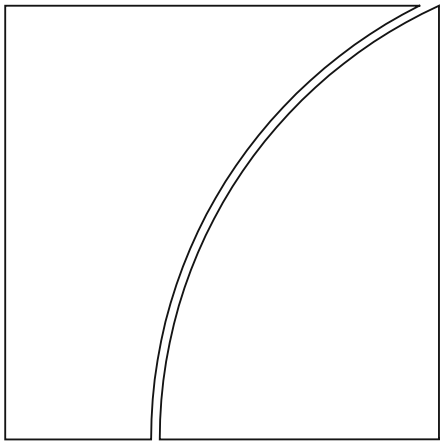
Committee on Payments and Market Infrastructures



Cross-border retail payments

February 2018

BANK FOR INTERNATIONAL SETTLEMENTS

This publication is available on the BIS website (www.bis.org).

ISBN 978-92-9259-133-5 (print)

ISBN 978-92-9259-134-2 (online)

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Executive summary

For many businesses, individuals and government agencies, making or receiving payments that cross borders is a necessary activity. Many businesses serve customers abroad and rely on buying goods from suppliers abroad but, in order to do so, they need to be able to receive payments from those customers and make them to those suppliers. Similarly, many people depend on the ability to readily send or receive cross-border payments, such as migrants who send money to families in their home countries or individuals who make online purchases from foreign retailers.

Taken together, these sorts of payments – those that are sent by an individual, business or government agency in one jurisdiction to a recipient in another – constitute what can be termed "cross-border retail payments". These payments are typically perceived as being slower, costlier and more opaque than domestic payments. Cross-border retail payments involve more risks to manage, complexities to navigate and rules to comply with than domestic payments; nonetheless, the difference between the two in terms of end user experience can often feel more disproportionate than those factors might explain. This difference is exacerbated by technological developments and innovations that have recently led to broad improvements in domestic payments in many countries at the same time as cross-border retail payments are becoming increasingly important for many end users, which is likely to further increase the already significant volume of cross-border retail payments. Manufacturers are expanding their supply chains across borders; and international trade and exports, cross-border e-commerce activity and international remittances are all growing and expected to continue doing so.

Work by a number of institutions has covered certain elements directly or indirectly related to cross-border retail payments, whereas this report aims to provide a holistic view of cross-border retail payments and a broader understanding of general issues and challenges in the cross-border retail payments market. In order to inform the report, a detailed analysis of the market was carried out, supplemented by a survey of almost 100 providers of cross-border retail payment services. Workshops were also held in late 2016 and early 2017 with stakeholders from the supply and the demand sides of the market to contribute to the analysis, corroborate the findings of the survey and explore themes. Where applicable and necessary, the report cross-references previous and ongoing work by the Committee on Payments and Market Infrastructures or other international organisations on specific issues that may relate to cross-border retail payments.

Each of the different types of end users for cross-border retail payments has broadly different preferences, experiences and challenges. Notably, large corporate users, which make high-value or frequent payments, tend to face fewer difficulties than small businesses, non-government organisations (NGOs) or individuals sending small or sporadic payments. Despite this heterogeneity, there is increasing commonality across end user types in the desire for cross-border retail payments to be more aligned with domestic payments in terms of their speed, convenience, transparency and cost.

On its journey from payer to payee, a cross-border retail payment can take a variety of potential paths, with a significant number of actors potentially involved in just one payment. "Front-end" (ie end user-facing) payment service providers (PSPs) vary in the range of services they provide, addressing the different needs of end users they target. There is also a variety of "back-end" payment infrastructure providers, but correspondent banking arrangements currently perform the majority of clearing and settlement functions (including any necessary foreign exchange transactions) for cross-border retail payments.

To date, innovation and competition seem to have been focusing mainly on the front-end part of the cross-border retail payments market. These developments have improved end user convenience to some extent. However, limited access to transaction accounts and electronic payment instruments and/or sustained preference for cash, especially in some developing countries, increases the barriers to new entrants with innovative models. Established PSPs face challenges too, especially in complying with

multiple regulatory regimes. Moreover, due to a lack of message standardisation and commonly agreed rules and procedures, PSPs may struggle to interoperate with other front- or back-end service providers, which may increase operational costs and the time needed to complete a payment.

As noted above, the majority of PSPs use correspondent banks to settle their payments and execute associated foreign exchange transactions (and to manage the accompanying exchange rate risk). One of the reasons might be that cross-border retail payments may be a special or value added business that is not easily scalable. Furthermore, traditional PSPs may not have strong incentives to modify their technology and processes to improve cross-border retail payments, and new providers of cross-border retail payments may be constrained by existing infrastructures and arrangements. Nevertheless, a number of ongoing projects aim to improve correspondent banking arrangements and broaden the same day foreign exchange market. There are also a number of alternatives emerging to the established correspondent banking model. These include interconnecting domestic payment infrastructures; expansion of "closed-loop" proprietary systems across borders (ie proprietary networks linking end users); and "peer-to-peer" mechanisms based on distributed ledger technology (DLT). However, these alternatives are mostly still nascent, and continue to face inherent cross-border complexities in messaging, clearing and foreign exchange settlement. It remains to be seen if they can provide viable solutions to bring across-the-board improvement.

The task of interconnecting domestic payment infrastructures is a complex undertaking, and studies note the limited success of projects in this area to date and the challenges of implementing such arrangements. Closed-loop systems are, by contrast, easier to establish and are reportedly seeing the fastest growth of all back-end arrangements. There are two key risks associated with such growth: first, that a lack of supervisory oversight of closed-loop systems might fail to identify possible shortcomings in their risk management; and second, market inefficiencies in terms of (a) fragmentation if there is a proliferation of non-interoperable systems or (b) dominance if only a few prevail. Finally, although peer-to-peer models based on DLT are conceptually possible and generate a great deal of interest, current arrangements share a lot of similarities with closed-loop systems and often target a niche market.

If these challenges can be overcome, an increase in back-end choice from a variety of properly overseen and interoperable back-end clearing and settlement arrangements could improve the efficiency of the cross-border retail payments market and create further momentum when it comes to front-end innovation and competition, ultimately further improving end user experience.

1. Introduction and general overview

For many businesses, individuals and government agencies, making or receiving payments that cross borders is a necessary activity. Many businesses serve customers abroad and rely on buying goods from suppliers abroad and, therefore, need to be able to receive and make payments across borders. Similarly, many people depend on the ability to readily send or receive cross-border payments, such as international migrants who send money to families in their home countries or individuals who make online purchases from foreign retailers.

Taken together, these sorts of payments – those that are sent by an individual, business or government agency in one jurisdiction to a recipient in another – constitute what can be termed "cross-border retail payments". Comprehensive and comparable data on cross-border retail payments are challenging to compile due to a lack of common definitions and the absence of an agreed methodology and coordinated, large-scale data collection efforts. However, existing research suggests that such payments represent an important and growing part of total retail payments. Factors that intuitively contribute to the growing importance of cross-border retail payments include:

- increased international trade, with world merchandise exports experiencing strong growth over the last 20 years;[1] and the internationalisation of production, which has led to increasingly global supply chains, requiring business-to-business cross-border retail payments for corporations and small and medium-sized enterprises;
- increased cross-border e-commerce activity in recent years, which has contributed to the growth of person-to-business cross-border retail payments[2] and is expected to substantially grow further in the years to come; and
- the significant volume of international remittances,[3] which represent the largest type of person-to-person cross-border retail payment and are expected to grow in the coming years as the global economic outlook improves and trends related to international migration likely continue.[4]

Current trends suggest that the already significant demand for cross-border retail payments will continue to grow in the near future. As a result, end users are making more regular use of cross-border retail payment services for an increasing variety of use cases and, therefore, require payment services that meet existing and evolving needs.

However, there is a broad perception and anecdotal evidence that, compared with domestic payments, cross-border retail payments remain slow, costly and opaque, with heightened risks to manage. Despite some promising developments in cross-border retail payments, improvements in the market for domestic retail payments have been more far-reaching. Spurred by various forces, such as national payment strategies, technological advances and changing expectations, domestic retail payments in many jurisdictions have experienced or are experiencing improvements in terms of speed and convenience.

[1] The average share of exports and imports of goods and commercial services in world GDP increased significantly from 20% in 1995 to 30% in 2014, leading the World Trade Organization (WTO) to conclude that today's GDP is highly influenced by international trade. See WTO (2015).

[2] Parcel volume in this area, considered to be a fair proxy for trade (WTO (2015)), increased by 48% between 2011 and 2014 according to the Universal Postal Union.

[3] Although the term "remittances" is sometimes applied to both corporate/business and personal payments, for the purposes of this report it is used to refer to person-to-person transfers without an underlying economic transaction.

[4] The World Bank estimates that global remittances, which include flows to high-income countries, totalled $575 billion in 2016, with $429 billion involving flows to developing countries. The World Bank expects remittances to developing countries to grow to $444 billion in 2017, an amount that exceeds official development assistance. See World Bank Group (2017).

Previous CPSS and CPMI[5] reports analysed these developments and their implications in the retail payments market because of the importance of retail payments for commerce and the broader effectiveness and stability of the financial system. In particular, successive reports examined general innovations in retail payments,[6] the role of non-banks,[7] the emergence of digital currencies[8] and the development of fast retail payments.[9] Although these reports sometimes touched on cross-border retail payments, they mostly dealt with domestic retail payments given that much of the innovation has been occurring in domestic settings.[10]

Certain areas directly or indirectly related to cross-border retail payments have also been the subject of recent and ongoing work by a number of institutions. These areas include correspondent banking, financial integrity (especially anti-money laundering/combating the financing of terrorism (AML/CFT)), digital innovations, international remittances, and payment aspects of financial inclusion (Annex 1). These individual topics have been the subject of focused work by the CPMI, the Financial Stability Board (FSB), the Basel Committee on Banking Supervision (BCBS), the World Bank Group, the International Monetary Fund (IMF) and the Financial Action Task Force (FATF), among other institutions and organisations.

Although this previous and ongoing work by the CPMI and other groups addressing certain aspects was related to cross-border financial flows and issues with potential implications for cross-border payments, these various efforts have not focused on cross-border payments or have not covered all types of cross-border retail payments or the entire value chain. Therefore, the CPMI mandated its Working Group on Retail Payments to analyse the cross-border retail payments market; the findings of this work are summarised in this report.

The report aims to present a holistic view of cross-border retail payments, covering the various cross-border retail payment types and the processes behind clearing and settlement of cross-border retail payments. Where applicable and necessary, it cross-references previous and ongoing work by the CPMI or other international organisations on specific issues that may relate to cross-border retail payments. The report intends to facilitate a broader understanding of general features of the cross-border retail payments market and issues and challenges in that market.

For the purposes of this report, cross-border retail payments are defined as funds transfers of relatively low value and urgency where the parties to the payment are end users (ie individuals, businesses or government agencies) and the payer and the payee are located in different (national) jurisdictions. Typically, cross-border retail payments are remote payments[11] and involve the national payment systems[12]

5 The Committee on Payment and Settlement Systems (CPSS) changed its name to the Committee on Payments and Market Infrastructures (CPMI) on 1 September 2014. References to reports published before that date use the Committee's old name.

6 CPSS (2012).

7 CPMI (2014).

8 CPMI (2015).

9 CPMI (2016b).

10 One notable exception to this is CPSS-World Bank (2007), which sets out general principles to assist countries that want to improve the market for remittance services.

11 Remote payments in this context are payments for which the payer and the payee are not interacting in person.

12 The term "national payment system" as used in this report encompasses all payment-related activities, processes, mechanisms, infrastructure, institutions (ie payment service providers) and users within a specific jurisdiction. See CPMI-World Bank Group (2016).

of at least two jurisdictions, different currencies and specialised processes (including the execution and settlement of foreign exchange transactions).[13]

To support the working group's analysis, a survey of almost 100 established and innovative providers of cross-border retail payment services from across the globe was conducted in early 2017. This survey included providers offering services to end users, as well as back-end service providers. The survey was complemented with information about initiatives aimed at improving cross-border payments. In addition, two workshops were held in late 2016 and early 2017 with stakeholders from the supply and the demand sides of the market.

Based on these efforts, the report presents a number of key findings. On the demand side of the market, the report finds that, supporting evidence based on the drivers noted above, there is a large and growing demand for cross-border retail payments. Within that overall demand, end users exhibit substantial heterogeneity in terms of needs and preferences, as well as differences in their cross-border payment experiences. Despite this heterogeneity, there is increasing commonality across end user types in the desire for cross-border retail payments to be more aligned with purely domestic payments in terms of their speed, convenience, transparency and cost.

On the supply side of the market, the report finds that substantial innovation is occurring, but is often focused on certain parts of the supply process or is relatively nascent with effects that have not yet materialised. In particular, the front end of the cross-border retail payments market, involving the instruments and access channels available to end users as well as the entities providing them with services, has exhibited substantial innovation, much of it relatively mature. In contrast, innovations at the back end of the market, reflecting the service providers, processes and arrangements that effect the transfer of value and the exchange of currencies across borders, are generally less extensive and mature such that their long-run significance and impact are unclear.

While various innovations on the supply side have affected, or may in the future affect, the cross-border payment experience for end users, the report concludes that there remain challenges related to speed, transparency and cost, which may affect different users in different ways.

