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Presidency paper

Retail payments evolution: The rise of instant payments

An exploration of instant payment trends and their significance for national economies, with reference to India and sub-Saharan Africa

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Retail payments evolution: The rise of instant payments

Executive summary

This paper explores the transformation of retail digital payments from physical cash to digital platforms. Specifically, it assesses the rise of instant payment systems (IPS) as a successful and popular payment infrastructure around the world, through historical and regional perspectives. It focuses particularly on India and sub-Saharan Africa (SSA) (with an emphasis on South Africa), examining their distinct development paths, key drivers of change, lessons learned, and emerging trends. These examples offer valuable insights into how local conditions shape financial innovation, and how their experiences can serve as reference points for other markets aiming to modernise their payment ecosystems. Through this analysis, readers will gain a deeper understanding of why payment systems evolved the way they did, and the broader context that influenced these trajectories.

Payments are the base layer upon which financial systems function, reflecting economic, technological, and historical context within each country. In recent decades, digital payments have redefined economic participation, enabled more inclusive financial services, and driven efficiency, government accountability, and economic growth. Globally, countries have taken diverse paths toward digitising payments, influenced by local needs, socioeconomic conditions, and institutional maturity. Their impact stems from their flexibility and adaptability as a social technology, constantly evolving to meet emerging social and economic needs.

Each new form of money or payment method arises in response to widespread demands. For example, the increase in the use of payment cards reflected rising consumerism,[1] and mobile money responded to a need for cheap and safe remittance solutions that increased financial inclusion, as money in remittance businesses emerged in response to migrant workers' who needed to send money back home. These innovations are further amplified by network effects, where the value of a payment system grows as more people adopt it, reinforcing both adoption and ongoing evolution.

Understanding how digital payments evolve across regions, how instant payments have proliferated, and which approaches succeed in specific contexts is therefore key to shaping global and domestic financial ecosystems, providing lessons and models that can serve as references for others.

In India, the rollout of a robust digital public infrastructure (DPI), especially the Unified Payments Interface (UPI), has been transformative. Building foundational digital identity and payment rails first, while layering innovation, has ensured interoperability, scalability, and mass domestic adoption. Similarly, in South Africa and other parts of SSA, innovators have leveraged mobile networks and agent banking to extend digital services to previously unbanked populations. Mobile money platforms such as M-Pesa, Airtel or MTN illustrate how

[1] The opening remarks by Prasarn Trairatvorakul, Governor of the Bank of Thailand, at the OECD/Thailand Seminar on Financial Inclusion and Financial Literacy in Asia, indicate that consumerism refers to a social and economic trend characterised by increasing emphasis on consumption, which has rapidly intensified and spread widely through various perceptive channels, especially the mass media. https://www.bis.org/review/r150113c.pdf

the telecommunications infrastructure can substitute traditional banking rails, increasing reach, efficiency, and financial inclusion across countries.

Another key lesson is the importance of interoperability and standardisation. Fragmented systems that do not communicate create friction, high costs, and low adoption. Systems that encourage collaboration across banks, financial technologies (fintechs), and governments experience faster growth. Interoperability also enables cross-border integration, enhancing trade, lowering remittance costs, and fostering economic inclusion. Upgrading or replacing legacy infrastructure with new technologies can further improve efficiency.

Yet, technology alone is insufficient. Digital payments succeed only when people trust and understand them. Public information campaigns, transparent governance, and consumer protection are essential, and without them, even the best technologies may fail.

Alignment with local economic and behavioural contexts is also critical. As an example, in cash-heavy economies, digital systems must complement existing behaviours, and hybrid cash-digital solutions (e.g. via agents) are more likely to achieve adoption. When systems respect economic contexts, they succeed more broadly and sustainably.

Ultimately, the global evolution of digital payments reflects not only technological change, but also a shift in thinking: from fragmented to integrated networks, and from standardised to context-aware innovation. IPSs have been one of the most successful structures adopted locally by many jurisdictions, indicating that this has been able to address many of the demands of EMDEs. These changes empower people, expand global access, and reshape economic growth.

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1. Evolution of payments: From cash to a myriad of electronic offerings

The evolution of payments in emerging market and developing economies (EMDEs) has been nothing short of extraordinary in the past decades. At its most basic and traditional, '*money is a social convention where one party accepts it as payment in the expectation that others will do so too'*.[2] It has taken many forms: coins, paper, book entries and digits, continuously evolving to meet our needs.

Today, we are entering a new era where technologies such as digital wallets, real-time payments, programmable currencies, and digital tokens are transforming money from a passive medium of exchange into an active platform for innovation. This transformation, driven by the global digital evolution, highlights that payments are no longer just infrastructure or channels − they reflect technological progress, social needs, and national contexts.

The adoption of payment instruments mentioned across this first chapter varies between different regions and countries, shaped by a combination of socioeconomic context, technological evolution, financial literacy, public behaviours, and trust in financial systems.[3]

1.1. Cash, historically the most accessible payment method

Cash[4], while not the first form of money, represents a major milestone in the history of payment methods. Cash has been used as a primary medium of exchange for goods and services for hundreds of years in countries around the world. It is tangible, instant, universally accepted for face-to-face transactions, and does not require any electronic systems or intermediaries for its use. Cash is vital in regions where banking services are limited, ensuring that people can participate in the economy and maintain confidence in financial stability. It also becomes the ultimate fallback in more advanced economies when digital payments go down, such as during a technology failure, cyberattack, or loss of electricity or the internet. These characteristics make cash the most accessible payment method across different societies. This reliability fosters confidence, which is foundational to financial stability. A key role of central banks is to maintain this trust by ensuring that there is always enough cash in circulation and that it remains accessible to the entire community, although this is more difficult to achieve in some economies that have unreliable currencies and high hyperinflation.

[2] I Schnabel and H S Shin, 'Money and trust: Lessons from the 1620s for money in the digital age', *BIS Working Papers No. 698,* February 2018. https://www.bis.org/publ/work698.pdf

[3] The welcome address by Ignazio Visco, Governor of the Bank of Italy, at the ECB and Banca d'Italia Joint Conference on Digital Transformation of the Retail Payments Ecosystem, emphasises the rapid evolution of digital technologies, which offer significant benefits but also introduce new challenges for payment systems and their stakeholders in the European space. https://www.bis.org/review/r171208c.pdf

[4] Remarks by J Beermann, Member of the Executive Board of the Deutsche Bundesbank, titled 'Back to the roots - cash and its core functions' at the International Cash Conference on Cash in the Age of Payment Diversity, provides insights on cash as a store of value.

Achieving inclusive growth and sustainable prosperity in today's world requires economies to digitise and innovate.[5] Money and payments must evolve to support economic expansion, improve efficiency, and enable broader participation in the financial system. Digital payments offer clear advantages: they can scale effortlessly, reduce the risks associated with carrying physical money, enhance traceability, and integrate seamlessly with modern financial services. Yet, the shift towards digital payments is not without challenges. Technology can fail, systems can be hacked, and access can be uneven, leaving some populations vulnerable if cash becomes obsolete. The goal is not to replace cash, but to ensure that with digital growth, money and payments are designed with resilience, scalability, inclusivity, and trust as the key foundations.[6]

1.2. Digital payments in the early days (mid-1900s – 1990s)

The early days of digital payments marked a significant shift from traditional cash-based transactions to more electronic and automated forms of payment. Before fully digital systems emerged, some regions first transitioned from physical cash to paper-based instruments such as cheques. They were created as a device to allow trade without having to physically carry large amounts of cash. These instruments were adopted and scaled by banks in regions such as the United States and some countries in Europe, especially during the mid-1900s.

In the late 1950s and early 1960s, credit and debit cards revolutionised payments by allowing consumers to use cards as a substitute for banknotes and coin to make purchases. These cards are linked to bank accounts or a credit limit and enable electronic transactions, both online and in person. This system provides convenience, security, and traceability. Credit and debit cards are widely used in countries with advanced banking systems, such as the United States and Europe, where the infrastructure for card payments is robust. However, in developing countries or rural areas, access to banking services maybe be limited, and cash remains the dominant form of payment.

Account-to-account payments[7] were also introduced and became widely used, particularly for peer-to-peer transfers, bill payments, and business transactions. In 2001, South Korea introduced the Electronic Banking System (EBS), which was considered to be the first fast payment system.[8]

The era of online banking marked a pivotal point in the evolution of digital payments. As the internet became more widely accessible, financial institutions began offering online banking services, allowing users to transfer funds, check account balances, and even pay bills from the comfort of their homes. This was a significant step forward in terms of convenience and efficiency.

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[5] An International Monetary Fund (IMF) policy paper titled 'Measuring the digital economy' refers to the digital economy as the information and communication technology (ICT) sector, including telecommunications, the internet, ICT services, hardware, and software. A broader definition also includes traditional sectors integrated with digital technology.

[6] M Glowka, A Kosse and R Szemere, 'Digital payments make gains but cash remains'. *CPMI Brief No. 1*, January 2023.

[7] Payment Systems Regulator, Account-to-account payments: definition. See https://www.psr.org.uk/our-work/account-to-account-payments/

[8] M Bech, Y Shimizu and P Wong, 'The quest for speed in payments', *BIS Quarterly Review*, March 2017.

Simultaneously, online banking played a crucial role in the growth of e-commerce, a platform that facilitates the exchange of goods, services, and information without the need for physical interaction between participants.[9] The integration of digital payment solutions into e-commerce platforms revolutionised the way businesses and consumers interacted, making global commerce more accessible and efficient.

Digital payments could have macroeconomic benefits. One recent study finds that digital payments can be linked to higher economic growth and reduced informality.[10] In particular, the authors find that, with a global panel of country-level data, a 1 percentage point increase in the use of digital payments goes hand-in-hand with a 0.10 percentage point rise in per capita gross domestic product (GDP) growth over a two-year period.

1.3. E-money/e-wallets/mobile wallets and P2P payment apps (2000s – present)

Electronic money[11] (e-money) refers to a digital alternative to cash, wherein monetary value is stored electronically upon receipt of funds, that can be used for making payments. Countries with a strong reliance on cash, such as certain African nations, face slower transitions to digital payments. In these regions, mobile money solutions such as M-Pesa (launched in Kenya in 2007) have been essential in improving financial inclusion, offering individuals a way to send, receive, and save money using only their mobile phones.

An electronic wallet (e-wallet) refers to the cash value that is stored on a card, phone or any other electronic device. The term 'wallet' is used because the card or phone is considered a substitute for the cash normally carried in a person's wallet. A mobile wallet (m-wallet) is a type of e-wallet stored specifically on a mobile phone, which not only holds payment data but also enables users to initiate financial transactions, translating mobile instructions into messages that financial institutions can process. According to Worldpay's 2025 *Global Payments Report*,[12] digital payments grew from 34% of e-commerce value in 2014 to 66% in 2024, precisely reversing shares with cash and cards, and in 2024, the direct use of credit, debit, and prepaid cards[13] represented 45% of the global transaction value across e-commerce and point of sale (POS) globally. These digital payment applications have significantly advanced financial inclusion by reducing the need for traditional banking infrastructure and enabling access to digital payment services through mobile devices that are more widely accessible to individuals across diverse regions.

[9] V Alfonso, C Boar, J Frost, L Gambacorta and J Liu, 'E-commerce in the pandemic and beyond', *BIS Bulletin No. 36*, January 2021.

[10] A Aguilar, J Frost, R Guerra, S Kamin and A Tombini, 'Digital payments, informality and economic growth'. *BIS Working Papers No. 1196,* July 2024.

[11] J Firpo. 'E-money – mobile money – mobile banking – what's the difference?' *World Bank* blog, 21 January 2009. See https://blogs.worldbank.org/en/psd/e-money-mobile-money-mobile-banking-what-s-the-difference

[12] Worldpay, *Global Payments Report*, 10th edition, 2025.

