The Bretton Woods Committee

DECEMBER 2024

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A Dual Strategy to Transform Cross-Border Payments

A Publication from the Bretton Woods Committee's Multilateral Reform Working Group

Executive Summary

Many global cross-border payments are slow (often taking days to complete), complex (handled by multiple intermediaries), and expensive, especially for smaller payments such as remittances.

An efficient payments regime is an important public policy goal to pursue for several reasons. First, it would help low-income households that rely on remittances from family members working abroad. Second, an effective instant payments regime would benefit those who currently work in the informal economy and do not have access to financial services. Greater inclusion in the formal economy, in turn, would encourage increased saving and investment, facilitating capital deepening, productivity growth, and rising living standards. Third, by knitting together small countries, it would foster greater trade and economic integration. This is particularly important in Africa, where national economies are small and payment flows and cross-border investment are far lower between countries within the continent than with the rest of the world.

The G20 made a commitment in 2020 to reduce the cost and increase speed, transparency, and access of such transactions and to make the global payments regime more inclusive by 2027.[1] The Committee on Payments and Market Infrastructures (CPMI) and the Financial Stability Board (FSB) were tasked by the G20 with moving this work forward. To date, the CPMI and the FSB have completed an assessment of the best way to do so, identified the key steps that need to be completed in order to achieve the G20 goals, and begun to move into implementation, with guidance to help countries and regions to resolve policy issues with respect to issues such as data harmonization and regulation.

1. In 2011, the G20 also implemented an initiative to reduce the cost and increase the inclusion of cross-border payments.

To effectively facilitate cross-border payments in regions such as Africa, support from the major multilateral institutions will be needed.

To effectively facilitate cross-border payments in regions such as Africa, support from the major multilateral institutions, including the Bank for International Settlements (BIS), the International Monetary Fund (IMF), and the World Bank, will be needed. In particular, these institutions will need to play important roles in providing technical support and assistance and helping to coordinate the effort at a regional level.

The game plan envisioned by the BIS is to continue to develop national instant payment systems (IPSs) and to knit them together through a hub-and-spoke system. The BIS is working on building such a hub though Project Nexus. Project Nexus is designed to enable the IPSs of India, Malaysia, Singapore, and Thailand to seamlessly pass payments through Nexus from one country's IPS to another, with conversion from one sovereign currency to another. Over time, the goal is to link other national and regional IPSs to Nexus in order to create an integrated global IPS platform. Other regions, such as the European Union, have recently indicated interest in linking their systems to Project Nexus in the future.

At the same time, Agustin Carstens, BIS general manager, and Nandan Nilekani, Chairman of Infosys, have proposed a concept that is much more ambitious in its scope but would take far longer to implement. In the Finternet, financial asset claims would be tokenized and settled on a unified ledger. The tokenized assets would embody both the financial claim itself and its ownership information. Moreover, the tokens would have the capacity to embed smart contracts that would be executed automatically whenever the smart contract's predetermined set of conditions was satisfied.

Both approaches are worthwhile, in part because knitting national IPSs together will be achievable relatively quickly, while the Finternet will take far longer to be realized. At the same time, the potential payoff from the Finternet is far larger because it could substantially increase functionality and be applied to a wide range of financial and nonfinancial asset classes, not just cross-border payment transactions.

While knitting national IPSs together is clearly easier than leapfrogging to the Finternet, a number of issues still need to be addressed. Most importantly, viable national IPSs are a critical prerequisite to achieving a global system. If a national IPS does not have significant market penetration domestically, then the incentives to use the IPS to initiate cross-border payments will likely be modest. If many IPSs are in this position, building a viable global regime will be very difficult.

A review of the current status of IPSs around the globe reveals a sharp contrast between countries such as Brazil and India, whose IPSs have rapidly gained large market shares in domestic person-to-person (P2P) and person-to-business (P2B) payments, compared to countries such as the United States, where IPSs have much lower market shares.

In the United States, only a small proportion of US depository institutions are participants in the two competing IPSs—FedNow (operated by the Federal

Reserve) and Real Time Payments (RTP, operated by the New York Clearinghouse)—and the two IPSs account for a negligible share of total US retail payment transaction volume. Households in the United States appear content to use their credit and debit cards for most retail payments. The incentives to switch to a new IPS are weak in the United States because, from the household's perspective, credit card use is subsidized by the high interchange fees paid by retail merchants. In the euro area, the TARGET Instant Payment Settlement (TIPS) regime is not used much either, and in China, e-CNY has made little headway against incumbent payment systems such as Alipay and WeChat Pay.

Moreover, the road to harmonizing standards and agreeing on governance and how issues of anti–money laundering, fraud, and cyber risks should be addressed is a difficult one. Project Nexus will gain valuable experience tackling the problems that need to be overcome to successfully implement such a system. That said, the hub-and-spoke model is the appropriate one, as it reduces the costs of interoperability and shared governance.

Also, scaling to achieve full network effects will be difficult when major countries such as the United States do not have IPSs that are dominant domestically. It is hard to see how a global regime can be truly successful without much greater involvement by the United States, given that it is the largest economy globally, enjoys the world's leading reserve currency, and dominates international financial transactions. It is noteworthy, for example, that stablecoins denominated in dollars account for the overwhelming share of stablecoin assets.

Finally, there is a risk that cross-border payments will fracture geopolitically into two separate regimes, with one side using a dollar-based regime and the other side using a regime created by the BRICS countries (originally Brazil, Russia, India, China, and South Africa). Sanction risk has created incentives for some countries to move away from a dollar-oriented regime and to establish their own cross-border payments system. In October 2024, the BRICs members supported "strengthening of correspondent banking networks within BRICs and enabling settlements in local currencies in line with the BRICS cross-border payment initiative."[2]

Transitioning to a Finternet would be even more difficult, and a much broader set of issues would need to be addressed before this path to faster global payments would be viable. It would require developing harmonized standards for unified ledgers, ensuring interoperability across such ledgers, and developing robust regulatory and governance regimes in each country and then harmonizing these regimes across countries. Decisions would need to be made about whether the foundational financial asset would be a retail central bank digital currency (CBDC) or stablecoins backed by central bank reserves and short-term sovereign obligations. The risk of flight from

2. See "Kazan Declaration: Strengthening Multilateralism for Just Global Development and Security" (issued at the XVI BRICS Summit, Kazan, Russian Federation, October 23, 2024), http://static.kremlin.ru/media/events/files/en/RosOySvLzGaJtmx2wYFv0IN4NSPZploG.pdf.

stablecoins to CBDCs would also need to be addressed, as well as the risk of flight from one stablecoin or CBDC to another currency (e.g., the dollar) during times of stress.

In addition, the legal basis of tokens would need to be clarified and harmonized and agreement reached on who will regulate them, how they will be regulated, and what outcomes such regulation seeks to achieve. Although this clarification would take place on a country-by-country basis, it would need to take place in a harmonized way so that all the pieces could ultimately be integrated. This is important not just for increasing efficiency and reducing operating costs, but also to ensure operational resiliency and financial stability.

The BIS, through Project Agora, is beginning to tackle these issues. In this project, central banks will work closely with a consortium of regulated financial institutions brought together by the Institute for International Finance. The goal is to identify the pertinent issues that need to be resolved and determine how they should be addressed.

To support the success of the G20 initiative to reduce the cost and increase the speed, transparency, and access of cross-border payments, a number of structural changes to the current regime are necessary:

- The G20 countries need to fully support Project Nexus. BIS member countries should commit to interlinking their IPSs via Project Nexus and establish a plan and time frame for doing so.
- The IMF should be tasked with providing country-by-country evaluations of the status of and progress in developing national IPSs and linking them to Nexus. The World Bank should be tasked with providing technical and financial support to help lower-income countries do this.
- Central banks need to move more quickly to 24/7 real-time gross settlement. This is necessary to reduce liquidity and settlement risk and to decrease the opportunity for fraud. As part of this effort, the feasibility and benefits of creating a global financial market clearing and settlement utility should be evaluated.
- Countries need to take steps to ensure that their national IPSs are actively used by a large segment of households and businesses. Without a successful national IPS, the benefits gained from linking to a global regime such as the one envisioned by Project Nexus will be limited.
- The effort should include ensuring participation and access by nonbank payment endpoint providers. This would support the inclusion of people who are unbanked. Also, it would limit the market power of those who sit in the middle in current legacy payment systems who may not support changes that might reduce their profitability and market dominance.
- Explicit steps should be taken to more fully include the private sector in the transition process.

