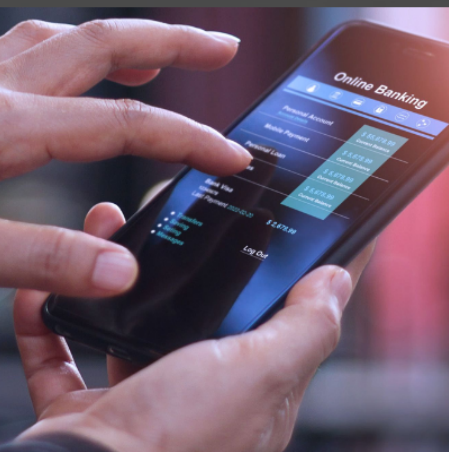


Interlinking Fast Payment Systems for Cross-border Payments

APRIL 2024



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Report

April 2024

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Executive Summary

The interlinking of fast payment systems is receiving significant attention among central banks, international organisations and market participants as a promising way to address the global challenges in cross-border payments. Interlinking involves establishing connections between fast payment systems to enable payment service providers (PSPs) in different countries to more seamlessly interact through the linked infrastructures.

Several countries in Southeast Asia have recently established bilateral connections between their fast payment systems to improve the end-user experience for low-value retail payments. The ASEAN-5 countries are now working to link up their fast payment systems multilaterally over the next few years, and a number of other countries are considering, or actively pursuing, interlinking projects for their fast payment systems.

Given these international developments and Australia’s commitment to enhancing cross-border payments, the Reserve Bank of Australia (RBA) recently collaborated with industry participants to better understand the issues associated with linking fast payment systems from an Australian perspective. This study was analytical in nature and did not assess the case for interlinking Australia’s fast payment system, the New Payments Platform (NPP), to other national fast payment systems.

This report, prepared by the RBA, summarises the findings of this study. It assesses the potential benefits of interlinking and discusses how an interlinking arrangement could be designed most effectively to realise these benefits. The report also considers various challenges to establishing interlinking arrangements. In sharing this analysis, the RBA seeks to add to the growing international discussion on fast payment system interlinking and stimulate further examination of key design choices.

Interlinking arrangements have a number of features that can help smooth frictions in cross-border payments and deliver improved outcomes for end users, particularly in relation to speed and transparency (Figure 1). By leveraging the 24/7 capabilities of fast payment systems, interlinking arrangements can enable cross-border payments to reach recipients in a matter of minutes, including outside of business hours. Modern fast payment systems also make it possible to integrate value-added services that improve the coordination of cross-border payments and the experience for end users.

Figure 1: Expected Impact of Fast Payment System Interlinking for End Users

FEATURE	24/7 availability	Common message and data requirements	Modern technology and capabilities	Common rulebook	Flexible participation model
End-user impact	↑ Speed ↑ Cost	↑ Speed ↓ Cost	↑ Speed ↑ Transparency ↓ Cost	↑ Transparency ↑ Speed	↑ Access ↓ Cost

Source: RBA.

Interlinking arrangements involve standardised message and data requirements and a common set of rules to enable interoperability between multiple fast payment systems. The standardisation and coordination that interlinking achieves by design is expected to provide a range of benefits for PSPs and end users, including greater straight-through processing (STP) rates and a more consistent and transparent cross-border payments experience. In some cases, these benefits may also result in lower costs of processing cross-border payments. However, there are also factors in an interlinking arrangement that could increase costs for PSPs and therefore end users; for instance, there may be additional costs associated with supporting 24/7 processing of cross-border payments. The overall impact of interlinking on costs for end users is thus considered unclear.

A range of scheme rules and payments processing capabilities can be implemented in interlinking arrangements to help achieve interoperability, support coordination between participants and/or manage risk. Well-designed interlinking scheme rules would play a central role in achieving the coordination and efficiency benefits noted above, and in ensuring the safety and integrity of the arrangement. A key consideration for interlinking scheme rules is where to set the minimum risk-related requirements for all participants, given fast payment systems and the jurisdictions they operate in will differ in their requirements, approaches and tolerances. While there are trade-offs involved in the calibration of these rules, setting minimum risk-related requirements at a robust level would build confidence and trust in the arrangement and support its long-term growth.

With regard to payments processing, pre-validation to confirm the accuracy of payment details before a payment is sent is considered essential to achieving the benefits of STP. The ability to address payments to an alias (e.g. a mobile phone number) and to confirm that payments are being sent to the intended recipient would also be highly desirable to improve the end-user experience of cross-border payments.

A variety of challenges influence the time and costs required to establish an interlinking arrangement. A primary challenge is dealing with the differing legal and regulatory frameworks that apply to fast payment systems and PSPs in different jurisdictions, particularly in relation to data privacy, anti-money laundering and counter-terrorism financing (AML/CTF) and consumer protection measures (including liability for fraud and scams). Failing to understand and address these differences could limit the capabilities of an interlinking arrangement or expose participants to risk. Another major challenge is agreeing on governance arrangements and developing a scheme rulebook for the interlinking arrangement. This requires alignment between parties in multiple jurisdictions on the overall objectives for interlinking, and on various commercial, legal, regulatory and operational matters. For some fast payment systems, the technical or business uplift needed to meet interlinking requirements could also be a significant hurdle.

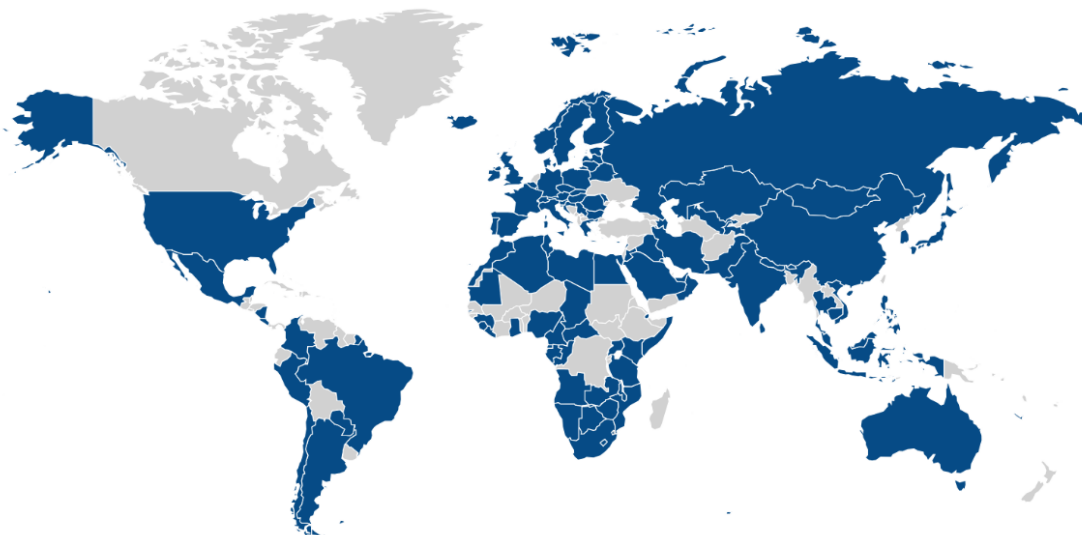
The RBA and industry participants involved in this study intend to build on the analysis presented in this report through ongoing engagement with international stakeholders in relation to interlinking initiatives, including the development of multilateral arrangements, and by undertaking further analysis with subject matter experts on key interlinking issues. This work will help inform future discussions in Australia about the potential for the NPP to be linked to other fast payment systems.

1 Introduction

Globally, the end-user experience with cross-border payment services lags well behind that of domestic payment services. Recognising the challenges in the market and the need for international collaboration, the G20 countries (including Australia) have endorsed a ‘roadmap’ to enhance cross-border payments (FSB 2020a). A centrepiece of the G20 roadmap is a set of quantitative targets, to be met by 2027, for the cost, speed, transparency and accessibility challenges faced by end users of cross-border payments.¹

Connecting fast payment systems across countries is considered one of the most promising options for enhancing the efficiency of cross-border payments (CPMI 2023c). Fostering the interlinking of fast payment systems is therefore a priority initiative in the current phase of the G20 roadmap (FSB 2023b). Fast payment systems can enable payments to be processed in (near) real-time on a 24/7 basis. Many of these systems have adopted modern technologies that can help improve interoperability for cross-border payments – notably, the ISO 20022 message format (which enables richer and more standardised data content) and application programming interfaces (APIs) (which can facilitate the development of real-time data exchange and payments functionality).² Fast payment systems are now widely available; to date, around 70 countries have deployed a fast payment system (Figure 2), and others are looking to introduce one in the next few years.

Figure 2: Availability of Fast Payment Systems around the World
As at April 2024



Source: World Bank Global Tracker.

1 For further information on the targets, see FSB (2021).
2 The International Organization for Standardization (ISO) Standard 20022 is a general-purpose message format used in the financial industry for electronic communication. The standard allows for flexible, structured and data-rich payment messaging (RBA 2020).

A number of countries have recently been pursuing initiatives to interlink their fast payment systems. In 2019, the ASEAN countries endorsed a policy framework for real-time cross-border payments within the region (ASEAN 2021). Singapore and Thailand became the first countries to link up their fast payment systems in 2021, while Singapore launched separate bilateral linkages with India and Malaysia in 2023 (Table 1). These initiatives have initially focused on low-value person-to-person (P2P) international account transfers and remittances.³ Similar initiatives are underway in other regions, including, notably, one to connect the euro area and the United States. And the ASEAN-5 countries are currently working to link their fast payment systems as part of the Bank for International Settlements (BIS) Innovation Hub’s ‘Project Nexus’ – a blueprint for a bridging platform that is designed to standardise the way that fast payment systems connect to each other on a multilateral basis (BIS 2023a).

Table 1: Recent Fast Payment System Interlinking Initiatives

Details as at April 2024

Initiative	Jurisdictions	Interlinking model	Status	Initial use cases
PromptPay-PayNow	Singapore, Thailand	Bilateral	Launched Apr 2021	Low-value P2P transfers
PayNow-UPI	Singapore, India	Bilateral	Launched Feb 2023	Low-value remittances
PayNow-DuitNow	Singapore, Malaysia	Bilateral	Launched Nov 2023	Low-value P2P transfers
QR code linkages	ASEAN-5 and others(a)	Bilateral	Varies; launched and in progress	In-person retail purchases (P2B)
Instant cross-border (IXB) euro-USD initiative	euro area, United States	Bilateral	Pilot phase	Lower-value retail payments for consumers and SMEs
Project Nexus	ASEAN-5	Multilateral	Under development	To be announced

(a) Other countries with cross-border QR code linkages include Cambodia, India, Hong Kong, Japan, Laos, and Vietnam. Sources: Bank of Thailand; BIS Innovation Hub; EBA Clearing; Monetary Authority of Singapore; The Clearing House.

Given the growing interest in interlinking fast payment systems as a means to enhance cross-border payments, the RBA and a number of Australian industry participants recently undertook a study of the issues that would be involved in linking up national fast payment systems, including the benefits, challenges and key design considerations.⁴ The study was analytical in nature, and did not aim to establish or evaluate the business case for interlinking in general or in relation to any specific interlinking initiatives.

This report, prepared by the RBA, sets out the findings of the study. Section 2 sets the scene by contrasting interlinking with other longer standing cross-border payments models. Section 3 discusses potential benefits of interlinking fast payment systems, and Section 4 identifies relevant considerations for the scope of an interlinking arrangement in terms of geographies and use cases. Section 5 outlines the attributes that would be necessary or desirable for an interlinking arrangement to help achieve interoperability and manage risk. Section 6 discusses the challenges to establishing an effective interlinking arrangement and Section 7 concludes.

