



GETTING CBDC RIGHT FOR INDIA

LESSONS FROM THE REST OF THE WORLD

**POLICY
BRIEF**

1

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Abstract

The fast-track launch of CBDC announced for 2023 means that the debate in India is no more about whether and when to introduce a CBDC, but the way forward. There are compelling reasons for India to pursue both a retail and wholesale CBDC. It is difficult to predict at the moment whether the bang for the buck will lie in serving a huge untapped domestic market or the potential for cross-border engagement through wholesale CBDCs. The policy brief provides an analysis of strategies adopted by different countries and the design choices that may be advisable for India, based on the existing experience of other countries. It is desirable for India to adopt a gradual, graded approach, contextualised to its financial and monetary system; there is no one size fits all for CBDCs. While the wholesale CBDC may be designed and implemented in co-ordination with an existing multi-CBDC project or a bilateral agreement with a partner country, a retail CBDC should ideally be intermediated in architecture based on a decentralised ledger and account-based identification.

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Getting CBDC Right for India: Lessons from the Rest of the World

1. CBDCs are the central banks' response to the growing popularity of private currencies

Central Bank Digital Currency (CBDC) is the 'digital liability of a Central Bank that is widely available to the general public'.¹ In other words, it is legal tender issued by a central bank in digital form.² It can be described as a new payment technology (Aeur et al., 2020a) either acting as instruments for settlements between financial institutions (wholesale CBDC) or one that is issued to the general public (retail CBDC).³ They flow through the monetary system just like coins and bank notes with a direct claim on the central bank.

The introduction of CBDCs comes on the back of the declining use of cash and the emergence of competing private sector digital payment options and increasing internet penetration. Although CBDCs were first proposed by James Tobin, an American Economist, in 1987, the tipping point according to some was Facebook's announcement to launch a digital 'stablecoin' called Libra, in January 2021, which was subsequently abandoned.^{4, 5} In China, the growing popularity of digital payment platforms such as Alipay and WeChat Pay appear to have compelled People's Bank of China (PBOC) to launch a digital renminbi. Since CBDCs, like other digital payment options, enable contactless payment, they were pushed through as priority during the Covid-19 pandemic. Finally, the recent collapse of several private cryptocurrencies bolstered the view that

digital currencies without sovereign backing will be inherently unstable, strengthening the case for CBDCs.

India's has both offensive and defensive interests in introducing a Reserve Bank of India (RBI)-backed digital rupee. On the offensive side, a CBDC feeds into the natural progression for a country that has a vibrant fintech ecosystem and more than 300 million digital payment users.⁶ CBDC will not only plug gaps in financial inclusion, it will also help India take a leadership role when the world embraces decentralised finance in a major way. Secondly, many Indian policymakers have talked about the idea of internationalising the Indian currency and the adoption of CBDC could accelerate that process. On the defensive side, Indian policymakers are concerned that the growing popularity of private digital currencies and assets could accelerate the dollarization of the Indian economy, especially in the absence of a sovereign-backed digital currency available as an alternative to private stablecoins.⁷

1.1 Some countries have already taken the CBDC plunge

No country has been completely immune from the CBDC phenomenon. Of the 109 countries that have been tracked, 10 countries have launched a CBDC, which accounts for 6 per cent of all the countries in the world (Figure 1). These include the Sand Dollar in Bahamas, which has been in circulation since 2020.⁸ Seven countries in the Eastern Caribbean launched D cash, a blockchain-

1 As defined by: <https://www.federalreserve.gov/publications/files/money-and-payments-20220120.pdf> Accessed in July, 2022

2 <https://www.bis.org/review/r210811a.pdf> Accessed in July, 2022

3 Liability typically includes (1) currency (2) deposits of government and of banks (3) loans (including securities) (4) other liabilities and (5) capital account including paid up capital and reserves. <https://www.rbi.org.in/upload/Publications/PDFs/60611.pdf> Accessed in July, 2022

4 Aeur et al., 2020a

5 "The term 'stablecoin' has no established international classification, and such coins may not actually be stable and may pose risks that are similar to those of other crypto assets." (G7 Working Group on Stablecoins, 2019). <https://www.tresor.economie.gouv.fr/Articles/5f8c26f2-a2cd-4685-ba82-fa9e4d4e5d67/files/d10fb97f-a9a6-472b-842a-8b279e8863c4>. Accessed in July, 2022

6 https://www.business-standard.com/article/technology/indians-embrace-digital-over-300-mn-smartphone-users-use-digital-payments-121090500826_1.html Accessed in July, 2022