The report is organised as follows: Section 2 describes the key features of the cross-border retail payments market; Section 3 describes the stocktaking approach and main findings; and Section 4 concludes.

[13] While certain cross-border retail payments may involve the use of cash when initiating or receiving a payment, physical transfer of cash across borders (eg via mail, cash-in-transit companies or unregulated intermediaries such as bus or taxi drivers) does not fall within the scope of this report.

2. Key features of the cross-border retail payments market

The cross-border retail payments market is complex, involving many different parties, use cases and underlying arrangements. The payer and payee in a cross-border retail payment are typically located in different jurisdictions and require intermediaries operating in multiple jurisdictions. In addition to these multiple actors, many different elements, arrangements and processes need to be in place to enable cross-border retail payments to be made and received.

Stylised overview of the cross-border retail payments market Figure 1

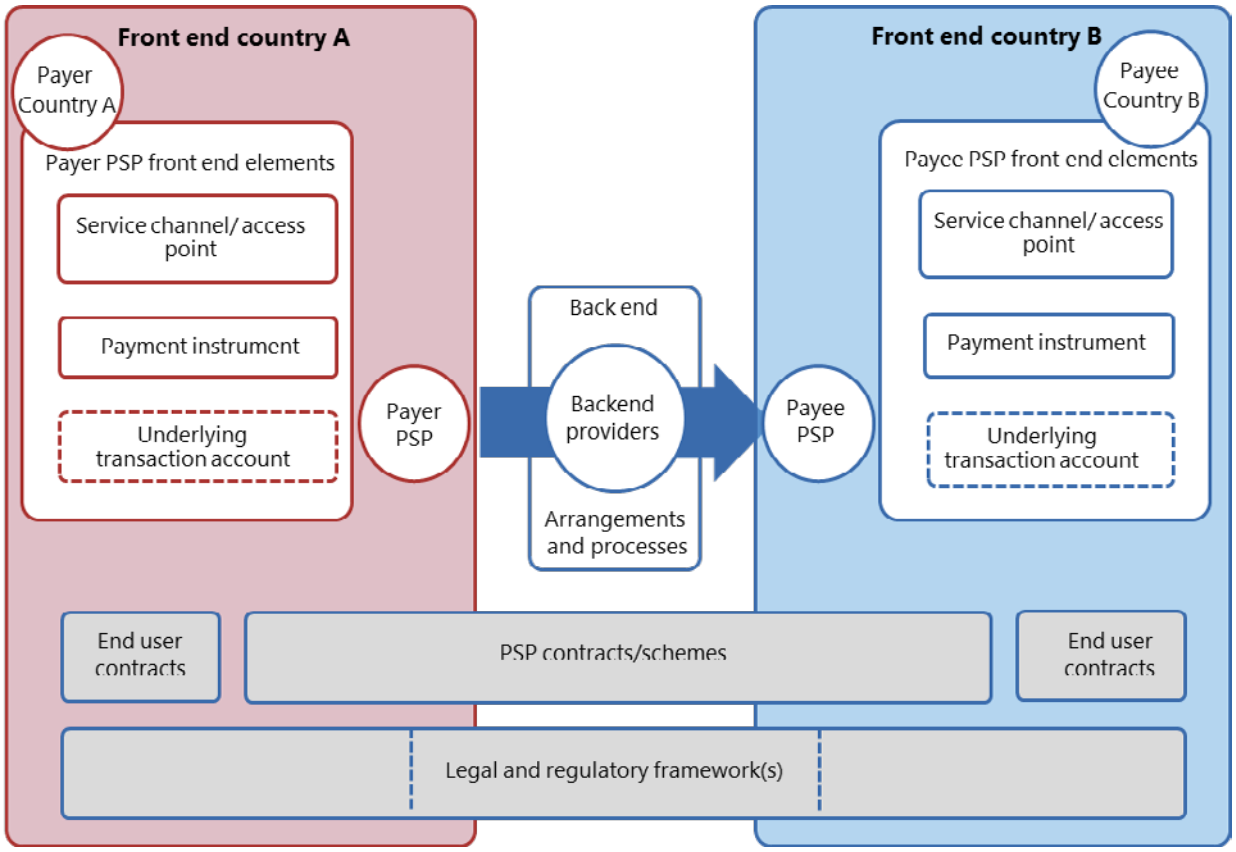


Figure 1 is a stylised overview of the cross-border retail payments market. Although it omits certain details,[14] it depicts the demand side, ie the end users (the payer and payee), and the supply side, comprising the "front" and "back" end.[15] The front end is made up of the interfaces provided to end users to initiate or receive cross-border payments as well as the payment service providers (PSPs) that interact with end users. The back end comprises the providers, arrangements and processes to effect those transfers, including associated foreign exchange transactions. Underlying everything are the contracts, schemes and legal and regulatory frameworks. This section discusses each component in turn and describes the key features of the market.

[14] For example, as described in CPSS-World Bank (2007, Annexes 3 and 4), a variety of steps, involving a number of possible intermediaries, may be involved in a cross-border retail payment. The current report abstracts from such details to provide a broad overview of the market.

[15] The use of front-end and back-end distinctions is based on the analytical framework used by the previous CPSS/CPMI reports on retail payment innovations (2012) and non-banks in retail payments (2014).

2.1 The demand side

End users differ across payment types in terms of their needs, requirements and capabilities. It is useful when analysing retail payment demand to distinguish between different combinations of several types of end users (Table 1).

Types of (cross border) retail payments — Table 1

Payer \ Payee	Person	Business	Government agency
Person	**P2P** (eg international remittances to family/friends)	**P2B** (eg payment for e-commerce purchases abroad)	**P2G** (eg payment of taxes and utility services for property held abroad)
Business	**B2P** (eg salaries and pensions to employees working abroad, judicial resolutions)	**B2B** (eg supply chain payments to foreign suppliers)	**B2G** (eg tariffs paid by exporters to authorities abroad)
Government agency	**G2P** (eg pension payments to retirees or childhood support for children living abroad)	**G2B** (eg purchases from international suppliers)	**G2G** (eg payments related to international aid)

The general classification of payment types and associated use cases broadly applies to retail payments. However, in the context of cross-border retail payments, the following payment types are typically considered the most important in terms of volume, value or both:

- **Person-to-person (P2P) payments**: the payer and the payee are both individuals. The most important P2P use case is the transfer of money to family members or friends abroad, without an underlying economic transaction. Such transfers are often referred to as international remittances.
- **Person-to-business (P2B) payments**: the payer is an individual and the payee a business. Important P2B use cases include payments for purchases of retail goods and services from businesses abroad via the internet, payment of bills (eg school fees or utilities) directly to a provider abroad, and payments resulting from international tourism or business travel.
- **Business-to-business (B2B) payments**: the payer and the payee are both businesses. Due to the broad differences among businesses, B2B use cases vary widely and can involve large payments by multinational corporations for raw materials, semi-finished goods and wholesale products, as well as smaller and less frequent payments by small and medium-sized enterprises (SMEs) or non-government organisations (NGOs).

Other payment types, such as payments between governments and individuals or businesses, can arise in certain situations (Table 1).[16] However, these payment types seem to contribute less significantly to demand for cross-border retail payments than the payment types noted above.

[16] P2G and B2G payments are typically made to fulfil an obligation to a public authority (eg payment of taxes, fines or fees). B2P or G2P payments usually stem from an obligation (eg payment of salaries) or an entitlement (eg payment of pensions or social benefits).

2.2 The supply side – front-end

Payers and payees generally interact with customer-facing PSPs to initiate or receive cross-border payments. The payer usually agrees with the payee which payment instrument to use and initiates the payment via one of the service channels or access points provided by its PSP. The payee then uses the service channel or access point and payment instrument of its PSP.

2.2.1 Payment service providers

PSPs provide the interface for end users of payment services and interact with back-end providers. Because of their involvement in front-end activities, PSPs are mostly present in the "first and last mile" of a payment, ie the receipt of funds from the payer, the transfer of information between jurisdictions and the eventual payment to the payee.[17] PSPs do not usually provide the back-end clearing and settlement, although some PSPs (eg large transaction banks) provide both front-end and back-end services (eg through correspondent banking services for other PSPs).

PSPs for cross-border retail payments can be categorised in various ways. One categorisation might differentiate between established (ie more traditional) and emerging (ie more novel) PSP types. Banks,[18] conventional money transfer operators (MTOs) and post offices are examples of established PSPs, whereas online-only banks or MTOs and mobile carriers are examples of emerging PSPs. An alternative categorisation might distinguish between bank and non-bank PSPs.[19] The non-bank category comprises conventional MTOs, online-only MTOs, post offices and mobile network operators (Table 2). Within these categories, there is still a wide variety of PSPs. For example, according to the International Fund for Agricultural Development (IFAD), over 3,000 MTOs operate worldwide, but many of them are small and focus on a limited number of countries. At the same time, five MTOs are reported to have a combined market share of 35% in the international remittance market.[20]

Categorisation of types of PSPs of cross border retail payment services — Table 2

Main business/Time in business	**Established providers**	**Emerging providers**
Banks	Traditional banks and credit unions	Online (only) banks
Non-banks	Money transfer operators, post offices	Online money transfer operators, mobile carriers

In certain instances, the same PSP may provide services to both the payer and the payee: while multinational banks might serve end users in the sending and the receiving countries, certain non-banks might also serve end users via their closed-loop or proprietary systems.[21] These end-to-end PSPs may

17 In the setting of P2P remittances, these front-end activities are often referred to as capturing and disbursing processes on the payer and payee side, respectively. See CPSS-World Bank (2007).

18 As in CPMI (2014, 2016b), the term "bank" includes savings banks, credit cooperatives or credit unions whose main activity is related to taking deposits from the public and providing loans.

19 Following CPMI (2014), non-banks can be defined as entities "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". As noted in that report, non-bank PSPs may compete with banks in certain dimensions, but typically cooperate with banks for the clearing and settlement of transactions.

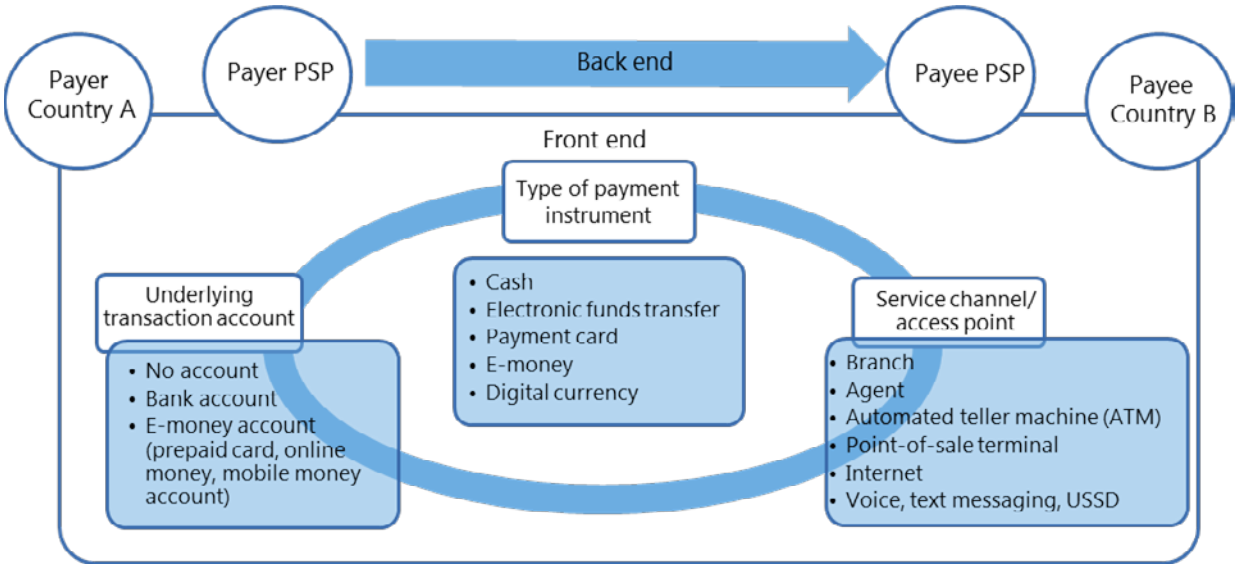
20 See IFAD (2017).

21 Examples are operators of three-party card schemes, providers of certain e-money products and some operators of remittance services.

provide comprehensive services to end users, although, with the likely exception of multinational banks, they often rely on other bank or non-bank parties for the provision of some services (eg as access points) and often use back-end arrangements for certain purposes (eg to settle accounts held in different jurisdictions or to access certain currencies).

PSPs and end users interact using different combinations of front end elements (see Figure 2).

Stylised overview of front-end elements for the payer, the payee and their PSPs Figure 2



2.2.2 Payment instruments

A number of payment instruments can be used by payers and payees to initiate and receive cross-border retail payments. The instrument used can vary across PSPs and use cases depending on the capabilities and needs of the PSPs' respective end users. For example, a payer can initiate a payment online with a payment card (Box A), and the payee can obtain the payment in cash via a physical outlet. Cash remains an important instrument for initiation and receipt of P2P remittances, often because the payer or payee in such a transfer may not have a general-purpose transaction account or may be using a closed-loop service provider without connection to a general-purpose transaction account.[22] In recent years, however, the use of electronic payment instruments has gained importance for P2P remittances, as e-money and electronic funds transfers have become more desirable and feasible for that use case. For B2B cross-border retail payments, electronic funds transfers across bank accounts are much more heavily used than e-money, payment cards or other electronic payment instruments, although those instruments can be used for some B2B payments.[23] Similarly, electronic payment instruments are used for most P2B cross-border retail payments due to their suitability for e-commerce and other remote P2B transactions.

