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What Does Digital Money Mean for Emerging Market and Developing Economies?

Fintech and the Future of Finance Flagship Technical Note



WORLD BANK GROUP

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Acronyms

ABL	Asset-Based Lending
AI	Artificial Intelligence
AML	Anti-Money Laundering
API	Application Program Interface
APIX	API Exchange
CBDC	Central Bank Digital Currency
CCAF	Cambridge Centre for Alternative Finance
CFT	Counter Financing of Terrorism
CGAP	Consultative Group for the Advancement of the Poor
DLT	Distributed Ledger Technology
DFS	Digital Financial Services
EMDEs	Emerging Markets and Developing Economies
FATF	Financial Action Task Force
FCA	Financial Conduct Authority
FSA	Japan Financial Services Agency
FSB	Financial Stability Board
FX	Foreign Exchange
GDPR	General Data Protection Regulation
GPFI	Global Partnership for Financial Inclusion
ICCR	International Committee on Credit Reporting
IOT	Internet of Things
KYC	Know-Your-Customer
LEI	Legal Entity Identifier
MCA	Merchant Cash Advance
MENA	Middle East and North Africa
MIS	Management Information System
ML	Machine Learning
MNO	Mobile Network Operator
OECD	Organization for Economic Cooperation and Development
P2P	Person-to-Person

PE	Private Equity
QR Code	Quick Response Code
SCF	Supply-Chain Finance
SDGs	United Nations Sustainable Development Goals
SEC	Securities and Exchange Commission
SME	Small and Medium Enterprises
UNDP	United Nations Development Program
VC	Venture Capital
WEF	World Economic Forum

Executive Summary

Physical cash and commercial bank money are dominant vehicles for retail payments around the world, including in emerging market and developing economies (EMDEs). Yet payments in EMDEs are marked by several key deficiencies—such as lack of universal access to transaction accounts, widespread informality, limited competition, and high costs, particularly for cross-border payments. Digital money seeks to address these deficiencies.

This note categorizes new digital money proposals. These include crypto-assets, stablecoins, and central bank digital currencies (CBDCs). It assesses the supply and demand factors that may determine in which countries these innovations are more likely to be adopted. It lays out particular policy challenges for authorities in EMDEs. Finally, it compares these with digital innovations such as mobile money, retail fast-payment systems, new products by incumbent financial institutions, and new entrants such as specialized cross-border money-transfer operators.

Proposals for global stablecoins have put a much-needed spotlight on deficiencies in financial inclusion, and in cross-border payments and remittances in EMDEs. Yet stablecoin initiatives are no panacea. While they may achieve adoption in certain EMDEs, they may also pose particular development, macroeconomic, and cross-border challenges for these countries and have not been tested at scale. Several EMDE authorities are weighing the potential costs and benefits of CBDCs. We argue that the distinction between token-based and account-based money matters less than the distinction between central bank and non-central bank money. Fast-moving fintech innovations that are built on, or improve existing financial plumbing, may address many of the issues in EMDEs that both private stablecoins and CBDCs aim to tackle.

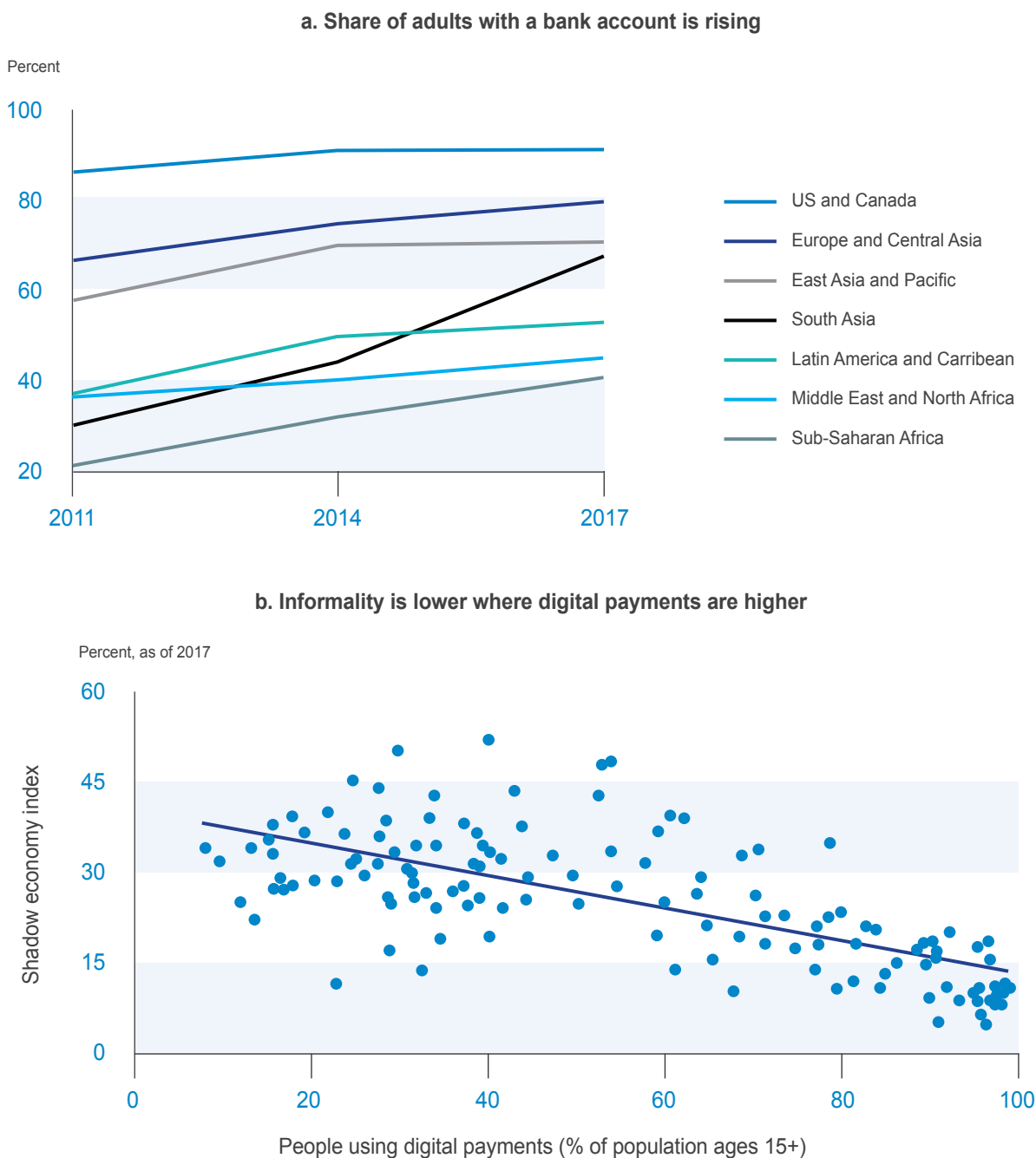
1. Introduction

From the ancient Indian *rupya*, to cacao beans in the Aztec empire, to the first paper money in China, money and payments have been evolving for centuries. The countries that are today called emerging market and developing economies (EMDEs), which collectively make up 84 percent of the world's population but only 37 percent of GDP at current prices, are no exception. In recent decades, physical cash and claims on commercial banks (deposits) have become the main vehicles for retail payments around the world (Bech et al., 2018). Compared to physical cash, commercial bank money provides more safety, enables remote transactions, and allows banks to extend other useful financial services. This may ultimately benefit economic efficiency and enhance economic policy oversight (Listfield and Montes-Negret, 1994).

Yet for retail users, especially in EMDEs, commercial bank money poses at least three key challenges. First, it requires a bank account—access to which is rising (figure 1, left-hand panel) but is still far from universal. The poor often lack the proper documentation to comply with banks' customer due diligence (CDD) requirements. In some cases, they live too far from a bank branch, or find the maintenance costs or minimum balances too onerous. E-money, which can be seen as a variant of commercial bank money, seeks to address these challenges.¹ Together with simplified CDD and networks of agents, e-money has improved access to transaction services. Still, in countries where bank accounts and e-money have not reached universal levels, the poor rely heavily on cash. This reliance on cash helps perpetuate informality, also known as the shadow economy—economic activities hidden from authorities for monetary, regulatory, and institutional reasons (Medina and Schneider, 2019).² Indeed, informality is higher in countries with lower use of digital payments like bank accounts and e-money (figure 1, right-hand panel).

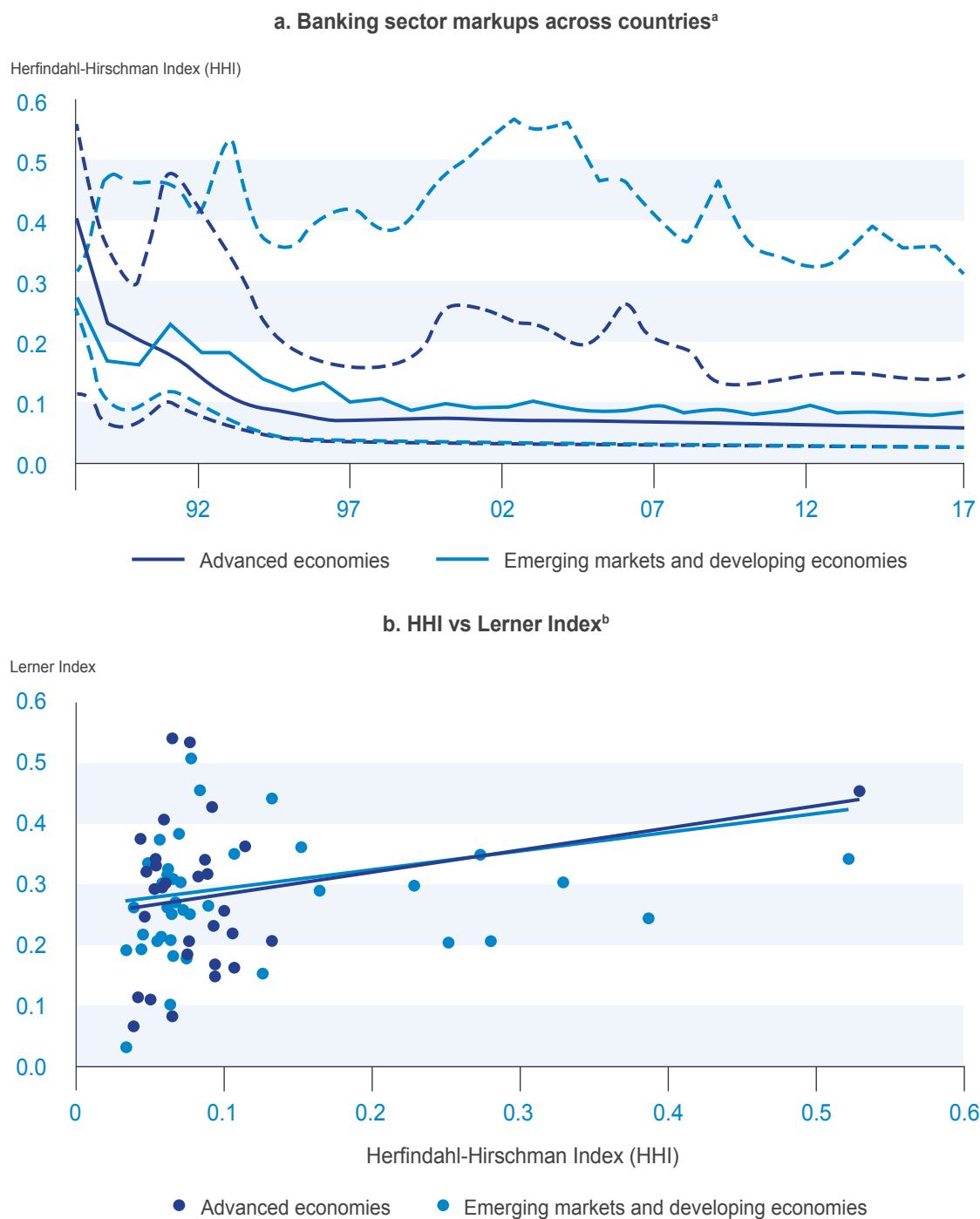
1. E-money refers here to monetary value that is stored electronically on receipt of funds, and which is used for making payment transactions. In almost all countries, e-money balances are held in commercial banks. A notable exception is China where funds are held with the central bank.