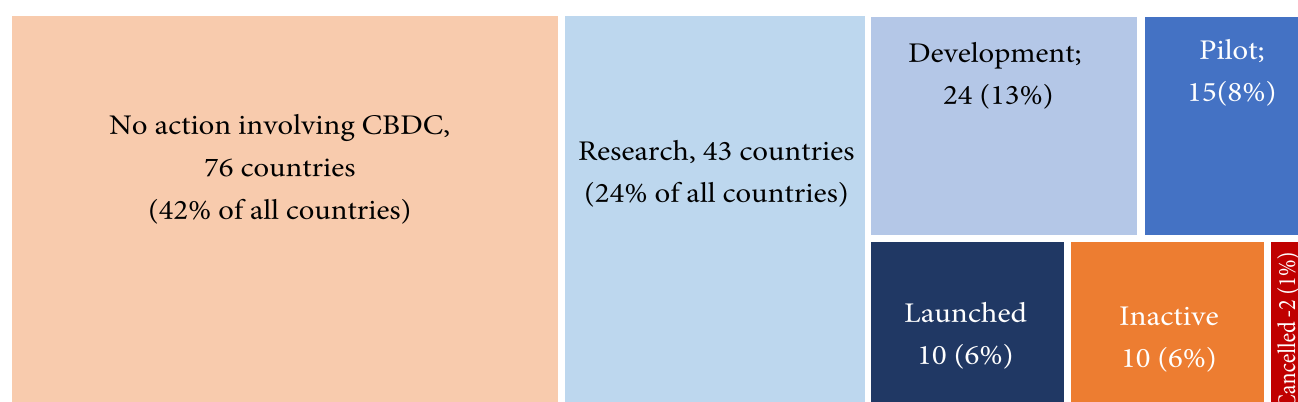
7 As indicated by Mr Rabi Shankar, Deputy Governor RBI, in his keynote address at a webinar organised by ICRIER.

8 <https://www.sanddollar.bs/> Accessed on July, 2022

based currency in 2021.⁹ D cash allows users to make payments using QR codes through an app on their smartphones and does not need the user to have a bank account. Users can be approved by a non-bank financial institution to create a D cash wallet. In 2021, Nigeria launched its CBDC, e-Naira, which is stored in a digital wallet and can be used for contactless in-store e-payments and

for transferring money. Bank account holders can access e-Naira by signing up for Nigeria's Bank Verification Number (BVN) identity. The most recently launched CBDC is by the Central Bank of Jamaica. Dubbed Jamaica Digital Exchange or JAM-DEX; the Jamaican CBDC was launched in May 2022 and will be rolled out in a phased manner.

Figure 1: Only 6 per cent of countries in the world have launched CBDCs, while the rest are at various stages of preparation



Source: CBDC Tracker, Atlantic Council

Apart from these ten countries, there are 15 in the pilot stage,¹⁰ and several others in the development and research stage (refer to Annex 1 for examples). There are also two countries – Ecuador and Senegal – that have cancelled their CBDC on account of poor uptake and compliance. CBDCs are inactive in 10 other countries. For instance, in Egypt, since the announcement in December 2018, when the estimated unbanked population in the country stood at 84 per cent, there has no public reference to CBDCs. In Denmark, a CBDC evaluation found significant legal, financial and administrative challenges with no clear upside for the Danish economy; the plans have been on hold since 2017. In several other countries, there have been no updates since their announcement a few years ago.

There are 15 countries in the pilot stage, including China, Russia, Sweden, Thailand, Malaysia,

Singapore and Saudi Arabia.¹¹ Sweden's Riksbank has developed a proof of concept and is exploring the technology and the policy implications of introducing a CBDC. In China, the digital renminbi [e-CNY] is being tested.¹² Singapore has been testing the model of wholesale CBDCs through a variety of cross-country collaborations including Project Dunbar with Malaysia, Australia and South Africa, and Project Jasper with Canada.^{13, 14}

It is clear that among the countries that have launched a CBDC, none occupy a position of global economic power. The largest economy in the set is Nigeria and the combined GDP of these countries as a percentage of world GDP is estimated at less than 1 per cent.¹⁵ However, countries in the pilot stage find a mix of prosperous and emerging economies that drive global trade, supply chains and are endowed with rich resources. Uniquely, all countries have a high level of internet penetration,

⁹ <https://www.euronews.com/next/2021/04/06/eastern-caribbean-becomes-the-first-currency-union-to-issue-blockchain-based-digital-currency> Accessed on July, 2022

¹⁰ For a discussion of the attempts made in various countries, see Aeur et al. (2020a).

