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Towards the holy grail of cross-border payments; the interlinking solution


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The holy grail of cross-border payments is a solution allowing cross-border payments to be immediate, cheap, universal, and settled in a secure settlement medium. The search for such a solution is as old as international commerce and the implied need to pay. Based on Bindseil and Pantelopoulos (2022), this policy brief describes in particular one vision as to how the holy grail can be found within the next decade through interlinked instant payment systems with a FX conversion layer. In doing so, the settlement mechanics are explained, and an assessment is provided on its potential to be the holy grail of cross-border payments.

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1. Introduction

Cross-border payments consist of transactions where the payer and payee (and typically their financial institutions) are located in different jurisdictions (e.g. Bech, Faruqui and Shirakami, 2020). They are more complex than domestic payments as they often involve different national legal and regulatory frameworks, more than one currency, multiple time zones, and often need to be facilitated through several intermediaries and financial market infrastructures (CPMI, 2020).´

The holy grail of cross-border payments is a solution which allows cross-border payments to be (1) immediate, (2) cheap, (3) universal, in the sense of covering ideally every addressable party in the world, and (4) settled in a secure settlement medium, such as central bank money. Unlike settlement in commercial bank money – which by definition implies the potential for liquidity and/or credit risk to arise for end-users – both forms of risk do not apply when transactions are settled in central bank money (see Bindseil, 2019, Chapter 2).

In 2020, improving cross-border payments was set as a key priority for the G20: the G20 asked the Financial Stability Board (FSB), working with the Bank for International Settlements' Committee on Payments and Market Infrastructures (CPMI) and other standard-setting bodies to co-ordinate a three-stage process to develop a roadmap to enhance cross-border payments.

In Bindseil and Pantelopoulos (2022), we reviewed in total 6 technical options for achieving the holy grail: modernised correspondent banking; emerging Fintech solutions; Bitcoin; global stablecoins; interlinking domestic fast payment system through a cross-system and FX conversion layer; future CBDC. This policy brief argues that the holy grail of cross-border payments can be found within the next ten years, if also the compliance with AML/CFT is made sufficiently efficient. While several options have further potential, we see particular benefits in **interlinked instant payment systems with a FX conversion layer**. We therefore focus on this solution. The settlement mechanics are explained, and an assessment is provided on its potential to be the holy grail of cross-border payments.

2. Interlinked instant payment systems with FX conversion layer

2.1 Motivation and design

The basis for interlinking instant payment systems in a cross-border context is the rise of domestic instant payment platforms in many jurisdictions around the globe, as noted by CPMI (2016). Instant (or "fast") payments are payments in which the transmission of the payment message and the availability of final funds to the payee occur in real time or near-real time and as close to a 24/7 basis as possible.

The interlinking of national payment systems as one option for enhancing cross-border payments constitutes building block 13 of the FSB/CPMI work on cross-border payments (CPMI, 2020). The creation of bilateral or multilateral arrangements – through interlinking payment systems – and integrating an instant FX conversion layer - would in principle allow for cross-border payments to be completed in central bank money. A number of preconditions however need to be fulfilled for this:

