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ORIGIN OF CBDC IN INDIA: PROSPECTS AND CHALLENGES OF ISSUANCE & MANAGEMENT

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ABSTRACT

With the goal of transforming the financial sector, India's digital rupee popularly known as central bank digital currency or CBDC intends to increase financial inclusion, improve transparency, and streamline payments. The improvement of the effectiveness and security of the nation's financial transactions is the main objective of CBDC. It offers cheap operating and issuance costs in addition to other advantages to meet the needs of all types of rupee users. This study delves into the origins of CBDC in India with special reference to three models of its issuance and management. Inferences drawn are empirical in nature and suggestive of the fact that an Indirect model of issuance is best suitable for India at this juncture of its potential design. Iterative design of technology and extensive stakeholder interaction are needed in the absence of a well-established prototype model for adoption. In light of this, the article examines the Chinese digital yuan case for policy recommendations as well as potential needs for an Indian-adoptable technology platform. Although the study outlines the purpose of CBDC and its anticipated benefits, it also highlights how CBDC may affect monetary policy and liquidity management, making it just as appealing as cash. The study indicates that in order to guarantee the sorting out of various models and designs of CBDC introduction in India, extensive preparation in terms of cost, time, and opportunity tapping is necessary. The conclusions gained from this study serve as a helpful tool towards attaining the same.

***KEYWORDS**: Digital Currency, CBDC, Financial Payment, Currency Issuance &Management, Iterative-Technology, Liquidity Management and Monetary Policy.*

Introduction

The idea of broad money as a conventional medium of trade has been challenged by the growing use of private cryptocurrencies in recent years. They are being celebrated as innovations poised to introduce decentralized yet volatile finance and disrupt the conventionally regulated, safe and transparent financial system. The RBI, which is in charge of maintaining and regulating the monetary policy framework, has consistently been mistaken about the different hazards connected to cryptocurrencies. These digital and virtual assets pose a threat to India's financial stability and their unregulated exposure increases their adverse effects. In response to this, it is incumbent upon the RBI to provide us with a risk-free central bank digital currency, offering the same convenience of digital currency transactions without the associated risks of private cryptocurrencies exposures. While enabling the

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general public to profit from virtual currencies and safeguarding consumer interests, CBDC seeks to lessen the detrimental effects of private virtual currencies on social and economic systems.

The proliferation of mobile payment systems and digital wallets in different parts of the world has prompted central banks to investigate the benefits and drawbacks of issuing CBDC. The Reserve Bank of India (RBI) under the same umbrella is currently progressing towards a phased implementation strategy. In order to minimize disruption to the financial system, this procedure entails launching trial programs on a large scale and then continuously evaluating use cases for issuing its own Central Bank Digital Currency, the Digital Rupee (e₹).

According to the Reserve Bank of India, CBDC is similar to digital cash in that it can be exchanged for other currencies, is secure to store, and can be used to make purchases. On the RBI's balance sheet, CBDCs are shown as a liability component. "BIS: Bank for International Settlements has established *foundational principles* and *core features* of CBDCs to guide exploration and enhance public policy objectives. These principles stress the importance of ensuring that CBDC issuance does not compromise on monetary or financial stability and that CBDCs can coexist with the existing forms of money, fostering innovation and efficiency."*(BIS Joint Report on CBDC: Foundation principles and core features, 2020)*

This paper aims to identify the implications of CBDCs for liquidity management and monetary policy, making CBDCs as attractive as cash through a comprehensive examination of different issuance models. It begins by exploring the motivation behind adopting CBDCs in India, examining various issuance models and technologies, and analysing the implications of these choices on CBDC adoption.

Objectives of the Research

- To investigating the inception and growth of CBDC in India.
- To study three models of CBDC issuance: direct, indirect, and hybrid.
- To examine the case of China's digital yuan for relevant policy insights and lessons.
- To identify the technological requirements and platform considerations for CBDC implementation in India.
- To investigate the effect of CBDCs on India's monetary policy and liquidity management.
- To how the CBDC will affect Indian monetary policy and liquidity management.