[22] According to IFAD, 90% of P2P remittance transfers via MTOs are conducted cash-to-cash (IFAD (2017)).

[23] Cheques, in the form of international bank drafts, can still be used for some B2B cross-border retail payments, as well as potentially in other use cases.

Box A

The role of payment cards in cross-border retail payments

Payment cards, their underlying schemes and their processing platforms are relevant in a number of ways for cross-border retail payments.

Payment cards are one of the payment instruments used to execute cross-border retail payments. Debit, credit and prepaid① cards can be used for in-person payments (eg using a point-of-sale terminal at a bricks-and-mortar store) or remote payments (eg over the internet for e-commerce). Both cases may involve a cross-border component. A payer can make a payment in person when abroad or, from home, a payment to an online merchant based abroad②. Alongside global and regional online e-money schemes, payment cards are the main payment instrument available for cross-border e-commerce, whereas for domestic e-commerce a wider variety of payment mechanisms and cash are usually available. At the back end, for payments that occur within a card network, an interbank payment card processing platform connects various payment card issuers and acquirers (typically banks). It allows the exchange of payment card transactions by a bank's cardholder with another bank's merchant, automated teller machine (ATM) or other card acceptance device, provided that both banks belong to the same scheme (ie adhere to the same set of business rules and technical standards) and the same platform or different interconnected platforms. While there are specialised card processors, major international card networks typically offer processing services for domestic and cross-border transactions, and the latter are often exclusively processed via the processing platform associated with the card network. Interbank settlement of cross-border card transactions typically relies on traditional correspondent banking, although not on a bilateral basis between the issuing and the acquiring banks, but rather by relying on the international card network to establish a multilateral net position that (issuing) banks have to settle by crediting the account that the international card network holds at its settlement bank. Foreign exchange conversions may also be required.

Other types of cross-border retail payments may also involve cards. Certain remittance service providers offer the possibility to initiate or receive international remittances by means of payment cards, either in person or remotely. Payment cards can also be used to fund or defund e-money wallets that can be used to effect cross-border retail payments. However, for those types of cross-border retail payments, the card transaction itself is typically a domestic one.

Finally, card networks have traditionally offered payments from persons to businesses or government agencies. More recently, some card networks have introduced products for P2P payments, including international remittances, using their access to existing cardholders and network of issuing banks. Additionally, payment card networks have offered cards for B2B payments, some of which include cross-border payments.

① In some jurisdictions, prepaid cards are legally considered as electronic money. However, because of their similarity to payment cards in terms of user experience and because card networks typically offer prepaid cards in addition to debit and credit cards, they are discussed in this box. ② Card networks typically define a payment as cross border if the country of the merchant differs from the country of the card-issuing bank (in other words, even if both, the merchant and the cardholder are domiciled in the same country, but the cardholder uses a card issued by a foreign bank, this would qualify as cross-border payment from the card networks' perspective).

2.2.3 Service channels and access points

Service channels and access points are the specific interfaces used to connect the payer/payee and the PSP so that a payment can be initiated or received. As with payment instruments, the capabilities and needs of end users generate variation in these interfaces across PSPs and use cases. Service channels and access points further vary based on the payment instruments chosen by end users. For example, physical outlets such as branches, agents and ATM/kiosks still play a dominant role for P2P remittances reflecting the continued use of cash at the initiating and receiving ends for that use case.[24] In contrast, payments

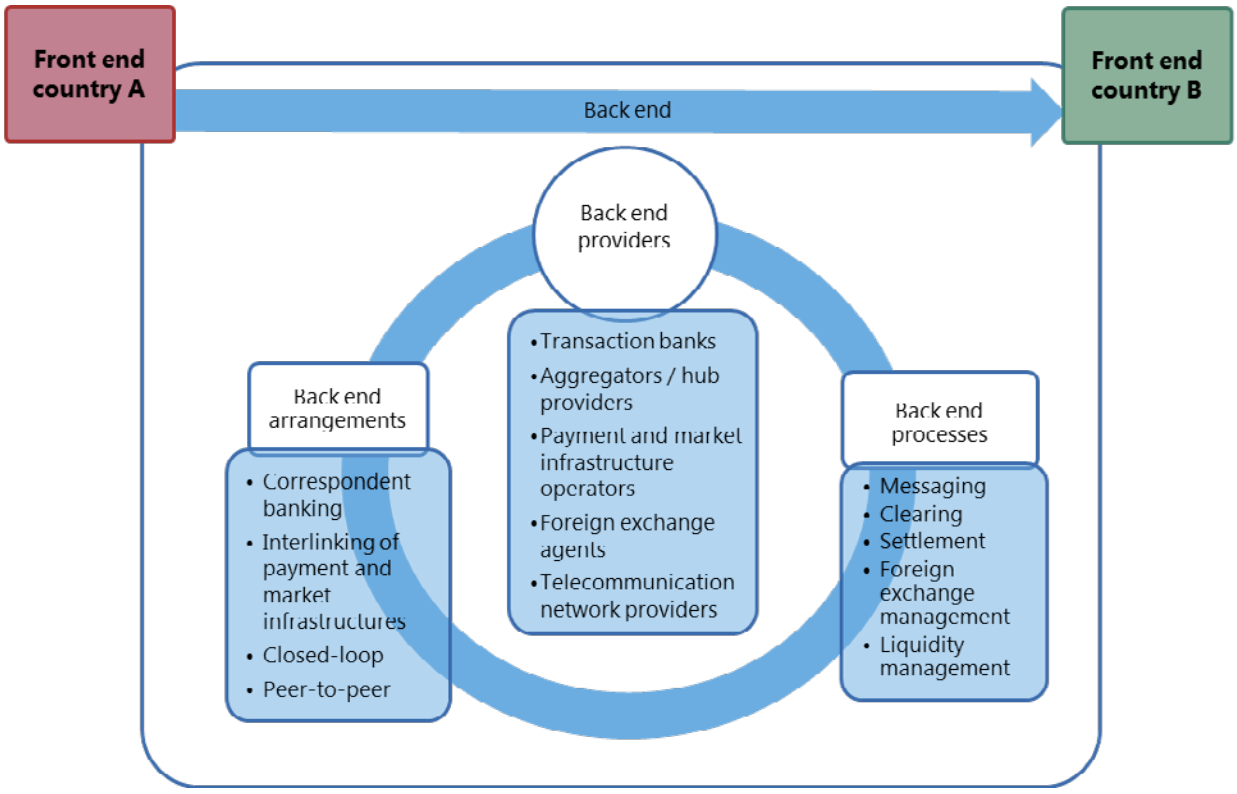
[24] IFAD reports that the number of payout locations has increased considerably over the last decade, reaching 1.5 million locations in the top 23 remittance-receiving countries (IFAD (2017)).

involving businesses, including B2B and P2B payments, are generally initiated and received via the internet or other electronic channels. However, as electronic payment instruments become more prevalent for P2P remittances, electronic initiation and receipt channels are becoming increasingly relevant for that use case too.

2.3 The supply side – back-end

At the back end of the supply side for cross-border retail payments, various back-end service providers and arrangements facilitate the processes required for the cross-border transfer of funds by PSPs on behalf of their end user customers. Figure 3 illustrates some of the key processes that occur at the back end of a cross-border retail payment, including messaging, clearing and settlement and, where necessary, foreign exchange transactions. As discussed in previous CPSS/CPMI reports, many of these activities apply to retail payments in general. However, a key difference for cross-border retail payments is that a PSP in one jurisdiction needs to exchange messages and clear and settle payments with a PSP in another jurisdiction and typically in another currency.

Stylised overview of the back-end entities and elements of cross-border retail payments Figure 3



2.3.1 Back-end service providers

The back-end processes described above are offered by service providers to PSPs. End users rarely have direct links to back-end service providers, and PSPs usually obtain these services through service agreements, via outsourcing arrangements or in the framework of a cooperative arrangement. Back-end service providers generally focus on specific stages of the payment chain and may cover several payment instruments. Examples are transaction banks offering correspondent banking services, aggregators that net cross-border payments, operators of payment systems with links or a direct presence abroad, foreign

exchange agents, specialised providers mitigating financial crime-related risks, and network providers offering cross-border messaging services.

2.3.2 Messaging

Electronic payments, whether domestic or cross-border, require the exchange of electronic messages between PSPs and the other supply side actors involved in a payment.[25] These messages typically identify, inter alia, the payer's and payee's (account) information, and the payment amount. Communication between PSPs and/or payment infrastructure operators is typically conducted via dedicated networks, with SWIFT being the largest global network provider.[26] In some instances, such as when an MTO or a bank is acting as PSP for both the payer and the payee or when a payment card is used, certain aspects of messaging may occur over a proprietary communication network.

2.3.3 Clearing

The CPMI glossary defines clearing as "the process of transmitting, reconciling and, in some cases, confirming transactions prior to settlement, potentially including the netting of transactions and the establishment of final positions for settlement". For cross-border retail payments, clearing can occur in various ways. End-to-end PSPs (eg some MTOs) that provide proprietary services to end users or other PSPs operating in multiple markets (eg multinational banks) may conduct clearing in-house such that clearing involves an internal account entry process of a single institution. Other cross-border retail payments, such as some payments exchanged by individual banks, may involve bilateral clearing of payments between PSPs. Finally, some cross-border retail payments, particularly those involving an infrastructure that supports payments from multiple PSPs, can clear payments on a multilateral basis.

Netting cross-border retail payments is an inherently more challenging task than domestic retail payments, as domestic payments are more homogenous than cross-border ones. Domestic payments are more likely to be largely standardised in terms of message format, currency and timing (eg peak volumes are likely to be predictable). Cross-border retail payments may be in different message formats, different currencies and spread out across a broader time period (as time zones extend beyond one jurisdiction) and many different PSPs (reducing the netting effect).

2.3.4 Settlement

Settlement occurs when an obligation is discharged in accordance with the terms of the underlying contract. In practice, for cross-border retail payments this discharge involves the receipt of funds by the payee (which can take place before or after inter-PSP settlement). In any payment, there may be multiple payment legs, involving multiple intermediaries, required to achieve the final settlement originally instructed by the payer.[27] In a cross-border retail payment, one or more legs may involve domestic transfers (eg from one PSP to another by using the national payment system) but at least one of the settlement legs will be cross-border (ie a claim in one jurisdiction is converted into a claim in another jurisdiction). The different settlement legs can be on a gross basis (deferred or real-time) or on a net basis

[25] Communication and messaging also occurs at the front end between end users and PSPs. This communication reflects the access/service channels used by payers and payees. PSPs also often provide information to the payer or payee about the status of a cross-border retail payment, including information about whether a payment was successfully initiated or completed.

[26] SWIFT has its origins in correspondent banking and connects 11,000 organisations in 200 countries and territories. These organisations exchange more than 23 million structured messages a day via SWIFT's FIN messaging service. SWIFT offers additional services, such as financial crime compliance services (eg sanctions screening), to facilitate cross-border payments and also establishes optional service-level agreements, covering issues such as execution times, remittance information and charging practices. See https://www.swift.com.

[27] See CPSS-World Bank (2007) and CPMI (2016b) for additional elaboration of some possible arrangements for settlement of cross-border payments.

(deferred) and in commercial or central bank money.[28] Exactly how settlements are made will depend on the back-end arrangement in place, as discussed below.

Related to settlement, foreign exchange is a key distinguishing aspect of cross-border payments. While domestic payments are settled in a single currency, cross-border retail payments usually involve at least two currencies, requiring a foreign exchange transaction. For less standard currency pairings, settlement might involve an additional currency serving as a bridge between the respective currencies of the payer and payee.

2.3.5 Back-end arrangements

Back-end arrangements of relevance for cross-border retail payments can be broadly classified into (i) correspondent banking, (ii) interlinking of payment infrastructures, (iii) closed-loop or in-house/ intragroup and (iv) peer-to-peer arrangements (Figure 4).

Correspondent banking is an arrangement under which one bank (correspondent) holds deposits owned by other banks (respondents) and provides payment and other services to those respondent banks. In international banking, balances held for a foreign respondent bank may be used to settle foreign exchange transactions. Reciprocal correspondent banking relationships may involve the use of so-called nostro and vostro accounts to settle foreign exchange transactions.[29] While correspondent banking might also be used for domestic payments, in the context of this report it is assumed that the two correspondent banks are based in different jurisdictions. In practice, a series of correspondent banking relationships might be involved in a single payment transaction, thereby increasing the complexity, cost and processing time of the transaction. Large transaction banks frequently offer correspondent banking services to smaller and/or domestically focused PSPs. For the transfer of funds between large transaction banks and the payer's and the payee's PSPs, often the respective national payment system will be used.