[13] Bank for International Settlements Committee on Payment and Settlement Systems (CPSS), 'A glossary of terms used in payments and settlement systems', March 2003.

Person-to-person (P2P))[14] payment apps have a different use case. They allow individuals to send and receive funds directly from one bank account or digital wallet to another. These apps are particularly popular for small-scale transactions, such as splitting bills or sending money to family and friends, and the rise of instant payment rails played a crucial role in shaping how consumers think about digital payments in this space. M-wallets and P2P apps have seen rapid adoption in regions such as Asia, where mobile wallets in markets with high smartphone penetration and limited access to physical bank branches have driven significant shifts in how people manage money in these regions. For example, the existence of super apps[15] enable consumers to pay for everything from street food to online purchases through their smartphones (e.g. Alipay and WeChat Pay in China, and Grab and GoJek in Southeast Asia).

1.4. Potential for further expansion of digital payments in rural areas and among unbanked populations

Despite the ongoing fast evolution of digital payment systems, the traditional reliance on cash continues to dominate in many parts of the world, especially in rural and underserved areas devoid of internet availability, representing a total of 33% of the population in 2023.[16] These are often places where there is no access to bank branches nearby, thus restricting the population from carrying out any form of banking activity. With the advancement of telecom/internet connectivity and the advent of digital payments through offline modes, the impact of digital payments in remote areas could be transformative. Families could send and receive money safely, save for the future, pay for education, and access government support, with access to only the basic digital financial tools.

The adoption of digital payment systems holds the promise to significantly enhance financial connectivity by integrating local communities from geographically remote and underserved regions into the broader international financial ecosystem. This digital transformation enables a bidirectional flow of economic value and opportunity, with individuals and businesses in remote areas gaining improved access to financial services while networks extend their reach into new markets. Consequently, digital payments serve as a catalyst for economic empowerment, contributing to regional development and reducing economic disparities. Beyond convenience, they carry the potential to advance financial inclusion, expand opportunities, and support greater economic independence.

1.5. The rise of real-time payments in a digital economy

The digital economy continues to reshape how people interact with financial services. It has opened the door for new and innovative payment solutions, especially benefiting the unbanked

[14] World Bank, 'Fast Payments Toolkit', n.d. https://fastpayments.worldbank.org/sites/default/files/2021-10/World_Bank_FPS_Singapore_FAST_Case_Study.pdf

[15] A report titled 'Payment aspects of financial inclusion' published by the Committee on Payments and Market Infrastructures (CPMI) and the World Bank Group in 2020 makes a reference to fintech developments of relevance to the payment aspects of financial inclusion and new access modes such as electronic wallets, open banking and super apps.

[16] According to the International Telecommunication Union (ITU), the United Nations specialised agency for digital technologies, the number of people worldwide not connected to the internet represented 33% of the global population in 2023 (2.6 billion people in 2023). See https://www.itu.int/en/about/Pages/default.aspx

and underbanked populations. At the heart of this transformation lies payments infrastructure, which has evolved rapidly to support broader financial inclusion and economic participation.

One of the most significant developments in this space is the emergence of real-time payments via IPS, foreshadowed above with Korea's introduction of the EBS in 2001, starting with a next-generation financial market infrastructure that offers instant, 24/7 fund transfers between bank accounts. According to the World Bank Group's Project FASTT,[17] about 100 jurisdictions have launched fast payment systems (FPSs), with several more preparing to go live soon. In some jurisdictions, IPSs have reached higher levels of maturity and evolved to meet broader economic and user needs, with functionality extending beyond basic account-to-account P2P transfers, to include diverse payment instruments such as merchant (Quick Response (QR) code payments), small and medium-sized enterprises or business-to-business (B2B) payments. This broader scope reinforces the network effect and strengthens the financial sustainability of the platform, extending its reach to a wider base of participants − both individual and businesses − and enhancing overall cost efficiency. The development of IPSs has been driven by effective public-private collaboration, offering a resilient infrastructure that supports the goals of efficiency, security, and financial inclusion.

The Bank for International Settlements' (BIS) volume on 'Faster digital payments: Global and regional perspectives'[18] highlights how innovations in FPSs have enhanced financial inclusion, reduced transaction costs, and improved user experience, particularly in Latin America and the Caribbean. While the exact responsibilities of central banks differ across jurisdictions, they are generally involved in the development and evolution of IPSs in three main capacities: as operators, directly owning and managing the system to ensure reliability and accessibility (e.g. Brazil, Mexico and Costa Rica); as regulators, establishing standards, governance frameworks, and risk management practices to guarantee safety, resilience, and efficiency (e.g. Brazil, Mexico, Peru, Chile, and Colombia); and as catalysts, fostering innovation and adoption by promoting interoperability, competition, and consistent technical standards (e.g. Brazil, Costa Rica, Peru, and Uruguay).

1.6. IPSs interlinking

With increased mobility due to travel, work, and for pursuing studies or increased cross-border trade in the micro, small, and medium enterprise (MSME) segment, the efficient functioning of retail cross-border payments and remittances assume increasing significance. Specifically, remittances remain central to the household welfare, and the steady inflows enable economic resilience while stimulating domestic consumption, savings, and investment. According to the Global Migration Data Portal, [19] an estimated USD857 billion was sent in remittances in 2023, of which USD656 billion was estimated to be directed to low- and middle-income countries.

[17] A Focus Note by the World Bank Group titled 'The future of fast payments' shows the main considerations and lessons for the development and implementation of fast payment systems, the case studies of countries that have already implemented fast payments, as well as specific technical topics related to fast payments. See https://fastpayments.worldbank.org/sites/default/files/2023-10/Future%20of%20Fast%20Payments_Final.pdf

[18] J Aurazo, J Frost and A Kosse, ' Faster digital payments: Global and regional perspectives', *BIS Papers No, 152*, December 2024. https://www.bis.org/publ/bppdf/bispap152.pdf

[19] The Global Migration Data Portal is managed by the Global Migration Data Analysis Centre of the International Organization for Migration. See https://gmdac.iom.int/global-migration-data-portal

Bilateral IPS linkages, where two jurisdictions connect their domestic IPS systems, offer a powerful stepping stone towards improving cross-border payments. They enable instant or near-instant fund transfers between countries, reducing costs and increasing speed, efficiencies and accessibility. There are 15 live or planned linkages between FPSs (IPSs) across jurisdictions. Most of the live linkages are in the Association of Southeast Asian Nations (ASEAN) region, where countries such as Singapore, Malaysia, Indonesia, and Thailand have taken a leading role.

Cross-border payments are more complex than domestic payments due to the potential involvement of multiple intermediaries and divergent legal and regulatory frameworks. Notwithstanding this, IPS linkages provide a relatively untapped solution to enhance cross-border payments. For instance, it can shorten transaction chains by enabling participating financial institutions in different countries to transact directly with one another instead of going through multiple intermediaries. The Group of Twenty (G20) has identified IPS linkages as one of the priority actions to help achieve its cost, speed, access and transparency targets.

However, the bilateral model poses the following challenges:

- Every new link requires complex technical integration.
- Each country pair must negotiate separate legal and regulatory agreements.
- Maintenance and scaling become increasingly burdensome.

This is where a multilateral approach of interlinking IPSs, such as Project Nexus,[20] addresses these challenges by making it easier to interlink multiple IPS systems. Each IPS operator only needs to invest time and resources to connect once rather than repeating this process every time they connect to a new country. Nexus will be discussed in more detail in a later chapter.

[20] See www.nexusglobalpayments.org for more information

2. Domestic instant payments: Country experience and learnings

Building on the previous discussion of the evolution of payments from cash to digital, this chapter examines how India and SSA, particularly South Africa, have navigated the transformation of digital instant payments through distinct strategies and innovations.

2.1. India's landscape and evolution

India has historically been a cash-dominated economy, with roughly 78% of all transactions still cash-based as of 2016.[21] Limited access to formal banking, user cash preferences, and underdeveloped digital infrastructure kept cash as the primary medium. Over the past decade, however, India has undergone a dramatic digital shift. Key enablers were JAM trinity – Jan Dhan Yojana[22] (mass bank account opening), Aadhaar[23] (biometric digital identity), and Mobile telecom expansion – which together established a foundation for digital finance. Hundreds of millions of previously unbanked citizens were brought into the formal system (over 500 million Jan-Dhan Yojana bank accounts were opened) and could be authenticated online via Aadhaar.[24] Mobile phone penetration above 1 billion provided a ubiquitous channel for digital services.[25] This DPI set the stage for a payments revolution.

A major inflection point came in late 2016, when India's policy of withdrawal of legal tender status for ₹500 and ₹1000 notes withdrew 86% of cash in circulation. The said move accelerated the adoption of digital payment alternatives, as individuals and merchants sought cashless modes. In the weeks after the withdrawal of legal tender status of the said notes, leading mobile wallet platforms added over 100 million new app downloads within weeks. This period vividly demonstrated both the appetite for convenient digital payments and the limitations of existing solutions.

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[21] Government of India, Ministry of Finance, Committee on Digital Payments, 2016.

[22] The Pradhan Mantri Jan-Dhan Yojana is a comprehensive programme aimed at providing access to various financial services for the excluded sections of society, particularly the weaker sections and those belonging to low-income groups. These services include the provision of basic savings bank accounts, access to needs-based credit, remittances facilities, as well as insurance and pension schemes. Delivering these benefits to low-income individuals at an affordable cost is possible through the effective use of technology.

[23] The Unique Identification Authority of India (UIDIA) is a statutory authority established under the provisions of the Aadhaar (Targeted Delivery of Financial and Other Subsidies, Benefits and Services) Act, 2016 (Aadhaar Act 2016). The UIDAI was created to issue unique identification numbers, known as 'Aadhaar', to all residents of India.

[24] The Government of India's March 2025 Jan-Dhan Yojana account statistics indicates that, as at 7 March 2025, 55.02 crore Jan-Dhan accounts had been opened, of which 36.63 crore accounts are in rural and semi-urban areas. https://www.pib.gov.in/PressReleseDetail.aspx?PRID=2112321#:~:text=A%20total%20of%2055.02%20crore,rural%20and%20semi%2Durban%20areas

[25] DataReportal – Global Digital Insights is an online platform that contains data, insights, and trends on the use of digital devices, online platforms in India and connected services.

2.1.1. Background surges in mobile wallet usage

Before the introduction of UPI, mobile wallets served as a critical stepping stone in India's digital payments journey. Between 2014 and 2017, consumer-orientated wallet apps gained rapid popularity, especially in urban and semi-urban areas. These apps allowed users to preload a balance and make digital payments for everyday needs such as prepaid recharges, utility bills, or shopping, without needing a debit card or bank account for each transaction. Promotional incentives, notably cashback rewards, were heavily used to acquire and retain users, effectively subsidising early adoption. By simplifying onboarding and offering a friendly mobile interface, wallets lowered the barrier for millions of first-time digital payment users.

Despite their success, mobile wallets had inherent limitations that prevented them from becoming a universal solution. First, most operated as closed-loop systems where money stored in one wallet app typically could not be sent to a user on another wallet, nor easily moved back to a bank account. This lack of interoperability created silos; users and merchants often had to maintain multiple wallet apps to cover different use cases or counterparts. Second, regulatory guidelines limited wallet balances and usage for non-Know Your Customer (KYC) users (capped at ₹10 000, or approximately USD114 per month). Meeting full KYC requirements introduced friction that slowed user acquisition. Third, as the number of wallet providers grew, the fragmentation of services led to confusion and reduced network effects – there was no single widely accepted standard for digital payments. Issues of security and fraud also began to surface as usage scaled, raising concerns about the robustness of the wallet ecosystem.

India's 2016 demonetisation policy dramatically highlighted both the potential and shortcomings of mobile wallets. With cash in short supply, wallet apps saw an unprecedented surge in transactions and new users – a 'trial by fire' that proved digital payments could be adopted en masse when needed.[26] However, wallets alone could not fully meet the economy's needs. The crisis underscored the need for a more interoperable, real-time, bank-integrated payment system that could be scaled nationally.