With respect to transitioning to the Finternet, a number of important factors must also be considered:

- Greater clarity is needed about the regulatory system under which such a tokenized regime would operate. This clarity is necessary to reduce legal risks and to provide a stable framework to facilitate business planning and to encourage experimentation and investment.
- Regulatory burdens and standards should be proportional to the risk. There also should be a road map outlining how regulation will evolve as scale is achieved and activities become systemic.
- Stronger public-private partnerships are needed. After all, innovation will be driven by banks; other financial service firms, including fintechs; and technologists. At the same time, central banks and other regulators need to develop greater expertise so that they can better assess the trade-off between opportunity and risk.
- Central banks will need to prepare to play a pivotal role in developing on- and off-ramps through which tokenized assets can be converted into fiat currencies (and vice versa). This will involve making important decisions about the role of CBDCs versus stablecoins backed by central bank reserves and sovereign short-term debt.

One important challenge in both regimes will be determining how to address anti–money laundering and sanctions violations risks. The current regime is grossly inefficient, with multiple intermediaries tasked with performing compliance checks on the same set of people and businesses in multiple jurisdictions. One can imagine a better regime in which there is a central clearinghouse that is a repository of customer identities, which could be used to establish whether a customer has the attributes consistent with being a "trusted" counterparty. Not only would a common registrar reduce complexity and cost, but it would undoubtedly be a spur to standardizing the approach to managing anti–money laundering risks.

This paper evaluates the progress made to date, the impediments that need to be overcome, and the steps that should be undertaken to facilitate faster progress.

Introduction

The central thesis of the Multilateral Reform Working Group is threefold: (1) cooperative international efforts can lead to superior outcomes compared to those achieved by each country going it alone; (2) there are many areas in which such cooperation would generate significant economic benefits; and (3) multilateral institutions can play an important role in this process.

The Working Group's first paper, Strengthening the Bretton Woods Institutions to Meet 21st-Century Global Challenges, examined how the major international multilateral institutions, particularly the International Monetary Fund (IMF) and the World Bank, might be reformed to help make these institutions more effective in tackling the most important global public goods problem of our time, climate change.[3] The authors identified three significant gaps that were limiting progress: governance, implementation, and accountability. The paper proposed a number of actions and reforms to address those gaps.

In this paper, we turn our focus to another global issue, with a much different set of public and private sector participants: How to achieve progress in making global cross-border payments less costly, faster, safer, and more inclusive—consistent with the goals established by the G20 in 2020. This paper evaluates the progress made to date, the impediments that need to be overcome, and the steps that should be undertaken to facilitate faster progress.

Two competing paths are evaluated: (1) further development of national instant payment systems (IPSs) and interlinking them together and (2) a new global regime in which tokenization would digitally represent financial assets on a unified ledger. This second regime would enable instantaneous settlement and allow "smart contracts" to be embedded in the tokenized assets. Such smart contracts would enable the automatic execution of a set of instructions when a given set of conditions was met.

The paper is divided into seven sections. The first discusses the G20 commitment to reduce the cost of and improve access to execution of cross-border payments, and what is being done to achieve the G20 targets. The second section of the paper evaluates two different paths to transitioning to a harmonized regime of low-cost global payments: development of national IPSs that are then linked together, or leapfrogging to a new technology and way of managing payments—tokenized payments settled on a unified ledger. The third section evaluates the development of national IPSs. The fourth evaluates progress in knitting these IPSs together, focusing on the Bank for International Settlements' (BIS's) Project Nexus. The fifth section evaluates the numerous issues and challenges involved with moving to a Finternet regime, and the sixth section proposes a number of actions that should be taken to help facilitate progress toward achieving the G20 cross-border payments mandate and transitioning, over the longer term, to a viable Finternet. The final section summarizes the conclusions of the report.

3. Multilateral Reform Working Group of the Bretton Woods Committee, Strengthening the Bretton Woods Institutions to Meet 21st-Century Global Challenges (Washington, DC: Bretton Woods Committee, 2024), https://brettonwoods.org/sites/default/files/documents/BWC_MRWG2024_final.pdf.

I. Global Cross-Border Payments: The G20 Agenda for Progress

In 2020, the G20 determined that the global payments system remained deficient in a number of important respects and endorsed a road map to remedy these shortcomings.[4] In particular, cross-border payments, in which transactions are executed across national borders and the funds are converted from one currency into another, were costly to execute, slow, and complex, often requiring a long chain of financial intermediaries to send, receive, and settle a global payment.[5] In response, the G20 committed to make significant progress to reduce cost, improve efficiency, reduce risk, and improve access by 2027.

There were several motivations behind the G20 initiative.[6] First, cross-border payments have grown rapidly, increasing by 64 percent, to $707 billion, during the last decade.

Second, despite the increase in the volume of activity, the unit cost of sending and receiving such remittances has remained very high. For example, the Financial Stability Board (FSB) estimated that the average cost of sending a $200 remittance in 2019 was 6.82 percent, far above the level targeted in 2011, when the G20 committed to reduce this cost to 5 percent.[7]

Third, in some regions, the correspondent banking networks through which most cross-border payments flow have been hollowed out. This is especially relevant for smaller, lower-income nations. In some cases, international banks have concluded that the business opportunities in such countries are too small relative to the risk of liability arising from anti–money laundering or sanctions violations. This problem is particularly acute in Africa. As a consequence, in some countries, access to international payment networks has become impaired and the cost of executing cross-border payments has increased.

The FSB and the Committee on Payments and Market Infrastructures (CPMI) were tasked by the G20 with moving the work forward. To date, the FSB and CPMI have made considerable progress in identifying the challenges and frictions involved in executing cross-border payments and providing a road map for further development. The box on pages 8 and 9 provide more details on the FSB's and CPMI's roles and efforts.

4. "Communique" (issued at G20 Finance Ministers and Central Bank Governors Meeting [virtual], October 14, 2020), https://www.g20.utoronto.ca/2020/2020-g20-finance-1014.html.
5. There are also cross-border payments denominated in a single sovereign currency or cryptocurrency (e.g., the US dollar or bitcoin). However, the focus in this report is on transactions in sovereign currencies that include a foreign exchange conversion component.
6. Financial Stability Board, Enhancing Cross-border Payments: Stage 1 Report to the G20; Technical Background Report (Basel, Switzerland: Financial Stability Board, 2020), https://www.fsb.org/uploads/P090420-2.pdf.
7. Ibid

Box. The FSB and CPMI Lead the Way

Following the G20 commitment to make cross-border payments faster, less expensive, more transparent, and more inclusive, the FSB and the CPMI were tasked with moving the effort forward.