2. For a seminal work on informality, see Hart (1973). Hart described the economic activities of low-income urban workers in Accra, Ghana, including complex and varied income-generating activities operating outside the formal legal system.

Figure 1. Access to Bank Accounts and Bank Services Is Heterogeneous, but Rising

Sources: World Bank Findex data; Medina and Schneider (2019).

Second, despite improvements in recent years, financial institutions in many EMDEs face limited competition (figure 2, left-hand panel). This concentrated market power often results in higher markups (figure 2, right-hand panel), that is, more expensive financial services. Concentration can also result in limited incentive for innovation over time. Together with households' recollection and past experiences of costly banking and financial crises, banking sector concentration can contribute to a lack of trust in the formal financial system.

Figure 2. Banking Sector Concentration, While Declining, Is Associated with Higher Markups

a. Solid lines denote the median and dash lines denote the 5th and the 95th percentiles.

b. Data for 2014.

Source: World Bank.

Third, many households in EMDEs depend on low-value cross-border remittances from family members working abroad. Remittances to EMDEs reached \$551 billion in 2019. Such flows exceed official development assistance by a factor of three, and—prior to the COVID-19 pandemic—were on track to overtake foreign direct investment inflows (Ratha et al., 2019; figure 3, left-hand panel). Specialized money-transfer operators (MTOs) have emerged to provide near instantaneous transfers, and to reduce the costs for sending money over time. Yet it still costs about \$14 on average

to send \$200 back home (World Bank, 2019; figure 3, right-hand panel). This is largely because of the need to convert remittances from and to cash on both sides of the transaction (also known as “cash-in, cash-out”). This arrangement requires manual processing (including verifying the customer’s identity) and a physical office (such as an MTO or post office). Micro, small, and medium-sized enterprises (MSMEs) and individuals participating in cross-border trade in EMDEs can face even higher fees and wait times than larger retail customers.

Figure 3. Remittance Flows Are Increasing



Source: World Bank: Remittance prices worldwide reports.

One specific problem for cross-border payments and remittances is the decline in correspondent banking. Correspondent banking is an arrangement under which one bank (correspondent) holds deposits owned by other banks (the respondents) and provides those banks with payment and other services (CPMI, 2016). Most modes of cross-border payments—including banks and specialized remittance service providers—depend on the correspondent banking system, which is often slow and opaque. Moreover, in the last few years, correspondent banks have become less willing to provide such services and have been selectively exiting the business or reducing the number of respondent bank relationships (FSB 2017; IMF, 2017; World Bank, 2018; FSB, 2019; CPMI 2019). All regions have seen a decline in the number of active correspondents, although these trends vary significantly (figure 4, left-hand panel). The rates of decline range from about 10 to 30 percent by region, with North America at the low end and Latin America at the high end (center panel). Additionally, the number of corridors (country-to-country connections) between countries fell by 10 percent over the same period. Here too, the decline was uneven across regions (figure 4, dots in center panel) and left some regions with fewer remaining corridors (figure 4, right-hand panel).

The retreat by correspondent banks raises three concerns: (1) some jurisdictions could face inadequate access to the global financial system; (2) greater concentration, or fewer correspondent banks providing services, could keep cross-border payment costs and frictions elevated; and (3) where banks are not providing financial (payment) services, users may resort to less regulated or unregulated channels, shifting payments outside the banking system, including, potentially, to digital currencies (Rice et al., 2020).

Figure 4. Correspondent Banking Landscape

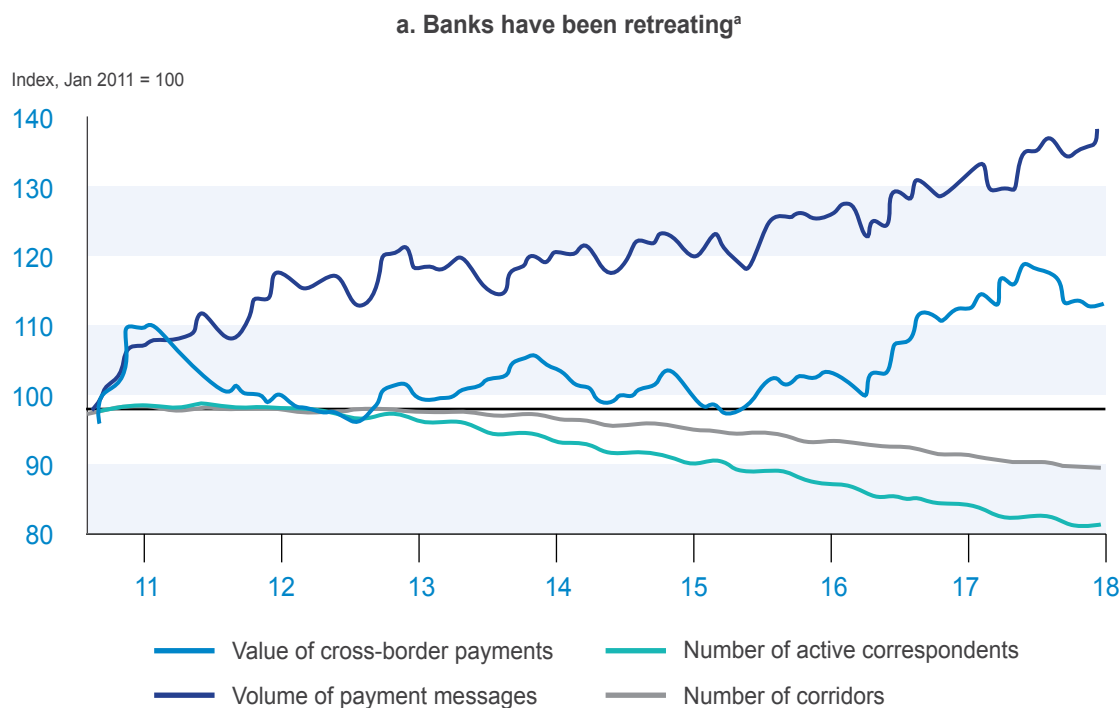
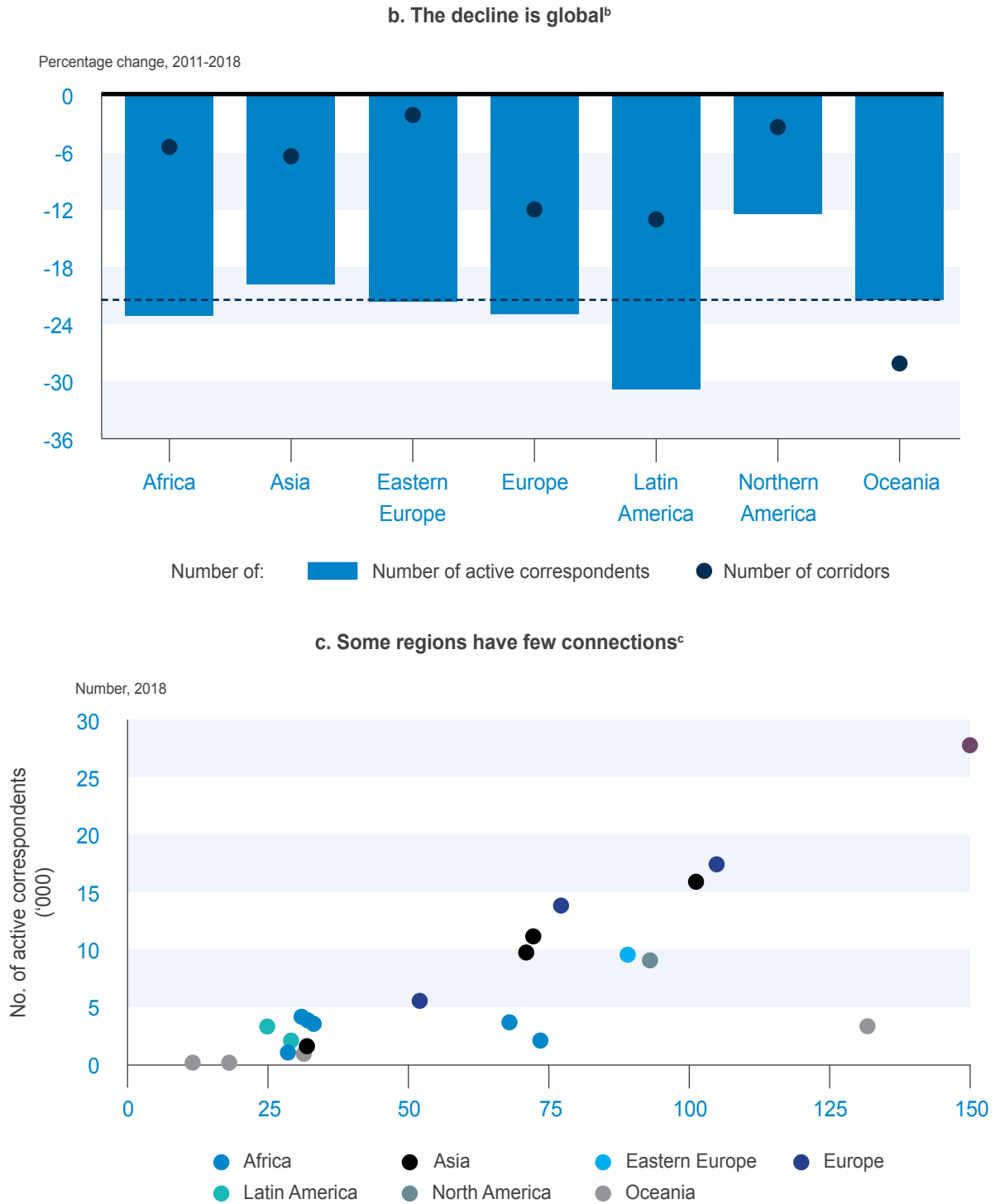


Figure 4 continued



a. Three-month moving averages.

b. The black dotted line shows the average percentage change of active correspondents across regions.

c. 2018 data. Averages across countries in the sub-regions listed. Africa = Eastern, Middle, Northern, Southern, and Western; Asia = Central, Eastern, South-Eastern, Southern, and Western; Eastern Europe; Europe = Northern, Southern, and Western; Latin America = Caribbean, Central, and South America; Northern America; Oceania = Australia and New Zealand, Melanesia, Micronesia, and Polynesia.

