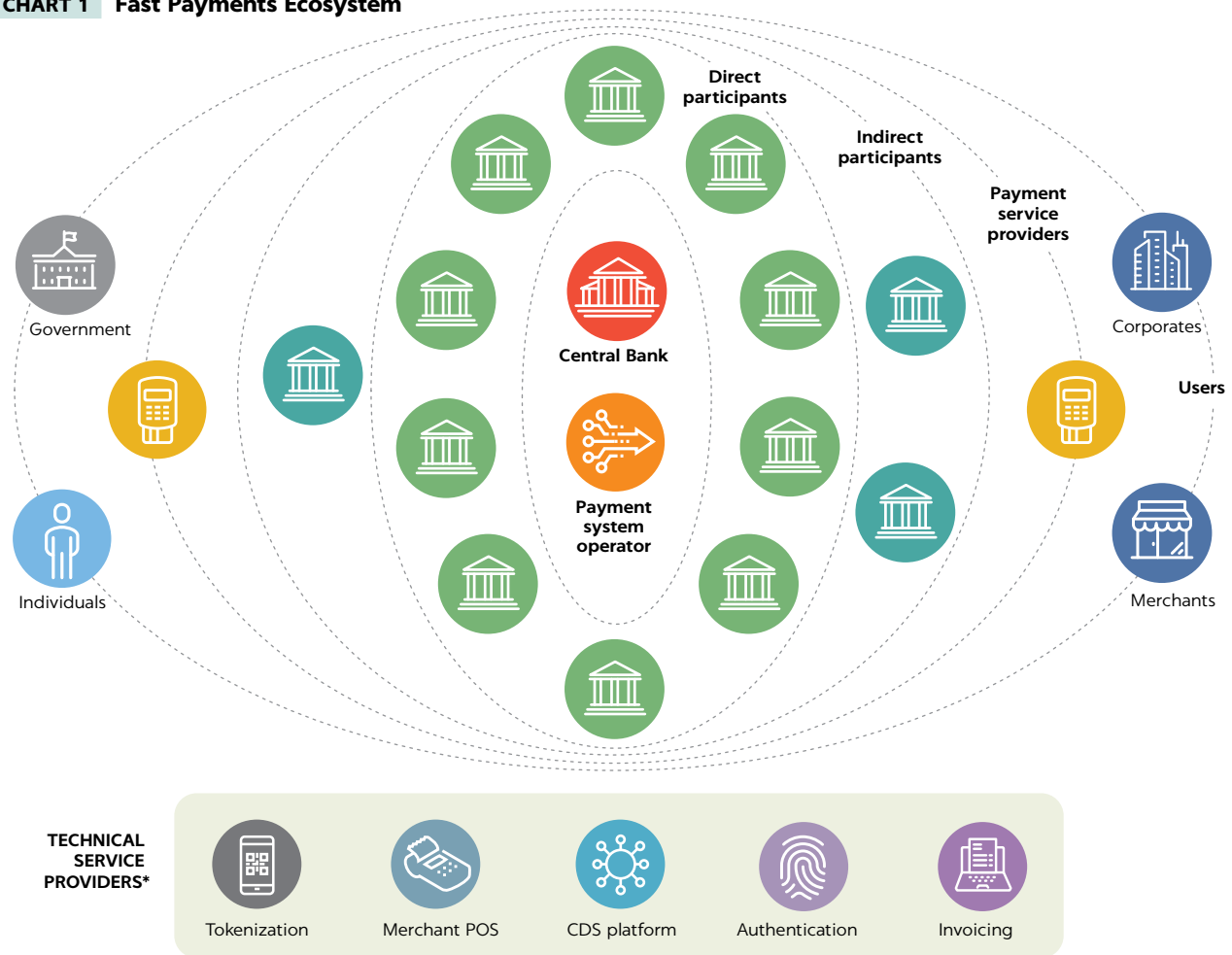
FPS typically accelerate the evolution of existing ecosystems and the integration of new networks. FPS often support the addition of new participant types and/or an expansion of the role of indirect participants. They also rely on an expanded array of technical service providers. New FPS functionalities will often require changes to system rule-books, standards, and terms and changes also on the side of system participants.

FPS implementations may expand participation and participant types. This usually helps in broadening uptake by harnessing the incentives of other actors in the economy. In this regard in India, for example, the UPI system introduced third-party app providers to provide access for consumers to initiate and manage payments. Third-party app providers include technology firms such as Google, chat application providers such as WhatsApp, and e-commerce players such as Amazon. In other markets, such as in Europe, similar firms can access an FPS as licensed payment-initiation service providers.

A broader ecosystem of technical and business service providers is emerging to facilitate the uptake of, and enhance usage of, FPS. These firms are not formal members or participants of an FPS but may support the banks, payment institutions, or other licensed PSPs. Both incumbent and new technology firms play this role of diversifying, customizing, and integrating new channels, overlay services, authentication, and value-added services around the core services offered by an FPS.

2.3 FAST PAYMENT SERVICES AND SEGMENTS

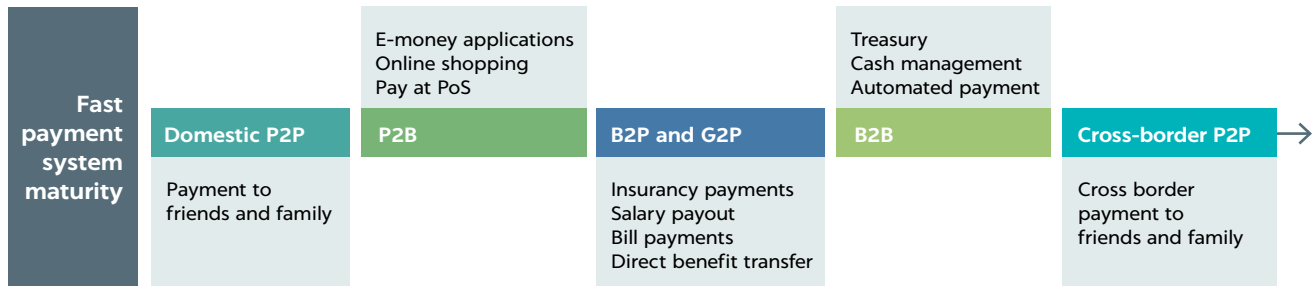
Fast payments are being adopted to provide a growing array of services addressing different segments. Early-stage implementations generally focus on filling the most basic gaps in the payment industry: Most FPS begin catering to person-to-person (P2P) payments. Once established, however, FPS expand real-time functionality to enhance other payment types. For example, driven by e-commerce and mobile phone usage, volumes in more mature systems are dominated by person-to-business (P2B) payments. While FPS ecosystems continue to evolve, a few prominent new service types, supporting functions and business-case deployments, recur across markets. Some examples of these are provided in charts and tables 1 and 2 in the following subsections. More recently, some national FPS have been interconnected to facilitate cross-border real-time retail transactions. FPS also enable request-to-pay (RTP) services for one-off and recurring billers (for example, subscriptions and rent), offering consumers control and security.

