



➤ PAYMENT SYSTEM INTEROPERABILITY AND OVERSIGHT: THE INTERNATIONAL DIMENSION

ITU-T FOCUS GROUP ON DIGITAL FINANCIAL SERVICES



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**Payment System Interoperability and Oversight:
The International Dimension**

Focus Group Technical Report

ITU-T

FOREWORD

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Payment System Interoperability and Oversight: The International Dimension

About this Report

The author of this Technical Report is Biagio Bossone, International Financial Consultant. Contributions were received from the members of the FG DFS Interoperability Working Group. The Technical Report was reviewed by the ITU Focus Group Digital Financial Services (FG DFS). Thomas Lammer provided the overall guidance for this project.

If you would like to provide any additional information, please contact Vijay Mauree at tsbfgdfs@itu.int

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Executive Summary

Much as it is critical for the development and diffusion of modern (digital) retail payment services across all service users in a domestic economy, payment system interoperability is also essential in today's globalizing world economy to enable the smooth and safe flow of cross-border transactions across users from different countries. This report approaches the issue of interoperability of payment systems and central bank oversight of payment systems from an international perspective. This report is a companion to the "Payment System Oversight and Interoperability" report by the ITU Focus Group Digital Financial Services – Interoperability Working Group (WG).

Today the interlinking of national Payment System Infrastructures (PSIs) and their interoperability represent important prerequisites for economic and financial development and constitute sources of potentially significant risks. Therefore, they require public authorities in the relevant jurisdictions to mutually cooperate in order to make them happen and to adopt suitable oversight provisions in order to render them sustainable. The purpose of this report is to discuss payment system interoperability and oversight policy in the context of international economic and financial integration.

Although international and national interoperability feature similar types of risk, the former raises specific challenges. Such challenges bear implications for central bank oversight policy. These challenges essentially stem from the scaling up to the cross-border level of the risks that are usually associated with national interoperability and from the international harmonization and standardization which national PSIs need to be subject to if they are to be part of an international interoperability agreement. While the principles elaborated in the companion report remain valid in the context of international interoperability, the challenges raised by the cross-border dimension of interoperability point to the need for adapting the scope of oversight of the linked or shared PSIs.

This report considers the implications of PSI interlinking and international interoperability for central bank oversight policy, and elaborates on a set of principles that complement those developed in the companion report. The principles cover some critical institutional aspects which underpin the establishment of international interoperability agreements, as well as the planning and implementation stages of the agreements, and their sustainability. National public authorities and private sector stakeholders should consider adopting these principles when establishing international interoperability agreements.

This report is not intended to be a regulatory document. The principles should be understood as providing methodological guidelines to public authorities and private sector stakeholders involved in establishing international interoperability agreements. This report's main aim is to provide policy advice, recommendations and indications to country authorities, PSI operators and administrators, and service providers.

Purpose of this Report

1 This is a companion report to the “Payment System Oversight and Interoperability” report by the DFS Focus Group – Interoperability WG. The report examines the issue of interoperability of payment systems and central bank oversight of payment systems from an international perspective.¹ As much as it is critical for the development and diffusion of modern (digital) retail payment services across all service users in a domestic economy, payment system interoperability is essential in today’s globalizing world economy to enable the smooth and safe flow of cross-border transactions across users from different countries.

2 The cross-border integration of trade and financial markets has accelerated with the successive waves of trade and financial liberalization, which have taken place worldwide since the mid-to-late 1980s. The international linking of critical market infrastructures for payments, securities, and lately, derivatives, have widened and deepened as national economies across the world have experienced increasing cross-border trade and financial flows. Many international interlinking initiatives, especially at the regional level, have progressed through the collaborative efforts of the financial industry and the public sector.

3 Today, the interlinking of national PSIs and their interoperability represent important requisites for economic and financial development and constitute sources of potentially significant risks.² They require public authorities in the relevant jurisdictions to mutually cooperate to make them happen and to adopt suitable oversight provisions in order to render them sustainable. The purpose of this report is to discuss payment system interoperability and oversight policy in the context of international economic and financial integration. This is in line with the objective of ultimately enabling payment service users worldwide to make/receive electronic payment transactions to/from any other users located elsewhere, in a convenient, affordable, fast, seamless, and secure way, possibly using a single transaction account.³ This report is not intended to be a regulatory document, and its main aim is to provide policy advice, recommendations, and indications to country authorities, payment system operators, and Payment Service Providers (PSPs).

4 The report is structured as follows: Section II discusses the factors that typically lead to public or private sector decisions in order to link PSIs internationally. It analyzes stylized

1. As in the companion report, the term “interoperability” is generally understood here as the property of products or systems which work with other products or systems without friction. When referred to retail payment systems, interoperability enables users to make digital payment transactions with any other user in a convenient, affordable, fast, seamless, and secure way, possibly via a single transaction account (see below). Interoperable payment systems allow two or more proprietary platforms to interact seamlessly, enabling the exchange of payment transactions between and among payment service providers and, consequently, users.

2. The term payment system infrastructure (PSI) is used here to generally refer to a payment system or any of its components (e.g., a platform, structure, or module) which combine with others to allow the system to perform its function of transferring funds between or among participants.

3. A transaction account is defined as an account (including an e-money account) held with a bank or other authorized and/or regulated PSP, which can be used to make and receive payments and to store value. All deposit accounts held with banks and other authorized deposit-taking financial institutions, referred to as “deposit transaction accounts”, which can be used for making and receiving payments qualify as transaction accounts. Prepaid instruments based on e-money, referred to as “e-money accounts”, can be offered by banks and other authorized deposit-taking financial institutions, as well as by non-deposit-taking PSPs such as mobile network operators (See the “Payment aspects of financial inclusion”, report by the Committee on Payments and Market Infrastructures and the World Bank Group, April 2016.) The desirability of a single account is based on two considerations: First, while interoperability can be achieved even among payment service users who do not possess accounts with banks or other PSPs, this type of interoperability would not be as financially inclusive as one among payment service users who all hold accounts. The difference is between interoperability built around “off-network” transactions (for example, as in the case of an individual sending money from her mobile account to another individual who doesn’t have an account) and “cross-network” transactions: the former requires recipients to cash out the payments received, whereas the latter makes it possible for recipients to store received funds, send them on or use them to make payments. The second reason in favor of achieving interoperability via a single transaction account is that this would allow every individual payment service user to make and receive payments from all other payment service users in the economy through only one entry point to the financial system, with maximum efficiency and user convenience.

modalities to achieve international PSI interlinking and describes major real-world examples of linked PSIs. Section III focuses on PSI interlinking and interoperability, illustrating the various types of solutions adopted to achieve interoperability at the national and international (regional and global) level, and points to the challenges and risks associated with international payment system interoperability. Finally, Section IV considers the implications of international interoperability for central bank oversight policy of payment systems, and elaborates on a set of oversight principles aimed to ensure the establishment of safe and efficient international interoperability agreements.

International Interlinking of Payment System Infrastructures⁴

⁴ This section draws on the World Bank's "Guidelines for the Successful Regional Integration of Financial Infrastructures", January 2014.

A. Drivers of international payment system infrastructures (PSIs) interlinking

5 Several factors may prompt the international interlinking of PSIs. In most cases, linking national PSIs to achieve international interoperability of certain payment services comes from a country's decisions to exploit the benefits of international economic and financial integration (i.e., greater international trade and investment activities, attraction of foreign investment capital, risk diversification, and deepening and broadening domestic financial and capital markets), since integration requires economic units to have convenient access to cross-border payment service facilities. A powerful driver to regional PSI interlinking is constituted by the political agreements among countries in a region on a broad, long-term economic and financial development cooperative program. Usually, in this case, the efforts to link payment system (as well as other financial market) infrastructures are supported actively by a core group of countries in organized regional development policy and planning forums.⁵ In some cases, interlinking may result from decisions by national financial authorities to address the demand from market participants (and/or their customers, including asset managers, other securities servicers, and other types of businesses) for cross-border access to international markets at lower end-to-end transaction costs.⁶

6 Market incentives can also be effective drivers of international PSI interlinking. Expanding operations across borders may strongly incentivize private-owned payment systems to extend and improve existing access channels and means by using or sharing international platforms that allow for greater speed of service or lower costs and risks. Such “supply-side-led” initiatives are most likely based on competitive, commercial, operational, risk management, and legal considerations. Another driver of international PSI interlinking is the growth-orientation of existing financial market infrastructures and their imperative to expand into new market areas within or across regions.

B. Modalities of international PSI interlinking

Interlinking solutions

7 International PSI interlinking can take different forms and feature various levels of depth and sophistication. Interlinking solutions range from simple agreements among national payment systems aimed to facilitate direct or indirect cross-participation of the participants in each of the systems, to full harmonization of operating systems and integration of technical platforms into a common infrastructure for the execution of cross-border transactions. In simple interlinking agreements, the relevant systems usually sign contracts that allow the participants of each national system to participate directly or indirectly in the other national systems.⁷ The alternative – which may take the form of a regional or global payment system with a common (unified) scheme and operating infrastructure – represents the deepest form of interlinking possible and amounts to full-fledged payment system integration.

⁵ The integration projects of the Association of Southeast Asian Nations (ASEAN), Central America and the Dominican Republic, the European Union (EU), and the Southern African Development Community (SADC), among others, are prime examples of this driver. These projects are discussed in further detail below.