In stage one, the FSB assessed the existing arrangements and challenges of cross-border payments and concluded the following:[8]

- Cross-border payments "face challenges of high costs, low speed, limited access and
- insufficient transparency."[9]
- To enhance cross-border payments, friction in existing payment processes needs to be reduced.
- "Financial innovation is creating opportunities to make payments more efficient."[10]
- Technological innovation is important in creating the potential for either improving existing processes and arrangements or developing "new structures and ecosystems."[11]
- The new technologies and business models also "involve challenges and risks."[12]
- The public sector "has an important role to play, working with the private sector to leverage opportunities and address challenges."[13]

In stage two, the CPMI outlined how to address the challenges, laying out 19 building blocks in five distinct areas:[14]

- Public and private sector commitment: Developing a common vision and targets, implementation of a common set of international principles, and defining appropriate service levels
- Developing regulatory, supervisory, and oversight frameworks: The alignment of these frameworks, including comprehensively and consistently applying standards to combat money laundering and terrorism financing, reviewing the interaction between data frameworks and cross-border payments, promoting safe payment corridors, and fostering "know your customer" and identity-sharing information
- Improving existing payment infrastructures and arrangements: Facilitating greater adoption of payment versus payment (PvP) mechanisms, improving direct access, exploring the potential for developing reciprocal liquidity arrangements, extending and aligning operating hours, and interlinking national and regional payment systems
- Data and market practices: Adoption of harmonized ISO 20022 messaging standards, harmonizing application programming interface (API) protocols for the exchange of data, and establishing unique identifiers with proxy registries[15]
- New payment infrastructures and arrangements: Evaluating the feasibility of new multilateral platforms and arrangements for cross-border payments, ensuring sound global stablecoin arrangements, and including the appropriate international dimension in central bank digital currency (CBDC) design

8. Financial Stability Board, Enhancing Cross-Border Payments: Stage 1 Report to the G20 (Basel, Switzerland: Financial Stability Board, 2020), https://www.fsb.org/uploads/P090420-1.pdf
9. Ibid., 1.
10. Ibid
11. Ibid., 2.
12. Ibid.
13. Ibid.
14. See Committee on Payments and Market Infrastructures, Enhancing Cross-Border Payments: Building Blocks of a Global Roadmap; Stage 2 Report to the G20 (Mexico City: Bank for International Settlements, 2020), https://www.bis.org/cpmi/publ/d193.pdf.
15. ISO 20222 is a global data messaging standard used in the exchange of financial information. A global standard facilitates communication between different payment and settlement systems and financial intermediaries, improving speed, increasing accuracy, and reducing the need for manual intervention.

(continued)

Box. The FSB and CPMI Lead the Way

In stage three, the FSB set out a road map for making progress, focusing on five areas:[16]

- Developing a joint public and private vision for how to enhance cross-border payments
- Coordinating on the development of regulatory, supervisory, and oversight frameworks
- Improving existing payment infrastructures and arrangements to support cross-border payments
- Improving data quality and straight-through processing
- Exploring the potential of new payment infrastructures and arrangements

These stages were followed by consultation and progress reports by the FSB and CPMI with respect to the road map. In 2024, the FSB has focused on aligning data frameworks to help enable interoperability and on how bank and nonbank payment service providers should be regulated. The CPMI has focused on more technical aspects of cross-border payments, including service level agreements and how to harmonize APIs. In addition, the CPMI has conducted a monitoring survey that focuses on payment system interoperability, data and message standards, and legal and regulatory frameworks.[17]

II. Two Alternative Paths: Linking National Instant Payment Systems versus the Finternet

Currently, there are two distinct potential paths toward an effective cross-border payments system that would be cost-efficient and accessible for those who want to make smaller-dollar retail and person-to-person (P2P) payments:

- Develop national IPSs, extend central bank real-time gross settlement (RTGS) systems' operating hours, and knit these national IPSs together—either bilaterally or via a hub-and-spoke system. In this regime, a payment that originated in one country and currency would be settled in another country and currency. This is the focus of the CPMI and FSB's work and the work of the BIS Innovation Hub's Project Nexus.

- Develop a Finternet in which tokenized assets (e.g., CBDCs, stablecoins, and other financial assets) can be exchanged within and across national borders and settled on unified ledgers.[18] In such a regime, the tokenized assets would include information about what the asset is and who owns it, as well as rules on how the asset can be used. This system would include the ability to embed "smart contracts" that could be automatically executed when some particular set of criteria was satisfied.

The first approach, of knitting IPSs together, has two alternative structures: a complex matrix of bilateral relationships or a common hub to which each national IPS is linked, with payments passing through the hub onward to other national IPSs linked to the system.

16. Financial Stability Board, Enhancing Cross-Board Payments: Stage 3 Roadmap (Basel, Switzerland: Financial Stability Board, 2020), https://www.fsb.org/uploads/P131020-1.pdf.
17. See Financial Stability Board, Recommendations to Promote Alignment and Interoperability Across Data Frameworks Related to Cross Border Payments, July 16, 2024, https://www.fsb.org/2024/07/recommendations-to-promote-alignment-and-interoperability-across-data-frameworks-related-to-cross-border-payments-consultation-report/ and Recommendations for Regulating and Supervising Bank and Non-bank Payment Service Providers Offering Cross-border Payment Services: Consultation report, July 16, 2024, https://www.fsb.org/2024/07/recommendations-for-regulating-and-supervising-bank-and-non-bank-payment-service-providers-offering-cross-border-payment-services-consultation-report/.
18. See Agustin Carstens and Nandan Nilekani, "Finternet: The Financial System for the Future" (BIS Working Paper no. 1178, Bank for International Settlements, Mexico City, April 15, 2024), https://www.bis.org/publ/work1178.pdf.

The hub-and-spoke model has several important advantages. First, the number of links increases linearly with the number of countries involved. In contrast, in a bilateral framework, the number of links expands geometrically as the number of countries increases. For example, with 5 countries, the number of bilateral links would be 10; with 10 countries, the number of links increases to 45. Second, the hub-and-spoke model is likely to encourage greater harmonization of standards in order to minimize the difficulty of linking with the hub and in passing payments along to another country's IPS.

In contrast, the Finternet concept represents a much more radical change in how payments would be executed on an international basis. It also is much broader in scope because the framework envisions including a much wider set of financial intermediaries—banks, securities firms, insurers, other financial services companies, payment providers—and types of assets and products. As envisioned, the Finternet would serve as the rails not just to execute payments but also to transact in a wide range of financial and nonfinancial assets. Cross-border payments would represent a small share of the total activity.

As shown in figure 1, the concept envisions developing an entirely new financial ecosystem that rests on the tokenization of financial assets and the use of shared, unified ledgers.[19]

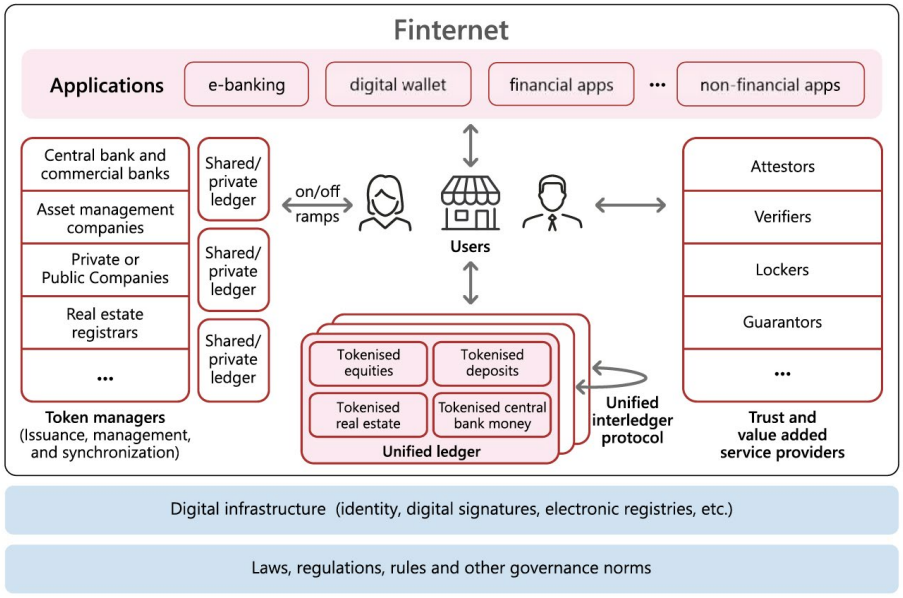

Figure 1. Finternet ecosystem.

While considerably narrower and less ambitious than the Finternet concept, the approach of linking together national IPSs is much closer to realization. Not only have a number of IPSs been established on a national level, but considerable progress has also been made on determining how to knit these IPSs together internationally.

19. Ibid., 13. See the paper for a more detailed description of the concept and its elements.

But the second approach, which is only at the conceptual stage, may ultimately turn out to be more transformative in improving the efficiency of and access to the global payment system. That is because it would rework how payments and other financial transactions are executed both nationally and across international borders. In this regime, tokenized assets tied to individual owners (e.g., stablecoins) would be recorded on a unified ledger. This ledger would enable settlement of transactions in central bank money on a global basis. The conversion of the tokenized assets back into fiat currencies would be managed through on- and off-ramps implemented and managed by national central banks.