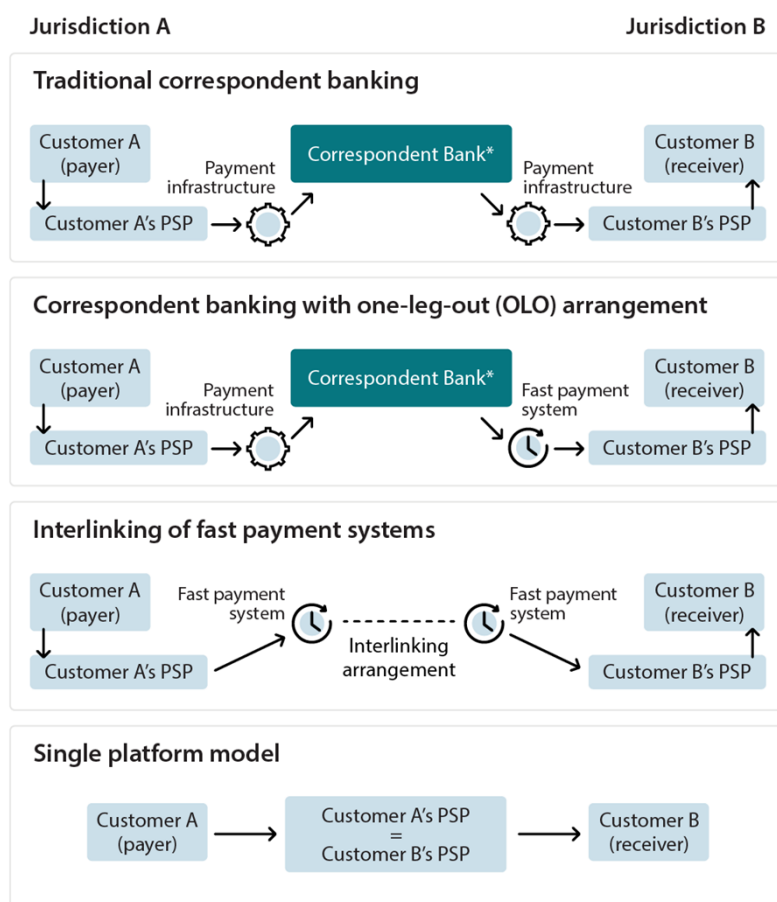
3 Remittances are a form of low-value P2P transfers sent to emerging market and developing economies (EMDEs) from family members or friends working overseas.

4 Views expressed in this report are those of the RBA authors and not necessarily those of individual institutions participating in the study group. The list of participating institutions can be found on page 40 of this report.

2 Overview of Cross-border Payment Models

This section outlines some key business models used by payment service providers (PSPs) in cross-border payments (Figure 3).⁵ This includes correspondent banking arrangements that facilitate the majority of cross-border payments, and the interlinking of fast payment systems – an emerging model that is being pursued in some countries. Several shortcomings of traditional correspondent banking arrangements are also identified. This discussion provides background for the analysis of interlinking arrangements in the remainder of this report.

Figure 3: Stylised Models in the Cross-border Payments Market



* Note: If Customer A's PSP has a correspondent banking relationship in the foreign jurisdiction, the transaction would not need to flow through domestic payment infrastructure in Jurisdiction A. Similarly, if Customer B's PSP is the same PSP as the correspondent bank, the transaction would not need to flow through domestic payment infrastructure in Jurisdiction B. In some cases, transactions may need to go through multiple correspondent banks.

Sources: CPMI, RBA.

⁵ PSPs is used throughout this report to refer to both bank and non-bank providers of payment services. While PSPs usually focus on a specific model, a mix of these models can be adopted to cater to the diverse business requirements of customers.

2.1 Correspondent banking

Correspondent banking arrangements have historically been the backbone for cross-border payments. In this model, a bank maintains relationships with banks in one or more foreign jurisdictions to facilitate the flow of funds across countries. This involves one bank (the correspondent) executing and processing payments on behalf of another bank (the respondent) that it holds foreign currency deposits for. Often the payment will need to flow through one or more correspondent banks and domestic payment infrastructures (Figure 3, first panel). However, the length of the payment chain in correspondent banking can vary depending on the relationship between the PSPs involved. For example, it can be shorter where the sending and receiving PSPs have a direct relationship, or longer where a bridge currency – a third currency used to facilitate the exchange between two different currencies – is required.

Despite its longstanding role in facilitating the bulk of cross-border payments, correspondent banking arrangements are the segment of the market where the speed, cost, transparency and accessibility challenges have tended to be more pronounced.⁶ Key shortcomings and frictions identified by the international regulatory community, market practitioners and industry bodies include:⁷

- **Inconsistent data standards and practices.** Variation in data and messaging standards across different countries and unstructured, incorrect or insufficient payments data from PSPs involved in the payments chain impede interoperability and increase the need for manual handling or compliance checks.
- **Different operating hours.** Traditionally, payment infrastructure and PSP operating hours have been aligned to business hours in the time zones they operate in. Differences in these operating hours across jurisdictions limit the amount of time in a day that payments can be processed and settled, leading to delays for end users.
- **Complex payment chains.** The potential involvement of multiple intermediaries in a payments chain can create complications due to differing business hours, processes, compliance requirements or technical standards.
- **Limited transparency.** The nested relationships between banks can introduce costs or delays at various stages in a payment chain and make it challenging to assign clear accountability for the end-to-end payment process. As a result, PSPs and their customers may have limited visibility over aspects of the payment process.
- **Legacy technology.** As a longstanding model for cross-border payments, correspondent banking systems are often built on older technology platforms. These systems may involve a greater number of manual or batch processes, can be relatively expensive to maintain and upgrade, and can be difficult to integrate with modern processes such as the use of APIs. Correspondent banking also relies on different systems across jurisdictions to interoperate. This is made more difficult where legacy technology platforms are used and can hinder the straight-through-processing (STP) of cross-border payments.
- **Barriers to correspondent relationships.** New entrants and smaller PSPs seeking to offer cross-border payment services can face significant cost, risk appetite and regulatory hurdles in setting up and maintaining relationships with large correspondent banks. This has contributed to a smaller and more

6 Other models for facilitating cross-border payments also face some of these challenges, to differing degrees. For example, managing multiple foreign currency accounts in the single-platform model can also add to funding costs.

7 For example, see FSB (2020b) and CPMI (2020).

concentrated global correspondent banking network (BIS FSI 2020). Barriers to accessing correspondent banking can reduce competition and technological innovation in the cross-border payment market.

- **Funding costs.** The need for PSPs to maintain liquidity in multiple currencies across different jurisdictions can lead to increased funding costs, which can impact the end-user pricing and availability of correspondent banking services.

Recognising the impact of these frictions on the cross-border payments experience, public and private sector stakeholders have been actively working to enhance correspondent banking arrangements. Various global and jurisdiction-specific initiatives related to payments messaging and infrastructure capabilities are collectively making progress towards improving correspondent banking (Box A). Notably, some jurisdictions have sought to augment the traditional correspondent banking model through ‘one-leg out’ (OLO) arrangements that allow a local currency leg of a cross-border payment to be processed via the domestic fast payment system, rather than the domestic real-time gross settlement (RTGS) system (Figure 3, second panel).⁸ Because fast payment systems offer near-real-time processing on a 24/7 basis, this will speed up payment times for cross-border payments that would otherwise have been processed via the local RTGS system.

2.2 Interlinking arrangements

Interlinking involves establishing connections between payment systems in multiple jurisdictions to allow PSPs to interact directly through the linked infrastructures (CPMI 2020). This can reduce the need for PSPs to process payments via correspondent banks or to participate in multiple payment systems (Figure 3, third panel).⁹ As fast payment systems have become more widespread, there has been increasing interest in establishing interlinking arrangements between them to facilitate more efficient cross-border payments.

Broadly speaking, interlinking arrangements are defined by the Committee on Payments and Market Infrastructures (CPMI) as ‘a set of contractual agreements, technical links and standards, and operational components between payment systems of different jurisdictions, allowing their respective participating PSPs to transact with one another as if they were in the same system’ (CPMI 2022b). Interlinking arrangements to date can be grouped into four basic models (Figure 4).

1. **Single access point:** Participants in a domestic payment system access a foreign payment system through a single shared ‘gateway’ entity that participates directly in the foreign system.
2. **Bilateral link:** Two payment systems are connected to each other, typically allowing participants in a domestic payment system to reach *all* direct participants in the foreign payment system.
3. **Hub and spoke:** A multilateral interlinking model where accounting, clearing and settlement are coordinated by a common intermediary (the hub), allowing participants in a domestic payment system to directly reach participants in one or more foreign payment systems.

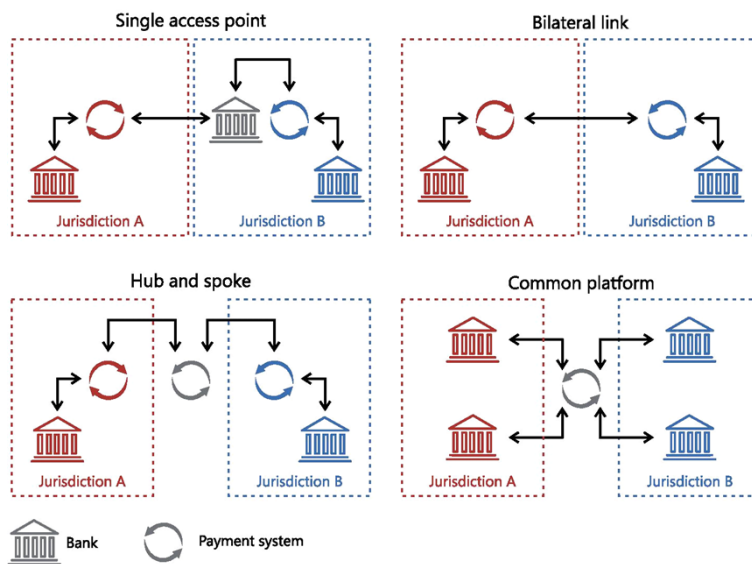
⁸ An RTGS system refers to a wholesale payment system used to settle interbank obligations arising from typically large-value payments on a real-time and gross basis.

⁹ However, it does not eliminate the need for correspondent banking relationships (see Section 3.1.5).

4. **Common platform:** Participants in one jurisdiction can directly reach participants in multiple other jurisdictions through a common payment system.¹⁰

This report largely focuses on the bilateral and hub-and-spoke models of interlinking, which have been at the centre of the international work to date.

Figure 4: Stylised Models for Interlinking Cross-border Payment Systems



Source: CPMI.

2.3 Other cross-border payment models

Another common arrangement for facilitating cross-border payments is the single platform (or closed loop) model, where the payer and payee are both customers of a single PSP that operates in multiple jurisdictions (Figure 3, bottom panel). This approach removes the need to rely on connections between financial institutions or payment infrastructures in different jurisdictions, although it does require the PSP to maintain a local presence in all jurisdictions that it facilitates payments between. This model may be used by money transfer operators, three-party card schemes and multinational banks with a presence in both the payer’s and payee’s country.

Finally, peer-to-peer models involve payers making cross-border payments directly to the payee, rather than via a PSP intermediary. An example of this is making a cash payment to someone in a different country. Digital currencies based on blockchain technology, such as crypto-currencies and stablecoins, also enable peer-to-peer digital payments across borders. Issues related to cross-border digital currency models are outside the scope of this report.¹¹

10 Common platform models are not interlinking in a strict sense, as PSPs are participating in a single shared payment system. For example, Buna in the Arab region and, to some extent, TARGET Instant Payment Settlement (TIPS) in Europe, could be considered multicurrency common platforms given the use of a single integrated technical platform. Considering the feasibility of multilateral platforms for cross-border payments is building block 17 under the 2020 G20 roadmap for enhancing cross-border payments.

11 Central banks and other international organisations have been exploring the potential role of global stablecoins and central bank digital currencies to enhance cross-border payments; these are building blocks 18 and 19 under the 2020 G20 roadmap. Examining how digital money could enhance cross-border payments functionality is one aspect of the RBA’s strategic priority to shape the future of money in Australia.

Box A: Initiatives to improve correspondent banking

Some notable recent initiatives to improve the efficiency of correspondent banking cross-border payments are outlined below.