The Government of India and India's central bank, the Reserve Bank of India (RBI), capitalised on this moment by promoting UPI through incentive schemes, awareness campaigns, and integration with public services. The impact was visible almost immediately: UPI transactions jumped from just 0.1 million in October 2016 to over 2 million by December 2016, and crossed 16 million monthly transactions by August 2017.[27] What began as a short-term response by the public to cash shortages became a structural shift in behaviour: merchants embraced QR codes, consumers grew comfortable with mobile-based transfers, and UPI rapidly evolved into the backbone of India's digital payments ecosystem. Demonetisation thus catalysed UPI's adoption, accelerating its growth from a nascent innovation into a mainstream payment rail within just a few years.

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[26] S Sen, 'Mobile wallets see a soaring growth post-demonetisation', *Hindustan Times*, 1 January 2017. https://www.hindustantimes.com/business-news/mobile-wallets-see-a-soaring-growth-post-demonetisation/story-zwdBi3UGqG1qZD92AEF9GK.html

[27] See National Payments Corporation of India, Unified Payments Interface (UPI) Product Statistics, available at https://www.npci.org.in/what-we-do/upi/product-statistics

2.1.2. Origins and adoption of UPI

Before UPI, Indian relied on cash or fragmented digital options such as cards, net banking, and mobile wallets – each with its challenges. Card payments incurred merchant discount rate (MDR) fees and needed POS machines, making small transactions costly for shopkeepers. Bank transfers, National Electronic Funds Transfer (NEFT)[28] and Immediate Payment Service (IMPS)[29] were available but not quite amenable for quick P2P payments. Early mobile wallets were siloed (not interoperable with other wallets or bank accounts), forcing users and merchants to juggle multiple apps. UPI solved these pain points by providing a single, interoperable system, linking all banks and payment apps for all small and large transactions. This unified, instant payment platform lets even a street vendor accept digital payments at no cost and enables any two people to send money in seconds using just a mobile phone and a UPI ID or mobile number or QR code.

UPI was conceived as part of India's push towards an inclusive, digital economy. Launched in April 2016 by the National Payments Corporation of India (NPCI)[30] with 21 participating banks, and backed by the RBI and the government, its mission was to unify the digital payments landscape through a single, mobile-first interface. Unlike closed-loop wallets, UPI is bank-centric and interoperable, linking directly to customers' bank accounts while working across all banks and apps in the ecosystem. Its success has been driven by a collaborative framework, with the RBI as regulator − whose supportive policies pushed interoperability, enabled innovation within regulated banks, and ensured active participation while managing systemic risks − and the NPCI as developer and operator, providing the core infrastructure, continually updating features, ensuring uptime and security, and monitoring compliance and fraud.

By the mid-2020s, India's payments landscape had transformed. As of mid-2025, UPI volumes have continued to increase, surging to 19+ billion transactions monthly, serving 491 million users with over 65 million merchants and 678 million merchants QRs, and accounting for about 85% of all digital transaction volumes in India.[31] This white paper examines India's experience with digital payments, with a focus on UPI's origin, design, and impact, and draws insights for policymakers, financial institutions, and global partners.

UPI introduced several innovative features and design principles:

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[28] The Reserve Bank of India's (RBI) NEFT is a nation-wide centralised payment system owned and operated by the RBI.

[29] The National Payments Corporation of India's IMPS is an emphatic service that enables instant fund transfers between banks across India. It is not only safe but also cost-effective. Currently, IMPS has 965 active members, which includes banks and payment service providers.

[30] The NPCI is an entity set up with the guidance and support of the RBI and Indian Banks Association as an umbrella organisation for retail payments in India. See Indian Banks' Association, 'Umbrella organisation for retail payments in India', 2008.

[31] According to the Government of India, UPI accounts for 85% of all digital transactions in India. Its impact goes beyond national borders, powering nearly 50% of global real-time digital payments. See Government of India, 'UPI: India's digital revolution goes global', New Delhi: Press Information Bureau, 17 September 2025. https://www.pib.gov.in/FeaturesDeatils.aspx?NoteId=155224&ModuleId=2#:~:text=With%20effect%20from%2015th%20September,all%20digital%20transactions%20in%20India

- **Real-time transfers:** UPI enables instant, 24/7 P2P and peer-to-merchant (P2M) payments, clearing and settlement transactions in seconds.
- **Virtual addresses:** Users can send or receive money using a simple virtual payment address (e.g. name@bank) instead of sharing bank account numbers or Indian financial system codes (IFSC).[32] This improves privacy and ease of use.
- **Universal interoperability**: Any UPI-compatible app can initiate transactions from any customer's bank account to any recipient's bank account. This open-loop approach allows banks and fintech apps to compete on customer experience over a shared infrastructure. A user on Google Pay can pay a merchant using PhonePe, for example, with funds moving bank-to-bank via UPI rails.
- **Mobile and multi-factor authentication:** UPI leverages smartphones for enhanced security. Device binding and two-factor authentication (such as UPI PIN) are required for each transaction, reducing the risk of fraud. Biometric authentication (through Aadhaar) and a one-time password (OTP) can also be used when needed.
- **Open Application Programming Interface (API) architecture:** UPI was built with an API-first approach, allowing third-party payment apps (third-party application providers, or TPAPs) to integrate seamlessly with the UPI platform. This fostered a vibrant fintech ecosystem built upon banks' core infrastructure.
- **No transaction fees to users:** To spur adoption, UPI transactions carry no charges for consumers or merchants for most common payments (i.e. a zero MDR policy for small transactions), making it effectively free to use.

These features – real-time speed, simplicity, security, and zero cost for users – made UPI a uniquely attractive proposition. The system was engineered for massive scale and resilience, given India's large population.

2.1.3. Impact of UPI on the Indian economy

UPI has become a powerful catalyst for financial inclusion in India. By leveraging the near ubiquity of mobile phones, UPI brought digital payments to populations that never had access to cards or internet banking. According to a nationwide survey by the Ministry of Statistics and Programme Implementation in early 2025, 85.5% of Indian households now have at least one smartphone, providing the basic tool needed for UPI use.[33] Among young adults (aged 15–29) who are digitally literate, an astounding 99.5% reported using UPI for online financial transactions, essentially a universal adoption in that demographic. By enabling instant payments directly from bank accounts, UPI has effectively turned every banked person into a potential digital customer, without requiring any additional sign-up beyond a simple mobile app registration. As a result, the share of adults making or receiving digital payments has climbed sharply, even in rural areas.

[32] Reserve Bank of India (RBI). IFSC codes, or Indian Financial System Codes, are unique 11-character alphanumeric identifiers assigned to each bank branch in India. These codes are used to facilitate electronic fund transfers such as National Electronic Funds Transfer (NEFT), Real-Time Gross Settlement (RTGS), and Immediate Payment Service IMPS).

[33] The Government of India's Ministry of Statistics and Programme Implementation provides insights on the 'Results of Comprehensive Modular Survey: Telecom, May 2025. See https://www.pib.gov.in/PressReleasePage.aspx?PRID=2132330

A key measure of inclusion, the RBI's Financial Inclusion Index, improved from 43.4 in 2017 to 67 in March 2025, reflecting greater usage of financial services nationwide.[34] RBI noted that this improvement was largely driven by the 'usage' dimension of the index, indicating that people are not just opening bank accounts but actively transacting. UPI's role in this is significant. The provision of a national digital biometric identity enabled broad access to the banking system, while the development of a real-time payments platform improved efficiency in retail and small-scale transactions. Given India's low levels of financial inclusion and formal identification in 2008, the challenges were immense: without these innovations, reaching 80% account ownership would have taken an estimated 47 years through traditional growth alone.[35] By reducing dependency and simplifying payments, UPI is fostering a sense of financial autonomy, especially for women and younger users in conservative or cash-first communities. In a very real sense, UPI has made formal financial tools more democratic and accessible.

Further, to measure the extent of digitisation of payments across the country, RBI has developed the Digital Payments Index (DPI) with five broad parameters, namely payment enablers, demand-side infrastructure, supply-side infrastructure, payment performance, and consumer centricity. From a base score of 100 in 2018, the DPI score stood at 493.22 as at March 2025, reflecting substantial gains in the adoption of digital payments in India, with UPI being one of the enabling factors in the growth observed.

Empowering MSMEs and merchants

The advent of UPI has been transformative for India's vast base of MSMEs and informal businesses. These small merchants historically dealt almost entirely in cash and often struggled with issues such as the risk of theft, lack of credit history, and cumbersome bank processes. With UPI, even a roadside vendor can accept digital payments cheaply and seamlessly – all they need is a QR code in either static or digital form. The impact is evident: over 65 million merchants now accept UPI payments, including millions in rural and Tier 3+ towns.

Perhaps most importantly, UPI is helping embed MSMEs into the formal financial system. For example, a small tea stall owner who earlier dealt 100% in unrecorded cash may now have a transaction history visible through UPI payments. These digital footprints are increasingly being used by lenders and fintech companies to assess creditworthiness. In short, UPI is not only a payment method but a tool for financial formalisation – bringing MSMEs into the fold where they can access loans, insurance, and other services to grow their businesses. UPI has thus become an engine for MSME growth and resilience.[36]

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[34] Government of India, '67 and rising: India's financial inclusion gains momentum', 6 August 2025.

[35] D D'Silva, Z Filková, F Packer and S Tiwari, 'The design of digital financial infrastructure: Lessons from India, *BIS Papers No. 106*, December 2019.

[36] According to the study titled 'Unified Payments Interface (UPI): A payment solution designed to transform economies of the 21st century': "With the advent of UPI, MSMEs are adopting digital payments for their day-to-day transactions which creates a valuable transaction trail; MSMEs transacting digitally has enabled NBFCs and new-age fintechs to identify, assess and create customised credit profiles of MSMEs, and provide solutions such as 'invoice-based overdraft facility' and 'small ticket personal loans'." https://www.npci.org.in/PDF/npci/knowledge-

Boosting consumption and economic activity

At a macro level, the digital payments boom via UPI is contributing to broader economic growth by increasing the velocity of money and enabling new consumption models. Payments that might have been delayed or lost in cash now circulate faster and more efficiently. A study by the Observer Research Foundation finds a strong positive correlation between UPI transaction volumes and India's GDP growth – specifically, a 1% increase in UPI transactions is associated with a 0.03% rise in GDP.[37] This linkage suggests that as UPI makes transactions easier and more frequent, it stimulates additional commerce that adds up at the national scale. For instance, UPI has fuelled the rise of e-commerce and the gig economy in India by enabling instant, micro-value payments.

UPI's impact on P2P transfers is also significant. India has a large migrant worker population that regularly sends money back home to support families. Traditionally, this meant cash sent through money orders or informal couriers, which were slow or unsafe. With UPI, a migrant labourer in Mumbai can instantly transfer money to his wife's bank account in a rural part of India with a few taps on his phone. Such cases highlight how UPI has made domestic remittances easier, benefiting low-income households by providing timely access to funds when it matters most.

Social equity and digital empowerment

Beyond the economic metrics, UPI has had a profound social impact by promoting digital inclusion and a sense of financial participation across diverse segments of society. Importantly, UPI does not require credit checks or a minimum balance − it is available to anyone with a bank account, from wealthy professionals to the urban poor and rural farmers. This has levelled the playing field: unlike credit cards which only a minority qualify for, UPI is every person's digital payment system. Many individuals who felt left behind by the formal financial system have embraced UPI as a symbol of empowerment.

UPI has become ingrained in daily life and increased digital literacy by practice. The network effects have also encouraged communities to on-board each other – for example, younger family members teaching elders to use UPI for the first time, or merchants themselves guiding customers on scanning a QR. The government and NPCI have run awareness campaigns (e.g. 'UPI Chalega' for safe usage) which have further reinforced trust. UPI, being a product of India's own DPI, has also become a point of national pride and a case study on how inclusive innovation can drive development.

