SAARCFINANCE Collaborative Study on Prospects of Central Bank Digital Currency (CBDC) in the SAARC Region

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Disclaimer

The findings, interpretations and conclusions expressed in the report are entirely those of the authors. They do not necessarily represent the views of their affiliated institutions. The results from the study were presented at the 43rd SAARCFINANCE Governors' Meeting and Symposium-2023 in Islamabad, Pakistan.

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LIST OF ACRONYMS

AML/CFT	:	Anti-Money Laundering/Combating the Financing of Terrorism
BB	:	Bangladesh Bank
BIS	:	Bank for International Settlement
CBDC	:	Central Bank Digital Currency
CBB	:	Central Bank of the Bahamas
CBN	:	Central Bank of Nigeria
CBSL	:	Central Bank of Sri Lanka
DLT	:	Distributed Ledger Technology
ECCU	:	Eastern Caribbean Currency Union
ECCB	:	Eastern Caribbean Central Bank
IMF	:	International Monetary Fund
KYC	:	Know your customer
LVPS	:	Large Value Payment System
MMA	:	Maldives Monetary Authority
NRB	:	Nepal Rastra Bank
POS	:	Point of Sale
QR	:	Quick Response
RBI	:	Reserve Bank of India
RMA	:	The Royal Monetary Authority of Bhutan
RTGS	:	Real Time Gross Settlement
SAARC	:	South Asian Association for Regional Cooperation
SBP	:	State Bank of Pakistan
SWIFT	:	Society for Worldwide Interbank Financial Telecommunications
WB	:	World Bank

EXECUTIVE SUMMARY

CBDC is the digital form of legal tender issued by the Central Bank. It has been widely discussed in the recent years and many Central Banks are working on it. It is expected to change the payment landscape by enhancing the efficiency and resiliency of the payment system and increase financial inclusion. Other potential benefits include a more effective monetary transmission and financial transparency.

This study was conducted as a joint effort of the researchers from SAARC Central Banks with a purpose to obtain an overview of the key initiatives going on in the SAARC region, identify the potentials and provide some insights and considerations regarding the future course of action on CBDC.

Key Insights and Considerations

i. **The interest of the Central Banks on CBDC is increasing. Majority of the Central Banks are either conducting pilots or actively researching on it.** To benefit from this race of future money, Central Banks should carefully design CBDC so as not to disrupt the existing financial system and maximize gains from it. They should consider the appropriate design features such as off-line functionality, holding limits, remuneration and interoperability. In addition, they should adopt a cautious and incremental approach with a careful consideration at the country level and should carefully weigh the costs and benefits in terms of financial inclusion, payment system development and most importantly financial stability.

ii. **In case of the SAARC Region, while India is at the forefront in experimenting CBDC, few other countries are making rapid progress in terms of research and development.** Reserve Bank of India has launched a pilot for wholesale as well as retail CBDC, Monetary Authority of Bhutan is conducting a detailed feasibility study and the Nepal Rastra Bank as well as Bangladesh Bank have planned to conduct such study. State Bank of Pakistan has planned to launch the CBDC in the next few years.

iii. **CBDC can be an instrumental move for expanding financial inclusion and reducing informal economy in the South Asia.** Still, one third of the adults lack access to the accounts at financial institutions and use of mobile money and other forms of digital payments is still low compared to the developed countries, CBDC can be used as an effective policy tool to bring them to formal financial services and formalize economic activities. However, for realizing the gains, the countries need to focus on improving the quality of infrastructures such as access to electricity and quality internet. In addition, they should work for the necessary legal and regulatory framework for issuing the CBDC. Focus on digital financial literacy will further help in the adoption of CBDC once it is rolled out. Moreover, CBDC could help in reducing the large size of informal economic activities in the region.

iv. **Regarding the modality of the CBDC in the region, the expert opinion survey shows three key preferences.** First, retail CBDC could be the most beneficial type of CBDC for the region. Second, efficiency of the payment system and digital payments should be the key motivation. Third, CBDC would improve monetary transmission mechanism, reduce informal economy, enhance the efficiency of the payment system and strengthen financial stability in the region.

v. **Many Central Banks in the region lack a legal as well as regulatory framework and adequate quality infrastructure required for the CBDC.** As such, the Central Banks need to review their legal, regulatory and institutional framework and further broaden the use of digital payments. The regulations should cover the data privacy and cybersecurity issues. As a part of the regulations, the Central Banks can come up with the Regulatory Sandbox to select the CBDC providers after going through a rigorous and independent cybersecurity assessment, among other tests.

vi. **Initiatives for developing a 'regional innovation hub' for cross-country knowledge sharing and capacity building could be a possible future initiative in the region.** Such collaboration will help in developing legal reforms and regulatory standards, regulating crypto assets, strengthening cybersecurity and more importantly designing the operational architecture of CBDC.

vii. **The countries in the region should work together for ensuring cross-border settlements of CBDCs.** For this, the countries can work collaboratively on a cross border CBDC initiative. This is important given the growing intra-regional connectivity in terms of trade, tourism and remittance flows. The cross-border interoperability will facilitate trade as well as transfer flows in the region.

CHAPTER I

INTRODUCTION

1.1 Background

Central Bank Digital Currency (CBDC) is a digital form of legal tender money issued by the Central Banks that can be used to make payments and store value. It is a highly secured digital instrument backed by state with the uniquely identifiable features so as to prevent counterfeiting and has the traditional features of currency such as a means of payment, denominated in a legally recognized unit of account, and a store of value (CEMLA Fintech Forum, 2019). Similar to the existing physical currency, it is a liability of the Central Bank and it can be transferred and stored in the digital form.

In the recent years, interest on CBDC has increased significantly. A survey[1] done by the Bank for International Settlement (BIS) in 2021 shows that the share of Central Banks actively engaging in some form of CBDC is 90 percent compared to 86 percent a year ago. Central Banks are moving forward into advanced stages of CBDC, progressing from conceptual research to experimentation and subsequently to implementation. The share of Central Banks currently developing CBDC or running pilots almost doubled from 14 percent in 2020 to 26 percent in 2021 while 62 percent of Central Banks are conducting experiments or proofs-of-concept (Kosse and Mattei, 2022).

The Central Bank of Bahamas launched the first nationwide CBDC in 2020. This was followed by a number of other countries who are either running pilot projects on CBDC or actively researching on this topic. According to the Atlantic Council, 114 countries, that occupy about 95 percent of global GDP are exploring CBDC compared to 35 countries in May 2020. Out of these, 11 countries have launched CBDC, 18 are in the pilot phase, 32 are in the development phase and 39 are researching on it (Atlantic Council, 2023). China and Korea are in pilot stage and preparing for the full lunch while Singapore, Malaysia, UAE, Saudi Arabia, Hong Kong and Thailand are also carrying pilots. Other countries including Indonesia, Philippines, Pakistan and Bhutan are actively researching on it. Moreover, India has launched a pilot on wholesale as well as retail CBDC[2].

[1] https://www.bis.org/publ/bppdf/bispap125.htm
[2] https://www.rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=54773

1.2 Difference between CBDC and other Forms of Money

CBDC is different from the present form of digital payments in the sense that it is the direct liability of the Central Bank whereas money in the existing digital wallets is the liability of the issuing financial institutions. As such, CBDC can serve as double security to the user with advanced digital payment facility.

The main differences between CBDC and other forms of money are presented in Table 1.1.

Table 1.1

Major Features of Different Forms of Money

Central Bank Paper Money (Cash)	Bank Money	Private Cryptocurrency	CBDC
Liability of Central Bank	Liability of issuer/ commercial bank	Nobody has legal liability	Liability of Central Bank
Tangible	Intangible	Intangible	Intangible
Stable value	Stable value	Significant fluctuations on value	Stable value

Source: Danmarks National Bank (2017)

Table 1.2 compares the existing fiat currency notes with the proposed CBDC modalities. Among them, the retail CBDC has more similar features than the other three modalities.

Table 1.2

Comparison between Cash & Proposed CBDC

Benchmark Features (Cash)	Account-based CBDC without DLT	Value-based CBDC without DLT	Retail CBDC based on DLT	Wholesale CBDC based on DLT
General Public	Yes	Yes	Yes	No
Anonymity	No	No with exceptions	Yes	Yes
Non-Traceable	Traceable	Traceable	Traceable	Traceable
Peer-to-peer Transfer	Yes	Yes	Yes	Yes
24 / 365 Available	Yes	Yes	Yes	Yes
No Limits or Caps	Limits or Caps	Limits or Caps	Limits or Caps	Limits or Caps

Source: Sayuri (2019), CEMLA Fintech Forum (2019)

1.3 Purpose of the Study

Interest on CBDC is growing as it has the potential to reduce the cost of printing, managing and distributing currency notes and coins significantly, reduce the payment and settlement cost, increase robustness of the payment system, control tax evasions as well as illicit payments and help the governments combat money laundering. It is likely to increase financial inclusion for the vulnerable groups, simplify the fiscal transfers to individuals and address the challenges arising from private crypto currencies (Mancini-Griffoli et.al, 2018, Boar and Wehrli, 2021). In addition, it is expected to enhance monetary sovereignty as well as the transmission mechanism of monetary policy and increase efficiency of cross border payments.

Rising interest on CBDC has motivated the Central Banks to prepare for the future of digital money. Many Central Banks are conducting research on the issue, some are conducting pilot tests and few have launched the CBDC. In this backdrop, this study attempts to explore the prospectus of CBDC in the SAARC Region, identify key infrastructure gaps and provide insights regarding the future roadmap of CBDC.

Specifically, the major objectives of this study are:

- To identify the opportunities and risks of the CBDC in the SAARC region and assess its macroeconomic implications.
- To assess the legal and infrastructural gap in the region.
- To summarize the key CBDC initiatives taken in the region.
- To provide insights on the future roadmap for the CBDC in the region.

1.4 Organization of the Report

The rest of the report has been organized as below: Chapter II discusses the technical designs of CBDC, Chapter III reviews the global developments on CBDC and summarizes the experience of selected countries, Chapter IV discusses the potential opportunities and the risks involved, Chapter V provides a summary of the initiatives taken regarding CBDC in the SAARC region and assesses the status of infrastructure, and the last chapter concludes the study with some insights and considerations.

CHAPTER II

TECHNICAL DESIGN OF CBDC

CBDC can be issued at the wholesale level to be used by the banks and financial institutions to settle their wholesale transactions or it can be used by the public for retail transactions. Also, depending on the role of the Central Bank, it can be designed as unilateral CBDC in which Central Bank carries all functions, an intermediate CBDC in which financial institutions are given some role to interact with the end users or it can be designed as a synthetic CBDC in which financial institutions issue digital currency that is backed up by holding Central Bank liabilities. This chapter discusses the technical design and operating architecture of CBDC and summaries the modalities adopted by the countries who have already issued CBDC or are running pilot projects.

2.1 Types of CBDC

CBDC can be classified as Retail CBDC and Wholesale CBDC, depending on the nature of users. General purpose or retail CBDC is held and used by individuals. Its main purpose is enhancing convenience, increasing safety, lowering overall costs, and further improving resilience of payment instruments using new digital and mobile technologies. It can reduce the concentration of liquidity and credit risk in payment systems by enabling widespread and retail use of digital currency (Dyson and Hodgson, 2016).

On the other hand, wholesale CBDC is primarily utilized by financial institutions such as banks. It would allow banks to make payments in a quicker and more automated manner. The underlying principle is that settlement systems for financial transactions can be made more efficient.

Wholesale CBDCs should be comparable to traditional Central Bank reserves into interbank payment systems to ensure efficiency and risk management in settlement (CPMI, 2017). It can yield better gains if non-bank institutions participate in the system directly, thereby facilitating the use of new technologies for asset transfers, authentication, record keeping, data management, and risk management. Furthermore, payments and securities settled in CBDC, instead of facilities hosted by commercial banks or other service providers, can help in reducing counterparty credit and liquidity risks in the financial system. Another motivation behind the wholesale CBDC is enhancing payment system security and efficiency in cross-border transactions and lowering such transaction costs.

2.2 Design Features

Design features of CBDC determine how it may serve as a means of payment and a store of value. The design choices have implications for payments, monetary policy, and financial stability. CPMI (2018) has highlighted various design features and a comparison of properties across existing and potential new forms of Central Bank money (Table 2.1).

Table 2.1

Key Design Features of Central Bank Money

	Existing Central Bank Money		CBDC		
	Cash	Reserves and Settlement Balances	Retail (Token)	Retail (Account)	Wholesale (Token)
24/7 Availability	√	×	(√)	(√)	(√)
Anonymity	√	×	(√)	×	(√)
Peer-to-peer transfer	√	×	(√)	×	(√)
Interest-bearing	×	(√)	(√)	(√)	(√)
Limits/Caps	×	×	(√)	(√)	(√)

√ = existing or likely feature, (√) = possible feature, ×=not typical or possible feature

Source: CPMI (2018)

2.2.1 Anonymity

Token-based CBDC can provide different degrees of anonymity as it is similar to private digital tokens, whereas non-anonymity is obvious in account-based CBDC. For CBDC, Central Banks need to make crucial decision regarding the anonymity of transactions. Many Central Banks that are in the process of developing CBDC have aimed anonymity for small value transactions and transparency for large value transactions (CPMI, 2018). This approach will encourage financial inclusion as the non-anonymous payments are costly to obtain for rural and disadvantaged people and at the same time maintain AML-CFT compliance.

2.2.2 Transfer Mechanism

The transfer of cash is conducted on peer-to-peer basis. CBDC may be transferred either on a peer-to-peer basis or through an intermediary, which could be the Central Bank, a commercial bank or a third-party agent. Bech and Garrat (2017) focus on the transfer mechanism rather than on the token or account-based technology.

2.2.3 Interest Bearing

Remuneration on CBDC is one of the most crucial issues as it can lead to a crowding out of the bank deposits and escalate bank run during the time of financial distress. During financial distress and in low interest rate regimes, even a zero-interest rate on CBDC can create challenges. Although many Central Banks are not considering an interest bearing CBDC and are mainly payment-focused rather than saving, they are open to the possibility of interest bearing CBDC in the future.

2.2.4 Limit or Caps

Quantitative limits or caps can be defined on the use or holdings of CBDC to control the potentially undesirable implications or to steer usage in a certain direction. The main purpose is to limit competition with bank deposits and also encourage financial inclusion. One instance of quantitative limits could be to make CBDC less useful for wholesale payments and more useful for retail payments. Such limits or caps are mostly envisioned and used in non-anonymous account-based CBDC systems (CPMI, 2018).

2.2.5 Offline Capacity

Offline capacity is being considered in issuing the CBDC so as to increase the resilience of the payment system. It is even more important in the countries prone to natural disasters or the regions having weak and vulnerable telecommunication network. Central Banks are exploring various options for building capacity such as the mechanism relying on the local area network or bluetooth technology (Soderberg et. al., 2022).

2.3 Choice of Technology

The choice of technology in case of CBDC incorporates whether it is account-based or token-based, who manages the records, whether it bears interest or not and whether it can be used for cross border payments or not. Popescu (2022) has emphasized four major dimensions for modeling choices for CBDC: form, access, remuneration and cross-border availability.

The first consideration of CBDC design is whether the CBDC should be ***account based or token based***. Token based CBDCs are similar to cash, with the difference that they take form of cash cards or electronic media/wallets which enable anonymous peer-to-peer payments. Account-based CBDCs, on the other hand, constitute deposits envisioned to be held in a Central Bank account, to be used either for payment and/ or store of value purposes. Account based CBDCs further allow the verification of users' identity in different layers and thus, offer advantages in terms of monitoring illicit activities, which is a key concern for many Central Banks.

The second dimension is that of access. Account based access demands account identity. Just as in bank accounts, all claims are represented in a database that records the value along with a reference to the identity. On the other hand**,** a token-based system ensures universal access, allowing anybody to obtain a digital signature. Token-based access is implemented by Central Banks for small payments. This further allows foreigners to make payments in CBDC using mobile number while they are traveling.

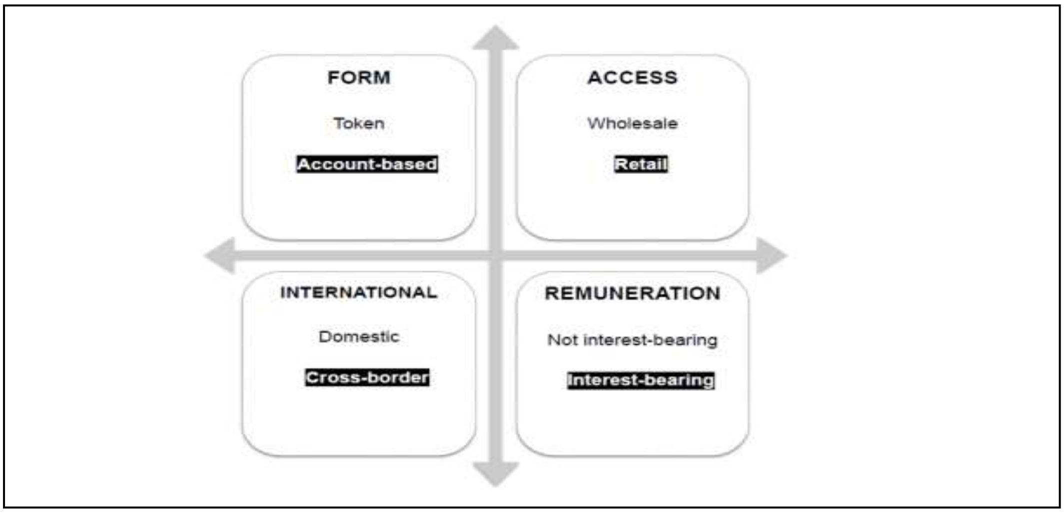
For an account-based CBDC, the Central Bank can either choose a Direct CDBC model or a Hybrid model. A direct model requires all accounts to be opened at the Central Bank, putting additional operational burden on it. An alternative to Direct CBDC is a Hybrid model, whereby the direct claim of CBDC is on the Central Bank and all front-end operations are handled by bank and financial institutions. The Central Bank has access to the ledger with full record of CBDC transactions and all retained balances, allowing it to easily step in as a backstop to the payment system, should the private sector providers fail.

A related consideration for CBDC is concerned with whether the CBDC should allow access only to selected users such as financial institutions (wholesale CBDC) or to a broader public (retail CBDC***)***. These design choices are based on policy objectives of the Central Bank. For instance, if the objective is to improve financial inclusion, retail CBDCs may be the most impactful design option (Popescu, 2022).

The third consideration is remuneration. An interest-bearing feature is easier to implement in an account-based CBDC and is considered as one of the novel monetary policy tools for the conduct of negative interest rate or distributing helicopter money, an alternative to quantitative easing (Popescu, 2022).

Chart 2.1

Key Dimensions of CBDC Design Options



Source: Popescu (2022)

The final consideration for a **CDBC Design is the inter-operability** (both domestic and cross-border). The warranted use case for multi-currency and multi-country availability of CBDC is allowing access to CBDC to non-residents, not only in its jurisdictions, but also abroad. Cross-border interoperability of CBDC requires extensive international cooperation and policy alignments. It further requires consistent technical standards, oversight frameworks, private and public laws, and AML/CFT Laws (Auer et.al, 2021). Domestic interoperability allows direct integration of CBDC with other public and private systems of the country, adding to the diversity of domestic payment landscape and creating competitive incentive for the public and private partners. However, cross-border interoperability is a complex and costly model (Sally et. al., 2022).

2.4 Choice of Architecture

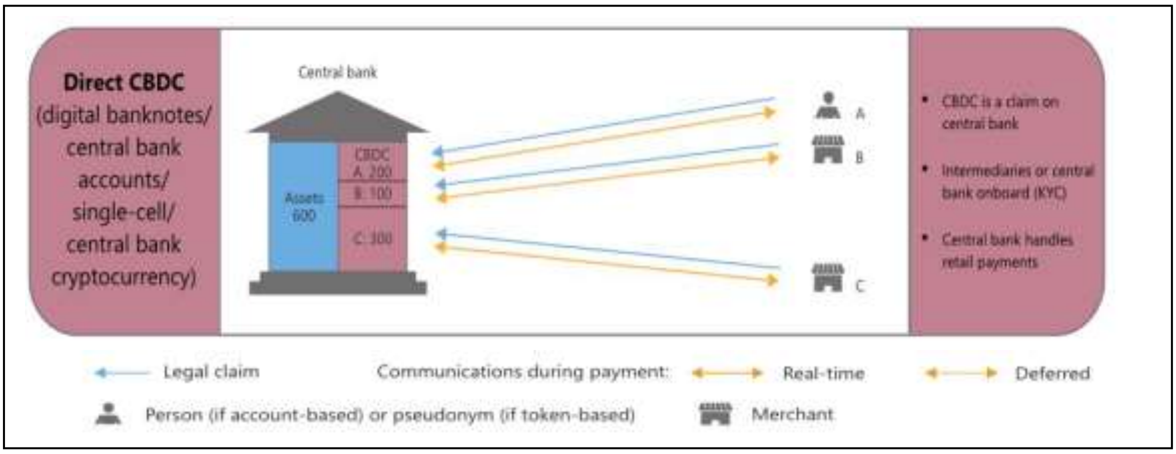
The operational architecture for the CBDC has been discussed broadly under there categories. The first is the direct/unilateral/single tiered CBDC where the Central Bank is both the issuer as well as distributor of the CBDC. The second is a hybrid/intermediated model where the Central Bank issues CBDC while the private sector works as the distributor. And the third type is the synthetic CBDC in which the digital currency issued by the private financial firms are backed by holding Central Bank liabilities. In most of the cases, the Central Banks have preferred the two-tier/hybrid model (Soderberg et. al., 2022).

2.4.1 Single-Tiered

Direct CBDC: Direct CDBC creates all claims and operational burden of CBDC on the Central Bank. Although such architecture improves resiliency of the payment system, it carries significant systemic risk arising out of centralized management of transaction ledger, backup of technical infrastructure, and operational activities, all by Central Bank alone. Any significant operational problem within the CBDC system could pose substantial risks to the entire financial system and to the macro-economy. The working mechanism of a direct CBDC is presented in Chart 2.2.

