FSB FINANCIAL STABILITY BOARD

Enhancing Cross-border Payments

Stage 1 report to the G20: Technical background report

9 April 2020

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Introduction

The Saudi Arabian G20 Presidency has asked the FSB to coordinate amongst the relevant stakeholders on a three-stage process to develop a roadmap to enhance cross-border payments:

- **Assessment (Stage 1):** The FSB, in coordination with relevant international organisations and standard-setting bodies has considered the existing practice of cross-border payment arrangements through conducting an assessment of existing arrangements and challenges, and accordingly is providing an update to the G20 Finance Ministers and Central Bank Governors (FMCBGs) meeting in April 2020.

- **Building Blocks (Stage 2):** The Committee on Payments and Market Infrastructures (CPMI) is leading the work on creating building blocks of a response to improve the current global cross-border payment arrangements. This will set out areas where further public sector work could assist in moving to an improved cross-border payments system and in public goods or removing unnecessary barriers, and accordingly provide an update to the G20 FMCBGs meeting in July 2020.

- **Roadmap (Stage 3):** Building on the previous stages, the FSB will coordinate, with CPMI and other relevant international organisations and standard-setting bodies, the development of a roadmap to pave the way forward. In particular, the FSB will report to the G20 on practical steps and indicative timeframes needed to do so. The three-stage process will be submitted as a combined report to the G20 FMCBGs meeting in October 2020.

This technical report is a supporting document for the assessment report to the G20, delivering on the Stage 1 mandate by covering:

- Existing arrangements for cross-border payments
- Issues/challenges with these arrangements
- Areas to explore further

To develop the report, the FSB formed a Cross-border Payments Coordination Group (CPC), co-chaired by Jon Cunliffe (Chair of CPMI) and Alejandro Diaz de Leon (Governor of Bank of Mexico) and comprises the BCBS, BIS, FATF, IMF and World Bank, the chairs of relevant FSB Groups (the Regulatory Issues of Stablecoins Group and Correspondent Banking Coordination Group), the G20 Presidency, and a small number of other FSB member institutions with payments responsibility in major currency areas. The CPC has been supported in the drafting of the report by a technical experts group, which comprises members of the CPMI Cross-border Payments Task Force and other experts nominated by members of the CPC, and the report has also benefited from input from the CPMI Cross-border Payments Task Force as a whole.[1]

[1] The Task Force reached out to almost 40 market participants and other stakeholders, both in writing and through discussions, to obtain their views on issues in cross-border payments and possible actions/solutions to improve cross-border payments. About half of the respondents were banks or banking associations, and the non-bank sector and back-end infrastructures each represented about a quarter of the respondents. The responses from this stakeholder outreach have largely confirmed the findings described in this report.

1. Existing arrangements for cross-border payments

1.1 Introducing the cross-border market

Definitions

For the purposes of this report, "cross-border payments" can be broadly defined as funds transfers for which the sender and the recipient are located in different jurisdictions.[2] Cross-border payments may or may not involve a currency conversion.[3]

The cross-border payments market is often thought of in terms of two segments, *retail* and *wholesale*, each with markedly different characteristics. In the *cross-border retail payments* market segment, the parties to the payment are end-users (i.e. individuals, businesses or government agencies), and the payments are usually of smaller size.[4] Although the term "wholesale" can be used to describe a variety of characteristics, in *cross-border wholesale payments* the parties are financial institutions (usually banks). Cross-border wholesale payments typically involve large-value transfers that are made between financial institutions for their own accounts or on behalf of their customers (including for the settlement of retail payments), through dedicated bilateral interbank arrangements or multilateral payment systems.[5]

Trends in cross-border payments

The increased international mobility of goods and services, capital, and people is contributing to the growing global importance of cross-border payments[6]:

- International trade has grown strongly over the last 10 years, and the internationalisation of production has led supply chains to become increasingly global. For instance, the global value of merchandise trade exports increased by 20% and of exports of commercial services by 46% between 2008 and 2018.[7]
- Cross-border e-commerce activity has contributed to the growth of person-to-business cross-border retail payments and is expected to grow substantially further in the years to come; 15-20% of e-commerce transaction value is already international.[8]
- International travel and migration continue to grow, creating additional demand for cross-border payments. International tourist arrivals worldwide grew 53% from 2010 to 2019.[9] Many international migrants send funds to support family and friends back home, and

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2 This simple definition does not cover all circumstances in which individuals or businesses make use of cross-border payments systems. For instance a tourist may be temporarily physically located in the same country as the receiver of funds, but wishes to send funds from an account in his home location; or a company may wish to make an internal transfer of funds between accounts in different currencies or locations.

3 Payments across national borders within a monetary union typically encounter fewer of the challenges and frictions discussed within this report; nevertheless a number of the challenges discussed in the report exist also for those payments.

4 CPMI (2018). https://www.bis.org/cpmi/publ/d173.htm

5 BIS (2017). https://www.bis.org/publ/qtrpdf/r_qt1703g.pdf

6 CPMI (2018) https://www.bis.org/cpmi/publ/d173.htm

7 WTO (2019) https://www.wto.org/english/res_e/statis_e/wts2019_e/wts19_toc_e.htm

8 McKinsey (2018) https://www.mckinsey.com/industries/financial-services/our-insights/a-vision-for-the-future-of-cross-border-payments

9 UN World Tourism Organization (2020). https://www.unwto.org/world-tourism-barometer-n18-january-2020

annual remittance flows grew 50% from 2010 to reach $707 billion, of which $529 billion were to low- and middle-income countries.[10]

These trends in the real economy suggest that cross-border payments represent an important, and probably growing, part of total payments volumes. However, comprehensive and comparable data on cross-border payments are not currently available. This is due to a lack of common definitions and coordinated, large-scale data collection efforts.

Most cross-border payments flow through the correspondent banking network (either as single transactions or bundled into wholesale payments).[11] Therefore, in the absence of comprehensive data on cross-border payments, and while acknowledging that other types of payment arrangements exist (as discussed in Section 1.3 below), correspondent banking values and volumes can serve as an indicator of overall trends in cross-border payments.

The volume and value of global cross-border payments sent using the SWIFT payment messaging system has risen in recent years, as shown in Figure 1 on the left. However the number of correspondent banking relationships has fallen globally by 20% from 2011 to 2018, with the decline affecting almost all regions and countries (Figure 1, middle panel). This is a source of concern for the international community because, in affected jurisdictions, it may have an impact on the ability to send and receive cross-border payments, or drive some payment flows underground, with potential adverse consequences on economic growth, financial inclusion, financial integrity and international trade.[12] Some regions (such as the Pacific islands) have relatively few correspondent banking relationships and are therefore more vulnerable to loss of access than others (right-hand panel).[13]

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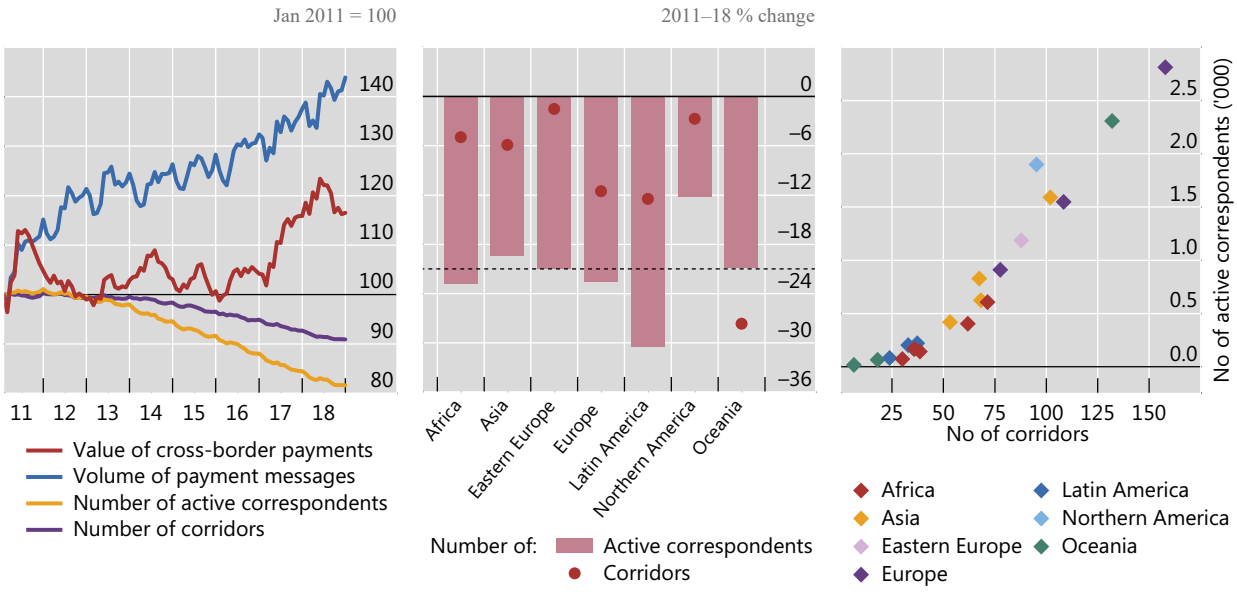
[10] World Bank, Remittance inflows data available at https://www.knomad.org/data/remittances

[11] Correspondent banks make their payments by sending instructions (mainly via the SWIFT Network) to debit or credit their accounts. Depending on which relationships are in place, several payments between different intermediary correspondent banks might be necessary for a single underlying transaction (a 'payment chain'). In the case of wholesale and large-value retail payments the transactions may be processed on an individual transaction basis via correspondent banking, whereas lower-value retail payments are often cleared locally and correspondent banking is used for the settlement of the final net positions only.