An alternative to the traditional correspondent banking model is the interlinking between the national payment infrastructures of two different countries. Such a link can be established by the private or public sectors between the automated clearing houses (ACHs) or real-time gross settlement (RTGS) systems of different countries and would allow PSPs from country A participating in the payment infrastructure of country A to send payments to PSPs from country B participating in country B's payment infrastructure. Where infrastructures settle in different currencies, arrangements will need to accommodate foreign exchange transactions. In view of the effort involved in establishing and operating links between payment infrastructures, they are more likely to be established between countries with considerable economic activity and/or migration flows. The forms of integration at the regional or cross-regional level can range from (i) relatively simple agreements among payment infrastructures to facilitate direct or indirect cross-participation among the participants in each of the payment infrastructures through (ii) interoperability arrangements involving technical interfaces between the separate operating platforms of the payment infrastructures involved to (iii) full harmonisation of the operating schemes and integration of the technical platforms into a common unified system for dealing with cross-border payment transactions and, in some cases, even supporting domestic transactions (World Bank (2014)).

In the case of closed-loop or in-house/intragroup transfer, the PSP of the payer is one and the same entity (or part of the same group) as the PSP of the payer. This can be the case for proprietary arrangements or multinational banks that are present in the payer's and the payee's country. In this case, rather than relying on a connection between institutions or infrastructures in the two jurisdictions, the PSP itself serves to bridge the two jurisdictions.

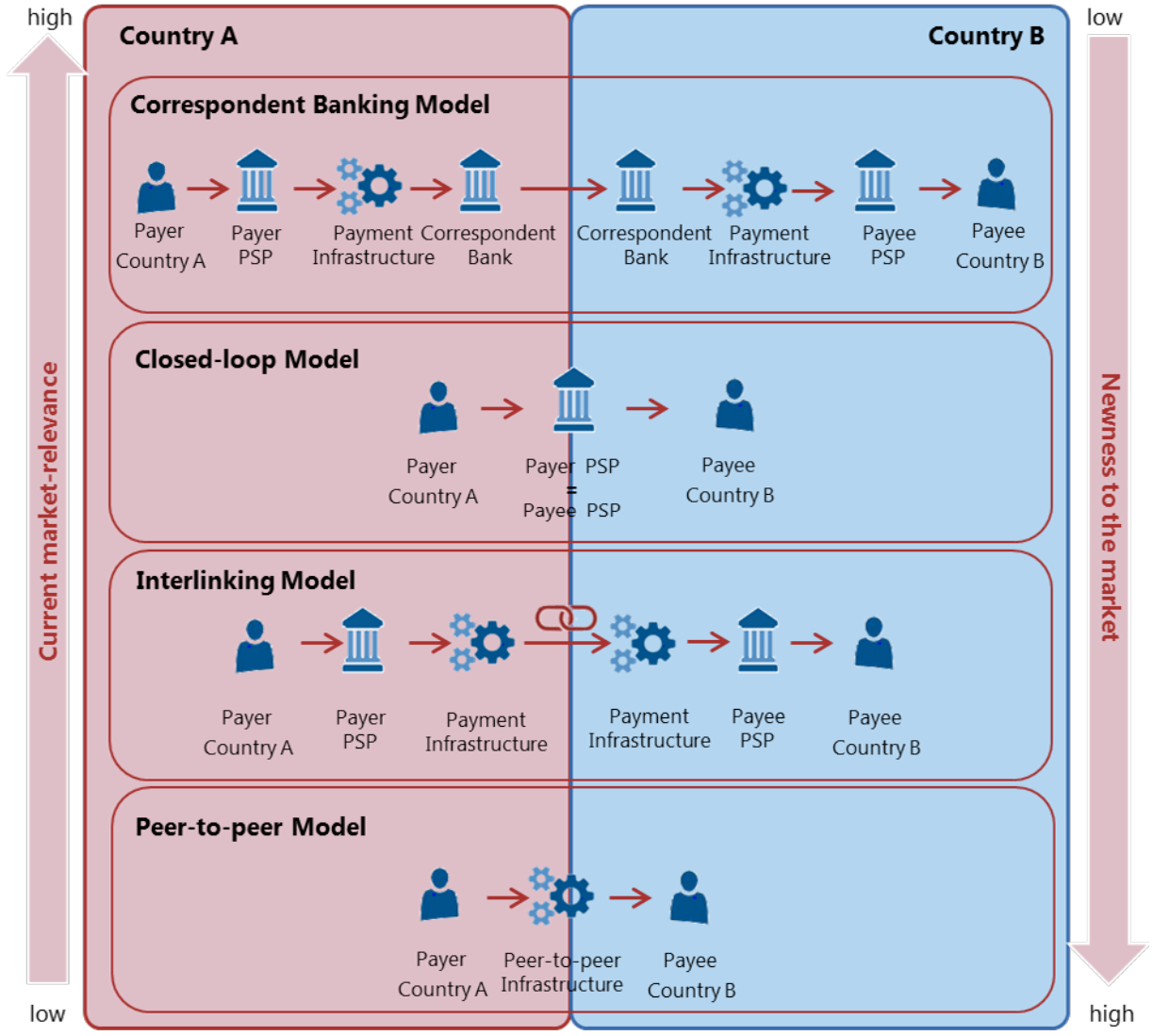
[28] Digital currencies provide an example of an alternative approach to settlement, as digital currencies (or a similar "token") could be exchanged in place of a cross-border leg involving a transfer of claims denominated in commercial bank or central bank money.

[29] See CPSS (2003).

Finally, the peer-to-peer model cuts out the financial intermediary PSP between the payer and the payee. Until recently, this model would have mainly involved paper-based transactions (eg the payer sending cash via mail to the payee). The emergence of distributed ledger technologies and digital currencies (Box B) now allows these type of transaction to be executed electronically too. Figure 4 provides a simplified illustration of the different models, which, admittedly, exhibit greater variation in reality.

Stylised overview of back-end cross border payment arrangements

Figure 4



Box B

Distributed Ledger Technology and cross-border retail payments

The CPMI published *Distributed ledger technology in payment, clearing and settlement: an analytical framework* in February 2017.① The main aim of the framework was to help readers understand the uses of DLT and, in doing so, identify both the opportunities and challenges associated with this technology in a critical part of the financial system. The framework noted that the use of DLT is being explored, in particular, for payment, clearing and settlement activities because of potential efficiency gains arising from the technology and associated streamlining of business processes. These potential gains could include simplifying the settlement and related reconciliation processes required of actors participating in payment, clearing and settlement arrangements.

As this report notes, cross-border retail payments could benefit from greater efficiency. For this reason, a number of DLT-based projects and ventures relevant to cross-border retail payments have been launched. There are several areas that appear to be attracting greater focus than others, owing to either the applicability of the technology, the potential for efficiency gains, or both. These include:

Correspondent banking

As mentioned elsewhere in this report, there are initiatives under way that seek to enable simultaneous settlement and reconciliation of cross-border payments between banks. DLT has the potential to be used for such purposes. There has also been some discussion about DLT's potential for use in improving and reducing the costs of customer due diligence ("know your customer") processes.② In addition to improving the efficiency of correspondent banking arrangements, there have also been projects that seek to replace such arrangements by exploring how DLT could link payment systems, thus removing the need for an intermediary correspondent bank.③

FX clearing and settlement

Another area where projects and initiatives are being launched is foreign exchange. A number of processes involved in currency trading, clearing and settlement could potentially be replaced or enhanced by DLT-based technology. These include: services converting fiat currencies into a digital currency, and then back into a different fiat currency to transmit to the recipient;④ facilitating netting;⑤ and developing a payment-vs-payment system.⑥ Whether DLT or other technologies are employed, shortening FX settlement cycles could potentially reduce risk.

① See CPMI (2017). ② https://www.ifc.org/wps/wcm/connect/3d215edb-55da-4097-982ce90409d6621a/IFC+2017+Survey+on+Correspondent+Banking+in+EMs+final.pdf?MOD=AJPERES. ③ https://interledger.org/ ④ https://www.fca.org.uk/publication/research-and-data/regulatory-sandbox-lessons-learned-report.pdf ⑤ https://www.cls-group.com/products/processing/clsnet/. ⑥ http://www.mas.gov.sg/~/media/ProjectUbin/Project%20Ubin%20%20SGD%20on%20Distributed%20Ledger.pdf.

2.4 Contractual, legal and regulatory framework

Cross-border payments do not involve only technical and operational aspects. Spanning the front and back ends of a cross-border retail payment are the contracts, laws and regulations relevant for establishing a framework for processing, clearing and settling cross-border payments. If different cross-border PSPs enter into agreements, this can be on a bilateral basis or in the form of a multilateral arrangement (a "scheme", ie a set of business and operational rules and agreed technical standards, which PSPs agree to adhere to). Furthermore, payment infrastructures can interlink on a cross-border level, as discussed earlier.

Cross-border retail payments are typically processed by PSPs and/or payment infrastructures subject to the legal and regulatory regimes of multiple jurisdictions. As a result, cross-border retail payments inherently encounter more legal and regulatory requirements than domestic payments, which typically fall under a single legal regime and are therefore governed under one consistent set of rules administered by the competent national authorities. Licensing and oversight requirements may differ from jurisdiction to jurisdiction, especially regarding non-bank front-end and back-end providers. In certain jurisdictions, MTOs are required to obtain a financial licence (eg a specific money remitter licence or a licence as a bank or payment institution), while in other jurisdictions they are required to enter into an

agreement with banks. Payment infrastructure operators, on the other hand, might often not be subject to any licensing requirements, supervision or even oversight, especially if they operate retail payment systems not considered to be of systemic importance within a jurisdiction.

While not specific to cross-border payments, money laundering and financing of terrorism risks are typically considered to be higher in the cross-border context. The risk-based approach, as set out by FATF, requires financial institutions to identify, assess and understand their money laundering and terrorist financing risks, and implement AML/CFT measures that are commensurate with the risks identified.[30] In its updated guidance for money and transfer value services (FATF (2016)), the Task Force requires the competent authority of the PSP providing cross-border payment services to liaise with the competent authorities of countries the PSP is sending money to, and to ensure that PSPs are subject to supervision and monitoring to verify their compliance with AML/CFT laws, in accordance with the institutional framework of the host country.

3. Key findings

The previous section described a market with diverse users, service providers and arrangements to enable cross-border retail payments to be made and received. This section builds on that description with an analysis identifying some key initiatives, developments and challenges for safety and efficiency.

To corroborate the analysis and review of current initiatives, a survey of supply side stakeholders was conducted and two workshops held with a selected group of supply and demand side stakeholders. For more details on the survey and workshops, see Annex 2.

3.1 The demand side

3.1.1 Different end users have different preferences for cross border retail payments

As discussed in Section 2, there are many different types and users of cross-border retail payments. This heterogeneity naturally leads to varying degrees of importance being assigned to certain features or attributes of cross-border retail payment services, such as cost, speed, predictability, transparency, payment aspects (eg information transmitted with the payment and opportunities for integration with related processes), preference of the payee, and ease of use.

The weight that different end user types attach to these characteristics may differ depending on the frequency, urgency, purpose and size of their cross-border payment activities. For example, multinational corporations may be willing and able to pay higher fees than individuals in order to benefit from enhanced speed, traceability or transparency for their payments. Moreover, there may be heterogeneity even within an end user category. For instance, while the B2B payment category includes businesses of all sizes, SMEs and NGOs may have different needs and face different challenges, often closer to those of individuals than of multinational corporations.[31]

[30] "When establishing correspondent banking relationships, banks are required to perform normal customer due diligence on the respondent bank. Additionally, banks are required to gather sufficient information about the respondent bank to understand the respondent bank's business, reputation and the quality of its supervision, including whether it has been subject to a money laundering or terrorist financing investigation or regulatory action, and to assess the respondent bank's AML/CFT controls" (FATF (2015)).

[31] SMEs face specific obstacles regarding access to e-commerce and global value chain participation, including problems related to logistics (ie shipping a good or delivering a service), the security and data protection aspect of information and communication technologies, and payments. See WTO (2016).

3.1.2 Expectations have risen across all types of user

Yet, irrespective of the weight different users place on the characteristics of a cross-border retail payment, workshop participants indicated that all users' expectations of payment services had changed as they became accustomed to faster, cheaper and more convenient domestic payments. Survey responses corroborated this, with PSPs noting that they understood end user demand to be broadly focused on improving convenience and usability and reducing cost. This trend is intrinsically linked to the increase in international trade, tourism and migration that has generated greater demand for cross-border retail payments and consequently a wider user base.

3.1.3 Users' experiences often fail to meet their expectations, particularly for certain use cases.

Perhaps due, in part, to increasing expectations, the survey and workshops demonstrated that users' expectations were generally unmet in several ways:

- Transparency – at the workshop with demand side stakeholders, users almost unanimously noted difficulty in tracing cross-border payments, especially in predicting when funds would be available to the person or business they were paying.[32]
- Speed – whereas fast, same day domestic payments are becoming more widespread,[33] PSPs taking part in the survey reported a seven-day execution time for some cross-border payments. Same day payments were sometimes available, but were usually restricted to closed-loop systems where both payer and payee were participants.
- Costs – cost is a concern to users of cross-border retail payments in two ways: (i) fee transparency (ie the ability to know how much a payment will cost before making it) and (ii) the amount charged (ie the price charged for services). More detail is provided in Box C.