Chart 2.2

Mechanism of Direct CBDC



Source: Auer and Bohme (2020)

2.4.2 Two-Tiered

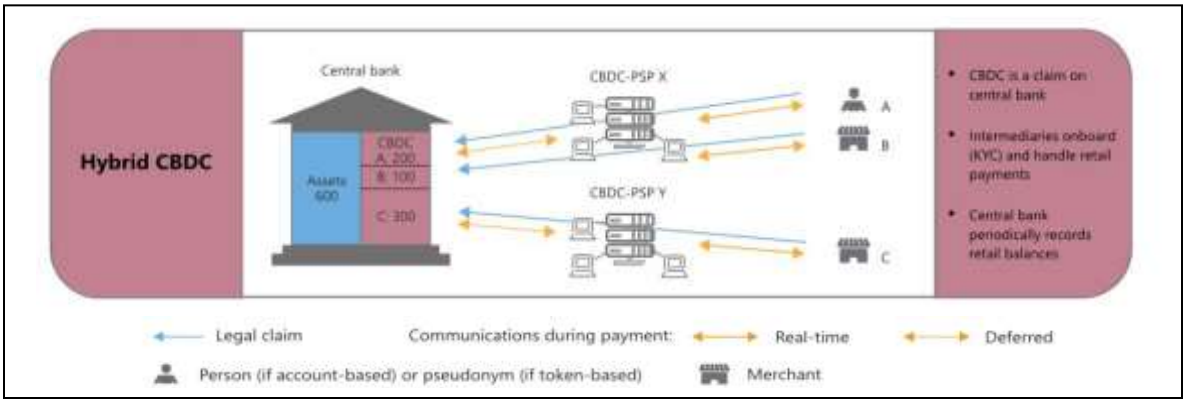
The two-tiered CBDC creates direct claim of CBDC on Central Bank while the payment intermediaries are responsible for onboarding and handling operational and real-time payment activities. The Central Bank also periodically records and reconciles the transaction balances in the books of account (Auer et al., 2021). Fan (2020) also emphasizes on hybrid technology as it is easier to manage the concentration and systemic risk at the Central Bank and reduce the risk of financial disintermediation. It utilizes the existing IT infrastructure as well as the capabilities of the intermediaries.

Under the two-tiered model, an intermediated CBDC is an architecture that records wholesale balances of the intermediaries and the intermediaries are responsible for onboarding clients and executing their retail payments. Since Central Bank maintains wholesale ledger, payment intermediaries need to be closely supervised to ensure, at all times, that the wholesale holdings they communicate to the Central Bank add up to the sum of all retail accounts (Auer et al., 2021).

On the other hand, in the hybrid model, the Central Bank does not operate retail transactions but keep a back-up record of all retail transactions which allows it to restart payment if the intermediary becomes insolvent or faces technical outages (Auer and Bohme, 2020*).* The working mechanism of the two-tiered CBDC is shown in Chart 2.3.

Chart 2.3

Mechanism of Hybrid CBDC

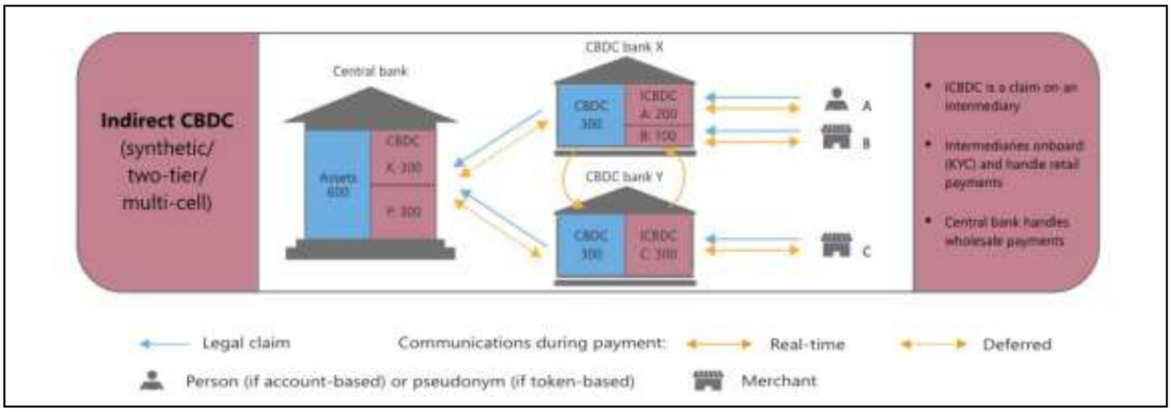


Source: Auer and Bohme (2020)

Synthetic CBDC: Synthetic/Indirect CBDCs are issued by non-Central Bank institutions in which the issued amount is backed by the assets acquired from the Central Bank. Synthetic CBDCs are termed as stable coin or a special type of e-money rather than CDBC because such CBDCs are not issued by Central Bank (Soderberg et.al., 2022). The working mechanism of the synthetic CBDC is shown in Chart 2.4.

Chart 2.4

Mechanism of Indirect CBDC



Source: Auer and Bohme (2020)

2.5 Modalities Adopted by Other Central Banks

Central Banks around the world have been researching the concept and design of digital currencies for several years. The Central Banks which have already rolled out their CBDC or are conducting pilots have followed similar architecture of CBDC. First, almost all of the banks have opted for the intermediate modality in which private sector participation and innovation is ensured. Secondly, many Central Banks have opted for the retail case of CBDC. Different design features opted by the Central Banks are summarized in Table 2.2.

Table 2.2

CBDC Modalities adopted by different Central Banks

Country	Type (Retail/Wholesale)	Architecture (Direct/Intermediate/Indirect	Technology (DLT/CLT)	Access (Account/Token)
Bahamas	Retail	Intermediated	Both	Both
ECCU	Retail	Intermediated	DLT	Both
Nigeria	Retail	Intermediated	DLT	Account
Jamaica	Retail	Intermediated	Conventional	Account

Note: ECCU = Eastern Caribbean Central Bank (includes 8 countries)

Source : Atlantic Council (2023)

Most of the countries conducting a pilot program of CBDC are also considering the retail case with an intermediate type of architecture. The details of the modalities adopted in some pilots are presented in Table 2.3.

Table 2.3

CBDC Modalities Adopted by Different Central Banks in their Pilots

Country	Type (Retail/Wholesale)	Architecture (Direct/Intermediate/Indirect	Technology (DLT/CLT)	Access (Account/ Token)
China	Both	Intermediated	Both	-
Sweden	Retail	Intermediated	DLT	Both
Russia	Retail	Intermediated	Both	Account
Japan	Both	Intermediated	-	-
South Korea	Retail	Intermediated	DLT	-
Thailand	Both	Intermediated	Both	Both
India	Both	-	Both	Both

Source : Atlantic Council (2023)

CHAPTER III

REVIEW OF GLOBAL DEVELOPMENTS AND COUNTRY EXPERIENCES

Interest in CBDC has increased significantly in the past few years. Such interest is mainly driven by the popularity of crypto currencies and constraints felt by the Central Banks during the COVID crisis. This chapter provides an overview of the global developments on CBDC and experience of some of the countries which has already issued CBDC or are conducting pilots.

3.1 Global Developments of CBDC

As of December 2022, 114 countries that represent over 95 percent of global GDP are exploring CBDC compared to only 35 countries in May 2020 (Atlantic Council, 2023). Likewise, 18 countries, including China and South Korea, are now in the pilot stage with their CBDCs and preparing a possible full launch. In addition, 32 economies are in the development stage. Eighteen of the G-20 countries are in the advanced stage of CBDC development and seven of those economies are conducting a pilot.

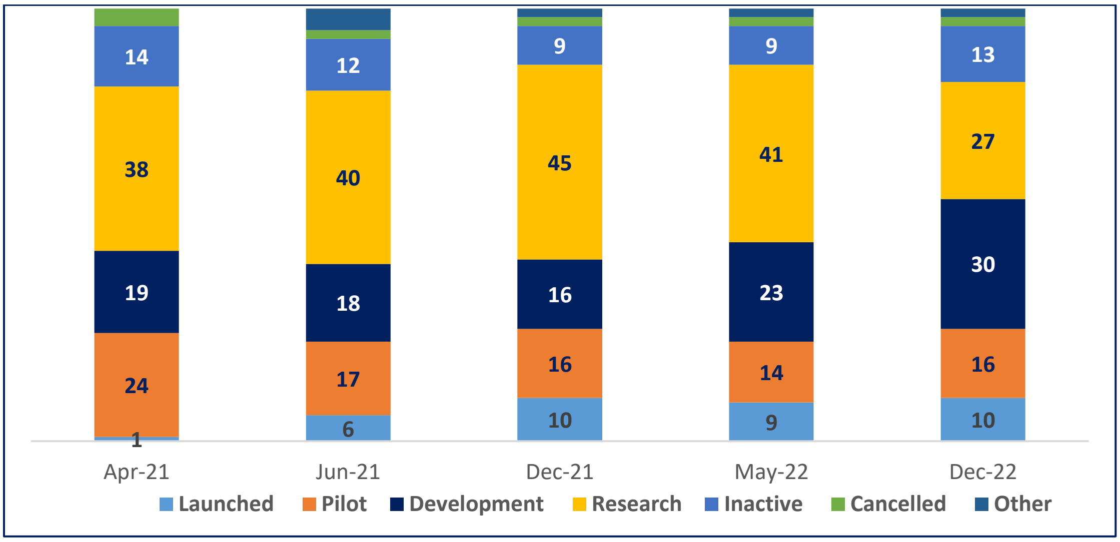
Not only the retail CBDC, interest on wholesale CBDC for the cross-border payments have also increased significantly over the last two years. There are now 9 cross-border wholesale CBDC tests and 7 cross-border retail projects, nearly double the number from 2021 (Atlantic Council, 2023).

As of December 2022, a total of 11 countries have fully launched CBDC. These include Bahamas, eight Eastern Caribbean countries, Nigeria and Jamaica. Jamaica is the latest country to launch CBDC. Moreover, about 68 percent of Central Banks around the world consider that they are likely to or might possibly issue a retail CBDC in short or medium term (Kosse and Mattei, 2022).

In October 2020, the Sand Dollar became the first CBDC in the world to go beyond the pilot stage and initiate an official launch. The digital currency became available for use by all Bahamian citizens upon release, while integration with the commercial banking system has been subject to a gradual rollout. The motivations for the Sand Dollar include improving financial inclusion and strengthening security against money laundering and illicit economic activities.

Chart 3.1

Share of Countries and CBDC Status



Source: Atlantic Council (2023)

After developing a digital currency since 2019, the Eastern Caribbean Central Bank (ECCB) launched its digital currency 'D-Cash' in March 2021 in the four of its eight-member states. With D-Cash, the Eastern Caribbean has become the first currency union Central Bank to issue digital cash. The digital currency pilot is available for use by the public on their smartphones. Consumers and merchants can utilize the D-Cash App or use it through participating financial institutions.

Table 3.1

Modalities Adopted by the CBDC Issuing Countries

Country	Purpose	Architecture	Technology	Access	Date
The Bahamas	Retail	Intermediated	Both	Both	Oct -20
Grenada	Retail	Intermediated	DLT	Both	Mar-21
Saint Lucia	Retail	Intermediated	DLT	Both	Mar-21
Dominica	Retail	Intermediated	DLT	Both	Dec-21
Saint Kitts and Nevis	Retail	Intermediated	DLT	Both	Mar-21
Antigua and Barbuda	Retail	Intermediated	DLT	Both	Mar-21
Saint Vincent and the Grenadines	Retail	Intermediated	DLT	Both	Aug-21
Montserrat	Retail	Intermediated	DLT	Both	Dec-21
Nigeria	Retail	Intermediated	DLT	Account	Oct-21
Jamaica	Retail	Conventional	Both	Account	May-22

Source: Atlantic Council (2023)

Table 3.1 shows the summary of key features of the CBDCs issued so far. It shows that the countries have issued retail form of the CBDC with intermediate architecture in which both Central Bank as well as commercial banks have a joint role in distributing the CBDC. Regarding the choice of technology, many countries have used distributed ledger technology (DLT) while some countries have used a mix of conventional technology and DLT. And in terms of access, most of the countries have used both account-based as well as token-based access.

3.2 Country Experiences

3.2.1 Bahamian Sand Dollar

The Central Bank of the Bahamas (CBB) rolled out its CBDC (Sand Dollar) nationwide in October 2020, following pilot phase in Exuma in December 2019. In effect, the sand dollar became the world's first account-based CBDC.

Sand Dollar is expected to promote more inclusive access to regulated payments and other financial services for unbanked and underbanked communities and socio-economic groups within the country. Moreover, it is also expected to reduce service delivery costs and increase transactional efficiency for financial services across Bahamas.

Objectives of Sand Dollar

- To increase the efficiency of the Bahamian payment system through more secure transactions and faster settlement speed.
- To provide non-discriminatory access to payment systems without regard for age, immigration or residency status.
- To achieve greater financial inclusion, cost-effectiveness and provide greater access to financial services across of the Bahamas.
- To strengthen the national defense against money laundering, counterfeiting, other illicit ends by reducing the ill effects of cash usage.

Features of Sand Dollar

- Interoperability among existing and new channels for the provision of payments services.
- 'Offline functionality' even if communication between the islands is disconnected.
- Near instantaneous validation of transactions/real-time transactions processing.
- Point of sale support for businesses accepting payments.

- Fully auditable transactions trail (non-anonymous). Transactions monitoring still protects user confidentiality, and would be governed by strict regulatory standards around access.
- Monitoring for fraud detection.
- Restriction of digital currency to domestic use. A Bahamian CBDC would be for domestic use only, and prohibited from acceptance by non-domestic payees.
- Multi-factor authentication for wallet users to complete some payments transactions.
- Each wallet provides a unique set of data encryption to ensure privacy and confidentiality. Therefore, while the wallet owner has full sight of their transaction trail, back-office operators are blind to transaction details.
- Digital ID solution (using KYC and identity features incorporated in the system design).
- All financial institutions providing Sand Dollar services, including the Central Bank, must undergo a rigorous and independent cyber security assessment. The organization's overall cyber security posture and, if available, the institution's proprietary mobile applications are assessed to ensure they meet international standards.

Source: https://www.sanddollar.bs/about

The latest data from Bahamas show a slow rate of adoption compared to currency in circulation. By November 2022, with two years since the launch, the outstanding amount of CBDC in circulation was only Bahamian dollar 0.68 million[3], compared to Bahamian dollar 31.32 million in coins and Bahamian dollar 517.18 million in bank notes. Sand Dollar currently makes up around 0.1 per cent of currency in circulation. However, CBDC and financial inclusion have found to be positively correlated[4]. The current adoption rate of CBDC is roughly 7.9 percent with 32,736 wallets having been created.

Key Lessons from Sand Dollar Experience

- Expanding the merchant network is important to accelerate adoption.
- Interoperability with the traditional banking system for merchants, who need to treat CBDC revenue like any other form of receipt.
- Enlisting participation from the traditional banking sector and credit unions is important.
- User education is important.

Source: Central Bank of Bahamas[5]

[3] https://www.centralbankbahamas.com/viewPDF/documents/2023-01-16-14-47-03-CBOB-Statement-of-Assets--Liabilities-as-at-November-30-2022-website.pdf
[4]https://www.centralbankbahamas.com/viewPDF/documents/2022-09-23-13-49-13-CBDCupdated-paper.pdf
[5] https://cdn.centralbankbahamas.com/documents/2022-11-10-16-42-59-European-Commission-Presentation-on-Sand-Dollar-Experience-20221107DG1.pdf

3.2.2 Nigeria's eNaira

The Central Bank of Nigeria (CBN) began its CBDC journey in 2017, with extensive study, consultation, identification of use cases and the testing of the CBDC concept in Sandbox environment. The design document published by CBN depicts details on the critical dimensions of the eNaira including its design, architecture and functionality; risks associated with eNaira and its mitigation along with the implementation roadmap.

Objectives of eNaira

- eNaira enables households and businesses to make fast, efficient, and reliable payments, while benefiting from a resilient, innovative, inclusive, and competitive payment system[6].

The design of eNaira has the following elements:

- eNaira is a hybrid CBDC or a two-tiered CBDC architecture. CBN will be responsible for issuing the eNaira, managing wallet, maintaining central ledger of transactions and will enable transactions to be recorded and payments to be processed and use of the existing financial system for the distribution of CBDC, payment facilitation, dispute resolution and engagement with users.
- eNaira infrastructure is based on hyper ledger fabric variant of the distributed ledger technology (DLT) which has a robust security architecture and supports the modular architecture.
- It is account based CBDC model that ensures inclusive access.
- Interoperability between eNaira and other CBDCs has been factored in the overall design of eNaira to promote global cooperation in the long term.
- Design of eNaira follows a platform model that entails building a technology platform and leveraging the existing structures and roles in payment system to deliver additional value for the users.
- CBN has defined regulations to guide all market participants; regulations around operations, compliance with existing AML/CFT guidelines, privacy and data protection, dispute resolution and consumer protection has been defined to ensure the smooth operation of eNaira.

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[6] https://enaira.gov.ng/assets/download/eNaira_Design_Paper.pdf

- eNaira is an open system that is accessible to all Nigerians based on tiered structure. Based on this structure, the Bank Verification Number (BVN) and the National Identity Number (NIN) will serve as unique identifiers. Each wallet is tied to a BVN or NIN depending on the tier and can only be used once to prevent duplicate identities and wallet creation on the eNaira platform.
- It has been designed to mimic the physical Naira and does not earn interest.
- CBN will regulate the effective working of eNaira payment system to promote an open, innovative, and resilient payment system.
- It is compliant with AML/CFT guidelines to ensure the integrity of the financial system. As it is an account based CBDC, CBN will be able to identify users on the platform using the identify frameworks: BVN and NIN.
- eNaira system is built with deep considerations around privacy and data protection and in compliance with the National Data Protection Regulations (NDPR). It is designed in line with AML/CFT guidelines.

Source : Central Bank of Nigeria[7]

CBN launched eNaira on October 25, 2021. Progress of eNaira during the first one year include[8]:

- It has recorded over 700,000 transactions amounting to about N8 billion.
- About 1 million customers have been onboarded.
- Over 3305 merchants successfully integrated with the eNaira platform.
- N3 billion has been minted by the Bank.
- N2.1 has been issued to the financial institutions.
- Thirty-three banks have fully integrated it on their platform.

3.2.3 Jamaica's JAM-DEX

JAM-DEX is the money issued by Bank of Jamaica (BOJ) in digital form to be held by the users in a CBDC wallet issued by banks or authorized Payment Service Providers. It does not earn any interest on wallet balances but can be exchanged one-for-one with bank notes and coins.

[7] https://enaira.gov.ng/about/features

[8] https://www.cbn.gov.ng/Out/2022/CCD/CBN%20UPDATE%202022%20OCTOBER%20EDITION%20web.pdf

Key Initiatives for the JAM-DEX

- Bank of Jamaica (BOJ) selected eCurrency Mint as the technology provider to support BOJ in testing a CBDC solution in the Bank's Fintech Regulatory Sandbox for a pilot after an extensive procurement process.
- BOJ minted the first batch of CBDC (JAM-DEX) of J$230 million dollars in August 2021 to be issued to deposit-taking institutions and authorized payment service providers during the CBDC pilot exercise.
- On 10 August 2021, BOJ issued to Bank of Jamaica's Banking Department $1 million worth of CBDC to be distributed to staff.
- On 29 October 2021, the Bank issued $5 million worth of CBDC to National Commercial Bank (NCB), marking this the first issuance of CBDC to a deposit taking institution.
- NCB, the first wallet provider in the pilot, successfully onboarded 57 customers which included 4 small merchants and 53 consumers. These customers conducted person-to-person, cash-in and cash-out transactions through 37 accounts and completed transactions with small merchants.
- The amendments to the Bank of Jamaica Act in June 2022 designated the Bank as the sole authority to issue CBDC.
- National Commercial Bank Limited worked as a Wallet Provider to distribute JAM-DEX. On 30 December 2022, JN Bank became the second deposit taking institution to receive digital currency. Other wallet providers are being assessed in Bank of Jamaica Fintech Regulatory Sandbox in preparation for the distribution of JAM-DEX.
- National Roll-out of JAM-DEX was done in December 2022.

Source: https://boj.org.jm/core-functions/currency/cbdc/boj-speaks/

3.2.4 China's e-CNY

The People's Bank of China (PBC) has attached great importance to the research and development of digital fiat currency. In 2014, the PBC set up a special research group / task force to study the possibility of digital fiat currency. In 2016, the Bank established Digital Currency Research Initiative, with the objectives of conducting research and technical trials for Digital Currency for Electronic Payment (DCEP) project.

On July 2021, PBC's working group on e-CNY research and development has released white paper on e-CNY after system testing and initiation of pilot programs to explain the background, objectives and visions, design framework and policy considerations for the e-CNY system. The development of e-CNY system aims to diversify the forms of cash provided to the public by the Central Bank, satisfy the public's demand for digital cash and support financial inclusion; support fair competition, efficiency and safety of retail payment services and echo the international initiative and explore the improvement of cross-border payments (People's Bank of China, 2021).

e-CNY is fiat currency issued by PBC which adopts a centralized management model and a two-tier operational system. The right to issue e-CNY belongs to the state. The PBC lies at the center of the e-CNY operational system. It issues e-CNY to authorized operators which are commercial banks, and manages e-CNY through its whole life cycle. It is mainly a substitute for currency in circulation (M0), and will coexist with physical Renminbi. In addition, e-CNY is a retail CBDC issued to the public that intends to serve domestic retail payment demands. It is expected to improve the efficiency of the retail payment system and reduce the cost of such payments.

People's Bank of China (2021) states the following objectives and features of e-CNY.

Objectives of e-CNY[9]

- To diversify the forms of cash provided to the public by the Central Bank, satisfy the public's demand for digital cash and support financial inclusion.
- To support fair competition, efficiency and safety of retail payment services.
- To echo international initiative and explore ways to improve cross-border payments.

Features of e-CNY

- **Legality:** It is backed by state credit and has the same status as paper currencies.
- **Two-Tier Operational Model:** China has adopted a dual or two-tier operational system, with Central Bank on one tier and commercial institutions on the other. PBC is responsible for issuing, canceling, institutional interconnection, and wallet management of e-CNY.
- **Non-interest accrual:** It is part of M_0, the monetary base that also includes cash-based payment vouchers and cash in circulation.
- **Low Costs:** Consistent with the management of physical RMB, the PBC does not charge authorized operators for exchange and circulation services, and the operators do not charge individual clients for the exchange of e-CNY either.
- **Settlement upon payment:** According to settlement finality, the e-CNY is loosely coupled with bank accounts, and thus payment through e-CNY wallets are settled upon payment.
- **Retail oriented:** e-CNY is a retail CBDC issued to the public.

[9] http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf

- **Managed Anonymity:** e-CNY follows the principle of "anonymity for small value and traceable for high value" and attaches great importance to protecting personal information and privacy.
- **AML/CFT Compliance:** The authorized institutions providing e-CNY exchange and circulation services have to perform AML duties and this undertake AML obligations accordingly, including customer due diligence, keeping customers' identity data and records of transactions, reporting large-value and suspicious transactions.
- **Protection of consumers' rights and interests:** PBC and authorized operators are responsible for authenticating e-CNY via its certificate and serial number.
- **Safety:** e-CNY adopts a variety of technologies, including digital certificate system, digital signature, and encrypted storage to make double-spending, illegal duplication and counterfeit, transaction falsification, and repudiate unfeasible. A multi-layer security system has been initially established to guarantee that e-CNY has a safe life cycle and risks are manageable.
- **Programmability:** e-CNY obtains programmability from deploying smart contract that don't impair its monetary functions. Under the premise of security and compliance, this feature enables self-executing payments according to predefined conditions or terms agreed between two sides, so as to facilitate business model innovation.

