



The Promise of Digital Rupee

Foreword

National digital currencies are gaining momentum across the world. Nearly 100 central reserve banks across the world are currently ideating or building their versions of a digital currency. While digitization has been reshaping world economies, India finds itself in a unique position that holds immense promise for the success of its digital currency.

Thanks to the concerted efforts by the India's central government, the country already has a robust digital payments infrastructure that is both low-cost and highly democratized. The country is poised to unleash its full potential when it comes to embracing the future of currency. However, cash continues to be the preferred mode of payment for certain consumers in India. Access to digital services is still low among certain consumer segments, while concerns about data security remain rife among sceptics.

In this point of view (PoV), the authors demonstrate various benefits of a Reserve Bank of India(RBI)-issued digital currency, and how it can build a more resilient, secure and efficient economy. The Central Bank Digital Currency (CBDC) will lower the country's dependence on cash, prevent fraud, facilitate faster cross-border payments, and improve the welfare distribution network. At a macro-level, it can also help the country spur financial innovation, and help the RBI with more precise monetary policy execution.

The authors also propose a way forward for a smooth adoption. The government needs to take into consideration three things: First, the digital currency needs to be available in different interchangeable formats. Second, commercial banks should be co-opted to leverage the full potential of fractional reserve banking. Finally, the government should consider establishing the Digital Rupee Corporation of India (DRCI) to develop the technology, protocols, and infrastructure for a nationwide distributed ledger of financial services powered by CBDC.

CBDC is a vast topic that warrants a nuanced discussion. We hope that this PoV can start the conversation about how the CBDC can be used to create value for the Indian economy.



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Table of contents

- 1. The Promise of Digital Rupee 4**
- Lowering cash dependence 7
- Improving resilience and overcoming infrastructure constraints 8
- Preventing fraud 9
- Facilitating faster and cheaper cross-border payments 10
- Improving welfare distribution 11
- Deciding on and executing targeted monetary policy 12

- 2. The Path Ahead 13**
- Enable multiple interchangeable Digital Rupee tokens 15
- Leverage fractional reserve banking and co-opt the banks 16
- Make a structural intervention by establishing a DRCI or its equivalent 17

- 3. References 18**

- 4. Authors 19**

The Promise of Digital Rupee

As the world around us becomes more hyper-connected and ecosystem-dependent, central bank digital currency (CBDC) – a new digital form of money issued by central banks – may just be the new infrastructure we need for ushering in more trust, resilience, and efficiency.



It therefore comes as no surprise that nearly 100 central reserve banks¹ across the world are currently planning or building their own digital currencies.

CBDCs, and cryptocurrencies such as the popular Bitcoin, both belong to a class of digital currency. However, unlike cryptocurrencies, a CBDC is issued by a central bank representing a liability of the former and is a more trusted form of money like a currency note issued by the central bank. CBDCs also differ from the electronic money deposits that most of us hold with commercial banks, which are mere digital representations of the currency value. Much like the distinctive serial number on a currency note, every unit of digital currency can be uniquely identifiable. Electronic money does not have this characteristic. A deposit of one hundred rupees in a given bank account is indistinguishable from one hundred rupees in any other bank account.

The second differentiating feature of digital currency is that it has more dimensions than just value – its programmability allows us to add multiple dimensions like prescribed end uses, time limits and transferability.

Thirdly, digital currency can be recorded on distributed ledgers, i.e., all participating banks record the transactions and balances on the same distributed ledger. With electronic money, these transactions are recorded only between the pairs of banks that effect the transaction and change the balances in each party's bank.

Taken together, these three differentiating characteristics – identifiability, programmability, and distributed ledgers – can unleash a new set of economic possibilities. These can be realized in three ways: central bank wholesale money (wholesale CBDC), central bank digital retail money (retail CBDC), and commercial bank money (tokenized deposits or the liabilities of commercial banks) created under fractional reserve banking. While technically speaking, only Reserve Bank of India-(RBI) issued digital money can be termed as digital rupee, for the sake of simplicity, we are also including tokenized rupee-denominated commercial bank liabilities under the term 'Digital Rupee'.



Globally, the primary benefit cited in the business case for CBDC pilots is having an agile and robust digital payments system. However, India is in a unique situation where the payments infrastructure is already low-cost and widely democratized.