[12] FSB (2019) https://www.fsb.org/wp-content/uploads/P290519-1.pdf

[13] An analysis of challenges in correspondent banking in the small states of the Pacific is available at: Alwazir et al., (2017). https://www.imf.org/en/Publications/WP/Issues/2017/04/07/Challenges-in-Correspondent-Banking-in-the-Small-States-of-the-Pacific-44809

Correspondent banking landscape[14] Figure 1



[1] Three-month moving averages. [2] The black dotted line shows the average percentage change of active correspondents across regions. [3] 2018 data. Correspondent banks that are active in several corridors are counted several times. Averages across countries in the following subregions: Africa: Eastern, Middle, Northern, Southern and Western; Asia: Central, Eastern, South-Eastern, Southern and Western; Eastern Europe; Europe: Northern, Southern and Western; Latin America: Caribbean, Central and South America; Northern America; Oceania: Australia and New Zealand, Melanesia, Micronesia and Polynesia.

Source: SWIFT BI Watch, National Bank of Belgium.

Global figures for the different channels used for cross-border payments do not exist. The channels used in different regions may be strongly influenced by the availability of multilateral cross-border payment systems and by other factors, such as the existence of a monetary union. For instance, data suggest that around half of euro-denominated cross-border payments originated through correspondent banking arrangements are settled through various types of multilateral payment system, while the remaining payments are processed solely through correspondent banking arrangements.[15]

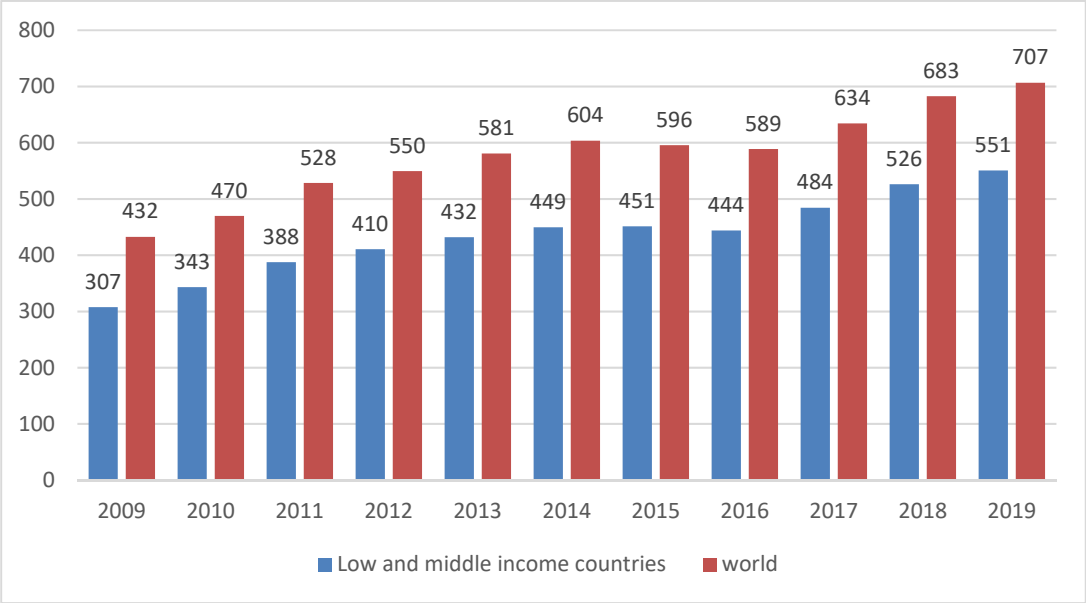
Globally, one important purpose for cross-border retail payments are international remittances. Remittances are a critical source of financing for people in most developing countries and play an important role in economic growth. For many households in these countries they are probably the most stable, or even the primary, source of income.

Remittances inflows have increased by 64% in the last decade, from $432 billion in 2009 to an estimated $707 billion in 2019 (see Figure 2). Remittances sent from G20 countries account for more than 50% of the global total.

[14] Source: Rice, T, G von Peter, C Boar (2020): "On the global retreat of correspondent banking", https://www.bis.org/publ/qtrpdf/r_qt2003g.htm

[15] Around 46% in 2016 (down from 52% in 2014).

Remittances (Total inflows) in USD bn Figure 2



Source: World Bank[16]

The cost of sending remittances has declined over the last 10 years (see Figure 3), but the rate of reduction has slowed in recent years and the global average cost of sending $200, at 6.82% in Q4 2019, remains well above the G20 commitment in 2011 to reduce the cost to 5% and the UN Sustainable Development Goal target of 3% by 2030.[17] Costs vary widely across country corridors[18] and types of remittance service providers: the global weighted average of sending $200, which accounts for the relative size of the flows in each corridor, was estimated at 5.10% in Q4 2019, closer to the G20 commitment, but having reduced by less over the last 10 years than the global average.[19]

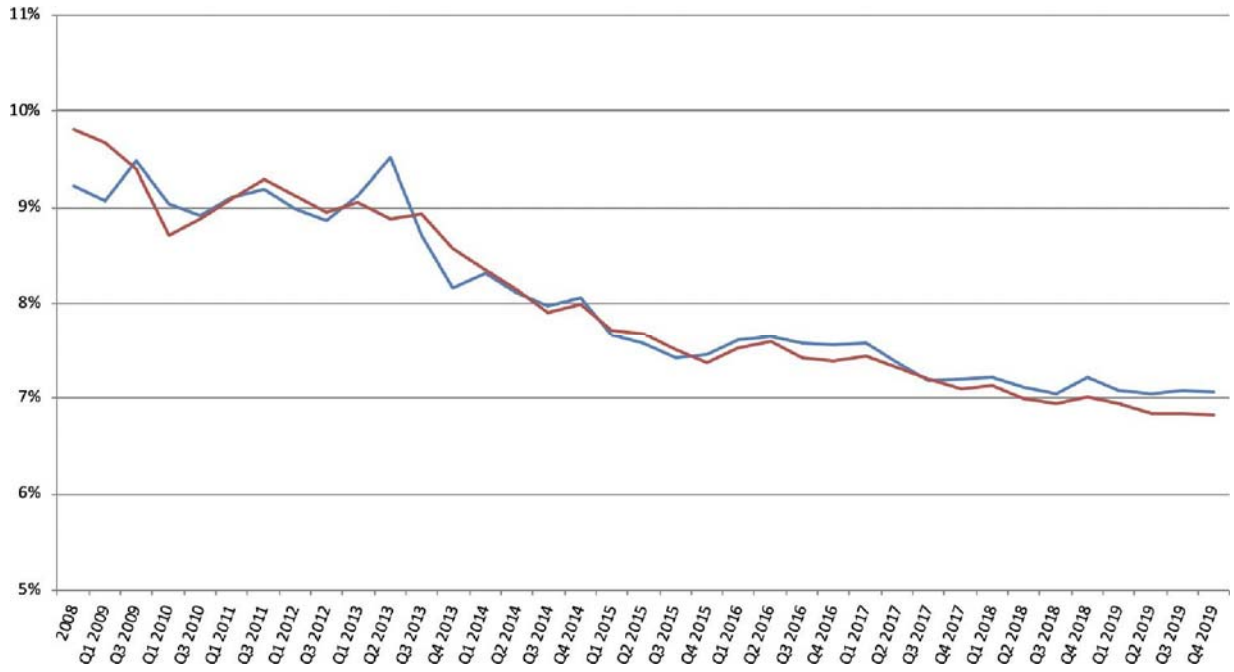
16 World Bank, Remittance inflows data available at https://www.knomad.org/data/remittances

17 Remittance Prices Worldwide (https://remittanceprices.worldbank.org/en)

18 The set of payment flows between country A and country B is referred to as the 'country corridor' between country A and country B.

19 To complement the Global Average and Global Weighted Averages described above, the World Bank introduced the SmaRT indicator in Q2 2016, which aims to reflect the cost that a well-informed consumer with access to sufficiently complete information could pay to transfer remittances in each corridor. In Q4 2019, the Global SmaRT Average was recorded at 4.37 percent, below the G20 commitment, but still well above the Sustainable Development Goal target. This illustrates the importance of transparency to users about costs and available services.

Average cost of sending USD 200 from G20 countries Figure 3



Blue = Average Cost of Sending from G20 Countries, Red = Global Average

The purposes for making cross-border payments

Cross-border retail and wholesale payments have different purposes:

1. **Cross-border retail payments** are typically between individuals, businesses and government agencies and have a variety of purposes, as shown in Figure 4 below. The most frequent types (in volume and value terms) are person-to-person (P2P), person-to-business (P2B) and business-to-business (B2B).