Pilot schemes

According to data from the State Council Information Office, as of December 31, 2021, there were more than 8,085,100 e-CNY pilot scenarios, a total of 261 million personal wallet accounts were opened, and the total amount of transactions has reached a value of RMB 87.6 billion (USD 13.8 billion)[10].

The pilot scheme has already been expanded to cover a total of 23 cities across China, including the cities of Beijing, Shanghai, and Tianjin. There are currently seven commercial banks (ICBC, Agricultural Bank of China, Bank of China, China Construction Bank, Bank of Communications, Postal Savings Bank of China, China Merchant's Bank) and two online banks (WeBank and MyBank) that are eligible to provide e-CNY[11].

[10] http://english.scio.gov.cn/pressroom/2022-01/19/content_77998651.htm
[11] https://www.china-briefing.com/news/china-launches-digital-yuan-app-what-you-need-to-know/

CHAPTER IV

IMPACT OF CBDC ON MACRO-ECONOMY AND MANAGING THE RISKS

CBDC has a number of potential benefits including enhanced financial inclusion, resilience of the payment system, financial transparency and a more effective monetary policy transmission. At the same time, it is likely to create some challenges such as data privacy, cybersecurity and financial disintermediation. This chapter discusses the major opportunities created by the CBDC and ways to manage the risks.

4.1 Opportunities Created by CBDC

CBDC has been taken as a promising innovation that could help in achieving the objectives of the Central Bank. These include support for the modern payment system, avoiding the risk of private money creation, promoting financial inclusion, facilitating cross border payments, making the monetary transmission channels more effective and increasing transparency of financial transactions, among others.

4.1.1 CBDC and Payment System

CBDC could enhance financial stability by contributing to resilience of payments. By providing a new way to make payments, it could diversify the range of payment options, particularly for e-commerce. Therefore, it could serve as a substitute to card and other payment networks.

Existing payment systems transfer money that has been created by either the Central Bank or commercial banks. Commercial money used in existing payments system is not risk free as commercial bank could fail. CBDC may be able to provide better payment services, backed by risk free Central Bank money and offering low-cost payments as public good. In addition, it could help enhance the speed and efficiency of payment systems by offering a fast and efficient payment service to end users as well as by creating more competitive payment systems.

In case of South Asia, even though countries are adopting newer technologies for digital payments, only one third of the adults use digital payments and the cost of such services is still high (World Bank, 2022). Introduction of CBDC could significantly increase the use of digital payments by reducing transaction cost and at the same time making the payment system more resilient.

4.1.2 Availability, Use and Management of Central Bank Money

CBDC could enable households and businesses to hold Central Bank money in electronic form, and use it to make payments. This would increase the availability and utility of Central Bank money, allowing it to be used in a much wider range of situations than physical cash. Central Bank money plays a fundamental role in supporting monetary and financial stability by acting as a risk-free form of money that provides the ultimate means of settlement in the economy. Introduction of CBDC could enhance the way the Central Bank maintains monetary and financial stability by providing a new form of Central Bank money and a new payment infrastructure.

CBDC could lower the cost associated with printing, storing, distributing and destroying paper currency (Kiff et. al., 2020). India, for instance spent INR 49,844 million for printing notes in 2021-22[12] whereas Nepal spent NPR 2,403 million in the same year[13]. With a full-fledged CBDC, many of such costs could significantly drop creating efficiency in monetary management function of the Central Banks. However, there will be some upfront cost in CBDC infrastructure and operation cost to maintain the infrastructure.

4.1.3 CBDC and Financial Inclusion

CBDC converts mobile device into a wallet which helps enhance financial inclusion and helps in creating cashless economy. At present, around one fourth of the adult population of the world do not have an access to account at financial institutions. Moreover, access gap exists in terms of gender, region, occupation, education and income groups. Most of the financially excluded population live in the developing world and most of them are women (World Bank, 2022).

Retail CBDC can be an effective tool to promote financial inclusion in expanding the financial access in developing and emerging market economies. With the help of internet and mobile, people can be given access to digital payments and transactions without a formal bank account. CBDC could potentially facilitate financial inclusion by increasing access to digital payments and thus serving as a gateway to wider access to financial services.

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[12] https://www.indiatimes.com/worth/news/rbi-spent-nearly-5000-crore-rupees-on-banknote-printing-in-fy22-572767.html

[13] https://www.nrb.org.np/contents/uploads/2022/10/CBDC-for-Nepal.pdf

In case of South Asia, while only two-thirds of the adults have an access to bank accounts, the percentage of adults that make digital payments is only 33 percent (World Bank, 2022). In such a context, CBDC can be used as a potential leverage to expand the access to financial services to rural, backward and unprivileged sections of the society.

4.1.4 CBDC and Financial Transparency

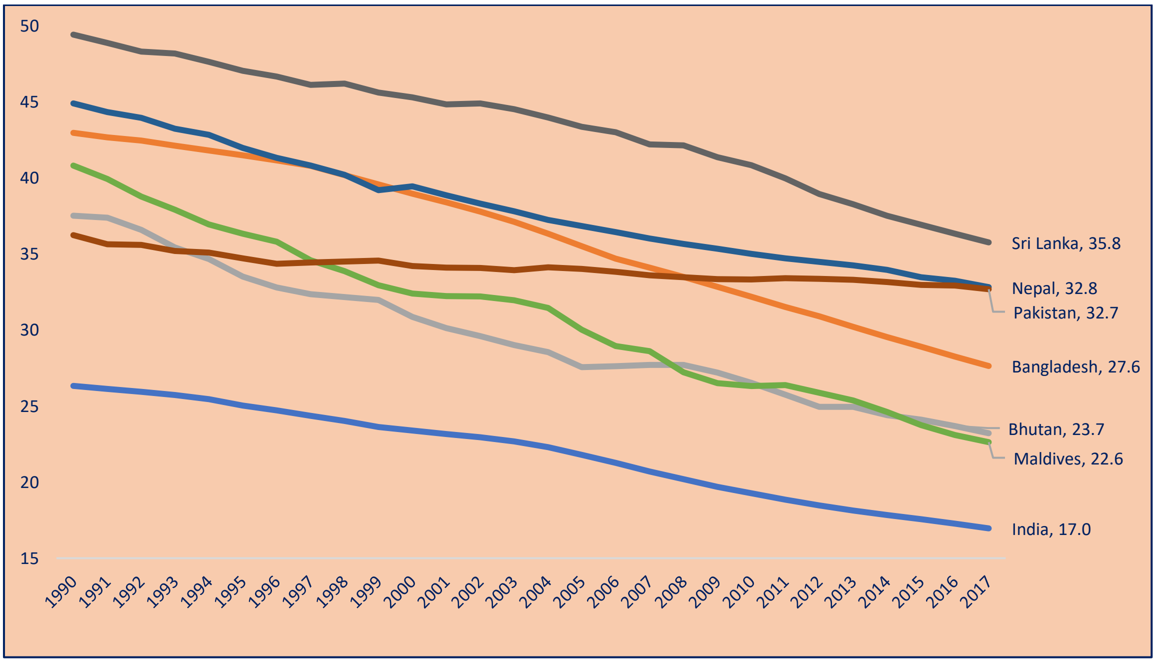
Apart from being a system of efficient retail payments, CBDCs can help government's better control illicit payments and tax evasion (Stanley, 2022). This can also help governments combat money laundering and terror financing.

Unlike physical cash, a digital currency will be much easier and cheaper to track and eventually lead to an efficient, regulated and legal tender-based payment system. It shall ensure that the transactional currency of a country remains consistent, and outliers can be identified. In addition, financial transparency will make it easier to monitor the activities like money laundering as well as combating of terrorism that are challenging in the currency note based system at present.

Use of CBDC enables more transparency and traceability across levels for the financial services sector. It is assumed to discourage the informal and underground as well as illegal activities in an economy and thus increase the size of formal economy. In case of South Asia, the size of informal economic activities in GDP is still high (Chart 4.1). CBDC has the potential of formalizing such activities.

Chart 4.1

Share of Informal Economy in the SAARC Countries (%)



Source: Elgin et.al. (2021)

4.1.5 CBDC, International Trade and Cross-border Payments

CBDC could offer a safer and efficient way to carry out cross border payments. It can reduce the time needed for cross boarder payments to seconds from days and reduce costs. In international trade, if an importer wants to settle a payment in abroad, often it takes a lot of time to settle the transaction to the beneficiary due to time zone differences and prices change due to fluctuations in the exchange rate. CBDC can facilitate settlement of cross border transactions in the real-time.

CBDC is likely to reduce the cost of sending remittances and save billions of dollars each year. According to the World Bank, South Asia gets about one-fifth of the world remittance inflows that stood 162 billion USD in 2022[14]. The average cost of sending remittances remained 6.30 percent in Q3 of 2021. While such cost is 4.49 percent for South Asia, it is as high as 8.27 percent for Sub-Saharan Africa. In addition, the cost of sending remittances through bank is as high as 10.40 percent[15]. Even though, intra-regional trade in South Asia is less than 5 percent compared to 35 percent in East Asia and 60 percent in Europe[16] and the intra-regional remittance flows is around 10.47 billion USD which is about 6.67 percent of the remittances received by the SAARC region from all the countries[17], CBDC could reduce transactions costs and encourage intraregional trade and remittance flows through formal channels.

4.1.6 CBDC and Economic Crisis

CBDC is likely to increase the effectiveness of monetary policy in stimulating the economy during economic crisis. It can reduce the effective lower bound on the interest rate and facilitate the transfer of stimulus packages to households and businesses during the crisis periods. It will also help governments in the quick transfer of public funds or emergency grants in a crisis situation (Engert and Fung, 2017). In addition, it can facilitate the implementation of negative interest rate policy targeted to stimulate the economy.

4.1.7 CBDC and Financial Stability

CBDC can facilitate better monitoring and surveillance of the financial system and help strengthen financial stability. It could support financial stability by accelerating the adoption

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[14] https://www.worldbank.org/en/topic/migrationremittancesdiasporaissues/brief/migration-remittances-data
[15] https://remittanceprices.worldbank.org/
[16] https://www.worldbank.org/en/news/infographic/2016/05/24/the-potential-of-intra-regional-trade-for-south-asia
[17] https://www.knomad.org/data/remittances

of digital payments, improving anti-money laundering, and thus supporting banks' ability to finance the economy (Mnohoghitnei et.al., 2021). Overall risk and financial stability could benefit because CBDC is essentially risk-free (Engert and Fung, 2017).

On the other hand, there are some challenges to financial stability objective of the Central Bank. Such risk can mainly arise from the financial disintermediation risk and the risk of bank run and panic during financial stress periods (Zhang, 2020). Such risks can be managed by putting limits on holding CBDC by the individuals.

4.1.8 Impacts on Monetary Policy Framework

CBDC can enhance the effectiveness of the monetary policy transmission mechanism in a number of ways: transmission can strengthen with the increasing financial inclusion, and interest-bearing CBDC could eliminate the effective lower bound on interest rate (Mancini-Griffoli et.al, 2018). In addition, CBDC can improve the control over inflation and accelerate the implementation of countercyclical instruments when classical monetary policy instruments are no longer effective (Mnohoghitnei et.al., 2021). It can facilitate a more accurate and close monitoring of liquidity and credit aggregates and has the ability to influence the level of aggregate demand across all sections of society and thus achieve the monetary objectives (Ali et.al., 2014). Likewise, it has been claimed to make the Central Bank better able to control the aggregate demand by reducing the use of private currencies and illegal cash.

However, the actual impact of the CBDC would depend on the form of CBDC: whether it bears interest rate or not, whether it is retail or wholesale. If the CBDC is interest bearing, people can switch from bank deposits to CBDC and it can accelerate the bank run during the time of stress thereby weakening the transmission mechanism of monetary policy. This risk can be minimized by putting the limits on the holdings of CBDC by individuals. In addition, CBDC could compete with the bank deposits thereby leading to an increase in interest rate without an increase in policy rate. This requires the Central Banks to inject more liquidity in the banking system from time to time (RBI, 2022).

4.2 Managing the Risks of CBDC

Converting cash into digital currencies will surely come with its complexities. CBDC does not bring only opportunities for Central Banks, but also creates miscellaneous risks and challenges. Proper risk mitigation plans enable Central Banks to correctly assess the level of impact of each risk, and help them to prioritize their plans around that impact. The major risks from the CBDC include the following:

4.2.1 Risk of Financial Disintermediation

CBDC is likely to substitute the forms of money currently being used by citizens, i.e., cash and bank deposits. If this substitution is very large, it could reduce bank deposits, and subsequently affect the credit creation capacity of the banks.

If depositors perceive that some particular financial institution is going to face financial stress, they can withdraw deposits within minutes leading to a bank run that might invite systemic risk in the system (Kim & Kwon, 2019). This can lead to the risk of structural disintermediation of banks and centralization of the credit allocation process within the Central Bank (Bindseil, 2019). This can crowd out the bank deposits and escalate the probability of bank run during stress period. Hence, the design of CBDC should include the safety nets for preventing such stress in the financial system. Proper limits on the holding of CBDC should be considered to avoid the risk of financial disintermediation.

4.2.2 Cybersecurity

The next issue with the CBDC is the operational risk of CBDC arising from system disruptions and cyber-attacks (Mancini-Griffoli et.al, 2018). Other than such cyber-attacks, a CBDC can be exposed to other cyber threats like distributed denial-of-service attacks that disrupt services, supply-side attacks to infrastructure and side-channel attacks to user devices and payments applications. To make CBDC resilient to cyber-attacks, decentralized systems with anti-hack measures should be in place.

4.2.3 Risk of Privacy Breach

Central Banks and the financial intermediaries, as per the architecture design of the CBDC, get access to large volume of information and data. If a robust data protection system is not implemented, there exists the risk of privacy breaches. It can further discourage the use of CBDC and make the adoption rate low.

The opportunities as well as motivations for issuing a CBDC may vary in the SAARC region. However, a trade-off should be done by balancing the opportunities with the underlying risks. While the disintermediation risk can be managed by a careful consideration of the design features such as limits on holding and remuneration, a systematic approach is needed to strengthen the system against privacy breaches and cyber-attacks.

CHAPTER V

CBDC IN THE SAARC REGION

This chapter summarizes the status of the legal as well as physical infrastructures in the SAARC region that are taken as the prerequisite for realizing the full gains from CBDC. Soft infrastructure for CBDC includes the legal and regulatory framework whereas the hard infrastructure includes access to electricity, internet and mobile phones. This chapter also summarizes the key initiatives taken by the Central Banks of the region regarding CBDC. In addition, it presents the main results of the expert opinion survey regarding the motivations of introducing CBDC in the region, potential benefits and managing the risks arising therefrom.

5.1 Financial Access and Financial Inclusion

Financial access is increasing in South Asia along with other regions of the world. The proportion of adult population having access to accounts at financial institutions in South Asia has more than doubled from 32 percent in 2011 to 66 percent in 2021. However, it is still below the level of developed economies. In 2021, the proportion of adults having access to accounts at financial institutions stood 99 percent in Euro Area, 95 percent in North America and 76 percent in the world (World Bank, 2022).

Table 5.1

Financial Access Indicators in the South Asia as of 2021 (% of age 15+)

	Financial institution account	Owns a credit card	Owns a debit card	Owns a debit or credit card	Mobile money account
Afghanistan	9.7	0.0	2.6	2.6	0.0
Bangladesh	37.7	0.6	4.9	4.9	29.0
India	77.3	4.6	27.1	27.8	10.4
Nepal	52.8	1.9	13.8	14.2	6.1
Pakistan	16.3	0.2	7.7	7.7	8.5
Sri Lanka	88.9	10.0	52.6	52.8	3.1
South Asia	**65.8**	**3.7**	**22.7**	**23.3**	**11.6**

Source: World Bank (2022)

The relatively low level of financial access in the region and disparity in financial inclusion in terms of gender, income groups and geographical areas imply that CBDC could be useful in enhancing financial access and ensuring financial inclusion.

5.2 Status of Digital Payments

Promoting digital payments has been one of the prime agendas for the Central Banks of the SAARC region. The banks have taken a number of initiatives for real time large value and retail payment systems, establishment of payment switches and building cross border transaction networks. The Bangladesh Bank established National Payment Switch Bangladesh (NPSB) in 2012 and Bangladesh Real Time Gross Payment Switch (BD-RTGS) in 2015. Likewise, the Unified Payments Interface (UPI) of India, the Maldives Payment System Development Project (MPSD) and Instant Payment System (IPS) of Maldives, large value and retail payment switches in Sri Lanka, use of RTGS and Retail Payment Switch in Nepal and Bharat Interface for Mobile Money of Bhutan are some of the important initiatives in the region taken for promoting digital payments.

Despite these efforts, the use of digital payments is far below the other regions. In 2021, while 64 percent adults of the world and 97 percent of the adults from the Euro area made digital payments, such proportion in the South Asia was just 33.7 percent, ranging from 7.9 percent in Afghanistan to 55.1 percent in Sri Lanka (World Bank, 2022). In addition, the proportion of adults using mobile or internet to pay bills stood 9.3 percent and such proportion for digital in-store merchant payment stood 9.3 percent.

Table 5.2

Use of Digital Payment Means (% of age 15+)

Country	Made or received a digital payment	Used a mobile or the internet to pay bills	Used a mobile or the internet to send money	Made a digital in-store merchant payment
Afghanistan	7.9	0.1	0.2	0.0
Bangladesh	45.3	10.5	17.6	2.7
India	34.9	9.9	10.2	11.4
Nepal	28.6	6.3	8.5	4.8
Pakistan	17.6	5.7	6.0	0.8
Sri Lanka	55.1	8.8	6.8	17.2
South Asia	**33.7**	**9.3**	**10.2**	**9.3**

Source: World Bank (2022)

The trend in the adoption of digital payments indicate that there are still challenges in the region to have digital payments as the primary means of transactions. A properly designed

CBDC can thus promote digital payments and expand the use of such channels across all sections of population.

5.3 Status of Infrastructure Required for CBDC

Access to electricity, internet and mobile phones are the basic physical infrastructure required for using the CBDC. While the access to electricity has reached to almost all of the population in the South Asia, the region lags behind in terms of the access to quality internet facility and use of mobile phone. While 86 percent of the adults in the world own a mobile, the percentage of adult population owning a mobile in South Asia is only 67 percent, varying between 63 to 96 percent across the countries. In case of access to internet, only 39 percent of the population has access to internet which is quite below the average of the developed economies and the world average.

Table 5.3

Access to Electricity, Mobile Phone and Internet in South Asia

Country Name	Access to electricity (% of population)	Individuals using the Internet (% of population)	Owning a Mobile (% of adult population)
Afghanistan	97.7	18.4	68
Bangladesh	96.2	24.8	79
Bhutan	100.0	53.5	-
India	99.0	43.0	66
Sri Lanka	100.0	35.0	96
Maldives	100.0	62.9	-
Nepal	89.9	37.7	80
Pakistan	75.4	25.0	63
South Asia	**95.8**	**38.6**	**67**
World	**90.5**	**59.9**	**86**

Source: World Bank (2022)

Moderate progress in the availability of basic infrastructure required for modern payment system in the region show that in order to benefit from the modernization of the payment system, the region must enhance the access to basic payment infrastructure including electricity, internet and mobile network.

5.4 Review of Legal and Regulatory Provisions and Need for Amendment

The Central Banks in the SAARC region are striving for preparing the legal basis for the CBDC. As of now, the RBI has largely established such framework while other Central Banks are yet to establish the required frameworks.

Bangladesh Bank is entrusted with the responsibility of issuing currency by the Bangladesh Bank Order 1972. However, two most important aspect of issuing CBDC-the legal foundations of CBDC under Central Bank law and its treatment under monetary law is under process now. The issuance of CBDC will naturally also require necessary adjustment in tax law, private law (including property law), contract law, payment systems and settlement finality law, insolvency law, privacy and data protection law, and private international law.

While the **Royal Monetary Authority Act of Bhutan 2010** empowers RMA to issue notes in Ngultrum, however, adoption of CBDC will necessitate further review and amendment of the Act to accommodate the issuance of digital legal tender. The Act might need a review to provide clear provisions with regard to digital form of fiat currency on the mining and destruction as well as its relationship with fiat currency. Other necessary amendments include Financial Services Act of Bhutan, 2011, and Payment and Settlement Systems Rules and Regulations, 2018.

The necessary amendments in the **Reserve Bank of India** Act 1934 have been incorporated as part of the Finance Act, 2022, which provide enabling provisions required for issuance of CBDC by Reserve Bank of India. The required changes in the regulatory framework to enable introduction of CBDC shall also be issued by the RBI. In some of the cases, existing frameworks can be extended, while in some respects, new frameworks need to be issued.

In case of Maldives, wholesale CBDCs can be issued by the **Maldives Monetary Authority (MMA)** to the Government, its agencies and other affiliated institutions, as well as the Banks and other financial institutions in the Maldives – within the purview of Section 22(h) of the MMA Act. However, it is important to consider that the MMA Act does not authorize the MMA to open accounts in the name of the general public. As such, the implementation of an account-based retail CBDC comprising of the general public currently lacks adequate legal basis.

In case of **Nepal**, amendments in legal and regulatory framework regarding CBDC have not been done yet. The Nepal Rastra Bank Act, 2002 assumes only the bank notes and coins as the legal currency. The act does not recognize the CBDC and virtual transfer of legal tender.

However, the act is in the process of amendment by incorporating the issue of digital currency.

In case of Pakistan, the State Bank Act, Payment Systems and Electronic Funds Transfer Act, Electronic Transactions Ordinance and other Acts, Ordinances and Amendments cover much technological advancements that have been made in banking and finance. All laws, in bits and pieces form the basis of which money is created, issued, and transactions and exchanges are made. Over time, provisions have been made to consider electronic or digital data to be permissible to be used in lieu of paper documents. They also cover electronic and digital payments. However, when considering creation of a system from the ground up, that will become the basis of the digital economy; other considerations like proof of ownership, verification and credibility play a key part. So, for instance if any land or property were to be traded through a digital currency, a counter leg of the transaction that would transfer the ownership of that land or property on the digital platform would need to be admissible in the court of law.