For example, Unified Payments Interface (UPI), India's leading real-time payment system for inter-bank peer-to-peer (P2P) and person-to-merchant (P2M) transactions, had about 300 million active users in December 2021, with 38 billion transactions in the calendar year 2021.²

In fact, India has created a world-class digital and fintech infrastructure with the help of National eGovernance Division (NeGD), India Stack, Account Aggregator Framework, government sites like Jansamarth.in and many more. However, there are still multiple opportunities and use cases that could be addressed using digital currencies.

These are discussed over the course of the next six pages:





01 Lowering cash dependence

India's 17% cash propensity – the ratio of cash withdrawn to GDP – is higher than those of the Nordic countries, the UK and Australia.³

Cash also continues to grow at a brisk pace: 10.5% in India as opposed to 9.2% in China and 2.1% in Korea. Cash is difficult to handle. But its anonymity enables its use for money laundering and funding of illicit and terrorist activities.

An inordinate amount of time and funds is being spent by the government of India, the Reserve Bank of India and commercial banks to prevent such illicit uses as well as the prevalence of counterfeit currency. It is estimated that the annual social and private costs in the European Union of handling cash represent about 1% of GDP, a cost likely to be significantly higher in India.⁴

A move to digital payments and digital currency could reduce dependence on cash. Sweden's central bank, Riksbank, has an e-krona project which provides a template for the use of digital currency as a digital alternative to cash and electronic money that is directly issued by the state.⁵ This approach is featured as an example in the BIS Annual Economic Report, which describes CBDC as a "public good that offers, in digital form, the unique advantages of central bank money: settlement finality, liquidity and integrity. They are an advanced representation of money for the digital economy."⁶

02 Improving resilience and overcoming infrastructure constraints

India is among the global leaders in terms of the number of digital payment transactions.

However, 100% digitalization of payments would put a strain on the existing financial and banking infrastructure. Commercial banks are already grappling with large transaction growth owing to their legacy core banking infrastructure and the lack of resilience in their technology architectures. Moreover, given that UPI transactions are executed at 0% merchant discount rate, there is no direct business case that incentivizes banks to invest in digital payments.

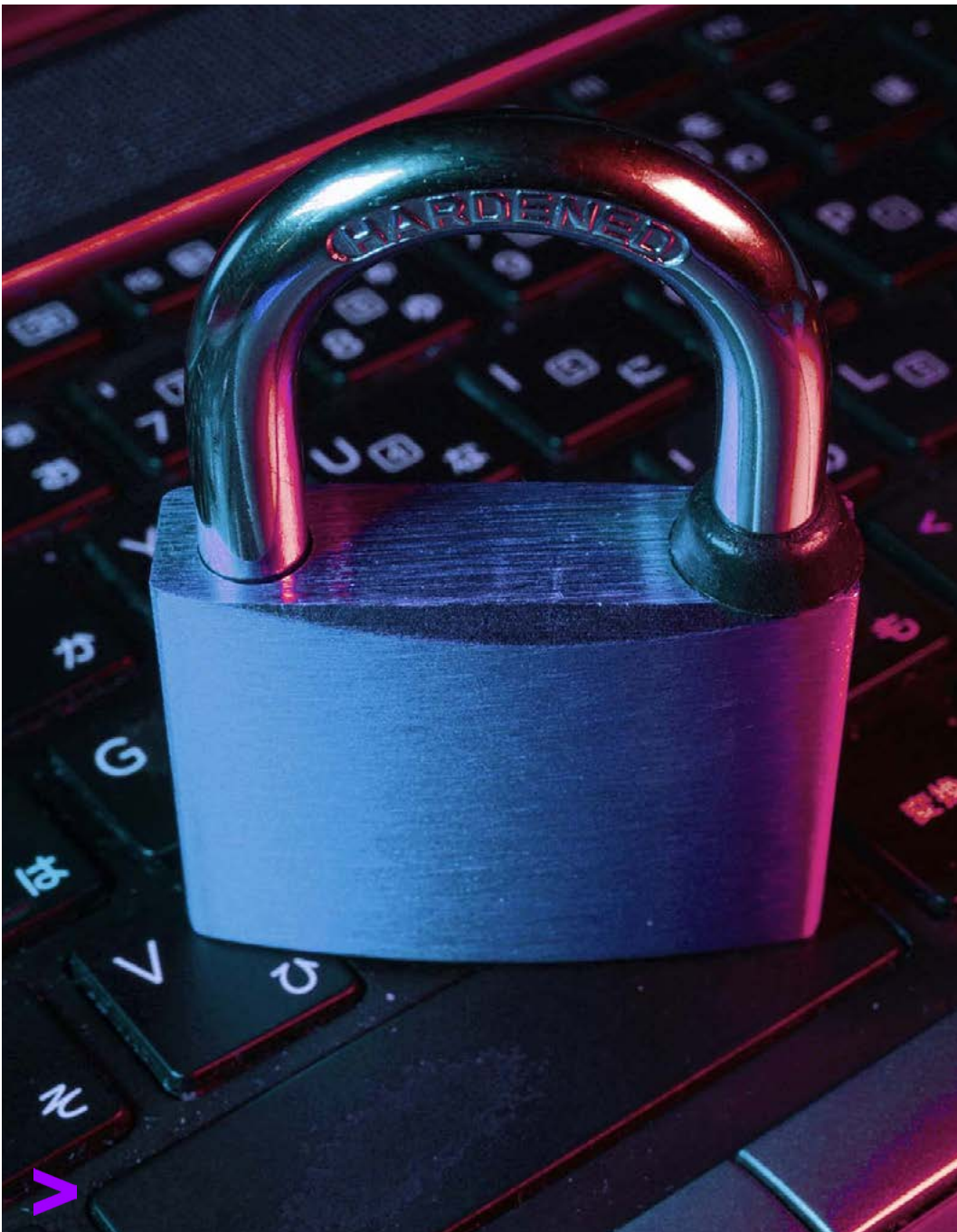
Further, the world lives in the shadow of terror strikes, and critical economic infrastructure such as the data centers of banks are especially vulnerable. A coordinated terror strike on three data locations of any major bank – its data center (DC), disaster recovery (DR) and near-DR – could cause economic disruption.