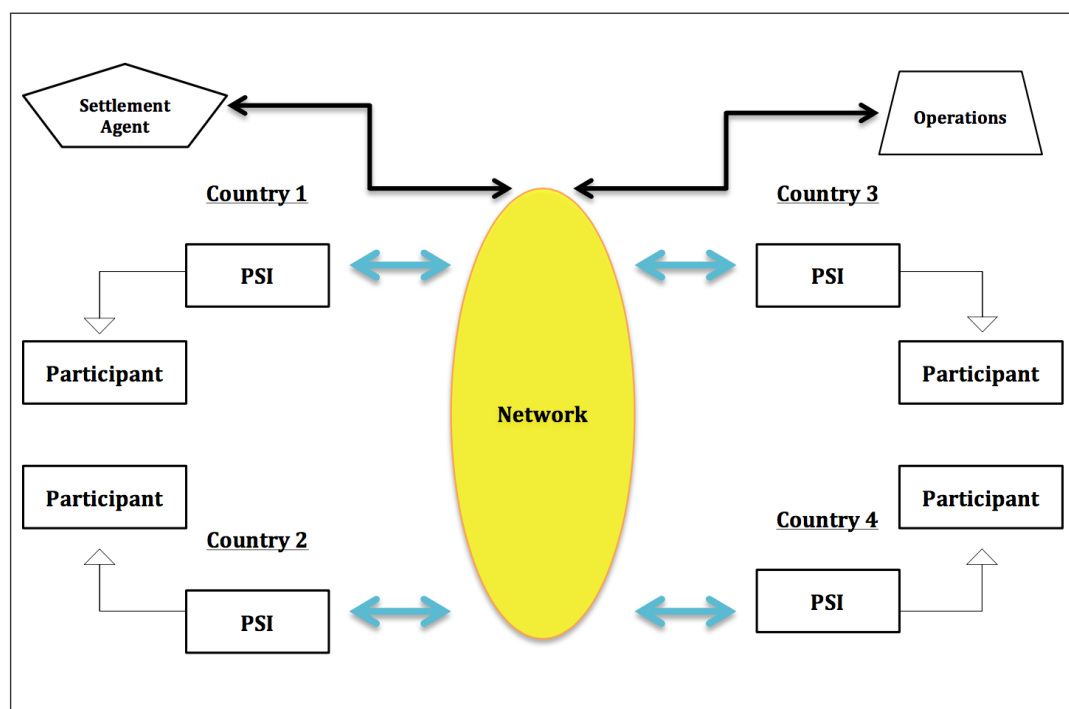
⁶ Transaction cost reduction is associated with the cost reductions related to straight-through processing of cross-border transactions, clearing, and settlement achievable through harmonization and standardization of regional payment systems, and to scale economies from commonly shared schemes and systems. Regional payment system integration may deliver liquidity-cost savings. These are greater where there is a single regional currency used to settle all domestic and cross-border regional payments, since the markets for the regional currency and assets denominated in it are potentially broader and deeper, making the settlement asset more available at a lower transaction cost than otherwise. Where there is no single regional currency, liquidity-cost savings depends on the use of a settlement currency that is highly available throughout the region and has relatively deep and active markets accessible to the regional financial institutions participating in the regional settlement network.

⁷ Indirect participation occurs either through the system to which the participant belongs or through an intermediary.

Technical modalities of international PSI interlinking

8 Cross-border transactions can be made possible by establishing bilateral links between national PSIs.⁸ Perhaps the simplest form of PSI interlinking is achieved when two central banks agree on a scheme to support or facilitate cross-border transactions. This likely requires linking the large-value transfer systems of the countries involved by developing technical interfaces between them. Some other solutions are possible which link national payment systems through central bank bilateral accounts, whereby participating central banks hold settlement accounts either with one another or with a common commercial bank.

Figure 1. Decentralized payments system



9 More advanced solutions for PSI interlinking are characterized by the adoption of a unified scheme and a common technical-operational facility to process the transactions defined under the scheme. The common (regional or global) technical-operational facility follows one of two basic architectures: the decentralized model, or the single or fully centralized model. Arrangements adopting a decentralized model for regional, cross-regional and/or global payments link existing national settlement systems (Figure 1). These normally feature different degrees of sophistication and complexity. Most decentralized regional payment systems are designed in a “hub-spoke” structure, in which there is a central administrative and technical-operational facility referred to as the “hub entity”, which links the participating systems.⁹ The interlinking mechanism is usually a standardized messaging and connectivity technology, which links account management

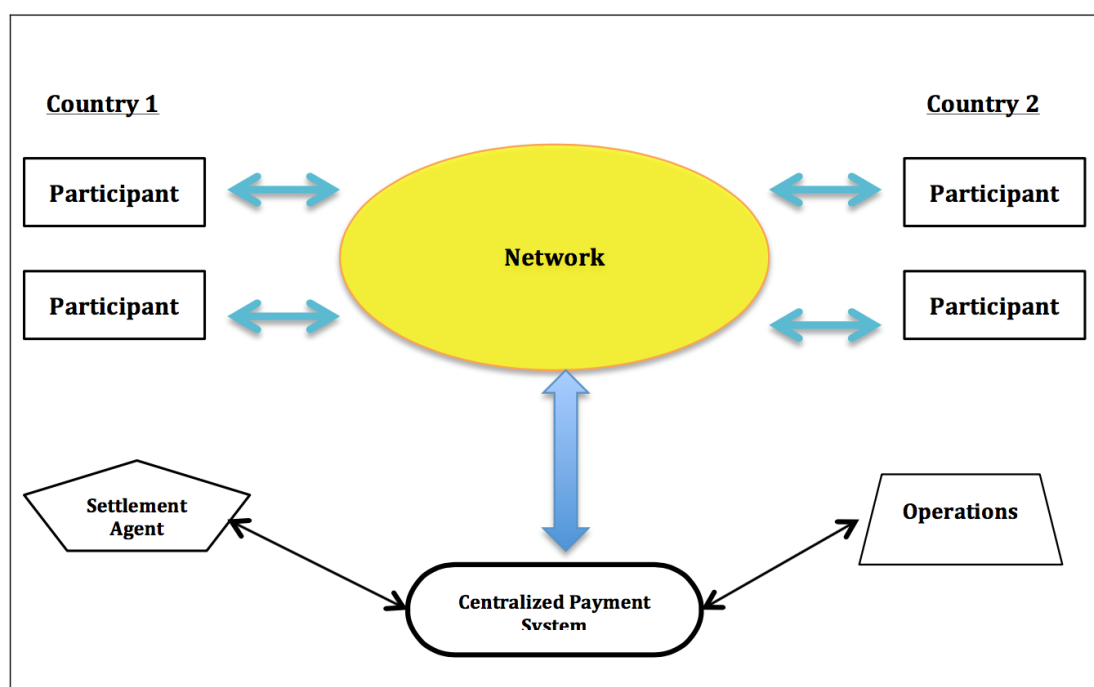
⁸ A link is a set of contractual and operational arrangements between two or more payment system infrastructures, which connects them directly or through an intermediary. While technical interfaces generally are developed to allow some degree of automation to support certain information and data exchanges, links generally also require some degree of harmonization of operating rules and other scheme features as a pre-requisite. More elaborate and sophisticated links allow for partial or even full interoperability and straight-through-processing at a transactional level of the underlying technical operating platforms. On links, see also Box 3.

⁹ The operator or “hub entity” can be one of the participating payment system infrastructures, an entity that is independent of the infrastructures linked through, or an operating unit of a participating infrastructure.

and the various national operating systems together, while participants access the hub entity through the national settlement infrastructure of their jurisdiction.¹⁰

10 In the centralized platform model, the national payment system infrastructures are replaced by a single international system (Figure 2). In this case, it is more appropriate to talk about international payment system *integration*. Participants access the system directly through the relevant telecommunications network or indirectly through any direct participant in the system. Centralized platforms are mostly identified with international integration projects, most notably regional, which have evolved into monetary unions with the use of a regional currency. They minimize or even eliminate the distinction between cross-border and domestic payments, and allow for processing both types of transactions in the same system seamlessly.

Figure 2. Centralized payments system



C. Examples of international PSI interlinking

11 Various examples illustrate the different technical modalities of interlinking discussed above. One example of bilateral links between national payment systems is the linking of the Hong Kong Monetary Authority's U.S. dollar real-time gross settlement (RTGS) system with the RTGS systems of other central banks in the region, specifically Bank Negara Malaysia's RENTAS and Bank Indonesia's BI-RTGS. These systems operate on a common operating platform. Their links, which are independent from each other, allow payment-versus-payment settlement between the national currencies of those countries and the U.S. dollar. Other illustrative examples are the East African Payments System (EAPS), which shows the case of national payment systems linked through the holding of bilateral accounts among central banks, and the Sistema de Pagos en Moneda Local involving the national RTGS systems of Argentina and Brazil, which is an example of the national payment systems linked through their respective central banks which hold settlement

¹⁰ Messaging formats between participating members and their national payment system are often standardized with those required for cross-border messaging, or are readily translatable through mapping interfaces to allow straight-through message processing between connected systems.

accounts with a common commercial bank. Currently, two SML systems are operational: one linking the RTGS systems of Argentina and Brazil, and other linking the RTGS systems of Brazil and Uruguay.

12 Other cases exemplify the decentralized and centralized models of international payment system integration. Schemes with a decentralized settlement system involving multiple parties have been developed in regions where there is a regional currency, as well as for settling cross-border payments denominated in a single foreign currency. The most well-known example of a unified scheme with a decentralized settlement system for a regional currency was the original TARGET in Europe, which linked the Euro RTGS systems of EU national central banks. Another example is the Sistema de Interconexión de Pagos in Central America and the Dominican Republic, which uses a decentralized architecture for settling cross-border payments in U.S. dollars.¹¹ With regard to the centralized model of PSI interlinking (or integration), relevant examples are TARGET2 and EURO1 supporting euro denominated payments in the European Union,¹² the STAR-UEMOA for the West African CFA Franc throughout the West African Economic and Monetary Union, and the RTGS system of the Eastern Caribbean Central Bank (ECCB) for the EC dollar in the Eastern Caribbean Currency Union. Over the past decade, centralized payment system infrastructures have also been developed regionally, where no regional currency existed, to facilitate settlement of domestic, regional, and cross-regional payments in more than one settlement currency (e.g., RAPID in the United Arab Emirates, and CHATS in Hong Kong). Finally, an example of a unified global system for settlements denominated in multiple currencies is CLS Bank International, which links the national RTGS systems of the participating jurisdictions/currencies, with a strong reliance on the legal agreement of the rulebook and the technical standards.¹³

13 The Southern African Development Community (SADC) regional payment integration project in the Southern African region captures aspects of a centralized model. The project develops on the International Payments Framework (IPF) concept to construct a regional payment infrastructure composed of a regional automated clearing house (ACH) and settlement system.¹⁴ The current architecture consists of the SADC Integrated Regional Electronic Settlement System (SIRESS), an electronic central system that facilitates cross border trade in the SADC region. SIRESS, and excludes domestic inter-bank payments and settlements. It allows participating banks to settle regional transactions denominated in South African Rand (ZAR) within SADC countries, on an RTGS basis. The system is operated by the South African Reserve Bank (SARB) on behalf of the SADC Committee of Central Bank Governors, with SARB also acting as the ZAR settlement bank. It is a safe and efficient payment/settlement system which reduces the cost to banks since there is no correspondent bank (intermediary) involved.¹⁵ The project should eventually evolve into a single regional payment settlement infrastructure, in tandem with the planned monetary union.