¹¹ Aeur et al. (2020a)

¹² IMF Speech <https://www.imf.org/en/News/Articles/2022/02/09/sp020922-the-future-of-money-gearing-up-for-central-bank-digital-currency> Accessed in July, 2022

¹³ <https://www.bis.org/about/bisih/topics/cbdc/dunbar.htm> Accessed in July, 2022

¹⁴ <https://www.mas.gov.sg/-/media/Jasper-Ubin-Design-Paper.pdf> Accessed in July, 2022

¹⁵ Estimates based on GDP for 2022

with the exception of Nigeria. However, the Network Readiness Index,¹⁶ which provides a more comprehensive review of the digital economy on measures of governance, technology, people and impact, finds countries ranging from rank 2 to rank 103 of the 130 countries included in the analysis. We try to correlate some economic dimensions to the architecture and design choices adopted by countries in implementing their CBDC in the following subsections.

2. CBDC Architecture, Use Cases and Design Features

The building blocks of a CBDC – the choice of operating model, design features, technology and implementation – are critical decisions in how a

country's CBDC could influence monetary policy, cross-border economic engagement and the country's traditional financial system. It is not surprising that countries spend years planning, designing and implementing a CBDC. In India, however, the target has been ambitiously set at a year. The World Bank Guidance Note on CBDCs helps country's think through the 5 'Ws', why a country should adopt CBDCs, what type and model of CBDC, when it should be implemented, where or which systems should issue and circulate CBDCs and who should be involved in the process and their designated roles.¹⁷ We discuss some critical choices related to architecture, use cases and design features. These choices are summarised in Table 1, followed by an elaboration in the subsections below.

Table 1: CBDC: Choices for Architecture, Use Cases and Design Feature

Architecture	Use Cases	Design Features
<ul style="list-style-type: none"> • Direct • Hybrid/Intermediated • Synthetic 	<ul style="list-style-type: none"> • Wholesale • Retail • Both Wholesale and Retail 	<ul style="list-style-type: none"> • Interest or non-interest bearing • Quantitative restrictions or unlimited • Anonymous or non-anonymous transactions • Online or offline transactions • Distributed ledger or centralised control • Token or account-based currency

2.1 Architecture: The popularity of a hybrid/ intermediated architecture

Countries can choose from three types of architectures – (i) direct or unilateral, (ii) hybrid or intermediated and (iii) synthetic. Most countries that have implemented or are considering the implementation of CBDCs choose architectures that help maintain an oversight on the economy and, in particular, on the financial system. This is possible in the hybrid/intermediated CBDC (the preferred option in all 10 that have launched a CBDC and 8 of 15 in the pilot stage) where issuance is done by a central bank and the private sector plays the role of an intermediary, contributing to onboarding of users or execution of payments, although the central bank oversees all activities for CBDCs. The other two categories are (i) direct or unilateral CBDCs where central banks are solely

responsible for carrying out all functions from issuing to distributing as well as interacting with end-users and (ii) synthetic CBDCs, not issued by a central bank but backed by one-to-one central bank-issued assets, which is similar to stablecoins.

2.2 Use case: Retail Versus Wholesale

Perhaps the most important choice made by countries is in determining the use case which can be retail, wholesale or both. Wholesale CBDCs have limited circulation, usually limited to regulated financial institutions, and are intended for the settlement of interbank transfers.¹⁸ Retail CBDCs, on the other hand, is central bank digital money made available to the general public. It is a digital form of cash with a direct claim on the central bank.¹⁹ Eight of the 10 countries that have launched the CBDC and 5 of 15 countries in the

¹⁶ <https://networkreadinessindex.org/> Accessed in July, 2022

¹⁷ Central Bank Digital Currency: A Payments Perspective, World Bank, November 2021 <https://openknowledge.worldbank.org/handle/10986/36765> Accessed in July, 2022

¹⁸ <https://www.bis.org/publ/arpdf/ar2021e3.htm> (Last Accessed on August 24, 2022)

¹⁹ Op. Cited

pilot stage have issued a retail CBDC. Two other countries that have launched CBDCs have allowed for both retail and wholesale, which includes China. More importantly, 4 of 15 countries in the pilot stage are considering wholesale CBDCs. These are Singapore, Malaysia, Saudi Arabia and UAE, while 5 others are considering both. These choices, and the choice of introducing a CBDC itself, as discussed above, can be driven by multiple political and economic choices; we focus on a few below.