Imagine millions of people not only being unable to access their accounts, but also not having their most updated account positions as the bank faces hours or even weeks of data loss. For a large bank in this scenario, there would be a huge number of intra-bank transactions that it may never be able to reconstruct.

A distributed ledger would dramatically improve systemic resilience, and a new umbrella entity (NUE) for payments leveraging the Digital Rupee could provide us with an alternative instant settlement mechanism, since DLT-enabled payment systems are inherently more secure than highly centralized systems. The adoption of a Digital Rupee would support greater diversification of India's payment system by offering alternative payment rails. It would also increase the resilience and security of the entire payments infrastructure.





03 Preventing fraud

RBI data shows that in just three years (2018 to 2020), Indian banks lost approximately USD 50 billion to fraud.

One of the main reasons, according to a CVC report on the top 100 cases of fraud,⁷ is the improper end-use of lent funds.

While the current system relies on post-facto checks, such as CA audit reports and stock statements etc, looked at in parts by different lenders, a digital currency could address these proactively with embedded programmability and regulated traceability.

04 Facilitating faster and cheaper cross-border payments

The rupee is a local medium. While rupee currency notes can circulate widely and be held offshore, the reserves can only serve domestic payments.

The geographic limits of a currency may no longer be consistent with the internationalization of current and financial account transactions.

A Digital Rupee that can be held by non-residents and be available to conduct cross-border and offshore financial transactions seems a natural extension to enable new retail payment possibilities and business models.

A Digital Rupee, therefore, needs to enjoy international acceptance while retaining sufficient controls for the RBI to ensure that its international circulation will not impair domestic policy objectives.

The CBDC project Jura, which explores the direct transfer of euro and Swiss franc wholesale CBDC between French and Swiss commercial banks on a single DLT platform, offers one possible approach for controlling a digital euro in an international setting.⁸



05 Improving welfare distribution

India has significantly improved its welfare distribution with initiatives such as Direct Benefit Transfer and the e-RUPI.



A Digital Rupee could further strengthen welfare distribution and make it more robust by plugging leakages – such as preventing welfare money from being diverted to unrelated bank accounts.

If one examines the current landscape, the e-RUPI doesn't completely address leakage as it is delinked from the banking system and, hence, does not benefit from its KYC processes.

On the other hand, a digital currency with embedded programmability and a distributed ledger across banks could be tightly integrated with the envisaged welfare chain, health chain and education chain to address these leakages.