Initiative	Description
Swift gpi	At the global level, Swift gpi is a business rulebook and digital tool for tracking international correspondent banking payments. It allows PSPs to provide end-to-end payment tracking, improving the transparency and traceability of cross-border payments, and has had a positive impact on how quickly funds are credited to a beneficiary (CPMI 2022c). Similarly, Swift Go, a newer service targeting low value cross-border payments, builds on the gpi service with the addition of a 'no-deduct' principle that guarantees the full amount is credited to the beneficiary. Realising the benefits of these services can be uneven as it depends on the extent of adoption in different jurisdictions.
Standardised messaging	Payment systems globally are increasingly adopting the ISO 20022 messaging standard, which offers enhanced data-rich messaging capabilities enabling the efficient exchange of payments information across different systems and jurisdictions. However, local differences in implementation and adoption of global industry messaging guidelines continue to create friction. The Committee on Payments and Market Infrastructures' (CPMI) harmonised ISO 20022 data requirements for cross-border payments aim to overcome this, but achieving and maintaining alignment across jurisdictions could remain challenging (CPMI 2023b). ^a
RTGS system operating hour extensions	Extending the operating hours of RTGS systems can improve the speed of some cross-border payments by increasing the processing time overlap with other jurisdictions (CPMI 2023d). Some countries, such as India and Switzerland, are already operating their RTGS systems on an extended basis, and many others, including the United Kingdom, are considering the same.
One-leg out (OLO) arrangements	At the local level, some jurisdictions are implementing OLO arrangements that enable their fast payment system to process the domestic leg of cross-border payments that may otherwise have been delayed due to limited RTGS system operating hours. For example, the European Payments Council recently launched the OLO Instant Credit Transfer (OCT Inst) scheme, which enables PSPs located in the Single Euro Payments Area to instantly process the euro leg of incoming and outgoing account-to-account credit transfers (European Payments Council 2023). In Australia, the new NPP International Payments Service (IPS) will allow the final AUD leg of inbound cross-border payments to be processed via the NPP on a 24/7 basis. ^b While these initiatives are notable, sending payments through OLO arrangements tends to be optional and practices may vary within and across fast payment systems.

(a) The minimum required data models may require future updates as the payments industry and ISO 20022 standards continue to evolve and these would need to be coordinated with the payments industry.

(b) In Australia's case, the NPP IPS does not support outbound cross-border payments.

3 Potential Benefits of Interlinking

This section discusses the potential benefits of interlinking national fast payment systems. Interlinking arrangements have a range of features that could alleviate shortcomings in the cross-border payments market (Figure 5). Improvements in these areas would deliver better outcomes in relation to the speed, transparency, accessibility and cost of cross-border payments for end users and thus help countries in their efforts to meet the G20 roadmap targets by 2027.

Figure 5: Potential Benefits of Fast Payment System Interlinking

Shortcoming	Interlinking feature	Potential benefit	End user impact
Misaligned operating hours	24/7 availability	<ul style="list-style-type: none"> Payments can be sent and received in real-time, including outside of business hours 	↑ Speed ↑ Cost
Inconsistent messaging and data standards	Common message and data requirements	<ul style="list-style-type: none"> Reduction in payment delays and investigations (greater straight-through processing) 	↑ Speed ↓ Cost
Legacy technology constraints	Modern technology and capabilities	<ul style="list-style-type: none"> Automation of payments processes and data exchanges Integration of additional services Traceability of payment status 	↑ Speed ↓ Cost ↑ Transparency
Patchwork of rules and agreements	Common rulebook	<ul style="list-style-type: none"> Upfront display of all fees and charges Consistent service levels around speed, disputes, etc 	↑ Transparency ↑ Speed ↑ Transparency
Barriers to correspondent relationships	Flexible participation model	<ul style="list-style-type: none"> Can provide an option for PSPs to expand cross-border payment services using a third party for FX liquidity Wider choice in cross-border PSPs 	↑ Access ↓ Cost

Source: RBA.

3.1 Features of interlinking

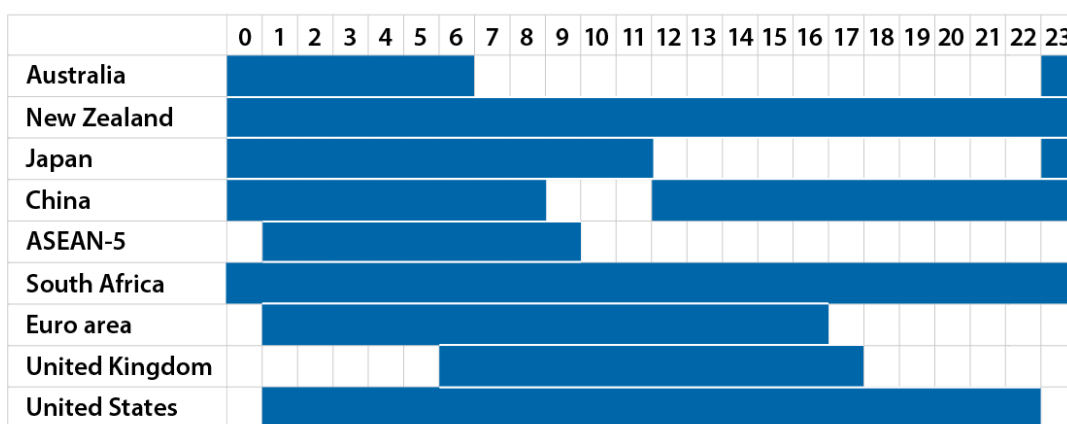
Interlinking arrangements for fast payment systems have several features that could help reduce frictions in the cross-border payments market.

3.1.1 24/7 availability

Cross-border payments can be delayed by the limited operating hours of traditional payment infrastructures, as noted in Section 2. Many cross-border payments involve at least one intermediary – for example, where the correspondent bank in the destination country is not the final recipient’s bank – and this often requires

interbank settlement to discharge the obligations between them.¹² In Australia, most cross-border payments are processed through the High-Value Clearing System (HVCS), with interbank settlement occurring in the Reserve Bank Information Transfer System (RITS), Australia’s RTGS system. The HVCS and RITS are closed on weekends and for periods outside of business hours. During this time, cross-border payments that require interbank settlement cannot be processed. Time-zone differences also mean that RITS operating hours for customer payments are significantly misaligned with some other major jurisdictions (Figure 6). For example, a payment sent from the United Kingdom to Australia on a Friday at 5:00 pm GMT (Saturday 3:00 am AEST) might arrive at an Australian correspondent bank within minutes, but cannot be on-sent to the recipient’s bank until the following Monday when the HVCS and RITS open.

Figure 6: RTGS System Operating Hours Overlap for Cross-border Payments
Hours on business days (GMT) per selected region^(a)



(a) Operating hours are rounded to the nearest hour. Australia operating hours show when customer cross-border payments are accepted and settled in RITS (which is open longer for other types of payments). ASEAN-5 operating hours are the common hours across Indonesia, Malaysia, the Philippines, Singapore, and Thailand. The business hours and practices of individual PSPs in these regions may vary.
Sources: RBA; CPMI; Reserve Bank of New Zealand; Bank Negara Malaysia; Bank of Thailand; Bangko Sentral ng Pilipinas; European Central Bank

In contrast, interlinking leverages the 24/7 availability of local fast payment systems to enable round-the-clock processing of cross-border payments. For end users, this translates to near real-time access to funds and the convenience of being able to send and receive payments immediately, irrespective of local banking hours. This could be particularly useful for urgent payments and where payers and payees are in very different time zones. However, supporting 24/7 processing of cross-border payments may involve some additional costs for PSPs, as discussed in Section 3.2.4.

3.1.2 Common message and data requirements

Differences in the payment message formats used in each jurisdiction and poorly formatted, incorrect or insufficient payments data currently impede interoperability and STP of cross-border payments. Although many fast payment systems use the ISO 20022 message standard, the specific versions and content of ISO 20022 messages can differ greatly between local implementations. The CPMI’s harmonised ISO 20022 data requirements

12 Interbank settlement resolves the financial obligations created between institutions when consumers, businesses and the government make payments in the economy (RBA 2022).

for cross-border payments aim to reduce some of the friction this causes, but achieving and maintaining ongoing alignment across jurisdictions without a central coordination mechanism is likely to remain challenging.

By design, interlinking achieves the messaging and data standardisation required for fast payment systems to interoperate under a common arrangement. Full standardisation across fast payment systems may not be required, but the message standards and data elements necessary to interoperate would be prescribed by the scheme rules. Coordinating changes to message standards and usage guidelines would reduce flexibility for fast payment systems to locally determine the timing of these changes. However, the efficiency and predictable cadence of changes as part of an interlinking arrangement could be preferable to the current fragmented approach to aligning message versions, release cycles and other market practices.

3.1.3 Modern technology platforms and capabilities

Some of the inefficiencies in cross-border payments today stem from the technical limitations of legacy payment infrastructures and technology platforms. These legacy systems can be costly to upgrade with new technologies and features that could enhance interoperability and end-user experiences.

In comparison, most fast payment systems have been developed in the past decade or so and use newer technologies that can be more straightforward to enhance with new functionality and integrate with other systems – for example, APIs (see Section 5.1.1). Many of these systems implemented ISO 20022 messaging from the outset. These attributes make it technically feasible to integrate data services that improve the coordination of payments both before and after a payment is sent, such as pre-validation and automated information requests for screening and compliance purposes (see Section 5.2). Integrating these services into the orchestration of cross-border payments would be a considerable improvement and would be difficult to achieve at scale by other means.

Some fast payment systems also provide services that offer greater convenience and certainty for end users, such as the ability to address payments to an ‘alias’ (e.g. the recipient’s mobile phone number) and functionality that confirms the payment is being sent to the intended recipient, or providing real-time notification to the sender when the payment is received. An interlinking solution could integrate these existing services to extend their benefits to cross-border payments, bringing the end-user experience of cross-border payments closer to that of domestic payments. These services are discussed in more detail in Section 5.2.

3.1.4 Common rulebook

Approaches to cross-border payments are fragmented because countries have largely developed payment systems, operating procedures, and legal and regulatory frameworks independently over time. Many of the key frictions arise from differences in technical standards, processing rules and business procedures. While ongoing initiatives aim to increase coordination and standardisation in the existing correspondent banking network (see Box A), they cannot be centrally mandated and rely on each jurisdiction independently uplifting their systems and aligning on processing rules. The implementation and maintenance of the various elements is likely to remain inconsistent without an overarching coordination mechanism.

The adoption of a common set of rules and procedures as part of an interlinking arrangement would, by design, standardise practices across providers and countries. This should help achieve a better and more consistent cross-border payments experience for end users. For example, the interlinking scheme rulebook would likely

include service level agreements to guarantee a certain level of speed, transparency and predictability for all payments (see Section 5.3).

3.1.5 Flexible participation model

New entrants seeking to offer cross-border payments services can face high barriers to accessing the payment systems and establishing the correspondent relationships required. And for established PSPs, certain jurisdictions can be challenging or costly to access.

A cross-currency cross-border payment requires an entity that is willing to accept one currency in exchange for another. Under the correspondent banking model, this is typically a large sending PSP who maintains foreign currency accounts in the countries to which they facilitate payments. In some proposed interlinking arrangements, this role can be played by a third-party foreign exchange (FX) provider. The separation of this role means that PSPs do not necessarily need to establish correspondent relationships and act as their own FX providers to facilitate payments to a given country. This could reduce difficulties in establishing numerous correspondent relationships and the FX costs involved in funding these foreign currency accounts (CPMI 2022b). In some cases, this model could be a more economical way for PSPs to expand their payment services to additional jurisdictions.

Some PSPs may wish to continue providing their own foreign currency liquidity, but with the option of also providing FX services to other PSPs. This flexible model could encourage more providers to participate in the market for cross-border payment services, boosting competition and increasing consumer choice.