For instance, correlating use case choices with the data on economic openness, we find that countries where the relative importance of trade in the economy is higher are those exploring wholesale CBDCs. Since wholesale CBDCs improve the efficiency of payments and securities settlement, including the lowering of counterparty credit and liquidity risks, it finds a variety of use cases including, most importantly, cross border payments.²⁰ For international trading, hubs easing backend settlements using CBDCs can be very advantageous. In Figure 1, we plot two graphs, one with trade-to-GDP ratio versus cash-to-GDP ratio, and the other with trade-to-GDP ratio versus bank branch density, for countries that have launched a CBDC or are in the pilot stage for adoption of CBDC. We use data on cash-to-GDP ratio and the number of commercial bank branches per 1000 sq. km (a measure of financial inclusion) to find trends in countries adopting retail CBDCs, since the most commonly cited reasons for a retail CBDC is lowering the cost of a cash-based financial system and enabling financial inclusion.

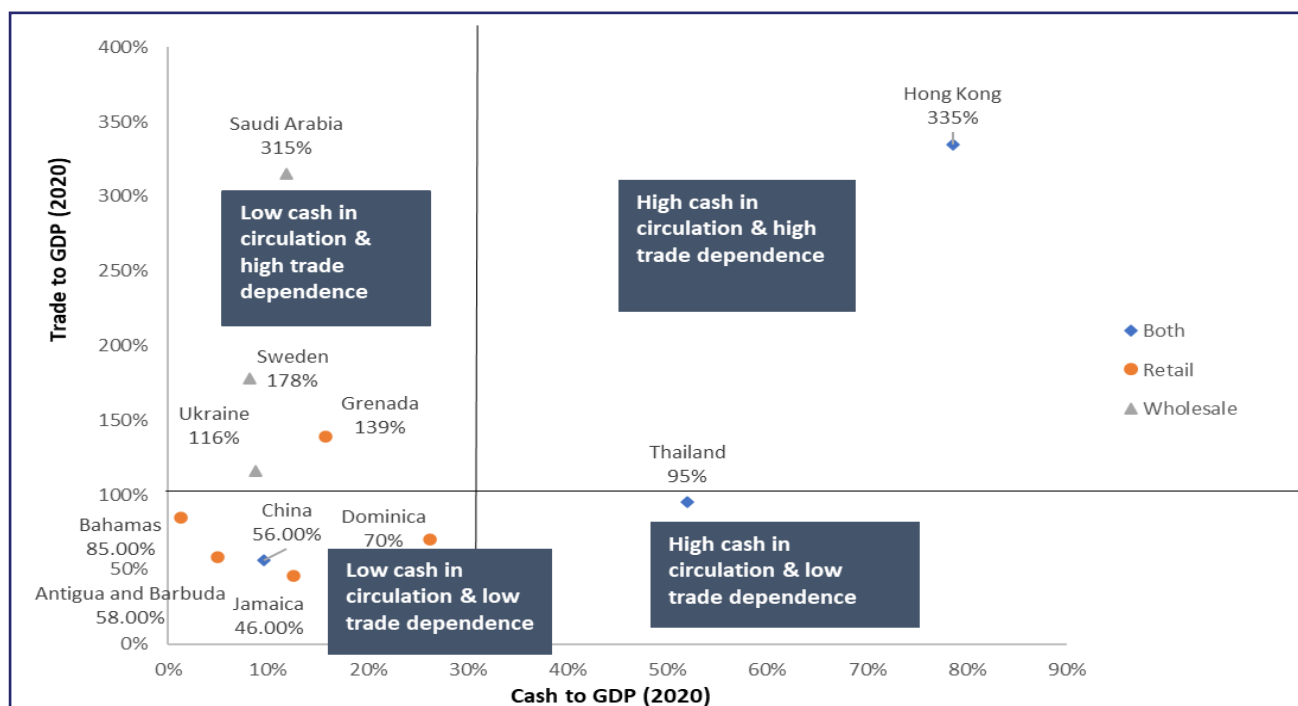
Trade-to-GDP ratio is over 100 per cent for Ukraine, Saudi Arabia and Sweden, which are piloting wholesale CBDCs. Singapore has not been included in the first graph because of missing data on cash-to-GDP ratio and on the second as an outlier (493.7 bank density against an average of 15.9 for other countries), but has a trade-to-GDP ratio of 139 per cent and is actively pursuing wholesale CBDCs through cross-border projects. Hong Kong, like Singapore, with a very high bank branch density (1259) and high cash-to-GDP ratio is pursuing both retail and wholesale CBDCs. In countries where the choice is only retail, trade dependence is relatively lower, although there is no clear trend on the preponderance of a cash economy or low levels of financial inclusion. We have countries both in the high and low categories. Anecdotally, however, countries opting for retail CBDC have been competing well on digital payment solutions, driven both by the private and public sector and have real time payment solutions that cut across traditional payments as well as digital payments systems. This, in some sense, relates to the readiness of the digital ecosystem to adapt to a CBDC.