CHART 1 Fast Payments Ecosystem

*Examples


TABLE 1 Technical Service Providers Supporting Fast Payments

Service Providers	FPS Implications
Merchant service providers	FPS require merchants and vendors to adapt the tools they use to initiate and accept payments and integrate them with their sales, customer-management, and other internal systems. Merchants service providers offer new point-of-sale devices and other payment acceptance methods, such as QR codes, software services, and value-added services, for merchants to accept fast payments as viable alternatives to payment cards and other existing payment methods.
Security and authentication	FPS may require new forms of client authentication and transaction authorization, including via combinations of mobile, internet, and point-of-sale devices. New methods to confirm identity and accounts are also needed to provide for a user-friendly service while ensuring security. Account identifiers are increasingly presented via QR codes to facilitate payment initiation—where account numbers would be too cumbersome and unsecure.
Payment gateways	With increasing choice of payment networks and overlapping domestic and international issuance and acceptance, payment gateway operators play an important role in helping merchants connect to different systems beyond those offered by their main bank, possibly including an FPS. Banks are also increasingly devolving acquiring operations to specialist providers that may have more incentive to commercialize new payment services and adapt them to specific user segments.
Billing and collections	Fast payments enable enhanced billing and subscription services but require new functionalities and providers to integrate with central systems and overlay services.
API integrators	Growth in the array of application programming interfaces (APIs) ³ offered by banks and technology companies has given rise to demand for specialized API service integrators within financial ecosystems to help with evolving standards, security, and authentications for payments as well as other services. API integrators play an important role in managing the growth of non-bank payment-initiation services that can be key to the growth of fast payments .

CHART 2 Typical Evolution of Fast Payments**TABLE 2** Service Types

	PERSON-TO-PERSON	FPS are frequently used in early stages of deployment to enable real-time domestic P2P transfers and payments. Coupled with user-friendly initiation, aliases, and account verification, these transfer services compete with cash and are often used to make on-the-spot transfers in person or remotely. Common use-case examples include bill-sharing applications and conversational commerce. The service has become valuable for making funds available immediately—for example, in unanticipated instances to a family member or friend. They are also used by smaller merchants or local service providers, especially in the informal sector, where personal bank accounts are normally used for business purposes.
	E-COMMERCE MERCHANT PAYMENTS	<p>Person-to-merchant or person-to-business payments can now be made instantly in many countries using the fast payment rails. Payment systems such as UPI in India, SPEI in Mexico, PromptPay in Thailand, and the Faster Payments Service in the United Kingdom, among others, offer an RTP service that facilitates such payments. Merchant payments are becoming a major use case, and the entry of multiple merchants is expected to bolster fast payments further, making it important for merchants to be a part of this ecosystem. Additionally, FPS have seen adoption of a variety of retail use cases, such as deferred payments or “buy now, pay later” (BNPL), digital lending, instant refunds, and electronic bill presentment and payment.</p> <p>Over the last decade, there has been a substantial shift in shopping preferences toward online payments. PSPs globally have been working on solutions to simplify the customer experience. Refunds are a pain point for both customers and merchants. For example, the lack of transparency and delay in refund processing (which normally takes five to seven business days and even longer in some cases) create customer-retention problems for merchants and dissatisfaction among customers. Instant refunds are now being hosted as a separate service built on top of fast payment services.</p>
	REQUEST TO PAY	<p>RTP is a real-time method of collecting payments, triggered by the payee. When compared with similar mechanisms, such as direct debits and electronic bill presentment and payment, RTP solutions are viewed as an easier, cost-effective, and faster alternative. Unlike the legacy pull payment mechanisms, RTP works on a one-off authorization model and does not require a mandate to be set up up front.</p> <p>The initial phases of a new fast payment implementation start with only the push mechanisms. In many cases, RTP is introduced as a separate service built on top of the fast payment rail at a later stage, when the payment framework has matured. FPS in the United Kingdom is an example of an implementation that started with only a push payment mechanism and introduced RTP as a service much later as a pull payment feature. Not all RTP are based on pull payments, though: The RTP in Mexico (that is, CoDi) is a push-type mechanism that was also introduced several years after the launch of SPEI.</p>
	SCHEDULED PAYMENTS OR STANDING ORDERS	Scheduled payments or standing orders charge a consumer on a recurring basis for a predefined term. This is commonly used by subscription businesses, online courses, education service providers, gyms, salons, internet service or cell providers, insurance companies, and payday loan companies, among many other businesses. With this feature, customers can preauthorize a transaction to be debited from his/her transaction account later, on a recurring basis.

TABLE 2 *continued*

	CROSS-BORDER FAST PAYMENTS	<p>Several jurisdictions are interlinking their national FPS. Consumers are increasingly expecting the ease and immediacy of domestic transfers also to be available between countries. Increased standardization in payment messaging, including for FPS, across global markets (the use of ISO 20022 is a key example) enables interoperability and is gradually facilitating end users to transfer funds across borders in close to real time.</p> <ul style="list-style-type: none"> • For example, PromptPay (Thailand) and PayNow (Singapore) have linked their FPS to provide cross-border payments to their users. A similar arrangement has been made between PromptPay and Malaysia's DuitNow. • In August 2022, the National Payments Corporation of India announced that UPI would become accessible as a QR code payment solution in the United Kingdom on all PayXpert's point-of-sale devices for in-store payments.⁴ • A specific cross-border initiative for fast payments (project Nexus) is under development by the Innovation Hub of the Bank for International Settlements. In essence, rather than a payment system operator building custom connections for every new country to which it connects, the operator can make one connection to the Nexus platform. By late 2022, a working prototype of Nexus had already been built and was being piloted to connect three established FPS from the European Union, Malaysia, and Singapore. Additional FPS are expected to join.
	GOVERNMENT PAYMENTS AND DISBURSEMENTS	<p>Rapid availability of funds and potential integration with wallets and other accounts used by the mass market make fast payments highly relevant to governments for executing their payments. Indeed, some government-to-person (G2P) payment arrangements already use FPS to transfer funds to recipients of salaries, pensions, subsidies, or benefits. This is the case of SPEI in Mexico, among many others. Further, in some cases, national ID numbers, mobile phone numbers, and/or other identifiers are being linked to fast payment services to enable the disbursal of such payments.</p>
	BUSINESS-TO- BUSINESS PAY- MENTS	<p>Business-to-business payments are supporting cash-flow management and reducing settlement risks. Banks and other PSPs are providing fast payment services to corporations through enterprise resource planning integration, significantly increasing rates for straight-through processing. However, a key concern for the modern-day corporate treasurer is the caps or upper limits set on the value of transactions in most FPS around the world, which might inhibit businesses from using them for business-to-business payments. Systems in some markets usually have a cap equivalent to a few thousand US dollars or lower, while in others such as in the European Union the cap can be as much as €100,000.</p>

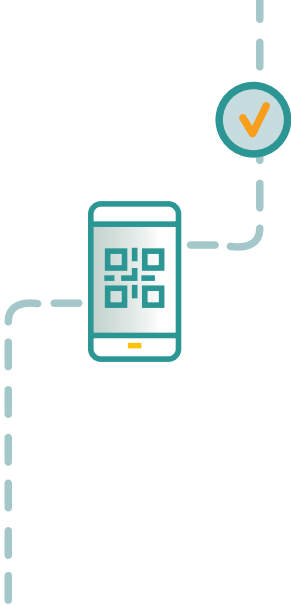
2.4 SUPPORTING FUNCTIONS AND OVERLAY SERVICES

Fast payments require new functions to help customers initiate, verify, or manage payments in new contexts, via new channels and integrated with value-added services. Digital

processes need to connect multiple parties across the ecosystem, including nonparticipant technical providers. These services that sit on top of FPS and broader ACH services are often referred to as “overlay services.” Some examples are outlined below in table 3.