11 Where there is no single regional currency, regional settlement schemes involve either a currency index composed of a (weighted) basket of local currencies, a global reserve currency such as the U.S. dollar, or the euro as a reference currency, for exchange conversion to and from local currencies on each side of the cross-border payments. In some schemes, the global reserve currency, or a dominant regional currency, is used as the settlement currency.

12 TARGET2, which was launched by the Eurosystem in 2008 and replaced TARGET, is a centralized platform that settles payments directly between participants – rather than through the infrastructure of the national central banks.

13 The CLS solution has been introduced to reduce principal risk in foreign exchange settlements. CLS, in fact, virtually eliminates principal risk by settling all payments on a payment-versus-payment basis.

14 The IPF was established in 2009, and is developed and managed by an association of banks and clearing systems from Europe, Africa, North America, and central and South America. Although less ambitious and prescriptive than the SEPA Framework for clearing and settlement (see in the text below), it provides a framework for cross-border clearing and settlement for multiple and single regional currency payments. Like the SEPA framework, the IPF is designed around accepted international operating and technical standards to permit efficient and secure regional and cross-regional interoperability among participating clearing infrastructures.

15 As of June 2015, six central bank and sixty-five commercial bank participants from nine SADC Member States (Lesotho, Namibia, Malawi, Mauritius, South Africa, Swaziland, Tanzania, Zimbabwe, and Zambia) participate in the SIRESS platform.

14 The prototypical regional systems for retail payments were multilateral arrangements governed by service agreements and operational protocols of limited standardization between participating banks in different countries. For example, TIPANET, which was designed as a cross-border retail payment service for credit transfers between cooperative banks in Europe and Canada, provided participating members with somewhat lower cost and faster payment delivery than the usual correspondent banking arrangements of that time.¹⁶ The widespread growth of credit and debit card payment schemes since the late 1980s provided a second wave of regional and cross-regional PSI linkages and integration.

15 Some regional cross-border arrangements have developed across direct (horizontal) linkages between national schemes. This is the case of the arrangement linking the Interac debit card system in Canada, the NYCE Payments Network and PULSE systems in the United States, and Union Pay in China for access by the schemes' cardholders to the cross-border debit and ATM networks. Global card payment schemes such as VISA and MasterCard provide cross-border interoperability in transaction systems for credit and debit payments and ATM cash withdrawals for cardholders and (vertical) integration of these systems with proprietary clearing and settlement systems. As global card payment schemes, they deal with domestic, regional, and cross-regional payments.¹⁷

16 Regional and cross-regional interlinking of national and funds transfer systems in general is a fairly recent development. Some, such as EBA Clearings' STEP2 in Europe and SICA-UMEOA in the West African Monetary and Economic Union, are single regional schemes and systems for both domestic and cross-border payments among member countries using the euro and the CFA franc, respectively. Others are generally constructed through (horizontal) bilateral linkages between national ACHs. These linkages allow the ACH members in one country to transmit customer payments, typically via credit transfers, to end-receivers holding accounts with ACH members in other countries. The network architecture for regionally or cross-regionally linked payment clearing infrastructure and for single regional ACHs can be either a hub-spoke arrangement with a central hub connection, a centralized network structure, or a distributed bilateral network structure, which contemplates the operation of large providers of payment clearing and processing services (Box 1). Another example, in Europe, is the Single Euro Payments Area (SEPA) scheme compliant clearing and settlement mechanisms (CSMs). Services offered by competing CSMs, based on the SEPA payment schemes, are governed by market forces and are outside the remit of the European Payments Council (EPC). The EU regulation provides that, within the EU, a PSP reachable for a national euro credit transfer or direct debit shall be reachable for euro credit transfers or direct debits initiated through a PSP located in any member state. Any PSP participating in any of the EPC SEPA Schemes (SEPA Credit Transfer, SEPA Direct Debit), under the relevant scheme adherence agreement with the EPC and the relevant EPC SEPA Scheme Rulebook, is permanently obligated to comply with reachability from its readiness date. Each PSP needs to determine how to achieve full reachability for the EPC SEPA Scheme(s) it has adhered to. There are several ways for PSPs to send and receive euro payment transactions to and from other

¹⁶ TIPANET was organized twenty years ago before the emergence of global banks that operate in multiple national payment infrastructures and focus on correspondent banking services as a core business line.

¹⁷ Notable features among these global schemes are: the interoperability between schemes at point-of-sale devices, at least in some countries and regions; the integration between transaction systems; and globally centralized clearing and settlement systems for each of the card schemes. They involve proprietary messaging and processing systems for inter-member-bank clearing and settlement with decentralized authorization and processing at the member-bank level for cardholders and merchants. However, the actual cross-border funds transfer involves central counterparty/correspondent banking linkages to the national large-value payment systems of the countries in which they participate. Cross-border/cross-currency payments involve banking relations between member-banks in one country and a correspondent bank in the other country. Thus, even some highly integrated schemes and systems, such as those for global card payments, must link through local banks to national and regional inter-bank payment settlement infrastructures in order to settle cross-border/cross-currency inter-member payments.

PSPs across SEPA. PSPs can choose and use any solution or combination of solutions, directly or indirectly, as long as reachability and compliance with the EPC SEPA Schemes are effectively ensured.

Box 1: Architecture of Regional Clearing Infrastructures

STEP2: Centralized Regional ACH

STEP2 is a centralized regional Pan European ACH for bulk payments in euros. Established in 2003 to clear cross-border euro credit transfer payments for its participating member-banks, it has expanded its services to include clearing of domestic euro payments for participating banks – primarily in Finland, Ireland, Italy, and Luxembourg, at present – and to include direct debit payments. STEP2 also developed clearing services for SEPA credit transfer and direct debit transfer schemes in 2008-09. STEP2 is a tiered connectivity system involving both direct and indirect participants with a processing platform that provides direct routing to beneficiary banks with straight-through processing and automated connectivity, for settlement, to TARGET2 for its SEPA services.

SICA-UMEOA: Hub-Spoke Regional Clearing Infrastructure

SICA-UMEOA, which was inaugurated in 2008, is also a regional retail payment clearing infrastructure but is comprised of 9 centers – a central regional clearing facility, a national clearing facility in each of the 8 member countries of the West African Monetary and Economic Union, and Clearance Access points in each country connected to the national facility. SICA-UMEOA clears domestic and cross-border intra-regional payments denominated in CFA francs. SICA-UMEOA clears batch files of various payment instruments, including digitized paper items such as cheques, for all participating banks within the region. It involves a single regional scheme on an integrated technical platform for all regional and national operating centers. Payment obligations are netted multilaterally with settlement on the regional RTGS system STAR-UMEOA, which is also operated by the Banque Centrale des Etats de l'Afrique de l'Ouest (BCEAO).

EACHA: A Distributed Infrastructure

The European Automated Clearing House Association (EACHA) network is a distributed bilateral network arrangement for ACH-to-ACH connectivity. The EACHA provides technical interoperability standards for the straight through processing of cross-border payments among its 27 member ACHs from 23 participating countries in a distributed bilateral network (although not all EACHA member ACHs are actually linked to each other). The EACHA scheme illustrates the case of interoperable national ACHs whereby the payment obligations resulting from the clearing of cross-border payment transactions in euros are settled in TARGET2. The scheme involves an interoperability framework between national ACHs rather than full technical integration between them. In February 2015, the EACHA published the “Study on Interoperability of Immediate Payment Systems”, followed in November 2015 by the “EACHA Instant Payments Interoperability.” Upon invitation by the ECB, the EACHA began leading a taskforce consisting of ACHs (including members of EACHA, EBA Clearing and representatives of TARGET2), national central banks, the ECB, and ad hoc other stakeholders, for the purpose of delivering to the Eurosystem a set of business requirements for ensuring risk management, clearing and settlement, and interoperability of instant payment services in euros.

Equens: A Payment Processor

Equens SE is a European full-service card and payment processor headquartered in Utrecht, Netherlands, with offices in Frankfurt, Stuttgart, Milan, Rome, Helsinki, and London. With an annual processing volume of 9.7 billion payments and the switching of 5 billion POS and ATM

transactions, Equens is one of the largest payment processors in Europe, leading the market for future-proof payment and card solutions. Equens provides payment and card processing solutions for POS and ATM transactions. More specifically, it delivers vendor-independent card services (including payment terminal solutions); acquiring services, such as POS and ATM acquiring hosting, POS terminal solutions, and merchant services; issuing services, including issuing transaction processing, payment clearing, and issuance and management services; risk and fraud, affiliate, co-branded, and managed services; mobile NFC and contactless payments; and clearing and settlement services. The company also provides automated clearing house and business process outsourcing services for payments; SEPA services, including domestic payment processing, SEPA credit transfer, and SEPA direct debit services; and corporate payment services for banks, companies, service agencies, and software developers. In addition, it provides digital services, including digital routing, e-Mandate routing, and mobile payment services.

17 Bilateral international PSI interlinking is an example of the partnership between MTN Côte d’Ivoire and Airtel Burkina Faso. In April 2014, MTN and Airtel launched a landmark collaboration to allow MTN Mobile Money customers in Côte d’Ivoire to transfer money to Airtel Money customers in Burkina Faso. It was the first time two operators from different groups interconnected their mobile money services internationally to offer cross-border remittances. Given their limited experience with international money transfers, MTN and Airtel were keen to work with an intermediary that would act as a hub between their two services. In June 2013, they engaged with HomeSend, which was the most established remittance hub at the time. HomeSend provided two main services to MTN and Airtel: a real-time money transfer messaging platform and interface, and the management of anti-money laundering activities. To keep all transactions in the local currency (CFA franc), MTN, Airtel, and HomeSend decided it would be easier for the two operators to settle funds directly between themselves. Technical integration was completed within four months. As a next step, MTN, Airtel, and HomeSend agreed on a commercial model that would be transparent for customers.¹⁸ Whereas the operators see cross-border mobile money remittances as a substantial strategic opportunity, their initial objective was not to maximize revenues, but rather to create a demonstration case for deciding whether or not to pursue new remittance corridors. MTN and Airtel then began working with their partner banks (Société Générale and Ecobank, respectively) to secure approval from the BCEAO to send and receive remittances using mobile money, which they obtained a few months later.¹⁹

18 Based on the commercial agreement, the sender on MTN’s side would pay a service-specific transfer fee, but Airtel’s receiving customers would not pay to receive a cross-border transfer. The standard cash-out fee would apply to the receiver if customers were to withdraw cash from their mobile money account.