The choice of a retail CBDC might also arise from an assessment of potential macroeconomic risks that wholesale or cross-border CBDCs are likely to raise. In an open economy context, CBDCs will have implications on currency substitution, degrees of international risk-sharing, and global spill-overs from other country shocks and policies.²¹ In other words, choice may be driven more by caution than need.

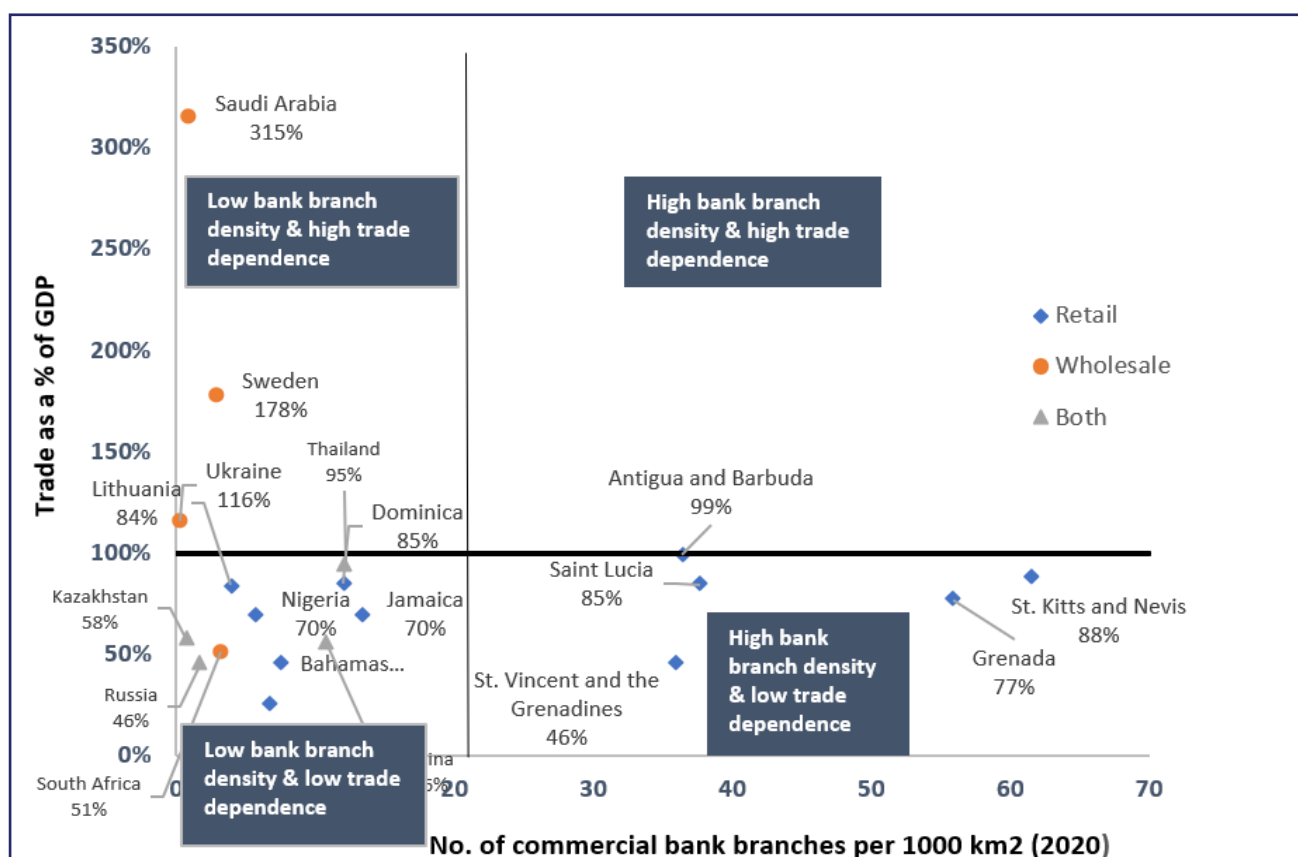
20 <https://www.outlookindia.com/business/all-you-need-to-know-about-wholesale-and-retail-central-bank-digital-currency-cbdc--news-192971> Accessed in July, 2022

21 Adina Popescu, 2022, Cross-Border Central Bank Digital Currencies, Bank Runs and Capital Flows Volatility, IMF Working Paper <https://www.imf.org/en/Publications/WP/Issues/2022/05/06/Cross-Border-Central-Bank-Digital-Currencies-Bank-Runs-and-Capital-Flows-Volatility-517625> Accessed in July, 2022