III. The Development of National Instant Payment Systems

In recent years, significant progress has been made in developing national IPSs that serve—in several countries—as the backbone of the nation's payments regime. Brazil's Pix system and India's Unified Payments Interface (UPI) are two of the most successful IPSs. See the box on page 12 for more details. Several Southeast Asian countries, including Malaysia, the Philippines, Thailand, and Singapore, have also established successful national IPSs.

In many other countries, progress has been much slower. While new IPSs have been introduced, take-up has often been disappointing, and the IPSs have not yet become a core part of the national payments system. In the United States, for example, the two IPSs, FedNow and the NY Clearinghouse RTP system, account for a small fraction of total P2P and P2B payments. See the box on page 13 for more details.

Similarly, in Europe, the TARGET Instant Payment Settlement (TIPS) regime, a system to facilitate the settlement of funds transfers nearly instantaneously and on a 24/7 basis, accounts for a small share of total retail payment volume. This appears to reflect the reluctance of European banks to promote instant payments and provide access to TIPS for settlement for fear of eroding significant revenue streams from interchange fees and other payment-related charges. That said, the broadening of access implemented this year to enable settlement of instant payments in Swedish krona has been a success. Sweden's usage of TIPS by Sweden has grown rapidly because Sweden already had a well-developed mobile phone IPS, SWISH, that could be connected to TIPS.

Instant payments within Europe will likely receive a further boost from the mandates announced by the European Union in March 2024. The European Central Bank (ECB) will require payment service providers that send and receive credit transfers to also offer the service of sending and receiving instant payment transfers, with the charges for such transfers no higher than the charges on the comparable credit transfers.[20] Moreover, charges for cross-border payments in euros must be the same as for comparable payments within a member state.

20. See European Central Bank, "Instant Payments Regulation," https://www.ecb.europa.eu/paym/integration/retail/instant_payments/html/instant_payments_regulation.en.html.

IPSs' lack of significant market penetration holds true even in the case of China, which introduced the digital e-CNY currency in 2020. While hundreds of millions of accounts have been established, Chinese domestic payments continue to be dominated by WeChat Pay and Alipay. See the box on page 14 for more details on e-CNY.[21]

Box. Success Stories: Brazil's Pix and India's UPI Payment Systems

Brazil's Pix and India's UPI payment systems account for a large share of the IPS payment transactions implemented on a global basis. Neither country previously had broadly used, efficient electronic retail payment systems, which has made it much easier for Pix and UPI to become the dominant means of executing domestic small-dollar payments.

The Brazil Pix payment project was implemented by the Central Bank of Brazil in 2019 to increase the speed and lower the cost of retail and P2P transactions. Before its introduction, a majority of retail payments were made with cash. Because merchant interchange fees were high for credit transactions, and the funds for the merchants were not available for up to 30 days, many merchants did not accept credit cards for payment; instead, cash payments predominated. In addition, about 20 percent of households were unbanked.

To address these problems, the Bank of Brazil developed the Pix system and mandated that Brazilian banks with more than 500,000 transaction accounts had to provide their customers with access to this service. In addition, the central bank opened up Pix to other financial service providers, which enabled millions of Brazilian households to obtain access even if they did not have a bank account.

The initial starting point—an inefficient payment system and the central bank mandate—enabled Pix to rapidly scale. Because Pix satisfied a real need for both households and merchants, usage rose rapidly. In one year, the volume of Pix transactions matched the volume of debit and credit transactions. Subsequently, Pix has continued to grow rapidly and has become the leading means for retail and P2P payments in Brazil.

India's UPI system was developed by the National Payment Corporation of India, with sponsorship by the Reserve Bank of India. Introduced in 2016, UPI is a platform that enables customers to transfer money instantly between bank accounts using their mobile phones and to initiate payments using a single identifier such as a mobile phone number. To stimulate adoption, UPI is interoperable (customers can use any bank's UPI app to execute a payment) and subsidized by the Indian government, which makes it the low-cost alternative, and development has continued in order to support a broader range of transactions, including new types of person-to-business (P2B), bill, and merchant payments. As a consequence, UPI is the dominant P2P and P2B payment system in India.

The success of Pix and UPI offers a number of important lessons:

1. The government (including the central bank) needs to play an active role in setting the ground rules and ensuring that the incentives are aligned to support household and business use of the new systems.
2. Starting conditions matter. When the incumbent payments regime is inefficient and less inclusive, there is a greater likelihood that innovation will lead to rapid take-up and widespread adoption of a new alternative.
3. Sometimes there needs to be a carrot, other times a stick. The carrot might be government financial support, technical assistance, and support in coordinating the roles of the public and private sectors. The stick might be mandates and requirements that help in ensuring interoperability, access, scale, and ease of use.

21. The World Bank is building a comprehensive database of retail fast payment systems around the world. See World Bank, "Project FASTT," https://fastpayments.worldbank.org/.

Box. The United States: Slow Going for FedNow and the NY Clearinghouse RTP System

The United States has two competing IPSs: the Real Time Payments (RTP) system (operated by the NY Clearinghouse and owned by a consortium of major US and foreign banks), which began operations in 2017, and FedNow (operated by the Federal Reserve), which began operations in 2023.

RTP was developed to enable money to be transmitted between banks in the United States, instantaneously, on a 24/7 basis. The system was developed to fill a need not met by automated clearing house (ACH) payments and wire transfer payments. For ACH payments, there is a delay between when payment instructions are made and final settlement (most ACH is next-day settlement, but a same-day settlement option is available). For wire transfers, while there is nearly instantaneous settlement, use is limited by the wire transfer operator's hours (neither CHIPS, which is the NY Clearinghouse service and nets transactions across its members, nor Fedwire, which is the Federal Reserve service, is available 24/7) and the higher cost of executing these types of payments.

FedNow was developed to ensure that thousands of smaller depository institutions would have equitable access to an IPS. A concern was that the RTP system—owned by the major banks—might not necessarily provide attractive terms of access to smaller, nonmember institutions. Also, the introduction of FedNow was consistent with the Fed's historical role in providing payment services for US depository institutions. FedNow augments the central bank's other payment systems, such as check processing and clearing; its automated ACH service (typically used to execute recurring payments, such as monthly utility bills and P2P payments via services such as Venmo and PayPal); and Fedwire, which offers nearly instantaneous settlement and is used mainly for large-dollar payments.

To date, these IPSs are making only modest headway in displacing other forms of payments, due in large part to two major factors. First, most households are content to use credit cards for most retail payments; merchants, rather than their customers, typically absorb the cost of merchant interchange charges (while some merchants offer discounts for cash, this practice is not prevalent). Also, users do not have to pay the charges until the next monthly credit card billing cycle, and many also earn points on their purchases, which they can use to obtain free airline tickets and other rewards. Second, banks do not wish to cannibalize the revenues they earn from merchant interchange fees by offering a lower-cost payment option to merchants and other businesses.

As a consequence, only a small proportion of US depository institutions have joined RTP and/or FedNow. Usage of RTP and FedNow, while increasing, represents only a small fraction to total US retail and P2P payments.

There are three lessons here. First, starting conditions matter. Once a payments regime is entrenched and ubiquitous, there must be strong incentives to motivate users to switch to a new regime. Second, without mandates requiring financial institutions to offer a service, scaling will be slow, which, in turn, will limit the incentives for other financial institutions and their customers to join the network and use the new payment systems. Third, if the United States does not have an IPS that garners a substantial share of US payment transactions, then it will be much more difficult to achieve the type of global regime that the BIS and others are trying to work toward. Due to the size of the US economy and the role of the dollar as the major reserve currency, the incentives to join a global network will be considerably lower without US participation at scale.

Box. China's e-CNY: Still Lagging as a Means of Payment

China's e-CNY is the CBDC issued by the People's Bank of China. It is a substitute for cash, pegged to the Chinese currency, the renminbi, and designed to be used as a medium of exchange for retail payments. Although some merchants accept e-CNY for payment, and hundreds of millions of Chinese households have established e-CNY wallets, e-CNY is not used widely. There appear to be two reasons for this. First, Alipay and WeChat Pay are well entrenched as payment media in China—they are low cost and ubiquitous, with each having over 1 billion users. Unlike in the United States, card-based means of payment never were dominant in China. Moreover, because these Alipay and WeChat Pay payment methods are part of broader economic ecosystems, they already have a large and sticky user base.

