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About this report

This document is the main output of the Financial Inclusion Workstream of the Policy & Governance working group of the Digital Currency Global Initiative.

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Executive Summary

The revolution in financial services brought on by digital currencies can help lift financial inclusion in accordance with the Sustainable Development Goals of the United Nations. Accordingly, the Financial Inclusion Workstream of the Policy and Governance Working Group of the Digital Currency Global Initiative considered the benefits and concerns stemming from digital currencies and seeks to develop policy recommendations that would help support efforts to bridge the financial inclusion gap.

The report of the Workstream begins by looking at private digital currencies in the form of mobile money, cryptocurrencies and stablecoins. Thereafter, it moves on to Central Bank Digital Currencies (CBDCs), which is the digitalization of fiat money. By enhancing the efficiency and accessibility of payment systems, CBDCs especially can promote financial inclusion in addition to other benefits stemming from being a public good.

The report then draws up a set of eight policy principles intended to maximize the benefits of digital currencies while mitigating risks, based on which technical standards can be developed:

- a) Digital currencies must be interoperable, as otherwise financial inclusion cannot be achieved if consumers/businesses/governments cannot engage in transactions across different payment systems;
- b) Digital currencies should operate through competitive and open networks, as otherwise costs will remain high and use will be restricted;
- c) Digital currencies must be secure as otherwise cyber attacks and other breaches can undermine trust;
- d) Digital currencies must be effectively regulated and supervised to ensure transparency, safety, soundness, stability and investor/consumer/data protection, while meeting national privacy laws;
- e) There must be universal access and availability, and policy efforts should aim to close the digital divide in infrastructure, technology and skills;
- f) To mitigate the risk of exclusion, both governments and financial intermediaries should aim to advance digital financial literacy programs, with due consideration to vulnerable, marginalized and underserved groups, women, youth, poor, less educated, people in rural areas, informal workers, migrant workers, and micro small and medium enterprises (MSMEs) and develop policies which will allow for acceptance of digital currencies in the ecosystem so there is a seamless exchange between digital and physical currencies ;
- g) National digital identity systems would be helpful for facilitating adoption, which could be through biometric means or other innovations; and,
- h) A centralized data registry would also be very helpful for facilitating adoption of data sharing (for example for non-collateral-based lending using behavioural data analytics) while safeguarding privacy.

It concludes by examining how Jamaica's CBDC is being designed and implemented in accordance with the eight policy principles to promote financial inclusion.

1 Introduction

Utilizing digital advances to lift “access to and use of formal financial services” (or financial inclusion) is a key pillar of the United Nations Sustainable Development Goals for 2030.¹ It is also enshrined in the Bali Fintech Agenda, launched by the International Monetary Fund (IMF) and the World Bank in October 2018, which is a set of 12 policy elements aimed at helping countries harness the benefits and opportunities of rapid advances in financial technology, while managing the inherent risks. The expectation is that greater financial inclusion will lift job creation and bring prosperity globally, while helping to mitigate income inequality and climate change concerns.

The importance of digital payments is increasingly evident in the wake of the coronavirus pandemic (COVID-19) shock to the world economy, with lockdowns and social distancing to combat virus transmission. COVID-19 is accelerating the decline in cash use, accompanied by a surge in digital transactions and e-commerce, along with a growing need for governments to provide financial aid to people and businesses through digital means quickly, securely and efficiently. As the world gradually emerges from the pandemic, further digitalization is in the cards going forward.

Over the past decade, technology breakthroughs spurred a revolution in digital financial services, which is sorely needed, with 1.7 billion world-wide unbanked and 60% of workers employed by small- and medium-sized enterprises (SMEs) with limited access to formal financial services.² The spread of banking has been constrained by the cost of physically reaching people in rural and geographically remote areas, as well as the economics of servicing low-income populations and SMEs. In this regard, digitalization has the potential to broaden the reach of formal financial services, sharply lowering costs and spurring economy-wide efficiency gains. Digital financial services can also increase resilience to future shocks negatively impacting mobility of people and to trends in reshoring that could affect the international provision of financial services. The resulting income and employment gains and poverty reduction could bring more inclusive, sustainable, stronger and greener growth.