TABLE 3 Supporting Functions and Overlay Services

	ACCOUNT ALIASES AND CUSTOMER DIRECTORIES	An account alias is a unique identifier that is mapped to the number of a payment account held at a bank or other PSP. Aliases make it easier for customers to identify and label payees and can enhance security by limiting divulgence of account numbers to unverified merchants or third parties. End users also find it convenient and practical not to have to annotate/enter routing numbers, account numbers, payee names, addresses, and so on, as these appear in bank records. An alias could be a name, word, or any combination of alphanumeric and/or other approved characters to reasonably represent and identify an account holder, including a mobile number. This account alias is unique. To make a transaction, the payer can enter a beneficiary alias in place of the beneficiary's account number. For further insights into aliases, see the World Bank's 2021 focus note <i>Proxy Identifiers and Databases in Payments</i> . ⁵
	CONFIRMATION OF PAYEE	Confirmation of payee allows a payer to check that the name (including a personal/business account indicator) they give for a new payee is the same as the account name/type held by the payee's PSP. The payer's bank or other PSP looks up the mobile phone number entered for the payer's beneficiary and receives back their sort code, account number, and account name. They inform the payer of the account of who the beneficiary is, to confirm the payment. The payer then transfers funds to the corresponding payee account, thus reducing chances of mistakes. As an example, FPS in the United Kingdom supports confirmation of payee with the following four possible outcomes: (1) Yes: The name and account type you supplied match the details on the account. (2) No: The name is a close match; the name on the account is “XYZ.” (3) No: The name doesn't match the name held on the account. (4) Unavailable: It has not been possible to check the name because timeout, account does not exist.
	QR CODE-BASED PAYMENTS AND TRANSFERS	QR codes contain payment information for both the payee and its payment provider. The payee is often a merchant, although QR codes are also used by individuals for P2P payments or transfers. QR codes are scanned by smartphones to initiate a payment. Dynamic QR codes are one-time generated QR codes that usually carry additional transaction-related data (such as the amount) as compared to static QR codes. QR codes are beneficial in FPS, as the receiver of a payment does not need to share any identification details of her/his account to the sender, and it reduces errors made by senders while manually inputting details about the receiver. In many countries, consumers already take advantage of QR code-based payments. For instance, the payer may scan the QR code through a third party or participant's mobile app that facilitates the connection to their financial institution's account. In Hong Kong, for example, users of the FPS can execute payments by scanning a QR code and can also receive money by generating a QR code. ⁶
	EXCHANGE RATE CONVERSION	For cross-border payments in different currencies, instant foreign exchange services will need to be provided. This can be provided directly through linked FPS or, eventually, a unified platform, or at a previous step by the participating banks and other PSPs, under common rules or in a totally independent manner from the cross-border payment arrangement.
	BILLER DIRECTORIES	Billing services require specific overlay services. Subscription-based and recurrent billing services require directories, invoice management, and account-mapping functionalities to enable payees to find, confirm, and pay their bills or to be addressed properly by requests to pay. These overlay services need to be integrated with both the FPS and the bank/payment account providers.



3 FAST PAYMENTS IN THE CONTEXT OF BROADER MARKET EVOLUTION

The decoupling of payment and banking services is enabling market forces to influence how fast payment services develop and compete with other payment alternatives and networks. The overall environment in which FPS are emerging is multifaceted, dynamic, and evolving in phases. External forces are influencing the landscape for FPS, but fast payments themselves are also influencing the behavior of market participants and competing payment systems and service providers.

Fast payments address several inefficiencies in legacy retail payment services. Apart from making funds readily available to beneficiaries, in an effort to replicate some of the benefits of cash, they also enhance access and usability. And by making fund transfers available to beneficiaries immediately, they lower hurdles to switching and “multi-homing”—the practice of consumers operating multiple bank or payment accounts. Built on networks that provide increasing returns to scale, FPS can not only broaden adoption and usage of digital payments but also contribute to further declines in the marginal costs of payments. In an open and more competitive market, this can lead to gains in system-level efficiency.

At a commercial level, markets are discovering the potential of real-time payments to be integrated into a growing array of use cases and business models. In both remote as well as face-to-face transactions, FPS can enhance cashless payment experiences and outcomes for businesses and the satisfaction of their consumers. For example, some “digital native” businesses would not be feasible without appropriate payment mechanisms.⁷ Now, as FPS become more widely available beyond closed proprietary networks, more

digital firms can benefit from the scale and accessibility of well-governed and interoperable retail systems. Furthermore, in several markets, micro businesses such as in-person family shops and street vendors are now in a position, through fast payments and the use of QR codes, to accept electronic payments seamlessly and at a low cost.

This section briefly outlines some of the exogenous and endogenous factors influencing the market and the demand-side trends shaping FPS service offerings and the business models in which they are integrated.

3.1 MARKET TRENDS AND FORCES

Policy Aims and Drivers

Policy makers can play an important role in reshaping incentives, upgrading infrastructure and the regulatory framework in which FPS operate. The following policy initiatives can shape the role of FPS:

- **Enhancing efficiency:** Alongside aims of protecting stability and integrity, most regulators have a mandate to enhance the efficiency of payment services and systems. In many jurisdictions, it is acknowledged that most incumbent PSPs and payment systems have been slow to adapt to, and embrace, innovations that could lower costs and improve services, or to integrate and address the needs of new participants in the economy. Therefore, some authorities have used various powers to introduce fast payments and/or to intervene more directly in the broader development road map for retail payments and the market infrastructure supporting them.

- **Regulation of payment services:** Reforms are being introduced in some markets to facilitate and properly regulate the role of new payment services and service providers, such as for innovative payment initiation (for instance, in the European Union), and to evolve the role of payment wallets or e-money accounts in the broader ecosystem. Such changes can alter the market structure in which FPS operate as well as the kinds of services and service providers with which they collaborate. Open banking-type regulations are also changing the legal framework and rights under which payment services can be offered directly to consumers.
- **Data and digital market policy:** FPS are a key element of the financial data ecosystem. As a matter of fact, FPS is viewed as a critical payments layer in Digital Public Infrastructure (DPI), and its interoperability with other DPI layers such as data is indeed important. Policy makers are seeking to enhance the control that users have over their financial data, including transactions. Open banking promotes innovative payment-initiation services together with powers for consumers to share consent-based access to transaction data held at banks. Many policy makers are seeking to expand controlled and secure consent-based access to financial product data. FPS already are core elements of a more open financial data ecosystem in which all sorts of users and service providers seek to tap into more granular payment data on a more frequent basis. FPS operators may be called upon to facilitate access by participants to legal and compliance controls as well as provide application programming interfaces (APIs) and standardized integrations so that payments are integrated with the rest of the evolving ecosystem for digital finance.
- **Interoperability:** Interoperability is key to enhance the reach, usefulness, and usability of all types of bank accounts as well as of e-wallets. For example, the Reserve Bank of India issued guidelines making interoperability of wallets mandatory by March 31, 2022, using UPI.

Supply- and Demand-Side Considerations

- **Price and variety of competition in retail payment acceptance**
FPS can adopt different pricing strategies building on some inherent structural differentiators from other forms of payment. For example, FPS operators and providers of fast payment services typically charge fixed fees per transaction to participants and end users, respectively. In several cases, regulators and operators have worked to keep these fees as low as possible, especially for low-value payments. Moreover, except for a very few cases, ACH credit transfers have not been readily used at the

point of sale; in contrast, FPS functionality is increasing the ease with which credit transfers (and debits) can be used by merchants as a viable alternative to card or e-wallet payments, as well as cash. Extensive usage of fast payments at the point of sale could put downward pressure on existing fee structures for payment cards, such as merchant discount rates.

Merchant service providers can harness FPS to offer lower-cost payment acceptance services to retailers. Merchant service providers complement their offer with other value-added services to merchants—for instance, integrating payments with loyalty, cash-management, or user experience enhancements that improve financing or client spend. In combination with lower transaction fees, this can unleash an increase in fast payments as a substitute for card payments and potentially put further downward pressure on card payment fees, and a shift in competition from pricing to value-added services.