19 In both countries, MTN and Airtel had a ‘360 degree marketing’ strategy that combined a strong above-the-line (ATL) campaign on TV and radio with below-the-line (BTL) actions on the ground. Focusing promotion on the sending market is key to the success of any remittance product, however, and MTN effectively carried most of the communication efforts. In the case of MTN, the customer experience was designed to be very similar to sending money domestically, and marketing materials closely mirrored those used to promote domestic transfers. Marketing materials were simple and focused on just one use case – ‘Send money home’ – and one competitive advantage: affordability. Focus groups targeting Burkinabé migrant workers in Côte d’Ivoire who send money back home have responded very positively to this marketing campaign. Following the launch campaign, MTN has continued to promote the service as part of its regular BTL activities, particularly in the western part of the country, where many Burkinabé migrants work as cocoa harvesters. (See Scharwatt C. and C. Williamson, “Mobile Money Crosses Borders: New Remittance Models in West Africa”, GSMA. March 2005.)

PSI INTERLINKING AND INTEROPERABILITY

18 PSI interlinking is essential to allow cross-system interoperability and to deliver convenient cross-border payment and settlement services. This section discusses the different geographical layers of interoperability, from national interoperability, that is, between PSIs within national borders, to international interoperability, that is, between national PSIs that are linked regionally or globally.

A. National Interoperability

19 As the vast majority of payment transactions are effected within national borders, most of the progress on interoperability so far has been achieved at the national level.²⁰ In fact, national interoperability has mainly been limited to the same types of accounts, e.g., between deposit accounts issued by different banks or between e-money transaction accounts offered by several mobile network operators (MNOs). Considering two baseline scenarios, one with a multitude of non-interoperable PSIs, and one with a single service provider, an interoperable payment ecosystem at the national level can typically be achieved via two migration modalities (Figure 3). The first, and most obvious, is the establishment of bilateral links between PSPs or PSIs, the second consists of a centrally interoperable solution. The former modality, which is largely followed by the mobile telecom and banking industries, requires setting up bilateral interoperability agreements between participating entities.²¹ This process may encompass PSPs or PSIs establishing bilateral links with other PSPs or PSIs. Very often, in practice, a subset of PSPs might take the lead and establish bilateral interoperability agreements first, while others would follow through at some later stage either in response to their own ambition or as they are prompted to do so by the authorities' moral suasion or by regulatory measures aimed to achieve interoperability countrywide.

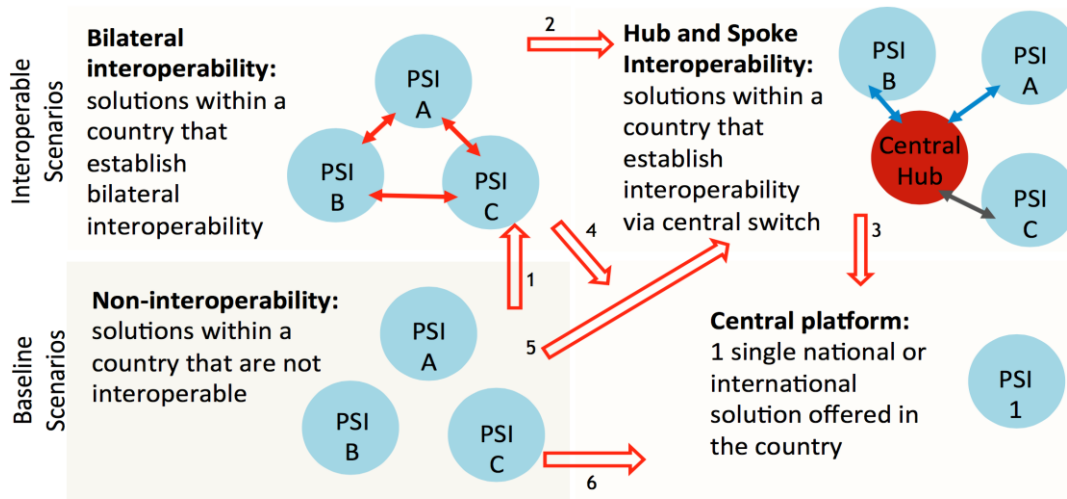
20 Bilateral interoperability agreements feature some advantages as well as considerable disadvantages. They are relatively easy to deploy and make use of existing account management processes; yet they require each PSP or PSI to link to all others which are participating, with

20 The World Bank included a dedicated questionnaire to capture developments in the area of interoperability as an annex to the 2010 edition of the biennial Global Payment Systems Survey. The questionnaire was designed to capture innovations resulting in new products as well as innovations in processing (hereinafter referred to as the survey). A total of 101 central banks completed the survey and reported 173 innovative retail payment products/product groups. The majority of the innovative products/mechanisms have very limited interoperability. Less than 20 per cent of the products were reported to be fully or partially interoperable. Around 25 per cent of the products/mechanisms supported some mechanism to exchange funds with traditional payment products. The traditional clearing and settlement infrastructure is not generally used. More than 50 per cent of the innovative products reported in the survey were settled in the books of the issuer, with only around 24 per cent settling in central bank money. Less than 40 per cent of the products settled in T+0. There is little evidence to assume that the situation has substantially changed since then. Interoperability of e-money accounts accessed via the mobile phone (mobile money accounts) has only been implemented (or is planned to be implemented) in very few countries. According to the GSMA "The Mobile Economy 2015" report, there were 255 mobile money solutions offered in 89 countries as of December 2014. In November 2014, the GSMA reported that, based on slightly lower figures, 60% of all mobile money services worldwide are led by MNOs. There were 57 markets with two or more live mobile money services (33 of which had 3 or more services). However, the GSMA report only lists four countries, where certain MNOs established interoperability between their mobile money solutions, namely Indonesia (2013), Pakistan, Sri Lanka, and Tanzania (all in 2014). Based on these figures, (partial) interoperability has only been introduced in 7 per cent of those countries with two or more mobile money deployments. In 2014, the GSMA introduced a Mobile Money Interoperability program with the support of Axiata, Bharti Airtel, Etisalat, Millicom, MTN, Ooredoo, Orange, Telenor, Turk Telekom, Vodafone, and Zain, aiming at accelerating interoperability of mobile money services by identifying and sharing best practices, guidelines, and processes, and by providing regulatory support in a number of leading markets.

21 An "interoperability agreement" is here defined as an arrangement among systems and participating entities to facilitate the delivery of interoperable payment services to participants and users, consisting of a combination of: 1) technical, legal, commercial, and contractual agreements among participating institutions, 2) shared telecommunication links and common standards for the exchange of transaction data between access and acceptance devices of participants and users, and 3) a central coordinating structure to manage the clearing and settlement of transactions as well as related business aspects such as rules, procedures, fees, sanctions, etc. This report will refer to "international" interoperability agreements, to be understood as interoperability arrangements involving two or more national PSIs.

obvious duplication of efforts and much more complex maintenance of bilateral agreements. In general, the complexity of bilateral interoperability agreements increases with the number of linked entities. While this may not be a major issue, say, for MNOs linking to each other, due to their limited number per country, it may become complicated when MNOs and banks aim to establish interoperable services.

Figure 3. Interoperability scenarios at the national level



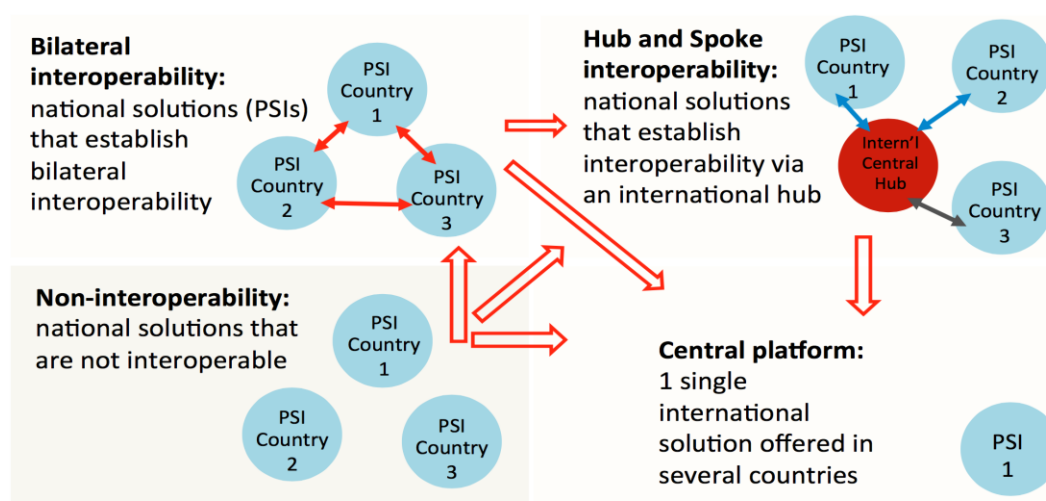
21 Central interoperability solutions usually rest on a hub and spoke model. Here, individual PSPs or PSIs are linked to a central switch for the execution of transactions between them, following a common scheme of multilaterally agreed rules. The adoption of a central switch is not a strict necessity, however, since individual PSPs or PSIs can still use their own processing platforms as long as they are technically interoperable. The real improvement of the central hub solution over the bilateral agreement approach derives from the adoption of a common scheme of multilateral rules. Bilateral interoperability is often considered to be an interim step before migrating to centralized solutions (arrows 1, 2 and 3, or arrows 1 and 4). In fact, bilateral interoperability might be skipped altogether and a country may leapfrog from the non-interoperable scenario to centralized solutions, either by moving to a hub and spoke solution (arrow 5), and eventually from here to a central platform (arrow 3), or by moving directly to the latter (arrow 6).