The different purposes of cross-border retail payments Figure 4

To	Person	Business	Government
Person	P2P Transfer of money to family members or friends abroad, without an underlying economic transaction (e.g. international remittances) or transfer of money due to international relocation/migration	P2B Payments for purchase of goods and services from businesses abroad via the internet, payment of bills for services directly to a provider abroad, and payments resulting from international tourism or business travel	P2G Payments made by individuals to government agencies or public sector organisations (e.g. payment of taxes and utility services for property held abroad)
Business	B2P Salaries and pensions to employees working abroad, to freelance workers, judicial resolutions	B2B Supply chain payments to foreign suppliers, payments for services offered from businesses abroad (e.g. storage in the cloud)	B2G Tariffs paid by exporters to authorities abroad
Government	G2P Pension payments to retirees or support for people living abroad	G2B Purchases from international suppliers	G2G Payments related to international aid

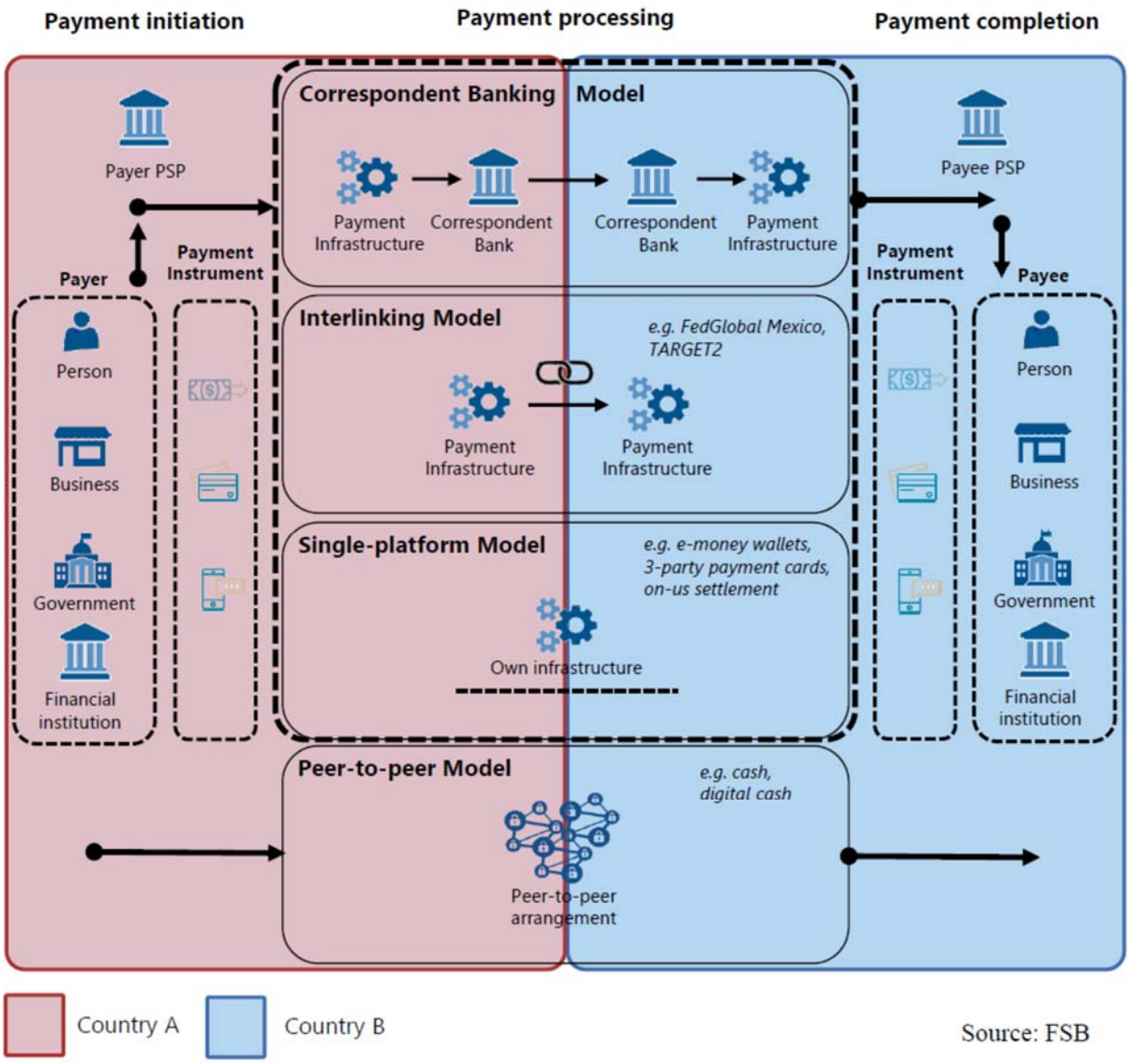
2. **Wholesale cross-border payments** are typically made between financial institutions, either to support the financial institution's own customers' activities, or its own cross-border activities (such as borrowing and lending, foreign exchange, and the trading of equity and debt, derivatives, commodities and securities). However, other types of users may also use wholesale markets for large transactions or financial management. Wholesale payments for multinational non-financial companies may be either to support trade or other business transactions, or may be connected with the financial services for the company such as cash management, which require moving funds across international subsidiaries to support the company's liquidity needs. Governments may also use wholesale markets for large transactions with other governments or businesses (G2G, G2B or B2G).

Overview of the structure of the cross-border payments market

Figure 5 (below) gives a stylised overview of the cross-border payment market, from retail or wholesale payment initiation to completion:

- The payment initiation and completion stages take place within **end-user facing environments**.
- The actual processing of payment transactions is supported by different types of **cross-border payment architectures delivering services** to end-users.

Overview of the cross-border payments market Figure 5



The following sections give an overview of both the end-user facing environments and the various architectures of cross-border payment services

1.2 Retail end-user facing environments (front end)

A number of payment instruments can be used by payers and payees to send and receive cross-border retail payments, e.g. cash, payment cards, electronic fund transfers, e-money. The specific instrument used can vary depending on the payment service provider (PSP), the countries involved in the transaction and the type of end user concerned. The following section gives an overview of retail environments for persons, businesses and governments.

Persons

The most common instrument for individuals to purchase goods and services from business abroad, e.g. online or in the countries they visit, is an international payment card (credit or debit), which offers convenience and wide acceptance. New entrants in the market, including e-money providers and challenger banks, offer pre-paid cards and e-money wallets as alternatives. Recently some FinTech providers have started offering overlay payment services; these services provide a convenient interface to initiate payments from existing bank accounts, e.g. through a mobile application or a digital wallet, without the need for the user to have a payment account with the overlay provider. The advent of open banking has allowed a number of new PSPs to focus their business models on providing payment services rather than traditional end-to-end banking. They have been active in offering innovative payment initiation products that enhance the end consumer experience, such as mobile wallets allowing for payments supporting biometrics or QR codes.[20]

Individuals also need to transfer funds to financial institutions when they pay back, for instance, mortgages on property held abroad. In those cases electronic funds transfers between bank accounts are the most common method used. Both bank account transfers, initiated increasingly online, and payment cards are widely used to pay taxes and other services to public agencies for e.g. property held abroad.

Individuals making international remittances to individuals in other countries use a variety of means. Transfers from bank account to bank account is a common channel between countries with more developed financial systems. Money transfer operators are also widely used for remittances instead of banks, especially when the receiver does not have a bank account. Agents located in different countries will receive and deliver the funds; settlement of net positions between agents is then managed by the money transfer operator. These services allow collection and withdrawal of cash, and therefore have long been the services most used by the unbanked. Money transfer operators are increasingly enabling use of debit cards, credit transfers and mobile money by senders and are partnering with banks and mobile money operators on the receiving side to credit funds into bank accounts or mobile money. Money transfer operators often have accounts with different banks that provide them access to settlement in different domestic payment systems. Operators can be licensed as credit institutions, money transmitters or payment institutions in many of the countries where they operate.

E-money wallets are also used for payment transfers to other users. These services have proved particularly popular in Africa, where mobile money operators have franchised commercial agents to exchange cash for electronic money units.

Informal value transfer systems like the Hawala system in the Middle East and Asia have played an important historical role for money transfers between individuals and continue to do so, including for the unbanked.[21] These systems do not necessarily imply the actual movement of money between intermediaries, and rely most often on the settlement of positions among a

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[20] Quick Response codes encode payment and other relevant data within two-dimensional graphics which can be displayed on screen and read through digital cameras. Together with modern smartphones, they can be used to initiate payments, either online or at a point of sale.

[21] See IMF (2003), "Informal Funds Transfer Systems. An Analysis of the Informal Hawala System", https://www.imf.org/external/pubs/nft/op/222/index.htm

network of brokers. However, they should not fall outside domestic and international regulatory frameworks.

Businesses

Bank transfers are the most widely used method when businesses send payments to other businesses for the purchase of goods and services. Because the payment transfer does not happen at the same time as the goods or services are purchased, there is some short-term credit involved. Sometimes payment cards are used for these transactions, especially in the case of smaller businesses with more limited access to credit lines.

Businesses also need to be able to receive cross-border payments from individuals, most often by payment cards, but sometimes also by bank transfers or from e-money accounts. Businesses tend to use bank account transfers to pay their staff salaries abroad, as well as to receive and pay back funding by financial institutions or to pay taxes and tariffs to foreign authorities, although payment cards are sometimes used.

Government

Governments need to pay benefits and pensions to their nationals living abroad. The bulk and regular nature of the payments make using bank accounts the most common method. Governments also make purchases from business abroad. Bank transfers are the most widely used method, with payment cards sometimes used for smaller purchases. Payments from governments to other governments or supranational organisations for international aid or contributions to common funding tend to take place through bank transfers.

1.3 Architecture of cross-border payment services (back end)

Cross-border payment arrangements typically rely on domestic payment systems to process transactions. In addition, for FX conversion, multicurrency settlement systems provide centralised infrastructures, allowing participants to settle FX transactions, generally on a payment versus payment (PvP)[22] basis, and bilateral settlement arrangements also exist.[23]

Back-end arrangements for the cross-border stage of payments can be broadly classified into the following models: (i) correspondent banking, (ii) single platform, (iii) interlinking and (iv) peer-to-peer (see Figure 5 above).

(i) **Correspondent banking** is an arrangement under which one bank (correspondent) holds deposits owned by other banks (respondents) from other countries and provides payment and other services to those respondent banks.[24] Correspondent banking arrangements enable banks to access financial services in different jurisdictions and provide cross-border payment services to their customers, supporting, inter alia international trade and financial inclusion. Under some

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[22] A settlement mechanism that ensures that the final transfer of a payment in one currency occurs if and only if the final transfer of a payment in another currency or currencies takes place.