Figure 2: Economic Profile and CBDC Use Case



Sources: Trade-to-GDP ratio: Country Profiles, UNCTADStat, Cash-to-GDP ratio: CEIC, Statista



Sources: Trade-to-GDP ratio: Country Profiles, UNCTADStat, Commercial Bank Branch Density: IMF Financial Access Survey (2021)

2.3 Design Features

Design features of a CBDC include aspects such as whether the digital currency will carry interest, whether quantitative restrictions will be placed on CBDC holdings, on anonymity of transactions, provisions for off-line transactions, token-based or account-based issuance, centralised control or a distributed ledger, etc. These design features are important in ensuring smooth modernisation of the financial system without disrupting traditional banking businesses. They are also informed by the policy goals governments intend to fulfil with the use of a digital currency. These may include reducing illegal use of money, accessibility to finance, competing alternatives to other digital payment platforms, monetary sovereignty, etc. For instance, interest bearing CBDCs can help improve monetary transmission.²² However, in many cases, as also seems to be the position in India,²³ CBDCs completely mimic cash, bearing no interest. The broader theme cutting across all these policy objectives is to modernise payment systems that are secure and allow for continuous innovation.

We find that countries such as Canada, China, Sweden, Uruguay, ECCU and Bahamas that have either implemented a CBDC or are in an advanced stage of doing so have made uniform choices across most of these features.²⁴ For instance, most of these countries have stayed away from interest bearing CBDCs, adhered to quantitative restrictions and permitted anonymity in a tiered approach with different thresholds for value of transactions. These choices reflect an incremental approach to centrally digitising the payment systems instead of a big-bang disruption.

Finally, the choice of technology, especially with respect to verification and security of transactions is an important consideration. Most countries

in the launch and pilot phases are adopting the distributed ledger technology as against a centrally managed database, although a handful of countries like the Bahamas, Russia and China are considering both options. It is also important to note that in many countries, central banks rely on technology partners to implement CBDCs. Another important point related to technology is access through tokens or accounts. In an accounts-based system, the identity of a payer is identified, while in a token-based system, the validity of the object used to pay is verified.²⁵ There is no uniform direction in why countries choose token or account or both; it is a choice that is determined by the legal framework for oversight.

2.3.1 Globally co-ordinated implementation

A design feature that merits more discussion is the role of CBDCs in enabling cross-border payments applicable to wholesale CBDCs. While most existing CBDC initiatives focus on domestic issues and use cases, the G20 is particularly interested in furthering its co-ordinated use across countries to build effective and robust means to issue, distribute and transfer CBDCs, improve connectivity and interoperability, and enable financial inclusion. Accordingly, this year's G20 Techsprint hackathon is focused on individuals and firms bringing to the table innovative and applicable solutions in CBDCs.²⁶

In a note of caution, the World Bank states that CBDCs may not be a panacea to enhance the efficiency and accessibility of cross-border payments.²⁷ The G20 stock taking on existing standards, data frameworks, payment systems and CBDC design finds that along with co-ordinated implementation of CBDC, other fundamental and technical areas such as liquidity bridges also need to be reviewed.²⁸ Central banks have responded to this by setting up collaborative projects that can

22 D. Priyadarshini and Sabyasachi Kar, 2021, "Central Bank Digital Currency (CBDC): Critical Issues and the Indian Perspective" IEG Working Paper No. 444 Available at http://iegindia.org/upload/profile_publication/doc-240921_152405WP444.pdf Accessed in July, 2022

23 <https://www.financialexpress.com/digital-currency/cbdc-will-not-bear-any-interest-rbi-dg/2485365/> Accessed in July, 2022

24 Behind the Scenes of Central Bank Digital Currency: Emerging Trends, Insights and Policy Lessons, IMF, Note 2022/004

25 <https://libertystreeteconomics.newyorkfed.org/2020/08/token-or-account-based-a-digital-currency-can-be-both/> Accessed in July, 2022

26 <https://www.ledgerinsights.com/cbdc-finalists-announced-for-g20-techsprint-hackathon/> Accessed in July, 2022

27 Central Bank Digital Currency: A Payments Perspective, World Bank, November 2021 <https://openknowledge.worldbank.org/handle/10986/36765> Accessed in July, 2022

28 <https://www.fsb.org/wp-content/uploads/P131021-1.pdf> Accessed in July, 2022

operate using three types of models²⁹ that have been described below.