However, some large corporate users that perform a low volume of cross-border retail payments of relatively high value indicated that they faced only partial difficulty making their payments and were satisfied overall with the cost involved. This contrasted with the opinions expressed by NGOs and SMEs, which encountered difficulties sending payments. For them, difficulties occur even for transactions between more developed regions (eg Europe and North America), and further obstacles arise in connection with emerging market economies (EMEs), lower-volume "corridors" (ie which countries and currencies a payment can be made from and to) and new payees.

[32] Tracing payments might become less important for fast payments effected within the same day.

[33] See CPMI (2016b) or Bech et al (2017).

Box C

International work on remittances

The CPSS-World Bank's *General principles for international remittance services* was published in 2007 and provides guidance on improving the market for international remittance services. The principles are aimed at promoting a comprehensive approach, covering transparency and consumer protection, payment infrastructures, the legal and regulatory framework, market structure and competition, and governance and risk management. Roles for remittance service providers and public authorities for the implementation of the general principles are also provided.

The general principles were subsequently endorsed by the G7 and the G20, which marked the start of substantial international efforts aimed at reducing remittance costs for end users. In 2009, the G8 set a target, later adopted by the G20, to reduce the cost of international remittances from 10% to 5% within five years. The target was known as the "5x5 Objective". Additionally, the UN Sustainable Development Goal, seeking to reduce inequality within and among countries, has a target indicator that seeks by 2030 to "reduce to less than 3 percent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 percent".①

The World Bank established the Remittance Prices Worldwide (RPW) database to monitor the cost of remittances and has recently proposed a new approach to measuring the cost of remittances.② The approach, the Smart Remitter Target ("SmaRT"), seeks to measure the total average cost that a well informed customer should expect to pay for remitting USD 200 for a given cross-border payment corridor, adjusted for the likelihood of accessibility of services in that corridor.③

While significant progress has been made, with the cost of sending remittances falling considerably since 2007, the global average cost of sending remittances was still 7.32% in June 2017, which is above the 5% target.

① https://sustainabledevelopment.un.org/sdg10. ② https://remittanceprices.worldbank.org/en. ③ https://remittanceprices.worldbank.org/sites/default/files/smart_methodology.pdf.

3.2 The supply side – front-end

3.2.1 Innovation is occurring on the front end of the cross-border retail payment market, improving end users' experiences

When asked to note innovations relevant to cross-border retail payments, survey respondents mentioned innovations featuring mobile technologies more than any other. When discussing this topic in the workshops, several participants noted the increase in the number of specialised services making use of mobile or internet applications to improve convenience for users, such as mobile payments in some jurisdictions where access to financial services is low (Box D).

Other notable innovations referred to by survey respondents include digitalisation in general (including the use of e-wallets and e-money); the emergence of blockchain/distributed ledger technologies and digital currencies; and innovations supporting "know your customer" (KYC) and AML/CFT compliance. The low proportion of PSPs offering or accepting digital currencies as a payment instrument contrasts with the number of mentions of this technology among innovations considered to be the most relevant. Although there are users that make cross-border retail payments using digital currencies (eg bitcoin), the use of digital currencies for cross-border retail payments remains a smaller, niche market.

Box D

The role of mobile payments in international remittances

Mobile telecommunication technologies and providers have become increasingly involved in retail payments, yielding what can be broadly viewed as "mobile payments". As discussed in the CPSS (2012) report on retail payments, this trend has involved (i) the use of mobile phones and other devices as service channels and access points; (ii) the use of mobile communication networks as channels for sending and receiving payments; and (iii) the provision of prepaid accounts (sometimes called "mobile money") by mobile network operators (MNOs). As with many other retail payment innovations, the development of mobile payments is largely a domestic phenomenon at the current juncture. Particularly in certain EMEs, the diffusion of mobile payments has been spurred by the high degree of access to mobile communication technologies relative to access to traditional financial services.

Despite the current domestic focus of many mobile payment innovations, mobile payments and, in particular, mobile money have the potential to facilitate cross-border retail payments and may be especially suitable for international remittances. To allow mobile payments generally for cross-border retail payments and specifically for international remittances, international MNOs leverage their mobile payment service offering in different countries (acting as end-to-end PSPs); PSPs enter into agreements with multiple MNOs across jurisdictions; and MNOs from different jurisdictions agree among themselves to exchange payments or partner with traditional or online mobile payments operators or global remittance hubs on one side of the cross-border retail payments corridor. As is generally the case for mobile payments, the success of these cross-border arrangements, particularly for EMEs, may result from the widespread diffusion of mobile phones and transaction accounts (including mobile money accounts) across jurisdictions.

To date, a relatively modest number of mobile money services enable cross-border transfers compared with the total number of such services.① Many of these services involve links between EMEs within a geographical region, although some enable remittances between developed and emerging economies. The number of such services for remittances may grow as existing links between MNOs are employed or new links established, with potential implications for the cost of remittances. In particular, some evidence suggests that the cost of mobile money remittances is low relative to the cost of traditional remittance services and, moreover, that traditional remittance fees are lower when mobile money remittance services are available.②

① See GSMA (2017). ② See GSMA (2016).

The increase in convenience is the most marked trend in cross-border retail payments enabled by front-end innovations. However, these innovations have also benefited consumers by increasing the set of providers in various jurisdictions, thereby enhancing consumer choice and competition conditions. Improvements such as fast payments, cost comparison services and online banking have all improved speed, cost and transparency respectively. In particular, card schemes allow individuals to make payments for goods and services in a much simpler way than in previous years, as their use for e-commerce increases and card companies design new products for P2B and B2B payments. Nonetheless, according to workshop participants, card payments for cross-border e-commerce may not always be a viable option in jurisdictions where the major card networks have a less developed market presence or if sellers do not accept card payments due to the high costs associated with them. Global and regional e-money schemes are also not available in all countries, often because the schemes lack partnerships with domestic financial institutions in all relevant jurisdictions or the schemes are unable or unwilling to meet local regulatory requirements.

3.2.2 The importance of cash in some jurisdictions may adversely affect access to many innovative services

According to survey responses, in some jurisdictions there are few practical alternatives to using cash and other traditional payment instruments. Cash payments or receipts require a payment service provider to have a network of branches or agents that payers and payees can conveniently visit. Survey respondents

noted that the need to establish or gain access to such a network is a considerable barrier to entry for new payment service providers, thus limiting competition in those jurisdictions that rely solely on cash.

However, heavy use of cash in a jurisdiction does not appear to impede competition or imply a lack of choice for users as long as access to other financial services exists, as is typically the case in countries with well developed financial service markets. One reason why users prefer cash transfers when other options are available is speed, as some PSPs offer to execute transactions faster when cash is used for the initiation or disbursement of certain cross-border retail payments.

3.2.3 Payment service providers face challenges with compliance

Survey respondents identified a number of cost factors and other challenges that may influence their provision of cross-border retail payments. The reported cost factors include correspondent banking fees, FX costs, telecommunication costs, scheme fees, interchange fees and fraud. The need to adopt new technologies to meet end user expectations or to match the services offered by competitors was a key challenge for many providers, especially in light of rapid technological changes and uncertain end user acceptance.

When asked to cite the most significant costs and challenges to their business, survey respondents noted legal, regulatory and compliance considerations more than any other. Payments, especially cross-border payments, demand significant compliance efforts from all parties involved.[34] For cross-border retail payments, the number of relevant parties and jurisdictions complicates and often multiplies compliance efforts. PSPs may face uncertainty about the interpretation/application of compliance requirements and difficulties obtaining centralised compliance information. As a result, banks and other PSPs may view cross-border retail payments as involving higher risks and costs of compliance than domestic payments. This perception may have contributed to so-called "de-risking" by some correspondent banks, which was cited by a number of respondents, particularly small banks and money transfer operators, as a challenge for their operations. The term "de-risking" refers to situations where financial institutions terminate or restrict business relationships with categories of customers.[35]

Exploring the relevance of compliance costs in the workshops, participants confirmed that complying with several sets of rules and regulations (compared with a single set for domestic payments) added costs, but that the greatest challenge arose when jurisdiction rules conflicted and the authorities concerned were uncooperative in providing assistance or liaising with one another to resolve issues or areas of conflicting interpretation. Such issues have been discussed elsewhere, eg ITU (2016) and FATF (2016) have highlighted the importance of international cooperation among the competent authorities in the relevant jurisdictions, be it continuous or on request depending on the circumstances.

In addition to compliance with multiple domestic requirements, those involved with cross-border payments may be subject to further, specific requirements – for example, completion of data returns for reporting and/or statistical purposes (eg in balance of payments reporting) and requirements relating to capital controls (eg obtaining prior approval for payments).

3.2.4 Providers may struggle to interoperate with one another due to a lack of standardisation.

PSPs can support a number of message formats. However, the survey showed that more than half use a proprietary format (which renders them less likely to be able to interoperate with other PSPs). Use of ISO standardised messages was low, with only a quarter of respondents supporting ISO 20022 (Box E) and even fewer the more narrowly focused ISO 8583 (designed for messaging related to card payments).

[34] In particular, most providers reported that they must comply with AML/CFT, KYC, risk mitigation and consumer protection measures, and must file periodic reports. Other cited regulatory requirements included funds segregation and minimum initial and ongoing capital requirements.

[35] See FATF (2015) and CPMI (2016b).

Standardisation and interoperability are important catalysts in the quest to increase efficiency and realise economies of scale and network effects in cross-border retail payments. Generally, messaging standards within jurisdictions are developed cooperatively by domestic service providers and are tailored to domestic requirements, which creates differences across jurisdictions. Some initiatives, such as the development of ISO 20022, aim to overcome this. However, although international standards can enhance efficiency and interoperability, their full benefits cannot be reaped if they are interpreted and implemented differently from jurisdiction to jurisdiction. For this reason, coordinated efforts among financial authorities to promote standards and interoperability for cross-border retail payments are key. Yet only a small number of the initiatives identified by the working group are seeking to address this problem (Annex 2).

Determining standards from a business and oversight perspective for cross-border payments is complex because of the numerous issues that need to be addressed; for instance, identifying and managing financial and operational risks, establishing dispute resolution procedures, and ensuring that arrangements are legally sound in each jurisdiction. This lack of standardisation has also inhibited the interoperability of payment systems across jurisdictions for the purposes of conducting cross-border retail payments. Challenges can arise when addressing these issues on a global level, and workshop participants saw a role for authorities, including central banks, to coordinate internationally in order to address certain aspects of cross-border retail payments.

Box E

ISO 20022 and international interlinking of payment infrastructures

Currently, the bulk of cross-border retail payments rely in some form or another on correspondent banking relationships. Since this type of arrangement typically implies a high cost per average low-value retail transaction, some organisations have explored the option of conducting clearing and settlement for cross-border retail payments through domestic payment infrastructures (such as ACH or RTGS).

Efficient cross-border message exchange across infrastructures can be impeded when different messaging standards are employed. ISO 20022 can play an important role in this respect, for message exchange between payment infrastructures and payment service providers alike. ISO 20022 is the international standard for financial service messaging, developed by Technical Committee 68 of the International Organization for Standardization (ISO). The standard aims to facilitate financial communication throughout the process chain between end users, financial institutions and financial market infrastructures.①

Cross-border considerations were an initial motivation for ISO 20022, but it has been increasingly adopted for domestic financial messaging, which may facilitate opportunities to interlink domestic payment infrastructures from different jurisdictions. As noted in the CPMI report on fast payments (2016b), many fast payment systems have adopted or are planning to adopt ISO 20022. For example, new implementations of fast payments in countries such as Australia, Canada, Denmark and Singapore have selected this messaging standard; and the Europe-wide scheme for fast payments ("SEPA credit transfer instant scheme") is also based on ISO 20022. Over time, the proliferation of ISO 20022 implementations could support linkages between national or regional fast payment platforms, thus facilitating cross-border transactions between different jurisdictions.

However, efficient use of ISO 20022 across borders requires standardisation of the implementation approach. Standardising the implementation approach can lead to additional efficiency gains by avoiding workarounds and translation from one implementation to another, thus reducing the implementation costs for new PSPs and enhancing the ability to achieve fully automated straight through processing functionalities. In line with this objective, the ISO Real-Time Payments Group was set up in 2015 as an international initiative to coordinate the implementation of ISO 20022 standards for fast payment systems in multiple jurisdictions.

① Beyond facilitating the exchange of messages, ISO 20022 can have additional benefits. For example, the standard's structured, rich message format can ease the automated processing of financial messages, which may deliver benefits such as more effective straight through processing. Its rich data messages may also simplify reconciliation, making it easier for businesses to link payments from customers with their corresponding invoices.

3.3 The supply side – back-end

3.3.1 Messaging and clearing are inherently more challenging for cross-border retail payments

Just as PSPs may struggle to interoperate due to a lack of standardisation of messaging formats, back-end service providers may struggle to transmit and reconcile transactions for the same reason. Most payment infrastructures were developed to cater for domestic needs, and typically not with international functionality or interoperability in mind.