Policy and regulatory support

Government initiatives: UPI's success rests on proactive policies. Since January 2020, MDR fees on UPI and RuPay debit card transactions were abolished, eliminating merchant costs. To offset losses, the government allocated subsidies – for example ₹1 500 crore

center/partner-whitepapers/Unified-Payments-Interface-(UPI)-A-payment-solution-designed-to-transform-economies-of-the-21st-Century.pdf

[37] R Bansal, K M Saini and A K Jha, 'Decoding India's UPI phenomenon: A digital revolution with global implications' New Delhi: Observer Research Foundation, September 2024.

(approximately USD169 million) in the 2024/25 financial year for free UPI transactions up to ₹2 000 (approximately USD 22.5).[38] Campaigns for a 'Less Cash' society, schemes such as Lucky Grahak Yojana[39] (Lucky Customer Scheme), and the integration of services such as railway bookings and subsidies pushed digital adoption. This consistent policy support instilled confidence in the ecosystem.

RBI oversight and interoperability: RBI regulates the NPCI as a critical infrastructure, ensuring stability while promoting openness and expanding UPI functionalities. It mandated wallet interoperability via UPI (in 2022) and standardised Bharat QR codes for universal acceptance. Consumer protection norms limit liability in fraud and require quick reversals of failed payments. Transaction caps (₹100000 per transfer, or approximately USD1 134) contain risks. With the NPCI's not-for-profit model, UPI functions as a public good: universal access, low cost, and strong guardrails.

Digital public infrastructure synergy: UPI builds on the India Stack – Aadhaar, Jan Dhan accounts, and IMPS rails. Aadhaar e-KYC simplified bank account opening, enabling 500+ million Jan Dhan accounts, which UPI leveraged. Virtual payment addresses eased transfers without account details. Platforms such as Co-WIN[40] showed synergy by integrating UPI for vaccine payments. This DPI approach − treating identity, payments, and data as public utilities − has become a global model.

2.1.4. Challenges and frictions faced by UPI

UPI removed the bottlenecks of older digital methods and rapidly accelerated India's shift towards cashless payments. While UPI's growth has been remarkable, it has brought forth new challenges that India's policymakers and stakeholders are actively working to address. Key issues include:

Cybersecurity and fraud: With increasing transaction base and to safeguard public's hard earned financial resource it is imperative to adequately tackle and address fraud and cybersecurity risks. Most scams exploit human factors – phishing, fake UPI PIN calls, bogus QR codes – not flaws in UPI's design. Regulators have countered with a centralised fraud registry, a 24/7 hotline and stricter app safeguards such as two-factor PINs, device binding, and limits. Awareness campaigns (e.g. 'UPI Chalega' – UPI will work and 'RBI Kehta Hai') educate users not to share PINs or scan unknown codes, while banks deploy artificial intelligence and machine learning (AI/ML) fraud detection. Further, a Digital Payment Intelligence Platform is being developed under RBI's supervision and guidance, which seeks to bolster fraud risk management by facilitating real-time intelligence-sharing and gathering,

[38] Government of India, Ministry of Finance, Press release: 'Advancing cashless India: ₹1,500 cr incentive scheme for low-value BHIM-UPI transactions', New Delhi: Press Information Bureau, 24 March 2025.

[39] Government of India, Ministry of Finance, 'NITI Aayog announces launch of the schemes - Lucky Grahak Yojana and Digi-Dhan Vyapar Yojana - for incentivising digital payment', New Delhi: Press Information Bureau, 15 December 2016.

[40] Co-WIN is an Indian government web portal for COVID-19 vaccination registration, owned and operated by India's Ministry of Health and Family Welfare.

thereby preventing fraudulent payment transactions.[41] These steps aim to keep UPI safe and trusted as usage scales.

Connectivity and infrastructure gaps: Rural areas still face patchy internet and power supply, causing failed or pending UPI payments. To bridge this gap, NPCI and RBI launched UPI 123Pay (interactive voice response-based for feature phones), UPI Lite (offline small-value wallet), and piloted UPI Lite X (NFC tap-and-pay). These tools let users pay offline, making UPI viable in weak-signal regions. Combined with telecom and power upgrades, they are narrowing the urban–rural divide.

Financial and digital literacy: Many new users, especially seniors or low-literacy groups, feel intimidated or fall prey to scams. RBI's annual Digital Payments Awareness Week, Financial Literacy Week, ongoing campaigns under 'RBI Kehta Hai' and the NPCI's 'UPI Chalega' campaign build confidence by teaching safe usage − double-checking recipients, not sharing PINs, and raising disputes. Government and self-help groups also train merchants and users at grassroots level, with the aim of inclusion, ensuring all citizens trust and benefit from UPI.

2.1.5. New opportunities for UPI

India's UPI has the ambition to become a recognised international payment system, and in so doing to be reinforced by a range of domestic and international initiatives that continue to expand its scope.

Domestic expansion

- Credit on UPI: RBI has enabled the linking of RuPay credit cards and pre-approved credit lines to UPI. This allows users to scan any UPI QR code and pay via credit.
- New use cases: UPI is evolving with AutoPay for recurring bills, Lite/Lite X for offline tap-and-go, and integration with the Open Network for Digital Commerce (ONDC)[42] to enable seamless e-commerce. In agriculture, UPI supports instant farmer payments. Its versatility is making digital payments ubiquitous across daily life.
- Strengthening the ecosystem: The NPCI is upgrading infrastructure with multiple data centres and cloud architectures. AI-powered national fraud monitoring is expanding. User education is being institutionalised, with safe digital payments taught in schools. Accessibility features − vernacular support, voice-based UPI, and screen-reader compatibility − are broadening inclusion.

Regional perspectives

India is actively promoting the internationalisation of UPI to reduce cross-border remittance costs and provide digital payment connectivity for its large global diaspora, while also showcasing the country's fintech innovation and leadership on the world stage. To this end, the NPCI established NPCI International Payments Ltd (NIPL) in 2020 as a dedicated arm to forge global partnerships and deploy UPI outside India.

[41] Reserve Bank of India (RBI), 'Statement on Developmental and Regulatory Policies', Mumbai: RBI, 5 February 2021. https://www.rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=51078

[42] The ONDC is a Government of India initiative aimed at creating a decentralised and interoperable digital infrastructure for e-commerce.

Through bilateral linkages, UPI has been integrated with other national payment systems and markets in Asia. Notably, Singapore's PayNow system is directly linked with UPI, enabling instant, low-cost fund transfers between the two countries and benefiting migrant workers, professionals, and students in both nations.

International initiatives

India has also pursued international initiatives to expand UPI's acceptance for merchant payments in other jurisdictions. Merchant payments through UPI-powered apps are now accepted at merchant outlets in countries such as the UAE, Singapore, France, Bhutan, Nepal, Mauritius, Sri Lanka and Qatar, allowing Indian tourists and diaspora to make seamless payments in a familiar manner when abroad.

Furthermore, at a multilateral level, India joined the BIS-led Project Nexus initiative in 2024, collaborating with Singapore, Malaysia, Thailand, and the Philippines to interlink national real-time payment networks. Participation in Project Nexus positions UPI within a broader interoperable cross-border payments ecosystem, moving beyond one-to-one connections towards a unified platform that can facilitate faster, cheaper, and more transparent international payments at scale.

2.2. Sub-Saharan Africa landscape and evolution, with a focus on South Africa

2.2.1. Background of a multi-country and multi-currency region

In terms of economic development, SSA faces a triple challenge: some of the poorest communities on earth,[43] a patchwork of 54 national regulatory frameworks, and around 40 different currencies. This reflects a legacy of European colonisation for much of the 20th century, followed by disruptive struggles for independence towards the establishment of stable post-colonial leadership. It is no wonder that, with a few exceptions, African economies were substantially cash-based up until the turn of the millennium.

South Africa was a unique case. Through much of the 20th century, South Africa's payment journey was a tale of two economies in one. From the 1970s until the advent of democracy in 1994, South Africa had a 'two-speed' payments ecosystem characterised by high levels of inequality. While the majority relied primarily on cash, a smaller, more advanced payment system existed to serve a privileged minority of the population, offering all the services typical of a developed economy such as cheque payments, credit and debit cards, and bulk automated clearing.

South Africa's banks and payment regulators adopted a collaborative approach to payment system development from an early stage, resulting in the creation of digital payment services that were among the most advanced globally.

Industry collaboration dates back to 1972, when the Automated Clearing Bureau (ACB) was established for processing cheques among the leading banks.

[43] According to the World Bank (2024): "World GDP per capita in International dollars on a PPP basis was US$24,247.90 in 2024; In Sub-Saharan Africa it was US$4,949.80".

In 1985, South Africa was among the first countries in the world to link automated teller machines (ATMs) into a national interoperable network, then called Saswitch.[44] ATMs and debit card usage at POS became and remain the dominant form of non-cash payment activity. ACB and Saswitch evolved into BankservAfrica[45] – the bank-owned national payments operator of today.

The National Payment System Act 78 of 1998 (NPS Act) established an industry-led collaborative development framework led by a payment system management body. The Payments Association of South Africa (PASA) assumed that role. In 2006, PASA and BankservAfrica launched a real-time account-to-account (A2A) payment service called Real Time Clearing or RTC – again one of the first such services in the world. In this way, by the early 2000s, South Africa had a digital payments system equal to any in the developed world.

By contrast, in other countries in SSA, the payments ecosystem was overwhelmingly cash-based: payment cards were owned by around 5% of the population and accepted in only a few city businesses, and bulk debits and credits were rare.

2.2.2. Origins of digital payments

Since around 2000, the trajectory of payment system development in SSA has changed markedly. By 2007, mobile phones had spread rapidly in SSA, even as the payments ecosystem remained largely cash-based. In that year, the leading mobile network operator (MNO) in Kenya, Safaricom, made a simple yet fundamental adjustment to its services: it promised to pay Kenyan shillings against minutes of phone credit at a published exchange rate, and allowed users to build up and exchange credit balances on their mobile numbers. Suddenly, Safaricom customers had a digital wallet attached to their mobile phone numbers. This new product, M-Pesa ('mobile money' in Swahili), was an elegant re-use of existing and widely available technologies. In particular, it relied on Unstructured Supplementary Service Data (USSD), the real-time communications protocol that enables even basic feature phones to conduct automated interactions with the MNO host. This was enough to launch an economic revolution.

M-Pesa instantly met a widespread domestic remittance need, whereby villagers moving to the cities for work or study could send and receive funds with their families in rural and remote areas. In many small villages, local stores or agencies in the business of mobile sim cards readily adapted to accepting and disbursing cash in exchange for mobile credit. As soon as a family owned a mobile phone − typically their first piece of computer technology − they could receive remittances from relatives or send money to support their children's education in other cities. Each transaction could be controlled by the mobile user, and balances and activity could be verified at the touch of a button in real time. This low-tech but fraud-resistant approach was a significant improvement on previous methods of remote payment, which depended on cash being transported over long distances or relied on trusting informal, unregulated remittance operators.