Sources: Rice et al (2020); SWIFT BI Watch; National Bank of Belgium.

2. Enter Digital: Crypto-Assets, Stablecoins, and CBDCs

Various crypto-assets claim to address deficiencies in the existing financial system. Many are vying to become a new form of digital money that can be securely sent and received over the internet, by anybody with a phone or internet connection, and with the convenience and cost-effectiveness of an e-mail. Some initiatives target cross-border payments, particularly remittances, in EMDEs. By cutting out financial intermediaries, such proposals aim to empower users and make domestic and cross-border payments more efficient. This may be particularly relevant for country corridors hit by the decline in correspondent banking relationships, and for those countries with growing participation in the digital economy but without a corresponding growth in access to e-commerce-enabled payment mechanisms.

Crypto-assets have suffered from various impediments, including high price volatility and scalability challenges, which prevent them from being adopted as a mainstream means of payment or store of value, much less a unit of account (see BIS, 2018). In response, a diverse family of so-called “stablecoins” has entered the fray, including proposals like Facebook’s Libra (since renamed “Diem”). Most stablecoins attempt to maintain a stable value relative to a fiat currency (like e-money or a currency board) or a basket of fiat currencies. To maintain a stable value, most initiatives adopt a collateral approach using bank deposits, government securities, or crypto-assets; although some projects attempt to maintain stability by algorithmically balancing the supply of coins in circulation with demand (Arner et al., 2020; Moin et al., 2019). This would be no small feat, as the eventful history of broken currency boards and pegs has shown. Furthermore, stablecoin systems that can tap into the massive user bases of platform companies may employ network effects to drive rapid adoption on a global scale. Several big tech-platform companies exist in EMDEs—in particular in Asia—that have a sufficiently large footprint to spur mass adoption.

Proposed stablecoin arrangements represent more than just a payment instrument; they are often ecosystems with entities that each plays a role in the overall functioning of the system with potentially multiple digital assets that are used for payment or investment running on top of them (Zetzsche et al., 2020). For most stablecoin arrangements that could reach scale, there are various key roles that are typically played by a variety of entities:

- Governance, which includes various tasks related to software protocols, issuance, and redemption policies, and the reserve investment strategy
- Issuance and redemption of stablecoins in circulation³
- Management of the reserve assets
- Validation of transactions to enable transfers
- Custody and exchange of stablecoins with users.

However, as pointed out by the G7 and FSB, stablecoins pose a wide range of risks related to, among others, legal certainty, financial integrity, sound governance, the smooth functioning of payments, consumer protection, data privacy, tax compliance, and potentially monetary policy and financial stability (G7 Working Group on Stablecoins, 2019; FSB, 2020). Moreover, stablecoins face many of the same obstacles that other players have faced with transaction accounts,

3. Some stablecoin arrangements have proposed to maintain stability by algorithmically controlling the supply of coins in circulation to match demand.

including mobile money. Further, they need to contend with new challenges of their own depending on the scale of adoption and their use as a means of payment or a store of value.

Recently, a number of central banks have proposed or piloted so-called central bank digital currencies (CBDCs). CBDCs would be a new form of digital central bank money that could be distinguished from reserves or settlement balances held by commercial banks at central banks (CPMI/MC, 2018). While the technology and design could take different forms, CBDCs would be issued by the central bank, like physical cash or the reserves that banks hold at the central bank, and would be in digital form.⁴ A recent survey finds that central banks representing a fifth of the world's population say they are likely to issue a CBDCs in the next few years (Boar et al., 2020; Boar and Wehrli, 2021). Several central banks are moving into more advanced stages of CBDC engagement, progressing from conceptual research towards practical experimentation. Other central banks, meanwhile, are moving at a more measured pace with further research or consultation, while yet others have concluded that risks currently outweigh potential benefits. Central banks give a wide range of motivations for CBDC initiatives; for EMDE central banks, this includes promoting financial inclusion and payments efficiency. Many of these initiatives target wholesale payments, that is, large-value transactions between financial institutions, in some cases for cross-border payments. Some pilots and research and development projects are for general purpose use by retail customers (Auer et al., 2020). Economically speaking, retail CBDCs amount to households having direct access to the central bank balance sheet—"reserves for all" (Niepelt, 2019).

A simple matrix helps to categorize these various digital money proposals and compare them to existing payments instruments (table 1).⁵ The first relevant dimension is whether a payments instrument is provided by the central bank or not. In most jurisdictions, central banks play a crucial role in the payments system, holding the required reserves and settlement balances of commercial banks, and usually issuing physical cash.⁶ Private sector parties, such as commercial banks, offer bank deposits and e-money. A second dimension is whether a payments method is an "account-based" instrument or is "token-based". This distinction depends on the method of verification: the receiver of a token will verify that the token is genuine, whereas an intermediary verifies the identity of an account holder (see Kahn and Roberds, 2009).⁷ Physical cash, crypto-assets, and stablecoins can be considered token-based—even if the first is in physical form, and the latter two are digital.

Notably, CBDCs could be either token-based or account-based depending on precise design options. A token-based CBDC would resemble a type of "digital cash", allowing access through a password or encrypted value. An account-based CBDC would involve intermediaries like the central bank or financial institutions verifying the identity of users (Boar et al., 2020). This distinction could have some relevant implications for the use of a CBDC. For instance, a token-based CBDC could allow for greater privacy or anonymity, similar to cash. Yet this distinction may be much less important than the distinction between central bank and non-central bank instruments (Carstens, 2019a; 2021).

4. See Adrian and Mancini-Griffoli (2019) and Auer and Böhme (2020) for a discussion of different CBDC models, including models whereby a private stablecoin arrangement solely uses central bank reserves as reserve assets.

5. For a fuller taxonomy of money ("the money flower"), see Bech and Garratt (2017).

6. Notable exceptions are Hong Kong and Macau, where a limited number of commercial banks are authorized to issue bank notes for general circulation.

7. A second distinction raised by some authors is the degree of centralization of the ledger. Account-based systems have a central ledger or book, while token-based systems typically run on distributed ledger technology (Bech et al., 2020).

Table 1. Categorization of Cash, Crypto-Assets, Stablecoins, Bank Deposits, and CBDCs

	Account-based	Token-based
Central bank	Reserves/settlement balances; account-based CBDCs	Cash; token-based CBDCs
Non-central bank	Commercial bank deposits; e-money	Crypto-assets; stablecoins

Source: World Bank.

Central bank and non-central bank payment instruments differ in a number of important ways. Crucially, the central bank is accountable to the public, rather than private shareholders. Governance frameworks have been built up over time, including in EMDEs, to safeguard central bank independence and transparency (see for example, Crowe and Meade, 2007). Forms of money offered by the central bank are provided as public goods, rather than with a profit motive. While theoretical models can assess sufficient conditions for the equivalence of public and private money (Brunnermeier and Niepelt, 2019), these conditions often do not hold in practice. It is in part for these reasons that most economies, including EMDEs, feature a mix of public and private forms of money.

Indeed, central banks provide a number of key central bank public goods that underpin a stable monetary system, including providing a unit of account, guaranteeing the finality of payments, providing liquidity and conducting oversight (Carstens, 2019b; BIS, 2020). Those forms of money that the central bank provides—currently reserve balances and cash—usually make up only a small part of the overall money supply, but are fundamental for the functioning of the system as a whole. Meanwhile, private sector banks create money through lending by crediting a deposit account, which is steered by regulation, supervision, and monetary policy. Other institutions issue e-money, which is also tightly regulated and generally kept in segregated accounts—typically in the banking system—to ensure safety and avoid money creation. In order to guard against excessive issuance and ensure the stability of money, substantial policy frameworks have been created, which may not yet be in place for crypto-assets and stablecoins.

Overall, digital forms of money like crypto-assets, stablecoins, and CBDCs show how new technologies can be applied to address challenges in the existing monetary system, including some challenges unique to EMDEs. Yet they are to date untested at a large scale and it is too soon to tell whether they could provide superior solutions to improving existing payment systems. Each of these innovations is evolving fast, yet understanding their risks and benefits will take time. What these innovations will mean for policy depends both on who issues them and how they are issued. In this light, the “who” may turn out to be the more important dimension. A number of practical policy challenges remain to be addressed.

3. Context in Which Digital Money May Be Adopted

Before addressing the policy challenges in more depth, it is useful to discuss in which countries private stablecoins and CBDCs could be adopted. This is necessarily speculative, as many stablecoin arrangements and CBDCs are proposals at this point and, thus, not yet operational. Even for those projects that are live, there is scant information on adoption by country. Nonetheless, some commentators (for example, Hileman, 2015; Brosens and Cocuzzo, 2019; Auer et al., 2020) have sought to sketch where crypto-assets, stablecoins, or CBDCs may be attractive. We provide a similar overview, based on the discussion above, and highlight a number of relevant indicators. We discuss the potential for adoption for both stablecoins and for CBDCs and review where the motivation for adoption could differ between them. Potential factors relate to both supply side (the digital money provider) and the demand side (the end user; household or business). These factors would also be driven by the attractiveness of the stablecoin or CBDC as a means of payment and store of value.

3.1 Supply Factors

A number of supply factors could help to support the adoption of stablecoins or CBDCs in EMDEs. Table 2 summarizes these factors.

Table 2. Factors That May Support the Adoption of Digital Money

Supply factors	Description	Indicators
Infrastructure for adoption	Digital money requires a network and digital infrastructure—such as mobile phone coverage and retail agent networks—for adoption.	Share of population with mobile phone subscriptions, share of population with access to the internet, availability of exchanges or MTOs for cash-in/cash-out.
Traditional payment-service provider profitability and costs	Incumbent financial institutional cost structures (including compliance costs) are high, making financial institutions unattractive. Digital money providers may not be subject to the same requirements (that is, arbitrage) or could have lower compliance costs.	FATF AML/CFT high-risk designation (proxies for higher KYC and risk-management costs to banks); measure of offshore/tax havens status (higher risk); incumbent financial institution profitability; level of interchange by payment card providers.