Methodology

This study uses a descriptive analysis approach, relying solely on secondary sources for data collection. Information has been drawn from a wide range of reputable sources, including reports from prominent financial organizations such as PwC, Bank of England, and Bank for International Settlements. Additionally, academic articles, working papers, and reports from recognized platforms like he National Bureau of Economic Research and the Asian Development Bank were utilized. Government publications, online databases, and central bank reports provided crucial insights into CBDCs.

Issuance of CBDC

A number of considerations, including reducing the operational costs of printing and distributing physical currency, advancing financial inclusion, and enhancing the payment system's resilience, efficiency, and creativity, drive the issuance of CBDC in India. These elements seek to increase the effectiveness of the settlement process, promote innovation in international payments, and provide the general public with secure advantages comparable to those of private virtual currencies without involving any.

Furthermore, Private virtual currencies differ greatly from traditional money in that they are worthless on their own and don't carry any value The swift expansion of private cryptocurrencies in recent times has attempted to question the traditional understanding of money. While hyping the advantages of decentralization, cryptocurrencies are presented as innovations that will revolutionize currency and disrupt the established financial system. However, their fundamental design often aims to bypass established and regulated intermediaries and controls, which are crucial for maintaining the integrity and stability of the monetary and financial systems.

As a result, the central bank has an obligation to provide its people with a secure digital currency that offers them the same benefits as private cryptocurrencies but without the associated

hazards. It is crucial to think about the following aspects of a Central Bank Digital Currency in order to comprehend why one is being issued:

- Central banks create CBDC, a government-backed currency, in accordance with their monetary policies.
- It is included as a liability on the central bank's balance sheet.
- It must be seen by all parties as a safe, reliable, and accepted form of payment and legal tender, including individuals, companies, and governmental bodies.
- It ought to be simple to swap for money in commercial institutions.
- Having a bank account is not mandatory for holders of this fungible legal tender.
- It is anticipated to reduce the expenses associated with creating money and completing transactions.

Models of Issuance of CBDC

A crucial step is determining how the central bank and private sector will work together to enable use and access to the CBDC. “Globally, three models exist for the issuance and management of CBDCs. (Bank of England: Discussion Paper, March 2020)” These models primarily differ in the framework of legal entitlements and the book-keeping practices of the central bank. The paper suggests that, based on such fundamental structuring, an Indirect model would be more suitable for India compared to a Direct model. *(Bank of England: Discussion Paper, march 2020)*

Here's a brief overview of all three types of issuance models:

- **“Single Tier model”**

In the "Direct CBDC Model," the central bank is in charge of all CBDC system operations, such as account management, transaction verification, issuance, and other associated duties. Every payment transaction in this approach involves the central bank's servers because the central bank is in charge of managing the retail ledger. With each transaction, the central bank updates its comprehensive record of account balances, and the e-rupee issued under this paradigm is a direct claim on it.

This setup offers the advantage of being highly resilient, as RBI possesses complete knowledge of all retail accounts, enabling easy fulfilment of claims due to the readily available verification database. However, a significant drawback of this model is its tendency to side-line private sector involvement, thus impeding innovative issuance modes in the payment system. This particular architecture is intended to facilitate direct communication between end users and the central bank. Although this approach has the ability to upset the present financial system's excessive intermediation, it also places more responsibility on central banks to handle Anti-Money Laundering/ AML checks, Know Your Customer/ KYC processes, and direct customer onboarding. In order for the central bank to undertake these functions effectively, they can prove difficult and expensive.

- **“Two -Tier Model (Intermediate model)”**

Due to the inherent inefficiencies in the single tier paradigm, these digital currencies must be designed inside a two-tier structure in which commercial service providers and the central bank collaborate to fulfil their respective functions. The “***Indirect model”*** and the “***Hybrid model”*** are the two models that are part of the intermediate architecture.

  - **Indirect Model:** In the "Indirect CBDC Model," individuals hold their digital rupee in accounts or wallets managed by intermediaries like banks or private service providers. In this setup, the responsibility for supplying CBDC on demand lies with such intermediary, rather than the Reserve Bank of India. The central bank would only keep an eye on the wholesale digital currencies balances that the intermediaries were holding, making sure that they matched all of the retail accounts that the clients owned. On the opposite end is the Hybrid model.
  - **Hybrid Model:** A hybrid model combines a private sector communication framework with a direct entitlement to the central bank. The task of transferring CBDC to other organizations, which thereafter take on accountability for all customer-related activities, has been assigned to the central bank. Under this arrangement, the central bank oversees all retail transactions while customers obtain retail services from commercial intermediaries like payment service providers.