B. International interoperability: At the regional level

22 With increasing regional economic integration and/or regional migration, cross-border payments (including international remittances) have gained importance. Again, the baseline scenario is a situation with non-interoperable solutions, this time offered in different countries within a region. In fact, these solutions might or might not be interoperable at the national level, and regional interoperability might be pursued even in the absence of national interoperability. Furthermore, the type of interoperability achieved at the national level may affect the degree of complexity of regional interoperability, with the centrally interoperable or single provider scenario on the national level being a less complex starting point than the bilaterally interoperable scenario. The other possible baseline scenario features one single PSI operating in several countries in the region or an international service provider that is present in various countries of the region. In such a scenario, payment service users are likely to benefit from being able to send and receive payments from the transaction account held with a service provider participating in the single PSI.

23 Several paths to regional interoperability are possible in a digital payments ecosystem, starting from the baseline scenario and featuring a number of non-interoperable PSIs operating in different countries (Figure 4). This is similar to national interoperability discussed above. A handful of PSIs might take the lead and establish bilateral interoperability agreements, while other PSIs would follow through at a later stage either in pursuance of their own business strategic objectives. First movers might also be individual PSPs that are active in different countries of the region seeking to establish interoperability. More direct paths to regional interoperability could be envisioned as a result of international agreements between governments in a region, whereby centralized interoperability solutions would be achieved more directly as part of economic or financial regional integration programs.

Figure 4. Interoperability scenarios at the regional level



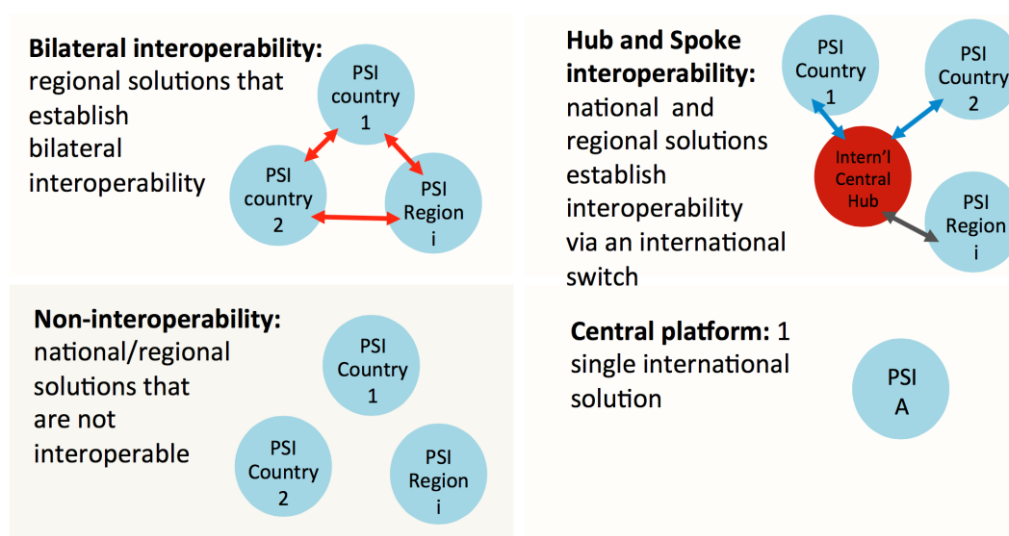
International interoperability: At the global level

24 Interoperability at the global level raises more complex issues. While national and/or regional interoperability can form the nucleus for global interoperability, (Figure 5) and can in principle be taken as basic models to be replicated on a larger scale to reflect global relations, in practice the coordination challenges to do so are much more critical than at the national or regional level. Various sources of complexity emerge, such as the coordination of a much more assorted set of stakeholders (including market participants and various national authorities), inconsistencies among several and possibly very different legal and regulatory regimes, and the identification of commercially viable business models and technological solutions that can match the preferences of very diverse stakeholders, to mention just a few.

C: Challenges and risks of international interoperability

Although international and national interoperability feature similar types of risk, the former raises specific challenges. Such challenges bear implications for central bank oversight policy. These challenges essentially stem from: i) the scaling up to the cross-border level of the types of risk that are usually associated with national interoperability, and ii) the international harmonization and standardization which national PSIs need to be subject to if they are to be part of an international interoperability agreement.

Figure 5. Interoperability scenarios at the global level



“Scaling up” of risks

25 Payment system risks take on new dimensions in the context of international interoperability. The scaling up of such risks does not imply only a shift in magnitude, but a qualitative change as well, since every cross-border link triggers complexities that relate to the interaction of the different national jurisdictions involved in the interoperability agreement and raises important issues of legal, technical, administrative, business, and operational consistency. The related challenges vary with the specificities of each of the linked systems and the legal, technical regulatory, administrative, business, and operational environments characterizing each of the underlying national jurisdictions involved in the agreement, and grow with their differences or incompatibilities.

26 International interoperability raises greater legal and regulatory challenges than national interoperability. Whereas a national interoperability agreement falls under a single legal regime, and is therefore governed under one consistent set of rules administered by the relevant national authorities, international interoperability agreements expose the linked PSIs to cross-border and cross-PSI events and call into question a multitude of legal and regulatory regimes that may differ substantially across national jurisdictions and are handled by authorities from different countries. Internationally interoperable payment services are processed in different national PSIs (and via different national intermediaries), which are subject to different national applicable sets of rules and regulations. Cooperation and coordination failures among overseers and regulators can also represent important impediments to international interoperability, as owners and participants of linked PSIs may need to deal frequently with various different national authorities, each with their own specific mandates, regulations, procedures and practices, which in some critical aspects may be duplicative or even inconsistent.

27 Conflicts of laws and regulations may arise in the context of international interoperability agreements. These conflicts arise when there is no clarity as to which specific laws, regulations and procedures apply to the transactions processed via the scheme or system links, and if there is no certainty as to how the various national oversight authorities involved handle emerging legal and regulatory issues and controversies. In extreme circumstances (e.g., the default of a participant in one of the systems), uncertainties or conflicts may arise if the rules governing the scheme or system links do not clearly specify the procedures to be followed in such circumstances.

Conflicts may also arise when the underlying legal basis, and in particular the contracts between the participating entities, do not clearly define the rights and obligations of the linked PSIs (as well as the intermediaries, in case of indirect participation), and their participants. Finally, conflicts may stem from differences in laws and regulations applicable to the linked PSIs (and any intermediary to the transactions processed) and their participants, in particular, including issues such as access to, and direct participation of, foreign institutions in domestic PSIs; choice of relevant laws; enforceability of collateral agreements and transfer of collateral ownership in the event of default; enforceability of netting for the purpose of final settlement; irrevocability and finality of settlement, and applicable resolution and bankruptcy laws and wind-up procedures for financial institutions. Incompatibilities between the legal frameworks underlying schemes and systems of different national jurisdictions might erect significant barriers to the achievement of international interoperability.

28 Some regional PSI interlinking arrangements address the above problems by adopting common agreements or directives. These agreements (e.g., TARGET2 guidelines) or directives (e.g., EU settlement finality directive) are ratified and incorporated into the legal and regulatory frameworks of the sovereign countries participating in the regional arrangement. In other cases, where common agreements or directives are not feasible, expert legal opinions might be necessary to ensure that the interoperability agreements have legal support and standing under the existing legal framework of each of the sovereign participating countries, and do not violate the legal and regulatory provisions governing the operations of the regional arrangement. This latter approach presumes that the existing legal and regulatory regimes of each of the sovereign participating countries are sufficiently compatible to permit a reasonably common legal standard for participation in the regionally integrated payment systems. This approach also presumes that there are no legal or regulatory barriers in the sovereign jurisdictions of the participating countries that will unfairly distort competition in favor of national systems and participating entities vis-à-vis foreign ones. This legal risk can ultimately generate network and business risks.

29 Two specific types of risk may be associated with the interlinking of national PSIs and international interoperability: sovereign risk and participation risk. Sovereign risk originates from the circumstance that the operations of internationally integrated PSIs are subject to the political, legal, and regulatory regimes of the participating countries. While there may be interoperability agreements among PSIs, and even cooperative agreements among national regulatory agencies of the national jurisdictions involved, national laws and regulations may change over time in ways that might violate the intent and even the letter of existing interoperability agreements. Generally, there is no effective recourse in these cases other than renegotiation for enforcing the agreements, short of expulsion of noncompliant PSIs. Regarding the second type of risk mentioned above, participation, it should be noted that the legal and regulatory requirements that govern participation of financial entities in national PSIs vary across the jurisdictions of the internationally linked or shared PSIs. There is the possibility that some of the jurisdictions involved may impose substantially less rigorous licensing, reporting, and prudential requirements on participating entities than the others. Similarly, oversight monitoring and regulatory enforcement practices may differ across jurisdictions, with some jurisdictions applying weaker standards or practices than others. As a result of these asymmetries, participants in an international interoperability agreement might be exposed to risks originating in any participating PSI which are being transmitted internationally across the interlinking mechanisms.

Harmonization and standardization

30 Challenges and risks may be associated with the harmonization and standardization of national PSIs. Harmonization of operating rules, procedures and standards, as well as standardization of critical technical processes and system modules for information exchange and

transmission, communication, data processing, and payment clearing and settlement are typically required to interlink PSIs and achieve international interoperability (Box 2). They help ensure that differences, inconsistencies, and incompatibilities between PSIs do not prejudice their interlinking and they are necessary to deliver efficiencies. Very often, in fact, the degree of homogeneity and compatibility of existing PSIs limits the choice of interlinking architecture. Challenges may originate from the intrinsic difficulties of achieving harmonization and standardization in an international environment with a multiplicity of industry interests, where resistance to changing current rules and procedures may be strong, and where agreeing on common standards may be problematic: many times, scheme or system owners will want to keep their specific processes, as they fear that harmonization and standardization might compromise their own way of doing business.