- **Trade in digital services and platforms**

The growth in demand for retail payment solutions is increasingly influenced by digital firms and platforms that work across borders using highly scalable models and with less need for a local legal and operational presence in individual markets. Beyond consumer-oriented e-commerce, firms are offering a growing array of services, including entertainment, computing, accounting, marketing, finance, and even logistics solutions on a cross-border basis. It is therefore natural that the payment services they need (for example, to get paid by users, manage subscriptions, or pay local fees or the few local employees they may have) be made via international solutions to and from bank accounts held in third jurisdictions. Fast payments will eventually need to adjust to these dimensions of demand for interoperable fast payments at the cross-border level.

Other Market Developments

- **Data analytics and data-monetization services**

As described earlier, the data generated through digital payments and other digital financial services is of great interest to platform owners/operators and to a large variety of PSPs and other parties. A growing accumulation of customer data, together with effective new tools to use this data to analyze behaviors and preferences, is now a key value element of the business model of many banks and other PSPs, including big techs that participate in the provision of payment services.

All these changes are altering the market for payments significantly, not the least because market dynamics, coupled in some cases with regulatory interventions,

are pushing for pure payment services to be offered at zero or very low cost, and stakeholders in the payments industry need to find other means to obtain revenues.

- **Changes in FPS settlement models**

The majority of the FPS that were first or early movers (that is, early in the past decade or in the mid-2010s) opted for the deferred net settlement model, in which the bank or other PSP of the payee credits the account of the latter before it receives the corresponding funds from the bank or other PSP of the payer. The real-time settlement model has nevertheless become more popular for new FPS implementations. In this settlement model, the bank of the payee receives the funds from the bank of the payer before it credits the account of the end beneficiary, and all this happens in a matter of a few seconds. For further insights, refer to the World Bank's 2023 focus note *Settlement Models in Fast Payment Systems and Implications for Participant Access*.⁸

- **Constant evolution of payment initiation**

As mentioned earlier, in several markets third-party initiation services are already one of the main drivers of service/experience innovations and overall volume growth in FPS. Strong customer authentication for payment initiation is a well-known challenge of this market development. Some of the most recent trends in this area include integrating facial recognition and voice biometrics to fast payment initiation.⁹

- **Fraud risk management**

FPS enable the immediate and around-the-clock transfer of value from payers to payees. Fast payments can be attractive to fraudsters precisely because of this immediacy, and also because practically any individual, business, or government entity is or can be a payer or payee in an FPS, and many are unaware of how they could keep from becoming victims of financial crimes. Phishing and social engineering, malware, advance persistent threats, and friendly fraud are among the main fraud techniques.

In summary, managing vulnerabilities has grown increasingly complex as new and sophisticated security threats have become prevalent. All relevant stakeholders, including regulators, operators, banks, and other PSPs, need to be involved in fraud prevention and management. Users also have a significant role to play in prevention.

- **USSD-based payments**

Despite vertiginous change, USSD technology¹⁰ is still useful and even necessary to facilitate fast payment transactions for non-smartphone and non-internet users.

In India, for example, an interoperable platform based on USSD was developed connecting all mobile network operators. This was envisioned for reaching out to the digitally excluded. USSD allows these customers to check bank balances, view mini statements, and initiate fund transfers through their feature phones.

3.2 BROADER SERVICE INNOVATIONS

Broader trends in retail financial services affect the way in which FPS and services are being deployed. Payment processes and services increasingly need to be adapted to specific circumstances with customized financial and non-financial value chains and services. An understanding of the key trends transforming finance can be important for the planning of FPS strategy and market development. This section outlines some of the more prominent financial services and business models relevant to FPS deployments.

Deferred Payments and Buy Now, Pay Later

BNPL solutions generally offer short-term loans with fixed payments and no interest and have become a standard service linked to new non-card payment services. BNPL services provide customers with short-term credit services, helping overcome situations that lead to abandoned shopping carts and enabling customers to bridge genuine gaps in working capital. While card payment services often include credit facilities, FPS require other arrangements to support credit. From a merchant's perspective, BNPL significantly increases the conversion rates of clients and the average order value. Unlike credit cards, BNPL alternatives are usually single-click options for a purchase, capped to a certain amount.

Table 4 shows some of the key drivers that have enabled the unprecedented rise of BNPL options globally when compared with legacy options for deferred payments, such as credit cards.

Some early-stage online payment companies used existing interbank credit transfer systems, while others initially built closed networks with proprietary wallets to offer merchants alternative e-commerce payment-acceptance solutions. Once established, they layered short-term credit services over these payment functions, leading to the BNPL services that offer customers the ability to shop now and pay later in installments.

Many of the new entrants in the BNPL space from the payment area—Adyen, Klarna, PayPal, and others—have embedded the BNPL option on their payment product services. In contrast, the availing of the option of equated monthly installments (EMIs) during a product purchase is

TABLE 4 Distinctions between BNPL and Equated Monthly Installments via Credit Cards

Parameters	BNPL	Equated Monthly Installments via Credit Cards
Revenue model	BNPL issuers generate revenue mostly through merchant and late-payment fees.	Credit issuers generate revenues from processing fees and interest charged on credit.
Credit tenure	The tenure for BNPL credit is lower than cards, ranging up to about 60 days.	The tenure for credit card repayments varies from 15 to 45 days. Customers also get the option to convert their repayment into equated monthly installments, which extend up to 60 months.
Check-out process	BNPL options are the most digitally native credit option to be embedded along with certain other payment features and options and are in line with the seamless one-click check-out process.	Credit cards are one of the prominent payment options available on the merchant check-out page and at brick-and-mortar stores. However, factors such as redirectioning of information (for example, for transaction approval) can increase the check-out process time and frictions. In-store payments sometimes experience higher response times along with transaction drop in certain scenarios.
Credit accessibility	BNPL is a relatively flexible way for consumers to access credit, including some who do not have a credit card.	Credit card issuers often set restrictive eligibility criteria for card issuance. Many consumers may not have access.
Average ticket size	The average ticket size for BNPL is generally lower than for cards and is linked to purchases from select merchants.	The average ticket size for credit card loans is higher, and the range is much broader than BNPL options.

hosted as a separate service from the core payment rail. However, the repayment of EMLs is often hosted on the core payment rail, in some cases using a RTP service—as an example, to pull funds from the customer’s account at the specified due date on periodic intervals.

FPS services have enabled this kind of service because (i) they generally charge lower, fixed fees to merchants for online transactions than payment cards and (ii) they enable merchants immediately to confirm receipt of funds, or at least that an irreversible payment has been made to them, therefore enabling them to confirm purchases online in a real-time process, as a substitute for cards.

There are, of course, several downsides to BNPL services. In general, BNPL services are not regulated as closely as credit card loans; therefore, terms and conditions for BNPL may vary significantly and be less transparent. Missing or late payments will most likely result in late fees and may damage a customer’s credit score. Moreover, it has been observed that people using BNPL services will tend to overspend on items they would not normally be able to afford if they had to pay up front. This can lead to excessive debt that may be difficult to manage. Indeed, in the United States, for example, a report issued by the Consumer Financial Protection Bureau in March 2023 found that users of BNPL services were far more likely to have bank overdrafts, payday loans, pawn loans, and other high-interest financial products, indicating that they are more financially vulnerable than nonusers of BNPL financing.

Embedded Finance and “Super Apps”

The digital economy is increasing commercial, operational, and technical integration between financial- and real-sector services. From both, the business and the user experience perspective, this leads to an expanding array of circumstances in which payments, as well as other financial services, are “embedded” in real-sector services. In some cases, bigger technology platforms have developed “super apps,” such as Grab, PayTM, and Gojek in Asia; Rappi in Brazil; and Jumia in Africa, that assemble a variety of services on one platform. But the phenomenon also applies to smaller or more niche platform firms offering services ranging from accounting and procurement to logistics, education, or even social commerce activities—for example, within the informal sector.