[23] Further information on the size and structure of the global FX market can be found in the BIS Triennial Central Bank survey: https://www.bis.org/statistics/rpfx19_fx.htm

[24] http://www.bis.org/cpmi/publ/d00b.htm?m=3%7C16%7C266

international card schemes, participating banks typically rely on correspondent banking for settlement (a "4-party model").

(ii) In the case of **single-platform**, or in-house/intragroup transfer, the PSP of the payer is the same entity (or part of the same group) as the PSP of the payee. In this case, the payment transaction is started and completed by the same PSP to bridge the two jurisdictions and therefore does not rely on a connection between institutions or infrastructures in the two jurisdictions. This can be the case for proprietary arrangements (e.g. traditional money transfer operators), some international card schemes (i.e. "3-party model") and e-money schemes, or multinational banks that are present in the payer's and the payee's country.

(iii) The **interlinking between the national payment infrastructures of different countries** can be established by the private or public sectors payment systems of those countries. It enables PSPs participating in the payment infrastructure of one country to send and receive payments to/from PSPs participating in another country's infrastructure (with the benefit for PSPs that they do not need to participate in different systems). The interlinking can take place between domestic infrastructures from different countries (such as the FedGlobal Mexico service, which enables US financial institutions to send automated clearinghouse (ACH) credit transactions to certain financial institutions in Mexico) or be within a geographic region (such as links between a number of ACHs in the European Union). Where infrastructures settle in different currencies, arrangements will need to accommodate foreign exchange transactions. The interlinking can develop into an integration model, where one payment infrastructure serves PSPs from different countries (e.g. the Eurosystem's TARGET2).

Interlinking can be costly and complex from a legal, operational and technical point of view, and therefore has generally only been set up between countries with considerable economic activity between them and/or migration flows.

(iv) The **peer-to-peer** model cuts out the financial intermediary PSP and enables the payer to send the payment directly to the payee. Peer-to-peer payments can take a variety of forms; the simplest form is a direct cash payment. The emergence of distributed ledger technologies can allow peer-to-peer transactions to be executed electronically between parties using a shared ledger structure where the transaction is settled and holdings are recorded. Peer-to-peer projects relying on this type of technology, e.g. so-called 'stablecoins' initiatives and other crypto-assets, remain still largely untested at this stage.

Payment arrangements may sometimes use a combination of these models. For example, to improve efficiency and reduce costs, financial institutions participating in a correspondent banking arrangement may make use of the interlinking between national payment infrastructures where available.

From a technical viewpoint, these infrastructures generally use different types of messaging protocols. For instance, in correspondent banking, SWIFT is the most commonly used messaging system however, other arrangements may rely on proprietary messaging formats.

Underlying legal and regulatory frameworks

Underlying the global payments ecosystem are the contracts, schemes and legal and regulatory frameworks which are relevant 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", i.e. a set of business and operational rules and agreed technical standards, which PSPs agree to adhere to). Therefore, cross-border payments that are typically processed by PSPs and/or payment infrastructures are subject to the legal and regulatory regimes of multiple jurisdictions.

The intermediaries providing payment services for the payer and payee in a cross-border payment typically must meet the different legal and regulatory requirements of two or more jurisdictions in areas such as:

- Licensing and authorisation regimes.
- Prudential supervision (including over risk management).
- Financial integrity (e.g. anti-money laundering and countering the financing of terrorism and proliferation (AML/CFT)[25]).
- Cyber security and other operational risks.
- Transparency (including traceability of transactions, and disclosure of costs and fees).
- Consumer protection and safeguarding customer funds.
- Foreign exchange regulations.
- Data collection, protection and transfer.

Apart from the above-mentioned areas, national regulatory frameworks may differ in areas such as transaction limits; the types of entities authorised to operate in cross-border payments and their licensing requirements; capital controls; sanctions regimes. PSPs may hence face uncertainties about the interpretation and application of compliance requirements and difficulties obtaining centralised information on the nature of those requirements. Because of the costs arising from multiple jurisdictions' regulations and the risk associated with non-compliance, PSPs may view cross-border payments as involving higher risks and costs of compliance than domestic payments. This may have contributed, together with a number of other factors, to the so-called "de-risking" by some correspondent banks.

2. Challenges and frictions in existing arrangements for cross-border payments

[25] The FATF Recommendations are the basis for national AML/CFT regulations. They require financial institutions to act as gatekeepers to prevent misuse of payment systems for crime and terrorism. They are required to conduct customer due diligence (CDD) to verify the identity of their customers, to maintain records of transactions, to report suspicious activity, to ensure that originator and beneficiary information accompanies wire transfers, to apply targeted financial sanctions based on UN and national lists, and to verify that their counterparts apply the same requirements. Banks are also required to conduct due diligence on their counterparts before entering a correspondent relationship in order to understand their correspondent's illicit finance and terrorist financing risks and assess their controls.

2.1 Challenges in existing arrangements

Chapter 1 described how cross-border payments today mainly rely on the "back-end" arrangement of correspondent banking relationships or single-platform models, but other innovative approaches, such as interlinking and peer-to-peer models, exist. Given the rather small role that these innovations in the processing of cross-border payments play today, this chapter will focus on the challenges of correspondent banking and single-platform models.

A general perception is that cross-border payments are lagging behind domestic ones and present four main categories of challenges, namely: **cost, speed, access and transparency**. In considering these challenges, it should be recognised that there is no single experience of cross-border payments and the challenges vary widely by type of payment and by country and currency corridor (nor indeed is there a single experience of domestic payments).

In addition, the challenges affect a number of different stakeholders on the demand side (end-users composed of individuals, businesses and government agencies) and supply side (bank and non-bank PSPs, payment system operators and technical service providers), but they do not affect all in the same way. For payers/payees that are large multinationals or financial institutions, delays and the uncertainty about timing of cross-border payments have a more negative effect on business and finance than the transaction fees. For underserved smaller businesses and individuals, access to regulated cross-border payment services and fees are a primary concern– these challenges are especially high for end-users in emerging market and developing economies (EMDEs) (including in fragile states). More generally, the bargaining power of the end-user or intermediary is an important factor.

The four main categories of challenges are discussed below from the demand and supply side perspectives, while recognising that the challenges of the two sides are interrelated (e.g. high costs incurred by providers of cross-border payment services will translate into high fees or limited choice for users), and that the four challenges are interdependent (e.g. low speed adds to certain types of costs).

Challenge 1: High cost

The challenge of cost comprises various elements including transaction fees, account fees, compliance costs, applied FX conversion rates and fees, fees across along the payment chain, and liquidity cost for prefunding.

Demand side: High cost can lead to reduced demand for cross-border payments, and hamper cross-border business and even financial inclusion. Multinational corporations may be less impacted due to a stronger bargaining power and their multi-country presence, but they may in aggregate face high funding/liquidity and FX conversion costs due to the size of their cross-border business. Individuals and small and medium-sized companies (SMEs) are impacted by high transaction fees (relative to the sum being transferred, especially in relation to smaller value payments) and slow payment execution. High costs for maintaining an account or, for account holders for individual transfers may discourage use of the regulated financial system for cross-border transfers, exacerbating financial exclusion and driving some payment flows underground, with potential adverse consequences for the integrity of the financial system. In other cases, individual users may be discouraged from making cross-border payments at all. Recent innovation by new PSPs offer services at lower cost per unit, though still often requiring the need for a transaction account.

Supply side: The cost elements that affect the supply side include operational cost, financial regulatory compliance cost, network cost, correspondent cost, FX cost, and liquidity cost and costs resulting from ensuring adequate transparency in order to help protect cross border payments from money laundering and the financing of terrorism and proliferation (AML/CFT).

These cost elements can lead to high barriers of entry and an unwillingness to do business with less profitable customers. Smaller banks and non-bank PSPs may need to rely on other banks in foreign jurisdictions, with accompanying additional liquidity and credit risk. Others may not be able to find correspondents or bank partners at all. A further cost component for multinational PSPs offering services in various countries and currencies is the need for liquidity access in several currencies and the related FX risk. Likewise, effective screening processes are costly.

Challenge 2: Low speed

The challenge of speed involves the processing time of a payment from end to end, including factors such as the time required for dispute resolutions, reconciliations and searches, possible slow processes for funding and defunding, daily cut-off times and closing times, as well as AML/CFT checks. Recent innovative solutions can reduce processing times though usually do not offer real-time settlement on a cross-border level and may not yet be able to demonstrate the same levels of due diligence in crucial checks, such as for AML/CFT.

Demand side: Low speed of cross-border payments brings delays and thus increases uncertainty, liquidity and credit risk, impacting all customers. Moreover it can negatively impact business and investments, in particular where payments are time-critical.

Supply side: The challenge of speed is impacted by the dependence on several correspondents/providers, cut-off times, asynchronous opening times or regulatory checks. Individual suppliers may not be able to address these challenges on their own. When processing speed is low, the cost for liquidity as well as FX settlement risk increases and liquidity management becomes more complex. Lack of interoperability of systems is a factor that slows transactions. Non-harmonised messaging and processing standards furthermore reduce speed further due to needed mappings and format conversions, which in turn impact the challenge of cost as well as the challenge of transparency (see below). Moreover, services that are not available on a 24-7 basis and are not synchronised can lead to payment delays.

Challenge 3: Limited access

This challenge includes limitations for users in accessing services and for PSPs in accessing payment systems and other arrangements.

Demand side: While multi-national corporates have usually no problems of access to services to make cross-border payments, access limitations may exist for SMEs and individuals, especially but not only in EMDE countries, possibly limiting financial inclusion and pushing customers toward inefficient or costly third-party services. When unregulated payments channels are used instead, such as cash transfers, this can exacerbate financial integrity risks, such as illicit finance and terrorist financing risks.