Box 2: Relevant standards for regional financial infrastructure integration

A prime example of global policy standards that promote and facilitate the strengthening of the clearing and settlement mechanisms of regional financial infrastructure are the CPSS-IOSCO *Principles for financial market infrastructures*.²²

Regarding the legal/regulatory standards covering the bilateral or multilateral relations of participants in regional financial infrastructures, all trading, clearing, and settlement platforms use a rulebook, owned by a scheme management organization or by the platform involved. Examples of rulebooks for payments are the SEPA Credit Transfer Rulebook, the SEPA Direct Debit Rulebook, NACHA Rulebook, IPF Rulebook, EACHA Framework and CLS Rulebook, and for securities and their clearing arrangements, the LCHClearnet Rulebooks. In addition to rulebooks, master agreements are also available, like the ISDA Master Agreement for derivatives transactions. In most regional integration projects, it is possible to re-use available rulebooks or master agreements.

The choice of technical standards is important to ensure such things as efficient processing between the infrastructure and its participants, the effective delivery of services to customers (in the case of end-to-end processing), or uniform reporting to the public authorities. Many vendors already have technology solutions available based on global standards. For example, product and service solutions are often coordinated around core standards such as ISO 20022, ISO15022, International Bank Account Numbers - IBAN (ISO 13636), and International Securities Identification Numbers – ISIN (ISO 6166). Also, mapping interfaces are available that allow for straight-through-processing between infrastructures using different messaging solutions. Similar benefits are provided by the interfaces that map proprietary messaging systems into standardized international formats.

31 Risks may derive precisely from inadequate harmonization and standardization. Lack of adequate harmonization and standardization may limit the overall benefits of scheme or system interoperability, for example, by raising the cost for PSPs to operate across schemes or systems. This lack of harmonization and standardization may also make the linked schemes or systems more prone to contagion. This would be the case, for instance, if oversight requirements were not sufficiently harmonized across the linked PSIs and if each PSI were to apply different standards than the others (say, on access criteria or for risk management): the PSIs that were subject to more stringent requirements would become exposed to those operating under weaker requirements. In this regard, risks may arise from the decision of PSI owners to follow a minimum-resistance path to interoperability agreements, deliberately lowering the degree of required harmonization and standardization accordingly.

²² See “Principles for financial market infrastructures”, joint report of the Committee on Payment and Settlement Systems and the Technical Committee of the International Organization of Securities Commissions, Bank for International Settlements, April 2012.

Implications for Oversight Policy

A. The cross-border dimension of payment system oversight

32 The role of central bank oversight of payment systems in the context of interoperability has been discussed in the companion report on “Payment System Oversight and Interoperability”. The focus of this section is on the implications for oversight policy of the cross-border dimension introduced by international interoperability, and the specific challenges and risks relating to it. In particular, although the principles elaborated in the companion report remain valid in the context of international interoperability, the preceding discussion suggests that the interlinking of national PSIs raises additional oversight issues and elevates the overall complexity of the oversight function. These additional issues and higher complexity change in relation to the technical nature of the interlinking solutions adopted. Decentralized models raise different issues than centralized ones: whereas decentralized models require focusing attention on the *links* connecting the different PSIs (Box 3) and on how different PSIs interoperate, centralized models require focusing attention on the shared *infrastructures*. Solutions under the two types of models not only differ technically, they demand different governance instruments since links generally fall under the primary responsibility of the national oversight authorities of the linked PSIs, whereas regional or global infrastructures fall within the purview of a lead oversight authority, which will coordinate its action with the relevant national authorities involved. All solutions involve a high degree of cooperation among authorities and between authorities and stakeholders.

Box 3: Links

A link between PSIs is a set of legal and operational arrangements aimed at facilitating the transfer of funds and fulfillment of payment obligations between entities participating in different PSIs. While general reference is made in this report to PSIs for the sake of convenience, links can also be between PSPs, and between PSPs and PSIs.

Links can be established both between PSIs located in the same jurisdiction or between PSIs in different jurisdictions (i.e., cross-border links). Links can work unilaterally or bilaterally. A link between two PSIs is unilateral when it is used only for the transfer of funds from one system to another, and not vice versa. A bilateral link between two PSIs means that a single agreement regulates the transfer of funds to and from both systems.

Links may take different forms, but the basic types are “direct”, “indirect” and “relayed” links. A direct link is established directly between two PSIs without intermediation by a third entity. An indirect link is established between two PSIs, whereby a third entity (generally a commercial bank or a central bank) intermediates between them. In an indirect link, there will be legal and operational arrangements involving the linked PSIs and an intermediary. Finally, - a relayed link involves three (or more) PSIs, in which at least one PSI intermediates between two other PSIs. A relayed link can be seen as a chain of two or more direct links.

Links between PSIs provide organized channels for the transfer, clearing, and settlement of payments. They are essential for the achievement of (national and international) interoperability, given that linked infrastructures enable payments to be exchanged across systems and jurisdictions, and facilitate the reachability of participants of different PSIs and their customers. Interoperability, in fact, requires advanced forms of relationships whereby PSPs agree to work together to establish solutions for improving their customer services.

Establishing a link allows PSI participants to transfer funds involving multiple instruments, channels, schemes, systems, and jurisdictions, through a single gateway and can thus reduce costs when compared with the costs of participating in a multitude of systems, schemes, and jurisdictions and when using several instruments and channels. Links can reduce the number of parties involved in the cross-system clearing and settlement of retail payments, which is conducive to mitigating legal and

operational risk. However, inefficiently managed links may also increase risks. The design and potential risks of a link should therefore be carefully analyzed before its establishment. The type and degree of risk varies according to the design and complexity of the PSIs involved and the nature of the relationship between them.

33 The cross-border dimension of international interoperability requires adapting the scope of oversight of the linked or shared PSIs. In the case of solutions based on the decentralized model, as noted, particular attention should be devoted to links, and the national overseers should be responsible for assessing the links of the PSIs under their jurisdiction against internationally recognized standards. In overseeing links, the oversight authorities should agree to adopt a set of harmonized expectations for the linked PSIs. To this extent, they should adopt the international standards relevant for interoperability discussed in the companion report on “*Payment System Oversight and Interoperability*”, as well as the principles specifically elaborated within. The overall goal should be to ensure that risks associated with international interoperability are properly managed. On the other hand, for solutions based on centralized models, the lead overseer – in cooperation with other relevant national authorities (see below) – should be responsible for safeguarding the integrity of the internationally shared infrastructures. In doing so, the lead overseer should monitor and intervene, as circumstances may require, on specific PSPs through the support of the oversight authorities of the concerned participating countries.

34 It is advisable to complement the standards and principles discussed in the companion report with a set of oversight principles specifically designed to address the challenges and risks raised by the international dimension of payment system interoperability. The proposed principles are intended to complement those elaborated in the companion report and are aimed to ensure the establishment of safe and efficient international interoperability agreements.

B. Oversight principles for international payment system interoperability

35 The principles covered in this section should be understood as providing methodological guidelines to public authorities and private sector stakeholders involved in establishing international interoperability agreements. The principles are intended to address the challenges and risks associated with international payment system interoperability, and complement those developed for national interoperability. The principles draw on the World Bank’s “*Guidelines for the Successful Regional Integration of Financial Infrastructures*”, cited earlier, and have been written with the idea that initiatives to establish international interoperability agreements between national PSIs may originate from decisions made by public authorities or may be the result of private sector undertakings.

36 The principles are intended for a broad audience. The principles are meant to provide policy indications on international interoperability to payment system oversight authorities and to supervisory and regulatory institutions that cooperate with oversight authorities. The principles are also addressed to PSPs, as well as to system operators and scheme administrators of linked or shared PSIs. It must be noted that while it would be the responsibility of the oversight authorities to adopt the principles and include them as part of internationally recognized standards for interoperable PSIs, it would be the responsibility of system operators and payment scheme administrators to i) design PSI rules that are consistent with the principles, ii) administer these rules, and iii) ensure participant compliance with rules. The oversight authorities would assess the PSIs against the principles and hold system operators and scheme administrators accountable for the implementation of the principles. The engagement of PSI operators and scheme administrators in

the implementation of the principles would help central banks better achieve their oversight objectives while reducing their involvement in day-to-day system administration.²³

37 An important qualification of the proposed principles is in order. The principles for national interoperability developed in the companion report were written assuming that national payment systems are under central bank oversight. As payment system overseers, central banks play an active role in the establishment, deployment, and operation of interoperability agreements between national PSIs – including their planning, implementation, and sustainability – even when the agreements are private sector-led initiatives. In view of such recognition, those principles were mainly intended to provide policy indications for retail payment system operators and PSPs to appropriately manage the risks associated with national interoperability agreements. On the other hand, the principles for international interoperability submitted below have been conceived by giving specific consideration to the need for both public and private sector stakeholder cooperation across all stages of international interoperability agreements, in particular, their planning, implementation, and sustainability: all areas where cross-border oversight responsibilities are typically not well identified or clearly defined. In fact, even when international payment system interoperability initiatives are led by the private sector, the close involvement of all relevant public authorities is essential to bring a clear systemic risk perspective into the management of the related international interoperability agreements, and to ensure that internationally interoperable PSIs take the necessary measures in order to make them as mutually compatible as needed, especially where critical differences in their risk management standards and practices might raise risks of shock transmission across PSIs (with cross-border implications).

38 The oversight principles for international payment system interoperability are the following:

INSTITUTIONAL BASIS

Principle 1: The public authorities and private sector stakeholders who consider establishing an international interoperability agreement should define a clear strategic vision articulating the purpose, scope, and form of the agreement, as well as its risks and oversight implications.

Key issues

- 1.1 The strategic vision for an international interoperability agreement should be incorporated within the national payment system policies of the countries where participating PSIs are located, with an emphasis on crystallizing their support to and participation in the agreement.
- 1.2 The public authorities and private sector stakeholders should also make a preliminary assessment of the risks associated with the agreement and the related oversight implications and requirements, and should open discussions on the appropriate oversight arrangements.

39 Establishing an international interoperability agreement among national PSIs requires a clear vision and a robust rationale. The public authorities and private sector stakeholders should prepare a general proposal expressing the vision of the initiative. The proposed vision should provide a high-level overview of comparable existing and projected national and international interoperability agreements, and include a preliminary and high-level (qualitative) benefit-cost analysis of the initiative for the international community, the participating countries, and the stakeholder groups involved. The general proposal supporting the agreement should serve essentially as a “request for information” for participating countries and key stakeholders and should not be intended to be an elaborated project plan or project development document. Instead,

²³ The regional payment system oversight arrangement adopted in the Southern African Development Community (SADC) provides an illustrative example in this regard. See Annex 1.

once finalized, it should provide a high-level framework for the subsequent planning and development stages.

