

CHAPTER 3

# Central Bank Digital Currency (CBDC) - RBI concept note

**This article aims to:**

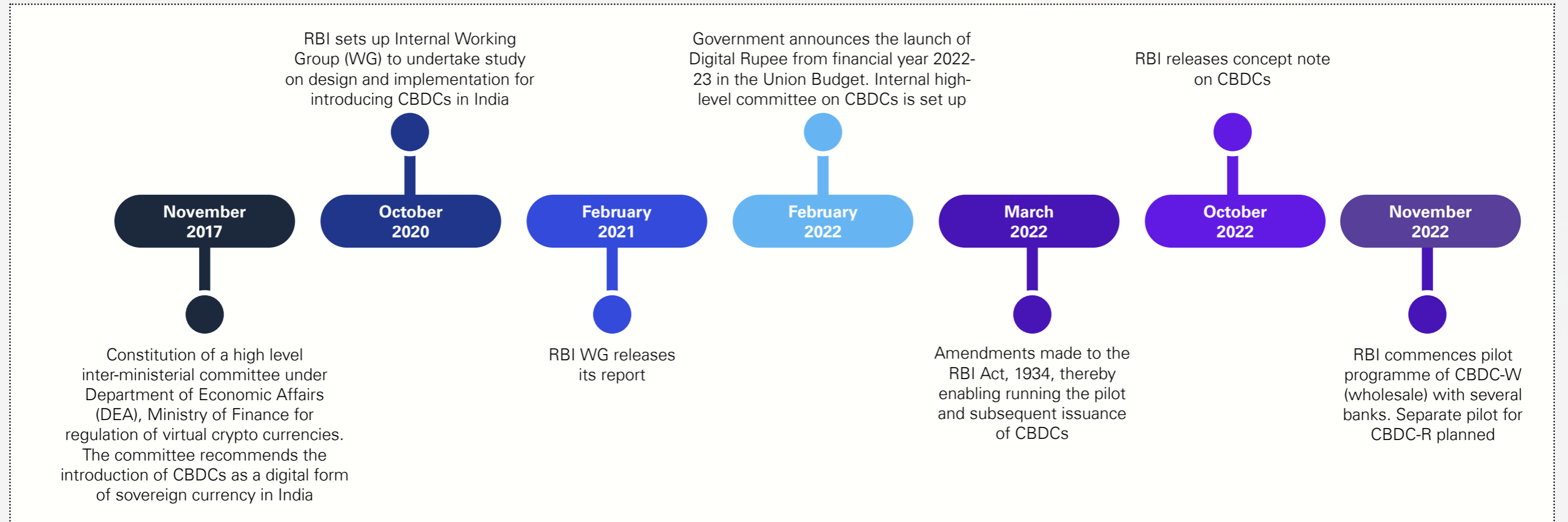
Highlight the CBDC concept note.



The Reserve Bank of India (RBI) has released a concept note on Central Bank Digital Currencies (CBDCs) on 7 October 2022. This concept note helps to create awareness about CBDCs. The concept note also discusses key considerations such as technology and design choices, possible uses of the Digital Rupee (e ₹), issuance mechanisms, etc.

The article discusses the key motivations and objectives for a CBDC, design and technology choices available and examine the policy and other implications of introducing CBDC in India.

A timeline of various events leading to this concept note is presented below:



*(Source: KPMG in India's analysis, 2022 read with the RBI Concept Note on CBDCs dated 7 October 2022)*

## CBDC – What is it?

Current form of currency is essentially a debt instrument. It is a liability of the issuer (the central bank) and an asset of the holders. A currency note/coin represents this claim on the central bank. CBDC is a digital representation of this claim (for example, through a digital token issued by the central bank). It does not involve a printed currency note/coin, therefore, it will be a virtual currency.

RBI defines CBDC as a legal tender issued by a central bank, in a digital form. It will be akin to existing fiat currency issued by the central bank and would continue to perform the same functions i.e., as a safe store of value, a unit of measure and as a medium of payment. In terms of value, it would be exchangeable at par (1:1 ratio) with the existing 'paper' currency.

Many of us use digital wallets and online payments platforms to perform various purchase/sale transactions. The key difference between the money held in the current digital wallets/deposit accounts and CBDCs is that, whereas the present digital wallets/account balances represent a claim on a commercial bank (or a digital wallet service provider), CBDC represent a claim on the central bank. It will be direct liability of the central bank. As a result, unlike a commercial bank liability, there is no credit risk or liquidity risk associated with the CBDC. It is important to remember that

the proposed CBDC is not expected to replace or substitute the existing payment systems but act as another mode/platform through which users can hold and transact in central bank money.