Supply side: Challenges to access to payment systems and wholesale services can also occur on the supply side owing to technical and financial entry barriers, regulatory requirements, or liquidity access limitations. Banks and other PSPs may not be able to access directly local and foreign payment systems and possible funding in foreign currencies. This may make them

dependent on other providers (and on the latter's services, cost and AML/CFT policies) impacting their cross-border payments offerings.

Challenge 4: Limited transparency

Limited transparency about costs, speed, processing chain, and payments status present challenges for end-users and (other than single-platform proprietary services) for providers alike. The challenge of limited transparency interacts with the three challenges of cost, speed and access. Recent initiatives aim at addressing transparency, e.g. SWIFT gpi[26], and by this aim at improving the other three challenges.

Demand side: Limited transparency concerns all stakeholders on the demand side due to the uncertainty it causes. For corporates, lack of information about the speed, fees and FX rates of payments in process leads to uncertainties over the timing and amount of payments and can impact business service levels, and may lead to hedging and insurance costs to address the risks.

Supply side: On the supply side, limited transparency can likewise lead to uncertainty and missed service levels to customers. Issues can be particularly great for cross-border transactions, because of the multiple local processes and requirements that may apply. Dependency on third parties can lead to difficulty in controlling the payments process and tracking the status of payments and resolving disputes. In addition, information gaps can create a lack of transparency for AML/CFT and other purposes, exacerbating the risk of illicit finance and driving up the severity of other challenges already discussed, such as creating delays while necessary AML/CFT procedures are completed.

It is important to address the four challenges

For any cross-border payments initiative to be considered successful, it needs to result in improvements for the stakeholders along all four of these dimensions. Several of the current initiatives aim at addressing the four challenges at the back-end level e.g. SWIFT gpi, single-platform systems, interlinking of payment systems or so-called stablecoins. However, so far these challenges remain for both wholesale and retail global cross-border payments.

The priority that different users attach to these challenges will vary considerably. Figure 6 below provides a representation of the relative priority of challenges for different types of users. (The relative priorities are illustrative only – all challenges affect all users, and the specific priorities vary considerably according to the individual users and the individual circumstances of the cross-border payment.)

[26] 'global payment initiative ', a multilateral service-level agreement among PSPs participating in the SWIFT network, which notably implements faster payment processing, transparency on costs (including FX-related) and traceability of payments exchanged via correspondent banking.

Figure 6: Relative priority of challenges of cross-border payments by user type

	High cost	Limited access	Low speed	Limited transparency
Governments				X
Large multinational corporation			X	X
Small financial institution	X	X		
Small local business, advanced economy	X		X	X
Small local business, EMDE countries	X	X	X	
Individual, advanced economy	X			X
Individual, EMDE countries	X	X		

BOX: A particular challenge for access: "de-risking"

A growing challenge for cross-border payment service providers relates to *'de-risking'*. This is a term used to encompass what the FATF sees as a way of financial institutions avoiding, rather than managing possible money laundering or terrorist financing risks by terminating business relationships with entire regions or classes of customers, such as money transfer operators (MTOs), and smaller local banks, as opposed to assessing potential clients or classes of clients individually. "De-risking" of entire regions or classes of customers is not in line with the risk-based approach set out in the FATF Standards. The decline in correspondent banking relationships can hamper the international flow of funds and potentially affect jurisdictions on both the receiving and sending side of cross-border payments. If customers find they cannot access regulated services, they may turn to unregulated channels for instance, and all parties could be affected by increased money laundering or terrorist financing risk.

The effects of de-risking are exacerbated by the fact that most correspondent banking activity takes place through a small group of large, global banks. An increase in the concentration of the correspondent banking market increases the market share of remaining participants, and

hence could affect competition, raise costs, and especially lead to more fragile networks since failure of a participant could have larger effects on the market and the economy. At the same time consolidation could strengthen the remaining correspondent banking relationships over the medium term as larger volumes address some of the business-related drivers of termination, leading to economies of scale due to increased efficiencies from the remaining correspondent and respondent banks.

De-risking may in turn make local banks reluctant to offer cross-border banking services to non-bank payment service providers, such as MTOs and new FinTech providers, if they become concerned that these customers could make the local bank appear risky to its correspondents, therefore limiting their ability to compete within the cross-border payments market.

The reduction in correspondent banking relationships appears to be driven by a combination of intertwined factors, which includes reduced profitability and risk appetite after 2008, changes in global business strategy, the cost of maintaining such relationships (including compliance costs), AML/CFT concerns, and a market structure which leaves banks unable to directly recover the cost of maintaining the correspondent relationship. The FSB has coordinated an action plan to understand and address this issue, including through clarifying regulatory expectations, capacity building in jurisdictions that are home to affected respondent banks, and strengthening tools for due diligence by correspondent banks.[27] [28]

Remittance services providers have suffered similar difficulties in maintaining their access to bank accounts (through which they make cross-border settlements). Drivers for this include profitability, the perceived high risk of the remittance sector from an AML/CFT perspective, supervision of remittance service providers that ranges from active and effective to complete absence and, in some jurisdictions, weak compliance with international standards, particularly those relating to AML/CFT. The G20, FSB, FATF and GPFI coordinated work to address this issue from 2017.[29]

Accessing payment services normally requires a customer's identity to be verified. This is challenging for certain communities who may lack identity documentation - particularly undocumented migrants and people in some EMDEs. Various efforts are underway to promote their financial inclusion, e.g. through provision of identity documentation to previously undocumented people, or by allowing payment services providers to relax the identification rules and accept a lower level of assurance, such as when offering basic services in a low-risk context. For instance, FATF published Digital ID Guidance in March 2020.[30]

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[27] The latest progress report is available from: https://www.fsb.org/wp-content/uploads/P290519-1.pdf

[28] An additional analysis of trends in correspondent banking relationship withdrawals is available at: IMF (2017). https://www.imf.org/en/Publications/Policy-Papers/Issues/2017/04/21/recent-trends-in-correspondent-banking-relationships-further-considerations

[29] The FSB report to the G20 is available from: http://www.fsb.org/wp-content/uploads/P160318-3.pdf

[30] https://www.fatf-gafi.org/publications/fatfrecommendations/documents/digital-identity-guidance.html

2.2 How frictions affect the cross-border payment process

This section sets out how the challenges in cross-border payments set out in section 2.1 are caused by frictions in existing processes for making these payments. In this context, a "friction" is a factor adding to the costs or lowering access, speed or transparency (i.e. increasing the challenges described in section 2.1 for a cross-border payment). This report focuses in particular on those frictions that add to the relative challenges of a cross-border payment compared with a domestic payment.

Identifying these fundamental frictions is crucial for analysing the potential effectiveness of actions to address these challenges. The frictions described in this paper may provide a framework for the evaluation of potential building blocks of a response to improve current cross-border payment arrangements in Stage 2, which is led by the CPMI and is part of the overall FSB-coordinated roadmap process.

To transmit a payment along a cross-border payment chain from original sender to ultimate beneficiary, each intermediary typically performs the same three basic processes:

- **Validation**: Gathering data on the parties to the payment, confirming the legitimacy and regulatory (including AML/CFT) compliance of the transaction, checking format and content of the payment message, verifying sufficient availability of funds.
- **Transmission:** Identifying the next recipient in the chain, transforming the data for onward sending to the next recipient, notifying other parties in the chain of the status of the payment.
- **Funding:** Receiving incoming funds, transforming currency if needed, releasing funds to next recipient.

An examination of these three basic processes reveals that frictions can emerge within each process step at each stage of the chain, and that these can delay release, add processing and funding costs or lose and corrupt data.

In addition there are two related business processes that the sender and beneficiary have to undertake in initiating and receiving a cross-border payment where frictions can arise:

- **Initiation**: Finding an intermediary (or in the case of the peer-to-peer model the payee) to deliver the payment, funding the transaction.
- **Reconciliation**: Matching the received payment to the underlying business transaction, extinguishing the exposure or releasing the goods being paid for.

Frictions

1. *Fragmented and truncated data formats*: Each intermediary uses data provided in the payment message to **validate** the identity of parties to the payment (or at least the immediate counterpart in the process) and confirm the legitimacy of the payment. Data standards and formats vary significantly across jurisdictions, infrastructures and message networks. The amount of data that is carried in most cross border messages is extremely limited,[31] preventing the accurate and complete transmission of underlying data about the

[31] For example, the existing messaging format for the correspondent banking network only permits transmission of a basic Latin character set, meaning names and addresses in other scripts have to be translated, leading to divergences in precise spellings. Furthermore there are limitations in terms of number of characters allowed, often requiring separate processes for the transmission of information related to the underlying business transaction.

transaction and its parties across these different data formats. These limitations prevent intermediaries from achieving high rates of automated "straight-through processing" of payments prevents end-users from undertaking automated reconciliation. The resulting complex conversion and translation of payment data through the payment chain leads to delays in processing and releasing cross-border payments and increases technology and staffing costs. Low quality data also creates processing costs and delays for the beneficiary by increasing the complexity of **reconciliation** processes.

2. *Complex processing of compliance checks*: Uneven implementation of regulatory regimes including for AML/CFT, sanctions screening and combating financial crime increase the complexity of **validating** the legitimacy of a cross-border payment. The same transaction may need to be checked for compliance several times as it moves along the payment chain to ensure that the parties are not exposing themselves to illicit finance. Different stakeholders might use diverging sanction lists and other databases to conduct their checks and the information used may contain errors (e.g. false positives where entities have names that have similar spelling to names on lists). This complexity increases with the number of intermediaries in a chain, and increases as the payment moves along the chain, as the data provided to meet initial checks may not contain elements needed for checks under other national regimes. These problems make compliance checks more costly to design, hamper automation and potentially lead to significant delays or the rejection of payments. These problems are more marked for transactions passing through corridors viewed as high risk from a compliance perspective. In addition, weaker implementation of FATF's AML/CFT standards by governments or financial institutions may complicate efforts by correspondents and other institutions in the payment chain to ensure illicit finance and terrorist financing risks are appropriately assessed and mitigated and exacerbate de-risking.