¹ See Sahay et. al. (2020) for a detailed discussion on financial inclusion and digital payments in the post COVID era.

² Sahay et. al. (2020) and IFC (2018).

2 Changing nature of money with the advent of digital currency³

The institutional arrangements underpinning money and payments in the modern economy have long been dominated by the two-tier financial system in which central bank-issued fiat money is complemented by electronic bank money in the form of deposits backed by reserve and settlement accounts held with central banks. This model is now increasingly being challenged by rapid digitalization, accelerated by COVID-19.⁴

Two-tier system financial systems were first shaken up by the retail digital payments revolution, with e-money or mobile money developed by telecom-led providers (e.g., M-PESA in Kenya) leading the way. Thereafter, offerings from e-commerce, ride-hailing and big tech firms (e.g., Ant Financial and Tencent in China, Gojek in Indonesia, and Grab in Singapore) followed. Payments companies also expanded regionally, as in East Asia, backed by investors from China, Singapore and the United States. Companies, such as Ant Financial and Tencent, expanded rapidly in China and through investments in other developing countries. Mobile money registered accounts have reached 1.2 billion in 2020, globally, corresponding to 310 deployments. In the same year, Sub-Saharan Africa had 157 mobile money deployments, followed by East Asia and Pacific with 49, South Asia with 36, Latin America and the Caribbean with 30 and Middle East and North Africa with 29. The biggest growth in the number of users in 2020 was in Latin America and the Caribbean, from a low base, followed by East Asia and the Pacific.⁵

A second source of disruption has been the emergence of cryptocurrencies, the most well-known of which is Bitcoin, and whose use transcends national borders.⁶ They promise, proponents contend, trustworthy private alternatives to sovereign money, with anonymity comparable to that offered by cash. More recently, with the extreme price volatility of first-generation cryptocurrencies undermining their usefulness as means of payment and stores of value, stablecoins have come to the fore. These promise stability with their values linked to an asset, a pool of assets or fiat currencies, or algorithms matching supply with changing demand. Stablecoins have usually been sponsored by technology firms or consortia including banks. The most prominent include Dai, Paxos, Tether, TrueUSD, and USD Coin.⁷

Meanwhile, market fervor concerning private digital currencies (e-money, cryptocurrencies and stablecoins) is triggering regulatory tightening and prompting a third wave of innovation in which countries are formulating plans and advancing experimentation to design, implement and operate CBDCs. The intent is to utilize technology advances for efficiency gains, inclusion, financial stability and improved monetary policy formulation and implementation.⁸ Three types of CBDCs are under consideration: wholesale, for use by financial intermediaries, retail (or general purpose), for use by individuals and businesses, and cross-border. The Bank for International Settlements (BIS) reported in January 2021 that 86% of the 65 central banks surveyed, accounting for 91% of global output, are actively engaging in CBDC work, although a broad global rollout is still sometime away (Boar and Wehrli, 2021). So far, 10 developing countries and eight advanced economies are considering wholesale CBDCs. Reflecting the greater inclusion and public good gains, more than 40 developing countries and 30 advanced economies are focusing on retail CBDCs. Those furthest along with real-

³ The Digital Currency Global Initiative (DCGI) considers Digital Currency (DC) as all digital currencies in any form including but not limited to Cryptocurrencies (CC) based on Distributed Ledger Technology (DLT), Central Bank Digital Currencies (CBDC), Digital Fiat Currency (DFC) and any hybrid variants including stablecoins (SC).

⁴ See BIS Annual Report (2021) for a discussion of money in the digital era, post-COVID.

⁵ For more information, see GSMA (2021), State of the Industry Report on Mobile Money 2021.

⁶ There can also be cryptocurrencies for localized community inclusion use, as in the Sarafu Network (see Bitcoinke, 2021) in Kenya, which utilizes Sarafu Coins, funded by donors for providing basic income support.

⁷ Diem (which morphed from Libra), and provided the initial impetus, has now been abandoned by Facebook in the face of regulatory concerns.

⁸ See Auer et. al. (2021) for a review of the literature.

world CBDC pilots are China and Jamaica, along with smaller projects in the Bahamas and the Eastern Caribbean. Around 10 countries are looking at cross-border. Part of the constraint is that national CBDCs must be ready before they can be utilized for cross-border use, although there are alternative designs, which do not require CBDCs in every country as a precondition for connecting.