Table 2 continued

Supply factors	Description	Indicators
Public sector desire to improve payments and financial systems	Improvements in domestic payments efficiency, payments safety and financial inclusion, reliance on cash use.	Low share of population with transaction accounts; high reliance on cash or very low cash usage.
Demand factors	Description	Indicators
Cost and convenience	Cost and speed of digital currency transfer or exchange may differ from traditional (cross-border) payments with a bank or MTO.	Cost of receiving remittances, current speed of receiving payments.
Confidence in incumbent banking system	Trust in incumbent financial institutions could be undermined by crises and concentrated markets or monopoly power.	Incidence of financial crises over recent years, concentration of banking system in local market, shadow economy.
Confidence in government	Trust in the public sector, including the public's expectation of sustainable monetary and fiscal policy may support CBDCs, while financial repression and weak macro-financial policies may support private stablecoins.	Trust in government index, corruption perception index (Transparency International, 2020), to proxy for poor rule-of-law and higher-risk countries, controls on domestic currency.
Macroeconomic factors	Poor growth and large fluctuations in the value of the domestic currency may make private alternatives more attractive to users.	Growth, foreign exchange volatility, inflation, trade flows.

Source: World Bank.

Issuance and redemption of digital currencies (either private or public) requires a network and digital infrastructure, such as mobile phone coverage, for adoption. A pre-existing network could enable wide-scale adoption and make entry into markets with such networks more attractive (figure 5, left-hand panel). Among EMDEs, particularly countries in East Asia, the Pacific, and Latin America and the Caribbean show high mobile cellular use. On a similar note, private arrangements like stablecoins may be more willing to introduce stablecoins where, for example, access to the internet (that is, the ability to transact via the internet) is higher (figure 5, center panel).⁸ Private arrangements may also be more willing to introduce digital currencies in countries with higher remittances and greater trade openness, such as the countries in East Asia and the Pacific and the Middle East and North Africa (figure 5, right-hand panel), as these countries would have a readier inward supply of such new payment instruments from foreign parties.

Issuance and redemption could also be driven by profitability and cost considerations of both incumbent banks and potential entrants. Such costs include entry costs (for example, licensing fees, costs to buy or build offices, and hire employees), and regulatory compliance costs (such as with anti-money laundering requirements). Private initiatives such as stablecoins would likely also require a network of physical agent offices for “cash in/cash-out” ability because most EMDEs still are extensive users of cash. Having a pre-existing network would reduce the costs and increase the scope for adoption.

Figure 5. Stablecoins May Be Supplied to a Greater Extent in Countries with Higher Mobile Use, Internet Access, Remittances and Trade Openness

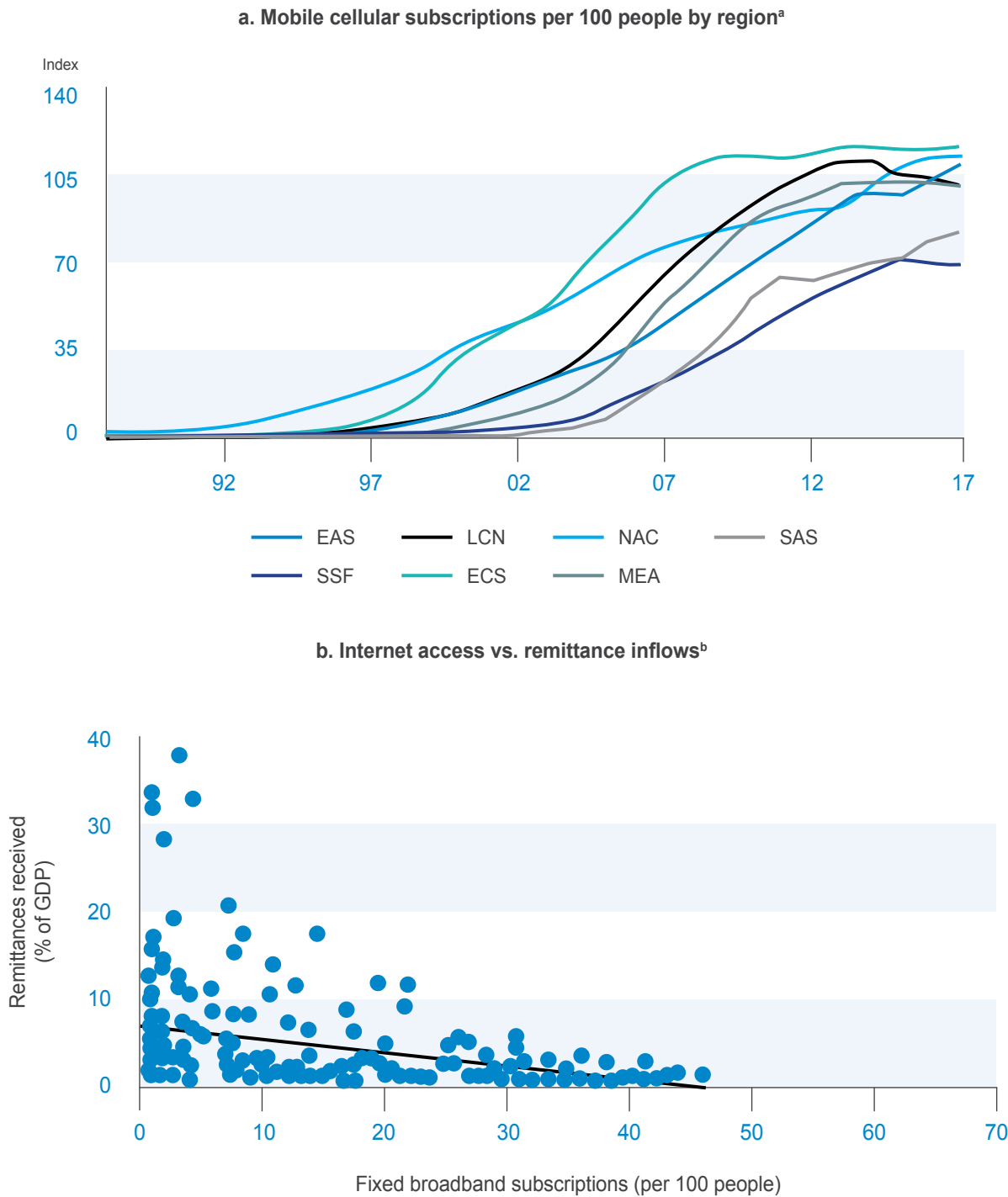
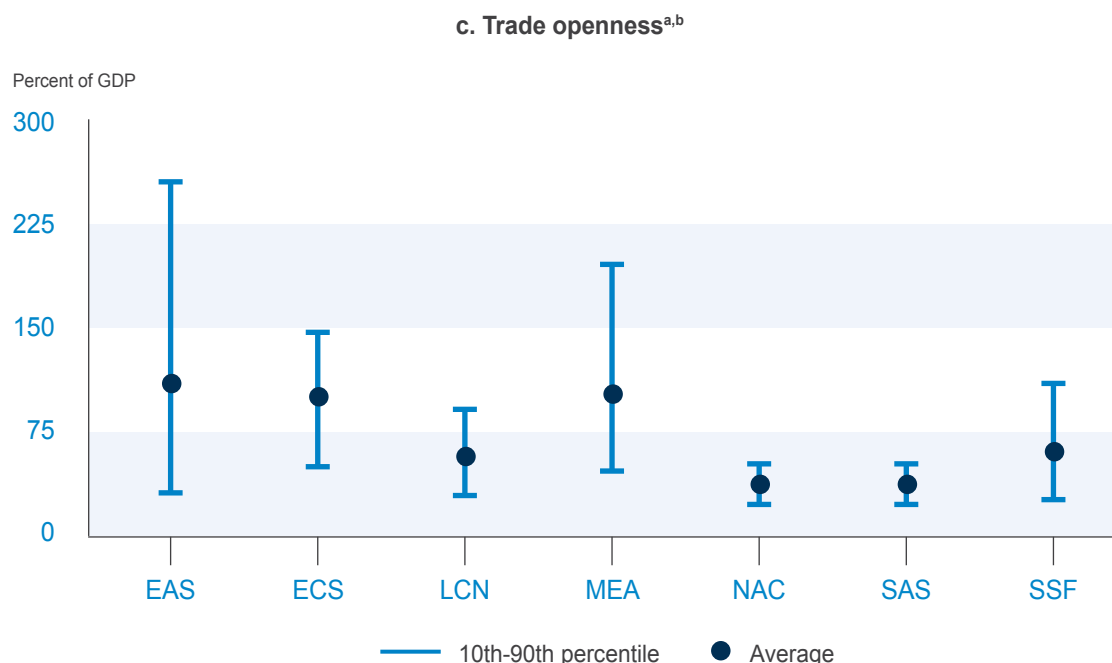


Figure 5 continued



a. EAS = East Asia and Pacific; ECS = Europe and Central Asia; LCN = Latin America and Caribbean; MEA = Middle East and North Africa; NAC = Northern America; SAS = South Asia, SSF = Sub-Saharan Africa.
 b. Data for 2017.

Source: World Bank.

Regarding CBDCs, a number of EMDEs central banks are developing CBDCs with the aim of improving their existing payments and financial systems. Domestic payments efficiency, payments safety, and financial inclusion were, on average, all considered “very important” in this respect for EMDEs (Boar et al., 2020). Interestingly, a country’s reliance on cash motivated work on CBDCs, but for various reasons. Those with a high reliance on cash see CBDCs as potentially reducing costs and improving know-your-customer (KYC), anti-money laundering, and combating the financing of terrorism (AML/CFT) arrangements, as set out by the Financial Action Task Force (FATF). Those with a low or declining use of cash for payments believe that a CBDC could help to maintain public access to central bank money (Boar et al., 2020).

3.2 Demand Factors

Technology is changing the way consumers transact. They increasingly expect platforms to be mobile-first and fully digital. In EMDEs, customers look to their phones and mobile carriers to offer payment and deposit services (Petrulia et al., 2019). Digital currencies have the potential to reduce costs of transacting across borders, and increase speed and transparency of transactions. Thus, demand for digital currencies would likely be higher in countries where those costs are relatively high and cross-border payments are slow or opaque.

In particular, remittance costs, which have been declining over the past several years due to coordinated cross-border policy initiatives, have not declined in countries where the loss of correspondent bank access has been greatest (figure 6, left-hand panel). For some regions, particularly Africa, costs remain high (figure 6, center panel). Stablecoins present potentially cheaper alternatives for cross-border transactions and would likely be desirable in countries

for which receiving remittances is most expensive. Use of mobile money (discussed in detail below) and MTOs are less expensive than banks (figure 6, right-hand panel). Offering stablecoins through mobile phone networks and MTOs could be attractive to users and further push down the costs of cross-border payments.