3. *Limited operating hours:* Payments can only be **transmitted** along a chain during the hours when the underlying infrastructures being used to settle them are available for submission. In most countries, large-value payment systems opening hours are typically aligned to normal business hours in that country and rarely available over weekends. Even where extended hours have been implemented, this has often been done only for specific critical payments; intermediaries are usually not available to process significant volumes of cross-border payments. This creates delays in clearing and settling cross-border payments, particularly in corridors with large time zone differences. As a result, positions need to be funded for longer periods of time, driving up the overall cost of the transaction.

4. *Legacy technology platforms:* A significant proportion of the technology supporting cross-border payment infrastructures and intermediaries remains on legacy platforms built when paper-based payment processes were first migrated to electronic systems and with a domestic focus. These platforms have fundamental limitations, such as a reliance on batch processing, a lack of real-time monitoring, and low data processing capacity, that hinder successful automation and modernisation of payment **transmission**. This in turn exacerbates delays in settlement and inefficiencies in liquidity management. These limitations affect domestic operations, but become even greater limitations to achieving cross-border automation of payments and interlinking systems when different legacy infrastructures need to interact with each other. The requirement to interface with legacy technology stacks can act as barriers for emerging business models and technologies to enter the market.

5. *Funding costs:* To enable rapid onward settlement, intermediaries are required to pre-position **funding**, often across multiple currencies, or to have efficient access to foreign currency markets. These open liquidity positions carry credit risk and often have a capital regulatory charge attached. The uncertainty about when incoming funds will be received often leads to overfunding of positions, which increases costs. Funding costs are typically higher for transactions in illiquid or non-tradeable currencies.

6. *Long transaction chains:* The costs imposed on payment intermediaries by frictions 1-5 make it costly to develop the many direct connections required to transmit cross-border payments in multiple currencies. Therefore chains of linked correspondent institutions are typically required to **transmit** payments across currencies. This even holds true for single-platform systems that will, from time to time, need to rebalance their positions held in different jurisdictions/currencies by using traditional correspondent banking channels. A longer transaction chain increases cost and delays, creating additional **funding** needs (including also to cover unpredictable fees deducted along the chain), repeated **validation** checks and the potential for data to be truncated or degraded through its journey.

   Correspondent banking is based on trust along the payment chain: a PSP has to be able to trust the PSP they transact with, and customers and their PSP have to be able to trust each other. This applies not only for a simple correspondent banking relationship. In other cases, where a series of correspondent banking relationships might be involved in a single cross-border payment transaction, this increases the complexity of the levels of trust involved, cost and processing time of the transaction. (Other types of payment models than correspondent banking also depend on trusted ledgers. The roles that trusted ledgers play in each type of payment model is set out in the Annex.)

7. *Weak competition:* Frictions 1-6 create significant cost barriers to entry for intermediaries seeking to provide cross-border payment services. Informational frictions and the complexity of the cost structure of cross border payments also make it difficult for senders to accurately assess the cost of **initiating** a payment. World Bank analysis of remittance prices shows wide dispersion across corridors and providers, while CPMI and FSB studies of correspondent banking have found concentration of providers has been growing.[32] These barriers can increase prices for end-users and intermediaries and dampen investment in modernising cross-border payments processes.

Figure 7 shows in which stages of the payment process the first 6 frictions tend to arise.

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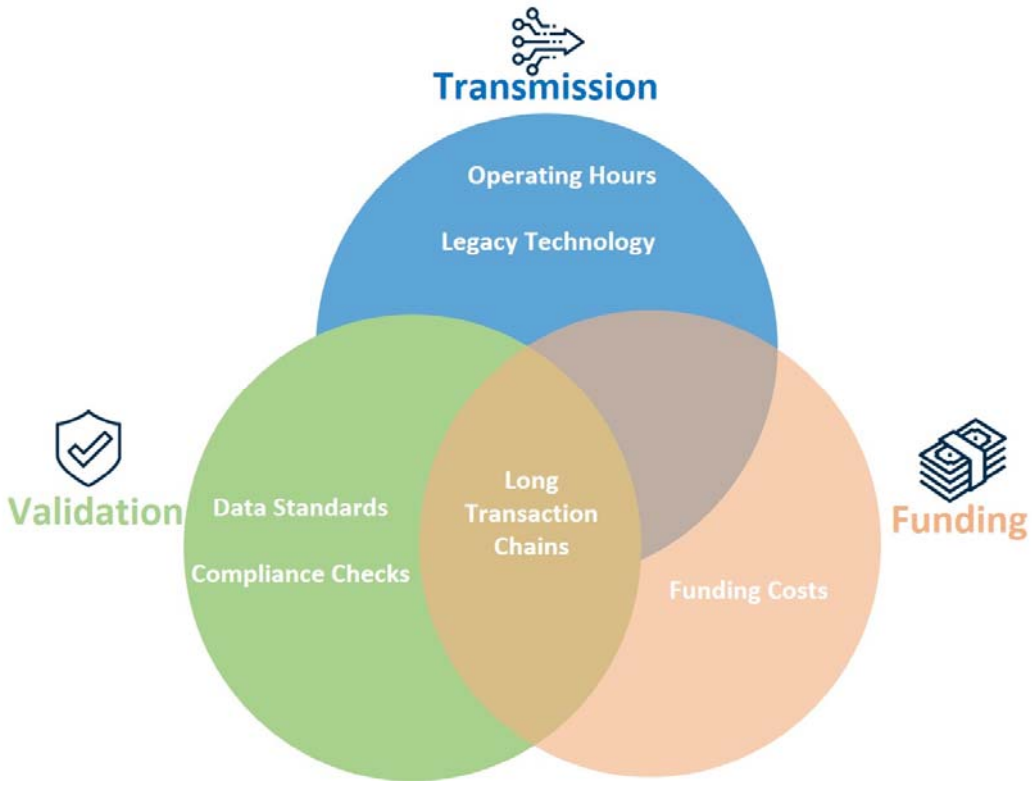
[32] "FSB publishes updates on work to assess and address correspondent banking declines", FSB, 2019: https://www.fsb.org/2019/05/fsb-publishes-updates-on-work-to-assess-and-address-correspondent-banking-declines/

"New correspondent banking data - the decline continues", CPMI (2019): https://www.bis.org/cpmi/paysysinfo/corr_bank_data/corr_bank_data_commentary_1905.htm

"Data release: Remittances to low- and middle-income countries on track to reach $551 billion in 2019 and $597 billion by 2021", World Bank, 2019: https://blogs.worldbank.org/peoplemove/data-release-remittances-low-and-middle-income-countries-track-reach-551-billion-2019

Figure 7: Mapping frictions to the stages of the payment process



The way in which these frictions arise in the three basic processes – validation, transmission and funding – varies considerably across the four payment models described in chapter 1:

- In the case of inter-linking and single-platform models, the number of entities conducting the three basic processes is limited to three (sender, receiver and the inter-linked system or single platform in between), while in the case of correspondent banking model, these processes have to be carried out by all intermediaries, the number of which depend on the length of the payment chain.
- Further, in the inter-linked and single-platform models, standardised messages, protocols and processing rules increase the efficiencies of these processes. The participating financial institutions in single-platform models still need to use correspondent banking system for the settlement of payments, but a number of techniques are used to streamline this – prefunding/collateralisation, netting and designated settlement banks. In inter-linked models typically the participants use the settlement mechanisms in the respective systems and a dedicated settlement arrangement is established for the inter-system settlement. The peer-to-peer models go further eliminating intermediaries and merging clearing and settlement.

Ameliorating the effects of some of these frictions arise more through cross-border differences and therefore may be most usefully addressed through multilateral international work, while others may be addressable by individual national authorities:

- Frictions 1, 2, 3 and 6 on fragmented data formats, complex compliance checks, operating hours and long transaction chains arise to a significant degree from cross-border differences.
- Frictions 4, 5 and 7 on legacy technology, funding costs and weak competition may be more dependent on country-specific factors.

Figure 8 below provides an illustrative summary of how the frictions identified above can affect the cost, access, speed and transparency challenges faced in cross-border payments (although the effects will vary according to specific circumstances).

Figure 8: Frictions at the origin of challenges in cross-border payments

	High cost	Limited access	Low speed	Limited transparency
Fragmented and truncated data formats	X	X	X	X
Complex processing of compliance checks	X	X	X	X
Limited operating hours			X	
Legacy technology platforms	X		X	
Funding costs	X			
Long transaction chains	X		X	X
Weak competition	X	X		

2.3 Considerations for policymakers

This section describes considerations for authorities as to how their actions can affect the frictions identified above, both positively and negatively. The considerations set out here will help inform the scoping of the building blocks in Stage 2 and represent the key avenues available to policymakers as they consider a roadmap in Stage 3.

Public authorities engage with cross-border payments arrangements in three core capacities:

- as **regulators, supervisors and overseers** charged with ensuring effective licensing, oversight and supervision of payment service providers and payment systems;
- as **operators of payment systems,** with the objective of providing safe and efficient services; and

- as **catalysts and facilitators** of improvements in the payments ecosystem.

In each of these roles, public authorities have both the potential to drive beneficial changes as well as the potential to generate unintended barriers. The following sets out considerations for public authorities as they execute these roles.