Second, there may be some reluctance to use retail payment rails operated by the Chinese government. While the People's Bank of China has put in place safeguards that provide some anonymity for users, there still is a residual fear that the e-CNY CBDC regime could be used to track individual activities in a way that is not possible with cash transactions.

What the future holds is unclear. The Chinese government certainly has the power to mandate use, including on dominant retail platforms. This could facilitate a much higher domestic market share, which might make e-CNY a more attractive addition to a global IPS network.

However, the notion that e-CNY might become the dominant means of cross-border payments seems very unlikely. To displace the dollar as the leading global reserve currency, a currency needs to satisfy a number of important attributes, including being a stable store of value, offering convertibility into other currencies and financial assets both domestically and internationally, and operating in a regime in which there is a strong and consistent enforcement of the rule of law. While the renminbi satisfies some of these attributes, it lags in others—especially relative to the US dollar. In particular, there are questions about convertibility, given China's use of capital controls to limit capital outflows, and whether the rule of law is inviolable. The underdevelopment of China's capital markets relative to those of the United States will also likely limit its role.

This lack of traction underscores the importance of initial conditions and incentives in driving the development and growth of a new IPS. When the means of executing retail payments are well established (e.g., the case with credit cards in the United States), it may be difficult for new IPS regimes to gain market share even when they may be more efficient and safer.

Also, when a country has a large number of depository institutions of different types and sizes—the United States has nearly 10,000 depository institutions (commercial banks, savings and loan associations, and credit unions)—this can slow new IPS growth. In the United States, as of July 2024, the NY Clearinghouse's RTP system had only 652 financial institutions participating, and only about 1,000 participating institutions had joined FedNow by the end of September 2024.[22] This limited uptake has important consequences from a global perspective: If the two US IPSs handle only a small share of payments nationally, the benefits of adding them to an international network will also be limited.

22. See FedNow, "FedNow Service Achieves New Participation Milestone: 1000 Plus Financial Institutions," October 9, 2024, https://explore.fednow.org/explore-the-city?id=3&postId=69&postTitle=fednow-service-achieves-new-participation-milestone:-1,000-plus-financial-institutions.

With respect to lower-income countries, the promise of an IPS is very attractive, not just as a payment medium but also because it can help spur economic development.

Finally, the support for a mandated public solution (i.e., viewing a national payment infrastructure as predominately a public good) may differ markedly across countries. The terms and conditions under which public entities can operate to provide such services also may be constrained. In the United States, for example, the ability of the Federal Reserve to offer subsidized payment services that it views as public goods is sharply constrained by the Monetary Control Act of 1980, which requires the Fed to recover its costs and earn a return on its capital investment. This means that its prices will generally be comparable to those of private sector providers. In contrast, India's UPI system is heavily subsidized. Use is free for most types of transactions, with the costs of operating the system assumed by India's federal government.

Progress has also been hindered because many central banks around the world have been slow to expand the availability of their RTGS systems.[23] Most RTGS systems are not available on a 24-hour, 7-day-a-week basis, and central banks are moving slowly (or not at all) to make the necessary operational improvements to provide such access. This means that there is a time delay between when transactions are executed during off-hours and when final settlement can take place. This creates significant residual liquidity and settlement risk and is one reason why limits need to be imposed on the size of payments that can be executed on national IPS networks that do not have 24/7 settlement.

Differences in settlement regimes also will make it more difficult to link IPSs together. How would a national IPS with 24/7 settlement become comfortable establishing a link to an IPS without 24/7 settlement? The IPS would potentially be forced to take on liquidity and settlement risks that it would not be accepting domestically.[24]

With respect to lower-income countries, the promise of an IPS is very attractive, not just as a payment medium but also because it can help spur economic development. If implemented correctly, it can increase financial inclusion and facilitate increased saving and more capital investment. Also, by shortening the time between payment and the receipt of funds, an IPS can significantly reduce the working capital needs of smaller businesses.

The case for developing IPSs at the national level is particularly compelling in Africa. Interlinking such systems would also be useful in stimulating cross-border inter-African trade and achieving greater economies of scale.[25] There are several dozen national IPSs, but the degree of penetration varies sharply across countries, progress toward inclusivity differs considerably across countries, and progress in interconnecting the systems has been slow.

23. See Committee on Payments and Market Infrastructures, "Steady as We Go: Results of the 2023 CPMI Cross-Border Payments Monitoring Survey," CPMI Brief no. 5, Mexico City: Bank for International Settlements, 2024, https://www.bis.org/cpmi/publ/brief5.pdf.
24. In principle, liquidity and settlement risk could also be mitigated by having large, closed-loop networks that would allow debits and credits to be netted out internally during off-hours when RTGS systems are not available. In that case, 24/7 access to the RTGS system would not be necessary to mitigate settlement risk. But this solution is often not feasible because no single payment network is dominant, and thus the scope for netting "on-us" transactions is limited.
25. AfricaNenda, "The State of Inclusive Instant Payment Systems in Africa-2024 Report," https://www.africanenda.org/uploads/files/siips_2024_report_en.pdf.

IV. Knitting National IPSs Together

The task of knitting national IPSs together is very challenging. Linking networks bilaterally, while possible, is not always a compelling proposition because the benefits of gaining access to another country may be small relative to the difficulty of harmonizing systems and agreeing on common operating standards and governance. Establishing any single bilateral link is just a small step on the road to a global payments regime.

A hub-and-spoke model, in which national IPSs plug into a common central interface that passes payments onward across national IPS regimes, is a vastly superior model. The advantage of this approach is twofold. First, each IPS only needs to develop a single interconnection with the central hub in order to connect to the other national IPSs. Second, this model facilitates the task of determining how to interconnect systems with different configurations and technologies because harmonization must be carried out only once, rather than repeatedly. Consensus that has already been reached among existing participants also will provide an incentive for countries that wish to join the network to implement any needed adjustments in their national regime that are required for access.

In addition, once the hub-and-spoke system is operating, network effects will grow rapidly as more countries and IPSs join. Payors and payees have more incentive to use the system as the number of countries and IPSs they can access increases. At the same time, as use and volume scale, prices and unit costs fall, increasing competitiveness with traditional cross-border payment methods. This further increases the incentive to conduct cross-border payments over the network.

Over the past few years, the BIS has made significant progress in turning this concept into a viable operating regime. As noted earlier, this has been accomplished through the development of a centralized hub via Project Nexus.

The BIS effort has transitioned from the proof-of-concept stage to the implementation stage. In 2022, working with the Eurosystem, Malaysia, and Singapore, the BIS Innovation Hub successfully demonstrated Nexus as a proof of concept. Currently, the BIS Innovation Hub in Singapore is working with the IPS operators of India, Malaysia, the Philippines, Singapore, and Thailand to use Nexus to interlink their national IPS regimes together.[26] Recently, the ECB expressed its interest in joining Project Nexus as a means for enabling instant cross-border payments to and from the euro area.[27]

Constraints on Progress

Although progress is clearly being made, the pace is slow, and the world remains a long way from having a truly efficient global payments regime.

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26. For a detailed description of Project Nexus and how this global payment interface would operate, see Bank for International Settlements, Project Nexus, "Enabling instant cross-border payments," July 1, 2024, https://www.bis.org/publ/othp86.pdf.
"Project Nexus: Enabling Instant Cross-Border Payments," updated November 4, 2024, https://www.bis.org/about/bisih/topics/fmis/nexus.htm.
27. See European Central Bank, "TIPS to Connect to Other Fast Payment Systems Globally," October 21, 2024, https://www.ecb.europa.eu/home/doc/ecb.doc241021_TIPS_to_connect_to_other_fast_payment_systems.en.pdf.

There are several important impediments. First, as noted earlier, progress toward viable national IPSs has been slow in many countries. A global system requires viable national IPSs, with broad participation and significant local market share.

Second, interlinking IPSs is difficult, reflecting several challenges: data harmonization; development of common governance standards; coordination of compliance rules, and addressing anti–money laundering, sanctions, and cyber and fraud risks.