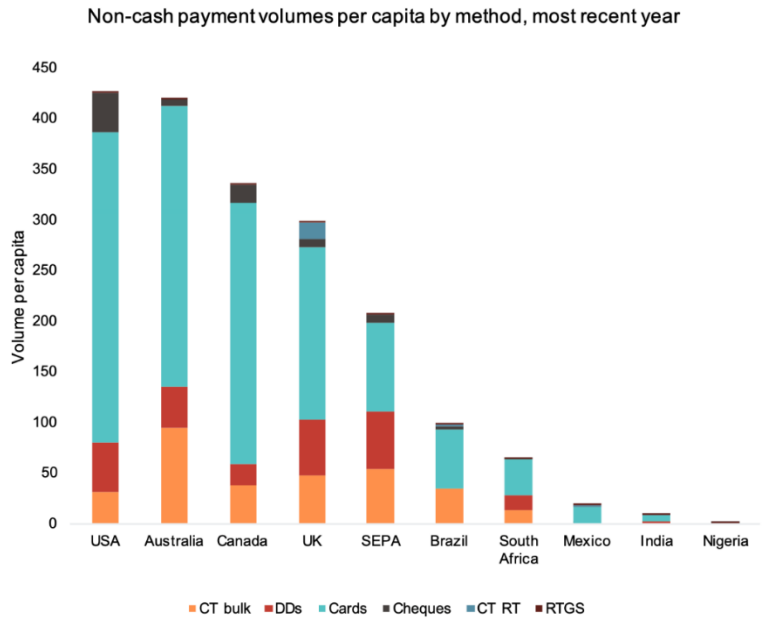
[44] 'The payment system in South Africa' published by the BIS, identifies the services provided by BankservAfrica, the country's largest operator. Among these is SASWITCH, which facilitates electronic payment switching between banks. https://www.bis.org/cpmi/paysys/southafrica.pdf

[45] On 29 August 2025, BankservAfrica changed its name to Payinc.

The Kenyan experience proved to be an attractive model for a string of countries across SSA: Uganda, Tanzania, Zambia, Ghana and many others. As mobile technology spread and improved, mobile money followed suit, adapting to smartphones, flexible addressing, a growing range of use cases and tailored regulatory frameworks. Over 17 years, African mobile money has expanded to 165 active networks in SSA, with 1.1 billion registered accounts and annual transaction values totalling USD1.1 trillion.[46] Further, this African innovation is now a global phenomenon: the Global System for Mobile Communications Association (GSMA) reports over 2.1 billion registered accounts globally, transacting USD 4.6 billion per day.

By contrast, South Africa's economy remained stuck between developed and developing. Data from 2016 shows digital payments activity per capita in South Africa as greater than 'Global South' comparators but markedly less than developed economies in the 'Global North' (see Graph 1 below). Given SA's historically high economic inequality,[47] this middle ranking reflects a minority population who are fully banked and financially included, and a larger population of those who still rely primarily on cash. For the fully banked, debit card payments make up the bulk of non-cash volumes.

Graph 1: Non-cash payments per capita per annum, 2016 − selected countries



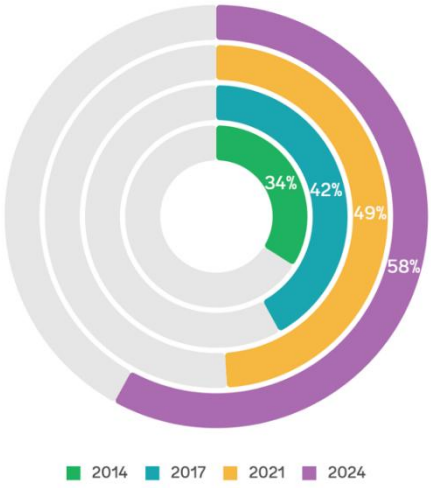
The industry and regulator responded with a multi-year implementation of a new domestic fast payment system, PayShap, specifically designed to address the cash challenge. PayShap combines best practice in design and technology with new, market-oriented scheme governance, providing a distinctive national brand and market presence. Key design features include:

- instant and irrevocable funds availability;

[46] GSMA, 'The State of the Industry Report on Mobile Money 2025', p11. https://www.gsma.com/sotir/

[47] According to the *World Population Review,* South Africa is ranked as the most unequal country in the world, with a Gini Coefficient of 63% - a measure of economic inequality.

- pay-by-proxy: account holders can associate their accounts with a unique address such as a mobile number, allowing easy, secure payment addressing while maintaining privacy; and



- request-to-pay: payees can initiate a payment digitally, straight to a payer's mobile phone.

2.2.3. Impact of the rapid digital adoption

The rapid spread of mobile money in Africa represents much more than increased convenience and reduced risks of fraud and crime. As the World Bank observes:

Mobile phones and the internet are revolutionizing financial inclusion, enabling more people to access and use digital financial services to manage their financial lives.[48]

Graph 2: Sub-Saharan account ownership

In SSA, account ownership, including bank accounts and mobile money accounts, has grown from 34% to 58% of adults[49] in the 10 years to 2024 – a remarkable financial inclusion success story.

Different countries are at varying stages in the journey, and the degree of impact of mobile money varies as well. AfricaNenda's[50] 'SIIPS 2024' Report identifies 28 domestic IPSs in 20 African countries, connecting banks and MNOs in various ways. Of these, 14 are 'cross-domain' – that is, they enable interoperability between bank accounts and mobile money wallets.

By contrast, South Africa's journey to digitisation remains a work in progress. After two years in operation, PayShap now has 12 banks participating and approximately 4.9 million PayShap IDs – payment addresses – registered. Over 40 million transactions have been processed, with month-on-month growth remaining in the double digits.

2.2.4. Challenges and frictions in the region

African central banks, charged not only with regulating the national payment system but also developing and enhancing it for the benefit of the community, have out of necessity responded to the mobile money revolution. In general, they have been keen to embrace and support the rapid increase in digital financial inclusion brought about by mobile money, while ensuring

[48] L Klapper, D Singer, L Starita and A Norris, 'The Global Findex Database 2025: Connectivity and financial inclusion in the digital economy', Washington DC: World Bank Group, 2025, p xvi.

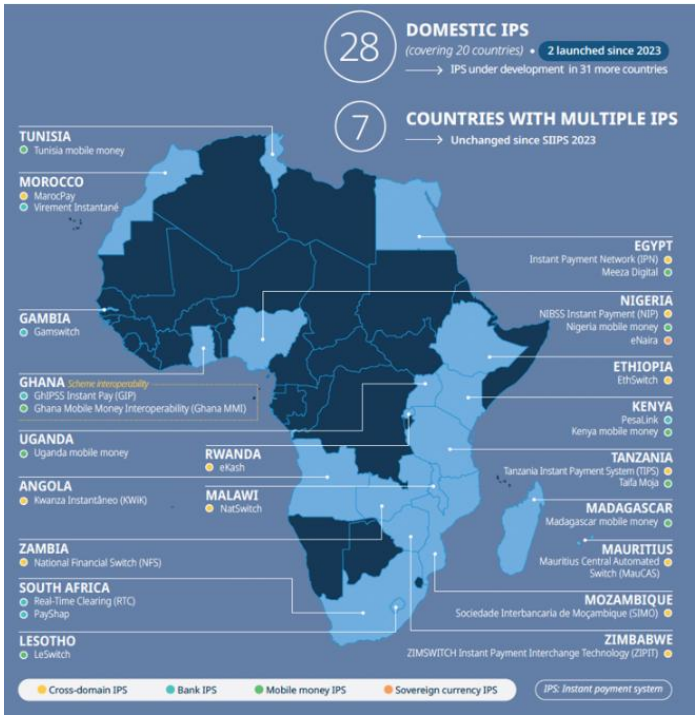
[49] The World Bank Findex data source is available in the 'Global snapshot of indicators and enabling regulations'.

[50] A non-profit organisation working in the field of financial inclusion by fostering the development and adoption of instant and inclusive payment systems.

appropriate consumer protection arrangements and oversight. In many countries, this has involved:

- licensing and oversight frameworks tailored to mobile money; and
- access regimes that ensure fair access to the entire instant payments network for all licensed service providers, designed to promote fintech participation.

Graph 3: Prevalence and types of African IPSs[51]



However, many African countries have also experienced a 'problem of success' – the fragmentation of digital payments into a few large mobile networks, resulting in limited interoperability. This has adverse effects on competition, innovation and efficient pricing. For example, in 2018 the National Bank of Rwanda collaborated with Rwandan participants to develop and publish a comprehensive business plan for the development of an interoperable hub linking all mobile and card networks in Rwanda.[52] The plan was designed to address limited, inefficient and non-scalable links between retail payment networks by creating a single interoperable hub. Other countries have adopted a similar approach.

In South Africa, the rapid evolution of mobile money in SSA was not easily replicated. Having leaped ahead of Arican peers initially, South Africa found itself with a predominantly cash-based economy. This is partly due to a significant undocumented migrant population that cannot access formal or traditional banking products or services. Despite the best efforts of industry and the central bank, the informal cash economy remains large enough to hinder economic growth impede prosperity. As Finmark Trust observed, South Africans are now largely remunerated digitally, but many still rely on cash (see Graph 4). The resilience of this second, shadow economy has become the new policy focus, as discussed next.

2.2.5. New opportunities in the region

South Africa's whole-of-market approach

In South Affrica, the focus remains on converting the residual cash economy to digital payments. As the South African Reserve Bank (SARB) has observed:

> *"Shifting from cash to digital payments helps economies achieve greater transparency, reduces the risks of illicit financial flows and unlocks new*

[51] AfricaNenda, 'The state of inclusive instant payment systems in Africa', 1 October 2024.
[52] National Bank of Rwanda, 'Business plan for the Rwanda national digital payment system (R-NDPS)', 2018.

innovations in financial services. This transition is more than just a technological advancement − it is a foundational step towards building a resilient, inclusive and globally competitive economy. Digital payments can boost South Africa's GDP by 0.5%."[53]

Graph 4: Incidence of cash withdrawal in South Africa, 2023[54]

In 2023, following slower-than-expected progress in payment reforms to achieve its Vision 2025 objectives, the SARB established the Payments Ecosystem Modernisation (PEM) Programme, aiming for a fundamental shift in SA's payments landscape. Drawing inspiration from a global trend towards direct infrastructure provision by central banks and informed by the World Bank's DPI playbook,[55] PEM recasts core payments infrastructure as a public good to be developed and operated in the interest of all. PEM has seven initiatives supported by three central components, as illustrated by the 'PEM wheel' in Graph 5 below. The functional elements align with the precepts of the DPI approach, specifically:

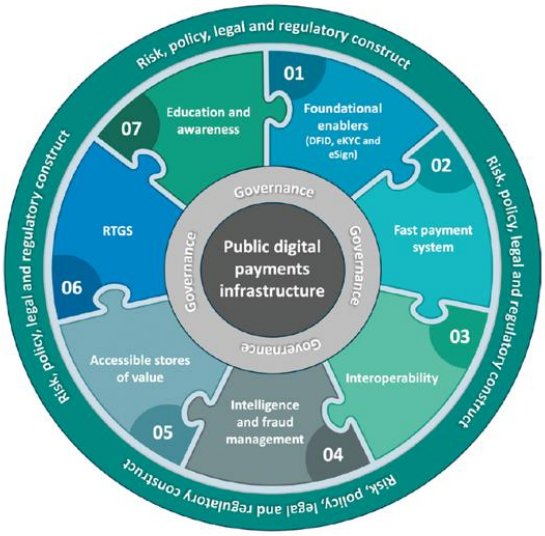
a. ***Digital identity and e-signatures:*** Regulators should prioritise establishing a robust identity verification system allows the electronic capture and secure storage of credentials that uniquely identifies individuals and enables authentication. E-signatures increase trust in the origination of information and ensure that transactions carried out electronically are legally valid.

[53] South African Reserve Bank, 'Positioning the South African Reserve Bank's Payments Ecosystem Modernisation Programme: A strategic shift to a higher equilibrium', 2025.

[54] Graph 4 highlights that 76% of social grant recipients withdraw their entire grant every month, despite having access to a debit card.

[55] J Clark, G Marin, O P Ardic Alper and G A Galicia Rabadan, 'Digital public infrastructure and development: A World Bank Group approach'. Digital Transformation White Paper, Volume 1.