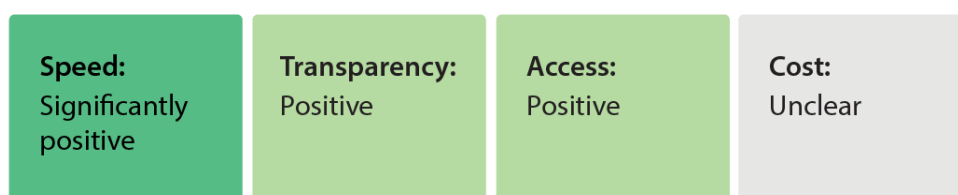
It is worth noting that in correspondent banking, a PSP can send a cross-border payment to a jurisdiction where they do not hold a foreign currency account by relying on the correspondent banking relationship of another bank in their jurisdiction. This is sometimes known as ‘nested’ correspondent banking. However, this payment flow can be opaque for PSPs (and consequently end users) in terms of the payment status, FX rate, or deductions applied by intermediaries. This is especially true in the absence of standardised messaging and a common rulebook. In comparison, interlinking could allow PSPs to facilitate payments to jurisdictions where they do not maintain foreign currency accounts in a more standardised and transparent way.

3.2 Impact on challenges for end users of cross-border payments

The features of interlinking arrangements described above would generally be expected to have a positive impact on the challenges facing end users of cross-border payments. Most notably, interlinking could considerably increase the speed of cross-border payments for end users (Figure 7). It could also improve the transparency of cross-border payments, and give users access to a wider range of PSPs. The expected effect on payment costs for end users is unclear, as discussed in more detail below.

Figure 7: Potential Benefits of Interlinking for End Users

Expected impact on cross-border payment challenges



Source: RBA.

3.2.1 Speed

Interlinking fast payment systems has the potential to significantly enhance the speed of cross-border payments for end users. It allows cross-border payments for interlinked corridors (sets of payment flows between one country and another) to be processed in near real-time on a 24/7 basis. In addition, because interlinking arrangements streamline the exchange of messages and data and can support payment services such as pre-validation, the proportion of payments that can be processed straight-through (that is, without manual intervention that leads to delay) should increase. Interlinking scheme rulebooks could also guarantee a certain level of speed for payments through service level agreements that define maximum end-to-end processing times.

The available evidence suggests there is substantial scope to improve the average speed of cross-border payments involving customers in Australia. In particular, a number of other comparable countries, including some in similar time zones, process incoming payments more quickly. Substantial improvements will be required to bring Australia closer to the G20 cross-border retail payments speed target of processing 75 per cent of payments within one hour and 100 per cent of payments within one business day. Preliminary estimates suggest that if most low-value payments to and from Australia's largest payment corridors could be completed within five minutes, this would reduce the average time taken for cross-border payments to and from Australia by around one-third.¹³

3.2.2 Access

Interlinking arrangements could be designed in a way that make it easier for PSPs to offer and expand their cross-border payment services for interlinked corridors. Flexible participation models and a common rulebook with clear and transparent access criteria could help to lower barriers to entry and broaden participation. Interlinking could be especially useful if it provided a standardised or more transparent way for PSPs to access more markets, particularly smaller markets with fast payment systems where establishing correspondent banking relationships might be less economical. Interlinking could also help to equip FX providers servicing more challenging corridors with more complete payments data and improved compliance tools. This could potentially reduce some of the impacts of de-risking in correspondent banking.¹⁴ A wider choice of providers servicing a given corridor should boost diversity, competition and innovation in the cross-border payments market, in turn benefiting end users.

3.2.3 Transparency

Interlinking arrangements could improve both price and non-price transparency of cross-border payments for end users. Interlinking scheme rulebooks, service level agreements and technical functionality could ensure a minimum or standardised upfront display of fees, FX rates and other charges to end users. This could include the full amount to be received by the payee after all fees are taken into account, the agreed exchange rate (including any markup), and any separate fees charged to the sender.

13 For the purposes of this analysis, 'most low-value payments' refers to 90 per cent of payments under US\$10,000, including future-dated payments (a simplifying assumption is that these might not have been future-dated if constraints around operating hours were not a factor). The largest payment corridors are the United States, United Kingdom, the euro area, and ASEAN-5 countries.

14 De-risking refers to correspondent banks withdrawing their services in response to due diligence and regulatory costs.

Leveraging the more efficient data exchange and validation capabilities of modern fast payment systems could also improve the transparency of non-price information to customers. As with the services available for many domestic fast payment systems, customers sending cross-border payments could be provided with greater certainty about who they are paying through the implementation of a confirmation of payee service (see Section 5.2.2) and about the status of their payment via immediate notification once the payment has been credited to the recipient.

3.2.4 Cost

Cross-border payments are widely considered to be expensive, even after factoring in the additional complexities and risks involved in facilitating them compared to domestic payments. The expected impact of an interlinking solution on costs for cross-border payments end users is unclear, given that there are factors that could influence the underlying costs to PSPs in both directions. The prices ultimately faced by end users are also dependent on any provider cost savings being passed on. This could be more likely in an interlinking solution that enables a wider choice of providers servicing a corridor and improves price transparency.

Interlinking could offer a number of cost savings for PSPs. The cost of fast payments tends to be lower than high value (RTGS system) payments. Increased STP also implies lower operational costs associated with manual payments handling. In addition, the specialist FX provider model proposed by some interlinking arrangements could reduce the need for PSPs to act as their own FX provider and hold foreign currency deposits themselves, thereby reducing funding costs (CPMI 2022b).

On the other hand, supporting 24/7 services and multiple rails (underlying infrastructure and systems that facilitate funds transfers between parties) could involve additional costs for PSPs. PSPs that participate in fast payment systems already support 24/7 processing for domestic payments, but there may be additional technical or operational costs involved in extending this to cross-border payments. There may also be some duplicated operational costs because some PSPs will still need to maintain accounts at correspondent banks for the provision of other international banking services, to support securities settlements, or to manage trade flows (particularly those invoiced in a foreign reserve currency). Where PSPs perform FX conversion as part of the arrangement, they will need sufficient FX liquidity on a 24/7 basis, which entails additional operational and liquidity costs, especially for after-hours payments when some foreign currency markets are closed. These costs tend to be higher for less commonly traded or volatile currencies. An interlinking solution would also require upfront investment from PSPs that would need to be recovered over time.

3.3 Broader economic and financial benefits

Improvements in cross-border payment outcomes for end users could lead to a broader range of economic and financial benefits.

Cheaper and faster transfers would be expected to result in greater international trade and capital flows over time. As seen in many of the initiatives overseas, linkages often have the objective of supporting regional integration and cooperation between interlinked countries, including by facilitating commerce, migration and tourism. In the short term, the largest benefits may come from linking with countries that already represent a significant share of current cross-border payment flows. Alternatively, there could be longer term benefits to linking up with countries that have the potential to play a larger role in future trade and capital flows. These issues are considered further in Section 4.

Individuals in lower-income emerging market and developing economies (EMDEs) can face limited options and disproportionately high costs in receiving remittances. Interlinking arrangements could potentially provide a more accessible, convenient and/or cost-effective option for individuals in EMDEs, improving their financial wellbeing. However, some lower-income EMDEs do not yet have fast payment systems. Other initiatives, such as national electronic ‘Know Your Customer’ projects, may therefore make more of an impact in improving financial inclusion in these countries in the near term (RBA 2023b).

3.4 Frictions not addressed by interlinking

Although interlinking arrangements could help alleviate a number of shortcomings in cross-border payments and deliver a range of benefits to market participants and end users, there are some underlying issues that interlinking solutions are unlikely to directly address. These include:

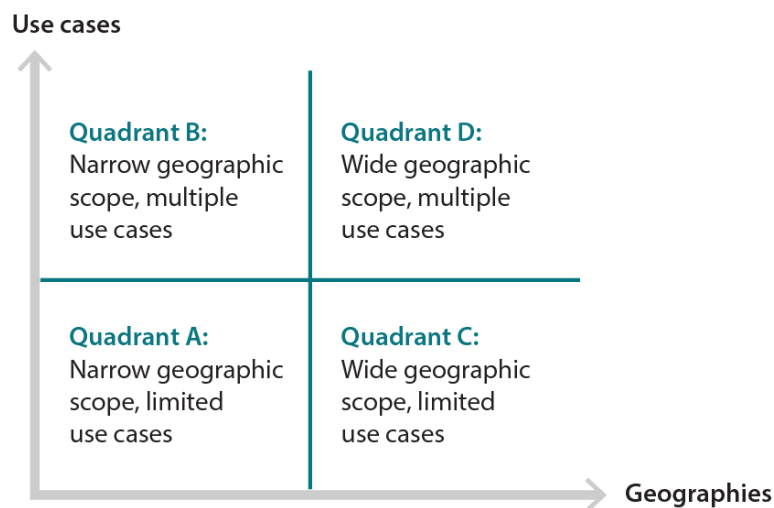
- Managing foreign currency liquidity is a key cost of cross-border payments. FX funding costs could be even greater with 24/7 real-time interlinking arrangements due to poor FX liquidity when local markets are closed or from unavailable currency trading pairs (which may require the use of a third currency). Initiatives to address this challenge include enhancing, and increasing the availability of, payment-versus-payment (PvP) solutions for deliverable FX trades (CPMI 2023a).¹⁵
- Data laws, regulatory and supervisory frameworks and the application of global AML/CTF standards differ significantly across jurisdictions. While interlinking can accommodate the resulting technical and business differences to some extent, increased regulatory cooperation and global standards could further reduce friction. The latest G20 roadmap outlines specific steps to tackle the challenges these differences pose for international payments.
- Domestic access challenges for PSPs seeking to join fast payment systems could limit the ability of an interlinking arrangement to encourage participation from a broader range of PSPs, and thus present a barrier to potential competition and innovation benefits (CPMI 2022a). Similarly, a lack of access to basic banking and payment services for individuals and businesses may limit the reach of an interlinking solution in certain countries.

¹⁵ PvP is a settlement mechanism that ensures that the final payment of one currency only occurs if the final payment of the other currency takes place. A notable portion of global FX trades (such as spots, forwards, and swaps) are settled without PvP because the systems are either too costly to use, do not support certain currencies or are unavailable outside of regular business hours.

4 Geographies and Use Cases

This section considers issues related to the scope of connecting fast payment systems across different jurisdictions (geographies) and for various payment purposes (use cases). Interlinking might initially be targeted towards priority jurisdictions and use cases (Figure 8, quadrant A). However, interlinking arrangements would ideally be designed in a way that allows for expansion over time to a broader range of jurisdictions and use cases (quadrant D), to maximise the benefits for PSPs and their customers. In this respect, multilateral linkages are likely to be the most effective way to scale the use of fast payment systems for cross-border payments.

Figure 8: Scope of Fast Payment System Interlinking



Source: RBA.

4.1 Bilateral or multilateral interlinking

A key consideration when interlinking fast payment systems is whether to pursue one or more bilateral linkages, or a multilateral linkage that involves connecting to fast payment systems in multiple jurisdictions under the one arrangement.

Bilateral linkages are likely to take less time to establish given they require only two jurisdictions to agree and implement the interlinking arrangement. Consequently, recent linkages between fast payment systems have been established on a bilateral basis (see Table 1).

However, in the longer term, bilateral linkages may not be the preferable approach because they are less scalable: each additional linkage involves separate set up costs (even if a standard template is followed) and increases the degree of technical and business complexity for fast payment system operators and participants. Establishing an effective multilateral interlinking arrangement could take a significant amount of time, but once in place it would enable access to a range of countries through the one connection, and to any new countries that join thereafter.

For these reasons, the Australian industry participants involved in this study indicated a general preference for any interlinking to be on a multilateral basis. Even so, bilateral connections could still be considered on a case-by-case basis in the future, if a large potential net benefit were to be identified.

4.2 Identifying priority corridors

Whether pursuing a multilateral interlinking arrangement or a series of bilateral connections, a jurisdiction will need to prioritise which payment corridors to link initially. A prerequisite to linking up a specific corridor is that both jurisdictions have fast payment systems in operation. Regions with a notable number of countries without fast payment systems include Africa, the Americas (including Canada) and the South Pacific (including New Zealand) (Figure 1).