40 An international interoperability agreement would benefit from government support of the participating countries. While an international interoperability agreement could be established at the initiative of private sector stakeholders and might in principle require no government involvement, the governments of the participating countries should, at a minimum, offer their support and facilitate the steps to the agreement, its deployment, and operation. If the agreement were a component of a broader international economic integration program, there should also be government support and facilitation. In such event, all national public authorities with relevant responsibilities over the agreement should be empowered, have the resources, and commit to address its related legal, oversight, and regulatory aspects. Also, they should be prepared to mutually cooperate for the success of the initiative and to ensure effective oversight of the linked or shared PSIs once the agreement is deployed and becomes operational (see below).

Principle 2: The public authorities and private sector stakeholders involved in an international interoperability agreement should establish the leadership that will secure adequate financial and human resource support to the agreement, ensure its implementation, and exercise effective oversight of the linked or shared PFIs.

Key issues

- 2.1 The public authorities and private sector stakeholders should devise appropriate organizational arrangements, including establishing a steering committee to lead the initiative and creating and empowering an effective implementation management team to carry out the planning and implementation stages of the agreement.
- 2.2 The public authorities and private sector stakeholders should devise appropriate oversight arrangements, including identifying a lead overseer institution and by defining the oversight responsibilities of the national authorities involved, to ensure the safe and efficient application of the agreement.

41 The purpose of establishing leadership is to enable the agreement proposal to move from a preliminary vision to a safe and effective implementation. While all public and private sector stakeholder groups involved in the agreement would have ownership in it, each group should establish a leadership team for the various development and operational aspects of the agreement. Each team should have a specific leader who is committed to the success of the initiative and have sufficient influence within the general stakeholder group to take formal commitments, including securing the required financial and human resources, and ensuring compliance of the agreement with oversight requirements. Group leaders should be members of a steering committee, which should have the highest-level decision-making authority in the agreement. The steering committee should include decision makers from the public and private sectors, such as senior representatives of the oversight authorities and participating PSIs, market players, and users.

Principle 3: The public authorities and private sector stakeholders involved in an international interoperability agreement should set up a forum to facilitate the necessary communication, cooperation, and coordination between the public authorities and stakeholders, as well as among and within stakeholder groups.

42 Endorsing and implementing a cooperative approach toward planning, designing, developing, and operating an international interoperability agreement are crucial steps. Adopting such an approach should involve the creation of representative key stakeholder groups with well-defined and organized consultative and cooperative mechanisms and processes. A critical

objective of these structures should be to promote and facilitate effective communication throughout the various stages of the project. Both the public and private sectors need to be adequately represented at the senior level.

43 The steering committee should rely on public authorities and private stakeholder groups to inform the policy discussion, shape the decisions, and design the international architecture of the agreement. In addition, a controlling function which reports directly to the steering committee on key factors as the initiative evolves would contribute to the effective progress of the initiative, especially during the implementation and rollout stages (see below).

PLANNING

Principle 4: The public authorities and private sector stakeholders who consider establishing an international interoperability agreement should undertake comprehensive diagnostics of the participating PSIs, including an analysis of their strengths and weaknesses, in particular in the context of their prospective interoperability.

Key issues

- 4.1 A review of comparable agreements in place elsewhere should be conducted before, or as part of, the exercise in order to understand what worked in those cases and what did not, and why, and to form a view of what might be appropriate in the new context.
- 4.2 The public authorities and private sector stakeholders should identify gaps and key divergences in participating PSIs, and assess existing strengths, weaknesses, opportunities, and risks to be addressed in order to make their interoperability safe and efficient. In particular, they should pay close attention to the legal, financial, operational, and other relevant public policy characteristics of the participating PSIs and assess their compatibility as well as their alignment with international standards and best practices.
- 4.3 The public authorities and private sector stakeholders should set a clear plan to address all pending gaps in a reasonable timeframe in order to minimize barriers to interoperability, and should propose mechanisms and realistic schedules for any required changes by participating PSIs. The rollout strategy, however, should be flexible enough to allow sufficient time for some entities intending to join to meet the participation requirements.

44 The planning framework for the initiative should underpin the cooperative and consultative arrangements established for the preliminary and exploratory discussions. It is important that all relevant stakeholder groups remain involved as needed throughout the initiative life cycle.

45 The diagnostic exercise should provide a comprehensive picture of the relevant environment. The diagnostic exercise is the basic exercise from which most of the preliminary analysis of the agreement's implication and requirements would draw. The diagnostic exercise should be broad in terms of scope and sufficiently detailed. It should cover national interoperability agreements, the key payment and financial instruments used, the types of financial institutions and other participating institutions and service providers, the relevant financial sector legislation and regulations, and the relevant private sector industry associations and public sector regulatory and oversight bodies. Also, it should have a strong focus on the organization, operations, and technical capabilities of the participating national PSIs, the organization, market structure, and market practices and conventions in key financial markets that will benefit from the international interoperability agreement; and the fundamental legal and regulatory environment in which they

operate. It should also cover in detail the lessons and best practices from comparable national and international interoperability agreements elsewhere.

46 The diagnostic exercise should be followed by a substantial gap analysis. In the gap analysis, the major differences in the key aspects of the national PSIs should be identified, and their strengths, weaknesses, opportunities, challenges, and risks for successful interoperability would need to be assessed. Comparators or benchmarks for the gap analysis should be developed, taking also into account the relevant oversight standards and principles discussed in the companion report on *Payment System Oversight and Interoperability*, the applicable technical standards and best practices derived from comparable national and international interoperability agreements. The detailed understanding of the critical gaps should highlight the necessary changes that participating national PSIs will need to undertake in order to ensure safe and efficient interoperability services. The steering committee and project management team (see below) should develop a plan for all such gaps to be addressed effectively, and ensure that this plan be supported and adopted by the various stakeholder groups.

Principle 5: Public authorities and private sector stakeholders who consider establishing an international interoperability agreement should develop a strong business case that evaluates not only the information from the diagnostic exercise and subsequent analyses, but also the benefits, costs, and risks of alternative PSI interlinking arrangements.

Key issues

- 5.1 The public authorities and private sector stakeholders should devise a feasible, risk-robust interlinking model for PSI interoperability, based on consultations and discussions among all stakeholders around the diagnostic and business case analyses.
- 5.2 The public authorities and private sector stakeholders should outline the selected interoperability solution as comprehensively as possible with due regard to the results of the studies and analyses performed during the planning stage.
- 5.3 The public authorities and private sector stakeholders should specify the business framework for the new agreement, including its organization, management and governance, business management functions, operational scope and core business functions, business practices and controls, rules and procedures, and technical conditions and standards, among the main features.

47 The planning stage should conclude with the development of a detailed business case evaluation to assess the viability of the agreement at the most realistic level possible. The business case analysis should be a construction of scenarios of expected quantified future use, cost-savings and net benefit allocation over one or more future intervals (e.g., 1, 3 and 5 years). The diagnostic exercise and the gap analysis should provide many of the key inputs for this purpose, like the model(s) deemed most feasible for PSI interlinking. Through completion of the business case evaluation, the project's planning and governance framework should be able to visualize more definitively the type of PSI interlinking model that might best suit the initiative.

48 The selection of the PSI interlinking solution for the agreement should be based on well-defined and transparent criteria. The criteria should draw on the overall vision underpinning the international interoperability agreement, the diagnostic exercise, the gap analysis, and the business case evaluation, as well as project development constraints and timelines. Moreover, since it is possible that more than one of the feasible interlinking solutions meet in some form the stated requirements and standards, there should also be an agreed-upon priority ranking on the selection

criteria that are perceived as most closely aligned with maximizing the net benefits and mitigating the risks associated with the agreement.

IMPLEMENTATION

Principle 6: The public authorities and private sector stakeholders implementing an international interoperability agreement should set proper implementation management procedures and processes under the supervision of a designated implementation management team, and adopt a clear communication strategy with the stakeholders and the public in general.

Key issues

- 6.1 The implementation management team, to be supported by sufficient and scalable human and financial resources, would oversee the progress of the agreement being implemented and exercise an effective and strictly enforced implementation control function, in close interaction with the steering committee.
- 6.2 The implementation control function should not only ensure effective implementation, it should alert the public authorities involved of any risks and challenges that may be emerging during implementation.
- 6.3 The public authorities and private sector stakeholders should set up an effective communication system to properly inform all relevant stakeholders as well as the general public throughout the implementation process of the project.
- 6.4 The agreement and its related business practices, organization, and operations should be comprehensively documented and made public to create awareness of the new arrangement and its benefits as well as to build support for using it.

49 A robust management team for the day-to-day implementation of the agreement should be created at an early stage. The team should ensure strong coordination and professional support to the various stakeholder groups from the very beginning. The team should also ensure that all potential risks faced during the implementation stage be adequately managed and mitigated. Risks include managing changes to the PSI interlinking solution originally accepted, delays, budget overruns, and faltering commitment of some individual participants. Other potential risks are “development fatigue” and “project creep”. The implementation management team should be directly responsible for the development, construction, implementation, and final rollout of the initiative. It should also be responsible for enforcing implementation time-schedules and budgets approved by the steering committee, and for carrying out consultation activities with key stakeholders on the PSI interlinking solution. In order to be able to perform all these duties effectively, the team should have sufficient expertise and overall project management experience, adequate empowerment, enough financial and human resources, and open and effective communication with project governance and the oversight authorities.

50 Transparency throughout the deployment of the agreement should help to ensure continuing buy-in and commitment from all relevant stakeholders. Transparency might also lead to improvements throughout implementation if a proper feedback mechanism is developed for this purpose. Progress reports should have a broad scope, though still with a certain level of detail. More detailed technical annexes may be produced and attached to the main reports. Progress reports should also be made available to broader audiences, though probably in a simplified format. This will serve the purpose of creating awareness about the initiative and its anticipated benefits. Building demand and participation from the early stages of the initiative would be a key part of its development and implementation process. Adequate financial and human resources should be allocated for this type of marketing effort.