Messaging can give rise to challenges for cross-border retail payments if the information originated by the payer's PSP does not tally, in content or format, with the information required by the payee's PSP. Such a mismatch may result from a lack of standardisation in messaging formats, or from manual processes that alter the contents or omit to retain specific data elements or differences in an effort to comply with legal and regulatory requirements (eg AML/CFT provisions). A lack of standardisation at the international level, in turn, can arise because payment messaging standards in a given jurisdiction are often developed jointly by PSPs and infrastructure operators in that jurisdiction and tailored to the needs of the domestic market. Furthermore, while comprehensive directories ensuring country-wide reachability are common at the domestic level, those domestic directories are often not accessible by foreign service providers, or use country-specific identifiers instead of international ones.

Payment messages that need manual intervention because of different formats or idiosyncratic information requirements naturally incur additional costs and take more time to prepare and process than homogenous, standardised payment messages benefiting from straight through processing.[36] Even cross-border retail payments that are sent using standardised messages in SWIFT and other communication networks might require additional information beyond that permitted by a standard format
(eg for invoice reconciliation, or for investigation of fraud or errors).

A key part of clearing that can enhance efficiency and reduce certain risks is netting. Netting can reduce the number of funds transfers that need to take place for settlement, which can in turn lower costs, especially when the transfers are across borders. However, different message formats, different time zones and especially different currencies may all impede netting efficiency. These effects make netting for cross-border retail payments generally more challenging and less effective than for domestic payments. A lack of effective netting can add operational and liquidity costs.

3.3.2 The need to settle in different currencies adds to risks and costs

The need to conduct foreign exchange transactions adds complexity and risk for PSPs and back-end service providers. These additional complexities, which do not exist for single-currency transactions, need to be managed and the risks mitigated, which can increase costs (in ways that are neither transparent nor predictable) and reduce the speed of an overall transaction.

Accepting funds in one currency and making payments in another is a function performed by many front- and back-end service providers. How this function is managed depends on the services provided and the back-end arrangements in place, which also determine how funds received are converted into other currencies, how funds in different currencies are held, whether the latter functions are performed solely by a service provider or with intermediaries, and how risks are managed. The risks include (i) exchange rate risk, where exchange rates move unfavourably from the moment a payment is initiated

[36] Messages exchanged via SWIFT and other communication networks include standard identifiers and syntax in the inter-PSP domain so that the information can be read and processed correctly by all parties. However, character limits and other restrictions may impede the sending of certain data directly with the payment, such as biller or invoice reconciliation information or information to facilitate investigations of possible fraud or error.

in one currency until it is completed in another; and (ii) settlement risk, where payment is made in one currency but the other party fails to make the reciprocal payment in the other currency.

For example, an end-to-end PSP (eg some MTOs) would need to hold idle balances in foreign currency, based on forecasts of customer demand. Those balances need to be adjusted from time to time when sent and received payments in different currencies are not reciprocal. Adjusting those balances requires entering the foreign exchange market to buy and sell currencies, the delivery of which typically takes at least a day or so depending on the currency pair.

Some of the challenges facing cross-border retail payments have been addressed. For example, there are initiatives to make same day trading and settlement in different currencies simultaneous; match payers and payees in different currencies to reduce the need for idle balances; and predict customer payments.

3.3.3 The majority of payment service providers rely on correspondent banks to settle their payments

Banks offering correspondent banking services must (in addition to other tasks and duties associated with establishing and operating the correspondent banking relationship[37]) perform due diligence on their customers (front-end service providers) and meet AML/CFT regulations. The CPMI (2016a) report on correspondent banking noted that banks cite "rising costs and uncertainty about how far customer due diligence should go in order to secure regulatory compliance" among the main reasons for cutting back their services. This rationalisation particularly impacts providers that (a) might not generate sufficient revenues to justify a bank's compliance costs, (b) are located in jurisdictions perceived as "risky" or (c) have customers that are difficult to risk-assess or manage for AML/CFT purposes.

More than half of providers reported to the survey that funds are effectively transferred/settled through one or more correspondent banking agreements. This is despite the declining size of correspondent banking networks worldwide, which in some regions in recent years has led to a concentration in a small number of institutions and made it difficult for smaller participants to gain or maintain access to correspondent banking services. The downward trend in the number of active correspondent banks since 2011 is most evident at the regional level, with Northern Africa, the Americas (with the exception of Central America), western Asia and Europe all experiencing declines. The most pronounced relative decline of active correspondents has occurred in Oceania, particularly among the Pacific island states.[38]

In response to these findings, in October 2016 FATF issued its *Guidance on correspondent banking services*, providing improved direction on how to apply a risk-based approach to prevent further terminations of correspondent banking relationships and other "de-risking" practices. This included a set of technical recommendations on the use of KYC and "know your customer's customer" (KYCC) utilities, information-sharing initiatives and payment messages.[39] The BCBS issued its revised *Sound management of risks related to money laundering and financing of terrorism* in February 2016, which also provided improved direction on how to apply a risk-based approach to correspondent banking, account opening and the use of KYC utilities.

[37] Correspondent banking arrangements are subject to intraday credit exposures, which are not commonly collateralised, and to operational risks arising from the processing and settlement of transactions. Legal uncertainties and a lack of transparency in the processing and settlement of payments have been documented in this context as well.

[38] See Alwazir et al (2017) for more details.

[39] See Annex 2 for more details on the work that various institutions have conducted to address AML/CFT concerns.

3.3.4 A number of projects aiming to improve traditional correspondent banking

Of the relevant initiatives noted above, respondents to the survey specifically commented on the relevance of ISO 20022 and the SWIFT global payments initiative (gpi)[40] to cross-border payments. Discussions at the workshops also focused on several potential enhancements that could improve current arrangements. These potential enhancements, which are at different stages of development and implementation, included initiatives that are intended to:

- enable simultaneous settlement and reconciliation of cross border payments, to improve transparency and efficiency;
- act as a "gateway" to correspondent banking networks, in order to better provide access and netting benefits;
- establish service standards across correspondent banks, to increase the speed of payments; and
- use technology to track payments made between correspondent banks, to improve transparency.

These coordination efforts seek to homogenise processes and standards (both standards as they relate to expectations of speed and functionality, and standards as they relate to messaging standards). Such efforts could help correspondent banks and larger corporations to reduce operational costs and improve transparency and traceability of payments. However, workshop participants suggested that although such initiatives were welcome, they do not explicitly address the core issues facing SMEs, which are access and costs. However, participants did note a rise in traditional and online MTOs offering services to SMEs, which may help improve access.

3.3.5 Alternatives to the established correspondent banking model are emerging but still nascent

Despite the innovations that aim to improve correspondent banking, many workshop participants thought it unlikely that correspondent banking could change sufficiently to address all the issues relating to cross-border retail payments faced by all users. Correspondent banking, it was felt, is mainly designed for high-value, low-volume payments that are not time-critical rather than for a large volume of low-value payments. The tracing of cross-border retail payments was considered non-transparent and unpredictable, with workshop participants also noting a potential role for authorities to address these aspects on a global level.

Among the innovations most frequently mentioned by survey respondents was DLT, which was seen as a potential means to improve correspondent banking networks. Although several implementations are under way, it is an evolving technology that has yet to prove it is sufficiently robust to achieve wide-scale operation. However, there are two other notable back-end models: (i) initiatives to link domestic payment infrastructures and (ii) closed-loop systems.

Links between domestic retail payment infrastructures have already been established in some jurisdictions, and several others are planned worldwide (see Box F and Annex 2). Some efforts to integrate national payment systems have only partially delivered their expected benefits, and other projects remain non-operational despite the amount of time and money invested in them.[41] For example, the Directo a México initiative, involving linkages between the United States and Mexico, has processed more than 4.9 million ACH payments, worth more than USD 2.6 billion, since its launch in 2003. However, these

[40] SWIFT gpi aims to improve "the customer experience in cross-border payments by increasing the speed, transparency and end-to-end tracking of cross-border payments". See https://www.swift.com/our-solutions/global-financial-messaging/payments-cash-management/swift-gpi.

[41] Exceptions include regional integration initiatives such as the Single Euro Payments Area (SEPA) and the payments-related work in the South African Development Community.

accumulated figures represent less than 6% of the annual volume and 10% of the value of remittances sent from the United States to Mexico in 2016.[42] The relatively limited market share may be due to limited participation by banks in the United States, as banks may be reluctant to adapt their services to use lower-cost ACH payment services that have limited global reach or uncertain demand.[43] Nonetheless, the total benefits to payers and payees[44] of the Directo a México service has been calculated at almost USD 153 million,[45] which significantly exceeds the development cost of the initiative.

The additional complexity arising from interlinking payment infrastructures entails challenges in terms of financial and operational risk management. It is important that each individual infrastructure manage its risks appropriately and, where relevant, follow the guidance in the Principles for Financial Market Infrastructure to "identify, monitor and manage all potential sources of risk arising from the link arrangement" (Principle 20).[46] Recognising the further logistical challenges of integrating financial infrastructures, the World Bank Group has developed guidelines to aid future efforts, based on the lessons learned by authorities that have already undertaken projects in this area.[47] In addition, the United Nations' International Telecommunication Union (ITU) has identified guidelines on establishing interoperability agreements, in both a domestic and an international context.[48]

Given the correspondent banking issues noted above (including messaging, clearing and settlement challenges) and the limited availability and viability of current interlinked payment infrastructures, workshop participants indicated that proprietary closed-loop systems were seeing the fastest growth. Although no data are available to substantiate this claim, new technology has reduced the cost as well as simplified the task of building a network that can link payers and payees that both have accounts in or otherwise use the same closed-loop system. As fixed costs for setting up a network have decreased but risk management and compliance costs have risen with each currency and country added, closed-loop systems generally offer services for a limited number of "payment corridors".

That said, closed-loop systems may not be supervised or overseen to the standards of more established PSPs or payment infrastructures, meaning that risk management standards may be lower and customers may lack protection (such as deposit insurance or consumer safeguards). Lower risk management standards could in turn lead to service disruptions or financial losses for customers,[49] the significance of which would increase in line with the market share of a closed-loop system in a jurisdiction.

[42] During 2016, around 91.6 million remittances totalling USD 27 billion were sent from the United States to Mexico (source: Bank of Mexico, Remittance Statistics, http://www.banxico.org.mx/SieInternet/consultarDirectorioInternetAction.do?sector=1&idCuadro=CE81&accion=consultarCuadro&locale=en).

[43] The Federal Reserve Board has periodically produced Reports to Congress that address these points and other details of FedGlobal ACH deployment for Directo a México and other connections. See https://www.federalreserve.gov/boarddocs/rptcongress/ACH_report_201107.pdf.

[44] Bank of Mexico regulation forbids the payees' banks from deducting fees from the principal amount of SPEI transfers and provides the payee with the competitive foreign exchange rate applied by the Bank of Mexico when receiving payment instructions from the Federal Reserve.

[45] Source: Bank of Mexico calculations. The savings are due to three factors: (i) payees' savings for substituting cheques in USD for ACH transfers; (ii) a more competitive FX rate compared with the retail rate offered by PSPs in retail transactions; and (iii) lower originating fees for payers compared to regular money transfer operators or regular bank transfers.

[46] https://www.bis.org/cpmi/info_pfmi.htm.

[47] See World Bank (2014) or Lipis and Adams (2014) for more details.

[48] See ITU (2016) for more details.

[49] The fact that closed-loop systems represent a single point of failure and that they usually rely on proprietary formats and systems could result in a "lock-in" effect, making it difficult for users to easily find alternative channels to process their payments, in case of failure.

Box F

Selected regional integration initiatives for cross border retail payments

Integration of payment infrastructures is typically aimed at enabling cross-border payments for PSPs and their customers, often between the countries within a region. The goal of such agreements tends to be the same as with other regional integration efforts: to foster increased intraregional trade and (in some cases) economic development. Many regional integration efforts in the payments space do not necessarily involve the establishment of a dedicated, centralised infrastructure. These initiatives are in effect enabling the integration of different national payment systems under a set of defined rules and business practices to enable faster and more efficient cross-border payments. Below, brief selected examples are provided of cross-border integration of payment infrastructures in the form of (i) the establishment of a single bilateral link, (ii) the development of a common interoperability framework and (iii) the development of a centralised platform.

Directo a México

Directo a México, established in 2003, is an example of interlinked domestic payment infrastructures. It provides a channel for depository institutions in the United States to send ACH credit payments to depository institutions in Mexico. Directo a México links the Federal Reserve-operated ACH service, FedACH, the US gateway operator, to the Mexican RTGS (SPEI) operated by the Bank of Mexico, the Mexican gateway operator. This initiative was implemented by the two central banks, in their roles as operator of their respective payment systems infrastructure as well as catalyst of new solutions to advance economic development and lower the cost of traditional cross-border retail payments. FedACH and SPEI are connected through secure private telecommunication networks, where ACH credits are sent to Mexico using US standard messaging formats. The Bank of Mexico translates the ACH files into domestic Mexican formats and uses SPEI to distribute payments to Mexican depository institutions. The processing time frames for posting the funds to the payee's account after the payer initiates a payment is typically one banking day.