- (a) Currency specific wholesale CBDCs (W-CBDC) are issued against a country's local currency for participating banks in their jurisdiction. Two central banks enter into an agreement to allow their participating banks to exchange if they maintain a W-CBDC account of the central bank in the other jurisdiction. In other words, these are single currency accounts.
- (b) In this model, commercial banks can hold multiple W-CBDC accounts with their central bank, and the home central bank must support multiple W-CBDC tokens.
- (c) In this model, there is a universal CBDC that will be backed by a basket of currencies and accepted by all participating jurisdictions.

Models (b) and (c) assume some degree of interoperability based on access and settlement arrangements. These can also imply connecting retail and wholesale CBDCs across borders and will require strong co-operation across central banks, including on technological and legal aspects. Project Dunbar co-ordinated by the BIS Innovation Hub, Project Inthanon-LionRock between the Bank of Thailand and the Hong Kong Monetary Authority as well as mCBDC Bridge driven by the Hong Kong Monetary Authority, Bank of Thailand, People's Bank of China, Central Bank of UAE and Monetary Authority of Singapore are some examples.

3. India's Policy Choices

The fast-track launch announced for 2023 means that the debate in India is no more about whether and when to introduce a CBDC, but the way forward. As the title of this policy brief suggests, India must work towards getting this right. With objectives that cut across financial inclusion,

transactional efficiencies, checking illicit use of money, smoothening the international payments system, etc., India has compelling reasons to pursue both retail and wholesale CBDCs. Both processes can be simultaneously designed and tested before a formal launch. There is some evidence emerging from the implementation of CBDCs and pilot projects across the world that inform the recommendations in this policy brief.

3.1 India's Wholesale CBDC

Both RBI and officials from the Ministry of Finance have highlighted global settlements as one of the policy priorities for CBDC; wholesale CBDC, hence, is an obvious choice. India should participate in the existing multi-CBDC projects that are being co-ordinated by the Bank for International Settlement's Innovation Hub (BISIH).³⁰ Some of the projects include Project Helvetia (Swiss), Project Dunbar (Singapore), etc. The activities are guided towards contributing to technology, proof of concept and currency prototypes. India could also initiate a new project through the BISIH that includes countries that are important for its cross-border trade and remittances. However it goes, this is a long-drawn exercise; as the progress of the BISIH projects suggests, existing projects are nowhere close to implementation.

Alternatively, India could initiate a bilateral dialogue with countries that are similar in the adoption of digital payments and macroeconomically aligned – for instance, Singapore and Canada's experiment with Project Ubin³¹ and Project Jasper.³² The experiment between Canada and Singapore is still to confirm its use at scale and other questions related to legality and governance. However, India will first need to develop an internal working system for a wholesale CBDC to explore external transactions. Private sector technology partnerships can greatly enable this process.

29 Central Bank Digital Currencies for Cross-Border Payments, November 2021, World Bank <https://openknowledge.worldbank.org/bitstream/handle/10986/36764/Central-Bank-Digital-Currencies-for-Cross-border-Payments-A-Review-of-Current-Experiments-and-Ideas.pdf?sequence=1&isAllowed=y> Accessed in July, 2022

30 <https://www.bis.org/about/bisih/topics/cbdc.htm> Accessed in July, 2022

31 <https://www.ledgerinsights.com/singapore-exchange-central-bank-blockchain-settlement/> Accessed in July, 2022

32 <https://www.payments.ca/industry-info/our-research/project-jasper> Accessed in July, 2022

3.2 India's Retail CBDC

The discussion on the architecture and design features in Section 3 outlined some of the decision variables that are core to the implementation of a CBDC. These are also closely tied with the policy objectives that the regulator has in mind. From public resources available, we know that the government in India envisions the CBDC catalysing the ongoing momentum to achieve financial inclusion, enable small value commercial transactions, lower currency management costs, protect financial systems from the rise of private currencies, etc. Accordingly, RBI has already taken a position on some of the design features.

Firstly, there is a decision to adopt a phased approach for the implementation of CBDCs. On whether this will be by institutions, sectors or geographies is still unclear. Digital literacy and the readiness of the ecosystem as well as the degree of economic integration will determine the sequence of adoption and scaling up of CBDCs. Secondly, there is a decision by the RBI that the CBDC will not be interest bearing and will mimic cash as a digital counterpart. On the others, there is no clear signal yet. For other features, we recommend the following.