3 Mobile money and financial inclusion – benefits and concerns

Despite some recent success in India,⁹ typically, the penetration of formal brick and mortar banking services globally has been low, with banks deterred by the high cost of reaching small and marginal customers through physical branches and choosing to focus more on corporate and higher income urban consumers. To promote universal access and avoid this cherry-picking, financial inclusion initiatives focused on pursuing the combined effects of different types of banking providers, such as state-owned, cooperative, development and community banks, and different networks of agents, such as post offices and retail outlets.

The emergence of e-money firms has been a game changer, however, as technology innovations have allowed providers of financial services to reach the unbanked and underbanked through digital platforms, in addition to serving higher income earners and SMEs. Digital solutions have been especially relevant for the financial inclusion of people in remote and rural areas, youth, and in countries underserved by physical networks of bank branches. The digital provision of financial services can work together with banking branches, correspondent banks and networks of agents, including post offices and retail outlets. The collaboration of these different channels allows for synergies, where physical networks gain reach with digital networks and, conversely, facilitate cash-in and cash-out of digital financial services.¹⁰ Other advantages of digital financial services comprise the ability to rely more on digital authentication systems and to use behavioural patterns for risk management (e.g., credit scoring), reducing the need to rely on collateral. The digitalization of financial services includes facilitation of access to saving and payment services. The latter have been central for international trade and e-commerce.

Non-bank e-money companies stepped in to target the retail payments sector, prompted by the large and rapidly growing payment market in both developing countries and advanced economies along with relatively low entry barriers and high profit margins. Over time, they have moved to offering credit and other financial services. The fintech companies, which have since then expanded from startups to include big tech, are now beginning to compete with banks in offering credit, saving, insurance and wealth management products. The payments revolution started in Africa by telecom-led companies, such as M-PESA in Kenya in 2007, followed by the entry of big tech, ride-hailing companies, established business groups, and pure fintech startups. COVID-19 and e-commerce are further accelerating these trends.

Greater use of mobile money for cross-border transactions are also helping consumers in terms of lower cost, speed and reaching the unbanked, but there is still a long way to go. The World Bank reports that the average cost of sending remittances globally is currently 6.0% of transaction value, with a wide dispersion between regions (ranging from 4.3% in South Asia to 7.8% in Sub-Saharan Africa in the fourth quarter of 2021) and channel (ranging from 3.0% in mobile operators to 10.4% in banks in the fourth quarter of 2021).¹¹ The United Nations Sustainable Development Goals (SDGs) call for lowering the average cost to 3% by 2030.

⁹ See D'Silva et. al. (2019) for a discussion on "India offers an example of how various policy reforms related to digital finance – including transformation of the traditional banking system with the central bank playing a pivotal role – can solve many of the challenges of inclusive financial development that once seemed out of reach."

¹⁰ For more information, see UNCTAD (2021), Financial Inclusion for Development: Better access to financial services for women, the poor, and migrant workers.

¹¹ For more information, see World Bank (2021), Remittance Prices Worldwide, Issue 40.

While mobile money innovations have been generally beneficial for consumers, they have prompted growing concerns among regulators, who have been struggling to keep regulatory frameworks updated with measures appropriate to address the risks related to digital financial services that evolve at a fast pace. These include credit and settlement risk for mobile money, which is the liability of the private sector firms that issue it. Such firms may also operate within large closed networks, which can limit competition and give rise to stability concerns in case of fraud or failure. Here, there have been more than a few prominent examples, including, most recently, Wirecard in June 2020 in Europe. These private firms, moreover, may be systemically important, as is the case with Ant Financial and Tencent in China.

Against this backdrop, regulatory authorities are seeing to take steps to mitigate risks. These include requiring mobile money to be backed by escrow accounts with banks, and more recently, by mandatory reserve deposits with the central bank. Authorities have also sought to implement the principle of ‘similar business, same rules’ to avoid regulatory arbitrage. This has led to capital and liquidity requirements as well as efforts to strengthen consumer protection. The authorities in many emerging markets and developing economies (EMDEs) have also tried to promote competition in mobile payments by making transactions interoperable across networks through public switches (routing infrastructure), but with limited success due in part to resistance from dominant players.