European Automated Clearing House Association Framework for interlinking of ACHs

EACHA is a technical cooperation forum of European ACHs, currently comprising 27 member institutions, which has developed interoperability frameworks for credit transfers and instant payments, based on the scheme rulebooks applicable in the Single Euro Payments Area.① While the interoperability framework can form the basis for establishing links between ACHs, it is up to the individual ACHs to choose whether to establish interoperability links and, if so, with which ACHs. If ACHs choose to establish interoperability, the EACHA framework enables parties to use the same technical standards and procedures and to exchange data fully automatically. The Interoperability Framework facilitates interoperability between ACHs, but may also be used by PSPs and helps operators of payment infrastructures to meet the requirement for technical interoperability within the European Union, as per Regulation (EU) No 260/2012.② Another example of the establishment of an interoperability framework is the work of the International Payments Framework Association (IPFA).

Arab Regional Payment System

The Council of Arab Central Banks Governors③ approved in 2014 a project to integrate the clearing and settlement of cross-border payments in the Arab world, with a view to establishing an Arab Regional Payment System (ARPS), and called on Arab central banks to coordinate with the Arab Monetary Fund (AMF). Among its high-level objectives, ARPS is expected to: (i) lower the costs of making payments and transfers among Arab countries as well as the range of liquidity variability and volume of operating requirements; (ii) shorten transaction processing times (by substituting a single system for multiple correspondent banks); and (iii) lower transactions fees (from a current estimated average of USD 33 to around USD 10). Scheduled for delivery in 2019, ARPS will act as a correspondent for its participants (eg banks, financial institutions) through a single, centralised platform for cross-border payments with provision for the use of Arab currencies for settlement.

Sources: Bank of Mexico and Federal Reserve System, EACHA, www.eacha.org. IPFA, www.ipf-a.org, Arab Monetary Fund (2017); Arab Monetary Fund (2017) and Carvalho (2017).

① The Single Euro Payments Area, or SEPA, is an area in which consumers, companies and all other users of payment services can make and receive payments in euros under the same conditions and with the same rights and obligations, regardless of their location within Europe. SEPA covers 34 European countries: the 28 Member States of the European Union as well as Iceland, Norway, Liechtenstein, Switzerland, Monaco and San Marino. SEPA is also defined as an industry project and a political process, both of these endeavours being aimed at removing the legal, commercial and technical barriers that currently still separate national payments markets. ② Regulation (EU) No 260/12 of the European Parliament and of the Council of 14 March 2012 establishing technical and business requirements for credit transfers and direct debits in euro and amending Regulation (EC) No 924/2009 (OJ L 94, 30.3.2012, p. 22). ③ Algeria, Bahrain, The Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, the United Arab Emirates and Yemen.

4. Conclusions

4.1 The demand side

Users' expectations of cross-border payment services have increased as they have become accustomed to faster, cheaper and more convenient domestic payments. Various innovations with a focus on improving users' convenience and the speed, transparency and cost of payments have been launched in recent years to meet these expectations. However, despite the accelerating pace of innovation, examples persist of the difficulty or high cost of sending cross-border payments, whether to a foreign supplier or as remittances or charity donations.

The survey and workshops conducted for this report bore out these issues. However, it is clear that different users have different priorities and experiences making cross-border retail payments. Large corporate users, which make high-value or frequent payments, may experience a lack of transparency, including problems tracing transactions, and uncertainty over settlement timing and the FX rates applied to transactions. Smaller businesses and individuals that send relatively smaller or more sporadic payments face similar issues, but concerns about access to services and the costs of sending cross-border payments are a much higher priority.

4.2 The supply side – front end

Understanding that some users face more challenges than others is a key starting point for those tasked with exploring ways to overcome those challenges. As regards SMEs, although there is some evidence that providers of payment services are responding with new services (eg non-bank MTOs developing services

for small businesses), what may be required is initiatives explicitly focusing on the specific needs of these users.

Another end user group facing particular challenges when making cross-border retail payments is individuals without access to transaction accounts. This set of users lack access to many of the front-end initiatives that have broadly improved convenience and speed for other users. However, as progress is made towards providing universal access to transaction accounts as a gateway to broader financial inclusion, more and more people are likely to benefit from the possibilities presented by digital payments on a cross-border level. This will potentially provide more options to those who currently rely on cash. At the same time, competition should increase, which could in turn reduce the cost of cross-border retail payments.

4.3 The supply side – back end

All back-end service providers face inherent challenges with messaging, clearing and settlement of cross-border retail payments due to additional complexities that do not need to be managed for domestic payments. However, progress is being made towards harmonising messaging standards and making same day trading and settlement of different currencies simultaneous.

Correspondent banking

The results of the survey indicate that the majority of cross-border retail payments are cleared and settled through correspondent banks, and that this arrangement perpetuates the issues related to cost, transparency and speed that users experience making such payments. In addition, the fact that services for certain PSPs, especially MTOs, have been curtailed or terminated by correspondent banks (referred to as de-risking) has hampered access for some end users.

These de-risking issues have been attracting a good deal of attention. The CPMI, through its own technical analysis, follow-up of recommendations and participation in the FSB's correspondent banking coordination group, has aimed to address some of the issues. Efforts have been complemented by a range of private initiatives, such as SWIFT gpi, that seek to mitigate some of the current difficulties faced by banks and PSPs as well as provide more structure to the network (eg through multilateral agreements).

Linking payment infrastructures

An alternative to correspondent banking is linking domestic payment infrastructures (Box F illustrates where this is happening). However, as noted by the World Bank (2014), "the majority of these schemes have failed to meet expectations, and account for a small amount of cross border retail payments made between the jurisdictions they link". The experiences provided by (end user) participants in the workshops held confirmed these findings.

While linking multilateral systems may in theory streamline certain processes, this is difficult in practice and may create other operational and financial risks that would need to be managed. It requires the harmonisation of legal, technical and operational aspects, a complex undertaking that requires political will, commitment from participants in both payment systems, and a convincing business case to be made for each jurisdiction. Working through these challenges can lead to compromises in the arrangements, which might mean reduced efficiency in the final implementation. Additionally, interlinked systems usually offer a narrower range of currencies and countries than a network of correspondent banks. Consequently, individuals, small enterprises and their banks will almost certainly need to supplement their use of interlinked structures in order to reach a wider range of countries using a wider range of currencies in a growing global marketplace.

Proprietary closed-loop systems

Despite the initiatives and efforts currently focused on improving correspondent banking and interlinking payment systems, the back-end arrangement reportedly growing faster than any other is the closed-loop proprietary system. Such a system relies on both payer and payee opening an account in or otherwise using the same closed-loop system, and can therefore offer services to both and control the end-to-end payment.

If such networks ultimately increase efficiency and offer cheaper, faster and more transparent payments whilst maintaining risk management and compliance standards, then their growth would be positive. However, there are two potential drawbacks:

- As the survey showed, the majority of respondents used proprietary messaging formats, with only a small proportion accommodating ISO message types, which would otherwise allow for greater interoperability. If there is a proliferation of closed proprietary networks, then market fragmentation is likely to occur, which may not represent an improvement on the current correspondent banking setup if users need to negotiate a series of closed-network corridors.
- Closed-loop proprietary systems in some jurisdictions may not be subject to the same regulatory, supervisory and oversight requirements as traditional PSPs. Offering cross-border payment services, especially FX services, involves taking both financial and operational risks. Failure to sufficiently manage risk could result in the failure of a provider, which might result in significant disruption (and potentially financial losses) to users. That disruption will only worsen as a system's market share in a jurisdiction increases.

Peer-to-peer DLT technologies

Of the four back-end arrangements, DLT-based solutions are in the most nascent state. Recent studies of the application of this technology to payments by central banks and others[50] have identified a number of technical, legal and regulatory obstacles that will take time to overcome. It could thus be a while before the use of DLT results in significant improvements to cross-border retail payments.

4.4 Closing remarks

Cross-border retail payments are generally slower, less transparent and more expensive than domestic retail payments. This should not be surprising, as moving money across borders and currencies inherently carries more risk and complexity than a domestic payment, while at the same time exhibiting lower economies of scale and scope. Nonetheless, a majority of the users and industry participants that contributed to the survey and workshops agree that the difficulties in terms of the speed, transparency and cost of cross-border payments are disproportionate to the inherent issues involved in transferring money across borders and currencies.

Yet the end users of cross-border retail payments are not a homogenous group. Their priorities depend on their circumstances and requirements, which naturally vary. With the notable exception of some SMEs, individuals and other entities (eg NGOs) that may face access issues, the majority of users have choice as to who provides their payment services. However, this choice of front-end providers is not mirrored in that of the back-end clearing and settlement methods available, with the only feasible option often being correspondent banking.

An increase in choice could potentially improve the efficiency of the cross-border retail payments market by matching different users to providers that focus on their needs (eg those users that value cost

[50] For example, the Bank of Canada's Project Jasper (2017), the Monetary Authority of Singapore's Project Ubin (2017), and the Bank of Japan's and the European Central Bank's Project Stella (2017).

over speed could elect to send payments through a slower but cheaper arrangement, and vice versa). Greater interoperability between private systems, including closed-loop systems, could help. Note, in particular, that market efficiencies may not materialise if new or existing closed-loop systems that cannot interoperate with one another simply replace correspondent banking networks. Likewise, the safety of future arrangements requires effective oversight from financial authorities to ensure that appropriate risk management standards are in place.

This report concludes that having more diversity of back-end clearing and settlement arrangements could result in cross-border retail payments that are quicker, cheaper and more transparent. Such diversity could include an improved traditional correspondent banking system, greater interoperability between domestic payment infrastructures and greater interoperability between closed-loop proprietary systems.

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Glossary

Cross-border retail payments: funds transfers of relatively low value and urgency where the parties to the payment are end users (ie individuals, businesses or government agencies) and the payer and the payee are located in different (national) jurisdictions. Typically, cross-border retail payments are remote payments and involve the national payment systems of at least two jurisdictions, specialised processes and different currencies.

Electronic money (e-money)-based instruments: in general terms, these instruments involve the payer maintaining a prefunded transaction account with a payment system provider, often a non-bank. Specific products include online money when the payment instruction is initiated via the internet, mobile money when initiated via mobile phones, and prepaid cards.

Money transfer operator (MTO): a non-deposit-taking payment service provider where the service involves payment per transfer (or possibly payment for a set or series of transfers) by the sender to the payment service provider (for example, by cash or bank transfer) – ie as opposed to a situation where the payment service provider debits an account held by the sender at the payment service provider.

National payment system: encompasses all payment-related activities, processes, mechanisms, infrastructure, institutions and users in a country or a broader region (eg a common economic area). Also referred to as "payment system".

Payment service provider (PSP): an entity that provides payment services, including remittances. Payment service providers include banks and other deposit-taking institutions, as well as specialised entities such as money transfer operators and e-money issuers.

Payment system operator: an entity that operates a payment network and/or other payment infrastructures.

Annex 1: Other work related to cross-border retail payments

Recent work by a number of multilateral institutions has covered areas directly or indirectly linked to cross-border retail payments.

Correspondent banking

Correspondent banking is an essential component of the global financial system, especially for cross-border payments, because it is the most common method that financial institutions use to transfer funds across borders.

In recent years, there have been indications that networks of correspondent banking relationships have decreased in size, leading to a concentration in a small number of institutions and difficulties for smaller participants to gain or maintain access to correspondent banking services.

The CPMI set up a working group on correspondent banking with a focus on payment system implications and potential technical measures to facilitate correspondent banking services. The working group published its final report in July 2016, including a set of technical recommendations on the use of "know your customer" (KYC) utilities, information-sharing initiatives and payment messages.[51]

In addition to the CPMI's work, the Financial Stability Board (FSB) established the Correspondent Banking Coordination Group in March 2016 to coordinate the actions of several interested parties, including the CPMI.[52]

AML/CFT regulations

The lack of a robust AML/CFT legal framework and concerns over the enforcement of such rules have been cited as one of several factors causing correspondent banks to cancel or curb correspondent banking relationships with certain geographies, financial institutions or groups of customers.

Various institutions have conducted work to address such concerns. The BCBS issued a paper related to management of money laundering and terrorism financing risks.[53] The Financial Action Task Force (FATF) has provided improved guidance on how to apply a risk-based approach to prevent further terminations of correspondent banking relationships and other "de-risking" practices.[54] The IMF has provided technical assistance and training to help affected countries enhance their monitoring of correspondent banking relationships and strengthen their legal framework, as well as their supervisory and enforcement capabilities.[55]

International remittances and financial inclusion

Reflecting the importance of international remittances, the CPMI (at the time, CPSS), together with the World Bank, analysed international remittances and published general principles aimed at the public policy

51 CPMI (2016a).

52 See FSB (2016).

53 BCBS (2016a,b).

54 FATF (2016).

55 See IMF (2017).

objectives of safe and efficient international remittance services.[56] The importance of international remittances for financial inclusion, given their high volume and recurrent nature, has also been emphasised in recent work by the CPMI and the World Bank.[57]

Digital currencies and digital innovations

Work by the CPMI has noted that the recent development of digital currencies has been partly driven by certain factors, such as lower costs and potential global reach, that may be particularly relevant for cross-border payments. Distributed ledger technology, which was examined in a subsequent CPMI report (2017), and other digital innovations have been identified as having potential implications for cross-border payments by researchers at various institutions.[58]

[56] CPSS-World Bank Group (2007).

[57] CPMI-World Bank Group (2016).

[58] See eg Mills et al (2016) and He et al (2017).