Graph 5: The PEM wheel



b. ***Digital payments****:* Digital payments should provide secure, convenient and interoperable cashless transactions, enabling individuals, businesses and governments to transfer money easily. Digital payments facilitate e-commerce, government-to-person (G2P) benefits, tax payments and P2P transfers, while allowing users to receive and manage funds remotely through digital stores of value. FPSs provide immediate access to funds, lower fees and promote interoperability, enhancing competition and efficiency in the payments ecosystem.

c. ***Data-sharing****:* Regulators should prioritise data-sharing systems that optimise data flow in the digital economy by enabling secure and efficient exchange while protecting sensitive information. Further, regulators should facilitate entity-to-entity data-sharing, open data access and decentralised personal data management, thereby enhancing service delivery and innovation. The choice of data-sharing infrastructure would depend on the type and purpose of data, with various technical solutions supporting seamless cross-sector exchange.

In practice, PEM seeks to build on and enhance PayShap as SA's domestic instant payments infrastructure. The SARB has pointed to inconsistent implementation, delays, lack of consumer awareness, pricing disparity and weak central governance in rolling out PayShap. To address this, the SARB has proposed taking a controlling stake in the national payment operator, PayInc (formerly BankservAfrica).[56] This is intended to form the base for a national payment utility, operating the desired DPI.

The SARB's entry into retail payments infrastructure provision is also supported by extensive reform of the NPS Act to expand the SARB's powers of regulation, oversight and supervision of payment institutions and services. A central driver of these reforms is to open access to national payments infrastructure to non-bank entities to promote service innovation and price competition.

Through these measures, the SARB plans a fundamental shift from an overly cash-reliant economy to one with greater access to and adoption of digital payments, which can deliver long-term economic benefits for South Africa.

Regional Interconnectivity

In SSA, national developments will continue apace, given the success enjoyed by first movers such as Kenya and Ghana. The next horizon is shifting towards the development of regional

[56] BankservAfrica blog, 'BankservAfrica announces the SARB's intention to acquire 50% of the company', November 2024.

and/or continental interoperability to support cross-border trade and investment. Africa already has two regional and one continental IPSs live, with four more regional systems in development. These regional systems align with existing regional trade and investment frameworks.[57]

Once again, South Africa was a relatively early mover. In 2013, working with central banks from the Southern African Development Community (SADC) nations, the SARB launched the SADC-RTGS (formerly the SADC Integrated Regional Electronic Settlement System, or SIRESS), a ZAR-denominated high-value cross-border settlement system serving the SADC community of nations.[58] This was followed by the development of Transactions Cleared on an Immediate Basis (TCIB) by Pay Inc. (formerly BankservAfrica). TCIB is a cross-border low-value payment scheme providing immediate clearing for transactions across SADC. TCIB membership is primarily bank-based. However, non-banks such as remittance operators can be sponsored into the system. South Africa is in the process of amending legislation to allow for the participation of non-banks end to end.

Plans are underway to reform TCIB, to serve as a hub-and-spoke model, which will allow domestic IPSs to connect and support universal interconnectivity between counties. Individual participation by financial institutions will still cater for SADC countries that do not yet have a domestic IPS. In the South African context, this will mean having PayShap connect to TCIB.

Similar cross-border, low-value payment systems are under development in other African regional economic groupings such as the Economic Community of West African States (ECOWAS), the Common Market for Eastern and Southern Africa (COMESA) and the East African Community (EAC).

As at mid-2025, there are four cross-border IPSs live in Africa: TCIB (mentioned above); GIMACPAY in the CEMAC region;[59] the Pan-African Payment and Settlement System (PAPSS), which serves banks across the entire continent; and PI-SPI, an instant payment service for the countries of the West African Economic and Monetary Union (UEMOA), which is a single-currency zone of eight West African nations administered by the Central Bank of West African States (BCEAO). These systems are accumulating members from Africa's financial institutions, and none has yet achieved critical mass to be self-sustaining. Yet, the effort and investment in cross-border instant payments highlight the unmistakable economic importance of providing efficient instant payments infrastructure for cross-border activity.

In addition, successful national mobile money networks are increasingly offering cross-border connectivity to their existing wallet holders. This may be based on interconnection within mobile operator groups that are active in multiple countries or through specialist linking services such as Onafriq.com.

There is a significant overlap in the scope of operations of the regional and continental IPSs, giving rise to risks of duplication and fragmentation. Nevertheless, the rapid success of IPSs, including mobile money, shows the clear way forward for SSA. For the first time, the continent

[57] AfricaNenda, 'The state of inclusive instant payment systems in Africa: SIIPS 2024', Chapter 2.1, 2024.

[58] South African Reserve Bank, 'Positioning the SARB's Payments Ecosystem Modernisation Programme: A strategic shift to a higher equilibrium', 2025.

[59] GIMACPAY covers six countries: Cameroon, Central African Republic, Chad, Republic of Congo, Equatorial Guinea and Gabon.

has the opportunity to overcome the legacy of diverse communities, complex governance and economic hardship to deliver lasting financial inclusion and engagement.

3. Promising future of cross-border instant payments

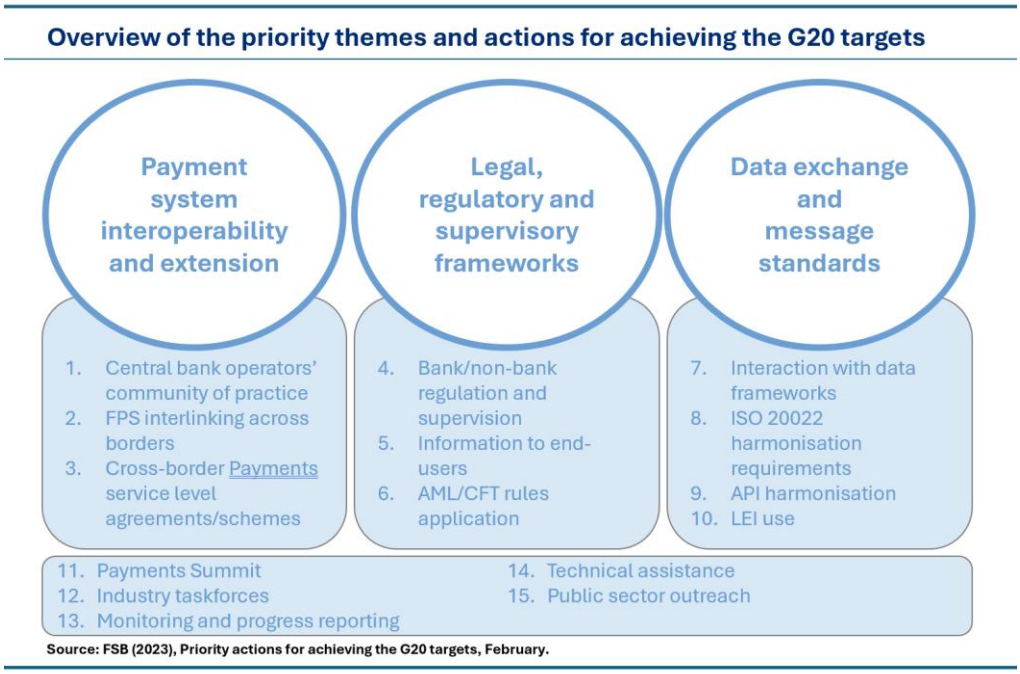
Payments is a fascinating landscape, full of innovation and the potential to bring transformative benefits to the financial system (as highlighted in the previous chapter) through some regional learnings. As digital payments continue to evolve, several cutting-edge technologies, global trends, and regulatory frameworks are reshaping how individuals and businesses transact.

3.1. Cross-border applications/use cases and prospects for cross-border payments

Having explored the evolution of digital payments within India and the SSA regions, it is important to recognise the importance of the future of cross-border payments globally – an area full of new opportunities where fragmentation, high costs, and inefficiencies remain persistent barriers. Addressing these issues has become a priority for the international community, with governments, central banks, and international organisations joining forces with the private sector to deliver more efficient, transparent, and secure payment solutions.

As digital payments undergo rapid transformation, global institutions such as the Financial Stability Board (FSB) and the World Bank are leading efforts to reimagine cross-border transactions. The FSB's G20 Roadmap for Enhancing Cross-Border Payments,[60] developed in coordination with the G20 and the Committee on Payments and Market Infrastructures (CPMI), lays out clear targets and priority actions to help make global payments faster, cheaper, safer, and more transparent. The 2024 Consolidated Progress Report shows that while more than half of these priority actions have been completed, further effort is needed to

Graph 6: Overview of the priority themes and actions for achieving the G20 targets



Source: FSB (2023), Priority actions for achieving the G20 targets, February.

[60] Financial Stability Board, 'G20 Roadmap for Enhancing Cross-border Payments: Consolidated progress report for 2024', 21 October 2024. https://www.fsb.org/2024/10/g20-roadmap-for-enhancing-cross-border-payments-consolidated-progress-report-for-2024/

convert policy frameworks into real-world implementation at the jurisdictional level.

The FSB also publishes key performance indicators (KPIs) to track progress across wholesale, retail, and remittance segments. These KPIs highlight persistent challenges, especially in lower-income regions, where cost, speed, and access still lag behind the set targets. With the importance of these priorities, there are several important organisations contributing to improving cross-border payments.

The International Monetary Fund (IMF) and the World Bank's approach to technical assistance[61] (TA) for cross-border payments plays a critical role in helping achieve the roadmap targets. While the global targets lay out a shared vision, large differences persist, particularly when compared to those of EMDEs, where the need for support is most urgent.

TA provided by the two institutions responds to these challenges by offering a wide range of tools – such as analytics, policy and technical advice, workshops, seminars, and training – at both country and regional levels. This work is closely tied to their respective missions: the IMF, through surveillance (Article IV consultations and joint Financial Sector Assessment Programs), strengthens policy dialogue and helps standard-setting bodies implement guidance and principles. The World Bank, in line with its vision, supports development outcomes by combining analytical and advisory work with financing, infrastructure development, and capacity building.

The IMF has identified focus areas where TA can best help meet these targets while safeguarding financial integrity. These include expanding access to payment systems, aligning operating hours, interlinking fast payment systems, applying anti-money laundering and combating the financing of terrorism (AML/CFT) standards, and supporting ISO 20022 harmonisation. The World Bank, in turn, leverages its global expertise and data initiatives (e.g. the Remittance Prices Worldwide database) to provide extensive TA for both domestic and cross-border payments. Its work includes scaling up fast payment system design, promoting international standards, and integrating enablers such as digital ID and cross-border data exchange. Their programmes are deliberately flexible and adaptable to the evolving landscape, with close coordination to ensure consistency, avoid duplication, and maximise impact in advancing the G20 Roadmap objectives.

The BIS Innovation Hub (BISIH) has taken a proactive role in exploring and piloting new technologies that can transform as well as support the cross-border payments landscape, considering previous priorities. Through collaborative projects (which will be explored in this chapter) with central banks and international stakeholders, these efforts aim to contribute directly to the G20's targets for cross-border payments, thereby reducing costs, enhancing transparency, improving interoperability, and expanding accessibility.

To deliver on the G20 targets for cross-border payments, key areas that need to be considered focus on the three main themes:

- interoperability of payments infrastructures to ensure seamless cross-border connectivity and wider accessibility;
- removing friction by streamlining compliance and fighting financial crime, while maintaining high standards to safeguard transparency and trust; and

[61] See the Report titled 'International Monetary Fund (IMF) and World Bank approach to cross-border payments technical assistance', December 2023.

- improving foreign exchange (FX) clearing and settlements to promote cost efficiency and reliable access for a broader set of participants.