Figure 6. Stablecoins Could Be More Attractive Where Cost of Sending Remittances Is High^a

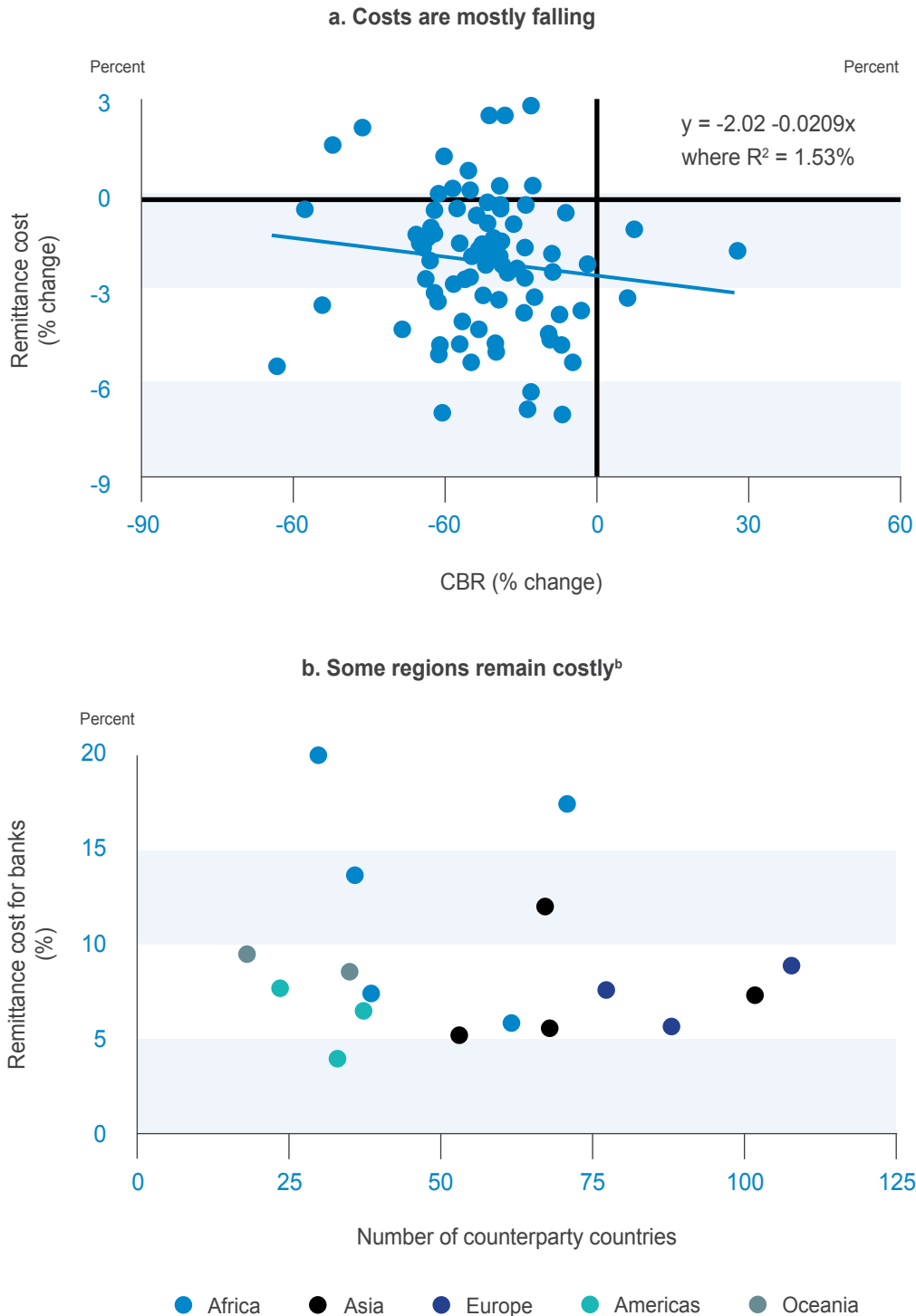
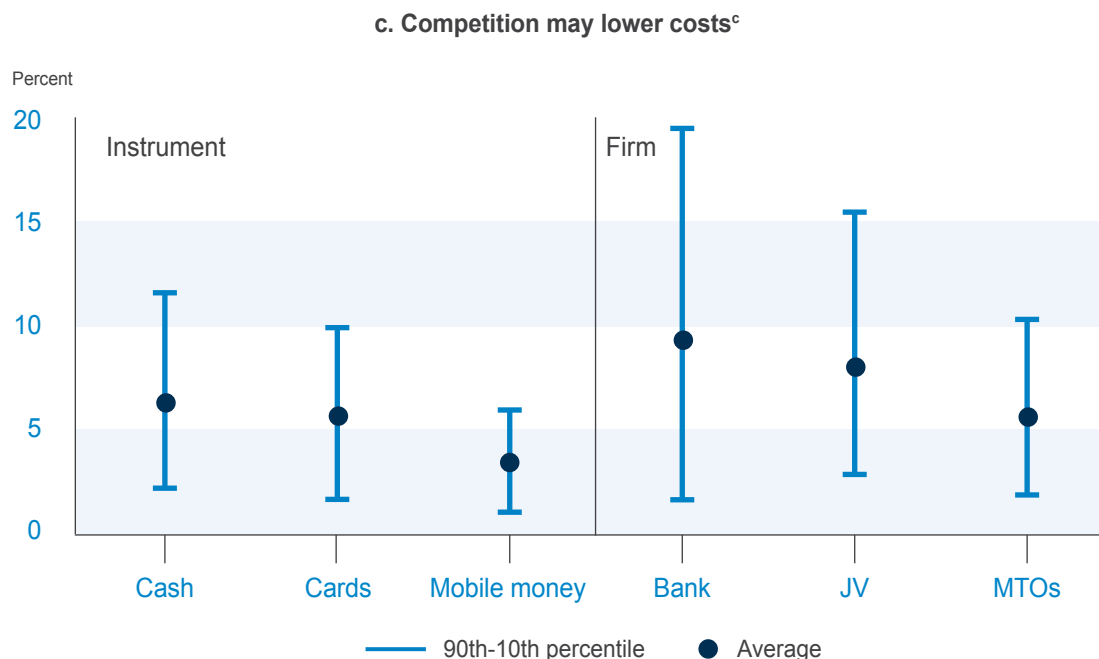


Figure 6 continued



a. The cost of sending \$200 to selected countries.

b. 2018 data. Receiving sub-regions in each continent: Africa = Eastern, Middle, Northern, Southern, and Western Africa; Americas = Caribbean, Central, and South America; Asia = Eastern, South-Eastern, Southern, and Western Asia; Europe = Eastern, Northern, and Southern Europe. Oceania = Melanesia and Polynesia.

c. Data for 2018. Cards = credit and debit cards. JV = Joint ventures, that is, partnerships between nonbank firms and financial institutions. MTOs = Money-transfer operators.

Source: Rice et al. (2020) using data from SWIFT BI Watch, National Bank of Belgium; World Bank, Global Findex database, and Remittance Prices Worldwide, remittanceprices.worldbank.org.

CDBCs could be attractive in countries where cash is difficult to obtain or where cash use is high, due to a **lack of cash substitutes** (Khiaonrong and Humphrey, 2019). A number of large EMDEs, including South Africa and Mexico, show relatively high cash usage and low use of card payments (figure 7, left-hand panel; Bech and Boar, 2019). Countries with reduced access to banking services, for example, due to concentration in the banking sector, may have greater demand for CBDCs or for private stablecoins. This could also occur where there is a lack of trust in incumbent financial institutions, due to, for example, a history of banking and currency crises. A relatively higher degree of financial repression (such as controls on the use of local currency or foreign exchange transactions) may make private stablecoins more attractive (Hileman, 2015). Trust in the public sector, including the public's expectation of sustainable monetary and fiscal policy may support CBDCs, while lack of effective government could make private stablecoins more attractive (figure 7, center panel).

Finally, macroeconomic factors may also play a role. Weak growth, large fluctuations in the value of the domestic currency, or high inflation (volatility) may make private alternatives more attractive to users. This could be the case in particular for some countries in Latin America and the Caribbean, East Asia, and Africa (figure 7, right-hand panel).

Figure 7. Adoption May Depend on Cash and Card Use, Government Effectiveness, Volatility