Table 1: Different Issuance Model of CBDC

Model	Description	Key Features
Direct CDC	Single-tier model where the central bank handles all retail payments in real-time.	• Users have a direct claim on the central bank. • Central bank records all retail holdings.
Hybrid CBDC	Two-tier structure with direct claims on the central bank, facilitated by intermediaries	• Intermediaries onboard clients (KYC) and handle retail payments. • Central bank periodically updates and retains a copy of retail CBDC holdings.
Intermediated CBDC	Two-tier model where the central bank manages wholesale balances while intermediaries handle retail payments	• Payment service providers (PSPs) execute transactions. • Central bank processes wholesale payments periodically.

Why an Indirect Model for India?

Based on the various models discussed, it appears that “the indirect system” is the most suitable framework for implementing CBDC in the country.

Reserve Bank of India is solely authorized to print banknotes under the terms of the RBI Act, 1934, which has now been extended to include digital currency. Tokens will therefore be created and distributed by RBI under this approach to approved organizations called Token Service Providers or TSPs, who will then give them to the end consumers taking part in retail transactions. The following is the reasoning for this method:

- There are numerous customer-related operations in which the central bank lacks a comparative or competitive advantage over banks in a rapidly evolving technological world.. Distribution of CBDCs to the general public, account management services, KYC procedures for client verification, compliance with AML/CFT checks, verification of transactions, etc. are some examples of these activities.
- Banks and other comparable intermediaries, in contrast to RBI, possess the knowledge and experience required to provide these services.
- In addition to improving the user experience, these intermediaries may encourage a broader adoption of CBDCs by allowing their customers to transact across the whole network.

While the indirect model offers these advantages, certain issues related to selecting the technology framewrk for CBDC deployment need to be addressed. To address this, the study draws valuable insights from the implementation of the Chinese e-Yuan and explores its applicability to our economy. (NTT DATA, 2023: The Future of Currency: How to Use CBDC in India)

Case of Chinese Digital Yuan

China's digital currency, referred to as the digital yuan or Digital Currency Electronic Payment (DCEP), has been operational since 2020 and has been under development since 2014. Currently it is undergoing deployment in various pilot programs across China and is backed by the People's Bank of China or PBOC.

One of the primary objectives of the digital yuan is reducing China's dependency on the US dollar, which is important in international trade, The impact of the digital yuan on the Chinese economy is also now being evaluated. Some analysts suggest that it could potentially enhance economic growth by increasing consumer spending, reducing transaction costs, and encouraging the financial system's efficiency. However, there are also concerns regarding its potential implications for privacy and financial surveillance. As a centralized digital currency, the PBOC has the capability to monitor every transaction involving the digital yuan. This has raised concerns about the Chinese government's ability to utilize the digital yuan for monitoring and regulating financial transactions of its citizens.

The experience gained from China's implementation of the digital yuan can offer valuable insights for India as it considers the deployment of its own digital currency. The Indian government can learn from China's regulatory frameworks, technical infrastructure, and public education initiatives.

Furthermore, India can address the concerns raised by the implementation of the digital yuan and ensure that its own CBDC achieves the appropriate balance between convenience, privacy, and security.

Technology Considerations for CBDC

Technology has always been important since CBDC is by its very nature digital. The core of any CBDC is technology and after looking at the models for CBDC issuance and management, it makes sense to look at its technological implications.

The first area to address is the selection of the platform of technology. This platform can take the form of either a distributed ledger or a centralized dissemination process. Apart from choosing platforms, regulatory requirements will give rise to other technology challenges. The support for offline outreach should be included, for example, if financial inclusion is one of the goals behind the introduction of CBDC. Additionally, CBDC's strong, safe, and resilient implementation will depend on its security features. Additionally, business enhancing and profitable planning must be integrated into the technology framework adopted for CBDC. Lastly, environmental and energy efficiency concerns must also be taken into account when designing technology solutions.