In case of Sri Lanka too, there are no provisions to issue CBDC in the Monetary Law Act (MLA), 1949. The Section 48 of the MLA states that 'currency means all currency notes and coins issued or circulated in accordance with the provisions of this act'. This definition does not include digitally issued Central Bank currencies. In the event, it is decided by the CBSL to issue CBDC in Sri Lanka, relevant amendments have to be made or new provisions have to be introduced to the applicable laws before such issuance

5.5 Initiatives for CBDC and Future Approach

The SAARC Central Banks are constantly working for modernizing the payment system and many of them are considering the CBDC. Bangladesh Bank has worked steadily for almost a decade to create a robust, safe, and efficient payment ecosystem. Like many emerging markets, Bangladesh's financial sector transformed from what was essentially a brick-and-mortar model to a network of advanced technologies within the 15 years. So, adoption and adaptation have been the first and foremost priority in the payment. It has issued and revised many individual guidelines and circulars over the last decade to keep up with the fast-changing payments landscape. It is in the final stages of preparing the Payment Systems Act, containing e-money regulation for every type of e-money provider, and an escrow account system for e-commerce.

The focus has now shifted to improving the quality of these initiatives, to make them more cost-efficient, more targeted to individual groups, and more financially self-sustaining. There is still a long way to go and many concerted efforts, including collaboration and coordination between the public and private sectors, as well as local and international entities, are required to ensure inclusive, sustainable, and resilient development and to build up the collective vision of 'Digital Sonar (Golden) Bangla.' Moreover, Bangladesh has announced that it will conduct a feasibility study regarding CBDC in 2022/23[18].

In case of Bhutan, the RMA has been pursuing digital payment systems in the country starting from the interoperable infrastructure to enabling policies and regulatory frameworks. Embarking further on the digital journey, the year 2020 marked another milestone in support of digitalization in Bhutan and RMA initiated approaches for piloting RMA wholesale CBDC. Since then, numerous assignments have been carried out to forward the approaches in adopting the CBDC. The first of the kind was developing an Approach paper by the department of Information and Technology (DIT) and the areas highlighted Need Assessment, identifying engagement with external organizations, identification of viable use case for CBDC and scoping and designing followed by CBDC technical development and proof of concept. Specifically, the CBDC concept in a pilot project in Bhutan consists of the following four phases

a) First Phase - Need Assessment
b) Second Phase - CBDC scoping and Design
c) Third Phase-CBDC Technical Development and proof of concept and
d) Fourth Phase-Pilot implementation upon successful outcome of the third phase.

Subsequently, the RMA appointed R3's Singapore Office based in the USA to undertake need assessments of CBDC in Bhutan. The assessment report recommended RMA to weigh in both the benefits and risks and accordingly consider either the Wholesale Digital NU or Retail/ General-Purpose CBDC. Accordingly, after careful deliberation particularly bearing in mind the essentiality of monetary sovereignty whilst equally promoting digital innovation that could ensure interoperability between and amongst financial institutions and other FSPs, the RMA has decided to pursue a wholesale CBDC.

RBI is actively working towards the phased implementation of CBDC in wholesale and retail segment. The aim is to build an open, inclusive, inter-operable and innovative CBDC

[18] https://fintech.global/2022/06/14/bangladesh-to-conduct-study-for-launch-of-cbdc/

system which will meet the aspirations of the modern digital economy of India and is expected to give further fillip to the digital ecosystem. The RBI has launched a pilot for the wholesale digital rupee on November 1, 2022 for the settlements of transactions in government securities. Nine commercial banks have participated in this pilot project. The first pilot phase for the retail e-rupee was rolled out on December 1, 2022, in four cities - Mumbai, New Delhi, Bengaluru, and Bhubaneswar. Four banks namely the State Bank of India, ICICI Bank, Yes Bank, and IDFC First Bank participated in the pilot providing access to their selected customers to use the e-rupee issued by the RBI. As of February 10, 2023, more than 50,000 users have enrolled for the retail CBDC and more than 5,000 merchants are participating. There are eight banks participating and the RBI is planning to increase it to another five banks. Also, the pilot is being carried out in five cities which is going to cover another nine cities. The total number of transactions has stood roughly about 7,70,000[19].

The Maldives Monetary Authority (MMA) is currently only engaged in the preliminary research stages of CBDC–although it remains part of the long-term agenda of the MMA. No formal study has been conducted in Maldives to explore the potential use cases for the issuance of a CBDC, with MMA’s current focus remaining firmly on the on-going implementation of the IPS under the Maldives Payment System Development (MPSD) project. While the IPS is expected to address the challenges associated with domestic payments, cross border payments could be a potential use case that can be addressed by a CBDC. However, a formal assessment is yet to be conducted to identify the requirements and specific use cases.

Nepal is in the research phase of CBDC. NRB announced to carry out a study about CBDC in the monetary policy of 2021/22. Accordingly, a high-level CBDC steering committee headed by a Deputy Governor was formed to provide necessary direction. A task force was formed by this committee to prepare a concept note on CBDC that has been prepared and published for public consultation. The NRB has planned to carry out a detailed feasibility study in 2022/23. In addition, NRB has recently established CBDC division in the Payment Systems Department to deal with the issues of CBDC and other payment system innovations.

State Bank of Pakistan (SBP) is in the exploration phase of digital currencies and related technologies. Currently, there is a working group from across the Bank that is bringing together a holistic ecosystem that supports each group’s agenda with regards to digitization.

[19] https://www.rbi.org.in/Scripts/BS_SpeechesView.aspx?Id=1350

The SBP has an ongoing collaboration with the World Bank for a deeper understanding about the design, architecture and technology.

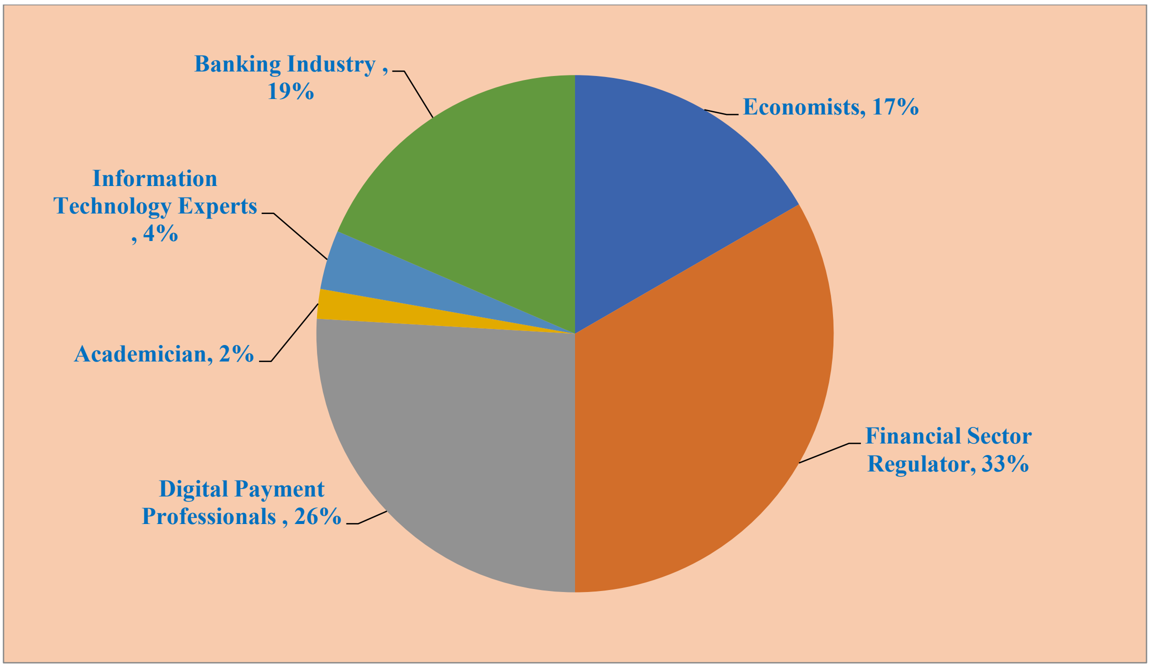
In case of Sri Lanka, the CBSL has identified the potential of CBDC as an enabler of digital payments which facilitates the creation of a less-cash society while increasing financial inclusion. In 2019, the Payments and Settlements Department (PSD) of CBSL conducted an initial study to evaluate the feasibility of issuing CBDC in Sri Lanka. In 2021, PSD conducted a further study on the readiness of environmental preconditions for a CBDC in Sri Lanka. The CBSL continues to study and evaluate the potential of issuing CBDC, especially in terms of its implications for the economic and financial system stability which are among the core objectives of the CBSL.

5.6 Survey Results

The results from the opinion survey are based on the responses of 54 experts from Bangladesh, Maldives, Nepal, Pakistan and Sri Lanka. The distribution of the respondents is shown in Chart 5.1.

Chart 5.1

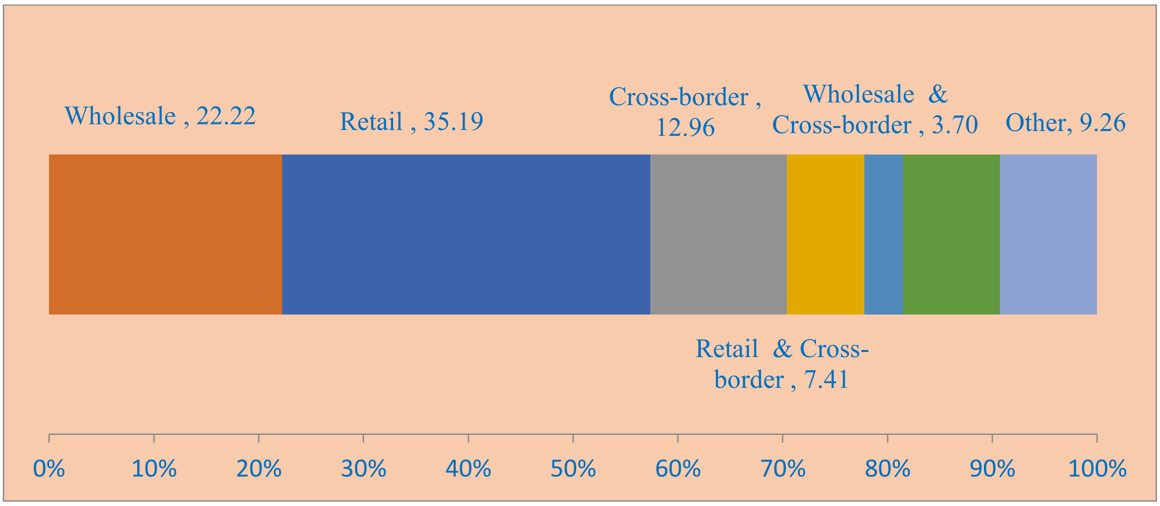
Distribution of Respondents



A majority of the experts revealed their preference for retail CBDC to be introduced. About 35.2 percent of the experts showed their preference for retail CBDC, 22.2 percent preferred wholesale CBDC, 12.9 percent cross border CBDC and other showed their preferences for some mix of wholesale, retail and cross border CBDCs.

Chart 5.2

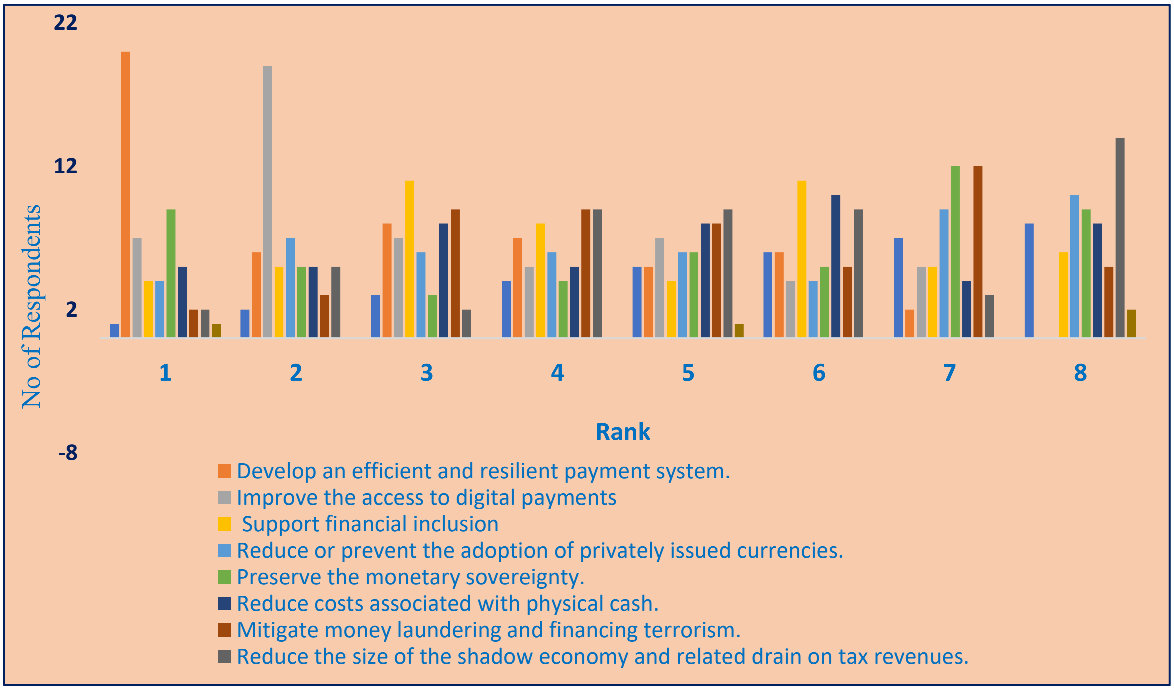
Preference for Types of CBDC (%)



Regarding the motivations of CBDC of the Central Banks, almost half of the experts (26 out of 54) opined that developing an efficient and resilient payment system and improving the access to digital payments should be the key motivations for issuing the CBDC.

Chart 5.3

Motivations of Central Banks for CBDC

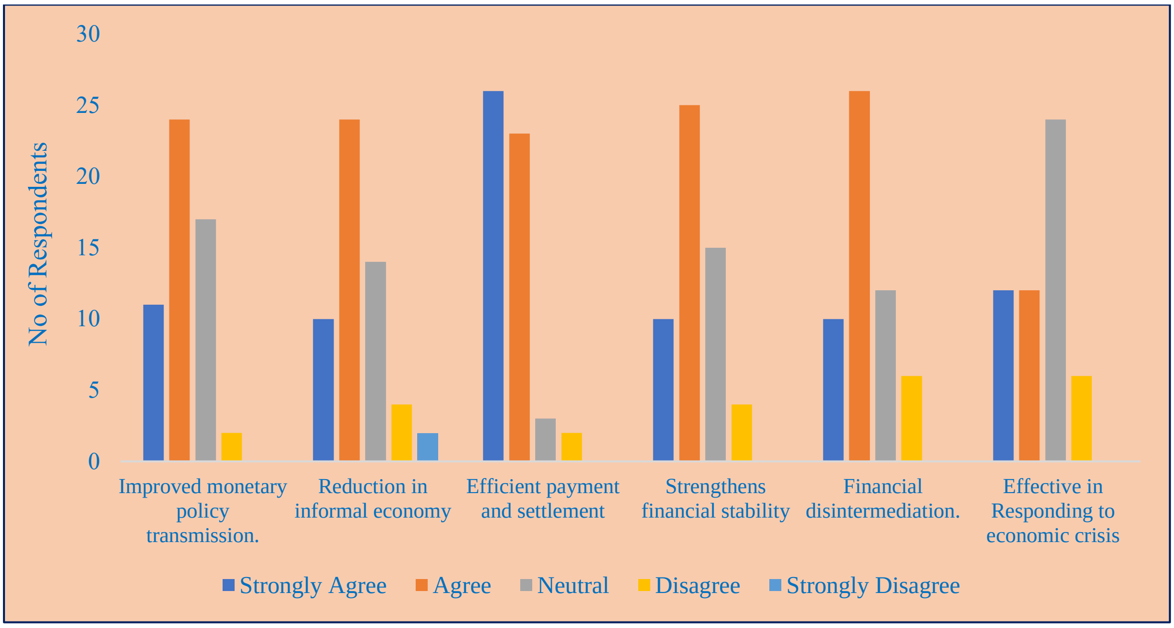


The experts emphasized the commitment of the Central Banks as well as government as a precondition for issuing the CBDC. More than half of the experts (36 out of 54) opined that Central Bank as well as government commitment is the most important precondition for issuing CBDC. Other preconditions emphasized by the experts are consulting among the stakeholders, reviewing legal as well as institutional framework and developing the physical infrastructure required for the CBDC.

Regarding the macroeconomic impact of CBDC, more than half of the experts agreed that CBDC would improve the monetary transmission mechanism, reduce the informal economy, enhance the efficiency of payment system and strengthen financial stability.

Chart 5.4

Macroeconomic Impact of CBDC



5.7 Cross Border CBDC in the SAARC Region

Improving cross-border payments efficiency is also an important motivation for CBDC work as it is likely to reduce the transaction time and cost, help simplify the intermediation chains and address the issue of lack of interoperability between domestic payment systems. The survey done by the BIS in 2020 also showed that cross-border payment efficiency is one of the prime motivations for CBDC issuance[20]. According to the Atlantic Council, there are now 9 cross-border wholesale CBDC tests and 7 cross-border retail projects, nearly double the number from 2021 (Atlantic Council, 2023).

[20] C Boar and A Wehrli, "Ready, steady, go? Results of the third BIS survey on Central Bank digital currency ", BIS Papers, no 114, January 2021

In case of South Asia, the intraregional trade is less than 5 percent compared to 35 percent in East Asia and 60 percent in Europe[21]. In case of remittances, the intra-regional remittance flows stood at 10.47 billion USD which is about 6.67 percent of the remittances received by the region from all the countries[22] (see Table 5.4).

Table 5.4

Bilateral Remittance Flows in South Asia (million USD)

Receiver (across) Sender (down)	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka	Total
Afghanistan							369		369
Bangladesh				126		82			208
Bhutan		0		186		2	0	0	188
India	1	5,747	9		1	1,583		436	7,777
Maldives		105		62			1	18	186
Nepal		1	25	1,596			4	0	1,626
Pakistan	56							1	57
Sri Lanka	0	2	0	45	2	1	4		53
Total	**56**	**5,854**	**34**	**2,015**	**3**	**1,668**	**380**	**455**	**10,465**
WORLD	**300**	**22,203**	**58**	**89,375**	**5**	**8,203**	**31,312**	**5,522**	**156,978**

Source: https://www.knomad.org/data/remittances

The intraregional flows in the region show the possibility that trade facilitation and other measures including the development of cheaper and faster payment solutions through cross border CBDC could boost the intra-regional trade and remittance flows in the region.

[21] https://www.worldbank.org/en/news/infographic/2016/05/24/the-potential-of-intra-regional-trade-for-south-asia

[22] https://www.knomad.org/data/remittances

CHAPTER VI

CONCLUSION

CBDC is the digital form of legal tender issued by the Central Banks. It has been widely discussed in the recent years with many Central Banks researching on the issue and conducting pilot test while some Central Banks have already issued CBDC. Such a currency is expected to change the payment landscape by enhancing the efficiency and resiliency of the payment system and increase financial inclusion. It is also expected to lead to a more effective monetary transmission mechanism, reduction in the cash management cost, financial transparency and increase in the effectiveness of monetary policy during crisis.

The main purpose of the study is to obtain an overview of the key initiatives going on in the SAARC region, identify the potentials and provide some insights and considerations regarding the future course of action.

6.1 Conclusion and Key Insights

- **CBDC can be an instrumental move for expanding the financial inclusion in the South Asia as about one third of the adults are out of the financial institutions and use of mobile money and other forms of digital payments is still low compared to the developed countries**. However, for realizing the gains the countries need to focus on improving the quality of infrastructures such as access to electricity and quality internet. In addition, they should work for the necessary legal and regulatory framework for issuing the CBDC.

- **In case of the SAARC Region, while India is at the forefront in experimenting CBDC, few other countries are making rapid progress in terms of research and development**. The RBI has launched a pilot for wholesale as well as retail CBDC, RMA of Bhutan is conducting a detailed feasibility study and the NRB has also planned to conduct a detailed feasibility study.

- **Many Central Banks in the region lack a legal as well as regulatory framework and adequate quality infrastructure required for the CBDC.** As such, the Central Banks need to review their legal, regulatory and institutional framework and further broaden the use of digital payments. The regulations should cover the data privacy and cybersecurity issues. As a part of the regulations, the Central Banks can come up with the Regulatory Sandbox to select the CBDC providers.

- **The countries should adopt a cautious and incremental approach regarding CBDC with a careful consideration at the country level.** They should carefully weigh the costs and benefits in terms of financial inclusion, payment system development and most importantly financial stability. In addition, they should build on their own experiences from pilots and consider the lessons from pilots as well as full launch in other countries.
- **The survey results show that retail CBDC could be the most beneficial type of CBDC**. The experts emphasized that efficiency of the payment system and digital payments should be the key motivation of CBDC. In addition, more than half of the experts agreed that CBDC would improve monetary transmission mechanism, reduce informal economy, enhance the efficiency of the payment system and strengthen financial stability.
- **Regional initiatives for establishing an 'innovation hub' for cross-country knowledge sharing and capacity building will help in developing legal reforms and regulatory standards, regulating crypto assets and more importantly designing the operational architecture of CBDC**.
- **The countries in the region should work together for ensuring cross-border settlements of CBDCs.** For this, the countries can work collaboratively on a cross border CBDC initiative. Such initiative would help in ensuring interoperability in the region and further promote intraregional remittances and trade flows.

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COUNTRY CHAPTERS

BANGLADESH

1. Financial Access and Financial Inclusion

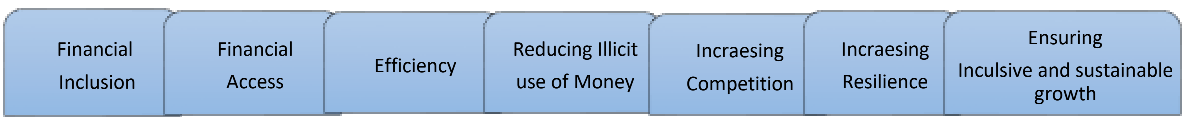
A broad social consensus for inclusivity and social justice in socioeconomic development worked as the core spirit of Bangladesh's liberation war, which anchored the government's development strategies and policies. The government of Bangladesh has developed policy, strategy, and action in accordance with the country's progress in sustainable development, with special thrusts on massive digitalization to support financial inclusion and inclusive growth, alongside a mitigation and adaptation response to climate change threats. "Digital Bangladesh" and "No One Left Behind" have been the driving forces behind its policy formulation over the last decade.

The financial landscape of Bangladesh has been rapidly transforming, driven by deeper forces: i) the adoption of financial technology led by the omnipresence of the internet and availability of power; ii) opportunities created by the demographic dividend of the country; iii) a young populace driving innovation, with widespread access and usage of technology; iv) rapid industrialization; v) rapid urbanization and; vi) as a result of the first five forces, desired level of economic independence for all may not met the expected level, the country has achieved reasonable success in decreasing the poverty level.