China has led the regulatory tightening on e-money.¹² This was triggered by the rapid expansion of Ant Financial and Tencent along with the failures of peer-to-peer lending and investment platform in 2018-2019. Recent tightening measures include limiting joint-lending with banks and curbs on cross-regional lending; capping interest rates on deposit products by internet platforms; requiring banks to do their own risk assessment; seeking more sharing of borrower data by online platforms; asking online lenders to take on more credit risk; and breaking up payments companies on antitrust grounds. Alibaba, which owns 33% of Ant Financial, was fined \$2.8bn and required to separate its payments and financial products businesses. Recently, Ant Financial was told to separate its lending business from its main business, with an independent app. User data must also be turned over to a new and separate credit scoring joint venture. Other tech companies were told to fix anti-competitive practices restraining data sharing, to help expand credit access, curb information asymmetries and lower cost.

However, even with strengthened regulatory and supervisory oversight, the risks of e-money do not fully go away. It is possible that mobile money companies’ liabilities may not be adequately backed by reserves. It can also be difficult for supervisors to monitor them effectively on a continuous basis. Anti-competitive practices remain a concern.

Furthermore, regulators and policymakers also need to address infrastructure challenges (including of energy and information and communications technology (ICT) services), data and personal privacy issues, fraud and security matters, technological skill gaps, agent networks that are insufficient or do not have enough liquidity, and lack of interoperability. In addition, the potential of digital financial services may not be fully available to poor people without access to phones, to people with disabilities or the elderly that face challenges in using phones, or to some women that may have limited access to phones due to cultural issues. Regulatory frameworks need to balance managing these risks while allowing for an adequately ample base of users that ensures business sustainability and thus the provision of the service. This balance is necessary to put technological solutions at the service of firms and households. This balance calls for a whole-of-society approach, in which policymakers, regulators, operators, consumer protection authorities and civil society collaborate to maximize the benefits of digital financial services and to minimize their risks.¹³

¹² See Crisanto et al (2021), “Big Tech Regulation: What is Going on?” and Yi (2021), “China’s Experience with Regulating Big Tech.”

¹³ For more information, see UNCTAD (2021), “Financial Inclusion for Development: Better access to financial services for women, the poor, and migrant workers.”

4 Cryptocurrencies/stablecoins and financial inclusion – benefits and concerns

Cryptocurrencies and stablecoins have gained initial prominence primarily as speculative investment products, but the latter are now starting to be used for online purchases, peer-to-peer lending and investing, and micro payments. They can also be utilized for programmable money applications, such as automated payments against delivery of goods and services or transfer of ownership of a security. In addition, cryptocurrencies and stablecoins were seen as having potential for cross-border payments, the market for which is riddled by inefficiencies, high cost, slow speed, and opaque, complex and antiquated payment and settlement processes. The use of cryptocurrencies and stablecoins in this virtual world of decentralized finance (DeFi), a general term for decentralized applications (Dapps) providing financial services on a distributed ledger technology (DLT), such as blockchain, settlement layer without the need for centralized intermediaries or institutions, is aimed in part at promoting financial inclusion.¹⁴ Whether this is achievable, given the risks, remains debatable.

While offering potential for enabling efficiency gains and inclusion, the principal shortcoming of DeFi arises from the use of cryptocurrencies and stablecoins to conduct financial transactions. Cryptocurrencies are nobody's liability. They are also volatile, speculative, and can be utilized for illicit activities since user identities are not disclosed. DLT, such as blockchain, that underpin cryptocurrencies are also highly energy intensive¹⁵ due to the need to validate and store transactions across many decentralized ledgers. Stablecoins differ by being a liability of their issuers, but still raise many of the same serious concerns around money laundering, consumer protection, and financial stability, due to risky or opaque backing, and with potential negative spillovers to the broader financial system depending on exposure. Overall, complex concerns arise from financial, technical, operational, scaling and legal risks, in addition to borrowers in digital assets nearly always having to hold excess collateral. These risks are magnified when cryptocurrencies and stablecoins are used across borders. Indeed, their uninterrupted future growth has the potential to undermine national currencies, monetary policy implementation, and global financial stability, as elaborated in recent G7, G20 and BIS reports (See G7, 2021; FSB, 2020; G20, 2021; and BIS, 2018).