With respect to data, a number of issues need to be resolved. Although the ISO 20022 messaging standard is being widely adopted, many national legacy systems have not yet made the transition. Moreover, even when the ISO 20022 standard has been adapted, it often has been adjusted to accommodate national frameworks and preferences. These modifications have been motivated by differences in law, regulation, and how institutional arrangements developed locally with respect to who provides payment services and how these payment service providers are regulated. Consider, for example, that nonbank money transmitters in the United States are regulated by each of the 50 states rather than nationally.

Governance is also an issue. How do the national payments regimes interact with one another to establish common standards with respect to speed, cost, transparency, resiliency, fraud and cyber risk, and compliance with anti–money laundering requirements and sanctions?[28] What protections exist for payees and payors against fraud? How are disputes between payors and payees resolved when they sit in different countries and legal regimes? How are local anti–money laundering standards enforced on a cross-border basis in a consistent manner?

Project Nexus is designed to address these issues. It does so, in part, by clearly defining the responsibilities of the central hub that provides the interlinking service, the local payment system providers, and the national IPSs that are interlinked.

As envisioned in Nexus, the hub acts as the mechanism that enables the transmission of payment instructions between distinct national IPSs. It does this by standardizing how IPSs connect to the central hub through the use of APIs. The hub's role is to hand off the payment instructions from one national IPS to another nearly instantaneously. The time to execute a payment can be as short as one minute—the time it takes each IPS to process its part of the transaction.

Figure 2 illustrates how the Nexus system would operate.[29] A payment sender would instruct their payment system provider to initiate a payment to a recipient in a different country. The payment instructions would pass from

28. In Project Mandala, the BIS Singapore Innovation Hub worked with the central banks of Australia, South Korea, Malaysia, and Singapore to evaluate how compliance could be automated to provide a real-time monitoring capability on a cross-border basis. The project shows how regulatory compliance requirements, which can differ among countries, can be embedded in cross-border transaction protocols. Project Mandala, Streamlining cross-border transaction compliance, October 2024, BIS Innovation Hub, https://www.bis.org/publ/othp87.pdf.
29. Project Nexus, Enabling instant cross-border payments, July 1, 2024, BIS, 27. https://www.bis.org/publ/othp86.pdf.

the sender's national IPS system through the Nexus gateway and onward to the destination IPS and from there to the recipient. A foreign exchange provider would manage the conversion of the sender's currency into the recipient's currency. This service would be offered competitively by foreign exchange providers, and the cost of the currency conversion would be made transparent to the sender.

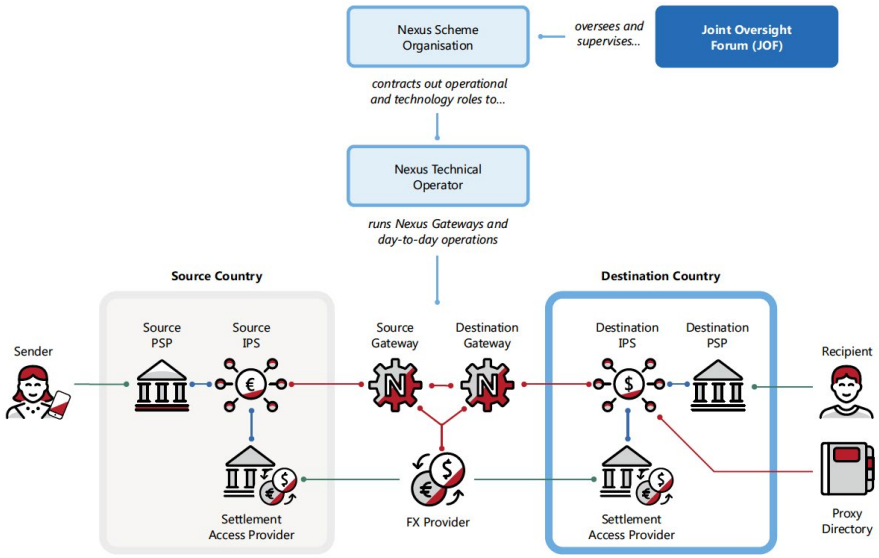

Figure 2. Nexus system operation.
Note: FX=foreign exchange; IPS=instant payment system; PSP=payment system provider

Nexus also takes important steps to ensure broad access. Any payor or payee that is allowed to participate in a national IPS can—subject to meeting anti–money laundering compliance standards—transact internationally. When different national IPSs have different payment limits, the lower limit applies for the international payment.

Finally, Nexus has created a standardized Nexus rulebook and governance structure. As envisioned, Nexus would be owned and governed by a legal entity called the Nexus Scheme Organization (NSO). The NSO would operate on a nonprofit basis. The NSO would be responsible for keeping the Nexus rulebook up to date and managing Nexus. Member countries would need to abide by the Nexus rulebook. Participating countries would jointly own Nexus (under the guidance of the country's central bank or IPS operator). They would have voting rights—one country, one vote—and the NSO's operations would be overseen by a CEO and the NSO Board of Directors.

Despite the progress made with Nexus, a number of impediments remain that may limit its success over the near term.

First, it takes considerable time to harmonize technologies and standards in a way that allows a national IPS to interlink with other national IPSs through Nexus.

Second, even when such links can be established, the use of Nexus to facilitate cross-border payments will be limited by two factors: the number of

A larger number of countries means greater scope and volume, which both reduces per unit costs and increases the incentives for users to use Nexus as their primary means of executing cross-border payments.

countries that have been interlinked and how successful each IPS is in its home country.

Third, regulators and central banks need to ensure that incentives are in place to encourage the private sector to participate.

A larger number of countries means greater scope and volume, which both reduces per unit costs and increases the incentives for users to use Nexus as their primary means of executing cross-border payments.

In the same way, more market share in the local IPS increases throughput in Nexus. It seems doubtful that a national IPS without a significant domestic market share of retail payments would be used extensively internationally.

In the project's initial stages, with a limited network of countries that can be accessed through Nexus and limited participation in some countries' IPSs, economies of scope and scale will also be constrained. Will the participating central banks retain the political support to provide the resources necessary to enable Nexus to operate during this start-up stage when it may be incurring significant losses?

With respect to incentives, the benefits of joining a network increase as the number of participating countries increases. This means that in its initial stages, when the network of countries is small, the incentives of others to join will be weak.

One particular challenge is the role the United States plays in global payments. While the United States is the biggest economy in the world, and the dollar is the major reserve currency supporting global trade and serves as a leg on 88 percent of global foreign exchange transactions,[30] the United States' national IPSs (FedNow and RTP) have only a small share of national payment flows—only about 1.5 percent in 2023.[31] Instead, the major credit card companies, such as Mastercard and Visa, dominate P2B payments domestically. And P2P payments are mainly handled by private companies such as Venmo and Zelle, using the Fed's ACH rails, and via cash and check transactions.

The United States also lags behind in a number of other areas: development of a 24/7 RTGS system, establishing a regulatory framework for digital payments and stablecoins, creating a CBDC, and enabling fintech firms to establish master accounts at the Fed to support the provision of their payment services.[32] In addition, the fact that US fintech firms that provide payment services are typically regulated as money transmitters on a state-by-state basis makes it more difficult to implement national standards.

Another impediment is the fact that regulators and central banks often demonstrate little appetite for proactive intervention to develop new

30. See Atlantic Council, "Dollar Dominance Monitor," updated June 24, 2024, https://www.atlanticcouncil.org/programs/geoeconomics-center/dollar-dominance-monitor/.
31. See ACI Worldwide, "It's Prime Time for Real-Time," (Elkhorn, NE: ACI Worldwide, 2024), https://aciworldwide.com/prime-time-for-real-time-report.
32. For example, when Facebook (now Meta) applied to the Fed to establish the Libra stablecoin, which was envisioned as a means for facilitating cross-border transactions, Facebook made no progress in obtaining approval for its application even after it demonstrated a willingness to make changes to address the Fed's concerns. Apparently, opposition by the US Treasury and fears that that Libra might scale very quickly with unknown and, potentially, negative unintended consequences, doomed the project. See "Facebook Libra: The Inside Story of How the Company's Cryptocurrency Dream Died," Financial Times, March 10, 2023, https://www.ft.com/content/a88fb591-72d5-4b6b-bb5d-223adfb893f3.

payments regimes that utilize cutting-edge technologies. This presumably reflects many factors, including uncertainty about the risks of new technologies and ways of doing business and the absence of demonstrable negative consequences of maintaining the existing ways of conducting cross-border payments. It may also reflect a bias that payments activity should be left, whenever possible, to the private sector—a bias sometimes reinforced by the lack of political support for central bank payment initiatives. For example, the US Congress has generally been hostile to the idea of the Federal Reserve developing a CBDC—so much so that Chairman Powell has said that the Fed would not proceed without explicit legislation by Congress.