## Global scenario<sup>1</sup>

Globally, more than 90 per cent of central banks are exploring the implementation of CBDC. It has been already launched in countries like the Bahamas, Nigeria and the East Caribbean Currency Union. Pilot projects/testing of CBDC is being undertaken in countries such as China, Sweden, Ukraine and Jamaica. China has also commenced a pilot of the e-yuan (e-CNY) in select cities and has launched a mobile app with a digital wallet for retail users. Further, France, Switzerland and Singapore have launched a joint trial of their experimental CBDC, a first cross-regional trial. Many other countries/regions are in the process of developing/designing CBDCs.

## Motivations for issuing a CBDC in India

India has made significant progress in digital payment systems. There are various systems such as NEFT<sup>2</sup>, RTGS<sup>3</sup>, IMPS<sup>4</sup>, UPI<sup>5</sup> to enable online payments. Newer platforms like IMPS and UPI are available 24X7 and the related transaction costs are one of the lowest in the world. Despite this, there

are still various motivations for issuing CBDCs in India. These are discussed below:

- Minimising use of cash and cash management expenses:** RBI recognises that cash remains the most preferred mode for payment relating to regular, small value expenses. This preference can be redirected to CBDC if reasonable anonymity can be assured to the users, which would further facilitate digitisation process in the country to achieve a 'less-cash economy'.  
 Due to the large volume of cash in circulation, the cost of physical cash management (i.e., expenses relating to secure printing, storage, transportation and replacement of bank notes) continues to be significant. These costs can be reduced through introduction of CBDC. Although designing and establishing a CBDC (including related infrastructure) may require substantial costs upfront, the subsequent operating costs are expected to be lower. Additionally, CBDC may be also perceived to be environment friendly.
- Promoting financial inclusion:** Another key motivation to implement CBDC is to promote financial inclusion. One would not need a bank account, to access and use the CBDC. The ability to perform offline transactions (peer-to-peer) is another key feature being

considered in the design of the CBDC. It is expected that these features would promote financial inclusion and enable more individuals (especially unbanked population in remote areas) in performing digital transactions and leave digital footprints in the financial system. This is likely to help the unbanked/underbanked population get easier access to credit facilities.

- Cross border transactions:** While there are multiple payment systems for transactions within India, 'cross border transactions' is an area that could benefit from the new technology and innovations. Implementing such new technology in collaboration with other central banks could be beneficial for India, being the largest recipient of cross-border remittances. The RBI is proposing to collaborate and work with other central banks in this area.

1. Source: The Economist article dated 16 February 2021 titled "What is the fuss over central-bank digital currencies?" and Euronews article dated 9 March 2022 titled "Central Bank Digital Currencies: Which countries are using, launching or piloting CBDCs?"

2. National Electronic Funds Transfer  
 3. Real Time Gross Settlement  
 4. Immediate Payment Service  
 5. Unified Payments Interface

- Rapid rise of virtual private currencies:** In the last few years, many crypto-assets and cryptocurrencies have been launched. The proliferation of private virtual currencies and crypto assets (such as Bitcoin) can pose risks relating to money laundering and financing of terrorism. Use of crypto assets can also undermine the monetary policy transmission and the stability of domestic currency through creating a parallel economy. Also, since virtual private currencies are not backed by any central authority and are issued by private players, there is an added credit risk relating to the issuer.

On the contrary, creation of a CBDC would provide the public a risk-free virtual currency with legitimate benefits of a digital asset (such as reasonable level of anonymity and ease of performing online transactions). This would also enhance and restore trust in the central bank currency.

## Design considerations for CBDC – the digital rupee (e ₹)

Based on the usage and functions of the CBDC, the RBI has proposed issuing two versions of the CBDC - a general purpose, retail CBDC (CBDC-R) and CBDC-W for wholesale use.

CBDC-W	CBDC-R
CBDC-W could be used for improving the efficiency of inter-bank payments or securities settlement. It could also be used for transactions relating to instruments such as government securities, commercial papers and debentures etc. bypassing the bank account route.	CBDC-R would be an electronic version of cash primarily meant for retail consumption. It would provide an alternative medium for making digital payments (with direct access to central bank money).

The RBI has considered the following key design questions relating to the CBDC:

### a. Role of the central bank and other entities – the concept note evaluates three models:

- Direct model:** The central bank will be responsible for managing all aspects of the CBDC system such as issuance, account keeping, transaction processing and verification etc.
- Indirect model:** Consumers would hold the CBDC in an account/wallet with a bank/ service provider (an intermediary) and the transactions would be processed by the service provider. Transaction processing and customer interface, etc. is managed by the intermediary. The central bank would only track the wholesale balances with the intermediaries and the obligation to provide CBDC on demand to the customers would fall on the intermediary.
- Hybrid model:** This model is similar to the indirect model; Under this model, commercial intermediaries (payment service providers) provide retail services to end users. However, the central bank would maintain a ledger/ record of all retail transactions (since it is a direct claim on the central bank).