Other criteria that could assist with identifying priority corridors include:

- **Alignment of strategic payments objectives.** Reaching agreement would be easier for jurisdictions that have similar payments policy strategies and objectives in relation to the purpose and scope of the interlinking arrangement. Consistent with this, interlinking arrangements to date have tended to be part of broader regional cooperation or integration initiatives (see Table 1).
- **Sizeable payments volumes at present and/or expected over the medium term.** Linking up corridors with larger existing volumes would be expected to benefit the most end users and could be more commercially viable for providers.
- **Underperformance of existing cross-border payments arrangements.** Corridors where the speed, cost, transparency or access challenges are more substantial offer more room for improvement. Improvements in these corridors could have a significant impact on end-user outcomes and in meeting the G20 targets. For example, cross-border payments intermediated by Australian banks face speed challenges across all corridors. These tend to be most significant for payments made to developing markets, and for payments received from major advanced economies with large time zone differences to Australia.
- **The potential for broader economic and financial benefits.** As noted in Section 3.3, interlinking could provide broader economic or financial benefits, such as by facilitating increased economic trade and tourism or improving financial wellbeing through more cost-effective remittances. Linkages to EMDEs could potentially offer the greatest benefits in this regard.
- **Jurisdiction-specific regulations.** Controls in some jurisdictions, such as those related to movements of capital or foreign currency, generate additional compliance costs and could circumvent some of the benefits of interlinking if frictions are not addressed prior to, or as part of, establishing an interlinking arrangement.
- **FX liquidity/volatility.** Interlinking to corridors where foreign currency markets are more liquid and less volatile would be beneficial for funding costs and the management of FX risks.
- **Technical compatibility.** It would be easier to achieve interoperability with fast payment systems that make use of similar technologies and processes (especially message formats).
- **Account reachability.** Jurisdictions in which a high proportion of bank accounts, across a wide range of PSPs, are reachable by the local fast payment system would allow the linkage to have a broad impact.

4.3 Opportunities beyond retail account transfers

National fast payment systems have served as an important foundation for innovation in domestic payments. Similarly, an interlinking arrangement could provide the infrastructure foundation for cross-border payments use cases and services beyond international account transfers. Consumers in many countries are transitioning from cash to digital payments at a rapid pace, particularly to mobile-based payments. In some markets, a material share of non-cash payments is now processed by fast payment systems (CPMI 2024). Interlinking presents opportunities for PSPs to leverage their investment in the domestic fast payment system to service more customers in these markets. Understanding these trends can help ensure the interlinking arrangement is designed in a way that allows new cross-border payment use cases to be supported in the future.

Figure 9 illustrates some possible payments use cases that an interlinking arrangement could enable. Existing initiatives have generally launched with a limited number of use cases – these are typically in-person QR code-based payments and/or P2P transfers, including remittances. This partly reflects that interlinking arrangements tend to involve low transaction value limits to begin with, to mitigate risk and ensure that appropriate controls are in place before scaling up.

Figure 9: Possible Payments Use Cases for Interlinking Arrangements

FROM	TO	Person	Business	Government
Person		<ul style="list-style-type: none"> Remittances Personal transfers Microfinance 	<ul style="list-style-type: none"> In-store purchases (e.g. with QR codes) E-commerce Bill payments Pull payments (direct debit) 	<ul style="list-style-type: none"> Tax payments
Business		<ul style="list-style-type: none"> Dividend/interest payments Global payroll 	<ul style="list-style-type: none"> Invoice payments (low value) Invoice payments (higher value) 	<ul style="list-style-type: none"> Tax payments
Government		<ul style="list-style-type: none"> Disbursements (e.g. pension payments) 		

KEY ■ Likely initial use case ■ Likely medium-term use case ■ May be enabled in longer term

Source: RBA.

Expanding to other use cases would add to the value proposition of an interlinking solution and could be considered after initial launch as the arrangement matures. For example, an interlinking solution could facilitate cross-border e-commerce payments, which have typically been dominated by international card networks. Use cases involving higher-value transactions or ‘pull’ payments (where payments can be initiated by the payee rather than the payer, such as a regular bill payment or subscription) may also be considered, but would likely be longer term initiatives given these use cases are not supported by some fast payment systems at present.

Any use cases in an interlinking arrangement would likely need to conform – at least initially – to the pre-existing design of the connected fast payment systems:

- For example, fast payment systems are typically designed to process lower-value, higher-volume ‘retail’ payments, but not the higher-value ‘wholesale’ payment segment, which can pose greater liquidity and settlement risks.¹⁶ Many fast payment systems have transaction value limits in place, which could limit the use cases that an interlinking solution could support, at least for those corridors.¹⁷ Australia’s NPP does not have a system-imposed transaction value limit, but individual participants can (and do) set their own limits based on business considerations. Nevertheless, given the typical value distribution of cross-border payments, even an interlinking arrangement with a relatively low transaction value limit in place (e.g. US\$10,000) could be expected to process a substantial share of cross-border payments.
- National fast payment systems do not generally accept payments where the currency is not local to the jurisdiction. This means they could not process an interlinked payment in a currency that is not supported by the domestic fast payment system, even if the payment flows can be coordinated by the interlinking arrangement. For instance, if a supplier in Australia issues an invoice to a buyer in Thailand, specifying payment in USD to a USD account held with their Australian bank (a foreign currency account), the inbound leg of this payment could not currently be processed by Australia’s fast payment system.¹⁸

In addition to new use cases, interlinking could also be an opportunity for some PSPs with larger balance sheets to broaden their role in an interlinking arrangement by providing ‘wholesale’ services to others. Examples include:

- A PSP with global operations and access to two or more pools of foreign currency could play the role of an FX provider, facilitating the FX conversion for the interlinked payments of other PSPs.
- A PSP that is a participant in a local fast payment system could provide settlement liquidity to FX providers who are not participants in the relevant fast payment system(s).¹⁹
- A PSP that is a direct participant in a local fast payment system could offer agency services to other PSPs to enable those PSPs to indirectly provide cross-border payments via the interlinking arrangement.

16 Wholesale payments are sometimes considered payments between financial institutions, while the FSB defines them, for the purpose of measuring progress against the G20 targets, as payments above US\$100,000.

17 For fast payment systems with transaction limits in place, these can vary from as little as US\$140 to as much as US\$1,200,000 (BIS Innovation Hub 2023).

18 In some cases, interlinking could make the use of local currencies more attractive for cross-border payments.

19 This could be achieved by the PSP (correspondent) providing a local currency account to the FX provider (respondent). As such, interlinking does not eliminate the need for correspondent banking relationships altogether.

5 Design Considerations

Interlinking fast payment systems involves the implementation of various arrangements – including technical standards, payments processes, governance mechanisms and rules – to achieve interoperability and manage risk for both infrastructure operators and participants. This section discusses how an interlinking arrangement could be designed. The focus is on interlinking on a multilateral basis, although many of the considerations would also apply to bilateral linkages.

5.1 Enabling technical interoperability

Interlinking generally involves making the payment clearing arrangements of two or more domestic fast payment systems interoperable with one another through the implementation of technical arrangements and standards, and by establishing connectivity to exchange clearing messages between participants in each system.²⁰

5.1.1 Standardised messaging and data exchange

Adopting ISO 20022 (or upgrading to newer versions of this standard) and implementing the CPMI’s harmonised ISO 20022 data requirements for cross-border payments will help to facilitate interlinking through greater alignment in message formats and richer data. For example, the CPMI requirements include a unique end-to-end transaction reference (UETR) that is carried throughout the payment chain, which would enable traceability and facilitate post-processing activities like reconciliations. In practice, fast payment systems seeking to participate in an interlinking arrangement would likely need to adhere to message usage guidelines specific to the interlinking arrangement to ensure the messaging between systems is, and remains, fully interoperable (see Section 3.1.2).

Standardisation of the data carried with a payment message also underpins the development of APIs that can support the interoperability of different technology platforms used by interlinked payment systems. APIs can be used in the exchange of data at different stages of the interlinked payment chain and between different parts of the architecture used in the interlinking arrangement. For example, depending on the design of the arrangement, a payment or its pre-validation check could involve an API request and response between the interlinking hub or gateways that connect the two fast payment systems involved.²¹

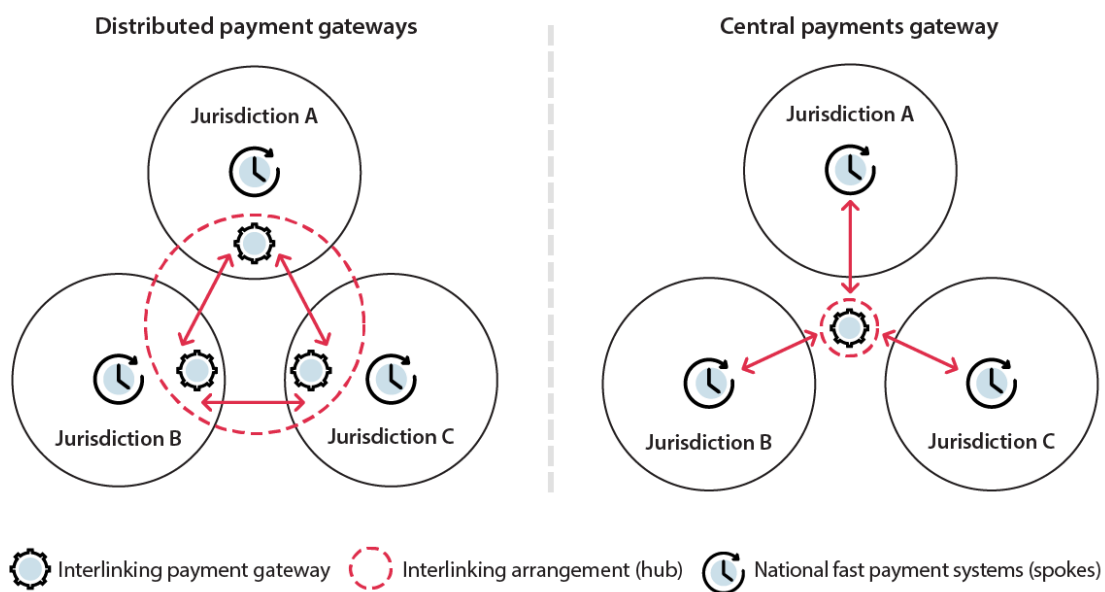
20 This refers to both the semantic (consistent standards) and technical (consistent systems) attributes of interoperability described in BIS (2021).

21 The CPMI has established a panel of experts that is developing recommendations for greater harmonisation of APIs in cross-border payments: see BIS (2023b).

5.1.2 Network and infrastructure connectivity

An interlinking arrangement involving fast payment systems on different communications networks requires a technical solution that allows payment messages and data to be exchanged securely between networks. For example, Australia’s NPP uses a local Swift network (distinct from the global network for messaging in correspondent banking) while the United Kingdom’s fast payment system uses a network provided by Vocalink. Some hub-and-spoke interlinking solutions achieve this with distributed payment gateways – a software component operated by each fast payment system that connects to the gateways of all other fast payment systems and, in doing so, is able to transmit information from one system to another over an agreed network path (Figure 10). Others may use a central gateway to perform a similar function.

Figure 10: Multilateral Interlinking Network Designs



Source: RBA.

Multilateral linkages also give rise to additional technical considerations regarding the extent of common functionality provided by the interlinking scheme operator and the architecture it uses. Some common functionality will likely be necessary, such as to authenticate PSPs or fast payment systems and for the storage of basic reference information. Depending on the functionality needed, a centralised architecture may be preferred over a distributed design across local jurisdictions. However, data localisation requirements in some jurisdictions (discussed in Section 6.1) may present a barrier to more centralised architecture. Generally, a range of technical implementations could be considered depending on the needs of a specific interlinking arrangement, and provided the chosen solution is secure, cost effective and operationally efficient.

5.2 Value-added payments processing

An interlinking arrangement could provide a set of common processing capabilities that are integrated into the payment flow to address key frictions in cross-border payments and fully realise the benefits identified in Section 3. These capabilities are discussed below in order of their desirability, as assessed by the study group (Table 2).