Annex 2: Stocktaking exercise

The stocktaking approach

In the first phase, working group members identified relevant providers and initiatives in their respective jurisdictions. In total, about 140 unique providers and several initiatives were identified. Most of the providers could be qualified as front-end or closed-loop providers.

In the second phase, detailed information about these providers and initiatives was obtained from mid-February to the beginning of April 2017. This phase included questions on notable drivers of and barriers to the development and implementation of cross-border retail payment services, the legal and regulatory framework, governance and participation criteria, geographical coverage of users, supported payment instruments and currencies. The survey also touched upon technical questions about the services' contractual aspects and clearing and settlement arrangements. It was designed to gather information from supply side actors. The survey findings were complemented by information obtained at a workshop held with providers and initiatives in December 2016 and secondary research. Information on the demand side was obtained via secondary research and via a workshop organised by the working group in March 2017. The supply side survey was not geographically representative, but included various relevant global players.

Main findings regarding providers

In total, information was gathered on 97 providers, whose services cover 210 countries and territories and 10 currencies. Of these providers, 42 operate globally, 23 regionally and 32 locally (usually for receiving cross-border retail payments). According to their involvement in the cross-border retail payments chain, 35 providers are front-end, six are back-end, 44 are end-to-end and 12 are infrastructure operators.

For analysis purposes, providers were grouped into two broad categories. One category includes front-end and end-to-end operators, while the other includes back-end providers and infrastructure operators. About 70% of the providers (primarily front-end and back-end providers) in the sample operate in their jurisdictions with a banking or money remitter licence. Some back-end and infrastructure operators, such as the global card networks and messaging service providers, indicated that they do not require a licence to operate. More than 80% of the survey respondents have a licence that allows them to support both inbound and outbound cross-border retail payments. Central banks and financial authorities are the licensing authority of almost two thirds of the providers surveyed. Central banks are more often the licensing authority for front-end providers, while financial authorities are the authority for back-end providers.

Main findings regarding initiatives

A variety of initiatives implicitly or explicitly address existing challenges in cross-border retail payments. Depending on their focus, they can be assigned to certain aspects of the cross-border retail payments process, as outlined in the diagram on page 42. However, certain initiatives – especially those focused on regional integration – address a variety of elements in the cross-border retail payments process (eg the legal and regulatory framework, scheme and contractual aspects, and/or certain back-end arrangements and processes).

Price monitoring and comparison initiatives: in line with the World Bank's and CPMI's joint publication, *General Principles for International Remittances Services* (CPSS-World Bank (2007), which emphasises the importance of price transparency for remittances, there are a number of initiatives and publicly available databases comparing remittance prices. The most comprehensive one is the World Bank

Group's RPW database.[59] As of 2017, the RPW database covers 365 country corridors. The World Bank Group has been promoting a unified methodology with 12 key minimum requirements and certification of regional and/or national databases, SendMoneyPacific being one of the certified databases.[60]

Financial education initiatives: financial literacy, especially of consumers and small business owners, is considered important to identify and compare alternative cross-border retail payment services. One example is the World Bank initiative Project Greenback 2.0, which aims to increase efficiency in the market for remittances by working directly with migrant communities and their families at home. Another example is the Mexican National Development Plan 2013–18, which includes financial education measures for Mexican nationals living abroad.[61]

Initiatives to address legal and regulatory challenges: the focus of these initiatives is on KYC/AML/CFT and associated challenges, such as the decline in correspondent banking relationships. In 2015, the G20 Leaders approved the Financial Stability Board's (FSB's) four-point action plan to assess and address the decline in correspondent banking; in that same year, the FSB established a Correspondent Banking Coordination Group. The World Bank conducted surveys to better understand the evolution and drivers of bank account closures or restrictions. The Financial Action Task Force issued three public statements on de-risking, focusing on a risk-based approach. The Basel Committee on Banking Supervision finalised its *Revised annex on correspondent banking* in November 2016 in a new release of its *Sound management of risks related to money laundering and financing of terrorism*, and the CPMI its *Correspondent banking* report (2016a). The Wolfsberg Group, an association of 13 global banks, aims to develop guidance and frameworks for the management of financial crime risks with respect to KYC, AML and CFT policies. SWIFT has established a KYC registry as a platform for SWIFT members to share and exchange their factual KYC data in a standardised format, validated by SWIFT, to assist financial institutions that use the registry with their obligation to conduct a risk analysis. Currently, there is little focus on other legal and regulatory challenges related to cross-border retail payments, eg foreign exchange controls, taxes on international remittances, and more general inconsistencies among regimes.

Initiatives for coordination and information exchange: initiatives in this area mainly focus on international remittances, eg the World Bank Group's Global Remittances Working Group to coordinate the work on remittances at the international level. The Centre for Latin American Monetary Studies set up the Latin America and Caribbean Forum on Remittances, in response to the needs of the region's central banks for obtaining more in-depth knowledge on remittance topics. The Global Forum on Remittances and Development is organised by the International Fund for Agricultural Development, a specialised agency of the United Nations, in collaboration with key partners.

Regional integration initiatives: the World Bank Group convened a group of experts who have been directly involved in a range of regional and cross-regional financial infrastructure integration projects and developed guidelines for regional financial infrastructure integration.[62] Concrete regional integration initiatives include the Single Euro Payments Area and the South African Development Community.

Initiatives to establish a common scheme/rules: notable initiatives are the International Payments Framework Association (IPFA) and SWIFT global payments innovation (gpi) initiative. IPFA is a platform that establishes rules for non-urgent and instant cross-border/cross-currency payments. It involves financial institutions, payment infrastructures and banking associations – authorities participate as observers. The SWIFT gpi initiative promotes (in its rulebook) multilateral service level agreements between participating banks. In its first phase, SWIFT gpi is focused on B2B payments and aimed at ensuring faster,

[59] See World Bank Remittance Prices Worldwide, remittanceprices.worldbank.org/en.

[60] See World Bank Group, *Remittance price comparison database: minimum requirements and overall policy strategy*, remittanceprices.worldbank.org/sites/default/files/StandardsNationalDatabases.pdf.

[61] See IFAD-World Bank Group (2015).

[62] See World Bank (2014).

same day use of funds (within the time zone of the receiving gpi member), end-to-end payments tracking, and delivery of unaltered remittance information.

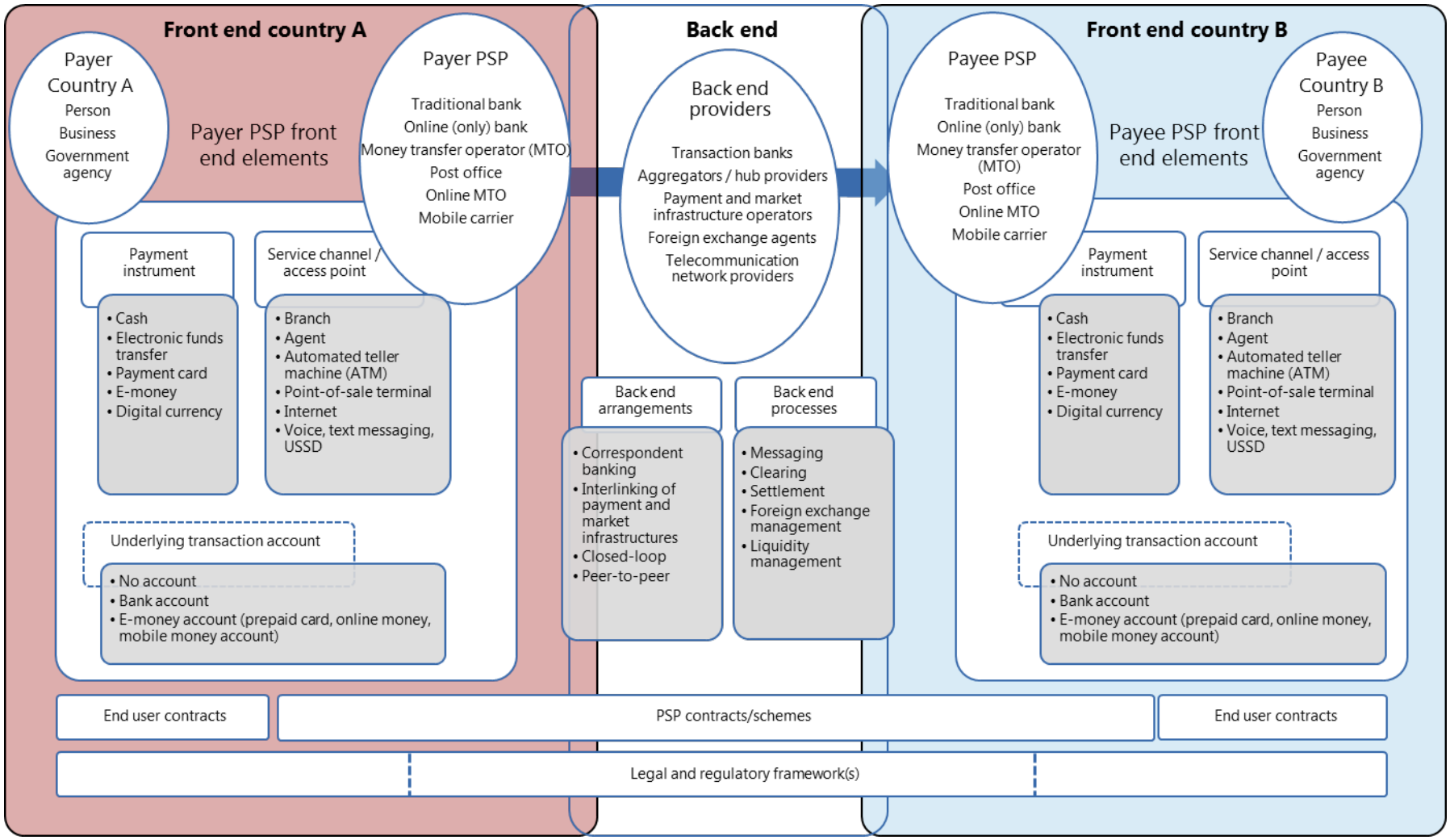
Initiatives to standardise message formats: SWIFT aims to harmonise the implementation of ISO 20022. In 2015, in close cooperation with several financial market infrastructures (FMIs) in the process of deploying ISO 20022 in their communities, SWIFT launched the ISO 20022 Harmonisation Charter, a formal document that sets out three key harmonisation best practice principles, ie share information, adhere to market practice, and introduce stricter message control and release management. The Charter has been publically endorsed by a number of FMIs.[63] The Federal Reserve Banks have been collaborating with several other organisations to prepare for the adoption of the ISO 20022 standard for domestic and international wire transfers and integration with and/or potential conversion for domestic ACH payments.

Initiatives to interlink payment infrastructures: the World Bank's *Guidelines for the successful regional integration of financial infrastructures* features, in its Annex 4, a comparative table of cross-border financial infrastructure integration projects, including payment settlement infrastructures/mechanisms and payment clearing infrastructures/mechanisms.[64] Concrete examples that were also included in the survey by the working group are the GCC RTGS System and GCCNET (a single ATM network linking all the GCC national switches).

[63] See SWIFT webpage *ISO 20022 Harmonisation Programme*, www.swift.com/standards/iso-20022-harmonisation-programme.

[64] See World Bank (2014).

Annex 3: Overview of the cross border retail payments market



Annex 4: Members of the working group

Chair	Lorenza Martínez Trigueros (Bank of Mexico)
National Bank of Belgium	Jan Vermeulen
Central Bank of Brazil	Lucio Oliveira
Bank of Canada	Paul Miller Ariel Olivares
People's Bank of China	Chen Xue
European Central Bank	Francisco Tur Hartmann Thomas Lammer
Bank of France	Alexandre Stervinou Julien Lasalle
Deutsche Bundesbank	Heike Winter David Ballaschk
Hong Kong Monetary Authority	George Chou (from August 2017) Clarence Hui (until August 2017) Helen Leung
Reserve Bank of India	Charulatha Kar
Bank of Italy	Maria Iride Vangelisti Nives Coppari
Bank of Japan	Takahiro Yamasaki Takashi Hashimoto (until June 2017)
Bank of Korea	Jungmi Kang
Bank of Mexico	Sara Gabriela Castellanos Alberto Mendoza Hernández
Netherlands Bank	Evert Fekkes (from January 2017) Jakob Rotte (until December 2017)
Central Bank of the Russian Federation	Yury Surodeev
Saudi Arabian Monetary Authority	Husam Al Mahmoud Mona Alsemayen
Monetary Authority of Singapore	Chek-Tchung Foo
South African Reserve Bank	Annah Masoga
Bank of Spain	Carlos Conesa (until March 2017) Sergio Gorjon
Sveriges Riksbank	Sara Edholm
Swiss National Bank	Nino Landerer David Maurer

Central Bank of the Republic of Turkey	Güzide Merve Öztürk Betül Üzer
Board of Governors of the Federal Reserve System	Mark D. Manuszak
World Bank	Harish Natarajan Massimo Cirasino
Secretariat	Henry Holden (from July 2017) Yuuki Shimizu (until July 2017)

Significant contributions were also made by Marc Hollanders, Takeshi Shirakami, Eva Vonaskova (Bank for International Settlements), Greta Kasperaviciute (European Central Bank) and José Javier Díaz Chilian (Bank of Mexico).