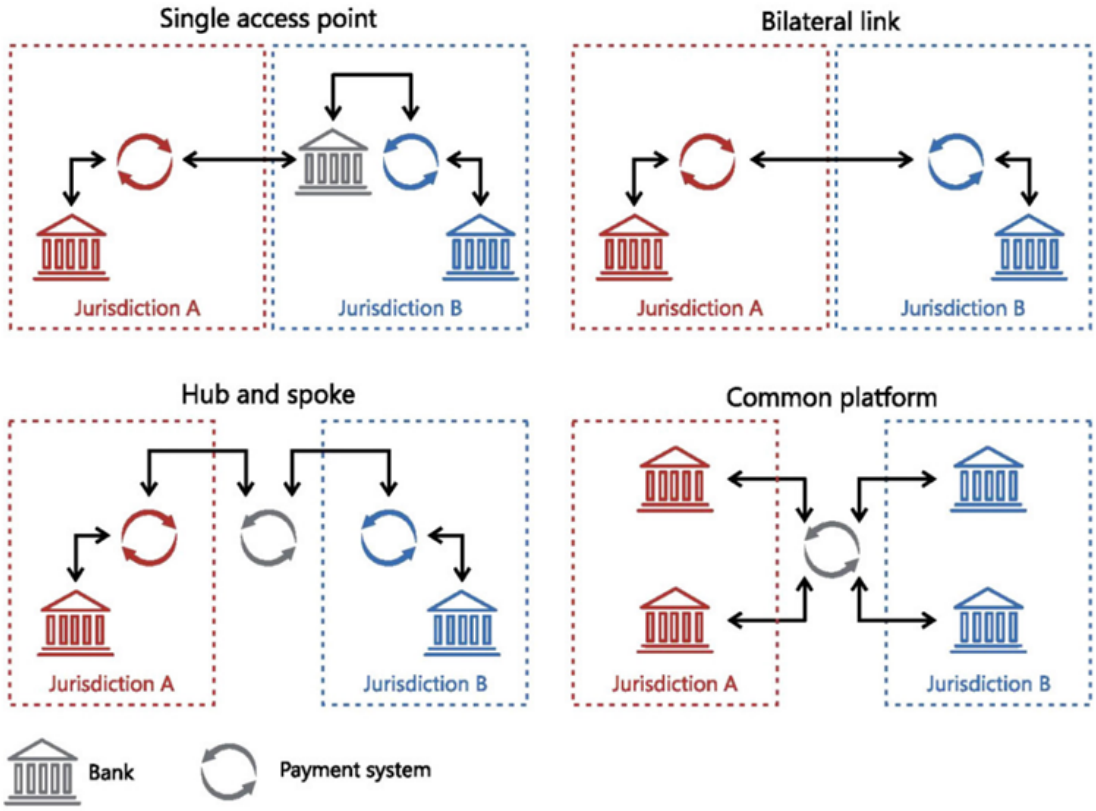
- **Addressability of accounts cross-border**: ideally, there is a global standardization of unique bank account identifiers (such as the IBAN) to ensure an efficient and secure routing of the payment to the payee. The "Single European Payment Area" (SEPA) has achieved this for the adhering European countries. From the user perspective, addressing accounts via a proxy (e.g. a unique e-mail address or a unique phone number) would be very advantageous, but would require a global proxy-look up solution.

- **Interlinked domestic systems**: The two or more instant payment systems need to be interlinked through a connecting layer that transmits payment orders from one domestic system to the other and more generally routes payment process information in both directions. This layer needs to address possible differences in message data formats by providing translation capabilities, while ideally being cost efficient.
- **An instantaneous and cost-efficient currency conversion layer**: This layer would effectively decompose the (pseudo-) cross-border payment into two domestic instant payments. Market makers would consist of banking groups having accounts in instant payment systems on both sides i.e. in the two relevant domestic instant payment systems. The cross-border payment would therefore be "simulated" by the banking group providing the fx conversion service, as one member of this group would simultaneously receive a payment in currency A by the payer (located in country A) within the country A domestic instant payment system, and the other member of the banking group, namely the one in B country would make in currency B a domestic instant payment to the payee within the domestic instant payment system of country B. To ensure that the currency conversion layer maintains an instant processing of the cross-border payment, market makers would have to accept an obligation to provide immediately executable, binding quotes for cross currency payments up to the agreed maximum value. The automated process would always immediately choose the most attractive conversion rate amongst the provided binding bid-ask quotes. The set up should incentivize a sufficient number of banks to commit to be FX market makers in the conversion layer, such as to ensure competitive price setting, depth and liquidity. This will of course be simpler for large FX/cross-border payment corridors.
- **Straight-through processable instantaneous AML/CFT checks**: Finally, AML/CFT compliance checks should be made automated and instantaneous by relying on positive ex ante criteria. Of course, "suspicious" payments would have to be rejected or be re-routed to a non-instant processing to allow for additional non-automated analysis.
- **Political support for the alignment of legal, regulatory and oversight frameworks** is also required, and maybe more challenging than for some other solutions because of the nature of interlinking existing payment solutions which have had their own established environments for extended periods of time.