Regulators are moving, if slowly, to put in place rules on cryptocurrencies and stablecoins.¹⁶ There is a long way to go. Among developed economies, the European Union is seeking to advance legislation for an appropriate registration or licensing regime, through their Markets in Crypto-Assets regulation, which allows for adequate information and monitoring, along with prudential requirements.¹⁷ Some developing countries, meanwhile, have begun (or are considering) prohibiting the use of cryptocurrencies and stablecoins. These include China, India, Indonesia, Thailand, and Turkey, as well as others in the Middle East and Sub-Saharan Africa. Facebook's Diem (rebranded from Libra) also precipitated concerns among G7 and G20 regulators, as well as the Financial Stability Board (FSB) (op cit.), which led to its demise. Globally coordinated efforts have called for careful assessment of risks before regulatory approval is given for cryptocurrencies for cross-border use, along with strengthening of supervisory frameworks.

¹⁴ See "DeFi Without the Hype" (Wharton, 2021) and "Decentralized Finance (DeFi) Policy-Maker Toolkit" (WEF, 2021).

¹⁵ See BIS (2018), "Cryptocurrencies: Looking Beyond the Hype" for further discussion as also Moneysupermarket (2021), for data on "Crypto Energy Consumption." While the industry is trying to lower excessive energy use through "proof of stake" approaches, it remains a work in progress. China, meanwhile, has recently banned crypto mining in part because of the energy concerns.

¹⁶ Monitoring backing for stablecoins is a complex undertaking as evident from the recent New York lawsuit against Tether.

¹⁷ The United States Treasury (2021) has also brought out a report on regulating stablecoins.

5 Central Bank Digital Currencies (CBDCs) and financial inclusion – benefits and concerns

In response to the need to maximize the benefits of digitalization and mitigate risks, countries are seeking to design and launch CBDCs, moving from conceptual research to practical experimentation and national rollouts. CBDCs are a technologically advanced digital representation of central bank money, which would be a safe, efficient, neutral, final and instantaneous means of settlement. They are also free of credit and settlement risk since central bank liabilities are being used instead of private ones. CBDCs would offer, at least in principle, low or zero cost, in addition to instantaneous speed, resulting in a dramatically improved ‘customer experience’. The different forms of CBDCs under consideration are:

- Wholesale CBDCs for efficiency gains in high-value, low-frequency interbank and securities settlement involving financial intermediaries.
- Retail or general purpose CBDCs for low-value, high-frequency payments by individuals and businesses, circulating alongside cash.
- Cross-border CBDCs connecting national CBDCs systems or standalone central bank-issued international settlement instruments for making cross-border transactions faster, cheaper, and safer.

The primary benefits from CBDCs would be welfare-enhancing economic gains from inclusion, competition, efficiency and innovation; stability; accessibility; and meeting macro-objectives.¹⁸

Inclusion, Competition, Efficiency and Innovation

- The payments system is a natural monopoly due to economies of scale, network externalities and centralized settlement. By introducing a CBDC, which is interoperable across existing and future payment rails, it would be pro-inclusion, pro-competition and pro-innovation.
- An interoperable payments system using CBDCs would ensure that the unbanked can have access through different mobile payments networks. A key consequence should be more information-based lending by banks and non-banks and expanding markets to boost financial inclusion.
- Efficiency gains would derive from expanded reach and commerce, especially for small businesses, as CBDCs are not limited by the denomination structure of banknotes and, being digital, unlike cash, are also not limited by geographical considerations.
- As high cash usage declines, there would also be efficiency gains from lower transaction costs and none of the recurring expenses associated with printing and distributing money.

Stability

- The use of CBDCs by nonbank e-money providers would remove counterparty risk and ensure that the general public had access to a well-regulated and state-guaranteed digital

¹⁸ See Auer et. al. (2021), BIS (2020), and BIS (2021), reports 2, 3 and 4.

means of payment, bolstering stability and trust. Avoiding the risk associated with new forms of private money would also enhance stability as would the resiliency of the payments system, guarding against network problems or failures.