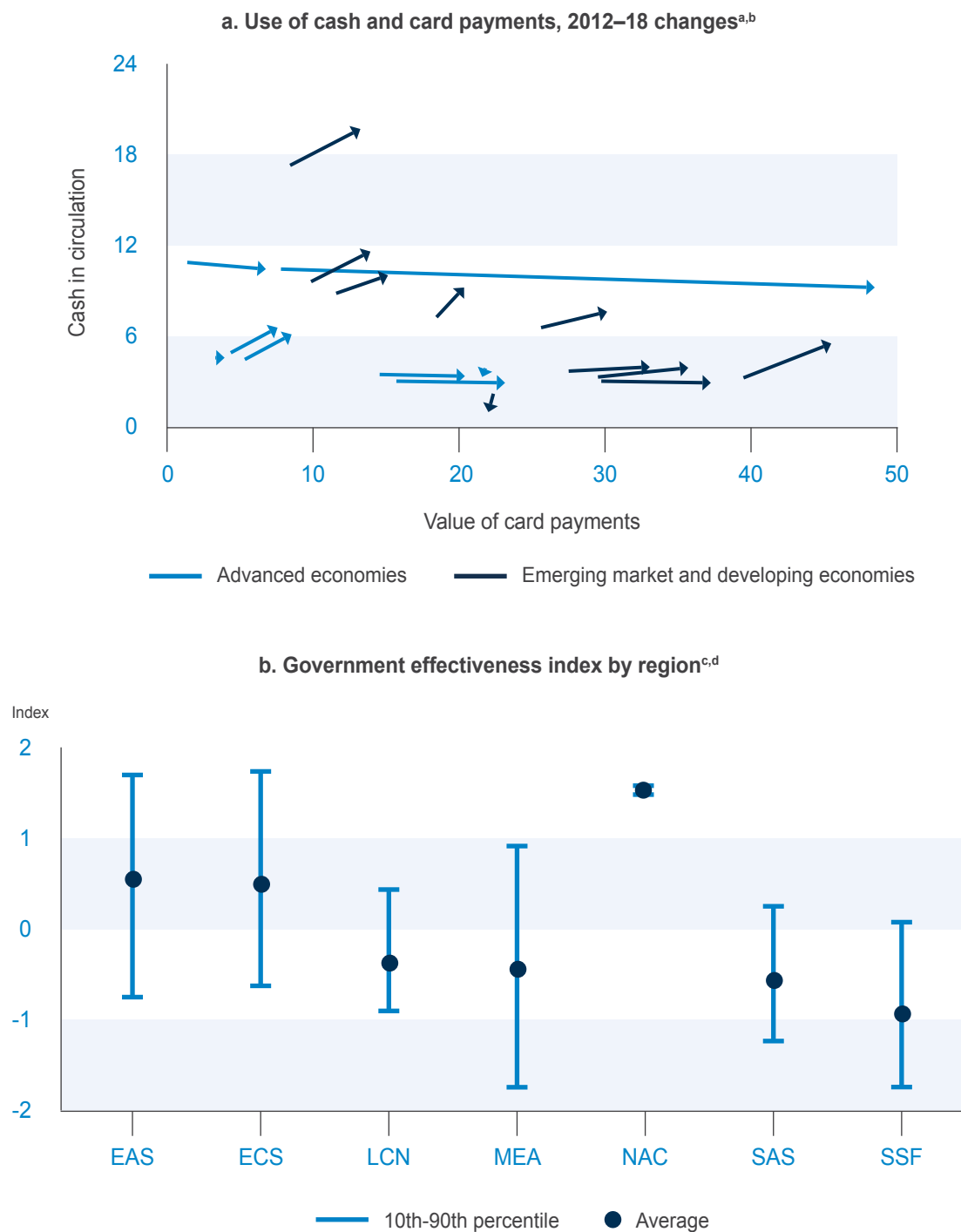
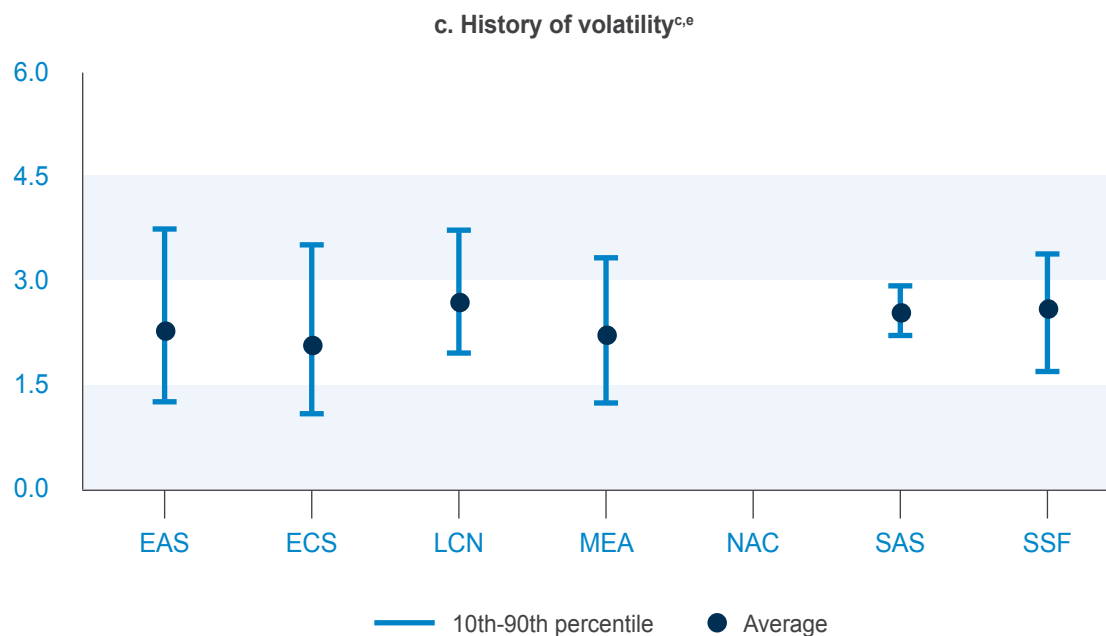


Figure 7 continued



a. AEs shown in red, EMDEs in blue. The start/end of an arrow represents 2012/2018. Data for Argentina and China are not comparable with those for other jurisdictions and are thus not shown. Data are not available for Hong Kong SAR.

b. Banknotes no longer issued are not included in the calculations. For India, 2012–16 change due to demonetization process.

c. EAS = East Asia and Pacific; ECS = Europe and Central Asia; LCN = Latin America and Caribbean; MEA = Middle East and North Africa; NAC = Northern America; SAS = South Asia, SSF = Sub-Saharan Africa.

d. Data for 2018. The index ranges between -2.5 (less effective) and +2.5 (more effective). It is based on 47 indicators and measures the quality of public services, civil service, policy formulation, policy implementation, and credibility of the government.

e. Data for 2017. Computed as the log of the maximum inflation rate in the past 20 years.

Source: World Bank; CPI Red Book.

4. Particular Challenges for EMDEs

Several policy issues related to stablecoins are exacerbated in EMDEs. Authorities are confronted with six main development,⁹ macroeconomic, and cross-border challenges. Table 3 provides an overview.

First, stablecoin systems could pose severe risks to the integrity of the global financial system, including for AML/CFT (FATF, 2019a).¹⁰ Stablecoin systems must comply with FATF standards to mitigate their use for illicit financial activities. These standards were recently amended to cover virtual assets (VAs) and virtual-asset service providers (VASPs) such as crypto-exchanges and wallets. These arrangements will now also need to conduct CDD (FATF, 2019b). In their current conception, most stablecoin projects do not seek to link “accounts” to real-world identities. This raises both financial integrity and regulatory arbitrage concerns if significant volumes of transactions occur in a peer-to-peer fashion rather than using VASPs or other financial intermediaries. While this risk is present in all countries, authorities in EMDEs, in particular, may have more difficulty keeping pace and adjusting their surveillance, regulatory, and supervisory frameworks, given resource constraints. They may also have challenges tracking and preventing financial crimes.

Second, stablecoins impose infrastructural requirements. Like branchless banking and e-money networks, stablecoin systems would need to offer robust and secure “cash-in/cash-out” functions between stablecoins and fiat currency through physical agent networks since most of the local economies in EMDEs are still far from widely accepting digital payments—for mobile money such transactions account for about 70 percent of transactions (GSMA, 2019). This is challenging if distribution networks are not equipped to handle crypto-asset or stablecoin transactions, lack geographical coverage, or are prone to cyber-attacks. So far, it is unclear whether stablecoin systems would work on simpler “feature phones” and in locations with poor connectivity or whether they could better address the challenges posed by a lack of ID for onboarding the unbanked, particularly in remote locations.

9. Development challenges refers here to the specific policy challenges around financial sector development, including financial deepening, financial infrastructure, financial inclusion, and institutional underpinnings like sound regulation and supervision.

10. Some of these risks are already apparent in the case of crypto-assets like Bitcoin. See Foley et al. (2019).

Table 3. Particular Challenges of Stablecoins for EMDEs

Development challenges	<ul style="list-style-type: none"> • Weaker capacity to address AML/CFT risks • Lack of robust cash-in/cash-out solutions
Macroeconomic challenges	<ul style="list-style-type: none"> • Volatility to local currency • Higher risk of losing monetary control
Cross-border challenges	<ul style="list-style-type: none"> • Capacity constraints in cross-border coordination • Oversight challenges as “host”

Source: World Bank.

Third, fundamentally, stablecoins in foreign currencies or in a basket of foreign currencies will fluctuate against local currencies in EMDEs. This inhibits their adoption for daily payments since prices will remain denominated in local currencies in all but the most extreme cases. If used for debt contracts, this is a new form of foreign exchange (FX) lending. FX lending has been at the heart of many financial crises in EMDEs.

Fourth, stablecoins may create monetary policy and macroeconomic challenges. Depending on the prevalence of their use domestically, stablecoins import the monetary policies of the fiat currencies in the basket that may not be optimal for most EMDEs and could thus impinge on their monetary policies. “Stablecoin-ization” could mean less effective monetary transmission and, in the extreme, countries that face shocks—political, economic, or financial—could face deposit outflows from banks and capital flight. This would amplify instability and render policy measures less effective. Countries with large cross-border inflows in stablecoins may face difficulties in maintaining international reserves in hard fiat currencies. This has implications for the functioning of FX and interbank markets, which are shallower in EMDEs. Liquidity and redemption shocks may thus create disruptive spillovers.

Fifth, interlinkages and cross-border issues around stablecoin ecosystems could pose challenges. In light of the different roles discussed earlier, the various entities in stablecoin arrangement are inter-dependent for the overall system to provide smooth and resilient services. Thus, disruptive spillover and spillback effects may emerge. This calls for a consolidated oversight approach to detect and mitigate risks. Such oversight may be impeded by cross-border challenges if entities operate in different jurisdictions. Stablecoin arrangements however may combine elements of multiple regulatory frameworks, e.g. for payment systems, bank deposits, e-money, commodities, FX, and securities. In some jurisdictions, there may be gaps as no specific framework would apply. This may create an unlevel playing field if countries adopt different regulatory approaches that impede a holistic regulatory and supervisory approach. EMDEs may have more difficulty to allocate proper resources to adjust their policy frameworks, adopt proportionate supervision, and engage in coordination across borders. Moreover, crypto-asset activity currently resides mostly outside the regulatory, supervisory, and safety-net perimeters. This raises the specter of domestic regulatory arbitrage and may lead to the buildup of risks related to financial stability (including due to cyber and operational risks), financial integrity, and consumer protection, which could create confidence spillovers.

Sixth, given reach, scale, network, and “winner takes all” effects, EMDEs will likely act as a “host” to entities in a stablecoin system that provides critical services such as governance and reserve-asset management, which may be headquartered elsewhere. Residents in EMDEs may also rely on exchange and custody functions from cross-border VASPs such as exchanges or wallets, which may elude “host” supervisory reach. This may call for additional tools for “host” supervisors to regulate cross-border VASPs that offer products or services in their jurisdiction, as the

FATF has done in its amended rules. Furthermore, stablecoins have a higher potential from a “host” perspective to become systemically important, even if they are not systemic in a “home” jurisdiction. This could create a misalignment of incentives between “home” and “host” supervisors and impede holistic oversight. This resembles existing challenges posed by supervisory colleges and crisis management groups of financial institutions that are active in small economies. As such, authorities may lack control over the broader stablecoin arrangement and its operations that involve residents. When domestically adopted at scale, this could inhibit monitoring of risks and effective oversight of payments to prevent illicit use and to foster financial stability, as outlined by international standards. Moreover, it raises questions on consumer protection and redress mechanisms.

Early impressions from interactions with EMDE policymakers yield the following observations around stablecoins:

- The need for an internationally recognized classification and guidelines for legal and regulatory frameworks to identify and address regulatory gaps and the potential for international arbitrage, particularly given that stablecoins could fall under different regulatory classifications.
- The need to review coordination mechanisms to enable a comprehensive and consistent regulatory and supervisory approach across a fragmented ecosystem
- The need for data and information exchange to allow regulators to get a comprehensive view and evaluate whether collaboration arrangements are adequate.