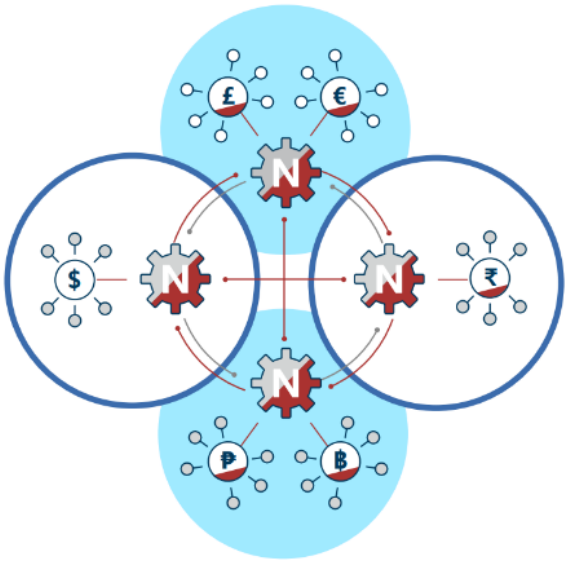
3.1.1. Interoperability and standardisation of payment/settlement systems

When focusing on enhancing interoperability and standardisation to improve cross-border payment efficiency, this vision aligns closely with the objectives of Project Nexus.[62] Project Nexus, already mentioned earlier, is an initiative which aims to increase financial inclusion by creating a public infrastructure that seamlessly connects domestic IPSs globally.

Nexus is a blueprint for connecting IPSs via a multilateral approach. It aims to enhance the speed, cost-efficiency, transparency, and accessibility of cross-border payments by connecting domestic IPSs globally.

Nexus has the potential to reshape cross-border payments. It is designed for scalability, enabling new countries to join effortlessly without burdening existing participants. The platform also supports a variety of use cases, including merchant payments, tailored to the needs of its members and the broader financial ecosystem.

Graph 7: Project Nexus standardises the way IPSs connect to each other. 'N' illustrates the different IPSs enabled by Nexus



By streamlining international transactions and fostering collaboration among central banks and payment systems, Nexus presents an efficient, agile, and sustainable global solution, backed by a strong business case and built to generate network effects over time.

Nexus is now a reality and has been handed over to the newly formed Nexus Global Payments (NGP), a not-for-profit entity owned by the five pioneering central banks of India, Malaysia, the Philippines, Singapore and Thailand, with aspirations for growing its participation and ownership to other interested and ready jurisdictions in due course.

3.1.2. Compliance and fighting financial crime in an era of instant cross-border payments

The growth of IPSs is particularly significant, as it delivers profound benefits to the ecosystem. However, as the capabilities of these systems develop, it is essential to also focus on the broader implications, especially regarding compliance with AML/CFT.

With the rise of digital payments, compliance has become an increasingly complex challenge. Instant payments may also lead to instant fraud, particularly in the cross-border context. This tension between speed and security is a key area of concern, as reflected in the Thomson

[62] See www.nexusglobalpayments.org for more information.

Reuters Regulatory Intelligence's 14th annual survey on the cost of compliance,[63] which explores the challenges faced by compliance officers in 2023 and the depth of issues encountered. Some of the key findings from the report include:

- Rising regulatory change: An increase in regulatory changes is anticipated, presenting major challenges for compliance officers and corporate boards.
- Cost management gaps: Even with growing cost pressures and the challenge of balancing compliance and competitiveness, 45% of respondents fail to track compliance expenses across their organisations
- Compliance team growth: Approximately one-third of respondents expect to grow their compliance teams. Despite budget constraints and staff turnover, the overall cost of compliance personnel is projected to increase. Additionally, more firms are turning to outsourcing for compliance functions.

Financial institutions and payment providers must comply with ever-evolving regulations, including AML requirements, KYC standards, and data privacy laws. The ability to meet these obligations while maintaining the speed, efficiency, and security of real-time payments is crucial.

By some estimates, over US$3 trillion[64] in illicit funds flow through the financial system each year. Fraud alone accounts for hundreds of billions of dollars, impacting both consumers and businesses that have to shoulder a considerable share of the losses. Furthermore, the true extent of fraud is likely underestimated, as most cases are probably never reported.

The extent of the challenge underscores the need for collective action. This is precisely the mission of initiatives such as the Global Coalition to Fight Financial Crime (GCFFC), an alliance of public and private partners founded in 2018 by Europol, the World Economic Forum and Refinitiv. The GCFFC brings together key players across the anti-financial crime ecosystem, with the overarching purpose of mitigating financial crime by identifying systemic weaknesses, advocating for tangible reforms at political and policy level, and making the global AML framework more effective.

Representing regulators, law enforcement, financial institutions, technology providers, and civil society, the GCFFC blends expertise in financial crime management, risk intelligence, and public–private information-sharing with strong thought leadership on how to address emerging threats. Its main objectives are to:

- raise global awareness of financial crime as a critical challenge with grave financial and human consequences;
- promote more effective information-sharing between public and private entities;
- propose mechanisms to identify new threats and best practice approaches for stronger controls against money laundering; and
- identify pressure points in the current AML/CFT framework and propose solutions to address them.

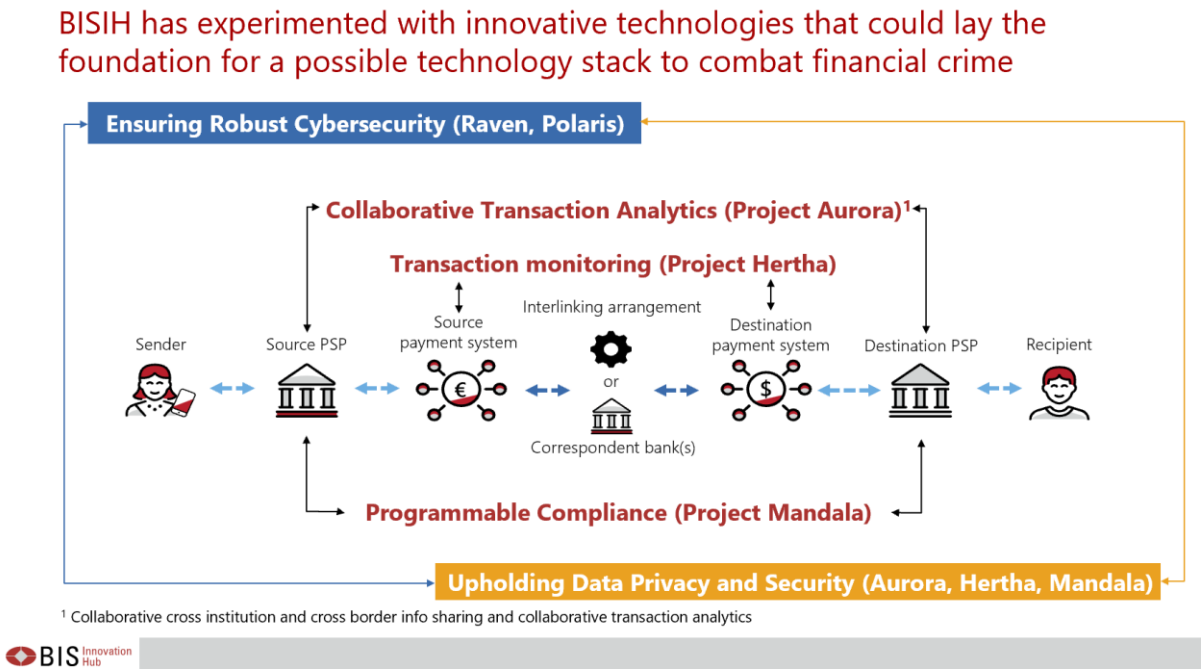
[63] Thomson Reuters Regulatory Intelligence, 'Cost of Compliance Report: Regulatory burden poses operational challenges for compliance officers', 25 May 2023.

[64] Nasdaq, 'Global Financial Crime Report: Insights at the intersection of financial crime data and real survivor stories', 2024. https://www.nasdaq.com/global-financial-crime-report

Reflecting the global nature of illicit finance, the GCFFC has established regional chapters in Europe, the Americas, MENA, , and Asia-Pacific, and has convened eight specialised working groups focused on areas such as anti-corruption, data privacy, digital assets, effectiveness, experts on technology, and fraud and scams. By uniting these diverse communities of expertise, the GCFFC underscores the critical importance of global partnerships in tackling the risks that grow as financial services become faster, more digital, and more interconnected.

This same purpose of collaboration also drives the work of the BISIH through projects that have developed technological solutions or components that could be combined in a potential 'technology stack'[65] to support global efforts to combat financial crime.

Graph 8: BIS Innovation Hub fighting financial crime technology stack representation



In this context, initiatives such as Project Mandala[66] may offer significant benefits, as it is designed to address compliance challenges in cross-border payments. Mandala enables participants to conduct peer-to-peer compliance checks ahead of initiating a transaction via a privacy enhancing approach. These checks generate a cryptographic proof of compliance that can be attached to the payment message or smart contract transaction. This helps financial institutions adhere to necessary compliance checks under data privacy requirements while simultaneously improving the transparency and security of transactions. This initiative aims to reduce the complexity of managing cross-border payments, ensuring that financial institutions can scale securely without compromising on compliance or speed.

Project Hertha[67] focused on demonstrating that advanced artificial intelligence (AI) and network analytics applied at the national retail payment systems level can support the detection of financial crime patterns that merit further review, while safeguarding privacy by

[65] C Skingsley, ' Working together to ensure financial integrity', BIS Innovation Hub Analytics Showcase, 2025.
[66] See more about Project Mandala at bis.org

[67] See more about Project Hertha at bis.org

relying only on a limited set of data points. For this purpose, the project generated synthetic transaction data resembling real payments through state-of-the-art AI methods.

Project Aurora,[68] on the other hand, demonstrated that applying AI, machine learning, privacy-enhancing technologies, and network analysis through collaborative analysis and learning significantly improves the detection of money laundering networks compared to siloed, rules-based approaches. It used synthetic payments data to prove concept feasibility while still addressing privacy and regulatory concerns. The next phase of this project aims to build on this foundation by developing a data handbook that offers a foundation for a common language for sharing money laundering information across institutions. It also seeks to further explore the use of privacy-enhancing technologies in multi-party collaborative analytics, to further tackle money laundering.

Completing the technology stack, Project Raven[69] can help the financial sector and authorities assess cybersecurity and resilience in their jurisdiction by using AI to lower the reporting and analytical costs, while Project Polaris[70] focused on the cybersecurity and resilience of potential future forms of money and payment systems, including offline digital payments.

3.1.3. FX clearing and settlement enhancements

In the cross-border payments space, FX requirements present another significant challenge, as these transactions often involve multiple currencies, intermediaries, and varying regulatory environments. The complexity of managing currency conversion, liquidity, and compliance can create inefficiencies, increase costs, and delay transactions. To address these issues, Project Rialto[71] is focused on streamlining the FX and settlement process for cross-border payments, including exploring the connection between non-tokenised and tokenised systems and testing direct FX or FX via a vehicle currency. This aims to improve the efficiency, speed, and transparency of FX transactions in cross-border payments. By simplifying the FX process and reducing reliance on intermediaries, Rialto could help lower the costs associated with currency conversion and enhance the overall user experience for both businesses and consumers. This project has the potential to improve the accessibility and efficiency of cross-border transactions, making them faster and more cost-effective.

3.1.4. Improving the existing and enabling the new

Graph 9 illustrates how three of the mentioned projects (Nexus, Mandala, and Rialto) work together within the broader cross-border payments ecosystem. Each project addresses a distinct layer of the value chain, upgrading existing processes while unlocking new possibilities. By showing how these components interconnect and fill critical gaps, the diagram highlights how the projects collectively modernise existing legacy infrastructures as well as enable innovative solutions for the future of cross-border payments.