Historically, central banks have shown an appetite for addressing problems that threaten financial stability and that impair the effective transmission of monetary policy to the real economy. For example, following the Great Financial Crisis of 2007–2009, central banks and securities regulators responded proactively in several areas beyond their traditional regulatory and supervisory mandates (e.g., requiring higher capital and liquidity requirements and bank stress testing) aimed at increasing the resiliency of the core banking system. These broader actions included (1) mandating the central clearing of over-the-counter derivatives and improving the regulation and oversight of financial market utilities and (2) mandating and managing the transition from LIBOR to SOFR (and to other benchmark rates).

In contrast, central banks have been much less proactive in cases where the problems do not pose a direct threat to bank safety and soundness or financial stability. With respect to payments, the incentive to move proactively is much lower, and support for change is harder to muster, given the disparate entrenched private interests; the uncertainties about the ability to successfully manage the transition and the benefits that will ultimately be achieved also limit the appetite for such initiatives. The fact that payments policy issues are typically subordinated to monetary policy, bank supervision and regulation, and financial stability concerns also makes it difficult to develop and retain the deep technological and payments expertise that is required to make sustained progress.

Finally, there is a risk that cross-border payments will fracture geopolitically into two separate regimes, with one side using a dollar-based regime and the other side using a regime created by the BRICS countries (originally Brazil, Russia, India, China, and South Africa). Sanction risk has created incentives for some countries to move away from a dollar-oriented regime and to establish their own cross-border payments system. In October 2024, the BRICs members supported "strengthening of correspondent banking networks within BRICs and enabling settlements in local currencies in line with the BRICS cross-border payment initiative."[33]

33. See "Kazan Declaration: Strengthening Multilateralism for Just Global Development and Security" (issued at the XVI BRICS Summit, Kazan, Russian Federation, October 23, 2024), http://static.kremlin.ru/media/events/files/en/RosOySvLzGaJtmx2wYFv0IN4NSPZploG.pdf.

Other Options

Although Project Nexus appears to be the leading candidate to make significant progress in reducing the cost and increasing the speed of cross-border payments, it is important to recognize that there are other potential paths forward. For example, while there has been considerable progress on the front end of payments (how payors execute payments on a P2P and P2B basis), much less progress has been made on the back end (how payments are cleared and settled). With respect to cross-border payments, one major pain point is the access and availability of correspondent banks to facilitate settlement. This problem has become more acute with the hollowing out of correspondent banking services, particularly in regions where some correspondent banks have judged that anti–money laundering and sanctions risks outweigh the revenue opportunities. This problem is particularly acute in Africa.

One way to address the shortcomings on the back end would be build a regulated financial market infrastructure (FMI) that would operate on a global basis and would provide clearing and settlement services across a broad range of financial markets, including cross-border payments.

Specific attributes of the FMI might include the following:

- Responsibility confined to regulated assets and liabilities to facilitate oversight
- 24/7 availability with instant, atomic settlement
- Incorporation of both commercial bank and central bank money
- Interoperability with domestic RTGS systems and on a cross-border basis

Obviously, the development of a new FMI of this type would require sponsorship, and many questions of governance would need to be resolved. But the precedent for this type of FMI already exists in other areas such as payment messaging (SWIFT) and foreign exchange settlement (Continuous Linked Settlement [CLS]). The BIS and the CPMI should evaluate what such a project would entail, its potential costs and benefits, and how it could be advanced, in consultation with the private sector.

V. The Finternet Regime

An alternative approach to linking IPS regimes together via Nexus or some alternative hub-based approach is to leapfrog to the Finternet. As envisioned by Augustin Carstens and Nandan Nilekani, the Finternet would leverage tokenization and unified ledgers enabling "multiple financial ecosystems interconnected with each other—much like the internet."[34] As envisioned by the authors, bringing multiple financial assets together on a single unified ledger would enable clearing and settlement to occur much more quickly and efficiently. Tokenization would allow all the information "required for the transaction of a financial asset (e.g., ownership, rules and logic governing

34. "The Finternet: the financial system for the future. BIS Working paper, 1178, April 15, 2024, 1, https://www.bis.org/publ/work1178.pdf.

transfers) [to] reside in one place."[35] The unified ledger could be implemented on blockchain or centralized. Most likely, to manage anti–money laundering risks, a blockchain solution would be permissioned rather than permissionless. Finally, tokens could have imbedded "smart contracts" that would enable actions to be undertaken automatically once a particular set of conditions had been satisfied.

Of course, getting from here to there would be extraordinarily challenging. In particular, the architecture of the Finternet would be vastly different from that of today's global payments regime.

Creating the Finternet would require the following:

- Developing global harmonized standards for unified ledgers
- Ensuring interoperability across unified ledgers
- Developing a robust regulatory and governance framework within each country that is harmonized on a global basis
- Settling on whether the foundational financial asset would be retail CBDCs or stablecoins backed by central bank reserves and short-term sovereign obligations and, if both were enabled, ensuring that the potential flight from stablecoins to CBDCs during times of stress would not threaten financial stability or the implementation of monetary policy
- Legal clarification of what tokens are (e.g., When should they be treated as securities versus deposits? What regulations would apply in each case?)
- Identifying who would regulate the tokens and what the regulatory goals and standards would be (e.g., with respect to consumer protection, anti–money laundering, operational resiliency, fraud protection, and cyber risk)
- Harmonizing standards and governance so that the regime could operate on a global basis

With Project Agora, the BIS Innovation Hub is beginning to take the first steps to tackle these issues. In Project Agora, seven central banks will begin to work on these issues with a large group of private, regulated financial intermediaries that have been brought into the project by the Institute of International Finance. The goal of the initial work is to "test the desirability, feasibility and viability of a multi-currency unified ledger for wholesale cross-border payments."[36] However, down the road, this work would need to be broadened to include retail cross-border payments and involve a wider set of participants, including payment service providers and others that wish to offer cross-border payments as a service.

35. Ibid., 9.
36. Bank for International Settlements, "Project Agora—Frequently Asked Questions," September 16, 2024, https://www.bis.org/innovation_hub/projects/agora_faq.pdf.

VI. The Way Forward

The public and private sector should work to ensure that both transition paths remain viable. The public sector should remain agnostic about whether knitting IPSs together globally is the best long-term solution or whether that approach would ultimately better serve as a bridge to a Finternet-type model, which will take much longer to implement. Similarly, in the design of a global IPS, the technology and interfaces should be constructed to facilitate a migration to a tokenized regime.

Linking IPSs Together

To gain the full benefits of the linked IPS model, a number of structural changes in the current regime are necessary:

- Countries need to take steps to ensure that their national IPS regimes are used actively by a large segment of households and businesses. It is particularly important that the United States do more, given the size of its economy and the role of the dollar as the global reserve currency. Without a successful national IPS, the benefits of linking to an international regime such as Nexus will be limited. Without the United States as a viable participant in a global IPS network, the global regime would be woefully incomplete.

- The G20 countries and BIS members (56 countries) need to throw their full support behind Project Nexus. It is time to transition from the pilot program stage to endorsing Nexus as the means to integrate national payments regimes into a global system. BIS member countries should commit to interlinking their IPSs via Project Nexus and establish a time frame and a plan to do so. This includes governments committing to fund Nexus during its start-up phase when costs will be high, and revenues limited. Nexus is a public good that needs to be adequately resourced and funded.