RBI in its concept paper has highlighted that the indirect model is the most suitable architecture for introducing the CBDC in India. Under this

model, the RBI would create and issue tokens to authorised entities called Token Service Providers (TSPs) who in turn would distribute these to the end users. All customer facing activities including customer verification, Know Your Customer (KYC), Anti-Money Laundering (AML) checks, transaction verification will be performed by these TSPs.

### b. Whether CBDC as an instrument should be interest bearing (deposit-like vs cash-like):

The concept paper highlights that an interest-bearing CBDC (remunerative CBDC) would be more attractive as it would serve as a store of value. It may also help in effective transmission of central bank's monetary policy, i.e., it would strengthen the pass through of the central bank rates to the financial system (for example – a central bank could even set a negative interest rate for CBDCs). However, a remunerative CBDC may make bank deposits less attractive. This would therefore increase borrowing costs for banks and could reduce credit supply in the market.

Further, since CBDC is an alternative to cash, the concept note argues that it should imbibe all elements of cash. Considering this, RBI highlighted that physical cash does not carry any interest and it would be logical to offer non-interest bearing CBDCs.



**c. Token based or account based CBDC:**

A CBDC can be structured as a 'token', an 'account' or a combination of both.

Token based CBDC would involve a type of digital token issued by the central bank with a unique token number (representing a claim on the bank) – like a bank note. It would be a bearer instrument (like bank notes), whoever holds the token would be presumed to be the owner. The token can be held and linked with an individual's mobile device, or a wallet provided by the TSP and exchanged/transferred electronically. On the other hand, an account-based system would require maintenance of records/accounts for all account holders to indicate the ownership of the monetary balances.

**d. Level of anonymity:**

Cash transactions can be performed without maintaining evidence of transacting parties, it has universality and has settlement finality. However, digital transactions usually leave a trail. Since CBDC is intended to provide an alternative to cash transactions, RBI argues that it should have the same characteristics that physical currency represents. Therefore, some level of anonymity would be incorporated in the design of the CBDC. However, it would be restricted to prevent illegal and shadow economy transactions, for example, by implementing transaction limits. This would be similar to the transaction limits and monitoring mechanism currently in place for large cash transactions.

**Technology considerations**

Since CBDC is a digital currency, technology considerations would always remain at its core to enable the translation of overall policy objectives into effective and smooth implementation across the country. In the context of the technology framework, the concept note discusses various functionalities that are desirable and can be considered for inclusion in the CBDCs. Some of these are discussed below:

- **Offline access:** Since major parts of rural and semi-urban areas of the country still face connectivity and internet issues, the concept note advocates for an offline capability in the CBDC architecture.
- **Integration with the existing payment systems and interoperability:** The aim of CBDC is to complement and integrate with the existing payment infrastructure available in the country and achieve co-existence, innovation and efficiency for the end users.
- **Cross border payments enabler:** RBI proposes to work together with other central banks and networks in designing an infrastructure that can facilitate easy and seamless international transactions.
- **Security considerations:** Security considerations have been given the center stage in the overall technological framework provided for the CBDCs. The concept note has suggested

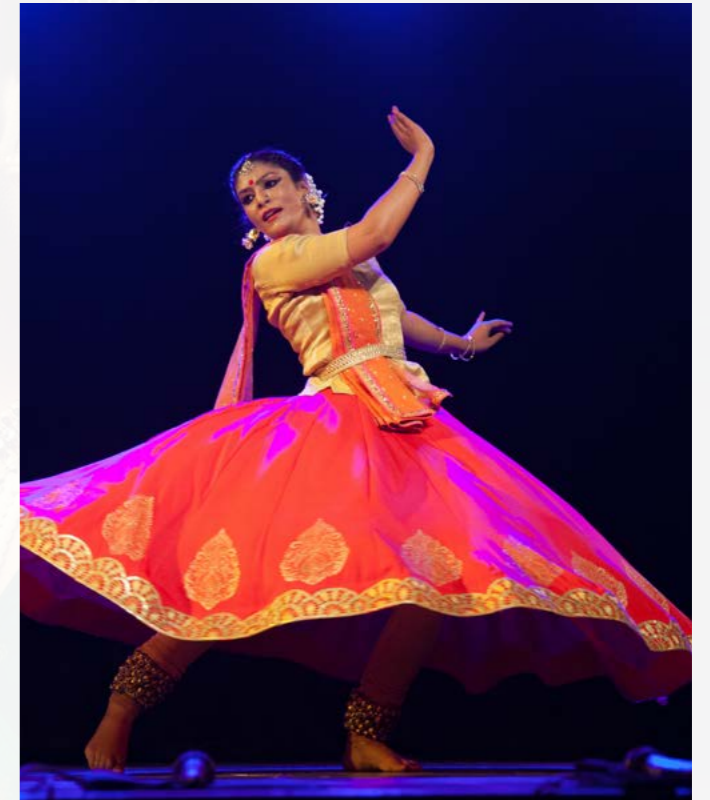
certain principles in this regard, including developing an enhanced risk management framework, rigorous testing of user interface, cryptography and quantum resistance, etc.