Implications of CBDC for

- **"Monetary Policy"**

According to the 'BIS CPMI-MC Report (2018), the introduction of Central Bank Digital Currency (CBDC) does not fundamentally change the mechanics of monetary policy; instead, it carries the potential to allow for timely transmission of monetary policy'. The structure and degree of adoption of CBDC will determine how it affects monetary policy. It is specifically dependent on the following policy decisions: (i) will CBDC be interest-bearing or non-interest-bearing; (ii) will it be freely accessible, akin to physical fiat currency, or limited to wholesale customers, like banks (as is the case with central bank reserves); and (iii) will it be anonymous or carry identifiable ownership, meaning that transactions will be visible?

In situations where CBDC functions akin to physical cash and does not generate interest income, economic entities would typically prefer to hold their funds in interest-earning bank deposits during normal circumstances rather than CBDC. Nonetheless, CBDC can be considered a safer option than standard bank deposits during periods of economic instability or widespread bank panics. It has no depreciation risk, is entirely backed by the central bank, and is simple to hold in big amounts. Because switching to CBDC is so simple, there's a chance that it will hasten a bank run, which would reduce financial intermediation and reduce the impact of monetary policy. Both the overall supply and demand in the economy would be significantly impacted in the event that bank loans became less accessible or more expensive. The restrictions on transactions and holdings by CBDCs may lessen these problems.

On the other hand, advocates contend that an interest-earning CBDC might improve the effectiveness of monetary policy by directly communicating monetary policy actions to economic entities. In this case, economic agents may transfer their money from bank deposits to CBDC, which would cause a withdrawal of bank deposits, also known as the sucking of banks' liquid assets. In spite of the policy rate being unchanged, this could lead banks to compete for deposits, possibly resulting in higher deposit rates and, ultimately, higher rates for retail loans. This would all reduce the monetary policy's efficacy. The central bank may need to more often and proactively infuse greater amounts of durable liquidity into the banking system in order to reduce this danger.

In summary, the potential effects of CBDC on monetary policy are still unclear and largely speculative, as only a few countries (like China in above case study) have issued limited CBDCs to date.

- **Liquidity Management**

A surge in the demand for CBDC signifies a removal of deposits from the banking system, just as an increase in the demand for actual currency. The transition of fiat from physical to digital form, could alter the public's behaviour regarding their money holdings, namely, between currency and deposits, and within currency, or from physical to digital forms. However, predicting exactly the nature of this change is challenging, given that most central banks are still in the exploration phase regarding CBDC issuance.

If CBDC were to offer remuneration, it would have a more significant impact on reserve money and money supply than its non-remunerative counterpart. This may be explained by the possibility that CBDCs will replace commercial bank deposits, which might put commercial banks under financial hardship and make them more reliant on the central bank for liquidity support. As a result of financial

disintermediation, the central bank's balance sheet would show rising reserve money. While a comprehensive examination of the monetary policy framework and its operational structure would be necessary for a remunerative interest-bearing CBDC, an unpaid CBDC could significantly reduce the likelihood of disruptions to the financial intermediation process and monetary policy. This would involve making choices about the interest rate to be paid on CBDC and dealing with the difficulties brought on by financial disintermediation.

Conclusion

The Central Bank Digital Currency highlights significant promises in terms of virtual currencies enhancing financial transparency, reducing operational costs, and expanding existing payment systems to accommodate a broader range of users. The indirect model of issuance and management as suggested in this paper would ensure these in phased manner.

Currently, planning, development, or testing phases are involved in CBDC projects in India. Since there are no existing prototypes or examples to refer to, it is crucial to conduct a thorough public engagement and use a flexible approach to technology design in order to develop a solution that promotes broad adoption. Although the goals and potential advantages of CBDC are evident, it is imperative to embrace novel approaches with compelling use cases and investigate cutting edge examples, like China's digital currency. These tactics will guarantee that CBDC gains the same level of appeal as actual cash, if not greater than it.

"The Concept Note, RBI and RBI report 7th Oct, 2022 on CBDC" provides a high-level summary of the reasons for implementing CBDC in India, possible features for the design, consequences for different policy matters, and possible needs for supporting infrastructure. The insights presented in this paper are a step ahead in exploring the ideal model of issuance and implications of various policy issues for monetary and liquidity management. To guarantee the prudent rollout of various models and phases of CBDC introduction, the suggested course of action specified in this study requires meticulous planning in terms of timing, scope, and cost.

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