A number of initiatives aim at interlinking instant payment systems in different currencies. For instance, **Project Nexus**, is a blueprint for interlinking instant payment systems cross-border, published by the Bank of International Settlements Innovation Hub Singapore Centre and the Monetary Authority of Singapore (MAS). The July 2021 report by the BISIH (2021a) describes the potential benefits of linking instant payment systems with the purpose of completing cross-border payments. The report notes that the interlinking of existing domestic payment platforms face a number of challenges, such as adding a conversion layer, and AML/CFT compliance checks. In addition, it highlights the difficulties of making different domestic instant payment processes compatible with one another (e.g. data formats, scheme rules, etc). Such complexities would obviously increase exponentially the more one links a greater number of domestic instant payment systems through bilateral solutions. For example, it is noted that "a network of 20 countries would require 190[1] country-to-country links", as each payment system operator would be required to maintain 19 separate links with each payment system operator. Nexus would remedy such issues by setting one single standard and processing model for cross-border and cross-currency payments. The Nexus platform would also cover currency conversion, through the system coordinating with FX providers to ensure that the currency of the payer is swapped for the currency of the payee via FX providers competing against one another to provide the best swap rates. Although FX providers can set a quote which is below the market rate, they are not permitted to "exit" the market (BISIH, 2021a). Moreover, it is anticipated that through "pre-screening" the system will be designed to mitigate common sources of delay through automatic processes (i.e. AML/CFT). Finally, with regards to message formats, Nexus will employ ISO 20022, but will provide a message translation service for those payment systems which do not use ISO 20022 (BISIH, 2021b).

[1] This number should probably be 380 (20*19)

Figure 1: Interlinking payment systems[1]



[1] Examples include *Single access point*: euroSIC; *Bilateral link*: Directo a México; *Hub and spoke*: Regional Payment and Settlement System (REPSS) of the Common Market for Eastern and Southern Africa; *Common platform:* Southern African Development Community (SADC)-RTGS.

Source: CPMI. (2022). Interlinking payment systems and the role of application programming interfaces: a framework for cross-border payments. Report to the G20. Bank of International Settlements, Basel.

2.2 Settlement mechanics

The following steps take place in this case:

- Firm A purchases a good from Firm B for a value of "**a**" in B-currency.
- It pays via an instant payment in A-currency with its bank, Bank A. The banking app of Bank A is able to convert for Firm A the amount of **a** B-currency into the SEK amount **βa** that it needs to transfer from its A-currency account with Bank A to be equivalent to **a** units in B-currency. This relies on the cross-border FX conversion layer selecting amongst market makers the best quote for the currency A to currency B conversion. This happens to be FXBank which is a banking group that has subsidiaries in both currency regions. The FX conversion quote is **β** (for simplicity we assume that the real good's value is also calculated in the same manner in the accounts of Firm A).
- Settlement of the FX transaction effectively consists of two domestic instant payment credit transfers between bank accounts with the central bank on each side, whereby the market maker (FXBank) acts as counterparty on both sides and creates as a balancing item an intra-FXBank group claim and liability. This illustrates that in some sense "cross-border payments with FX conversion" do not really exist in reality.
- To achieve PvP, settlement needs to be simultaneous, and must be linked through the relevant program code.