To support the momentum, Bangladesh has built up a payment ecosystem that is capable of supporting a stable 6 percent plus equitable and environmentally sustainable economic growth. Both financial regulation and policies, therefore, need to better anticipate, leverage and, where needed, shape these forces to improve both the breadth and quality of financial inclusion. The payment system in Bangladesh is also devised accordingly to meet the practical needs of the economy, facilitate the market to solve various day-to-day problems, and ensure accessible, affordable, and secure systems to end-users. Along with the national strategy of Government of Bangladesh, the Bangladesh Bank (BB, the Central Bank of Bangladesh) has accelerated its policies aiming to fostering financial access and financial inclusion programs for the sustainable and inclusive economic growth since last decade. In this regard, a policy goal of BB is illustrated in Figure 1.

Figure 1

Policy Goals of BB



At the national level, these deeper forces are nurtured by better coordination and communication among intermediaries, regulatory agencies, agents, and customers to prevent tunnel vision. Regulations have been designed to strike a delicate balance between innovation and risk management. For instance, digital finance was seen to be pushing the frontiers of both innovation and risk. A market-oriented approach was adopted to design a dynamic, inclusive, and resilient system for digital financial services (DFS). In Bangladesh, mobile financial services (MFS), the largest in the world, could reach a large percentage of citizens precisely because of a harmonious coordination between Bangladesh Bank (BB), telecom regulators, commercial banks, MFS providers, and mobile network operators.

2. Status of Digital Payments

For decades, the country's payment system was manual, subjected only to the banks. Off-branch/ off-bank payment services were not in the picture until the beginning of 2000. With the growth of the economy, it became imperative to develop an automated system for the banked populace and to sort out an alternative payment mechanism for non-banked citizens. There was also a need to develop a mechanism for graduating those who required access to finance after access to their payment necessities was met. At a broad level, BB formulated strategy and policy to leverage technological advances in automating the whole spectrum of payment needs, not only for the banked population, but also to develop cost-efficient and off-branch financial service delivery modes to reach the nation's unbanked households, as well as micro and small enterprises in remote locations, and to design a sustainable mechanism to help facilitate access to finance to those in need.

2.1 Modernizing the Payments Infrastructure

The new technological advances were often disruptive of current mainstream business models, necessitating regulatory and supervisory guidance for financial institutions and markets in adapting to the evolving external and local market environments. So, monitoring of risks to macro-financial stability that emerged out of these systems was also met by leveraging advances in information technology (IT) through real-time offsite supervision. Mention of approaches in Bangladesh will be relevant in this context.

The BB began with modernization of the country's payments system and financial sectors' IT infrastructure, putting in place the Bangladesh Automated Cheque Processing System (BACPS) in 2010 for image- and truncation-based cheque clearing and the Bangladesh Electronic Fund Transfer Network (BEFTN) in 2011 for the country's first instruction-based clearing. Both systems work together under the umbrella of the Bangladesh Automated Clearing House (BACH), which has proven to be a game-changer in the automation of the country's payment systems.

To reduce the time gap between transaction initiation and the availability of funds, the BB came up with the National Payment Switch Bangladesh (NPSB) in 2012. Further, to meet the need for real-time high-value instant payments, the BB introduced the Bangladesh Real Time Gross Settlement System (BD-RTGS) in 2015. As well, online real-time reporting and dashboard-based supervisory monitoring were enabled. Consultative engagements on policy coordination between the regulators, market participants, and users always topped the priority list.

2.2 Taking Care of the Unbanked

After taking care of the needs of the banked population through the implementation of a robust payments system, BB's focus extended to facilitating financial services access to the unbanked population of Bangladesh.

Unfortunately, efforts to reach geographically dispersed locations in the form of setting up bank branches in rural areas did not receive the expected traction due to the non-profitability of banks. Since the beginning of the last decade mobile phone users remarkably increases and however, it is observed that in 2010 the total number of mobile SIM holders in the country was higher than the number of bank accountholders in the country. The BB also noted that the nationwide spread of the mobile network and financial services-friendly IT infrastructure held promise to open opportunities to develop Mobile Financial Services (MFS).

At about the same time, mobile money took off in Africa and the Philippines was successfully using MFS for receiving remittances. With this enabling environment and a positive thrust from both the supply and demand sides, BB launched the country's mobile money market in 2011.This could be viewed as a second wave of development after meeting the needs of Bangladesh's banked population. However, unlike the African market, BB from the very beginning made sure that the mobile financial services market remained tethered to the traditional regulated financial institutions. To make this happen, BB allowed MFS to be provided only by a bank or by a subsidiary of a bank (the subsidiary could also be a joint venture).

In addition, unlike many other markets, mobile money agents in Bangladesh cannot be exclusive to one provider. This ensures the efficient use of agent resources. Very quickly, MFS became the driving force of financial inclusion in the country and the mobile money market developed with unprecedented speed.

Initially, during the early years, the market worked mostly as a means for cheap and efficient funds transfers. However, due to the lack of a developed payment ecosystem, at both ends of a funds transfer the mobile money had to be converted into real cash. So, in order to create value for MFS and to ensure that user needs could be met, BB focused on the creation of an enabling ecosystem.

As the user needs were multifaceted and market participants' demands were diversified, creating the enabling environment posed significant challenges. On one hand, a multilevel interconnecting network had to be built in which various stakeholders had to be on boarded. On the other side, the customers had to be educated to gradually adopt new payments methods and make the best usage of the changing payment landscape. The upside was, with the demographic dividend, Bangladesh has a young and adaptable population that is very agile and ready to adopt digital services without hesitation.

The MFS providers gradually interconnected with many other banks, gateway service providers, utility providers, merchants, and foreign money transfer operators (MTOs).

2.3 Filling the Financial Inclusion Gaps

Still, two major pieces of the puzzle were missing. One piece was the interoperability of all available financial services and the other was the last mile of supply management, i.e., micro- and nano-merchants, small homeowners, private practicing doctors, and other small service providers who accept the majority of their payments from mobile money holders.

To address the interoperability issue, BB has already implemented the Interoperable Digital Transaction Platform (IDTP) to interconnect all payment participants including commercial banks, MFS and Payment Service Providers. And to reach the last mile, the BB has adopted a policy to onboard micro-merchants. Up until this point, the primary barrier to on-boarding micro-merchants was the need for extensive documentation that established them as legitimate merchants that could accept payments. As a result, cash remained the predominant mode of payment in day-to-day life for many Bangladeshis.

By recognizing this issue, BB created an opportunity. These small- and nano-merchants that lack a merchant account will now be able to open a new type of account—a "Personal Retail

Account"—using only their image and National Identity (NID) card. With few restrictions, the new account type will allow small merchants to accept payments and make supply chain payments.

Recently, the Government introduced government-to-person (G2P) transfers, including part of its Social Safety Net payment programs, through mobile financial services accounts. The introduction of mobile G2P transfers has been particularly useful during theCovid-19 lockdowns. For example, the government provided soft loans to cover the export-oriented factory workers' salaries, which were paid directly to the workers' mobile and bank accounts. For this purpose, the MFS providers opened more than 2.2 million new mobile wallets. Cash assistance was provided to 5 million families as well. The whole G2P process during the current pandemic went frictionless with the help of four MFS providers that assisted in opening the new accounts.

2.4 Agent Banking and the Mobile Money Market

In 2014, BB also introduced biometric verification-based Agent Banking. This is a franchisee-type structure where a private entrepreneur becomes a bank's agent. The agent establishes an agent point where the bank provides some logistic support. The agent then invests in a fund and provides banking services to the locality. The paper requirements for opening an account at an agent point are closely monitored by the bank. The customer biometrics are captured and authenticated with the National Identification Database. For any transaction, the customer uses her fingerprint rather than a paper instruction.

The MFS providers are essentially Payment Service Providers (PSP) that are allowed to provide top-up and cash-out facilities through their own agent points. The third wave of development generated a demand for faster transfers and settlement of high-value funds and in response BB introduced the RTGS. Though at its inception, MFS were developed keeping the needs of marginal and financially excluded populations in mind, later both the banked and unbanked population started to realize the full potential of these wallets.

During this time, a thrust from the private sector emerged. PSPs expressed that they wanted to introduce mobile wallets specifically for the banked population. These PSPs were interested in introducing the most common model of mobile wallet, one that is linked to a bank account. But immediately some challenges emerged. The PSPs had to wait to process account top-ups, while an incumbent MFS wallet could be topped up instantly both from an agent point or a linked bank account. The banked population had already been using various

MFS wallets and the new PSPs could not make a business case for consumers to make the switch. Also, the PSPs lagged in marketing strategies. This was the only technology-based financial service that did not make the expected traction in the Bangladesh market.

For many years, the mobile money market was supervised under a BB guideline issued in 2011. By 2018, the market grew very large and newer services were being introduced. BB felt the need for a tighter and elaborate regulation. By this time, it was clear that the MFS market needed a serious and sizable investment for a provider to be impactful. Under this context, BB introduced a new MFS regulation in 2018.

Over the last few years, there has also been a push from the private sector to introduce newer Fin-tech services. To cater to such initiatives, in October 2019 BB launched a regulatory innovation office called the Regulatory Fin-tech Facilitation Office. Now the office is running several pilots to check the adaptability of market with new innovations.

Status of the digital payments in Bangladesh is snapshot in Table 1.

Table 1

Digital Payments Status

Particulars		Status
Banking system- Online/e-banking	✓	All banks, all branches
Mobile Financial Services	✓	Across the country
Agent banking	✓	Across the country
ATM, POS, CDM & CRM	✓	Limited
Card facilities (Debit, credit, prepaid)	✓	Limited

3. Status of Infrastructure Required for CBDC

With the developments of the concept of CBDC, it is still in the proof-of-concept stage along with the questions– whether the CBDC will be issued for retail, wholesale or general use; whether the model of CBDC will be account-based or token-based; what will be the network or distribution channel–in a centralized or decentralized manner; and so on; and finally, whether will be a success or failure project that mostly depends on the smooth functioning through a secured network, cost effectiveness and time saver to issuers, intermediaries and end users, and financial literacy of the users of the CBDC.

We find that only a few countries operating CBDC on trial basis while many others observing the success of them and also for smooth functioning of the ecosystem of the

CBDC developing secured networking system, defining CBDC models, and taking necessary steps as increasing global demand of the digital currency.

Digital networking infrastructure is an important issue for insurance, distribution and use of the CBDC in payment systems. In Bangladesh, existing digital infrastructure and payment system gateway alongside Digital Financial Services (DFS)– online or e-banking by through all branches of schedule banks, agent banking, MFS with the combined efforts of stakeholders– Central Bank, commercial banks, telecommunications authorities, payments interface and technical service provides are pretty sound. The silver lining is that the growth of the nation's Digital Financial Services sector. Adopting G2P payments through DFS, while the banks and MFS providers had already practiced, experienced, and established a network to transfer G2P funds. As a result, when Covid-19 hit the economy, the Government response was swift, frictionless and effective.

Furthermore, with the recently introduced e-KYC regulation, new mobile wallet opening rates increased during the lockdown. The beauty of MFS is that they can be used with or without a mobile app. At present, the majority of the population owns a feature phone rather than a smart phone, but a mobile wallet can still be used without requiring mobile or broadband data (although this admittedly slows down the development of an ecosystem). Bangladesh has been very successful in its recent efforts to expand its power and internet networks. Now, with cheaper smart phones and easily accessible data, the banking and MFS market is making a horizontal development with add-on services.

In Bangladesh, considering these developments alongside the payments system gateway, the infrastructure that requiring introducing CBDC are quite sound to take a pilot project for wholesale uses only. Before introducing in large scale, however, conducting an intensive study on issuing CBDC's pros and cons is required.

4. Review of Legal and Regulatory Provisions and need for Amendment

It is very important to find the legal basis and to ensure the necessary legal foundation before issuance of CBDC. Bangladesh Bank is entrusted with the responsibility of issuing currency by the Bangladesh Bank Order 1972. However, two most important aspect of issuing CBDC– the legal foundations of CBDC under Central Bank law and its treatment under monetary law is under process now. The issuance of CBDC will naturally also require necessary adjustment in tax law, private law (including property law), contract law, payment systems and settlement finality law, insolvency law, privacy and data protection law, and private international law. Another important aspect will be the treatment of CBDC in

AML/CFT framework. So, whenever Bangladesh will decide to issue CBDC, these legal aspects seek proper attention to ensure a robust legal backing for CBDC.

5. Initiatives for CBDC and Future Approach

Bangladesh Bank has worked steadily for almost a decade to create a robust, safe, and efficient payments ecosystem. Like many emerging markets, Bangladesh's financial sector transformed from what was essentially a brick-and-mortar model to a network of advanced technologies within 15 years. So, adoption and adaptation have been the first and foremost priority in the payment's arena. BB adopted a test-and-learn strategy in the evolution of the country's payments system, which has worked out well.

Now, work has begun to streamline regulations in the payments space. Bangladesh Bank has issued and revised many individual guidelines and circulars over the last decade to keep up with the fast-changing payments landscape. BB is in the final stages of preparing the Payment Systems Act, containing e-money regulation for every type of e-money provider, and an escrow account system for e-commerce.

But there is no room for complacency. The focus has now shifted to improving the quality of these initiatives, to make them more cost-efficient, more targeted to individual groups, and more financially self-sustaining. There is still a long way to go and many concerted efforts, including collaboration and coordination between the public and private sectors, as well as local and international entities, are required to ensure inclusive, sustainable, and resilient development and to build up our collective vision of *'Digital Sonar (Golden) Bangla.'*

6. Leveraging the Benefits of CBDC

In Bangladesh, MFS such as cash in and cash out through mobile banking account having exponential growth along with increasing trend of P2P, P2B, B2P, G2P, P2G payment services. But, till transactions at retail level through DFS is not so popular. In the country, large segments of the population still rely on, or prefer, making cash payments and retailers/firms refuse to accept cards.

However, as there is no universal and fit for all solutions of CBDC till now available globally, more studies will require providing a straight forward opinion in this issue.

BHUTAN

1. Financial Access and Financial Inclusion

The Financial Sector in Bhutan consists of five commercial banks and 3 non-banks (a pension fund and two insurance companies). In addition, the establishment of Royal Securities Exchange of Bhutan limited (RSEBL); the only country's stock exchange and one CSI (Cottage and Small Industry) bank and the five microfinance institutions have further deepened the Financial Sector. The Financial Institution in Bhutan is governed by the Central Bank; The Royal Monetary Authority of Bhutan (RMAB), established in 1982.

Owing to development of the Bhutanese financial sector, the financial institution has made a substantial progress especially in terms of financial inclusion and affordable access to finance. RMA as a Central Bank has made efforts and measures in developing infrastructure and enabling the regulatory reforms to enhance and increase the financial inclusion of the excluded populace.

As per the 'Financial Inclusion Indicators 2021' report, 79.52 percent of the total Bhutanese have a savings account in one of the banks in the country, a growth of 3.44 percent compared to the previous year. While on the credit front, 22.90 percent of the Bhutanese have access to the loans in 2021 compared to 21.79 percent in 2020. Likewise, 26.69 percent has an insurance policy with one of the insurance companies and 18.08 percent of Bhutanese are pension contributors.

Knowing the importance and significance of financial inclusion, one of the initiatives undertaken in the transition phase was the formulation of 'Bhutan's National Financial Inclusion Strategy (NFIS) 2018–2023 with the vision emphasized on the 'Enhancing access to and usage of quality and affordable formal financial services by all Bhutanese through an inclusive financial system." Based on the four pillars i) appropriate financial products and services; ii) financial accessibility and proximity; iii) financing for economic growth; and iv) financial literacy and consumer protection, the strategy aimed at promoting financial inclusion. The NFIS ensures the financial inclusion to those vulnerable, unbanked, under-banked and geographically deprived livelihoods to enter into the mainstream of the productive economy through financial inclusion initiatives.

Pertaining to achieving financial inclusion and expanding the access to credits, some of the initiatives undertaken by the RMA was launching of Priority Sector Lending (PSL) in 2017, JABCHOR platform, and Bhutan Crowd funding platform which aimed at providing improved and affordable access to finance while providing an alternative financing source through raising funds for new start-up business and cottage and small industry (CSI) sector.

2. Status of Digital Payments

Aiming towards the cashless and digital society, led by the RMA, the country's payment system has undergone a rapid evolution with technological advancement and digital innovations. Over the years, the payment transaction has transitioned from cash towards checks and paper-based instrument and now, to the electronic instruments. The electronic payment and settlement system have been in the market since 2011 while the support of mobile and online banking popularized in 2017. Aided by the onset of the COVID-19 pandemic, a significant evolution was made in embracing the digital payment from the offline payments especially during the country's repeated lockdowns.

Various domestic digital payments instrument was introduced and expanded over the short span of time, boosting the digital payment system in the economy. Payments options such as Quick Response (QR), payment get-way, internet banking and mobile banking apps has made the payments and transfer of the money seamless and easier. Currently, all the commercial banks along with the two telecommunications have their own mobile banking apps which facilitates the domestic payments and settlement.

On the regional level, the launch of the Ru-Pay, a cross-border interoperability of cards in ATMS and Point of Sale (PoS) terminals in Bhutan and India, and the Bharat Interface for Money (BHIM) mobile app which was the RMA's collaboration with the National Payment Corporation of India enabled the cross-border transaction between banks in Bhutan and India using QR code. These initiatives have deepened and enhanced the financial integration on the regional front.

On a global front, SWIFT (Society for Worldwide Interbank Financial Telecommunications) has been widely used by the customers for the trade of currencies, investments and international payment settlements by the banks and the RMA.

The market share of the payment ecosystem has been largely dominated by domestic mobile and internet banking, constituting 95.3 percent of the total transaction by volume. The remarkable share of mobile and internet banking transactions by volume is mainly because of increased transactions availed using Bhutan QR payment, domestic payment gateway and banking apps.

3. Status of Infrastructure Required for CBDC

Monetary innovation and diversity are peaking in as Central Banks sets out to explore and issue the digitized Central Bank money. In doing so, the infrastructure needs for the CBDC is getting prioritized. A key CBDC platform implementation decision is whether to run it on a decentralized (DLT) platform, rather than on a traditional centralized database. When it comes to the infrastructure essentials, the understanding is that the CBDC designed is to meet the desired outcome to deliver the evolving payments needs of users. For the CBDC to deliver the desired outcomes, the RMA may consider to overhaul the existing system (Integrated Core Banking System (ICBS) and enable compatibility to introduce CBDC. The other probable choice as most Central Banks around the globes are considering is to bring in and explore the use of distributed-ledger technology (DLT) to issue CBDC. The table below shows the types of infrastructure used by the Central Banks embracing CBDC project.

Table: 1

Lists of Central Bank's CBDC Project and type of infrastructure used

Central Bank	Accessibility	Jurisdiction	Approach	Architecture and distribution model	Infrastructure	Status
People's Bank of China	Retail or general purpose	Domestic	Token	Hybrid	Centralized and DLT	Pilot
Central Bank of the Bahamas	Retail or general purpose	Domestic	Token	Hybrid	DLT	Live
Bank of Thailand	Wholesale and retail or general purpose	Domestic and Cross Border	Token	Hybrid	DLT	Proof of Concept
Hong Kong Monetary Authority	Wholesale and retail or general purpose	Domestic and Cross Border	Token	Hybrid	DLT	Proof of Concept
Monetary Authority of Singapore	Wholesale	Domestic and Cross Border	Token	Hybrid	DLT	Proof of Concept
National Bank of Cambodia	Retail or general purpose	Domestic	Account	Hybrid	DLT	Live
Sveriges Riksbank	Retail or general purpose	Domestic	Token	Hybrid	DLT	Proof of Concept
Bank of Canada	Wholesale	Domestic and Cross Border	Token	Hybrid	DLT	Proof of Concept
Swiss National Bank	Wholesale	Domestic and Cross Border	Token	Hybrid	DLT	Proof of Concept
Banque de France	Wholesale	Domestic and Cross Border	Token	Hybrid	DLT	Proof of Concept
Central Bank of Uruguay	Retail or general purpose	Domestic	Account	Direct	DLT	Pilot

Source: R3

Essentially, the most important consideration would be the inter interoperability; the CBDC should be equipped to be interoperable to carry basic payment functionalities within the interbank markets in Bhutan and equally have adaptability to future payment needs of new businesses, without compromising the safety features needs in the times now and future ahead.

4. Review of Legal and Regulatory Provisions and Need for Amendment

While the **Royal Monetary Authority Act of Bhutan 2010** recognizes RMA as a Monetary Authority of Bhutan and empowers RMA to issue notes in Ngultrum, however, adoption of CBDC will necessitates further review and amendment of the Act to accommodate the issuance of digital legal tender. Likewise, RMA Act of Bhutan 2010 also solely states the rules on printing, minting and destructions of currency notes and coins. The Act might need a review to provide clear provisions with regard to digital form of fiat currency on the mining and destruction as well as its relationship with fiat currency.

Not only the RMA Act of Bhutan 2010, but also the **Financial Services Act of Bhutan 2011** may need specific review and amendments with regard to the provision and distribution of CBDCs, its treatment and settlement accounts of the FSPs with the RMA amongst others. Additionally, the Authority may need to look into the issuance of guidelines and regulations relating to FSPs and general account holders of CBDC (Prudential regulations and Macro- Prudential Rules and Regulations and others)

Following the Acts (The RMA Act 2010 and The FSA Act of Bhutan 2011), the other important review also entails visiting the gaps in the Payment and Settlement Systems Rules and Regulations 2018 might need to make a clear mention of CBDC as a payment instrument and then the policy on regulation and standardization on the interoperability, system risk management and accountability of FSPs and payment service providers of CBDCs.

Importantly, adoption of CBDC implies a total new system that will essentially require additional review and amendment to the risk management guidelines the Authority has issued under its supervision. As has been noted, the RMA identifies the need to review and amend Acts, regulations and guidelines, introduce new regulations and guidelines to ensure a safe, secure and efficient digital fiat currency in Bhutan.

5. Initiatives for CBDC and Future Approach

The RMA is the driving force to create an ecosystem conducive for digital payments as the most preferred choice for the Bhutanese. Through the adoption of innovations and modern technologies, the RMA has been pursuing digital payment systems in the country starting from the interoperable infrastructure to enabling policies and regulatory frameworks. On the domestic front, today the payment transactions are mostly carried through digital payment channels such as Mobile Banking Apps, QR, Payment gateway, Internet banking, mobile wallets (e-money) and electronic fund transfer (BIRT -fund transfer system). The not so traditional channels like ATM, PoS and paper-based transactions in the overall payment has become less prevalent, indicating a move and choice to and of digital payments.