A key success factor for these platforms has been their ability to integrate fast payment services into their own site. They need to connect all sorts of users, partners, and providers. Early movers set up their own closed-payment wallet networks. With the advent of open network FPS, super apps now have other means to fulfill payments between actors on the platform. They provide APIs and open data architecture to emulate rich data flows that FPS providers or third parties can use to add overlay services.

FPS have now enabled other smaller platforms to embed payments without the need to build their own proprietary payment networks. Big techs have gained technical access to some FPS to initiate payments and offer in-app payments in a range of contexts, including chat apps (for example, WhatsApp in India and Brazil)¹¹ or for smaller commerce sites.

Digital Lending

FPS may be integrated by new and incumbent financial institutions as they streamline credit value chains and processes, including to disburse and collect payments. In loan underwriting, digital solutions have enabled lenders to eliminate manual processes related to loan applications and approvals for both retail and business consumers. As part of the lending process, disbursements and loan repayments are being made by new payment options that reduce reliance on legacy payment rails, such as checks and ACH payment methods.

Traditional banking and non-banking institutions along with digital lending applications are integrating with FPS for faster disbursement of loans to customers. This has emerged as one of the key selling propositions.

Furthermore, payment data—including data generated by FPS—is being used extensively by scoring models to enhance information about consumer behavior, needs, and risk. Alternative scoring models use data from digital applications and platforms about consumer behavior for credit risk assessment. This data complements credit bureau data and internal lender assessments. From a demand perspective, alternative scoring models enable more borrowers with no credit history to gain access to credit with a key focus on ability, stability, and willingness to repay as key eligibility factors in the underwriting process.

Cash Management and Payments for Small and Medium-Sized Enterprises

The digitalization of businesses' financial and cash-management operations is leading to demand for more interactive and bespoke payment solutions. From invoicing and accounts payable to salary and customer claims, FPS services are finding increasing opportunities to enhance business financial management. While not all payments must be completed in real time, many ancillary functions and payment types—such as account sweeps, third-party initiation, RTP, e-invoicing, subscription management, and collections—are steadily becoming more readily available to even small enterprises. As the internal systems (for example, enterprise resource planning) and cash-management solutions used by small and medium-sized enterprises evolve, FPS services are likely, as part of a more comprehensive offering, to become more relevant and to integrate eventually with more related services and technologies. Some integration features include the following:

- **Electronic presentation of invoices and integrated payments:** Allows customers to have all required information in their device and, eventually, execute payment instantly.

- **Expanded digital billing channels and formats:** With the addition of various channels and formats, billers can stay ahead of the competition with the inclusion of technology-savvy channels, such as conversational commerce, intelligent personal assistants, and text messaging.
- **Accelerated cash flow:** FPS make customer receipts more quickly available for cash flow, enabling businesses to track payments in a more efficient manner.

Social Assistance and Benefit Transfers

Many countries provide social assistance payments to poor and vulnerable individuals. The last-mile delivery of these G2P payment flows relies heavily on the efficient functioning of payment systems, on whether beneficiaries are financially included, and on the overall development of the payment and the broader financial ecosystem. Thus, in the national context, the availability and usage of various payment options constitutes an important piece for delivering G2P payments effectively. Social assistance payments have been one of the areas in which PSPs have not felt incentivized enough to boost innovation due to low revenues and higher up-front costs for achieving the required volume penetration.

Recently, as a response to the COVID-19 pandemic, governments implemented an array of social assistance programs requiring efficient payments. Reliance on modern and scalable payment frameworks increased. For example, the Thai government started using its FPS solution, Prompt-Pay, to deliver social assistance payments to accounts linked with valid national IDs. FPS can be especially valuable for G2P services because (i) they are highly interoperable; (ii) they enable beneficiaries to obtain near instant access to funds, which is especially helpful during natural calamities; and, (iii) in several cases, transaction costs are lower than those of other retail payment systems.

From a user experience standpoint, a key element for governments is providing the appropriate choice of payment methods. Beneficiaries of social assistance programs may want to choose from fund transfers via fast payments or via traditional ACH services, use of checks, and cash. Including fast payment options in the framework provides scalability and enhancement. With a wide range of payment methods, beneficiaries are likely to have more options to use their funds electronically, which would reduce pressure on cash logistics and increase beneficiary convenience. Use of electronic payments in general—and of fast payments in particular—in the G2P context will nevertheless depend on the country's infrastructure and the level of maturity of its digital financial services.



4 OPEN BANKING AND FAST PAYMENTS

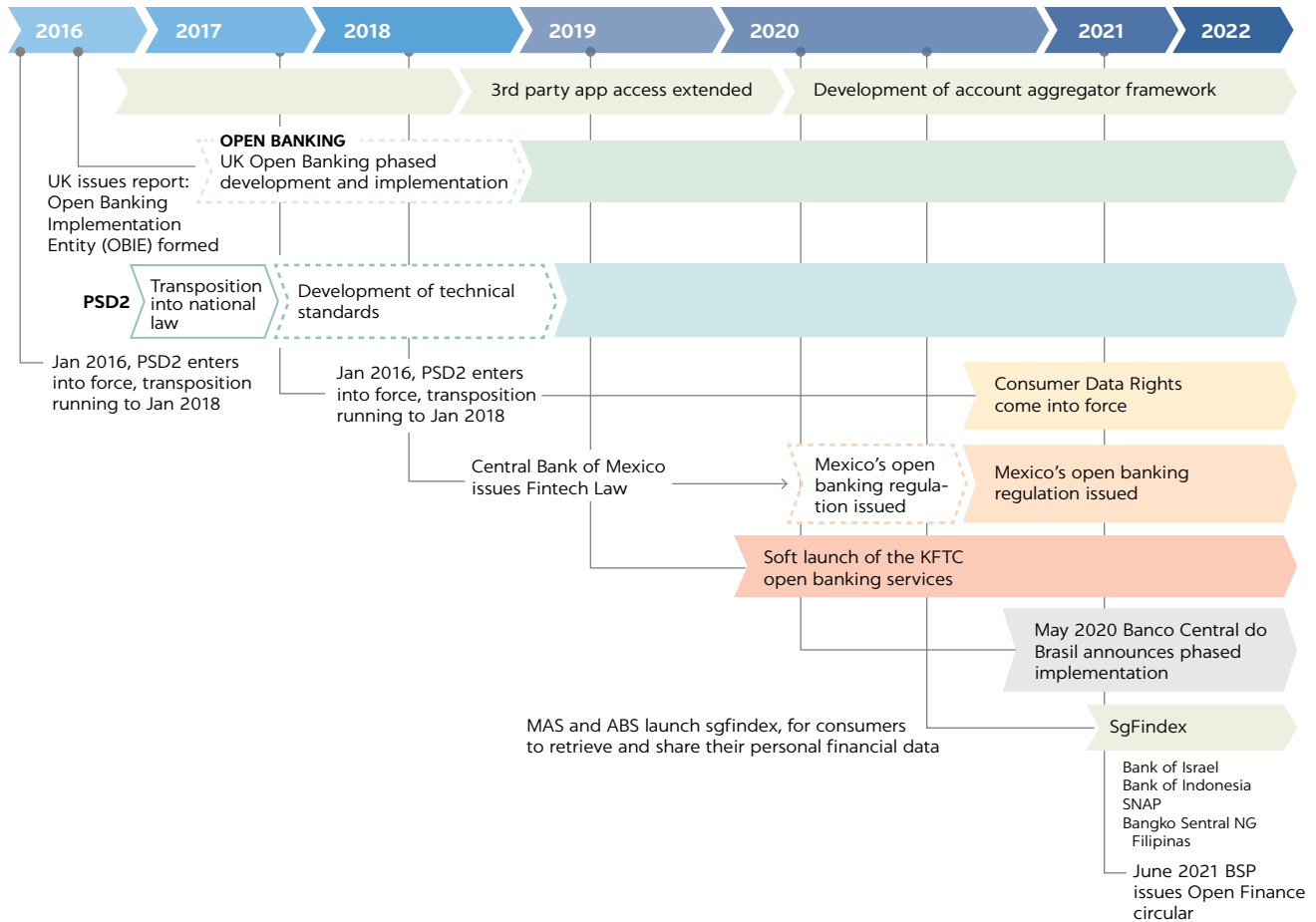
Open banking generally refers to regulatory frameworks that govern access by third-party providers to customers' bank account data and to initiate and manage payments on behalf of such customers. This enables service providers to offer applications that can lead to more efficient and transparent services and options.¹² In many jurisdictions, this covers payment services increasingly referred to as "payment initiation." These services may be provided by existing banks and PSPs or by new firms that seek authorization to provide specifically just these services. Many of these services also exist outside the framework of open banking regulation. But in such contexts, they may involve bespoke bilateral agreements and standards with limited interoperability. Open banking structures normalize some of the service integrations and commercial relationships that are already proliferating between banks and a range of third-party providers.