- **Data analytics:** The CBDC platform is expected to generate huge sets of data in real time. Thus, appropriate analytics can assist in evidence-based policy making, enforcing money laundering regulations, serve as a rich data source for service providers for financial product insights, among providing other benefits.

Having regard to the required functionality and the proposed design of the CBDC, the RBI has evaluated whether Distributed Ledger Technology (DLT), more commonly referred to as the blockchain technology, can be used as the platform for development of CBDC architecture.

Scalability has been identified as one of the key issues associated with the blockchain technology. In a DLT system, the ledger is usually managed jointly by multiple entities in a decentralised manner and each update (i.e., for each transaction) needs to be harmonised amongst the nodes of all entities. This limits number of transactions that can be processed using this system and it makes it slower than the conventional centrally controlled ledger.

Taking into consideration the vast geographical and demographic expanse of the country, concept note highlights that DLT, at this point of time, is not a suitable technology for the development of CBDC framework. However, depending upon future research and development activities, it could be evaluated for the indirect or hybrid CBDC architecture.



## Next steps

Earlier this year, introduction of CBDCs was announced in the Union Budget and an appropriate amendment was also made to the RBI Act, 1934. Additionally, from 1 November 2022, RBI has commenced the pilot programme of CBDC-W (wholesale) and is soon planning to launch the first pilot for the retail segment as well<sup>6</sup>. CBDC holds a lot of promise and potential to expand the existing payment systems and address the needs of a wider category of users, in addition to supporting cross-border transactions. However, in the absence of relevant international benchmarks, extensive stakeholder consultation along with iterative technology design must take place to develop a solution that meets the envisaged requirements. As this is an evolving area, it will be important to watch how this implementation progresses in India and worldwide.

Some of the areas where there would be substantial impact is discussed below:

- **User friendliness and impact on existing payment infrastructure:** With the presence of sound payment infrastructures ranging from RTGS and NEFT to UPI, the concept note argues that the CBDCs can provide an alternative medium of making digital payments (and it is not a substitute to the existing payment platforms). However, due care must be exercised that the

proposed framework offers seamless integration with the existing financial ecosystem and doesn't lead to unnecessary ambiguity for the users.

- **Anonymity of transactions:** Since one of the key objectives of introducing CBDCs is to minimise the use of physical cash in the economy, as this would help in promoting the aim of digitisation of economy. In this regard, the provisions with respect to incorporating the programmability<sup>7</sup> feature for keeping a check on the end use of funds may need to be deliberated upon, as it is likely to discourage people from switching to CBDCs from the present cash system.
- **Comparison with virtual cryptocurrencies:** The concept note has discouraged the use and application of private cryptocurrencies, accusing them of being highly volatile and disrupting the traditional financial system. The various central banks globally have considered the rise of crypto-currency as one of key reasons to CBDC (to address the need of the users to perform digital transactions with reasonable anonymity). However, since CBDCs would be issued in the form of a digital currency and would not be tradable on any exchange or other similar platforms, it may not be directly comparable to these crypto-currencies. It will be of interest to

see how the behavioural patterns relating to use of crypto-currencies evolve and change with the issue of CBDCs.

- **Impact on financial statement audits:** For entities that hold and transact in digital/virtual assets (including CBDCs), auditors would need to factor additional risks relating to such assets while performing audit engagements. Auditors would have to carefully assess the risks, evaluate the relevant internal controls relating to the performance of such transactions and perform specific substantive procedures to obtain adequate audit evidence relating to these balances. This will also include risks relating to cybersecurity and other relevant IT considerations.

6. The Economic Times article dated 9 November 2022 titled "RBI CBDC: Digital Rupee pilot starts from November 1; SBI, HDFC, 7 other banks to participate in wholesale launch"

7. CBDCs have the possibility of programming the money by tying the end use.