Embarking further on the digital journey, the year 2020 marked another milestone in support of digitalization in Bhutan and RMA initiated approaches for piloting RMA wholesale

CBDC. Since then, numerous assignments have been carried out to forward the approaches in adopting CBDC. The first of the kind was developing an Approach paper by the department of Information and Technology (DIT) and the areas highlighted Need Assessment, identifying engagement with external organizations, identification of viable use case for CBDC and scoping and designing followed by CBDC Technical development and proof of concept. Specifically, the CBDC concept in a pilot project in Bhutan consists of the following four phases

e) First Phase - Need Assessment
f) Second Phase – CBDC scoping and Design
g) Third Phase – CBDC Technical Development and proof of concept and
h) Fourth Phase – Pilot implementation upon successful outcome of the third phase.

Subsequently, the RMA with financial support appointed R3's Singapore Office based in the USA to undertake need assessments of CBDC in Bhutan. The report was to assist the RMA in reviewing the feasibility of a CBDC prior to its implementation and rollout. The assessment report recommended RMA to weigh in on both the benefits and risks and accordingly consider either the Wholesale Digital NU or Retail or General -Purpose CBDC.

Accordingly, after careful deliberation particularly bearing in mind the essentiality of monetary sovereignty whilst equally promoting digital innovation that could ensure interoperability between and amongst financial institutions and other FSPs, the RMA has decided to pursue a wholesale CBDC. The advantages bearing in mind with the wholesale CBDC surrounds around key identified players and economic implementation efforts while equally allowing the RMA to experiment and further affirm CBDC capabilities in improving the interbank wholesale market and challenges related to technology platform, scalability, security and system resiliency.

6. Leveraging the Benefits of CBDC:

The most common motivation the Central Bank authorities exploring and issuing CBDC is driven by greater goals of financial and monetary stabilities, financial inclusiveness and efficient and accessible means of payments. CBDCs are one promising form of technology-enabled money that is believed to have a power to change the future financial landscape. Some of the possible benefits the CBDC may offer to the Bhutanese financial market and users are discussed hereunder:

a) As a means of payments

Like all other Central Banks, the RMA also considers as its mandate to ensure continued access to risk-free Central Bank money to the public. The Payment System Report 2022 shows that both the cash and cheques use declined of 54.27 % by volume and 49.57 % by value. On the other hand, the payment transactions made through digital channels operated by RMA and the banks increased enormously. This indicates that the payment and settlement through digital channels is on an ever-increasing trend and is likely to continue growing. With increasing public demand for digital banking services, RMA issued CBDC could thus serve as an alternative to cash as a means of payment and ensure continued access to Central Bank money.

Similarly, the interest for issuance of digital currency by a Central Bank over the world is also seen as a reaction against crypto currencies like Bitcoins and stable coins which are largely in the unregulated space and free of ties to monetary authorities. While this concern is nonexistent in Bhutan, at least for now, nevertheless the RMA's adoption of CBDC is time relevant in this era of digital finance.

b) Enhance payment efficiency and offer financial stability

The considerable interests for Central Banks pursuing CBDC, that is also relevant for Bhutan is to improve payment efficiency and equally provide financial stability. Cryptocurrency and stable coins which are highly volatile with unstable purchasing power could pose issues related to price and financial stability. Moreover, with the cash use decreasing and most transactions carried on digital platforms, RMA issued CBDC could offer as an important instrument to meet the public needs for efficiency and stability.

c) Encouraging Financial Inclusions

Globally, financial inclusion is considered as a key enabler to economic growth and the wide adoption of technology and accelerated digitalization is pursued to boost financial inclusions. Likewise, Bhutan also spearheads to promote effective and innovative technology to enhance financial inclusions. According to RMA (2020), Bhutan pursues to achieve an 85 percent financial inclusion by 2023 for her economic and national growth. This paper views Bhutan's adoption of CBDC to provide an alternative opportunity to advance financial inclusion and ensure access of formal financial services and products to the unserved and underserved sections. However, CBDC may not be a viable instrument if access to and technology-know-how is limited.

d) Improving/ Easier Cross Border payments

The increasing globalization of economic activity necessitates commensurate efficient cross-border online services and focuses on enhancing cross border payments highlights a need for faster, economical, more transparent and added inclusive cross-border payment services, including remittances for economies of benefits. Yet, the conventional system of cross-border payments with cash and transactions has limitations with cumbersome structures and intermediary's role players.

Such issues are no exceptions to Bhutan and efficient cross border payment has become vital for Bhutan too. Currently, the RMA facilitates cross border payments for the financial service providers in Bhutan through correspondent banking networks in overseas. However, FSPs are faced with difficulties in terms of managing documents and inadequate channel designs with significant rising costs. Adoption of cross border CBDC may simplify the current issues the FSPs in Bhutan are faced with. However, it is obvious that the RMA recognizes the need to engage with other Central Banks for potential joint explorations in addition to addressing the gaps and compliances in regulations and others.

INDIA

1. Financial Access and Financial Inclusion

RBI has constructed a composite Financial Inclusion Index (FI-Index) to capture the extent of financial inclusion across the country. The FI-Index has been conceptualized as a comprehensive index incorporating details of banking, investments, insurance, postal as well as the pension sector in consultation with Government and respective sectoral regulators. The index captures information on various aspects of financial inclusion in a single value ranging between 0 and 100, where 0 represents complete financial exclusion and 100 indicates full financial inclusion. The FI-Index comprises three broad parameters (weights indicated in brackets) viz., Access (35%), Usage (45%), and Quality (20%) with each of these consisting of various dimensions, which are computed based on a number of indicators.

The Index is responsive to ease of access, availability and usage of services, and quality of services, comprising in all 97 indicators. A unique feature of the Index is the Quality parameter which captures the quality aspect of financial inclusion as reflected by financial literacy, consumer protection, and inequalities and deficiencies in services. The FI-Index has been constructed without any 'base year' and as such it reflects cumulative efforts of all stakeholders over the years towards financial inclusion. The annual FI-Index for the period ending March 2021 is 53.9 as against 43.4 for the period ending March 2017. Further, the value of FI Index for March 2022 stands at 56.4 vis-à-vis 53.9 in March 2021, with growth witnessed across all the sub-indices.

2. Status of Digital Payments

The Reserve Bank had announced construction of a composite Reserve Bank of India – Digital Payments Index (RBI-DPI) with March 2018 as base to capture the extent of digitization of payments across the country. The RBI-DPI comprises 5 broad parameters that enable measurement of deepening and penetration of digital payments in the country over different time periods. These parameters are – (i) Payment Enablers (weight 25%), (ii) Payment Infrastructure – Demand-side factors (10%), (iii) Payment Infrastructure – Supply-side factors (15%), (iv) Payment Performance (45%) and (v) Consumer Centricity (5%). Each of these parameters have sub-parameters which, in turn, consist of various measurable indicators.

The index for March 2022 stands at 349.30 as against 304.06 for September 2021. The RBI-DPI index has demonstrated significant growth representing the rapid adoption and deepening of digital payments across the country in recent years.

The index series since its inception is as under:

Period	RBI - DPI Index
March 2018 (Base)	100
March 2019	153.47
September 2019	173.49
March 2020	207.84
September 2020	217.74
March 2021	270.59
September 2021	304.06
March 2022	349.30

3. Status of Infrastructure Required for CBDC

India has an advanced digital payments ecosystem, wherein, the payment systems are available 24X7, accessible to both retail and wholesale customers, are largely real-time and with one of the lowest cost of transactions across the globe. The users have an impressive menu of options for doing transactions and digital payments have grown at an impressive CAGR of 55% over the last five years. With availability of such digital infrastructure, the use case of CBDC needs to be carefully examined.

A pilot survey was conducted by the Reserve Bank on retail payment habits of individuals in six cities between December 2018 and January 2019, results of which were published in April, 2021 RBI Bulletin. The survey results indicate that cash remains the preferred mode of payment and for receiving money for regular expenses. For small value transactions (with amount up to `500) cash is used predominantly. There is thus a unique scenario of increasing proliferation of digital payments in the country coupled with sustained interest in cash usage, especially for small value transactions. To the extent the preference for cash represents a discomfort for digital modes of payment, CBDC is unlikely to replace such cash usage. But preference for cash for its anonymity, for instance, can be redirected to acceptance of CBDC, as long as anonymity is assured. Further, India's high currency to GDP ratio holds out another benefit of CBDCs. To the extent cash usage can be replaced by CBDCs, the cost of printing, transporting, storing and distributing currency can be reduced.

With regard to technology infrastructure, it is understood that the creation of population scale digital currency system is contingent upon evolution of high-speed internet and telecommunication networks and ensuring the wider reach of appropriate technology to the general public for storing and transacting in CBDCs. Further, the underlying choice of technology, whether CBDC would be based on centralized or de-centralized architecture, or a mix of both, is currently under examination by RBI.

4. Review of Legal and Regulatory Provisions and Need for Amendment

Reserve Bank broadly defines CBDC as the legal tender issued by a Central Bank in a digital form. It is akin to sovereign paper currency but takes a different form, exchangeable at par with the existing currency and shall be accepted as a medium of payment, legal tender and a safe store of value. CBDCs would appear as liability on a Central Bank's balance sheet.

CBDC requires a legal framework that clarifies whether the Central Bank has the mandate to issue CBDC. Existing legal frameworks were typically enacted in a pre-digital age and operationalizing CBDC therefore also entails ascertaining whether law reform is necessary to ensure that a CBDC can be issued by the Central Bank.

In this regard, the necessary amendments to the Reserve Bank of India Act 1934 have been incorporated as part of the Finance Act, 2022, which provide enabling provisions required for issuance of CBDC by Reserve Bank of India. The required changes in the regulatory framework to enable introduction of CBDC shall also be issued by RBI. In some of the cases, existing frameworks can be extended, while in some respects, new frameworks would need to be issued. The related aspects are currently under active examination by RBI.

5. Initiatives for CBDC and Future Approach

RBI is actively working towards the phased implementation of Central Bank Digital Currency (CBDC) in wholesale and retail segment. The aim is to build an open, inclusive, inter-operable and innovative CBDC system which will meet the aspirations of the modern digital economy of India and is expected to give further fillip to the digital ecosystem. Towards operationalization of the pilots, various aspects related to design choices, technical architecture and security aspects of CBDC are being actively considered by RBI.

RBI has commenced pilot launches of India's CBDC, referred to as Digital Rupee (e₹) for specific use cases in both wholesale and retail segment. The pilot in wholesale segment was launched on November 1, 2022, with the use case being settlement of secondary market transactions in government securities. The pilot is testing immediate settlements by dealing in Central Bank currency.

The e₹ pilot for retail segment was also launched on December 1, 2022. The retail pilot is covering select locations in closed user group comprising participating customers/ merchants and is covering both use cases of Person to Person (P2P) and Person to Merchant (P2M) transactions. The pilot is testing the robustness of the entire process of digital rupee creation, distribution and retail usage in real time. The pilot is currently functional in Mumbai, New Delhi, Bengaluru, Bhubaneswar and Chandigarh and is being gradually rolled out to other cities including Ahmedabad, Gangtok, Guwahati, Hyderabad, Indore, Kochi, Lucknow, Patna and Shimla. The scope of pilot shall be expanded gradually to include more banks, users and locations as needed.

Different design elements shall be tested during pilots in both wholesale and retail segments to ascertain their suitability.

6. Leveraging the Benefits of CBDC

The introduction of CBDC will bring numerous benefits to the financial ecosystem which may inter-alia include reduced dependency on physical cash and reduction in associated costs, improvement in efficiency of currency management, enabling near real time settlement in wholesale transactions, providing Central Bank money to common public in digital form securely in line with emerging expectations etc. Cross-border payments efficiency is also an important motivation for issuance of CBDCs with an aim to boost innovation in cross-border payments and make these transactions instantaneous. However, the full benefits which can be reaped with introduction of CBDC will depend on the design choices, technology used and the architecture of the CBDC.

Further, CBDC ecosystems may be at similar risk for cyber-attacks as the current payment systems are exposed to. Further, in countries with lower financial literacy levels, the increase in digital payment related frauds may also spread to CBDCs. Ensuring high standards of cyber security and parallel efforts on financial literacy is therefore essential for any country dealing with CBDC.

MALDIVES

1. Financial Access and Financial Inclusion

One of the key challenges faced in the development of the financial sector and payment services in the Maldives are the geographically dispersed nature of the country, and its relatively small market size. The country is served by a total of 8 commercial banks – of which 3 are locally incorporated, and 5 established as foreign banks.

As at the end of 2021, approximately 90% of the adult population have a bank account – approximately 85% of which are held by a single bank that also captures 80% of the retail payments market. Due to this, there is a severely uneven distribution of financial infrastructure such as bank branches, ATMs and POS terminals across most parts of the country. Although recent times have seen more densely populated areas of the country boosted by bank branches and self-service banking service facilities to a fair extent, this mainly comes at the expense of many islands with a smaller population. With this being a common trait for majority of the islands across the country, it has largely been considered financially unviable for the banks to adequately supply financial infrastructure equally across all or most islands.

As an initiative to mitigate the obstacles resulting from the geographical challenges, Mobile Payment Services were introduced during 2017 via an MNO-led model with services provided by the two telecommunication service providers in the Maldives. With 100% mobile service coverage and almost every demographic accustomed to the use of a smart device, this was recognized as a massive opportunity to boost financial inclusion and accessibility to digital financial services which would potentially minimize the prevalence of cash. The number of non-Bank PSPs providing electronic money issuance services in the Maldives has since increased, and the market is currently served by a total of four PSPs.

In consideration of the unique characteristics of the market in terms of high mobile phone penetration and coverage, these entities are expected to play a key role in contributing to increased financial inclusion over the forthcoming years, while more non-bank PSPs are expected to enter the market with innovative solutions delivered via digital channels.

On the other hand, the lack of adequate infrastructure has significantly restricted the accessibility to basic financial services, mostly for those in the more isolated parts of the country, or islands with relatively smaller populations. Due to these challenges in accessing such services, the country has observed low levels of inclusion in the formal financial system despite a high banked population. As people are often required to travel to nearby islands with relevant facilities to access basic services such as opening a bank account or applying for a loan, people are reluctant to take on this additional burden. Instead, customers tend to opt for traditional approaches to saving and managing their funds, such as storing cash at their homes, and borrowing from friends and family. This has further magnified the need for means of digital access to financial services – in addition to means of utilizing the customers' funds in a safe and efficient manner.

Existing inefficiencies in the market such as lack of interoperability among banks and non-bank PSPs that are associated with digital alternatives such as card payments and electronic money issuance services, and high fees of card payments, has also proven to be a challenge in the enhancement of these services. From a customer perspective, these inefficiencies make the services more inconvenient as an alternative to the traditional methods. This has also resulted in further setbacks in the efforts to promote it as a more inclusive option for financial or payment services.

2. Status of Digital Payments

Digital Transactions

The Maldives is a highly cash-dependent economy, with a relatively high proportion of payments still being made via traditional methods such as cash and cheques. However, owing to several actions implemented by the MMA over the past three years – and aided in part by the changes to business operations and customer habits due the breakout of Covid-19 – Maldives has observed a greater affinity towards digital alternative solutions. Between 2020 and 2021, currency in circulation decreased by 3.9%, and the usage of cheques declined by 15%. During the same period, an increase of 32% for transactions conducted via cards, and an increase of 76% for bank transfers were recorded. This was an encouraging change in trajectory observed in line with the MMA's objective of enhancing the efficiency of payment services in the country.

Currently, card payments and electronic money issuance services are the most prominent alternatives in the market for cash and cheques. However, the existing challenges in the market – including the uneven distribution of financial infrastructure across the country as well as the lack of interoperability, and higher fees associated with some digital payments – hinders the use of these instruments to their full potential.

This can be observed from the usage of electronic money issuance services – where an increase of 60% in new mobile wallets opened was recorded in 2020 compared to the previous year, while a decrease of 34% was recorded in 2021. This could denote that additional effort remains to be taken to develop these services and the underlying infrastructure to fully realize the benefits of these services. Furthermore, the limited types of services offered by these service providers, and a relatively low number of merchants across the country, is also likely to be a reason for the underdevelopment of e-money based payment services.

Measures taken to promote usage of digital solutions

As a way of keeping up with the momentum of the rise in the usage of digital payment alternatives over the past 3 years, the MMA initially implemented measures to reduce the usage of cheques in the Maldives in 2020. This included policy measures to reduce the usage of cheques by Government entities and state-owned enterprises, while also assigning cheque reduction targets for all the banks operating in the Maldives.

Following a year-long implementation of these measures, encouraging trends were observed in the market, although it could be attributed in part to unprecedented changes in the business operations as a direct result of the Covid-19 pandemic. Subsequently, a two-year Action Plan, which broadens the scope to be inclusive of measures applicable to all individuals and corporate customers nationwide has also been initiated during 2022. The main objective of this Action Plan is to prepare the market for a potential discontinuation of the usage of cheques by the end of 2024 and promote the usage of digital payments across the country.

Maldives Payment System Development Project (MPSD)

Despite the positive results of the measures implemented and the positive increments in usage of digital payment solutions in the Maldives, MMA still recognizes the need to address the several challenges to financial inclusion and accessibility identified in the market.

In view of this, the MMA embarked on multi-phased initiative to implement an Instant Payment System (IPS) under the MPSD. All the banks in the Maldives, as well as the licensed non-bank PSPs will be connected to a single central infrastructure developed by the MMA – facilitating real-time payments 24/7/365.

The primary objective of this project will be to ensure that customers can make and receive payment instantly, regardless of the island they live in, or where they bank – while also not presenting any discrimination in accessibility to the system owing to whether they are banked or unbanked. The project also aims towards establishing a level playing for banks as well as non-bank PSPs who shows interest in providing innovative solutions to the market which will address the aforementioned challenges. The enactment of the National Payment System Act and the Regulation on Payment Services in late-2021 and early-2022 respectively, has also provided a clearer pathway for non-bank entities to enter the market.

Furthermore, the project also comprises of a Payment Platform – which will be launched with a white-labelled mobile application. The mobile application will be a ready-made solution already integrated with the IPS, available for potential participants to use in order to extend the benefits of the IPS to their customers. This is being developed in consideration of the banks and smaller market players which may find it challenging in terms of costs, time and customization efforts to develop solutions with robust connectivity to the central infrastructure. The PSPs can use this application to serve their customers by re-branding the application to be reflective of their identity. This way, the customers will be able to access the services of the IPS via their preferred service provider – which will no longer need to be an established Bank.

All the services that are envisioned through the system aligns with the MMA’s objectives of reducing prevalence of cash and cheques as a mean of payment, while acclimatizing the public towards digital financial services.

3. Status of Infrastructure required for CBDC

Maldives has a higher level of digital and infrastructure connectivity in comparison to the neighboring countries. With over 60% of households’ active users of the Internet – 83% of the users having access to fixed broadband services – and a mobile broadband penetration of 45%~~,~~ Maldives has made significant strides in terms of infrastructure development. Network coverage and quality is also comparatively better in the Maldives, with a 100% coverage of the country for 2G, 3G and 4G wireless technologies (World Bank, 2021; National Bureau of Statistics, 2020). As innovative, complex and disruptive financial technologies are largely reliant on the underlying infrastructure, the high availability of such services is viewed as strong enablers for the potential implementation and adoption of a CBDC in the country.

Despite this, there are gaps in the access and adoption of these digital technology across the country, with differences spanning across groups based on their locations, income, level of financial literacy, etc. As such, significant effort would be required to equalize access to these critical infrastructures, in order to support the roll-out and adoption of a technology such as CBDC.

Furthermore, different types of CBDCs have different implications and requirements with regard to underlying technology. For instance, retail account based CBDCs, and hybrid tier based CBDCs may have large, far-reaching implications for the verification of identities, and KYC procedures, in order to account for and mitigate the risks to data privacy and KYC process that are posed by such types of CBDCs, a robust digital ID system may be needed. In this sense, Maldives is also in the process of developing a National Digital Identification System, which is expected to be rolled out during 2023, and would assist the service providers in efficient and faster onboarding of customers. An e-KYC Regulation and supporting guidelines are also currently in the finalization stage and expected to be published during early 2023. As far as CBDCs are concerned, a digital ID system would also inherently assist in the successful and efficient on-boarding of customers for usage of CBDC.

In addition to the underlying factors, it is highly important to consider the various technological designs of CBDCs – as this would have a large bearing on meeting the overall objective of deciding to issue a CBDC. Owing to the fact CBDCs are a nascent form of technology, there has been no formal study conducted in the Maldives to explore the use cases and technological designs of the CBDC. Given that based on the use case, the technical infrastructure requirements would differ, it is also essential that the motivation and use cases of CBDC be identified. Given the complexities and concerns regarding the technological considerations of CBDCs, a comprehensive assessment of the use cases, and the related technical designs, and its trade-offs, and constraints are yet to be analyzed to make a well-informed decision.

4. Review of Legal and Regulatory Provisions and Need for Amendment

CBDC's can be structured and issued in multiple ways – token-based, account-based, centralized or decentralized CBDC or in a hybrid form, all with distinct and fundamental legal implications to the regulatory framework of the Maldives. Despite all of these structures having implications, one of the major legal implications is foreseen with the token-based and account-based CBDC, with the focus on issuances of a digital currency as legal tender, and issuance of the digital currency to the banks and/or the public.

As for an account-based CBDC, wholesale CBDCs can be issued by the MMA to the Government, its agencies and other affiliated institutions, as well as the Banks and other financial institutions in the Maldives – within the purview of Section 22(h) of the MMA Act. However, it is important to consider that the MMA Act does not authorize the MMA to open accounts in the name of the members of the general public. As such, the implementation of an account-based retail CBDC comprising of the general public currently lacks adequate legal basis. As Section 22(h) of the Act allows for wholesale CBDCs, hybrid tier-based CBDCs may be possible – with MMA issuing CBDC to banks and other financial institutions, and these institutions distributing it to the general public.

Furthermore, Section 14 of the MMA Act provides MMA with the sole authority to issue legal tenders in the Maldives. Although the provision opens for it to be interpreted as limiting the form of such legal tenders solely to banknotes and coins, such is not the intention of this provision. Where MMA decides to issue CBDC, a decision at policy level of the State would need to be made on whether the MMA would be granted the sole authority to issue CBDC in the Maldives and granting the legal tender status to it. Hence, to ensure clarity as to the legal basis of implementing CBDC in the Maldives – such a policy decision should be made prior to reforming the existing MMA Act, where MMA is explicitly granted with the power to issue and produce CBDC.

5. Initiatives for CBDC and Future Approach

MMA is currently only engaged in the preliminary research stages of CBDC – although it remains part of the long-term agenda of the MMA. In this regard, it should also be noted that any further developmental or research work, will need to consider the many pre-requisites leading up to a project of this nature. This would include any potential changes to the regulatory framework, in addition to the identification of the use cases that a CBDC will cater for, and the possible implementation approach to be utilized.