Open banking arrangements can both benefit from and enhance the impact of fast payments. Around the world, well over 50 countries¹³ have implemented or are developing variants of open banking that can enhance access to payment systems and facilitate consent-based access to customers' data held at banks and other financial institutions. (See chart 3.) Payment systems sit at the heart of this expansion in access and variety.

Payment initiation unbundles payment instruments from account servicing. Typically, banks exercise significant control over the type of payment method or instrument available to merchants or billers and to consumers in a specific

payment context. Payment-initiation services enable payees or payers to authorize a third-party payment provider (TPP) to interface with their bank to initiate a payment. In a regulated environment, if consent is properly obtained and the payment initiator is duly licensed, the bank holding the client's account may not have a right to refuse such access. While a merchant acquiring bank may have an interest in promoting card payments, a TPP could enable merchants to request payments via FPS services instead of the card network. TPPs offering payment initiation can provide consumers with more choice for using different instruments to pay from their bank account.

Open banking and APIs provide many useful services and functionalities to end users. These include account aggregation, payment initiation, merchant payments, transaction history, business-to-business payments, e-commerce payments, authentication, account balance, bill payments, profile management, P2P payments, and reversals, among others.¹⁴ For example, UPI in India provides tools for authentication and authorization that provide a connection to all the parties of the transaction, helping customers use FPS from any location at any time. Apps also allow smartphone users to choose from multiple accounts to make such transfers. Further, Deutsche Bank and Serrala have created an interface through which companies can conduct cross-border and domestic transactions while also giving the companies access to the European Union's SCT Inst. Table 5 shows additional examples of the use of open banking and APIs in the context of fast payments.

CHART 3 Open Banking in Selected Markets*Implementation Timeline***TABLE 5 Examples of Open Banking Use Cases**

Participant use case	Customer services			
	for Personal Customers		for Business Customers	
Account information sharing (e.g. balance, transaction history)	Account aggregation	Enable customers to view finances across different institutions via single interface	Accounting platform integration	Enable business to integrate banking services with their accounting and enterprise resource planning systems
	Credit decisioning	Enable customers to share financial data with third parties to inform/enhance credit risk assessment, e.g. for loans	Cash forecasting	Enable business to use third party analytics for cash management optimisation
Payment initiation service (e.g. bank transfer)	Wallet top-up	Enable customers to top-up wallet through different accounts and channels	Accounts payable / receivable	Enable business to better manage cash management and reconciliation processes across different applications
	Credit card payments	Enable customers to access credit	Merchant payments	Enable business to offer new payment mechanisms to customer, different rates and loyalty services

4.1 IMPLICATIONS FOR FPS DESIGN

FPS need to be prepared to enable these innovative payment-initiation services. There should be clarity on how payment-initiation services and TPPs are dealt with within the regulatory framework. Some TPPs may already be licensed PSPs with direct access to an FPS. In other jurisdictions or systems, they may need to be accorded technical or sponsored access, or a new determination might be required to align their services with the FPS rules and regulations. If open banking stipulates a role for third-party payment initiation, there must be appropriate means for TPPs to interface legally and on fair commercial terms with an FPS and its participants.

Technical and operational features of an FPS may need to adapt to enable open banking services. Payment-initiation services may specialize in enhancing consumer experience that requires dynamic verifications of accounts and balances. They may support bespoke interfaces, recurring payments, reversals, or subscriptions that require overlay services to be integrated with an FPS—for instance, to map aliases, confirm account owners in real time, manage individual confirmations, and support payment types, such as RTP.

Commercially, there are significant opportunities for open banking to boost FPS volumes. Typically, FPS have fixed fees for transactions and fees that are lower than card networks. TPPs may be able to use the differences in fee levels to attract merchants to switch payments from card networks to an FPS, especially if they also provide concurrent value-added services. TPPs may also be able to offer consumers other benefits—such as in the form of better user experience, loyalty, or other value-added services—to switch payment behavior from incumbent cards or wallets toward FPS services. However, given the significant role of

incumbent banks in their governance, FPS operators and their overseers may need to consider how to align interests with new stakeholders from the open banking community.

In an open banking framework, an FPS may need to consider extension of participation. Beyond banks, there may be payment account providers offering e-money or similar services that need to be integrated in order for open banking to benefit an FPS. Especially in emerging markets, the uptake and usage of semi-closed-loop payment wallets or e-money solutions is significant. These services are capturing an important share of low-volume retail payments within proprietary ecosystems. These systems may not yet be connected to an FPS or have an interest in promoting interoperability. FPS governance and strategy should consider the role of these proprietary systems not only as PSPs but as payment initiators.

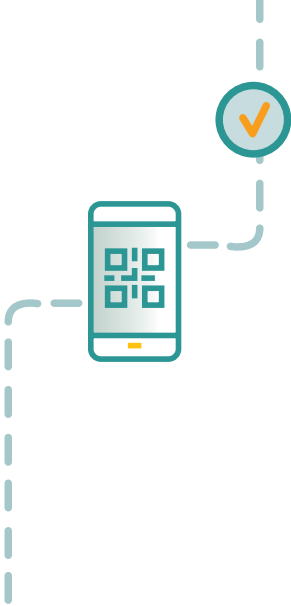
Technically, the integration of open banking services within an FPS ecosystem will require alignment on API standards and security standards for authorization and authentication. FPS will need to enable developers to establish communication between their own apps and the information systems of the FPS operator and/or the PSP. API standardization promotes trustworthiness and reliability. Standardization of APIs for functions such as payments or submission of reports (to the regulator) can reduce duplication of functionality and lead to cost optimization by promoting reuse.

There are also significant implications for participating banks and financial institutions. They may need to make related investments in data monitoring and security. For example, an API gateway may need to be created to provide an additional layer of security to the API calls. Further, beyond up-front costs, open banking also entails ongoing costs as banks operationalize open banking offerings.