Many of these challenges can be addressed, or at least mitigated, by adequate policies. These could include additional resources on AML/CFT supervision, regulations to limit currency mismatches and further international coordination. Existing frameworks like the Principles for Financial Market Infrastructures (PFMI) can also help address risks (CPMI-IOSCO, 2012).¹¹ Moreover, authorities can learn from regulatory and supervisory arrangements of existing financial market infrastructures that operate across borders. For example, the Southern African Development Community (SADC) Payment System Oversight Committee (PSOC) works to advance the objectives of payment, clearing, and settlement systems. In this regard, the SADC PSOC collaborates with various stakeholders to ensure the safety and efficiency of the regional payment system. As another example, authorities can learn from established frameworks such as the Joint Forum Principles (BCBS, 2012) to supervise financial conglomerates that operate across borders and often face regulatory gaps and blind spots. Many of these Principles are broadly relevant to stablecoin arrangements, including the need for adequate supervisory powers, supervisory tools that induce timely corrective actions, cross-border coordination mechanisms between supervisors, and corporate governance frameworks. Yet such policies and frameworks take time and resources to be developed and enacted, and the potential opportunities from stablecoins have to be weighed against the substantial risks.

CBDCs—and, in particular, retail CBDCs—present their own policy challenges for EMDE authorities. In particular, there is a risk that in periods of systemic stress, households and other agents may suddenly shift from bank deposits or other instruments to CBDCs, spurring a “digital run” of unprecedented speed and scale (CPMI/MC, 2018, p. 16). Numerous ideas for capping balances in CBDCs or restricting convertibility between CBDCs and deposits are being proposed (see, for example, Kumhof and Noone, 2018; Bindseil, 2020). Yet as EMDE authorities can attest, measures to suspend convertibility and restrict retail payment options for the sake of domestic stability are not without their own challenges and drawbacks.

11. The PFMI are the international standards for financial market infrastructures, that is, payment systems that are systemically important, central securities depositories, securities settlement systems, central counterparties and trade repositories.

5. Technological Advances Are Already Enhancing Inclusion and Efficiency

Stablecoins and CBDCs are certainly not the only game in town. In recent decades, technological advances have given EMDEs an opportunity to “leapfrog” into the digital economy (IMF and World Bank Group, 2018). Fintech facilitates the digitization of money, making accounts and payments services more accessible, safer, cheaper, more convenient, and closer to real time. Across all levels of economic development, the share of unbanked adults and the costs of remittances are falling. Several factors have facilitated these developments.

First, there is a global rise of non-bank e-money issuers such as e-commerce platforms or telecom operators with large user bases that benefit from network effects. E-money is a bridge to commercial bank money, as in most countries it needs to be fully covered by commercial bank money. E-money can be conveniently stored on and exchanged from a mobile phone or online and funds can be transferred through digital channels as well as physical agent locations. This is better suited for many consumers in EMDEs, particularly for those who live in remote areas. In Sub-Saharan Africa, the share of adults with an e-money or mobile money account nearly doubled from 2014 to 2017, to a level of 21 percent (figure 8, left-hand panel).¹² Globally, 52 percent of adults used digital payments in 2017, up from 42 percent in 2014 (figure 8, right-hand panel; Demirgüç-Kunt et al., 2018).

Figure 8. Digital Payments Like Mobile Money Are Already Taking Off

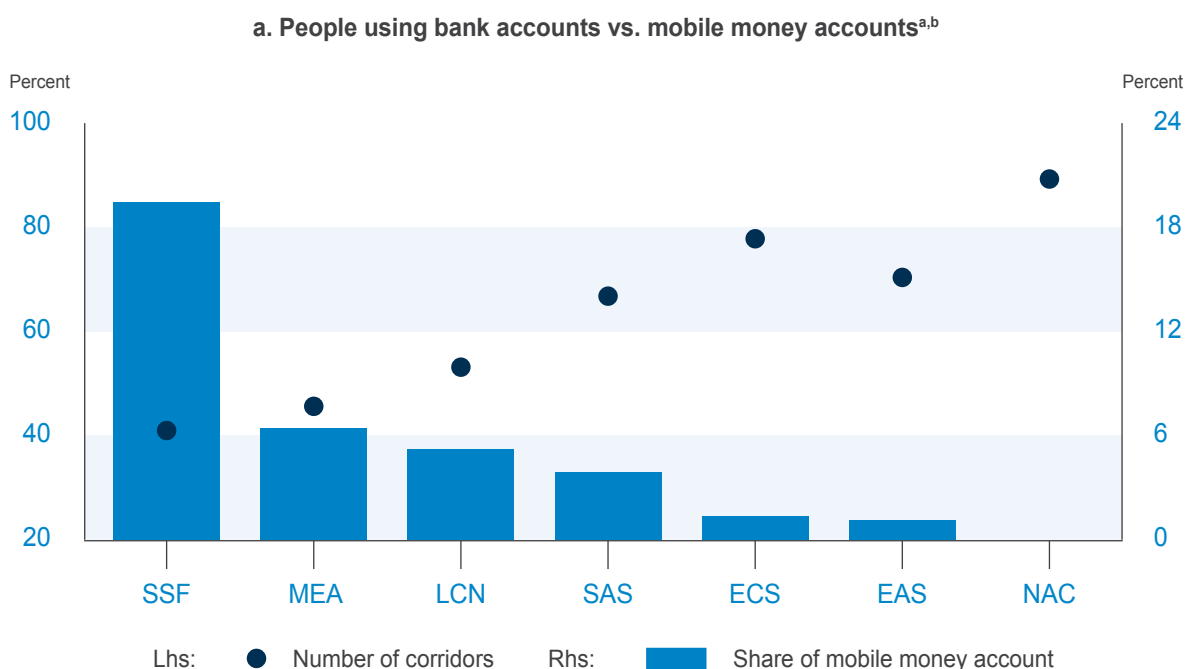
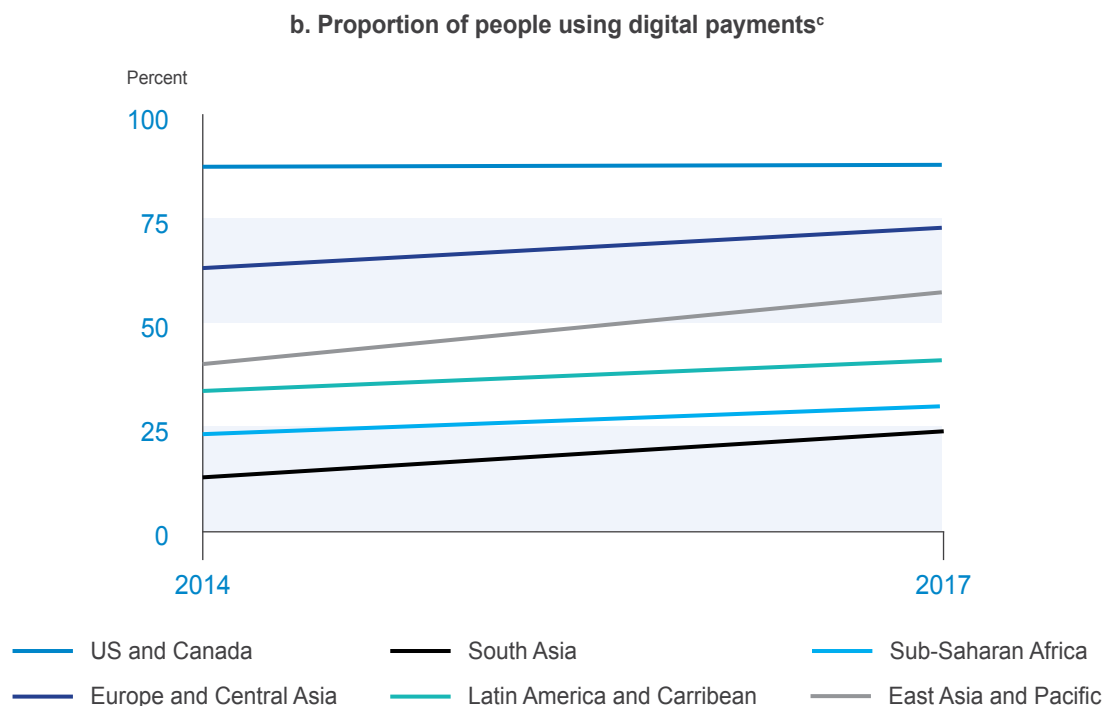


Figure 8 continued



a. EAS = East Asia and Pacific; ECS = Europe and Central Asia; LCN = Latin America and Caribbean; MEA = Middle East and North Africa; NAC = Northern America; SAS = South Asia, SSF = Sub-Saharan Africa.

b. Data for 2017.

c. 2017 data for Middle East and North Africa is 38 percent.

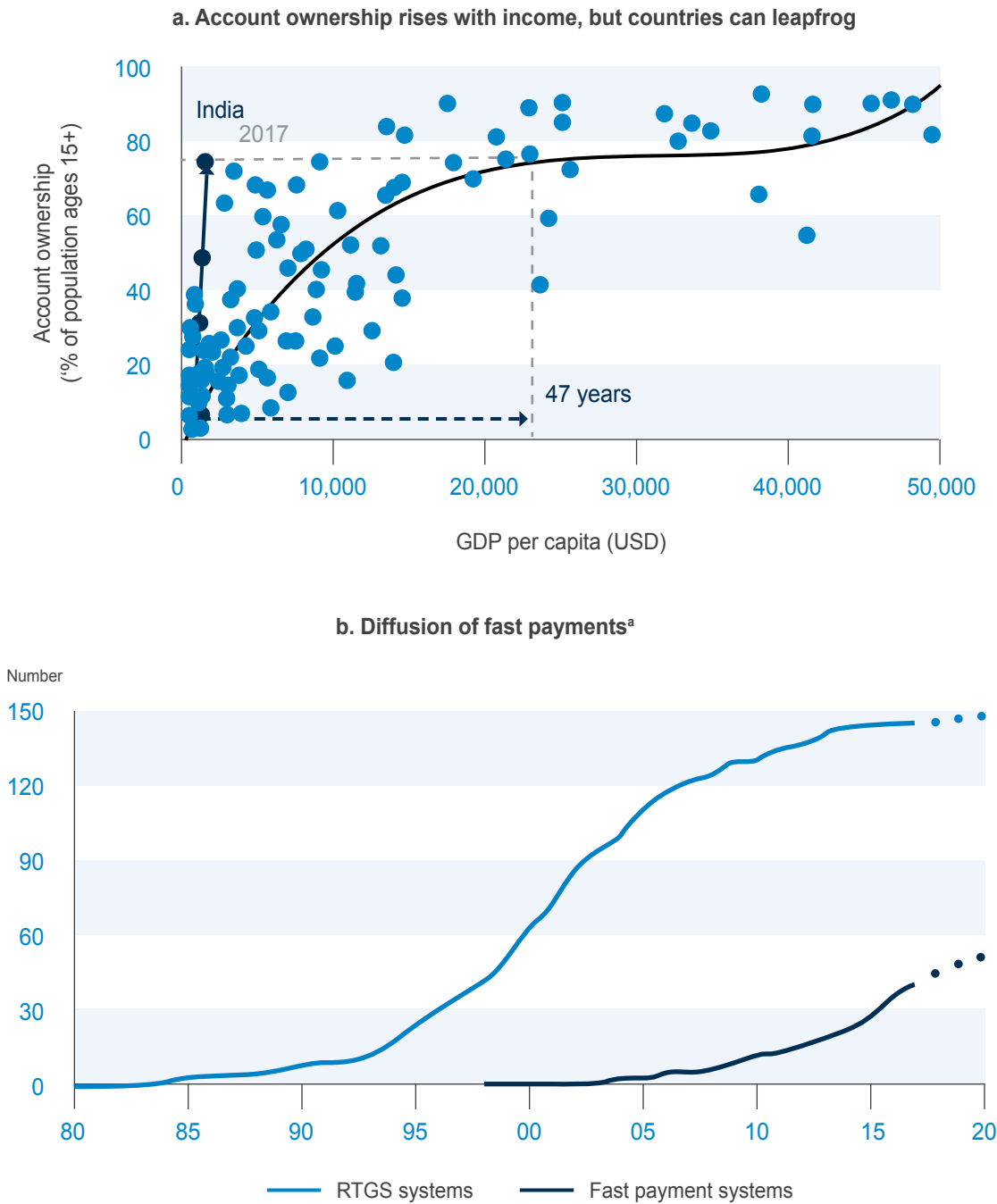
Source: World Bank Findex data.