- The IMF should provide country-by-country evaluations of the status of and progress in developing national IPSs and linking them to Nexus. The World Bank should be tasked with providing technical support to lower-income countries. This would augment the work of the FSB and the CPMI, which operate with more limited resources and have a much narrower reach in terms of country membership.

- The public sector should take explicit steps to fully include the private sector in the transition process. Historically, progress in international payments and managing settlement risk have required strong public-private partnerships. For example, the SWIFT international messaging regime was established based on the efforts of a consortium of international banks to replace the TELEX regime and to ensure that global messaging standards were not dominated by a single bank. In contrast, CLS for foreign exchange settlement was developed as a partnership, with the BIS taking the lead in pushing for a better regime to manage foreign exchange settlement risk in the aftermath of the Herstatt Bank

failure in 1974. After a long period of discussion and prodding, a consortium of international banks responded by establishing CLS Bank, which began its operations in 2002.

The response of the G20, BIS, and FSB to the problems posed by over-the-counter derivatives during the Great Financial Crisis suggests a model for how implementation might work. The G20 decided that over-the-counter derivatives should be centrally cleared to reduce counterparty risk and that financial market infrastructures should be strengthened. The Committee on Payment and Settlement Systems (the precursor to the CPMI) and the International Organization of Securities Commissions developed the Principles for Financial Market Infrastructures (PFMI) to establish standards in terms of outcomes that FMIs should meet.[37] These included, for example, standards about the ability of a central counterparty to withstand the failure of its largest counterparties. The IMF was then tasked with conducting assessments of progress toward compliance with the PFMI standards, and this helped keep the pressure on countries to improve their national standards. The end result is that the central clearing of over-the-counter derivatives has bolstered financial stability, and FMIs have, over the past decade, proved robust to market stress and counterparty failures. The PFMI framework continues to broaden and evolve—expanding to address, for example, how the PFMIs could be applied to stablecoins.[38]

Steps to Support Development of the Finternet

The most important step to support the development of the Finternet is to provide greater clarity about the regulatory regime under which such a tokenized system would operate. This is needed to reduce prospective legal risks and to provide a framework so that private companies can plan and implement the new technologies and ways of doing business.

Such regulation needs to focus on ensuring that the goals of the regulation (e.g., financial stability, consumer protection, resiliency, and anti-fraud protections) are achieved without unduly constraining the ability of innovators to use new technologies and business models to achieve the desired outcomes. This means that the focus should be on regulation and oversight that ensures desired outcomes, rather than simply retaining existing regulatory rules and methods of supervision and oversight.

In addition, regulatory burdens and standards should be proportional to the risks. In the early stages of development, when scale and scope pose little risk to financial stability, the regulatory burden with respect to oversight, capital and liquidity, and resiliency presumably should be less. At the same time, there should be a road map outlining how these requirements will evolve as such efforts mature, use increases, and systemic risk increases.

Central banks and other regulators should develop greater technological

37. See Committee on Payment and Settlement Systems and Technical Committee of the International Organization of Securities Commissions, "Principles for Financial Market Infrastructures," Mexico City: Bank for International Settlements, 2012, https://www.bis.org/cpmi/publ/d101a.pdf.
38. Committee on Payments and Market Infrastructures and Board of the International Organization of Securities Commissions, "Application of the Principles for Financial Market Infrastructures to Stablecoin Arrangements," Mexico City: Bank for International Settlements, 2022, https://www.bis.org/cpmi/publ/d206.htm.

expertise and understanding of the private sector's plans and initiatives. Without this, it will be difficult to assess the risks of the new technologies and ways of doing business and determine how regulation should be adjusted. Establishing formal advisory groups operating under the aegis of central banks, the BIS, IMF, and World Bank would be useful.

Stronger public-private partnerships are needed. Innovation will likely be driven by technologists and new fintech firms. But regulators and central bankers need to be involved at the early stages to provide guidance about their expectations and standards. There will likely also be a public-goods aspect of the new regime that will require official sector involvement and intervention at certain points.

Strong engagement between the public and private sectors should also include more scope for experimentation and for demonstration projects. Not only do such efforts help educate and inform, both sides, but engagement at an early stage can also help in identifying and then solving issues of design and governance.

Most important is to do no harm by making choices that would make it more difficult to transition at a future stage to a superior architecture, technology, or business model. Path dependency can vastly influence future potential outcomes, and the official sector needs to consider this at each stage and in all its choices. In this respect, as IPSs develop, evolve, and expand their scope and capabilities, attention should be paid to ensure that these changes will ultimately support rather than impair transition to a Finternet model.

Finally, central banks will need to play a pivotal role in developing on- and off-ramps through which tokenized financial assets can be converted into fiat currencies and settled in central bank money. This does not necessarily require that each central bank establish a CBDC. After all, this may not be politically feasible in some countries due to concerns about privacy and the potential that a CBDC might be used to increase the power and capabilities of the sovereign state. But settlement in central bank money is required because, without that, trust in the viability of the regime and the "singleness of money" would not likely prove attainable. And without such trust, financial stability would be at risk.

With both approaches, one important challenge will be determining how to address anti–money-laundering and sanctions violation risks. Currently, the global regime is extremely inefficient. Each country implements its own anti–money laundering standards, and individual banks are required to do the necessary forensics and compliance work on each of their customers. This involves considerable complexity and duplication of effort. Moreover, the costs of lapses—in terms of fines, penalties, and operating constraints—are considerable.

Developing a better international regime would deliver considerable benefits in terms of lower costs and better compliance. One option is to establish a central clearinghouse that is the repository of customer identities, which

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would determine whether a counterparty has the attributes consistent with being "trusted." Developing a common registrar would reduce complexity and cost and would make it easier to standardize the approach to anti–money laundering risks across national regimes.

VIII. Conclusion

Both potential paths—linking IPSs together and transitioning to the Finternet—are likely feasible ways of achieving a faster, less costly, and more inclusive global payments regime. But much needs to be done to speed up the pace of progress and ensure success over the long run.

In terms of knitting national IPS regimes together into a coherent whole, the first challenge is to ensure that the national IPSs are themselves viable and important parts of their respective domestic payments systems. In some cases, this will require greater government involvement in terms of offering 24/7 RTGS and mandates and financial support to push against the resistance of incumbents protecting their existing business models and to encourage household and business users to migrate their activities to the new systems.

Project Nexus is a credible framework for knitting national IPSs together. The model is well considered, and the governance model is credible. But the BIS does not have the financial capacity or bandwidth to implement this project alone. In particular, given the importance of the US dollar internationally, greater support from the United States is warranted. Also, the private sector needs to be brought more deeply into the design, planning, and implementation stages. After all, almost all of the global financial initiatives relating to global financial transactions that have been successful, such as SWIFT for international payment messaging and CLS for foreign exchange settlement, have had a major private sector component. Similarly, the central clearing of over-the-counter derivatives required the public sector to partner with the private sector.

With respect to the Finternet, the idea of leapfrogging beyond the constraints imposed by existing legacy systems and technologies is a beguiling notion. But that is really all it is at this stage—an attractive concept. Substantive work, stretching over many years, will be required to create and agree on the operating standards, governance, resiliency, and anti-fraud measures necessary to create a regime that can be relied on as the backbone of the global financial system. To succeed in developing this possibility, central banks and other national regulators will need to be much more forward-leaning in embracing the tokenization of financial assets, including the use of smart contracts, and in adjusting their regulations and oversight to accommodate the differences in how the new regime would operate. This means a focus on desired outcomes, rather than only on the means. It also requires greater flexibility to accommodate new business models, as long as the substantive outcomes in terms of issues such as safety and soundness and consumer protection are sustained. Also, national governments will need to make important decisions about whether to develop a national CBDC and how to create on- and off-ramps between financial tokens and their fiat currencies.

An efficient global payments regime is an important goal to pursue for several reasons. First, it will particularly help many low-income households that depend on their family members' cross-border remittances. Second, by knitting together small countries, it will foster economic integration, greater trade, and the achievement of economies of scale. This is particularly important in Africa, where most countries' payment flows to and from the rest of the world are far larger than those within Africa. Lower costs and greater inclusion are worthy goals and should be actively pursued by the public and private sectors working together.