Table 2: Key Payments Processing Capabilities for Interlinking

Capability	Description	Desirability
Pre-validation	Confirms the accuracy of payment information prior to sending a payment, maximising the likelihood that a payment will be completed without delay.	Essential
Proxy/alias addressing and confirmation of payee	Alias addressing allows payments to be addressed to an alias associated with the recipient's bank account, such as their mobile phone number or email address. Confirmation of payee enables customers to check whether they are sending money to the intended recipient.	Highly desirable
Compliance screening tools	These could include automated services for requesting additional information from other PSPs, or a means of providing visibility over minimum data requirements for AML/CTF and sanctions screening purposes.	Desirable
FX conversion mechanism	Optional marketplace service to provide executable quotes to PSPs, promoting competition among FX providers and supporting flexible participation models.	Potentially desirable
Message format translation	A centralised message mapping or translation service that could convert payment messages from the formats used in domestic fast payment systems to a standardised format required for the interlinking solution.	Less desirable

Source: RBA.

5.2.1 Pre-validation

Pre-validation of payments may be considered essential for any interlinking solution if it is to achieve the benefits of increased STP. Comprehensive pre-validation capabilities could reduce manual interventions and misdirection of funds, and detect some scams and fraudulent payments; these advantages would be particularly important in a near-real-time context.²² Aside from verifying beneficiary account information and reachability, pre-validation could extend to the rules and characteristics of destination fast payment systems, such as routing options, system response times and message usage guidelines (including any required data elements). Pre-validation could also encompass pre-screening for sanctions compliance.

5.2.2 Proxy/alias addressing and confirmation of payee

Alias addressing would be highly desirable for improving the user experience and reducing frictions around cross-border payments addressing. This is a particular issue for payments coming into Australia, where a material proportion are handled through exception because 'BSBs' (a six-digit code that identifies a specific branch of an Australian financial institution) and account numbers are populated incorrectly or missing, given they are distinct from other international account identifiers. Confirmation of payee functionality would also be desirable to reduce mistyping errors and to help combat some scams and fraudulent payments.

The absence of these services in international payments today is a factor that inhibits STP and detracts from the end-user experience. However, in both cases, data privacy regulations may limit the information that is able to be shared across borders, which is an issue that would need to be explored further with regulators domestically and overseas (see Section 6.1). It is also worth noting that not all domestic fast payment systems currently have proxy addressing and/or confirmation of payee services in place.

²² Relatedly, PSPs will need to decide on an approach to handling payments that cannot be validated or that fail when sent via an interlinking solution, such as whether to redirect customers to another payment option or automatically switch the payment to other rails.

5.2.3 Compliance screening tools

An interlinking arrangement will need to integrate with participants' existing AML/CTF, sanctions screening and fraud detection processes. Depending on the design, interlinking could potentially improve the efficiency of these processes and provide opportunities to embed certain requirements into the arrangement. For example, an automated service to enable more efficient processing of 'requests for information' would streamline investigations in the case of payment instructions that fail screening, as envisioned by Project Nexus (BIS Innovation Hub 2023). Similarly, a reference data service could provide PSPs with visibility over any mandatory data elements required for screening in the destination jurisdiction. Standardised message usage requirements could also ensure that certain structured data elements are included in all payment messages to assist with compliance screening. Pre-screening payments, with a strict pass-or-fail regime at initiation, would further minimise friction at a later stage of processing and is likely to be preferable in a real-time context. In combination with more robust pre-validation, this could materially reduce the compliance frictions and associated delays in cross-border payments processing.

The technical capabilities of an interlinking solution could also serve as a catalyst for more ambitious screening solutions, such as a centralised screening service or a platform for the mutual exchange of financial crime data. These could further reduce compliance costs for participants and improve the sophistication and efficacy of monitoring using a broader transaction set. However, there are likely to be significant hurdles to implementing such a service, such as restrictions on the sharing of data across borders and the need for PSPs to be sufficiently confident that relying on any arrangement is consistent with local regulatory frameworks. Some form of support from the relevant regulators in each jurisdiction may therefore be required.

5.2.4 FX conversion mechanism

Interlinking arrangements can be designed to provide a flexible participation model to suit the commercial needs and operational capabilities of different participants and market contexts (see Section 3.1.5). In addition to a flexible distinction between the roles of a PSP and FX provider, an interlinking platform could include an FX quotation mechanism to promote greater choice in FX providers and rates. This mechanism would function as an FX marketplace providing binding quotes from FX providers to PSPs that can be immediately executed and fulfilled per payment, as envisioned by Project Nexus (BIS Innovation Hub 2023).

Such a marketplace could promote competition between FX providers by allowing PSPs to select their preferred rate upfront and in a standardised way. This could be particularly advantageous for new PSPs entering the market, or for PSPs who opt out of providing FX conversion themselves for certain corridors or payment types.

An FX conversion mechanism could also help to improve certainty for end users relative to cases in correspondent banking where a PSP relies on an FX intermediary further down the payment chain (such as a local correspondent's foreign account provider) and therefore has limited visibility and choice of the FX rate applied. This means the PSP cannot provide customers with certainty of the final amount to be delivered in the destination currency.

Views on the usefulness of an FX conversion mechanism are likely to vary depending on the commercial model of PSPs. Established PSPs with a preference to continue performing FX conversion themselves may see less value in this, although in some cases the option to separate the roles of PSPs and FX providers could help with expanding their services into new markets, particularly those that are more complex to access.

5.2.5 Message format translation

An interlinking arrangement that requires standardised messaging potentially avoids the need for message translation services that can lead to errors or data truncation. However, recognising that some jurisdiction-specific nuances are likely to persist for a period, some form of centralised message mapping or translation service could be beneficial to assist with implementation, even though it would introduce additional cost and complexity to the interlinking arrangement. Alternatively, individual fast payment systems would be responsible for converting their domestic messaging formats to an agreed harmonised format for cross-border payments as required. The need for extensive translation capabilities could gradually diminish over time due to increased harmonisation in message formats, usage guidelines and market practices across jurisdictions.

5.3 Governance

5.3.1 Governance frameworks

As with any payment system, an interlinking arrangement requires a governance framework to determine what decisions are required, who takes those decisions and the decision-making processes to be followed. Establishing effective governance for interlinking is a relatively complex task given fast payment system operators and participants in different jurisdictions may have different goals and incentives, and may be subject to divergent legal, regulatory and/or policy frameworks. Given these complexities, the CPMI has established a workstream to develop a governance and oversight framework for payment system interlinking across borders, as a reference for public and private-sector stakeholders.²³

Interlinking arrangements may aim to leverage domestic payment systems' existing governance frameworks to the extent possible, but would require a separate governance framework for the cross-border aspect of the arrangement. It would be important that this governance framework does not conflict with those of the individual fast payment systems; this may be easier to achieve where participating jurisdictions have more comparable arrangements. The appropriate governance framework for a specific interlinking arrangement will depend on a range of factors. These include, for example, the chosen ownership structure and legal set-up of the interlinking arrangement, the (pre-existing) governance approaches of the relevant domestic fast payment systems and the specific design of the arrangement (CPMI 2023c).

In general, key governance (board-level) decisions for an interlinking arrangement may involve:

- determining interlinking objectives and the longer term vision, such as in relation to the geographic and business scope of the arrangement
- articulating overall principles and approaches in relation to risk and scheme access
- ensuring business viability and putting in place appropriate commercial arrangements
- approving policies to ensure compliance with relevant legal, regulatory and oversight requirements
- developing and approving an interlinking scheme rulebook – this is discussed in further detail below.

²³ In October 2023, the CPMI published an interim report on interlinking governance and oversight considerations: CPMI (2023c). The final report is due to be completed by the end of 2024.

5.3.2 Scheme rules

Scheme rules form the basis for the relationship between the owner of a payment system and its participants, defining the way the system will operate, and the roles and responsibilities of participants. Fast payment systems already have scheme rulebooks in place for domestic payments, covering areas such as participant access criteria, operational and risk management procedures, and technical standards. However, scheme rules may vary considerably between different fast payment systems. An interlinking arrangement will require its own scheme rules to govern the cross-border aspect of the arrangement and facilitate interoperability between multiple fast payment systems. Table 3 provides a high-level overview of the key elements that an interlinking scheme rulebook would likely need to cover.

Table 3: Selected Scheme Rules in an Interlinking Arrangement

Area	Rules
Membership	<ul style="list-style-type: none"> • Scheme participant types and participation options • Minimum eligibility requirements for each type of participant • Roles, rights and responsibilities of participants • Basis and procedures for suspension and termination
Risk management and compliance	<ul style="list-style-type: none"> • Requirements around minimum availability, business continuity and information security for infrastructure providers and participants • AML/CTF and sanctions screening obligations • Risk management framework (and the extent to which participants have the flexibility to put in place additional measures in line with their risk appetite) • Mechanisms to monitor compliance with scheme rules and penalise non-compliance
Operations and payment processing	<ul style="list-style-type: none"> • Clearing and settlement rules and processes • Transaction screening requirements and fraud checks • Processing rules, including practices around integrated services such as pre-validation, proxy look ups and notification of crediting • Service-level agreements for response times and overall processing times (considering differences between systems) • Rules and procedures for exception handling, payment investigations, disputes and reversals
Commercial terms	<ul style="list-style-type: none"> • Pricing and cost recovery model for participants (e.g. onboarding fees, scheme fees) • Agreed approach to the upfront display of key information to customers, such as pricing, payment term and use of customer data • Non-compliance fees and financial penalties
Technology	<ul style="list-style-type: none"> • Connectivity requirements and communication protocols, including APIs • Common ISO 20022 messaging standard including minimum required fields^a • Identification of third-party providers/vendors necessary to implement interlinking arrangements
Legal	<ul style="list-style-type: none"> • Applicability of national laws to the interlinked system and its participants (e.g. in relation to data privacy, AML/CTF, reimbursement frameworks for fraud and scams, and when a payment is considered final)

(a) This would ideally include the CPMI's harmonised requirements for end-to-end use in cross-border payments.

Sources: RBA; World Bank.

Well-designed interlinking scheme rules can play a central role in bridging differences between participating fast payment systems, ensuring the safety and integrity of the arrangement, and encouraging wide participation to achieve scale. They can also help to ensure a consistent and predictable experience for end users across different corridors and PSPs. The rules should be clear and enforceable in all participating jurisdictions, with processes to identify and mitigate legal risk and conflict of law issues. In some cases, it may be necessary for domestic fast payment systems to make changes to their existing scheme rulebooks and/or put in place additional rules or requirements that apply only to payments sent through the cross-border arrangement, to ensure compatibility with the rules of the interlinked system. In other cases, differing rules of the fast payment systems can coexist; for example, it is possible to interlink two fast payment systems that manage interbank settlement risk in different ways (see Box B).²⁴

An important consideration for interlinking scheme rules is how stringent minimum risk requirements are for system operators and PSPs. There are likely to be trade-offs involved in the calibration of rules related to access, financial risk, operational risk and financial crime/fraud risk. If minimum requirements are set too low, some jurisdictions and PSPs may not be comfortable participating in the arrangement. On the other hand, minimum requirements that go well beyond the requirements that apply in some domestic fast payment systems may make it difficult for those systems and their participants to join the arrangement, at least in the near term (see Section 6.3). Industry participants involved in this study suggested it would be preferable for minimum risk-related requirements to be set at a robust level, as this would engender trust in the arrangement and support its long-term expansion.

Another consideration in this regard is how compliance with minimum access requirements and other scheme rules will be monitored and enforced, particularly where they are in excess of local requirements and regulations, and who will be liable for breaches.

Given it may not be feasible for interlinking scheme rules to address all differences in requirements and risk tolerance between jurisdictions, an important risk management feature from the perspective of Australian participants is having the contractual and technical ability not to connect to certain fast payment systems and/or PSPs in a multilateral arrangement (or to set differential transaction limits). This would allow participants to decide which corridors and individual PSPs to interact with based on their individual risk appetite and assessment, as is possible today under correspondent banking arrangements.

Financial crime compliance, mitigation and liability was also viewed by study group participants as an area where strong and clear interlinking scheme rules would be beneficial. Box C discusses financial crime risks in interlinking arrangements and how scheme rules could help mitigate these risks.