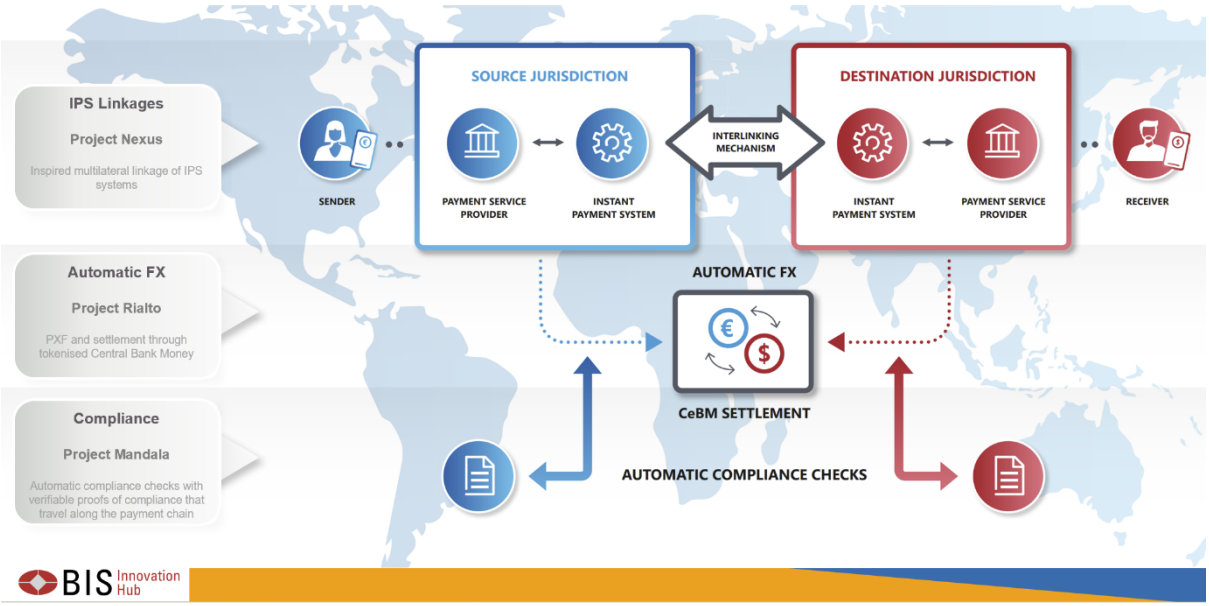
[68] See more about Project Aurora at bis.org

[69] See more about Project Raven at bis.org

[70] See more about Project Polaris at bis.org

[71] See more about Project Rialto at bis.org

Graph 9: BIS Innovation Hub illustration of the possibilities to address the challenges within the cross-border ecosystem



Project Nexus interlinks domestic IPSs, enabling financial institutions to provide end users with instant, low-cost, transparent, and widely accessible cross-border payments. This ensures that end users benefit directly from faster transactions and greater reach. Project Rialto focuses on the FX and settlement layer, enabling participating banks to exchange currencies and settle obligations in tokenised central bank money. This reduces counterparty and settlement risks, while supporting interoperability across multiple currencies. Project Mandala addresses the compliance and regulatory dimension by standardising and automating compliance processes across jurisdictions through smart contracts in a decentralised model. Mandala lowers frictions while ensuring regulatory safeguards are upheld. Together, these projects could form a complete and interoperable stack for secure, efficient, and compliant cross-border transactions.

3.2. The future of money in a tokenised world

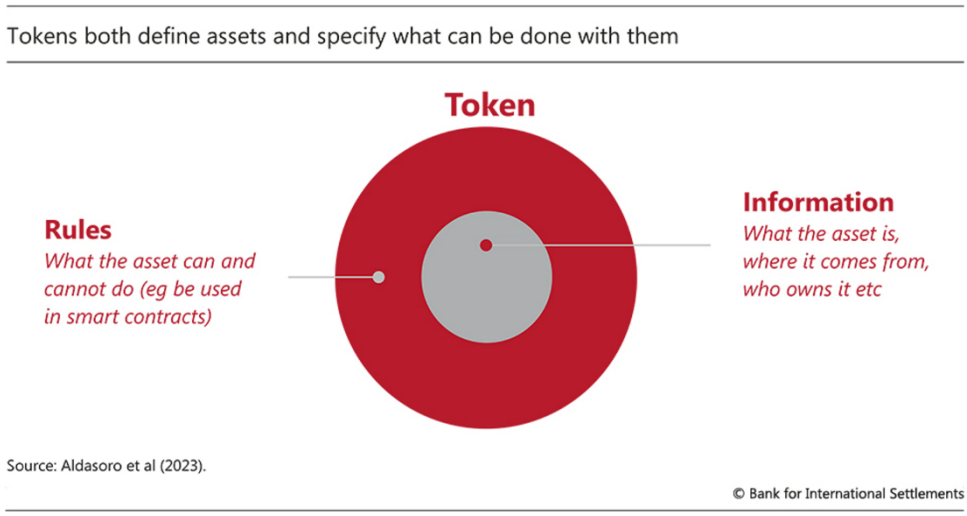
Today, money exists in two forms: public money, which is issued by a central bank as banknotes and central bank reserves, and private money, which is issued by commercial banks in the form of deposits and by non-bank financial institutions in the form of electronic money (e-money).[72] Although the existing monetary system has functioned effectively for society, recurring bottlenecks expose some frictions. These frictions largely stem from the system's architecture, where digital money and related claims are held in separate, proprietary databases positioned at the periphery of communication networks.

Major leaps in economic activity have always gone hand in hand with innovations in the monetary system. The shift from physical money to book entries overseen by trusted intermediaries opened the door to new financial instruments that spurred trade and commerce.

[72] Bank for International Settlements Financial Stability Institute (FSI), 'Central bank digital currencies – Executive Summary, 31 August 2023.

Over time, paper ledgers gave way to their digital counterparts, transforming how economies and societies function. Today, tokenisation may represent the next step in this evolution. Tokens[73] integrate the payments information in a traditional database with rules and logic that govern transfers, as represented in Graph 10. This integration enables the contingent performance of actions and enlarges the universe of possible economic arrangements. Tokenisation, which is the process of representing claims digitally on a programmable platform,[74] is a more fundamental approach towards addressing the shortcomings of the current system, bringing transformative innovation to both improve the old and enable the new. It paves the way for new arrangements in cross-border payments, securities markets and beyond.[75]

Graph 10: Representation of a token (BIS)



There is a vision for a future monetary system that leverages the transformative power of tokenisation to strengthen current frameworks while creating new opportunities.[76] The tokenisation of money and assets holds significant promise, yet most initiatives to date have developed in isolation. This vision captures its full potential in a unified ledger, which combines central bank money, tokenised deposits, and tokenised assets on a single programmable platform, where settlement finality is assured by having central bank money coexist with other claims in the same environment. By relying on the trust placed in central banks, such a shared infrastructure could substantially strengthen the monetary and financial system.

[73] H S Shin, 'Tokenisation for the real world', Speech by Mr Hyun Song Shin, Economic Adviser and Head of Research of the BIS, at the OCC Symposium on the 'Tokenization of Real-World Assets and Liabilities', Washington DC, 8 February 2024.

[74] Bank for International Settlements, 'Chapter III: Blueprint for the future monetary system: Improving the old, enabling the new'. *Annual Economic Report,* 2023.

[75] Bank for International Settlements, 'Chapter III: The next-generation monetary and financial system', *Annual Economic Report*, 2025.

[76] Bank for International Settlements, 'Chapter III: The next-generation monetary and financial system' *Annual Economic Report,* 2025.

The most prominent advantages that tokenised money can bring are programmable and atomic settlement, enhanced transaction transparency, reduced dependence on intermediaries, and lower costs. Beyond these, more advanced or strategic benefits emerge, such as the creation of new financial products, stronger security and risk management, and greater financial inclusion.

Following the rise of the tokenised experiments, Project Agorá[77] explores how tokenised commercial bank deposits can be seamlessly integrated with tokenised wholesale central bank money in a public−private programmable core financial platform.

Building on the unified ledger concept proposed by the BIS,[78] the project aims to assess how tokenising central bank money and commercial bank deposits (referred to as 'tokenised deposits') on a programmable platform can improve the safety, cost, and efficiency of wholesale cross-border payments, while broadly maintaining the 'correspondent banking model'. The project's primary objective is to build and evaluate a technical prototype platform, which may serve as a starting point for future developments. Project Agorá is structured as a public−private collaboration, bringing together seven central banks and more than 40 regulated financial firms, convened by the BIS and IIF respectively.

The future trajectory of money in a tokenised world remains uncertain. However, it is clear that by combining the trust of central bank money with the possibilities provided by programmable platforms, tokenisation has the potential to address long-standing frictions and unlock new forms of economic activity. The journey ahead will require experimentation, collaboration, and sound governance, yet it points towards a future monetary system that is more efficient, more inclusive, and better equipped to serve the evolving needs of the global economy.

4. Conclusion

The evolution of digital payments has been a story of transformation shaped by jurisdictional differences. From the earliest shifts away from cash to the rise of digital-first platforms, each phase has laid a foundation for what comes next in every region. As we look ahead, the future of payments will build on these foundations, leveraging past lessons while embracing new opportunities.

One of the most powerful insights from the global journey is that innovation and robust public digital infrastructure are key drivers of progress. However, as the ecosystem continues to evolve at a rapid pace, so too does the risk of fragmentation. The path forward must be one of intentional design and collaboration, ensuring that new technologies enhance, rather than fragment, the global financial system.

Success in the future of both domestic and cross-border instant payments will depend on a clear focus on interoperability, standardisation, systems interlinking, and public−private collaboration, as they are necessary pillars for building trust, resilience, and seamless user experiences, regardless of geography or economic context.

[77] See more about Project Agorá at bis.org

[78] Bank for International Settlements, 'Chapter III: The next-generation monetary and financial system' *Annual Economic Report,* 2025.

There is no single path to success. As shown in this paper, different economies have followed their own model, tailored to local needs and impacts, infrastructure, and policy environments. Yet a common thread binds all effective systems: they are accessible, user-centric, and underpinned by strong public–private coordination. These examples reinforce the notion that diversity in approach can coexist with unity in outcome, provided there is alignment in purpose and commitment to inclusion.

Central banks and governments increasingly recognise payments as critical national infrastructure with global implications. As such, the design and governance of payment systems are no longer just technical matters; they are central to broader goals of economic development, financial stability, and social equity.

Ultimately, the responsibility for shaping the next chapter of payments is shared. It requires continued engagement and cooperation between governments, central banks, the private sector, international organisations, and academia, among others. Together, these actors can ensure that progress in payments remains a public good, serving the needs of all, across borders, across sectors, and across generations.

The road ahead may be complex, but by pushing the boundaries of what is possible, learning from historical chapters (as we do in this paper), and maintaining a steadfast commitment to inclusivity, security, and global financial resilience, we can ensure that the future of payments is equitable and enduring.

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Annexure 2: Abbreviations

AI	artificial intelligence
AML	anti-money laundering
ATM	automated teller machine
BIS	Bank for International Settlements
BISIH	BIS Innovation Hub
CFT	combating the financing of terrorism
CPMI	Committee on Payments and Market Infrastructures
DPI	Digital Payments Index
EBS	Electronic Banking System
EMDE	emerging market and developing economy
e-money	electronic money
e-wallet	electronic wallet
fintech	financial technology
FPS	fast payment system
FSB	Financial Stability Board
FX	foreign exchange
G20	Group of Twenty
GCFFC	Global Coalition to Fight Financial Crime
GDP	gross domestic product
GSMA	Global System for Mobile Communications Association
IFSC	Indian financial system codes
IMF	International Monetary Fund
IMPS	Immediate Payment Service
IPS	instant payment systems
KPI	key performance indicator
KYC	Know Your Customer
MDR	merchant discount rate
MNO	mobile network operator
MSME	micro, small, and medium enterprise
NEFT	National Electronic Funds Transfer
NGP	Nexus Global Payments

NIPL	NPCI International Payments Ltd
NPCI	National Payments Corporation of India
ONDC	Open Network for Digital Commerce
P2P	person-to-person
P2P	person-to-person
PASA	Payments Association of South Africa
PEM	Payments Ecosystem Modernisation (Programme)
POS	point of sale
QR	Quick Response (code)
RBI	Reserve Bank of India
SADC	Southern African Development Community
SARB	South African Reserve Bank
SSA	sub-Saharan Africa
TA	technical assistance
TCIB	Transactions Cleared on an Immediate Basis
UPI	Unified Payments Interface

Annexure 3: Contributing members

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