TABLE 6 Use of APIs in the Context of Fast Payments in Selected Jurisdictions

Australia	The New Payment Platform (NPP) API Framework defines the key technical approach and mandatory data attributes for NPP APIs, aligned to ISO 20022. It is designed to support interoperability and standardization. APIs play an important role in helping innovators and third parties to use NPP's capabilities. While NPP Australia does not mandate the use of this framework, it encourages NPP participants, third-party service providers, and software developers to refer to this framework or build further upon it when developing API solutions for NPP transactions.
European Union, Israel	<p>The Berlin Group is a pan-European payment interoperability standards and harmonization initiative with the primary objective of defining open and common scheme- and processor-independent standards. It was formed in 2004, well before the advent of legislation for the second European Payment Services Directive (PSD2) but has evolved to take an important role in developing common API standards for the payment-initiation and account information services defined under PSD2.</p> <p>While the initial goal of the Berlin Group was to meet the aims of the European Central Bank, the European Commission, the European Payments Council, and (more recently) the Euro Retail Payments Board with regard to the Single Euro Payment Area, its standards have been adopted, or used as a baseline, more broadly by jurisdictions outside the Eurozone and the European Union, including Georgia and Israel.</p>
Mexico	Limited APIs are provided by Banco de México. The FPS SPEI allows use of limited-purpose APIs for value-added services such as checking transaction status and retrieving transaction details. CoDi, the overlay RTP service, also runs on an array of APIs that are open to all SPEI participants. Furthermore, Banco de México is considering allowing access to third-party open APIs.
United Kingdom	<p>Under the framework developed by the Open Banking Implementation Entity, three types of licenses are granted: AISP, PISP, and CBPII. Payment initiation, account aggregation, and card-based conformation of funds, among other services, are provided through these licenses. The scope of the payment initiation includes domestic, international, schedule future dated, and standing-order payments.</p> <p>The open banking framework covers technical and nontechnical elements, such as customer experience guidelines, operational guidelines (to track and monitor APIs developed by banks), dispute-management process, liability framework, TPP accreditation process, conformance testing tool, dynamic client registration, API monitoring tool, and security specifications.</p>

Source: World Bank, *Considerations and Lessons for the Development and Implementation of Fast Payment Systems: Part of the World Bank Fast Payments Toolkit* (Washington, DC: World Bank Group, 2021).



5 CENTRAL BANK DIGITAL CURRENCIES AND FAST PAYMENTS

Other emerging trends in payments and technology have disrupted even such basic concepts as money and currency. Traditionally, money has been described as anything that can serve as a store of value, a unit of account, and a means of exchange.¹⁵ From another perspective, money itself has evolved as a concept over time from the rocks and shells used in a barter system to metallic money, banking money, currency issued by a central authority, and, finally, digital money. Central bank digital currency (CBDC) is a form of money that has emerged lately and is being explored by several countries.

5.1 CENTRAL BANK DIGITAL CURRENCIES AND FPS

A CBDC is a form of money issued by the central bank. It is issued originally in digital form, and like cash, it forms a liability on the central bank that issues it. CBDCs can be designed to be wholesale or retail in nature, just as some traditional payment systems have been designed for wholesale activity (that is only financial institutions being able to access) and retail activity (that is, individuals and businesses would have access).

Growing attention to CBDCs has also created a need to understand the payment systems that may coexist with them or that may be required to facilitate their circulation.

This is because, at least from a conceptual standpoint, retail CBDCs could be seen as alternatives to fast payments. For example, a retail CBDC could in principle fill the gap where the digitalization of payment is still not possible or where the interoperability between FPS is a barrier to efficient and cost-effective transactions, such as cross-border payments. Others believe that CBDCs and fast payments would not have to compete against each other, and that FPS could actually end up being used as the payment rails for CBDCs. Indeed, an efficient and easy-to-use CBDC fundamentally needs to be built on a payment rail that is available 24 hours a day, seven days a week, 365 days per year to issue and redeem CBDC in real time. Given the nature of retail CBDC, an FPS could be an efficient underlying mechanism to enable users to achieve an interoperable, immediate, and cost-effective way to exchange retail CBDC with the money held in their PSP accounts.

Nevertheless, in a 2018 report on CBDCs, the Committee on Payments and Market Infrastructures considered that in many countries—especially those with high levels of financial inclusion—the existing FPS already provides much of the expected benefits for retail payments of CBDCs in terms of efficiency and convenience. One notable exception is cross-border retail payments, which are generally slower, less transparent, and more expensive than domestic retail payments.¹⁶

5.2 POSSIBLE MODELS FOR THE INTEGRATION OF CBDCS WITH FPS: ILLUSTRATIVE EXAMPLES

Depending on whether a country has an existing FPS or retail CBDC system, there are different ways to think about integration and not creating silos. For instance, in the euro area, there has been discussions to reuse as much as possible of existing European payments standards and scheme rules for the potential launch of a digital euro. Specifically, relevant scheme rules from the SEPA Instant Credit Transfer scheme (SCT Inst) and European QR standards are expected to be used for the digital euro system, as well. As such, the interlinkages can be at different levels of the system/arrangement (e.g. infrastructure, overlay service, scheme). In the same vein, the Central Bank of Brazil is exploring how to add new features to its existing Pix infrastructure, and how it could interoperate with existing or new payment solutions and systems.

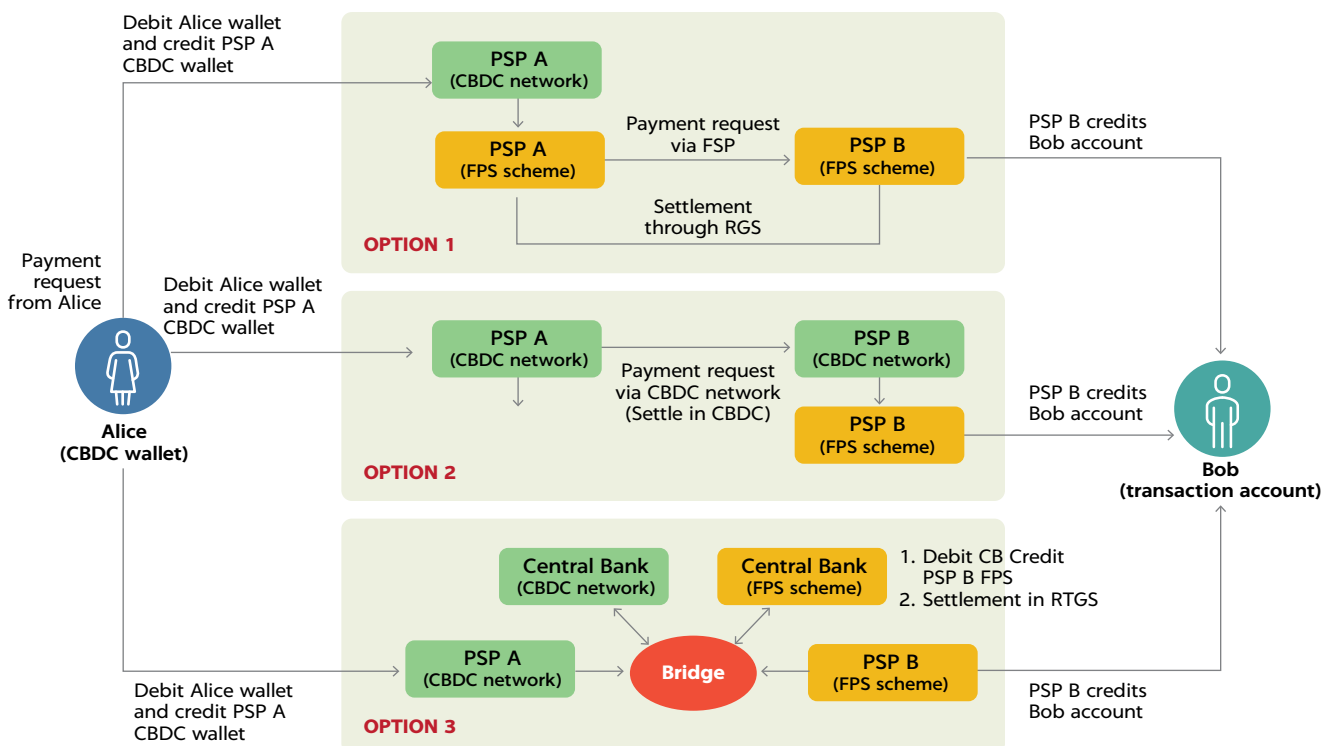
If carefully designed and regulated, CBDC and FPS can indeed co-exist, helping achieve full digitalisation of payments by, on the one hand, replacing cash usage and not cannibalizing each other, and on the other hand, maintaining the role of the central bank in the digital economy. CBDC can fill the gap where the digitalization of payment

is still not feasible via other solutions (eg, remote areas with limited Internet connectivity). For instance, the retail CBDC in Nigeria, e-Naira, also supports transactions using the unstructured supplementary service data (USSD) technology for text messages in the country, and it is expected to be used by low-income people who use feature phones and mainly live in a cash-based ecosystem.