Access

- Consumers would not be deprived of access to a safe and trusted medium of exchange, amid a decline in the use of cash. The introduction of a CBDC at the national level could also serve as a building block for cross-border transactions, although this is not necessary.

Macro Objectives

- CBDCs would help preserve monetary sovereignty. Monetary policy formulation could be strengthened through the generation of real-time data regarding the use of CBDCs. They could also be a helpful fiscal tool to ensure that spending on social programs reached their targeted recipients quickly, at low cost and with minimum leakage.

Policy and operational questions revolve around the potential impact of retail CBDCs for banking intermediation and financial stability, monetary policy, and financial integrity and privacy. In addition, the use of CBDCs for cross-border transactions have to consider implications for capital flows. By contrast, the policy questions are less relevant for wholesale CBDCs, as they are of use by financial intermediaries, and not for the general public. These are all important aspects to take into account in the design and implementation of CBDCs and ensure that the concerns are mitigated by appropriate checks and balances.

Banking Intermediation and Financial Stability

- Concern has been expressed that retail CBDCs could lead to a reduction in bank lending (credit intermediation) as a result of an outflow of bank deposits into CBDC accounts or wallets and banks' funding costs could rise. Many also fear that by providing an easy way to convert bank deposits into a safe government-backed asset, CBDCs could destabilize the financial system by facilitating and accelerating bank runs during crises.
- However, the concerns are overstated in a modern money creation view of banking. Bank also having access to non-deposit funding sources. Moreover, the concerns can be mitigated by design features including limits on CBDC transaction sizes and holdings as well as non-interest bearing or tiered remuneration structure for e-wallet balances depending on their size. Meanwhile, the rise of non-banks over the past few decades has not undermined money creation and credit expansion by banks.
- Trust in banks is derived from deposit insurance, regulations, and supervision, backed by their providing value-added services. These do not change in a post-CBDC world. It should also be noted that retail users can already switch funds out of the banking system instantaneously, into money market funds or government securities. In addition, the largest bank run threat typically comes from wholesale funding, and institutional investors already have access to other safe-haven assets. Meanwhile, central banks would retain the ability to inject liquidity into banks as needed.

Monetary Policy

- Monetary operations may need adaptation, but CBDCs should not affect monetary policy transmission significantly. Transmission could even strengthen if CBDC spurs greater financial inclusion. As such, there should be limited monetary policy and inflationary implications of CBDCs as asset prices/collateral values/exchange rates are not altered, while existing policy-setting arrangements are maintained.

Financial Integrity and Privacy

- It is important that, in the shift from cash and private money to CBDCs, financial integrity should be strengthened, while not burdening the central bank with operational headaches. This could be done by requiring CBDC transactions to be done through payments intermediaries subject to anti-money laundering (AML), know-your customer (KYC) and counter-terrorism financing (CTF) regulations.
- Moreover, although the CBDC system may not provide the same degree of anonymity as cash, it must adhere to privacy laws, applicable to both the government and payments intermediaries.¹⁹ To protect privacy, central bank should not know the identity of CBDC users, unless the transaction size is above a certain threshold set by law or as a result of a legal discovery process, in accordance with existing practices.

Design is especially important for the success of CBDCs for retail use.²⁰ For the most part, two architectural models are primarily under consideration. The first is the ‘direct’ model, where the CBDC is operated by the central bank, which keeps a record of balances in a central ledger and may also handle payment services. The second is the ‘hybrid’ model, where the central bank issues CBDCs, possibly as a token or a bearer instrument, distributed through banks and non-bank payment providers, for use by individuals and businesses.

While the direct model is a possibility, operational and policy considerations would rule it out. Building and operating the payments network would be a challenge for a central bank and costly. The central bank could have the operational headache and cost of managing hundreds of millions of accounts, depending on the country. The central bank may not have the legal authority to offer direct accounts to individuals. Having to handle customer relationships means that privacy may not be assured. Moreover, although overstated, policy concerns related to outflow of bank deposits to CBDC accounts, banking disintermediation and bank runs could be exacerbated in such a system.²¹

By contrast, the ‘hybrid’ model may be the preferred approach and is being used by China and Jamaica among developing countries.²² The central bank provides the core platform for CBDCs, including issuance, distribution, and withdrawal from circulation. The payment interface providers connect to the core to provide customer-facing services. At its heart, the model is essentially a public-private partnership, where the central bank provides the CBDC instrument, which is then used across all (primarily private but can be public as well) payments rails. With regard to technology choice, the China and Jamaica pilots do not use DLT for the core in order to achieve

¹⁹ See BIS (2021) Annual Report for detailed discussion on how central banks are balancing privacy and data issues in CBDC design.