Furthermore, in terms of a higher level of digital and infrastructure connectivity such as cellular network coverage, smart phone penetration, electricity and internet coverage, the Maldives is relatively well placed in comparison to most other neighboring countries (World Bank, 2021). While these are key enablers and dependency factors for the successful operations of a CBDC, no formal study has been conducted in the Maldives to explore the potential use cases for the issuance of a CBDC. This is also an important consideration, as it is highly dependent on the selection of the most appropriate technology to be adopted for the implementation of a CBDC.

Despite this, MMA's current focus remains firmly on the on-going implementation of the IPS under the MPSD project. With this being a nation-wide project, the impact on the overall financial sector across the board remains to be seen over a prolonged period. While the IPS is expected to address the challenges associated with domestic payments, cross border payments could be a potential use case that can be addressed by a CBDC. However, a formal assessment is yet to be conducted to identify the requirements and specific use cases.

Considering the purely digital nature of a CBDC, initiatives to increase the levels of digital literacy among all demographics would also likely be a key pre-requisite for a successfully delivered CBDC. Although the Maldives has a high smart phone penetration and mobile network coverage throughout the country, the adoption of services delivered over internet / mobile applications are relatively low. CBDC essentially being money in digital form, the public must have a strong affinity towards the use of mobile applications and other technological solutions, for it to efficiently work as a generally accepted means of payment. For this reason, measures taken to acclimatize the public towards the use of digital channels and increase the digital awareness, will also be a potentially be a key factor for the success of any future initiatives for a CBDC in the Maldives.

6. Leveraging the benefits of CBDC

Technological innovations have been at the forefront of transforming the payment industry. MMA is currently in the process of implementing an Instant Payment System (IPS) – with plans to go-live during 2023. This system is expected to enable greater efficiency in payments and provide a gateway to cater for domestic inter-bank payments. Implementation of instant payments are also expected to act as a catalyst for improving financial inclusion, by paving the way for lower cost, faster payments. CBDC's share some features of an IPS, as it also facilitates payments in real time. While the IPS fulfils the objectives of domestic retail payments, CBDC's unique technical and operational composition may aid in addressing challenges in cross-border payments, and in disbursement and collection of government payments.

As a significant portion of the remittances conducted in the Maldives are for outward remittances, – with outflows of over $52.1 million in 2021 – enabling efficient, faster and more secure cross-border payments through CBDC could be viewed as one of the key potential use cases in the Maldives. As such, introduction of CBDC in the Maldives could potentially assist the country’s de-dollarization efforts, and to reduce the high dependency on US Dollars. Projects which address similar issues (such as Project Ubin – Jasper) has demonstrated that cross-border payments are possible in local currency, without procuring an intermediary currency, via an asset / currency swap. At the same time, introduction of a CBDC may not necessarily prove to be the most cost-effective approach to address the challenges faced in cross border payments. With this also being a viable option, especially with the development of the on-going IPS implementation project, a through cost-benefit analysis of the different approaches and the use cases it will cater for will help in identifying the most suitable approach in the local context.

As is the case with any model for implementing a CBDC – and especially in achieving interoperability on a country level would be highly dependent not only on the technical design or standards, but also on the operational complications that may arise in the initiation of such a payments infrastructure. A cross-border use of CBDCs between two or more jurisdictions necessitates strong cooperation among Central Banks, and harmonization of technological and legal/regulatory requirements among the countries, which could be time consuming and a challenging task.

NEPAL

1. Financial Access and Financial Inclusion

Financial access has expanded significantly in Nepal during the last five years as seen in terms of the expansion in the branch network of banks and financial institutions, number of bank accounts and use of FinTech products such as mobile banking and wallets. The number of deposit accounts has increased from 27.86 million in July 2019 to 44.75 million in April 2023 and mobile as well as internet banking users have almost doubled during this period. In addition, due to the expansion in the branch network of the banks and financial institutions, per branch population has fallen from 3363 to 2505 (see Table 1).

Table 1

Financial Access Statistics of Nepal

Indicator	July 2019	July 2020	July 2021	July 2022	Apr 2023
No of Deposit Accounts (Million)	27.86	32.4	37.77	43.29	44.75
Mobile Banking Users (Million)	8.3	11.3	14.19	17.38	20.43
Internet Banking Users (Million)	0.9	1.01	1.16	1.66	1.79
No of Debit Cards (Million)	6.7	7.3	8.8	10.44	12.19
Branches of Banks and Financial Institutions	8686	9765	10683	11528	11643
Per Branch Population	3363	3072	2844	2532	2505

Source: Nepal Rastra Bank

Increase in financial access has been driven by the policy initiatives of Nepal Rastra Bank. Major initiative in this regard include the relaxations of some regulatory standards for banks who open branches in the rural area, promotion of microfinance financial institution operating in the rural area and other measures. NRB has worked with Alliance for Financial Inclusion, UNCDF and other international organizations for expensing the access to financial services and financial literacy in the country.

In terms of the presence of bank branches relative to population, Nepal occupies second position in the South Asia after Bhutan. However, despite the extensive network of bank branches, the population with at least one bank account stands at 67.3 percent, while 32.7 percent still remains unbanked or informally banked in Nepal[23].

[23] https://www.nrb.org.np/contents/uploads/2021/08/Financial-Access-Report-2078.pdf

Table 2

Commercial Bank Branches per 100,000 Population

Country	Bank Branches/ 100,000 population
Nepal	18.98
India	14.74
Bangladesh	8.99
Pakistan	10.31
Philippines	9.17
Bhutan	19.31
China	8.79

Source: World Bank[24]

2. Status of Digital Payments

The development of digital payment systems in Nepal in a planned way after 2014. The foundational arrangements for modernizing the payment systems started in 2014. The National Payment Systems Development Strategy (NPSDS), 2014 was formulated to further develop a secure, healthy, and efficient payment system as mentioned in the NRB Act, 2002. After that NRB issued regulatory framework for the payment service operators as well as payment service providers and promoted digital payments. In this regard, Licensing Policy for Payment Related Institutions/Mechanism, 2016; Payment and Settlement Act, 2019; and Payment and Settlement Bylaw, 2020; Retail Payment Strategy, 2019; Nepal QR Standardization Framework and Guidelines, 2021; and Digital Lending Guidelines, 2022 have helped to modernize and systematize the payment systems. Moreover, the COVID pandemic helped further in the adoption in the digital payment channels.

As of Mid-July 2022, 37 institutions are licensed as payment institutions. Among them, 27 are PSPs, and 10 are Payment System Operators (PSOs). In addition, all 26 commercial banks, 13 development banks, 14 finance companies, and 1 microfinance financial institution have obtained the license to operate as PSP from NRB. Nepal has already implemented Retail payment switch in late November 2021 and Nepal Clearing House Ltd. is in progress of implementing National Cards System. The government has also initiated the implementation of National Payment Switch. Real Time Gross Settlement System

[24] https://data.worldbank.org/

(RTGS) is operational since last 3 years to process large and critical value payments in Central Bank money and through the books of account in the Central Bank.

Use of digital banking products and services has increased substantially in the last two years. In terms of the number of transactions through ConnectIPS increased by 109 percent in 2021/22. Such increase for the payments through mobile banking and QR code payments stood 62 percent and 383 percent respectively. In terms of transaction volume, payments through connect IPS increased by 127 percent, payments through mobile banking increased by 163 percent and payments through QR codes increased by 366 percent. Taken altogether, the total number of transactions increased by 48 percent and transaction volume increased by 73 percent in 2021/22 (Table 3).

Table *3*

Number and Volume of Digital Payment Transactions

	No of Transactions (Thousand)			Transaction Volume (Rs. Billion)		
	2020/21	2021/22	2022/23 (10 months)	2020/21	2021/22	2022/23 (10 months)
RTGS	534	751	666	20552.21	42134.02	28553.37
ATM- Withdrawal	74480	100989	99951	648.27	839.73	795.1326
ECC	12296	13920	9851	8056.45	8773.75	4948.457
IPS	10841	13424	12614	2369.11	2060.04	1597.838
Connect IPS	18834	39417	40048	1356.74	3081.76	3198.969
Debit Cards	81649	110831	108080	679.35	881.40	830.1686
Credit Cards	1717	2271	2345	9.99	14.14	14.84847
Prepaid Cards	131	490	598	0.85	3.10	3.931803
Internet Banking	3179	3356	2615	98.66	159.49	126.7769
Mobile Banking	111923	181546	225306	460.01	1210.13	1722.077
Branchless Banking	639	752	725	12.87	16.19	14.91301
Wallet	124945	167492	171938	114.43	184.29	179.3349
QR-Based Payments	5582	26950	58754	20.28	94.51	187.1888
Point of Sales (POS)	7547	11773	10246	31.73	51.43	48.79712
E-Commerce	1345	819	800	9.10	4.84	4.968452
Total	**455,643**	**674,780**	**744,538**	**34,420**	**59,509**	**42,226.77**

Source: Nepal Rastra Bank

3. Status of Infrastructure Required for CBDC

With the development of the energy sector in recent years, Nepal has made significant progress in the production and consumption of electricity. Around 92.2 percent of the population has access to electricity[25]. The number of telecommunication service providers

[25] https://censusnepal.cbs.gov.np/results/files/result-folder/National%20Report_English.pdf

and service users in Nepal has increased significantly with the advent of new and advanced technology. Access to mobile services is available in all districts of Nepal with better network coverage and quality. By mid-January 2023, mobile phone subscriptions stood around 35.98 million with mobile phone density of 123.28 percent. Moreover, fixed broadband density has reached 37.23 percent and mobile broadband density has reached 93.18 percent. Within the mobile broadband subscribers, the density of 4G broadband services has reached 65.5percent[26].

The geography and the diverse landscape of Nepal have resulted in varied access to basic infrastructures such as electricity and the internet. The connectivity limitations have restricted the implementation of financial services technologies. Despite these challenges, the government has taken important steps toward improving internet access and upgrading its quality and coverage through investment in important infrastructures.

4. Review of Legal and Regulatory Provisions and Need for Amendment

There is no existing legal and regulatory framework regarding CBDC in Nepal. Currently, Nepal Rastra Bank Act, 2002, the Central Bank or monetary law of the country, has mandated NRB to issue the legal currency for the country as one of its duty, responsibility and right. However, the act assumed that only the bank notes and coins as the legal currency. The current Central Bank law does not authorize the issuance of CBDC in Nepal. In fact, the act does not imagine the CBDC and virtual transfer of legal tender either. Actually, the existing laws of the country are written only for direct physical transfer.

After observing the current legal and regulatory provision in Nepal, it seems that the issuance and implementation of CBDC need a significant change or amendment in current legislative framework. As the NRB has the legal mandate to issue the fiat currency for the nation, it should also be provided the legal mandate, with full authority, to issue and control the digital currency for the country. The CBDC must be accepted as a legal tender of the country along with the bank notes and coins.

5. Initiatives for CBDC and Future Approach

Nepal is in the research phase of CBDC. The NRB announced to carry out a study about CBDC in the monetary policy of 2021/22. Accordingly, a high-level CBDC steering committee headed by a Deputy Governor was formed to provide necessary direction. A task

[26] https://nta.gov.np/wp-content/uploads/2023/03/MIS-poush-2079.pdf

force formed by this committee to prepare a concept note on CBDC. The concept note has been made public and the NRB has planned to carry out a detailed feasibility study in 2022/23. In addition, NRB has decided to establish an incubation center to deal with the payment system innovations including CBDC.

PAKISTAN

1. Financial Access and Financial Inclusion

Financial inclusion is defined as access to formal financial services by individuals and firms to use a range of quality payments, savings, credit and insurance services which meet their needs with dignity and fairness. In order to enhance financial inclusion, State Bank of Pakistan implemented the financial inclusion program with the objective to improve access to financial services for the poor and marginalized groups and for micro, and small enterprises in Pakistan.

The Financial Inclusion Program (FIP), implemented by SBP with support of the UK Department for International Development (DFID), aims to transform the financial market with a clear objective to provide equitable and efficient market-based financial services to the otherwise excluded poor and marginalized population including women and young people.

FIP focuses on enhancing access of financial services for lower segment of population. FIP contributed in financial sector development through enhancing governance structure, product development, creating better systems & controls, and developing IT infrastructure, etc. FIP has also been instrumental in meeting liquidity & credit requirements of Micro & Housing sectors, fostering innovations in rural & agriculture finance, digitizing streams of Government to Peron payments, etc., while gender finance & Islamic finance are the cross-cutting themes. The key elements for success of the program lies in its structured governance framework and creating strategic partnership among the private & public sector institutions.

The Government of Pakistan (GoP) has prioritized NFIS as part of its 100-days agenda to address these gaps going forward. The GoP has set following headline targets to be achieved by 2023:

1. Enhance usage of Digital Payments (65 million active digital transaction accounts, with gender segregation of 20 million accounts by Women)
2. Enhance Deposit Base (Deposit to GDP ratio to 55%)
3. Promote SME Finance (Extend finance to 700,000 SMEs; 17% of the private sector credit)
4. Increase Agricultural Finance (Serve 6 million farmers through digitalized solutions; enhance annual disbursement to Rs.1.8 trillion)

5. Enhance share of Islamic Banking (25 percent of the banking industry; increase branches of Islamic banks to 30 percent of the banking industry)

Also, SBP regularly conducts surveys/research to gauge state of financial inclusion, the performance of its initiatives, innovations, industry trends, and to determine demand/supply side evolutions/trends. The findings from these surveys & researches not only provide baseline data for the development of national financial inclusion strategies but also support policy formulation.

Although statistics related to financial inclusion have improved over the years in Pakistan, almost 40 percent of the population in Pakistan is still financially excluded.

2. Status of Digital Payments

Digital Financial Services (DFS) include a broad range of financial services accessed and delivered through digital channels. DFS can be a catalyst in improving living standards, reducing poverty, decreasing fiscal deficit, and providing equal income opportunity to all Pakistanis. State Bank of Pakistan has been playing an instrumental role for the development and promotion of digital payments in the country. In particular, SBP is:

- Enhancing payments systems for digital age,
- Championing a platform to boost financing for small businesses,
- Developing an all-inclusive non-discriminatory data strategy,
- Promoting an enabling regulatory environment for new players,
- Facilitating firms’ use of technology for operational resilience,
- Forming new contractual relationships between financial institutions and third parties.

In addition, State Bank of Pakistan (SBP) has launched licensing and regulatory framework for setting up digital banks in Pakistan as a separate and distinct category in the banking business.

Digital bank is defined as a bank which offers all kinds of financial products and services primarily through digital platforms or electronic channels instead of physical branches.

The government has set the following targets to be achieved by end 2023.

- 100 % digitalization of Govt. payments & receipts along with back-end automation
- Digitalization of Pakistan Post
- Digitalization of Central Directorate of National Savings (CDNS)

- Creation of Transformation office at PM Secretariat
- Launch fully functional Assan Mobile Account (AMA) Scheme

Payment Systems Department at State Bank of Pakistan has taken a number of initiatives for the benefits of Pakistani's living abroad enabling international financial transactions more modern and secured. To develop and maintain robust payment systems mechanisms for the growth of international remittances and support trading activities while focusing economic growth with a special emphasis on this region is one of the core objectives of SBP's vision and strategy 2020.

Since 2012, SBP is the Secretariat of SAARC Payments Initiative (SPI) taken by the SAARCFINANCE Group in 2007. In 2008 the SAARC Payments Council (SPC) was established under the SPI to take forward the vision of SPI i.e. improving and developing modern payment and settlement systems and mechanisms in the SAARC region.

3. Status of Infrastructure Required for CBDC

Pakistan is going through a digital transformation with an exciting startup landscape. With a young population that has access to the internet, the digital footprint of the economy is growing.

Pakistan is in the research phase of CBDC, targeting specific use cases like peer-to-peer payments, cross border trade payments, international remittances, financial access and inclusion.

The infrastructure required is diverse in nature. The way technology has become an intertwined with economics and business, this mix is creating a whole new discipline. It requires that people from technology, economics and users of information in trade, supply chains, production, etc. come together to design the system.

The Bank has already experimented a little with micro projects on the Hyper Ledger Fabric by IBM. The experience from that tells us that the hardware already provided by the Information Technology Group (ITG) of the Bank is ample in terms of processing power and memory. The team of software engineers or developers on the other hand would need considerable expansion. These then need to be paired up with economists who will design the monetary functions and how trades and settlements will take place.

These are just the tip of the design considerations that need to be considered. As the scope and depth of the system increases, more and more stakeholders will be needed to be taken on board. Having said this, there is still a considerable knowledge and experience gap that which will need to be covered before a proper structure is visible. A valuable undertaking would be to establish a dedicated lab to explore and experiment with different design and architecture options of the digital currency system.

4. Review of Legal and Regulatory Provisions and Need for Amendment

The State Bank Act, Payment Systems and Electronic Funds Transfer Act, Electronic Transactions Ordinance and other Acts, Ordinances and Amendments cover much technological advancements that have been made thus far in banking and finance. All laws, in bits and pieces form the basis of which money is created, issued, and transactions and exchanges are made. Over time, provisions have been made to consider electronic or digital data to be permissible to be used in lieu of paper documents. They also cover electronic and digital payments. However, when considering creation of a system from the ground up, that will become the basis of the digital economy, other considerations like proof of ownership, verification and credibility play a key part. So, for instance if any land or property were to be traded through a digital currency, a counter leg of the transaction that would transfer the ownership of that land or property on the digital platform would need to be admissible in the court of law.

We are not entirely sure at this time about the specific legal and regulatory provisions that are needed to for the issuance of a digital currency. Broadly speaking, we understand that the current laws empower the Central Bank to issue currency but there are some conflicting opinions about what the provisions of the law that governs "issuance of banknotes" permit and therefore the form of currency that can be issued. The Electronic Funds Transfer Act defines electronic money elaborately enough to cover the form a CBDC would be of; but issuance of it is a debate.

The onboarding and integration of participants (including other government departments and even the Federal Government) who wish to use the digital currency onto the system may also bring some caveats with them which may require change in laws relevant to them. This will evolve with time as the usage of the digital currency grows and there is value in being a participant (either for transparency or efficiency or something else) of the system.

5. Initiatives for CBDC and Future Approach

At this point, SBP is in the exploration phase of digital currencies and related technologies. Currently there is a working group from across the Bank that is bringing together a holistic ecosystem that supports each groups agenda with regards to digitization. We have an ongoing collaboration with the World Bank for a deeper understanding about design, architecture, technology and the likes. We are also interacting with local technology partners and businesses to understand their needs. While functions of the financial system remain an important aspect of the system, documentation is another area where this technology can greatly encourage and push formality within the economy.

We will continue engaging with more and more stakeholders as the scope of the experiments expands.

6. Leveraging the Benefits of CBDC

Digital currency is the programmable money. This is useful for payments to citizens by the government whether it be tax refunds, disaster relief or part of some social safety net program or some other payment. Their advantage in terms of time and cost over conventional transfer methods brings transparency and efficiency and therefore credibility.

For the financial regulator it means that it could program money to conduct various monetary policy functions such as to provide interest on deposit as set from time to time. It can play a critical role for financial access and inclusion. Also, the speed at which economic activity is carried out would significantly increase. This on its own could be significant enough for a meaningful increase in total output of the economy.

For businesses it means they can carry out business transactions through the system in a trustless environment anywhere in the world. All the strength of the currency and economy comes from the level of trust in the system. New technologies such as the blockchain offers carrying out exchange without having to know the identity of the counterparty and has the ability, by virtue of it being programmable, to provide recourse to arbitration or claims to warranties.

In finance, the Financial Technology (FinTech) companies with their digital products are bringing about disruptive changes to traditional finance. From payment systems, to borrowing, saving, access to bond and equity markets FinTechs are at the forefront of this transformation. Within the crypto sphere, Decentralized Finance (DeFi) is the most widely adopted use case. Currently Total Value Locked in DeFi is about UD$70 billion (at its peak, TVL was more than US$250 billion). This is where startup and new projects in blockchain are raising considerable sums of money to finance their development. Non-Fungible Tokens (NFT) is another booming spare where digital artwork and unique digital assets are being traded. NFT is a digital form of an asset. This can be a real asset like a house for which a "certificate" reflecting ownership can be made.

The examples given above are just indicative of the diversity digital currency or CBDCs can cater to. This, in reality would extend to the full depth and breadth of the economy. It would so seem that virtually any use case would benefit from the digital transformation. This should be taken with a pinch of salt because for digital currency or CBDC to be widely used, the public acceptance of it and their ability to use it for all their purposes is one of the necessary preconditions. It would be equally important that all agents within an economy are cooperative in the change in form of money.

SRI LANKA

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1. Financial Access and Financial Inclusion

The Central Bank of Sri Lanka (CBSL) contributes to the enhancement of access to finance with the view of achieving balanced growth through poverty reduction and enhanced participation across broader segments of the economy, through a network of participating financial institutions. These participating financial institutions mainly comprise Licensed Commercial Banks and Licensed Specialized Banks. To increase financial access and promote financial inclusiveness in the country, the CBSL with the assistance of other financial institutions, conducts a series of awareness-building and skill development programs, especially for those who have limited access to the formal financial sector. These programs include the areas of financial management, entrepreneurship development, training of trainers and workshops for entrepreneurs.

Sri Lanka's efforts to increase financial inclusion began early in the 20th century when loans were provided to farming communities through cooperative societies.[27] Following the initial efforts, there were several state-initiated programs that aimed to improve financial inclusion in Sri Lanka. However, the contribution of such programs towards achieving financial inclusion, has been restrained due to uncoordinated efforts at the national level.