In general, there are different ways that CBDC and FPS systems could be integrated and communicate with each other. Three options are presented below:

- In the first option, the PSP of the payer is in both payment systems; hence, the PSP of the payer would debit the CBDC account of the payer and send the transaction directly to the FPS system, debiting the PSP and crediting the PSP of the payee, which would credit the payee, and the PSP of the payer would act as the intermediary between the two payment systems.
- In the second option, the PSP of the payee is in both systems. The PSP of the payee would receive the funds in the CBDC system from the payer directly or from the PSP of the payer and credit the e-money or bank account of the payee, and the PSP of the payee would be the intermediary.

CHART 4 Options to Achieve Retail CBDC and FPS Integration



- In the third option, a third party that is neither the payer PSP nor the payee PSP, most probably the central bank, would act as the intermediary between the two systems. The central bank would receive the funds from the PSP payer in the CBDC system and credit the PSP of the payee in the FPS. It could be very relevant for the central bank to act as the intermediary among

financial institutions to transfer funds from and to the CBDC system. The relevance is mostly because the central bank could have infinite liquidity in the domestic currency in any payment system, and there is no credit risk when the central bank performs the intermediation role, as the central bank will never become insolvent in the domestic currency.



6 CONCLUSION

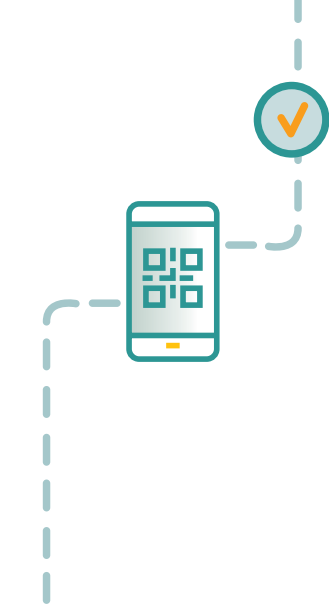
Innovations in payments have multiplied at a gravity-defying pace. FPS across the globe have been implemented to fill the gaps in the payment industry and continue to evolve and adapt to changing market dynamics. In fact, safe and efficient fast payment services are no longer just an option but a necessity, given the observed large demand from consumers and businesses.

While initially most FPS were launched to support real-time and around-the-clock domestic P2P fund transfers, use cases have expanded drastically in recent years. This is explained mostly by technological progress, changing expectations, and the increased adoption of fast payments by a growing number and diversity of end users. The COVID-19 pandemic was also an accelerator of these transformations.

Increased standardization in payment messaging across global markets is enabling interoperability and gradually permitting users (both businesses and consumers) to transfer funds across borders in close to real time. The interoperability between payment providers both domestically and across different jurisdictions is expected to grow multifold in the coming years.

Retail payment trends such as digital lending and deferred payments present an opportunity to payment schemes, financial institutions, and overlay services to monetize and increase their customer base by offering services above and beyond the reach of traditional payment channels. Banks have been investing heavily in the development of open banking for sharing and leveraging customer-permissioned data with third-party developers and firms to build applications to provide more efficient and transparent services and options in banking. On the other hand, innovations such as digital currencies have caught the eye of both central banks, which are researching its probable usage as a fiat currency that can be transferred cheaply and quickly, and private-sector players.

FPS operators, regulators, and participants need to track these digital innovations closely and leverage them to enhance customer experience together with the overall safety and efficiency of the system. Indeed, a good understanding of the key trends transforming the payment market and financial industry more broadly is critical for the planning of an ongoing FPS-development strategy, including for enabling its extensibility and scalability and continued improvements in service for all stakeholders, including end users.



7 ACKNOWLEDGMENTS

Organization	Contributor
PwC India	PwC India
World Bank	Harish Natarajan
	Ivan Daniel Mortimer Schutts
	Jose Antonio Garcia Luna
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	Holti Banka
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NOTES

1. According to the Committee on Payments and Market Infrastructures, a fast payment can be defined as a payment 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 on as near to a 24-hour and seven-day (24/7) basis as possible.”
2. Grand View Research, “Real-Time Payments Market Size, Share and Trends Analysis Report by Enterprise Size (Large, SME), by Payment Type (P2B, P2P), by End-Use Industry, by Component, by Deployment, and Segment Forecasts, 2023–2030,” <https://www.grandviewresearch.com/industry-analysis/real-time-payments-market>.
3. In essence, an API defines how software components communicate with one another.
4. It is possible that the RuPay card scheme (that is, India’s largest card ecosystem) is also part of this project. For further details, see NPCI International Payments Ltd., “India’s NPCI International Signs PayXpert as UK’s First Acquirer for UPI and RuPay,” press release, August 18, 2022, <https://www.npci.org.in/PDF/npci/press-releases/2022/NPCI-Press-Release-India%E2%80%99s-NPCI-International-signs-PayXpert-as-UK%E2%80%99s-first-acquirer-for-UPI-and-RuPay.pdf>.
5. This focus note is part of the World Bank Fast Payment Toolkit. The note is available at https://fastpayments.worldbank.org/sites/default/files/2021-10/Proxy_Identifier_Final.pdf.
6. Standard Chartered, “Faster Payment System (FPS)” (web page), <https://www.sc.com/hk/bank-with-us/sc-pay/#apptoapp>.
7. Early in the internet era, companies such as Alibaba integrated their own closed-loop proprietary payment solutions as a necessary element of their operations.
8. This focus note is part of the World Bank Fast Payment Toolkit. The note is available at https://fastpayments.worldbank.org/sites/default/files/2023-05/Settlement%20Note_Final_April%202020.pdf.
9. In some cases, for example, the systems of the PSPs or of third-party payment initiators are already able to generate unique sound/voice tones, which in turn generate and send the relevant information from a certain payment-initiation device to the actual point of sale to initiate a payment.
10. USSD is a technology commonly used for communication between GSM handsets and mobile network operators’ back-end computer systems. It can be used on any phone, including feature phones.
11. WhatsApp, “Learn More about Participating Countries” (web page), <https://faq.whatsapp.com/general/payments/learn-more-about-participating-countries/?lang=en>.
12. Bank for International Settlements, “Report on Open Banking and Application Programming Interfaces,” press release, November 19, 2019, <https://www.bis.org/press/p191119.htm>.
13. As of 2022, this includes, among others, Australia, Bahrain, Brazil, Chile, Colombia, European Union member states, Georgia, India, Indonesia, Korea, Malaysia, Mexico, Nigeria, Pakistan, the Philippines, Thailand, Turkey, the United Kingdom, and Uruguay.
14. APIs can also enable smoother reconciliation processes. For example, SWIFT offers services within its network to track payments through APIs.
15. Reserve Bank of Australia, “What Is Money?” (web page), <https://www.rba.gov.au/education/resources/explainers/what-is-money.html>.
16. Committee on Payments and Market Infrastructures, Central Bank Digital Currencies (Basel: Bank for International Settlements, 2018), 7.