²⁰ See Auer et. al. (2022) for a discussion on retail CBDC design for promoting financial inclusion, along with barriers and challenges.

²¹ However, these concerns are overstated since bank deposits are not necessarily needed for bank lending; banks create money in the lending process and only need funding (i.e. central bank reserves) to finance potential money outflows; CBDC design also incorporates mitigating checks and balance.

²² See Fan (2020), Yao (2018), BoJ (2021), and ITU (2021).

required scale, speed, finality of settlement, security, privacy and sustainability.²³ The design, however, allows flexibility to connect with all payment rails, including DLT-based ones if any.

The private sector can build and operate the payment systems and continues to innovate wallets, access channels and so on. The result is simpler to operate and less expensive than the direct model for the central bank, which does not need to build all the required infrastructure. Compliance with anti-money laundering and know-your-customer regulations is done by the payment service providers, and privacy preserved for small transactions. Interoperability is assured as is competition. Concerns about disintermediating banks are mitigated by setting holding and daily transaction limits, which will vary across countries. The design may also incorporate a tiered remuneration structure to disincentivize large holdings.

Given that they are just starting out, the positive effects of CBDCs on financial inclusion cannot be empirically validated at this time. The planning and designing of CBDCs should build on the lessons learned from experiences of digital financial services, and of private cryptocurrencies and stablecoins. This is necessary to anticipate, to the extent possible, the opportunities and risks of CBDCs and to inform the planning and designing of the related policy, regulatory and technology options. This has been the focus of earlier sections of this report. The analyses will need to be complemented by data from the CBDC rollout experiences as they start to occur.

The examples of Jamaica and other frontrunners, such as China, will need to be examined to review CBDC design choices and their efficacy vis-à-vis financial inclusion. In Jamaica, the rollout in 2022 will start to provide this empirical information on promoting financial inclusion.²⁴ Even among advanced economies, financial inclusion made possible by CBDCs is increasingly a policy priority.²⁵ The Federal Reserve Board of the United States has started discussions on CBDCs, although it is yet to take a decision on implementation. The Federal Reserve mentions that electronic transactions accounts facilitate access to digital payments, enhancing efficiency in tax collection and refunds, wages and other payments. As such, CBDC should reduce transaction costs and barriers to access to financial services.²⁶ The United Kingdom is also evaluating a possible CBDC. The eventual implementation of its digital currency would also provide useful empirical information as the Bank of England mentions a financial inclusion objective.²⁷

²³ See ITU (2021) for a presentation by Rikbank on problems identified with DLT during the course of the e-krona exploration.

²⁴ The Bank of Jamaica announces that CBDC could foster financial inclusion, as persons who do not currently have regular bank accounts would be able to access CBDC accounts in a way that would be easier and simpler than accessing regular bank accounts. See Haynes (2022).

²⁵ White House (2022) highlights both the need for reducing risks from private digital assets as well as promoting access to safe and affordable financial services, including financial inclusion, through a United States CBDC.

²⁶ Board of Governors of the Federal Reserve System (2022).

²⁷ The CBDC payment systems should be designed to minimize barriers to use. These barriers may encompass insufficient literacy, disabilities and access to data networks or equipment. In the latter, the Bank of England illustrates that reliance on the latest smartphones should be avoided. Bank of England (2020).