Second, policy makers are facilitating fintech innovation and adoption by updating policy frameworks and promoting digital literacy. Many countries are working on digital ID systems, which provide the opportunity to bring the over one billion undocumented people into the financial sector and promote transaction security. The experience with Aadhaar in India is particularly instructive (D'Silva et al., 2019). The combination of digital ID and other services (the “India stack”) has allowed India to lower the cost of KYC checks and increase account ownership from 20 percent in 2008 to 80 percent in 2017. One rough estimate, based on cross-country experience, is that it would have taken 47 years to achieve this level of adults with bank accounts if India had solely relied on traditional growth processes (figure 9, left-hand panel).

Third, authorities are upgrading payment infrastructures with “fast payments”, allowing banks and eligible non-banks to offer 24/7, near real-time payments (Bech et al., 2017; 2020). These fast payment systems are now available in over 55 countries (figure 9, right-hand panel) and show a logistic rate of adoption, similar to the earlier experience with real-time gross settlement (RTGS) systems. Moreover, “open banking” initiatives allow for third party-initiated payment services,¹³ often de-coupling transaction accounts from banks and empowering customers. This can help boost competition.

13. Open banking refers to a system in which financial institutions' data can be shared for users and third-party developers, for example, through application programming interfaces.

Figure 9. Digital Technologies Can Help Support Inclusion and Convenience



a. The dashed part of the lines corresponds to projected implementation.

Sources: [Bech, Shimizu and Wong \(2017\)](#); [FIS \(2018\)](#); IMF, World Economic Outlook, October 2019; World Bank Findex data; Instapay; national data.

Fourth, feeling the pressure to innovate, incumbent banks and payment providers are embracing fintech to improve their services so consumers can conduct payments more conveniently, faster, and 24/7. For example, many incumbent banks are joining hands, in some cases also with non-banks, to develop fast payment networks and offer access to their deposit-based products via mobile apps (Petrulia et al., 2019). Existing MTOs are increasingly supporting a wide variety of payment instruments and integrating into payment systems in sending and receiving countries—including in some cases with fast payment systems. Central banks are also increasingly considering extending access to public payment systems to fintech players and operate them on a 24/7 basis.

Finally, new fintech firms have extended the MTO model for cross-border transfers by connecting to local payment infrastructures and banks or e-money providers on both sides of a transaction. Closely related to this trend, a range of specialized providers have entered the market establishing non-branded (“white-label”) cross-border payment services (Earthport, MFS Africa and Currencycloud). Incumbent institutions and fintech firms can integrate with these white-label solutions to rapidly offer cross-border payment services to their clients. Further, the global financial messaging network SWIFT has launched the Global Payments Initiative (SWIFT gpi) to bring transparency, speed, and reliability to correspondent banking transactions. These initiatives could bring down fees in cross-border payments, such as FX fees (figure 10, left-hand panel). While these fees have come down a bit recently, they remain high for some regions, particularly Africa and the Middle East (figure 10, right-hand panel).

Figure 10. FX Margins Make Up the Bulk of Overall Fees

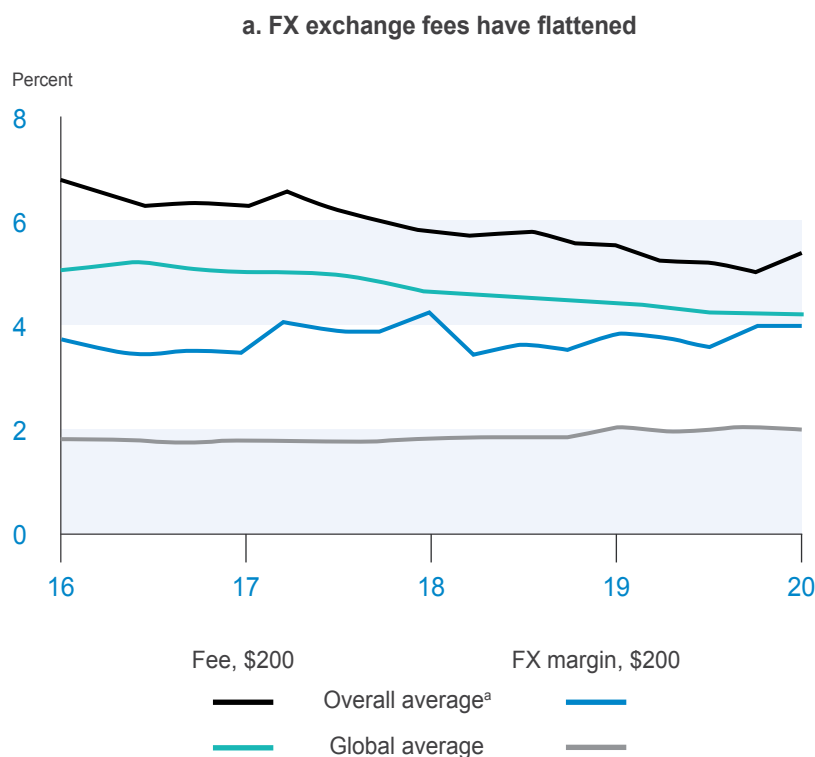
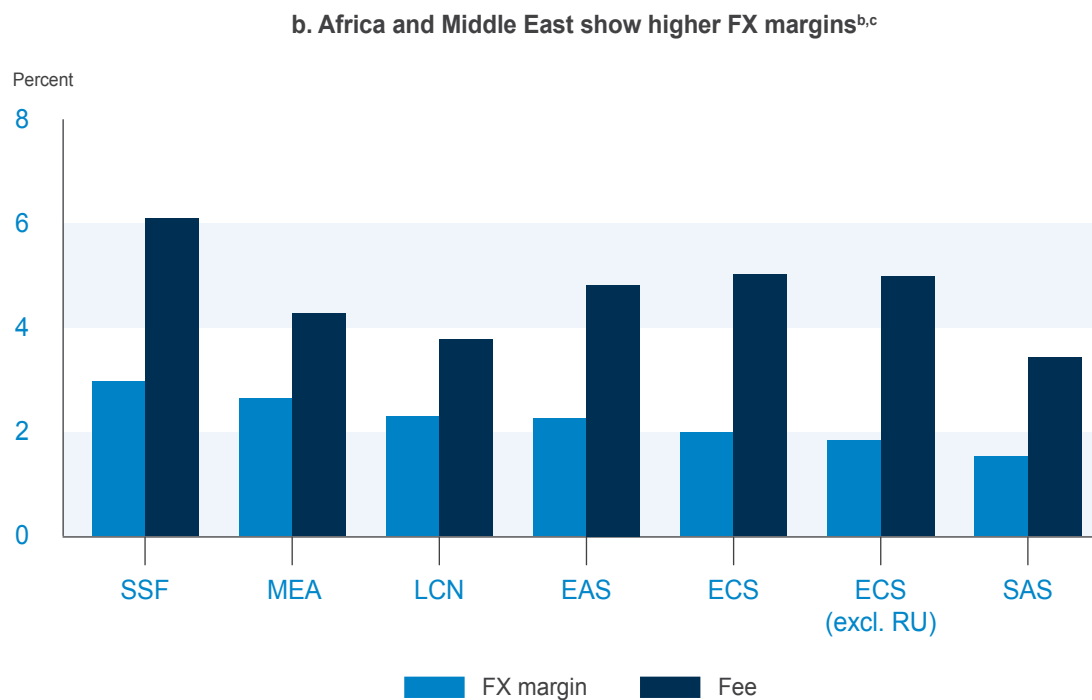


Figure 10 continued



a. Computed for small states.

b. EAS = East Asia and Pacific; ECS = Europe and Central Asia; LCN = Latin America and Caribbean; MEA = Middle East and North Africa; SAS = South Asia, SSF = Sub-Saharan Africa.

c. Data for Q4 2019.

Source: World Bank.

6. Conclusion

Stablecoin arrangements aspire to improve financial inclusion and cross-border remittances—but they are neither necessary nor sufficient to meet these policy goals. They are not yet tested at scale, and it is unclear whether they would offer lasting competitive advantages over rapidly evolving digital payments services that are built on top of or aim to improve existing financial plumbing. Innovations such as digital ID, e-money, mobile banking, open banking, and faster payment systems may be adequate in a domestic setting. The development of SWIFT gpi and the cross-border integration of faster payment systems could help improve cross-border payments, although more work is clearly needed.

Meanwhile, stablecoins face various challenges and pose new risks, particularly in EMDEs. Thus authorities may consider limiting or even prohibiting the use of stablecoins as a means of payment, and bar regulated entities such as banks and agent networks from holding stablecoins or offering stablecoin services.

Some countries have begun to accelerate their investigations into a CBDC for consumers. However, a new digital equivalent to cash also raises various challenges for EMDE authorities. While research is ongoing, it is not yet clear whether CBDCs are necessary or desirable for all jurisdictions.

Taken together, perhaps the most important contribution of stablecoins thus far is that they have drawn greater—and much-needed—attention to the challenges of financial inclusion and more efficient cross-border payments and remittances. This highlights the efforts underway to strengthen monetary and financial stability frameworks; promote an enabling regulatory environment for fintech; upgrade payment infrastructures, particularly across borders; and ensure a global regulatory level playing field through greater collaboration.

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