Public authorities as regulators, supervisors and overseers

In their roles as regulators, supervisors, and overseers of payment services, public authorities seek to establish clear, effective and efficient regulatory, supervisory and oversight regimes, including with respect to cross-border payments. Furthermore, regulatory requirements targeted at other objectives (e.g. capital controls, foreign exchange regimes and data protection and privacy) may affect cross-border payments.

An effective regulatory approach promotes financial stability, consumer and investor protection, and financial integrity, while supporting responsible financial innovation.

A number of considerations arise when attempting to achieve these objectives with respect to cross-border payments.

1. *Implementation of international standards*

Cross-border payments are inherently subject to regulatory and supervisory regimes of multiple jurisdictions. Licensing and regulatory requirements may differ by jurisdiction. These regulatory and supervisory regimes cover areas such as AML/CFT requirements and regimes that apply to banking and the operation of financial market infrastructures. Differences in domestic regulation and supervision across jurisdictions, especially if they fall short of international standards, may challenge the overall efficacy and efficiency of oversight over cross-border arrangements as a whole, and increases the risk of regulatory arbitrage and regulatory gaps in the supervision of cross-border arrangements.

International standards and guidance relevant to cross-border payment systems or payments include the CPMI-IOSCO Principles for Financial Market Infrastructures (PFMI),[33] CPMI-World Bank General Principles for International Remittances,[34] the FATF Recommendations,[35] and the BCBS Basel III framework.[36] These international standards are effective in achieving their policy objectives only if implemented fully and consistently across jurisdictions at the domestic level. Uneven implementation may also exacerbate some of the frictions identified in Section 2.2, such as the complexity of compliance checks, de-risking, and inefficiencies in liquidity management.

Implementation of FATF's internationally agreed AML/CFT standards remains uneven. Despite many strong performers, the results of peer reviews and recent major breaches show significant vulnerabilities remain in some jurisdictions and firms. Weak AML/CFT controls in any one bank will expose its correspondents to increased illicit finance and terrorist financing risks, which increases the need for correspondents to apply additional controls. Similarly, weak regulation and supervision in a jurisdiction will exacerbate cross-border risk, which may lead

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

[34] https://www.bis.org/cpmi/publ/d76.pdf

[35] http://www.fatf-gafi.org/publications/fatfrecommendations/documents/fatf-recommendations.html

[36] https://www.bis.org/bcbs/basel3.htm

to correspondent banks applying additional controls to (or exiting) business with the weak correspondent or jurisdiction.

2. Cross-border information access and exchange

Implementing effective and efficient regulation and supervision over cross-border payments also depends on ensuring cross-border access to information for regulatory and supervisory purposes. In some cases, there is real or perceived tension between regulatory requirements, including banking regulation and AML/CFT rules on one hand, and restrictions on cross-border data flows and data localisation on the other hand. These may include rules related to data protection, privacy and confidentiality that may restrict or prohibit such information sharing. The historically limited cooperation among financial regulatory and supervisory bodies, as well as with data protection and privacy agencies, domestically and internationally on these possible tensions tend to exacerbate these issues.[37] Lack of trust among regulators, supervisors or overseers may also restrict information-sharing. Cross-border supervision and oversight requires the sharing of information with competent authorities in other jurisdictions and effective risk management requires sharing of information within a financial group that may span multiple jurisdictions. AML/CFT rules, for example, require cross-border information sharing within financial groups for the purposes of AML/CFT risk management. Policies that impede cross-border data flows may not only make supervision and oversight more difficult (potentially increasing risks for financial institutions and payment systems) but ultimately prevent the provision of cross-border payment services in the first place, as those services depend on the ability to send messages about those payments across borders.

3. International coordination on regulation and supervision.

Addressing potential risks and policy challenges with respect to cross-border payments requires international engagement. There are a range of existing cooperation mechanisms that have assisted in implementing international standards and mitigating the risks of regulatory gaps and arbitrage, but weaknesses have been identified. For example, weaknesses have been identified in international cooperation among specialist AML/CFT supervisors. Work is currently underway (in the EU and through the FATF) to develop improved cooperation mechanisms to enable supervision of group-wide financial crime risk management, and enable faster identification of cross-border risks, and a better-coordinated response. Technical assistance is also provided by international organisations and national authorities to help capacity building in other countries.

As technologies and business models continue to evolve, new challenges may arise with existing coordination mechanisms, such as with respect to the composition and structure of those arrangements. This is in part because the risk profile of a cross-border payment arrangement may differ based on the perspective of a home jurisdiction, which may focus on the operational resiliency of an arrangement, such as governance and liquidity management considerations, and a host jurisdiction, which may focus on investor and consumer protection, as well as on broader monetary and financial stability considerations in its own jurisdiction. As an example, Responsibility E of the PFMI provides that "central banks, market regulators, and

[37] FATF amended its Standards in 2018 to require cooperation and coordination between relevant authorities to ensure compatibility of AML/CFT requirements and data protection and privacy rules.

other relevant authorities should cooperate with each other, both domestically and internationally, as appropriate, in promoting the safety and efficiency of FMIs".[38]

Public authorities as operators of payment infrastructures

The public sector, in particular central banks, in many jurisdictions operate payment infrastructures, mostly in the form of wholesale and sometimes retail payment systems as described in Section 1, on top of which private service providers can build their own account and customer-facing services. A number of key considerations with respect to cross-border payments arise in this context.

1. *Domestic settlement focused*

Central banks operate payment systems to provide a trusted unit of account, finality of payments, and sufficient liquidity for settlement, including with respect to cross-border payments that are ultimately settled on those systems. However, the infrastructures operated by the public sector are primarily designed to settle transactions between domestic participants. A small number of projects that connect public sector infrastructures in one country with such infrastructures in others have been successful so that cross-border payments are settled in central bank money and without use of correspondent banks.

2. *Interoperability challenges*

Differences in payment infrastructures across jurisdictions, such as their speed and availability, compatibility in terms of technical standards and protocols (e.g., ISO20022), and supported payment instruments may impede cross-border connections between payment systems, including those provided by public authorities. These differences also mean that private payment providers must make bespoke investments in technology and business processes for each market or currency zone that it serves.

3. *Foreign exchange considerations and financial stability implications of cross-border connections*

Even when questions of interoperability have been addressed, cross-border connections between public sector infrastructures may also raise a range of additional considerations with respect to foreign exchange and financial stability. For example, the cross-border processing of payments from a sender in its local currency to the receiver in its local currency also raises FX considerations (such as the point of FX conversion, FX conversion rate, or the possibility of multi-currency accounts and accessing and holding FX, as well as the need to ensure compliance with FX regulations and, for some countries, capital controls).

Capital flows might be another area of consideration. Bi-directional cross-border payment flows may not be equal in aggregate value, a jurisdiction could build up imbalances if it receives more payments than it sends (claim position) – and vice versa if it sends more than it receives (liability position). Persistent uneven cross-border flows may thus result in the accumulation of possibly large imbalances (in particular during times of stress), balance-of-payments issues and call for considerations about frequent settlements or collateralisation.

Public authorities as catalysts and facilitators of improvements

Public authorities also serve as catalysts and facilitators, seeking to foster private sector improvements in cross-border payments and thereby promote financial inclusion. Innovation

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

may either take place through individual firms or in a more coordinated fashion through multilateral payments systems. In addition, public authorities could promote improvements through other technical service providers, such as SWIFT. The fragmented role of the payments market can sometimes make coordination among stakeholders difficult without the involvement of public authorities.

One key challenge is how public authorities can use their role as catalysts and facilitators to increase interoperability or integration in cross-border payment services. This could include supporting the use of internationally recognised technical standards and greater standardisation of APIs. But differences in consumer habits across markets (different preferences for cash and cashless payments) and varying degrees of maturity in banking systems and payments markets may impede solutions to achieve greater interoperability or integration. Disparate levels of technological advancement and adoption can also create challenges for cross-border payments and the ability of public authorities to coordinate across jurisdictions.

3. Areas to explore further in developing the roadmap

This report describes some challenges and frictions associated with existing cross-border payments arrangements that the roadmap to be delivered in October 2020 should aim to address.

This concluding section sets out some preliminary thinking on the nature of the building blocks for responses to improve current global cross-border payment arrangements (Stage 2), which will inform the development of the eventual roadmap with practical steps, actors and indicative timeframes.

The underlying frictions discussed above vary considerably in terms of their scope, nature, and types of entities that could contribution to improvements. Some solutions may be easily implemented while others may take considerable time to achieve. It will be important that the building blocks put forward for the roadmap contain a mix of near-term deliverables, and longer-term initiatives, which may require several stages of mobilisation and depend upon coordination among many stakeholders.

The roadmap will require action by both the public and private sectors, as only through coordination between both groups will significant progress be achieved. The eventual roadmap could helpfully set out appropriate roles for the public and private sectors in each element, including areas where a division of responsibility may be appropriate and areas where they may usefully work together to deliver desired outcomes. To support this, Stage 2 of the process will incorporate industry input at an early stage to help to shape the direction of the proposals.

In developing the building blocks and the roadmap, there are a number of areas that could be explored further. These areas include both potential improvements to the existing payment system infrastructure and encouraging more fundamental innovations in payment arrangements that can offer structural improvement but will pose greater adoption challenges. Topics that could be explored further include the following:

Operational improvement of payment infrastructures

Improvements to the operational aspects of cross-border payments could improve the efficiency and speed by which these payments are processed. Building block analysis will examine ways

in which the public and private sectors can catalyse operational improvements to address these constraints. Questions to be explored further include:

- How can the public and private sectors help to catalyse improvements in technology that help to better satisfy user needs?
- Are there initiatives that public authorities could take to enhance key payment infrastructures (cf. real-time gross settlement automated clearing houses, faster payment platforms), including to enhance interoperability?
- Are there areas where operational improvements can reduce the burden of maintaining liquidity in multiple currencies while meeting prudential liquidity requirements?
- Could operational improvements reduce the length of payment chains and, as a result, reduce complexities and risks?