6 Policy principles for promoting financial inclusion

Looking forward, digital currencies have an important role to play in bolstering financial inclusion.²⁸ However, the question remains as to how best to harness this revolution to maximize the benefits from digital currencies, while minimizing risks? In this regard, the analysis, as set out in this report, points to eight key policy principles, as a core part of the toolkit, which call for technical standards for digital currencies to deliver the promise of financial inclusion:

- a) Digital currencies must be interoperable, as otherwise financial inclusion cannot be achieved if consumers/businesses/governments cannot engage in transactions across different payment systems;
- b) Digital currencies should operate through competitive and open networks, as otherwise costs will remain high and use will be restricted;
- c) Digital currencies must be secure as otherwise cyber attacks and other breaches can undermine trust;
- d) Digital currencies must be effectively regulated and supervised to ensure transparency, safety, soundness, stability and investor/consumer/data protection, while meeting national privacy laws;
- e) There must be universal access and availability, and policy efforts should aim to close the digital divide in infrastructure, technology and skills;
- f) To mitigate the risk of exclusion, both governments and financial intermediaries should aim to advance digital financial literacy programs, with due consideration to vulnerable, marginalized and underserved groups, women, youth, poor, less educated, people in rural areas, informal workers, migrant workers, and MSMEs and develop policies which will allow for acceptance of digital currencies in the ecosystem so there is a seamless exchange between digital and physical currencies;
- g) National digital identity systems would be helpful for facilitating adoption, which could be through biometric means or other innovations; and,
- h) A centralized data registry would also be very helpful for facilitating adoption of data sharing (for example for non-collateral-based lending using behavioral data analytics) while safeguarding privacy.

²⁸ See ITU (2022) DC³ Conference fireside chat.

7 Applying the Policy Principles: Jam-Dex as a Driver of Financial Inclusion in Jamaica

After successfully completing a pilot last December, Jamaica is embarking on a national rollout of its CBDC, named Jam-Dex.²⁹ A key objective is financial inclusion, and, to this end, the design of Jam-Dex is in synch with the above policy principles. The architecture is a digital bearer instrument, issued by and a liability of the Bank of Jamaica, intermediated by regulated financial institutions, including payment-service providers, for general purpose use. The Bank of Jamaica is utilizing eCurrency's DSC³ technology³⁰ to mint, issue and distribute the Jam-Dex. Banks and payment-service providers interface through standard APIs, published by eCurrency.³¹

Jam-Dex is interoperable across all payment rails, utilizing existing infrastructure, which ensures competition with universal access and availability in Jamaica. It is integrated with Jamaica's RTGS system. The core CBDC instrument is secured by the Bank of Jamaica using hardware and software to make it quantum resistant. There is another layer of security provided by customer-facing private sector wallet providers. The design preserves privacy vis-à-vis the authorities by delinking the identity of the holders of Jam-Dex from the instrument. The architecture calls for private sector wallet providers to innovate on products and services, using the Jam-Dex.³²

Speaking at the ITU in late January,³³ Bank of Jamaica Governor Richard Byles outlined the key ingredients to ensure the success of Jam-Dex in advancing financial inclusion in Jamaica:

- Get major banks to sign on and promote the currency with their business and retail customers;
- Mount a national campaign emphasizing the advantages of digital payments using Jam-Dex, especially zero usage costs, and create confidence and cultural change through public education;
- Bring telecom operators on board to proactively stimulate the market, by registering as payment-services providers and promoting the new digital currency to their customer base;
- All government welfare payments are to be made using Jam-Dex, ensuring that every beneficiary with a phone (feature phones as well as smartphones) and a CBDC wallet can receive payments instantaneously; and,
- Establish the universal national digital ID card facilitating electronic compliance with KYC regulations by private sector intermediaries.

Following the national rollout of Jam-Dex in 2022, Jamaica will be among a handful of pioneering countries to have successfully implemented a CBDC for retail use. The architecture and the design of Jam-Dex holds the key to its mass adoption accompanied by an effective education and stakeholder management campaign. The expectation is that Jam-Dex will help play an important role in advancing financial inclusion in Jamaica in the years ahead, while showcasing globally how such a program can be undertaken.

²⁹ After a national competition, the Bank of Jamaica announced, in late February, the name for its CBDC, Jamaica Digital Exchange, Jam-Dex for short, with the tagline, "No cash, no problem" (Bank of Jamaica, 2022).

³⁰ eCurrency (2020).

³¹ See ITU (2019), page 38.

³² See Griffiths (2022) for a discussion on how the Jam-Dex works, responding to questions from the public.

³³ Byles (2022) contains the BoJ Governor's Keynote Address at the ITU's DC³ Conference – From Cryptocurrencies to CBDCs.

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