²⁴ Settlement risk is 'the risk that settlement in a funds or securities transfer system will not take place as expected. This risk may comprise both credit and liquidity risk' (CPMI 2016a).

Box B: Interbank settlement in interlinking arrangements

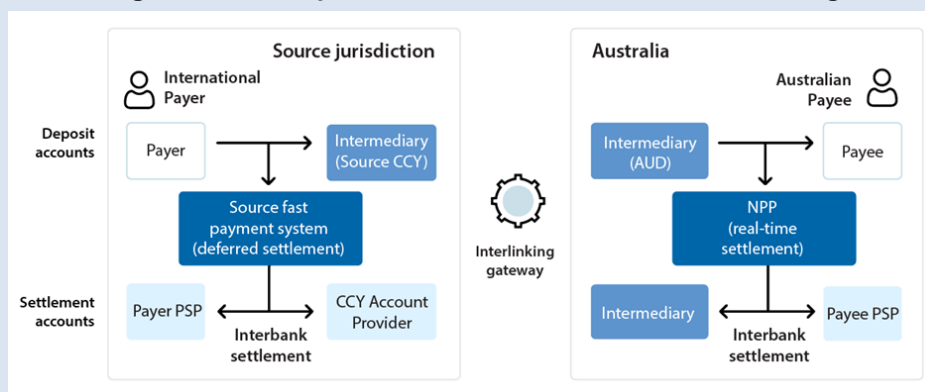
Fast payment systems are characterised by the near-real-time availability of final funds to the payee. However, the timing of interbank settlement between the payer PSP and payee PSP depends on whether a fast payment system uses a real-time or deferred settlement model (CPMI 2016b). Unlike a real-time model, deferred settlement generates credit exposures between PSPs until the funds settle across their accounts with the central bank. This exposure is typically mitigated with protections such as caps on net debit obligations, transaction value limits and pre-funding, which seek to reduce, and in some cases eliminate, risks to PSPs should a financial or operational problem occur with another PSP in the fast payment system.

As with domestic fast payments, settlement risk for an interlinked cross-border payment is managed according to the design of the fast payment system used for each leg of the payment. Interbank settlement risk, if any, continues to be borne by the PSPs that are the direct settlement participants in either fast payment system (those that hold a settlement account with the central bank). In a correspondent banking model, this PSP could be the correspondent bank providing a deposit account to a foreign PSP, or in interlinking, the correspondent bank providing a deposit account to an FX provider. Interlinking does not alter the risks associated with holding these commercial bank deposits.

The example below illustrates a cross-border payment sent from an international payer to a payee in Australia through interlinking between the source currency fast payment system with a deferred settlement model and Australia’s NPP, which is a real-time settlement model (Figure B1). In this example, neither the Payer PSP nor Payee PSP hold a foreign currency account in the other’s jurisdiction, so the payment requires an intermediary FX provider – an entity with access to both currencies. We assume this is an Australian PSP that is a direct participant in the NPP and holds a foreign currency account in the source jurisdiction (Intermediary). The Intermediary’s correspondent bank in the source jurisdiction is a direct participant in the source fast payment system (CCY Account Provider).

In the first leg of the payment, the Payer (via Payer PSP) sends the payment through the source fast payment system to the Intermediary’s source currency account. As with other fast payments, this is irrevocable, and the source currency funds are available immediately to the Intermediary. Interbank settlement between the Payer PSP and CCY Account Provider will occur separately, at a later time. The Intermediary bears no exposure if the Payer PSP fails to settle this obligation when due. The risks arising from delayed interbank settlement are borne by the CCY Account Provider and are managed in the same manner as other domestic fast payments in that fast payment system. The second leg of the payment in Australian dollars is sent from the Intermediary to the Payee through the NPP, with interbank settlement occurring in real-time.

Figure B1: Example of Interbank Settlement in Interlinking



Source: RBA.

Box C: Financial crime risks in interlinking arrangements

Financial crime is an issue that affects all payment systems, but is particularly prevalent in cross-border payment arrangements as funds that are moved across borders can be much more difficult to track and recover. There are also factors that may increase the risk of financial crime in fast payment systems relative to other payment systems, including their 24/7 real-time processing capability and payment finality (World Bank 2023).^a Managing financial crime and compliance risk in a cross-border interlinking arrangement is therefore a key consideration for participants, and is an area for clear interlinking scheme rules.

Fast payment systems and the jurisdictions they operate in are likely to differ in their approach to managing financial crime risks. For example, there may be gaps in jurisdictions' implementation or enforcement of Financial Action Task Force (FATF) Recommendations in their AML/CTF frameworks, and differences in sanctions screening requirements between jurisdictions. Fast payment systems may also differ in the maturity of their approach to combatting fraud and scams through prevention, detection and mitigation measures, as well as in their procedures around investigations, disputes and reversals. Working through the differences in domestic approaches and putting in place effective minimum requirements for interlinking payments will be crucial to effectively managing financial crime risk and building trust from PSPs and customers in an interlinking arrangement.

Liability for scams is another important consideration in an interlinking arrangement. For example, scheme rules would need to take into account the existence and extent of any liability of participants that facilitate payments to or from jurisdictions where reimbursement frameworks for scams are in place. On the other hand, a lack of consumer protection arrangements in other jurisdictions could present a higher risk to domestic participants and their customers. Strong scheme rules in this area could help to clearly define the liabilities of participants and provide processes for arbitration and remediation.

Other scheme rules to mitigate financial crime risk in an interlinking arrangement could include mandatory arrangements for monitoring and reporting on financial crime, and the sharing of financial crime related information across borders (subject to support from the relevant regulators). Rules might also allow service-level agreements on processing time to be relaxed in cases of suspected financial crime.

- (a) On the other hand, richer data capabilities and payment functionality (e.g. confirmation of payee) are factors that could lower financial crime risks relative to, for example, correspondent banking arrangements involving legacy account-to-account systems.

5.4 Oversight

Interlinking arrangements also require oversight by payments regulators within and across participating jurisdictions to ensure the safety and efficiency of the arrangement. The design of an interlinking arrangement will help determine the appropriate oversight model. Oversight could, however, be a consideration when designing an interlinking solution, particularly when it comes to decisions around governance arrangements. It may therefore be helpful to involve overseers during the design process to ensure that governance arrangements meet overseer expectations (CPMI 2023c).

The cross-jurisdictional nature of interlinking gives rise to specific considerations for oversight. To minimise change and complexity, a natural starting point is to consider the extent to which oversight of the interlinked service can be carried out using the existing oversight frameworks that apply to domestic fast payment systems. In this regard, a relevant question prior to establishing an interlinking arrangement is whether the domestic

oversight arrangements (if any) for fast payment systems are appropriate or need to be enhanced.²⁵ The aspects of an interlinking arrangement that come under the oversight of domestic regulators would depend on the nature and scope of existing oversight arrangements, the specific design of the interlinking solution, and whether there are gaps that need to be addressed.

Where the interlinking arrangement requires a dedicated oversight framework, it will be important to ensure that framework is well-coordinated with existing frameworks and proportional to the systemic relevance and risk profile of the interlinked system. The oversight framework for an interlinking arrangement should address differences between participating jurisdictions' oversight and regulatory regimes.²⁶ It may also need to address differences in domestic fast payment system rules; for example, around default, settlement finality, AML/CTF and fraud controls, and risk management practices. In both cases, a primary concern for regulators and participants in jurisdictions that are subject to more stringent requirements would be to avoid the transmission of risk from fast payment systems that operate under materially weaker requirements.

The establishment of an interlinking arrangement may also have implications for the domestic oversight of fast payment systems – for example, if it materially changes the volume or risk profile of payments processed through the system.

25 In Australia, the RBA is extending its oversight of systemically important systems to also include 'prominent payment systems' (such as the NPP) and has been consulting on the development of a risk-based framework.

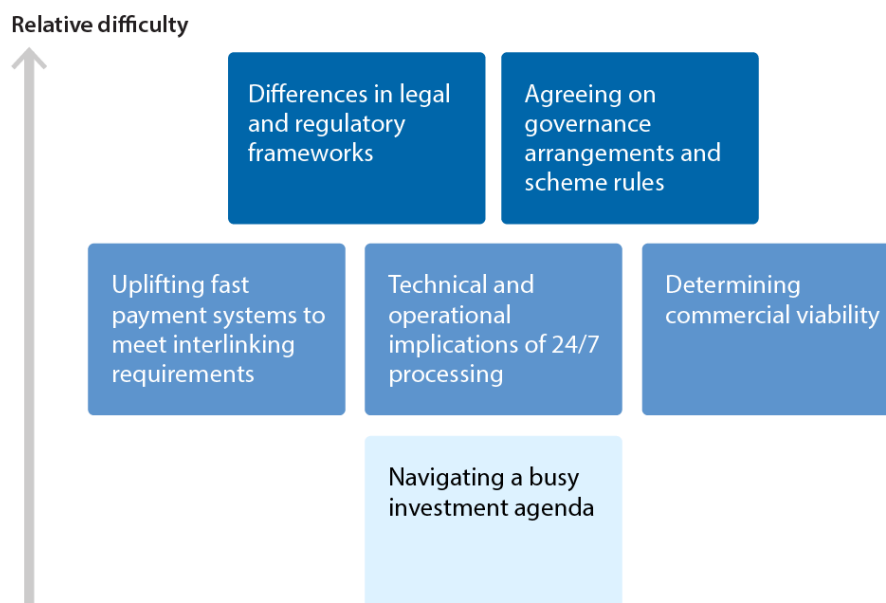
26 Differences could include whether jurisdictions have adopted the Principles for Financial Market Infrastructures (PFMI: CPMI-IOSCO 2012) as binding regulation and whether they consider non-systemically important payment systems to be subject to a subset of the PFMI (or to no oversight at all).

6 Challenges to Establishing Interlinking Arrangements

This section discusses some key challenges to establishing an effective interlinking arrangement (Figure 11), including implementing the design features discussed in Section 5. Overcoming these challenges for a specific interlinking arrangement will affect the time and costs involved in setting up a linkage.

Figure 11: Key Challenges to Establishing an Interlinking Arrangement

Relative difficulty based on the views of study group participants



Source: RBA.

6.1 Dealing with differing legal and regulatory frameworks

Dealing with differing national legal and regulatory frameworks is considered a primary challenge in establishing an effective interlinking arrangement (Figure 11). Fast payment systems and their participants are subject to various legal and regulatory frameworks that are relevant to cross-border payments. These frameworks often evolve independently across jurisdictions, and in some cases reflect considerations that extend beyond payments, such as citizens' privacy.²⁷ Even where international regulatory standards exist (such as the FATF Recommendations for AML/CTF), local implementation may differ. Understanding and addressing these differences may be necessary to manage legal risk in an interlinking arrangement. It may also be essential to realising certain benefits of interlinking (such as increased STP).

²⁷ For a stocktake of existing national and regional data frameworks that apply to cross-border payments, see FSB (2023c).

Some key differences in legal and regulatory frameworks that may need to be reconciled include:

- **Data privacy frameworks.** Legal frameworks related to the flow or use of data across borders are fragmented globally. Some jurisdictions apply specific restrictions, such as requiring certain data to be processed or stored in-country (data localisation). Frictions from differing data privacy frameworks could inhibit the adoption of value-added services in an interlinking arrangement that would otherwise support STP, increase certainty for end users and/or reduce payments fraud. These include the pre-validation of beneficiary account information or a confirmation of payee service to verify that funds are being sent to the intended recipient. Alias addresses such as phone numbers or email addresses may be considered personal information for data privacy purposes, which would affect how this information could be used or stored in an interlinking arrangement.