SUSTAINABILITY

Principle 7: The public authorities and private sector stakeholders involved in an international interoperability agreement should regularize the public consultative arrangements to ensure that the evolution of the agreement in terms of new business functions, services, and operating procedures is broadly responsive to, beneficial for, and accepted by stakeholders.

Key issues

7.1 The consultative arrangements that were created for the planning and implementation stages of the agreement should not be intended to disappear once the agreement is rolled out.

51 Maintaining consultative arrangements is crucial for achieving the continuous buy-in and commitment that will accelerate the initial migration of transactions and promote future volume growth. Likewise, public sector authorities' cooperative oversight arrangements that were devised and established in the planning phase should be meant to operate on an ongoing basis once the international interoperability agreement becomes operational. To ensure the effectiveness and transparency of the oversight arrangement, the regulatory standards and the detailed oversight policies and procedures that will be applied to the agreement should be developed and published. A communication program for broader audiences should be maintained after implementation. The program should inform those audiences not only on achievements and milestones, but also on future plans and developments intended to better meet the needs of participants and other market players and users.

Principle 8: The public authorities involved in an international interoperability agreement should establish effective cooperative public governance, regulatory, and oversight mechanisms to allow for the effective oversight of the linked or shared PSIs.

Key issue

8.1 A cooperative oversight body for the international interoperability agreement should be established with senior representatives from the participating national PSI supervisory and/or regulatory authorities that are relevant to the type of agreement.

8.2 The cooperative oversight body should be developed in a manner that is consistent with Responsibility E of the CPSS-IOSCO *Principles for financial market infrastructures*.²⁴

52 The cooperative oversight body should be given a mandate to monitor and assess the linked or shared PSIs against the recognized standards and, if necessary, to propose or even

²⁴ This responsibility calls for central banks, market regulators, and other relevant authorities to cooperate with each other, both domestically and internationally, as appropriate, in promoting the safety and efficiency of financial market infrastructures. As the CPSS-IOSCO report explains, central banks, market regulators, and other relevant authorities should cooperate with each other, domestically and internationally (that is, on a cross-border basis), in order to support each other in fulfilling their respective regulatory, supervisory, or oversight mandates with respect to financial market infrastructures (FMIs). Relevant authorities should explore, and where appropriate, develop cooperative arrangements that take into consideration i) their statutory responsibilities, ii) the systemic importance of the FMI to their respective jurisdictions, iii) the FMI's comprehensive risk profile (including consideration of risks that may arise from interdependent entities), and iv) the FMI participants. The objective of such arrangements is to facilitate comprehensive regulation, supervision, and oversight and provide mechanisms whereby the responsibilities of the authorities can be fulfilled efficiently and effectively. Authorities are encouraged to mutually cooperate to reduce the likelihood of gaps in regulation, supervision, and oversight, which could arise if they did not coordinate, and to minimize the potential duplication of effort and the burden on the FMIs or the cooperating authorities. Relevant authorities should cooperate with resolution authorities and the supervisors of direct participants, as appropriate and necessary, to enable each to fulfill their respective responsibilities. Cooperative arrangements should foster efficient and effective communication and consultation among relevant authorities. Such arrangements should be effective in normal circumstances and should be adequately flexible to facilitate effective communication, consultation, or coordination, as appropriate, especially during periods of market stress, crisis situations, and the potential recovery, wind-down, or resolution of an FMI. Inadequate cooperation, especially during times of market stress and crisis situations, may significantly impede the work of relevant authorities.

undertake regulatory action. In any case, national oversight authorities should stand ready to cooperate with the body and should be able to exert control over aspects of the agreement that affect their jurisdictions. Therefore, as part of the framework outlining its overall mandate, powers and functions, the cooperative oversight body should identify the division of responsibilities and the forms of interaction with national oversight and authorities.

Principle 9: The public authorities involved in an international interoperability agreement should put in place all necessary regulatory and oversight arrangements to ensure ongoing compliance of the participating PSIs with the legal and regulatory requirements and any other relevant policy standards that apply to the agreement.

Key issues

- 9.1 The public authorities and private sector stakeholders should maintain sound and committed organizational, governance and senior managerial leadership of the agreement and ensure that the staffs dedicated to the agreement are well informed and trained in the goals, functions and operations of the agreement.
- 9.2 The public authorities and private sector stakeholders should institute a regular evaluation program of the agreement.

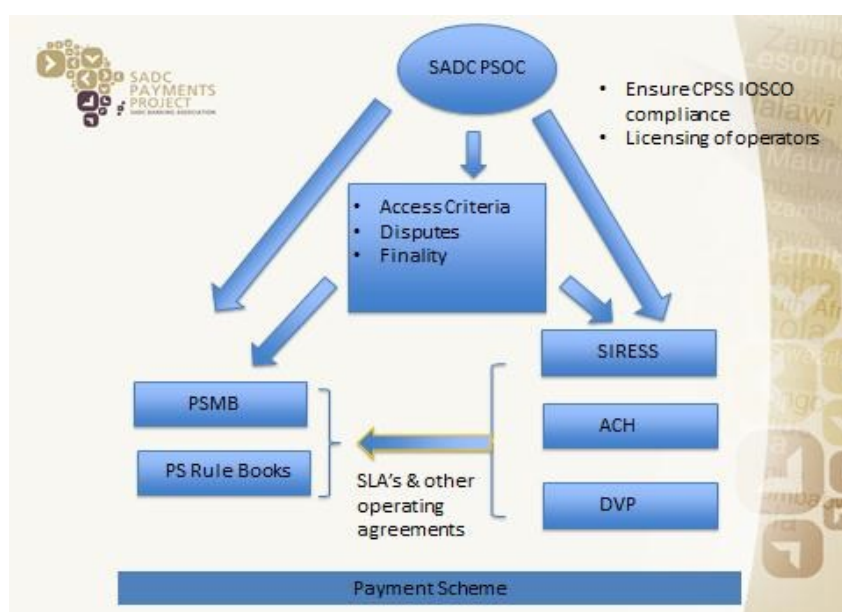
53 Oversight should aim at ensuring that the agreement remains effective and relevant for its participants and the cross-border markets it serves. For this purpose, the governance of the agreement should be robust and be continuously strengthened. The steering committee should evolve into a board or similar arrangement reflecting the nature of the agreement as a going concern. Under its direction, management should continuously ensure that the agreement activities are consistent with its objectives, strategy, and risk tolerance. In this last regard, the board (or similar) should ensure that the organization provides the right incentives to attract qualified senior and mid-level professionals that will act diligently and in the best interests of the agreement. The board and management should also ensure that all of the staff members are adequately trained and understand the goals, functions, and operations of the agreement and can apply that knowledge in practice in a variety of circumstances.

54 The cooperative oversight body should institute a program of periodic assessments of the agreement. The assessments will assist the relevant oversight authorities in ensuring that the agreement is managed effectively. The assessment reports should be made available and accessible to all interested parties.

Annex 1: Oversight of payment systems in the SADC

In Southern Africa, the Committee of Central Bank Governors (CCBG) has undertaken to facilitate cross-border payments. To this end, the SADC Payments System Project Team (the project team), as the CCBG group responsible for payment systems, has initiated a process to develop a framework for an integrated regional payment environment. The CCBG has appointed the SADC Payment System Oversight Committee (SADC PSOC), an oversight committee that is vested with the necessary powers to ensure the proper functioning of the various payment schemes adopted in the regional SADC Payment Systems. The SADC PSOC sets out policies regarding access criteria for participation in the payment schemes, handles dispute matters referred to it, and ensures that any Financial Market Infrastructures (FMIs) that are appointed by the market to provide clearing and settlement services adhere to international standards and best practices.

Payment Systems in the Southern African Development Community²⁵



Payment system oversight in SADC is established under the principles for international cooperative oversight contained in the CPSS (now: CPMI) report “*Central Bank Oversight of Payment and Settlement Systems*”,²⁶ and adopts the CPSS-IOSCO *Principles for financial market infrastructures* (PFMI) as minimum standards against which the PSIs are assessed by the participating central banks.

Individual participating central banks consult with each other, and, when necessary, before implementing policies or taking any action that could materially affect the PSIs. This consultation is done in order to avoid inconsistencies in the oversight relationship.

The South African Reserve Bank (SARB) is the Lead Overseer and accepts primary responsibility for the oversight of the PSIs. It coordinates the cooperation between the participating central banks, and facilitates the work of the SADC PSOC. The SARB provides for the Chairperson and Secretariat of the PSOC. Each participating central bank designates a Country Leader to serve as the principal member of the Committee and to ensure ongoing senior-level engagement and accountability on oversight matters.

²⁵ SIRESS stands for SADC Integrated Regional Electronic Settlement System.

²⁶ See “Central bank oversight of payment and settlement systems”, Committee on Payment and Settlement Systems, May 2005.

The SADC PSOC periodically assesses the design and operation of the PSIs against the PFMI. It may accomplish this either by reviewing and commenting upon analyses and assessments prepared by the PSI operators, or by preparing independent analyses and assessments. PSI operators are required to submit a self-assessment against the PFMI at least every two years or when there is a material change (e.g., the addition of new initiatives, major new services, and changes to the PSI operations and risk management procedures.)

Individual participating central banks reserve the right to prepare their own independent analyses and assessments of the PSIs against the PFMI, when they deem it necessary to do so. They share their assessments with the SADC PSOC, and seek to reach consensus on their assessment of PSI compliance with the PFMI. The participating central banks aim to take compatible actions with regard to PSI oversight, with the intention of achieving common understanding and consensus in the SADC PSOC. Differences that cannot be resolved by the SADC PSOC may be referred by the Country Leaders to their respective Governors for further guidance.

The Payment System Management Body (PSMB) administers the scheme rulebooks and ensures that participating members and PSIs comply with their obligations in terms of the rulebooks. The PSMB deals with any deviations from the rules and refers any dispute that it is not able to handle to the SADC PSOC for further consideration.

A SADC payment scheme consists of the rules, operating agreements, and processes adopted by its members and PSIs, which are administered by the PSMB under the oversight of the SADC PSOC.

The involvement of the PSMB allows the participating central banks to focus on their oversight responsibilities, leaving to the PSMB in its capacity as PSI scheme administrator the task to design rules that are consistent with the oversight principles and the role of first line actor in the event of rules non-compliance from PSIs, with an emphasis on reducing the needs for central bank involvement in PSI administrative aspects.