Standardisation of data and market practice

Frictions arise from the lack of use of standardised payment messages and the data they contain and from divergent market practices in processing payments. Questions to be explored further include:

- What steps could the public or private sector take to increase overlaps in operating hours across payment systems in different time zones?
- What steps could the public or private sector take to increase the use of standard message format protocols or other mechanisms to ensure interoperability?
- What other steps could be taken to address and handle other operational aspects such as data quality, transparency of fees and status of processing, etc?

Legal, regulatory and oversight framework

This report sets out how the need to transmit cross-border payments across multiple jurisdictions with diverse legal and regulatory practices can create frictions. Current arrangements can delay payments and increase the cost of offering services across many currency corridors. To improve the efficacy and efficiency of that regulation and supervision, enhancements may need to be considered. Questions to be explored further include:

- Which initiatives could be taken to improve the efficiency and reduce costs of AML/CFT and other compliance processes without compromising on the quality of compliance and to ensure adequate oversight? This could include facilitating improved customer due diligence mechanisms for AML/CFT, greater use of the Legal Entity Identifier (LEI) for firms and digital IDs for individuals and stronger regulatory frameworks that reduce unnecessary barriers to cross-border data-sharing when implementing the FATF standards and other regulatory and supervisory requirements.
- What further steps in cross-border cooperation in regulation, supervision or oversight could help to reduce frictions?
- What further steps can authorities take to enable appropriate access to cross-border payment services?

Progress monitoring and information sharing

Progress monitoring and information sharing will be essential for successful implementation of the roadmap. Questions to be explored further include:

- What data would it be useful to collect going forward to enhance understanding and monitoring of cross-border trends and costs (while taking account of the need to avoid undue burden on firms from data collection)?
- What steps can be taken to share good practices in areas such as regulation/supervision/oversight?
- How can authorities share experiences in facilitating FinTech development while maintaining a sound financial system and a level playing field?
- Are there opportunities for providing technical assistance to improve jurisdictions' supervisory and regulatory frameworks and thereby enhancing their ability to access cross-border payment markets?

Annex – Trusted ledger arrangements for payment arrangements

In order to settle any payment, it is necessary to modify a trusted ledger, and it is this modification that gives the operation its fundamental characteristics (e.g. finality). In this sense, the wide diversity of cross border payments arrangements can also be categorised by considering the characteristics of the ledger on which the settlement occurs and the necessary trust relationships among the participants that allow such a ledger to fulfil its settlement objective. This remains consistent even in the cases in which the currencies are different between the jurisdictions, since the FX transaction does not modify the main insights. Overall, the basic structures of these ledgers are the basis for the systems to work, which in turn, allows to better identify the different causes of the challenges addressed in this report

It is possible to classify these arrangements by considering the types of structures, such as:

i) One-sided trusted ledger in which the settlement ledger is managed by one of the PSP on which the other PSP has an account;
ii) Multi-sided trusted ledger managed by a third party;
iii) Directly accessible shared ledger in which both the payer and payee trust and can directly instruct their payments; and
iv) Shared ledger through the intermediation of multiple PSPs.

These structures are common in both retail and wholesale cross-border payments arrangements.

Different types of ledger arrangements

One-sided trusted ledger refer to an arrangement in which the settlement ledger is managed by one of the PSPs on which the other PSP has an account (the ledger could be managed either by the PSP either of the sender or the receiver). In this basic structure, a PSP has to trust the other PSP, and individuals have to trust their respective PSP. Examples of this are *simple correspondent banking* and *closed loop transactions of global bank branches* that happen to have separate ledgers for the jurisdictions relating to the transaction.

The second basic structure is when a settlement is carried out through a **multi-sided trusted ledger,** managed by a third party. The third party with an account on the other participant (in most cases another third party in the other jurisdiction) must trust it; whereas PSPs must trust their respective third parties, and individuals must trust their PSPs. This is the case for *complex correspondent banking relationships* and arrangements *interlinking payment infrastructures*, in a bilateral or regional basis.

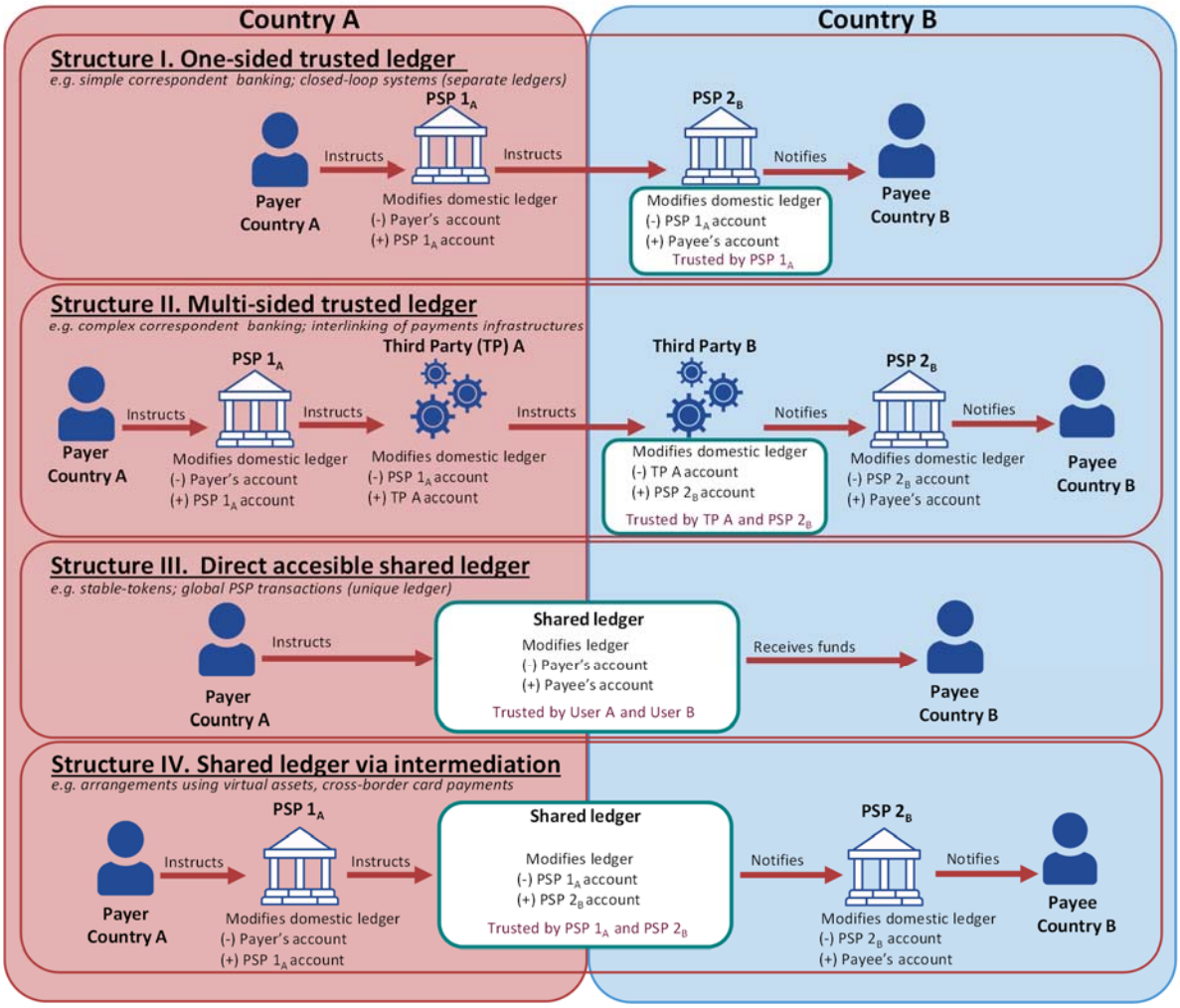
Other possible cases are those in which a unique ledger serves as the bridge to connect different jurisdictions. On the one hand, this may be possible through a **directly accessible shared ledger** in which both the payer and payee trust and can directly instruct their payments. In order to allow this direct interaction, this model only needs individuals to trust the unique ledger (no indirect trust on an unknown PSP as with other structures). This can be the case of models that cut out financial intermediation (such as *arrangements using stable-tokens*) and models in which the PSP of the payer and the payee is the same entity or part of the same group as the PSP of the payee, without the involvement of other third parties *(as in internal transactions within a global bank transactions or even e-money issuers*).

Finally, the fourth structure relies on a **shared ledger**, but operates **through the intermediation** of multiple PSPs. Here PSPs must trust the centralised ledger, but not

necessarily each other, and individuals must trust their PSPs. This can be the case for certain crypto-assets that are operated only through validated intermediaries, as well as retail transactions on *cross border card payments*.

Combinations of these types of basic structures are common in both retail and wholesale cross-border payments arrangements. For instance, most **Remittance Service Providers**[39] settle their customer's transactions through systems based on the third structure. On the other hand, they also use the first structure to carry out their liquidity management requirements.

Figure 9. Basic structures of trusted-ledgers



[39] Remittance Service Providers are a type of Money or Value Transfer Service, as defined by FATF that engage in the transmission of cross-border payments, frequently through the use of agents, and are regulated as non-banking entities. For further reference, see https://www.fsb.org/2018/03/stocktake-of-remittance-service-providers-access-to-banking-services/