- *Hybrid/intermediated architecture* – Like most other countries, it will be advisable for India to adopt a hybrid/intermediated architecture, i.e., engage with technology partners to design and implement, but control its roll out and overall functioning. A direct model will become too onerous for the RBI, given the lack of experience with large-scale technology projects while a synthetic architecture might become too risky for the scale at which CBDC will impact the economy, especially the financial system. Even with the hybrid model, the government will have to make a choice between an indigenous technology partner with blockchain capabilities or foreign companies like Bitt Inc., Soramitsu, Ripple, etc., that have established CBDC expertise.
- *Building quantitative restrictions* – The decision on quantitative restrictions will depend on the phasing of the implementation programme. It will be advisable to follow some restrictions, at least in the beginning, to allow

the banking and payments system to readjust and align themselves to a CBDC.

- *Anonymity of transactions* – One of the biggest advantages of physical cash is anonymity, at least for low value transactions. Even in the current system, regulations demand the PAN only for transactions over INR50,000. In keeping with this norm, anonymity in the digital rupee should also follow a tiered approach, allowing a maximum threshold below which transactions will be anonymous. This is also adopted by many countries since privacy is a paramount concern.
- *Offline Access* – The government must make provisions for offline access and transactions through CBDC. Given the status of the network infrastructure, where connectivity to the unbanked might be limited, enabling offline transactions will be a huge upside in driving the adoption of CBDC. The government has worked with these challenges in the past, enabling transactions through USSD, coupons and QR codes. Similarly, for the digital rupee, both online and offline transactions should be available to provide for quick adoption and scale.
- *Distributed Ledger* – Distributed ledgers are more popular than centrally controlled technologies for the implementation of CBDC projects. The DLT ecosystem is fairly mature in India and can be leveraged to support the CBDC project. Moreover, the technology also provides a sense of security and trust, making it more attractive for adoption. However, in comparison to private digital currencies, which work on permissionless blockchains, CBDCs usually work on permissioned identities with multiple copies of financial records instead of a single central database.
- *Account-Based* – Users of the current payments system in India are more familiar with an account-based system rather than tokens. To that extent, we would recommend using accounts for transfer and payments of the digital rupee. The choice of an accounts-based system also makes users identifiable, unlike the anonymity offered by tokens. However, a detailed review of the pros and

cons, perhaps in a survey of users, might be useful to determine the right choice. Table 2

below summarises this discussion.

Table 2: Architecture and Design Implementation Choices for India's Retail CBDC

Feature	Architecture (Direct, Intermediate or Synthetic)	Quantitative Restrictions (Yes or No)	Anonymity of Transactions	Online or Offline	Technology (Distributed Ledger or Centralised Control)	Access (Token or Account -Based)
Approach	Intermediate	Yes	Tiered	Both	Distributed Ledger Technology	Account-based
Rationale	Technology partners with existing expertise will expedite the implementation and ensure quality	This will be necessary to moderate the impact of the CBDC and can be aligned to phased implementation	It will help achieve a balance between ease and privacy of small token transactions and check illicit use at the same time	India's current internet infrastructure demands that an offline option be made available, especially in rural areas that suffer from financial exclusion	The technology inspires trust and security. The tech ecosystem brings relevant expertise	Existing governance frameworks are familiar with account-based access. However, careful reconsideration through a survey is recommended

CBDCs are undoubtedly a very complex decision making and implementation project. Some decisions are more obvious than the other, more so since other countries have a proven track record. For many others, further research and analysis of features, in addition to a well-planned pilot, will definitely help build a robust framework for India's CBDC. It is difficult to predict at the moment

whether the bang for the buck will lie in serving a huge untapped domestic market or the potential for cross-border engagement through wholesale CBDCs. As stated above, it may be advisable for India to explore both wholesale and retail CBDCs simultaneously. There is no one size fits all; the choice for the Indian digital rupee has to be driven by its own economic circumstances.

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Annex 1: Status of CBDCs around the world

Status of CBDC	Number of countries	Examples of Countries/ Regions
Launched	10	Bahamas, Nigeria, Eastern Caribbean (Antigua & Barbuda, Dominica, Grenada, Montserrat, St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines) and Jamaica
Pilot	15	Anguilla, China, Hong Kong, Jamaica, Malaysia, Russia, Saudi Arabia, Singapore, South Africa, South Korea, Sweden, Thailand, UAE, Ukraine
Development	24	Australia, Brazil, Canada, India, Turkey
Research	43	Belarus, Chile, Czech Republic, Indonesia, Iran, Norway, Taiwan, UK, USA
Inactive	10	Bermuda, Curacao, Egypt, North Korea, Denmark
Cancelled	2	Ecuador and Senegal

Compiled from <https://www.atlanticcouncil.org/cbdctracker/> (Last Checked on June 7, 2022)



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