A Digital Rupee would serve as an effective infrastructure to conduct fiscal operations, including the distribution of benefits amid a possible new division of labour between the central bank and the government.

06 Deciding on and executing targeted monetary policy

A digital currency would have the unprecedented ability to provide the RBI and other policy makers with real-time visibility and insights into the state of the economy.

Policy makers would have access to data that could help them understand the flows and stock in every sector at a granular level.

Further, a programmable currency would allow the RBI to conduct its monetary policy interventions with hyper-precision, enabling faster transmission through the economy and more complete achievement of policy objectives.

The Khokha2 digital currency project by the South African Reserve Bank is an example of a wholesale CBDC use case which includes enabling interbank and bond settlements. These bond settlements provide an opportunity to innovate and to enable faster and more targeted economic measures.⁹



The Path Ahead





The opportunity canvas for the Digital Rupee is compelling. It could help India spur financial innovation, address persistent fraud, improve resilience and increase the ease of doing business. It could help the RBI with more precise monetary policy execution and make regulation pre-facto. In addition, it may enable the rupee to leverage the Indian diaspora and its trading influence to expand its role as a reserve currency.¹⁰

We recommend three ways in which the Government of India and the RBI could think about the digital currency to realize this potential.



Enable multiple interchangeable Digital Rupee tokens

Token-based mediums provide new functionalities that leverage identifiability, programmability and decentralized consensus that can spur financial innovation.

In our current monetary system, cash issued by the central bank accounts for only a fraction of the total money supply in circulation. The bulk of the money supply is in the form of deposits parked with commercial banks. Addressing use cases across the economy will require tokens for the different types of money: wholesale CBDC, retail CBDC, and commercial bank money (tokenized commercial bank liability) issued by commercial banks under fractional reserve banking.

Digital Rupee, therefore, needs to be available in different and interchangeable formats while allowing a seamless exchange between the different formats. The Government of India and the RBI should establish a token-based financial market infrastructure that allows the RBI and commercial banks to issue, buy, sell, and swap tokenized rupees for different use cases. Further, they should enable banks and even entrepreneurs to leverage these tokens to create financial products, like the US Federal Reserve's emphasis on potential use cases for the US CBDC.¹¹ Such an approach would enable participants to serve many markets, rather than just the narrow cash cycle.

Leverage fractional reserve banking and co-opt the banks

Banks provide many critical functions for the economy, including providing maturity transformation – they take short-term liabilities and support long-term lending.

Existing banks already have the critical infrastructure and knowledge related to banking. Further, from an end-customer perspective, there is in most cases an intermediary, whether it is a bank, a decentralized finance (DeFi) provider or a crypto exchange. Merely replacing the bank as the intermediary is not enough to create value. However all banks, as permissioned nodes using the Digital Rupee, could not only enable a new generation of financial services but also dramatically improve competition by enabling real-time account portability,

360°-view credit underwriting by all credit providers and more. The distribution of a Digital Rupee should leverage the existing banking system. A two-tier retail CBDC distribution model, as pioneered by Accenture with the e-krona in Sweden, would allow the Digital Rupee to be distributed by the banks to end-users. This would maintain existing monetary relations in the economy. A Digital Rupee could enhance the reach of the banking system and support broader inclusion and financial deepening of the Indian economy.





Make a structural intervention by establishing a DRCI or its equivalent

National Payments Corporation of India (NPCI) was promoted by the RBI with ten major banks as shareholders – and was critical to develop the payment infrastructure in the country. Similarly, the Government of India and the RBI should consider establishing a Digital Rupee Corporation of India (DRCI) to develop the technology, protocols, and infrastructure for a nationwide distributed ledger of financial services powered by the Digital Rupee. The DRCI should establish connectivity with other chains as part of the National Blockchain Mission. It could also leverage an initial coin offering to fund its own growth and/or generate capital for the government.

A wise man once said that *“taking a dip in the ocean is not equivalent to taking a dip in the entire ocean”*. Similarly, the CBDC/Digital Rupee is a vast, complex, and emerging topic which encompasses economics, monetary systems, behavioral science and other established digital infrastructure. Through this PoV we have attempted to scratch the surface of how the concept of CBDC could be applied to create value for the Indian economy and the country’s financial system.

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Read more: [The Digital Dollar Project is a partnership between Accenture and the Digital Dollar Foundation to advance the exploration](#)



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