It is likely to be significantly easier for participants in an interlinking arrangement to comply with the data privacy requirements of their own jurisdiction where other jurisdictions take a similar approach. Initiatives to promote greater consistency between national data privacy frameworks could assist in this regard.²⁸

- **AML/CTF rules.** Participants need to meet their own jurisdiction's AML/CTF rules. However, gaps in jurisdictions' implementation or enforcement of FATF Recommendations in their AML/CTF frameworks could be a concern for domestic participants when considering which corridors to include in an interlinking arrangement, given the potential for increased financial crime and compliance risk associated with the near real-time processing of payments. In Australia, an interlinking service would require its own money laundering and terrorism financing risk assessment before it is offered to customers for a particular corridor.
- **Sanctions rules.** Differences between jurisdictions in sanctions laws, screening requirements, and the persons and entities subject to sanctions, may also need to be managed. These differences exist today, but would need to be considered in a real-time context and in relation to the location of any centralised hub. However, interlinking arrangements may also provide an opportunity to reduce frictions associated with jurisdictions' differing sanctions screening requirements, as discussed in Section 5.2.3.
- **Consumer protection requirements.** Certain aspects of consumer protection might need to be reconciled for the purpose of establishing interlinking scheme rules, such as those related to product disclosure, complaints handling or liability for fraud and scams.
- **Supervisory oversight arrangements.** Payment system operators and participants in different countries may be subject to significantly different levels of supervisory oversight, as noted in Section 5.4. Given the real-time nature of fast payment systems, specific risk-based access requirements or rules might be needed to address possible differences in supervisory oversight and risk profiles between jurisdictions, particularly in relation to operational risk (including business continuity, cyber risk and payments security) and market conduct.

Some degree of coordination between authorities in the jurisdictions involved may be required to fully address legal and/or regulatory differences.²⁹ Innovative technical solutions may also help to bridge differences in

28 For example, Australia has joined the Global Cross-Border Privacy Rules (CBPR) Forum; other members include Canada, Japan, Singapore and the United States: see <<https://www.globalcbpr.org/>>.

29 To this end, building blocks 4, 5 and 6 of the 2020 G20 roadmap aim to address challenges in cross-border payments related to differing supervisory arrangements, inconsistent implementation of global AML/CTF standards and fragmentation of data frameworks.

jurisdiction-level regulatory measures in the future. For example, the BIS Innovation Hub's Project Mandala aims to develop a technical protocol that will automate policy and regulatory compliance requirements for cross-border payments (RBA 2023a). These may include measures related to AML/CTF, sanctions and capital controls. Automating these requirements could ease the regulatory compliance burden for PSPs and enable more efficient cross-border transfers, whether through an interlinking solution or other cross-border payments arrangements. The RBA is participating in Project Mandala, along with other central bank partners.

6.2 Agreeing on governance arrangements and scheme rules

Agreeing on governance arrangements and developing a scheme rulebook is a prerequisite to establishing an interlinking arrangement and was identified as another top challenge. The process would require coordination, consensus building and agreements across a range of parties involved in fast payment ecosystems in multiple jurisdictions, to set the overall objectives for the linkage and agree on a range of commercial, legal, regulatory and operational matters (see Section 5.3). Reaching agreement could be particularly challenging if there are material differences between parties in relation to payments policy objectives, risk tolerances, capabilities and resources. More effort will likely be needed to secure agreement where the arrangement involves a large or geographically diverse group of countries.

Interlinking arrangements to date have generally involved both public and private sector stakeholders. Public sector support or involvement can be pivotal to establishing more complex multilateral linkages, particularly in the early stages of development, to help coordinate parties, address legal and regulatory barriers and, in some cases, contribute initial funding and/or infrastructure. Public sector objectives for interlinking vary, but may include supporting the G20 roadmap targets for enhancing cross-border payments and promoting regional integration and/or financial inclusion (such as by providing more cost-effective remittances for end users). However, interlinking arrangements will ultimately need to be commercially viable and attract private sector participants if they are to succeed and achieve scale. How to balance public and private sector objectives in an interlinking arrangement, at the outset and during expansion, is a key question that will take time to work through as part of establishing governance arrangements, and in developing core policies and an interlinking scheme rulebook.

6.3 Uplifting fast payment systems to meet interlinking requirements

While national fast payment systems have typically been introduced for similar purposes, their design and implementation can vary widely. Conforming to the rules of an interlinking arrangement, including meeting minimum requirements, could be challenging for some fast payment system operators and PSPs. Some may face barriers to interlinking until they can upgrade their infrastructure or uplift their risk management capabilities. In certain areas, such as message formats, the interlinking platform could provide common capabilities to bridge the gap, although this would involve its own trade-offs (see Section 5.2.5).

Identifying where differing technical and business set-ups pose the greatest challenges to interoperability is a crucial step in interlinking. For existing interlinking arrangements, clear and transparent interlinking requirements will be essential for prospective participants to understand the amount of uplift required.

Where a local fast payment system falls short of the minimum requirements of an interlinking arrangement, this will influence the time and costs needed for them to interlink. For example, two areas that may require significant uplift in domestic fast payment systems to meet (likely) interlinking requirements include:

- **Message formats.** Around 70 per cent of fast payment systems use ISO 20022, but implementations vary widely (FSB 2023a). For some systems, such as Australia’s NPP which operates on the 2014 version of ISO 20022, a version upgrade may be necessary. For fast payment systems that do not currently use ISO 20022, adopting this messaging standard would be a major project (see also Section 5.1.1).
- **Reachability.** Having been introduced in recent years, many fast payment systems have not yet reached full coverage across customer accounts and some PSPs may not be connected at all. Limited reach could make sending funds to a country more difficult compared with the correspondent banking network. Where fast payment systems do not have near-universal coverage, a pre-validation service to check that the beneficiary PSP and account is reachable would be particularly important.

6.4 Determining commercial viability

Individual fast payment systems and their participants will need to dedicate time to working through a range of commercial considerations before deciding whether to establish (or join) an interlinking arrangement. For first movers, this will need to happen before the arrangement can be established. Assessing the business case for interlinking will depend heavily on the design and scope of the arrangement. Nevertheless, some general points that participants will need to consider include:

- **Revenues.** The value proposition for PSPs will partly depend on whether the interlinking arrangement would help them to grow their overall cross-border payments volumes and revenues over time. An arrangement that aims to expand to more corridors and use cases may be more likely to generate additional revenues, which could then be used to fund innovations and value-added services within the arrangement that further attract end users.
- **Costs.** PSPs will also need to determine how participating in an interlinking arrangement will impact their costs for facilitating cross-border payments in the short- and long-term. As discussed in Section 3.2, there are factors which could increase, as well as decrease, ongoing costs for PSPs. Determining the overall cost impact would require an assessment of the costs involved in participating in a specific interlinking arrangement, including its pricing model for participants, as well as the impact on PSPs’ existing cross-border payment rails given that an interlinking arrangement is unlikely to cover all use cases.
- **Initial funding.** The initial funding required to set up an interlinking arrangement could be significant, particularly for a multilateral solution that includes many common functionalities. However, a more comprehensive solution could be more cost-effective for PSPs in the long term and/or help to generate greater revenues. To encourage participation in the early stages when payment volumes are low, the central bank or relevant authority may consider whether there is a public policy case for providing some form of support for the arrangement, for example, by providing central infrastructure.

6.5 Adjusting to 24/7 cross-border payments processing

PSPs that participate in 24/7 fast payment systems have expanded their technical and operational capabilities to support 24/7 domestic payments, but further development would likely be required to extend these capabilities to cross-border payments. For example, technical changes to back-office systems may be needed,

and the resourcing for after-hours operations may also be affected.³⁰ For PSPs that use or plan to use OLO arrangements, the changes required to support this will likely address some gaps and could provide useful experience in understanding what further developments may be required to extend this to an interlinking arrangement. Some operational costs, such as those related to payments investigations, could be mitigated through the design of the interlinking arrangement, such as strict STP requirements.

Meeting demands for after-hours liquidity to settle 24/7 cross-border payments could add further challenges for market participants, particularly over weekends when unexpected shortfalls cannot be funded from currency markets or domestic money markets. For example, in Australia, this may require reconsideration of the minimum central bank reserves that direct participants are required to hold for funding after-hours AUD settlements arising from the fast payment system.³¹

6.6 Navigating a busy investment agenda

The payments investment agenda in Australia is currently very busy, including the delivery of new capabilities that are mandatory.³² Fast payment system participants in some other jurisdictions may be in a similar position, given the rapid pace of transformation in domestic payment systems at present. Once the decision to pursue an interlinking arrangement has been taken, participants will need to find the time and resources to invest in delivering an interlinking solution. This could present challenges, although these are perhaps not as substantial as the others discussed here. In fact, some of the projects on the investment agenda in Australia and overseas would help to facilitate, or are prerequisites for, interlinking in the future – for instance, upgrading ISO 20022 message versions or adopting the CPMI's harmonised ISO 20022 requirements for cross-border payments.

30 For further discussion of the operational and technical considerations associated with extending operating hours, see CPMI (2023d).

31 For further detail on RBA liquidity facilities, see RBA (2023c).

32 Major projects underway or scheduled in Australia include rolling out new payments services and technologies for the NPP, completing the HVCS ISO 20022 migration, upgrading the NPP to the latest ISO 20022 version, implementing the CPMI's harmonised ISO 20022 requirements for cross-border payments, and planning for the transition away from the Bulk Electronic Clearing System (BECS).

7 Conclusion

This report – prepared by the RBA based on a study undertaken with Australian industry participants – explored a range of issues involved with linking national fast payment systems.

The report identified potential benefits from interlinking fast payment systems, most notably that it could significantly increase the speed and coordination of cross-border payments for end users and PSPs. It considered how an interlinking arrangement could be effectively designed, finding that several payment capabilities and scheme rules would be crucial to achieving interoperability and managing risk. The report also discussed challenges associated with establishing an interlinking arrangement. Among these were the need to deal with differing legal and regulatory requirements across jurisdictions – such as in relation to financial crime and data privacy – and the need to reach agreement on governance arrangements and scheme rules.

Looking ahead, the RBA and industry participants involved in this study intend to build on the analysis presented in this report through further engagement with international stakeholders, including in relation to the development of multilateral interlinking arrangements, and by undertaking further analysis with subject matter experts on key aspects of interlinking. This work will help inform future discussions in Australia about the potential for the NPP to be linked to other fast payment systems.

The RBA also intends to coordinate some broader complementary work this year to monitor Australia’s progress in addressing shortcomings in existing cross-border payments arrangements and improving outcomes for end users. This work could be an input into any future decisions around interlinking the NPP.

Participation in the Interlinking Study

Organisations represented in the interlinking study

Reserve Bank of Australia (Chair)

Australian Payments Plus

ANZ

Australian Payments Network (AusPayNet)

Commonwealth Bank of Australia

HSBC

National Australia Bank

Swift

Westpac

Wise

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Glossary

List of abbreviations

AML/CTF	anti-money laundering and counter-terrorism financing	HVCS	High Value Clearing System
API	application programming interface	NPP	New Payments Platform
ASEAN	The Association of Southeast Asian Nations	NPP IPS	NPP International Payments Service
ASEAN-5	Indonesia, Malaysia, the Philippines, Singapore, and Thailand	NPPA	NPP Australia
BIS	Bank for International Settlements	OLO	one-leg out
CPMI	Committee on Payments and Market Infrastructures	PFMI	Principles for Financial Market Infrastructures
DNS	deferred net settlement	PSP	payment service provider
EMDE	emerging market and developing economy	RITS	Reserve Bank Information and Transfer System
FATF	Financial Action Task Force	RTGS	real-time gross settlement
FMI	financial market infrastructure	STP	straight-through processing
FSB	Financial Stability Board	UPI	Unified Payments Interface
FX	foreign exchange		
G20	Group of 20 forum for international economic coordination		

Definitions

Bank	In Australia, an authorised deposit-taking institution.
Clearing	The process of transmitting, reconciling and in some cases confirming payment instructions prior to settlement; it may include netting of instructions and the calculation of final positions for settlement.
Remittances	Relatively low-value person-to-person (P2P) payments, typically sent to emerging market and developing economies (EMDEs) from family members or friends working overseas.
Payment corridor	A set of payment flows between one country and another.
Payment service provider	An entity that provides payment services, including remittances. Includes banks and other deposit-taking institutions, as well as specialised entities such as money transfer operators and e-money issuers.

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