Accordingly, the need for a national financial inclusion strategy, which covers the broader aspects of the economy, was highlighted. This necessitated a new coordinated approach to

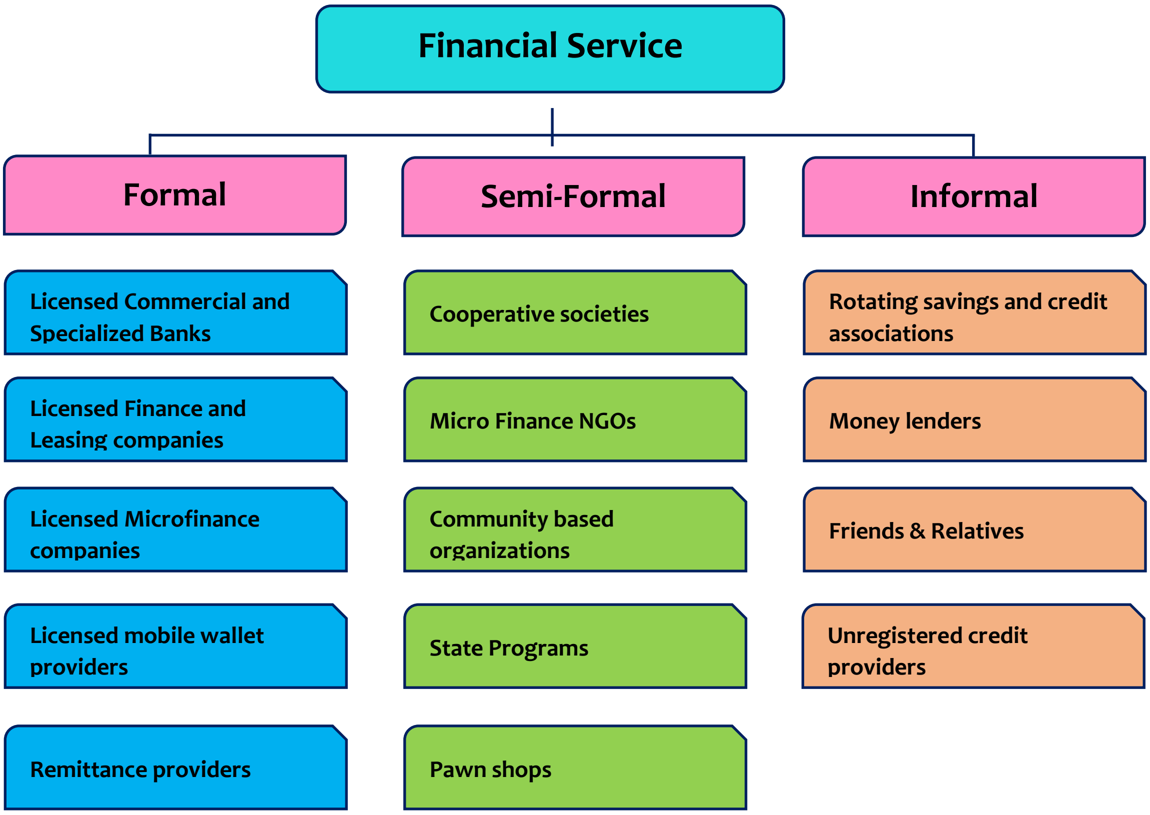
[27] National Financial Inclusion Strategy for Sri Lanka (2021-2024), CBSL

financial inclusion by the CBSL and the Government of Sri Lanka, with the assistance and coordination from other financial service providers. Consequently, in March 2021, the first-ever National Financial Inclusion Strategy (NFIS) of Sri Lanka, was launched as a collaborative effort of the CBSL and International Financial Corporation (IFC).

The NFIS intends towards a financially inclusive Sri Lanka, where all individuals and enterprises in Sri Lanka are well-informed and have fair, and equitable access to a range of high-quality, appropriate, secure, and affordable financial products and services that they can use to contribute to economic growth and improve their living standards. The NFIS also coordinates with organizations in more than 60 countries to improve financial inclusion landscapes, thus ensuring sustainable and inclusive economic growth.

Figure 1

Classification of Financial Service Providers in Sri Lanka Based on Regulatory Intervention



Source: National Financial Inclusion Strategy for Sri Lanka (2021-2024), Central Bank of Sri Lanka

Financial inclusion and the access to finance in Sri Lanka remain at comparatively high levels, reflecting the continued efforts made to coordinate, facilitate, and implement the inclusive growth by various stakeholders led by the CBSL. This is reflected in the indicators of financial access and inclusion. Sri Lanka has an extensive network of physical bank branches with a bank branch density of 16.4 branches per 100,000 adults as of end 2021.[28] Meanwhile, the National Financial Inclusion Survey, which was jointly conducted by CBSL and the International Finance Corporation (IFC) in 2018, revealed that 88 per cent of respondents have deposit accounts at a financial institution and there is no significant gender or regional disparity in account ownership.[29] Further, the developments in the FinTech domain in Sri Lanka presents great potential to bridge the remaining gaps between urban/suburban areas and rural areas in terms of access to financial services.

Table 1

Financial Institution Outreach in Sri Lanka

	2010	2020	2021
Total No. of bank branches and other outlets	5,874	7,406	7,319
Total No. of automated teller machines	2,006	6,176	6,342
Bank branches per 100,000 persons	14	17	16
ATMs, CRMs and CDMs per 100,000 persons	11	32	31

Source: Annual Reports, Central Bank of Sri Lanka

Despite having increased access, a high level of usage, and high-quality financial infrastructure, Sri Lanka is yet to make notable progress from the low level of 35 per cent in adult financial literacy.[30] However, this implies that there are ample opportunities to grow through financial innovations, which enables the country to achieve sustainable economic growth. The introduction of mobile phone-based e-money systems in 2012 followed by the introduction of national QR Code based payment system 'LANKAQR' in 2018 are significant measures taken to promote access to finance and financial inclusion in this regard.

[28] Annual Report – 2021, Central Bank of Sri Lanka
[29] National Financial Inclusion Strategy for Sri Lanka (2021-2024), CBSL
[30] S&P Global FinLit Survey

2. Status of Digital Payments

In Sri Lanka, the national payment system is regulated and supervised by the Central Bank of Sri Lanka (CBSL) considering its importance in maintaining financial system stability and effective transmission of monetary policy. CBSL also acts as a catalyst in promoting developments in the national payment system with the objective of enhancing safety, efficiency and stability. Over the years, the digital payment space in Sri Lanka has grown tremendously and at present, there are various digital payment systems, instruments and methods facilitating digital payments to the citizens of Sri Lanka.

Digital payments can mainly be classified into two types, considering the value of the payment and the type of party that initiates the transaction, namely: large value and retail value payments. Large value payments are generally high-value payments made by financial institutions whereas retail payments are executed by individuals and are of relatively low value. This section provides a summary of the prominent large value and retail value payment systems as well as payment instruments and methods in Sri Lanka and their recent performances.

Large Value Payment System – Real Time Gross Settlement (RTGS) System

The Large Value Payment System (LVPS) facilitates high value payments among banks, individuals, corporates etc. The Real Time Gross Settlement (RTGS) System in Sri Lanka which is owned and operated by CBSL is the sole LVPS in the country. The settlement under RTGS System takes place in "Real-Time" and on "Gross Basis".

The RTGS System, which became operational in 2003, and the LankaSecure System, which became operational in 2004, form a larger settlement system called LankaSettle, which facilitates fund transfers through RTGS System and government security transactions through LankaSecure' system. The RTGS System is operated by the Payments and Settlements Department of CBSL. The performance of the RTGS System is shown in Table 02.

Table 2

The Performance of the RTGS System

	2020	2021	Growth (%)
Volume of transactions ('000)	397	450	13.4
Value of transactions (Rs. bn)	150,051	294,602	96.3

Source: Payments Bulletin - First Quarter 2022, Central Bank of Sri Lanka (2022)

Retail Payment Systems

Retail payment systems and instruments cater for low-value retail payment needs of individuals and institutions. Most commonly used digital retail payment systems and instruments include Common Electronic Fund Transfer Switch (CEFTS), Sri Lanka Interbank Payment System (SLIPS), QR-Based Payments (LANKAQR), LankaPay Online Payment Platform (LPOPP), Internet Banking, Payment Cards and Mobile Payment Applications.

The clearing house function for retail payments has been outsourced to LankaClear (Pvt) Ltd. (LCPL), a company jointly owned by the CBSL and commercial banks. CBSL issues regulations, directions, circulars and guidelines on various retail payment systems that are operated by LCPL. Given below are the details and performance of several important retail payments systems and instruments in Sri Lanka.

Common Electronic Fund Transfer Switch (CEFTS)

The Common Electronic Fund Transfer Switch (CEFTS), which was introduced in 2015, facilitates real-time interbank fund transfers within the country by providing a common infrastructure for switching and clearing electronic payments initiated from multiple payment channels such as mobile banking, internet banking, ATMs, kiosks, and over-the-counter. CEFTS facilitates fund transfers in the nature of both credit transactions and debit transactions between accounts maintained in CEFTS member institutions. CEFTS is operated on a 24x7 basis by LCPL. The performance of the CEFTS is shown in Table 03.

Table 3

The Performance of the CEFTS System

	2020	2021	Growth (%)
Volume of transactions ('000)	27,644	54,675	97.8
Value of transactions (Rs. bn)	2,415	4,927	104.0

Source: Payments Bulletin - First Quarter 2022, Central Bank of Sri Lanka (2022)

Sri Lanka Interbank Payment System (SLIPS)

SLIPS is an electronic fund transfer facility operated by LCPL. SLIPS was introduced as an offline payment system in 1993 by the Sri Lanka Automated Clearing House (SLACH) which operated under CBSL. In the year 2002, the operations of SLIPS were delegated to LCPL. SLIPS transactions carried out before the cut-off time will be settled on the same day

(T+0 basis) and transactions carried out after the cut-off time will be settled on the following day (T+1). The performance of the SLIPS is shown in Table 04.

Table 4

The Performance of the SLIPS

	2020	2021	Growth (%)
Volume of transactions ('000)	36,830	41,868	13.7
Value of transactions (Rs. bn)	2,257	2,862	26.8

Source: Payments Bulletin - First Quarter 2022, Central Bank of Sri Lanka (2022)

QR-Based Payments (LANKAQR)

LANKAQR, launched in 2018, is the national Quick Response Code (QR) standard for local payments. It is based on EMV QR Code specifications for payment systems. LANKAQR-enabled payment applications provide access to low-cost and secured digital payments to a wide range of customers and merchants. By downloading any LANKAQR certified mobile payment application and linking any current account/savings account in any licensed bank, a user can make a payment to a merchant who has displayed a LANKAQR code. The performance of the LANKAQR payment ecosystem is shown in Table 05.

Table 5

The Performance of LANKAQR Payments

	2020	2021	Growth (%)
Volume of transactions ('000)	133	849	538.3%
Value of transactions (Rs. mn)	333	1,922	477.1%
Merchants (as at end period)	169,214	295,921	74.9%

Source: Payments Bulletin - First Quarter 2022, Central Bank of Sri Lanka (2022)

LankaPay Online Payment Platform (LPOPP)

LPOPP, introduced in 2017, enables customers of Licensed Commercial Banks to make secure and convenient online payments to government institutions by transferring money directly from their current or savings account. Board of Investment of Sri Lanka, Sri Lanka Ports Authority, Inland Revenue Department, Employees' Provident Fund, Import and

Export Control Department and Sri Lanka Standards Institution have joined LPOPP as of February 2022. The performance of the LPOPP is shown in Table 06.

Table 6

The Performance of the LPOPP System

	2020	2021	Growth (%)
Volume of transactions ('000)	96	514	433.9
Value of transactions (Rs. bn)	75	198	163.1

Source: Payments Bulletin - First Quarter 2022, Central Bank of Sri Lanka (2022)

Internet Banking

Internet banking allows fund transfers and payments to be executed through the internet using mobile phones, tablets, personal computers, and laptops etc. Under this, financial institutions provide facilities to registered users to perform fund transfers within the financial institution, fund transfers to accounts in other financial institutions as well as bill payments. The performance of Internet Banking in Sri Lanka is shown in Table 07.

Table 7

The Performance of the Internet Banking

	2020	2021	Growth (%)
Volume of transactions ('000)	57,861	135,387	134
Value of transactions (Rs. bn)	4,442	6,470	45.7

Source: Payments Bulletin - First Quarter 2022, Central Bank of Sri Lanka (2022)

Payment Cards

The service providers of payment cards include issuers of payment cards and financial acquirers of payment cards which are licensed by CBSL. Payment card issuers issue credit cards, debit cards, and stored-value cards under several international card schemes while Sri Lanka launched its National Card Scheme (NCS) in partnership with JCB International in 2019. The performance of Payment Cards in Sri Lanka is shown in Table 08.

Table 8

The Performance of Payment Cards

	2020	2021	Growth (%)
Credit cards in use (as at end period)	1,984,525	2,054,985	3.6
Volume of transactions ('000)	44,692	50,689	13.4
Value of transactions (Rs. bn)	222	283	27.4
Debit cards in use (as at end period)	17,803,673	18,069,812	1.5
Volume of transactions ('000)	75,094	108,040	43.9
Value of transactions (Rs. bn)	210	316	50.5
Volume of E-commerce transactions (Credit Card + Debit Card) ('000)	45,755	74,589	63
Value of E-commerce transactions (Credit Card + Debit Card) (Rs. bn)	85	162	90.5

Source: Payments Bulletin - First Quarter 2022, Central Bank of Sri Lanka (2022)

3. Status of Infrastructure Required for CBDC

In Sri Lanka, CBDC is at an initial stage of consideration where the country is equipped with the basic requirements to develop the infrastructure required for the introduction and implementation of CBDC.

Firstly, the core system, which includes the Central Bank and financial intermediaries would require secure and resilient ways of engaging in CBDC transactions. Incidentally, in February 2020, the Financial Technology Regulatory Sandbox of the Central Bank of Sri Lanka was introduced, with the objective of facilitating robust and sustainable innovations that can enable more efficient financial intermediation, greater financial inclusion, and creating a less-cash society through digitalization.[31] Reinforced by such movements, Sri Lanka is witnessing the emergence of several FinTech applications which are now allowing users to enjoy various financial services.

Secondly, the merchants and end-users would require processing infrastructure, which is convenient, fast, and scalable. In terms of processing infrastructure required by the financial intermediaries and end-users of CBDC, Sri Lanka has recorded a greater penetration of mobile phones and internet connections.

[31] Financial Technology Regulatory Sandbox of the Central Bank of Sri Lanka - Version 1.0

Table 9

Penetration of Telecommunication Services

	2017	2018	2019	2020
Cellular phones per 100 persons	132	150	151	131
Internet connections ('000)*	6,747	10,563	13,408	17,524

* Includes mobile internet connections

Source: Economic and Social Statistics 2021 - Central Bank of Sri Lanka

However, physical cash is still Sri Lanka's primary mode of monetary exchange, as the digital payment ecosystem is still growing. While the efficiency and effectiveness of digital payments are ensured to a great extent, the majority of users still need more awareness in order to adopt digital payments as part of their day-to-day transactions. The CBSL is actively promoting digital payments in this regard.

4. Review of Legal and Regulatory Provisions and Need for Amendment

An evaluation of the existing legal framework for issuing currency in Sri Lanka reveals that currently there are no provisions to issue CBDC in Sri Lanka under the Monetary Law Act (MLA), No 58 of 1949. The Section 48 of the MLA states that 'Currency means all currency notes and coins issued or circulated in accordance with the provisions of this act'. This definition does not include digitally issued Central Bank currencies (i.e., CBDC). In the event it is decided by the CBSL to issue CBDC in Sri Lanka, relevant amendments have to be made or new provisions have to be introduced to the applicable laws before such issuance.

5. Initiatives for CBDC and Future Approach

The CBSL has identified the potential of CBDC as an enabler of digital payments which facilitates the creation of a less-cash society while increasing financial inclusion. Following initiatives have been taken by the CBSL in order to identify and evaluate the need for CBDC in the country.

- In 2019, the Payments and Settlements Department (PSD) of CBSL conducted an initial study to evaluate the feasibility of issuing CBDC in Sri Lanka.
- In 2021, PSD conducted a further study on the readiness of environmental preconditions for a CBDC in Sri Lanka.

- The CBSL continues to study and evaluate the potential of issuing CBDC in Sri Lanka, especially in terms of its implications for the economic and financial system stability which are among the core objectives of the CBSL.

6. Leveraging the Benefits of CBDC

Several potential benefits of CBDC can be identified as follows.

- CBDC offers a more efficient, secure, and modern form of Central Bank money to the citizens which augments existing digital payment mechanisms in a country, further promoting a public shift towards digital payments and a less-cash society.
- CBDC provides a safer and trusted means of payment as the widespread adoption of private currencies, which include cryptocurrency and stable coins, may pose a threat to the stability of the monetary and financial system through the substitution effect.
- The cost of currency issuance would be less with CBDC as opposed to conventional currency notes and coins, since the issuance, distribution and overall management of the digital currency is conducted digitally.
- Government-to-Person (G2P) payments could be facilitated with fast and direct delivery of funds, improving the efficiency and transparency of government programs.
- Several new innovative possibilities such as programmable money, data insights and automated tax collections, etc., can be introduced with a CBDC system.

While above benefits exist, the introduction of a CBDC could also affect existing financial market structures via the potential disintermediation of banks which may pose risks to the stability of the financial system. In addition, balancing the privacy of citizens' transactions while maintaining AML/CFT compliance is another consideration when introducing CBDC. Due to the digital nature, CBDC systems should also be robust and resilient against cybersecurity threats. As such, the design and implementation of a CBDC system must carefully consider above aspects as well, in order to obtain the full spectrum of benefits of a CBDC.

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QUESTIONNAIRE FOR EXPERT OPINION SURVEY

SAARCFINANCE Collaborative Study

on

Prospects of Central Bank Digital Currency (CBDC) in the SAARC Region

Expert Opinion Survey

Introduction: A research team comprising officials from Central Banks of the SAARC region is conducting a collaborative study to get a comprehensive view of the prospects of CBDC in the SAARC region.

As a part of the study, we are conducting an opinion survey with the participation of various experts in the SAARC region. It includes experts from banking sector, payment service providers & payment system operators, Central Bank officials, law practitioners, economists, researchers in block chain and CBDC. Information provided via this survey will be treated as strictly confidential and will be used only for the above-mentioned study.

Respondent Information

Name: ………………………

Country: …………………..

Professional background: …………………

Work Experience: ………………………..

Select your area of expertise:

a) Banking
b) Digital Payment
c) Financial Sector Regulator
d) Economist
e) Others (please specify) …………….

Changing Landscape in the World of Finance

1. How much do you agree to each of the following statements about changes in the world of finance, caused by global fintech innovation and development? [Strongly disagree, disagree, neutral, agree, and strongly agree].

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
A. Domestic and cross-border payment systems are on the threshold of transformation.	1	2	3	4	5
B. Decline in the use of cash	1	2	3	4	5
C. Digital currencies pose threat to fiat currency.	1	2	3	4	5
D. The emerging changes to money and the payment system will have significant repercussions on financial and macroeconomic stability.	1	2	3	4	5
E. The Central Banks could seek innovative ways of producing money such as the issuance of CBDC.	1	2	3	4	5

2. Given the recent fintech development in your country, in the next 5-10 years, you expect [select one]
   a. Existing digital payment options to expand and be available widely.
   b. The emergence of CBDC

Motivation/Rationale for Issuing CBDC in Your Country

3. Please rank each of the following statements about the motivation for Central Banks to issue CBDC. (*Instruction: Begin by picking out the most important one and assign it number 1. Then select the second most and assign it number 2. Continue this procedure until you have ranked all the statements.)*

	Rank
A. Develop an efficient and resilient payment system.	…..
B. Improve the access to digital payments	…..
C. Support financial inclusion	…..
D. Reduce or prevent the adoption of privately issued currencies.	…..
E. Preserve the monetary sovereignty.	…..
F. Reduce costs associated with physical cash.	…..
G. Mitigate money laundering and financing terrorism.	…..
H. Reduce the size of the shadow economy and related drain on tax revenues.	…..
I. Others, please specify (……………………………………………)	…..

4. What Central Bank objectives or functions do you think CBDC will serve in your country?
   a. ……………..
   b. …………….

c. …................

5. In your opinion, is there a specific need that can be fulfilled by issuing CBDC, which cannot be achieved through other forms of digital alternatives/money (i.e. e-money, payment cards)?

   a. ……………..
   b. …………….
   c. …................

Preconditions for Issuing CBDC

6. Please rank each of the following statements about preconditions necessary for the issuance of CBDC? (*Instruction: Begin by picking out the most important precondition and assign it number 1. Then find the second most and assign it number 2. Continue this procedure until you rank all the statements.)*

		Rank
A.	Review of the existing legal and institutional framework.	…..
B.	Adequately developed technological infrastructure such as electricity and mobile network.	…..
C.	Adequate level of digital financial literacy.	…..
D.	Extensive consultation and coordination among key stakeholders.	…..
E.	Commitment and readiness of Central Bank and the government towards CBDC.	…..
F.	Availability and development of skilled human resources	…..
G.	Allocation of sufficient resources in developing, operating, and managing CBDC.	…..
H.	Others, please specify (……………………………………)	…..

Macroeconomic Impact of CBDC

7. How much do you agree to each of the following likely macroeconomic impact of CBDC? [Strongly disagree, disagree, neutral, agree, and strongly agree].

		Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
A.	Improved monetary policy transmission.	1	2	3	4	5
B.	Reduction in informal economy	1	2	3	4	5
C.	Efficient payment and settlement	1	2	3	4	5
D.	Strengthens financial stability.	1	2	3	4	5
E.	Financial disintermediation.	1	2	3	4	5
F.	Effective in Responding to economic crisis	1	2	3	4	5

8. Do you think there is the necessity for a review of legal provisions in your country to encompass CBDC?
   a. Yes
   b. No
9. In your opinion, what are the major internal organizational requirements within the Central Bank for CBDC?
   a. ………………………
   b. ………………………
   c. ………………………

Downside of Issuing CBDC (Risk)

10. How much do you agree to each of the following statements about **risks associated with the issuance of CBDC?** [Strongly disagree, disagree, neutral, agree, and strongly agree].

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Disintermediation of banking sector if CBDC competes with deposits.	1	2	3	4	5
Affect the current transmission mechanism of monetary policy.	1	2	3	4	5
Risk of massive flight of deposits "bank runs" from banking system during financial panic	1	2	3	4	5
Important implication on Central Bank balance sheets.	1	2	3	4	5
Risks regarding the availability and dependency on other infrastructure (i.e. telecom network, availability of electricity).	1	2	3	4	5
Technological vulnerabilities such as hacking.	1	2	3	4	5

Design Considerations of CBDC

11. Please rank each of the following statements about the design consideration of CBDC according to importance. (*Instruction: Begin by picking out the most important and assign it number 1. Then find the second most and assign it number 2. Continue this procedure until you have ranked all the statements.)*

	Rank
A. Compliance with legal framework.	…..
B. Centralized traditional or decentralized platform	…..
C. Cybersecurity consideration	…..

D. Compliance with Financial Action Task Force (FATF) standards. …..

E. Degree of anonymity to financial privacy …..

F. If other, (Please specify) ………………………………… …..

12. What are the types of CBDC your countries would prefer to introduce given the level of financial and technology development?

    a. Retail Payment
    b. Wholesale Payment
    c. Cross-border Payment
    d. Any other, please specify..

13. What would be the preferred choice of technology for CBDC?

    a.
    b.
    c.

14. Any additional suggestions, opinions about CBDC, and/or important information or sources that you want to share

    a. ……………..
    b. …………….
    c. …..................

Thank you. Your contribution will be highly appreciated.