Table 1: Instant cross-border payment with central FX conversion layer

Country A (in A-currency)			
Firm A			
Real goods	X + β a	Equity	X
Account Bank B	X - β a		
Bank A			
Deposits with central bank	X - β a	Deposits	X - β a
Other assets		Credit from central bank	X
Central Bank A			
Credit to banks	X	Deposits Bank A	X - β a
		Deposits FXBank A	X + β a
		Banknotes issued	X
FXBank – A-country subsidiary			
Deposits with central bank	X + β a	Credit from central bank A	X
Other assets	X	Intra-Group liability	X + β a
FX-Bank – B-country subsidiary			
Deposits with central bank	X - a	Credit from central bank B	X
Other assets	X		
Intra-Group claims	X + a		
Country B (in B-currency)			
Firm B			
Real goods	X - a	Equity	X
Account Bank B	X + a		
Bank B			
Deposits with central bank	X + a	Deposits	X + a
Other assets	X	Credit from central bank	X
Central Bank B			
Credit to banks	X	Deposits Bank B	X + a
		Deposits FXBank B	X - a
		Banknotes issued	X

2.3 Can interlinked instant payment systems with FX conversion layer be the holy grail?

There are a number of advantages of interlinking domestic instant payment systems including a competitive FX conversion layer, as also developed in the Nexus report (BISIH, 2021a):

- **It is efficient** as it re-utilizes the domestic instant payment infrastructure and the associated services of banks and their relationship with bank account holders (including KYC);
- **It preserves competitiveness** to the extent that the connecting and conversion layer is not run by a single profit-maximizing firm with market power, but governed like a utility which aims at organizing strong competition between FX market makers. Further, it also avoids the potential market power of closed-loop stablecoin arrangements and/or the implied market fragmentation.
- Compared to correspondent banking, **it allows for a simpler, more efficient and more competitive architecture** of cross-border payments.
- At the same time it preserves the **universal reach** achieved by correspondent banking (every bank account holder can be addressed if a link has been established).
- **Monetary sovereignty is preserved** as interlinking prevents currency substitution and the global power of a few dominant payment firms (such as under a global stable coin arrangement).

Potential challenges relate to the technicalities and costs of interlinking and setting up the competitive and instantaneous currency conversion layer, which requires willingness and ability to collaborate not only by network service providers and message standard setters (e.g. SWIFT, ISO 20022) but also by legislators and central banks, i.e. there needs to be a political will to remove possible barriers and to make the arrangement legally sound, also in contingency scenarios, such as the default of a party to a payment. In other words, the legal and political set up costs have to be added to the other fixed costs of such arrangements. Interlinking will probably not be a solution for very narrow cross-border payment corridors in which the costs of the interlinking will be relatively high, and where it will be difficult to organize sufficient competition within the FX conversion layer, also in view of liquidity costs for the FX conversion services providing banks.

A key element of the efficiency of interlinking will be the width of the bid-ask spread on which users can rely. This width will depend on factors such as (i) volatility of exchange rate; (ii) cost and reliability of liquidity available to FX conversion service providing banks in both currencies; (iii) duration for which a quote needs to remain binding (in view of processing times in the payment initiation phase). Notwithstanding these various challenges, it seems that for more important corridors the interlinking of domestic instant payment systems can constitute the holy grail of cross-border payments: it appears efficient, relies on existing tested and successful infrastructures, and avoids closed loop systems and the associated fragmentation and potential abuse of market power, whilst preserving monetary sovereignty. Global initiatives like Nexus could reduce the set-up costs for individual payment corridors by realizing economies of scale on the technical side and by providing a benchmark for domestic system providers and legislators.

3. Conclusion

This policy brief has argued that through interlinked instant payment systems, the holy grail – whereby cross-border payments can be (1) immediate, (2) cheap, (3) universal in terms of reach, and (4) be settled in a secure settlement medium such as central bank money – is in reach for the first time. This is thanks to the rapid decline in the costs of global electronic data transmission and computer processing, new payment system technology (allowing for instant payments), innovative concepts (such as the interlinking of payment systems including a currency conversion layer; or CBDC), and unprecedented political will and global collaboration like the G20 work on enhancing cross-border payments. Progress to make compliance with AML/CFT rules more efficient and reduce related costs and legal risks is however also necessary.

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