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Central Bank Digital Currency (CBDC) and its Implications for India's Monetary Policy

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Abstract
The advent of Central Bank Digital Currencies (CBDCs) represents a transformative step in the monetary system of emerging economies like India. The Reserve Bank of India (RBI) has initiated pilots for the digital rupee to modernize payment systems, improve financial inclusion, and enhance monetary policy efficiency. This paper examines the potential implications of CBDC adoption on India's monetary aggregates (M1, M2, M3), commercial bank credit creation, and the effectiveness of monetary policy transmission. Using simulation modelling, comparative analysis of global CBDC experiences, and empirical assessment, the study provides policy-relevant insights into how digital currency can reshape liquidity management, banking operations, and financial stability.

Keywords: CBDC, Digital Rupee, Monetary Aggregates, Bank Credit, Liquidity Management, Monetary Policy

Introduction
The global rise of CBDCs reflects a broader transformation in money: from physical cash and bank-deposits to digital, programmable, centrally issued currency. For a country like India with a large unbanked population, widespread use of cash, and growing digital infrastructure CBDC presents an opportunity to modernize payments, reduce costs, and extend financial inclusion.

India has joined the global trend of CBDC exploration, following experiments in countries like China, Sweden, and the Bahamas. In October 2022, the Reserve Bank of India (RBI) published a concept note for the "Digital Rupee," laying out motivations including expanding financial inclusion, promoting a cashless economy, reducing costs of currency issuance and management, boosting payment innovation, and simplifying settlements. As India moves forward with pilot issuance and gradually expands the use of e-Rupee (both retail and wholesale), it becomes important to assess how CBDC could reshape India's monetary policy and macroeconomic management. This paper explores those implications. CBDC adoption could significantly alter the structure of India's monetary system, impacting bank deposits, credit creation, and policy transmission. Understanding these impacts is critical to designing a digital currency that enhances efficiency without destabilizing the financial system.

Literature Review
CBDC Concept and Global Experiences
The Bank for International Settlements (BIS, 2022) highlights that CBDCs have the potential to enhance payment efficiency, reduce transaction costs, and influence monetary policy operations by directly affecting the money holdings of the public.

Chiu and Koeppl (2019) emphasize that CBDCs can affect both money demand and credit creation. Their study notes that the impact depends on adoption rates and whether the CBDC is interest-bearing, which could incentivize shifts in holdings from bank deposits to digital currency.

Similarly, the International Monetary Fund (IMF, 2021) argues that CBDCs can strengthen policy transmission by expanding the reach of monetary policy, though they caution that poorly designed CBDCs may create banking stability risks by altering deposit bases and affecting credit intermediation.

CBDCs and Monetary Aggregates

One of the primary implications of CBDC adoption is its effect on monetary aggregates. Barrdear and Kumhof (2016) demonstrate that large-scale CBDC adoption can reduce traditional measures of money supply, such as M1 and M2, as funds shift from bank deposits to central bank digital accounts. This reallocation has direct consequences for liquidity management and the central bank's control over the money supply.

In the Indian context, the Reserve Bank of India (RBI, 2023) notes that the digital rupee pilot has been designed to maintain banking system stability while improving liquidity management. By carefully controlling issuance and adoption pathways, India aims to integrate CBDC into the monetary system without causing destabilizing outflows from bank deposits.

CBDCs and Credit Creation

Kumhof and Noone (2018) argue that the adoption of CBDCs could reduce deposits held in commercial banks, limiting their ability to extend loans and potentially constraining credit availability. Conversely, Rogoff (2020) suggests that interest-bearing CBDCs can serve as a direct monetary policy tool, influencing consumption and savings behavior by offering a safe alternative to bank deposits, thereby allowing central banks to modulate economic activity more effectively.

CBDCs in Emerging Economies

Emerging economies present unique opportunities and challenges for CBDC adoption. China's e-CNY pilot demonstrates that controlled CBDC adoption can coexist with commercial banks while enhancing the effectiveness of monetary policy. The pilot emphasizes a two-tiered approach, where the central bank issues the currency but intermediaries manage distribution, ensuring banks continue to play a role in credit provision.

Furthermore, the BIS (2021) emphasizes that CBDCs can improve financial inclusion, particularly in countries with large unbanked populations. By providing direct access to central bank money, CBDCs can bring previously excluded individuals into the formal financial system, enhancing both monetary policy reach and social welfare.

Objectives of the study

- To examine the impact of CBDC on Monetary Aggregates in India
- To study CBDC Impact on Liquidity Management and Monetary Policy Transmission
- To analyse the effects on Commercial Bank Credit Creation and Lending Behaviour
- To know the Lessons for India from International Experiences

What is CBDC and Why India is Deploying It

A digital form of a central bank's sovereign currency is called a CBDC. It is a legal tender, fungible with physical currency, but exists in digital form. It can be designed for retail use (public payments, everyday transactions) or wholesale use (inter-bank settlements, securities settlement). CBDC also offers features beyond simple digital cash: it can support programmability (conditional transfers, smart-contract style restrictions), offline usage (for areas with limited connectivity), and instant settlement.

India's Rationale for e-Rupee- For India, the motivations are multiple:

- **Financial Inclusion**: Many Indians, especially in rural or remote areas, lack access to full banking services. CBDC accessed via a digital wallet on a mobile phone could bring formal financial services to such populations.
- **Minimizing Cash Expenses & Structuring the Economy:** The processes of issuing, printing, distributing, and maintaining physical cash generate significant expenses for both the central bank and the government. Transitioning to digital currency can decrease these costs and lessen dependence on cash.
- **Payment Speed & Creativity:** Central Bank Digital Currency (CBDC) offers the potential for quicker, more affordable, and more secure payment methods for both domestic and international transactions compared to conventional cash or bank deposit-based payments.
- **Reducing Black Economy & Enhancing Transparency**: Digital currency transactions generate a traceable record, thereby reducing the scope for cash-based tax evasion, money laundering, and informal unregulated transactions.

Given these attractions, India's CBDC rollout seeks to leverage digital infrastructure and financial inclusion goals to modernize the monetary system.

Impact on Monetary Aggregates (M1, M2, M3)

Central Bank Digital Currency (CBDC) is expected to have significant implications for monetary aggregates in India, influencing both the composition and measurement of money supply. Monetary aggregates, such as M1 (currency in circulation and demand deposits) and M3 (broader money including time deposits), are fundamental indicators for monetary policy, as they reflect liquidity in the economy and guide central bank interventions.

Table 1: Impact of Central Bank Digital Currency (CBDC) adoption on monetary aggregates (M1, M2 and M3)

CBDC Adoption	M1 (₹ Lakh Cr)	M2 (₹ Lakh Cr)	M3 (₹ Lakh Cr)
0% (Base)	100	150	180
10%	98	148	179
30%	94	144	176
50%	90	140	172

The table illustrates the projected effects of Central Bank Digital Currency (CBDC) adoption on India's monetary aggregates M1, M2, and M3 under different adoption levels ranging from 0% to 50%.

M1 (Narrow Money: currency in circulation + demand deposits)

At the baseline (0% CBDC adoption), M1 stands at ₹100 lakh crore. As CBDC adoption increases to 10%, 30%, and 50%, M1 declines progressively to ₹98, ₹94, and ₹90 lakh crore, respectively. This trend indicates that a portion of demand deposits or physical cash is being substituted with CBDC balances. Since M1 represents the most liquid form of money, the reduction highlights the direct impact of digital currency adoption on money readily available for transactions.

M2 (Broad Money: M1 + savings deposits + short-term time deposits)

M2 starts at ₹150 lakh crore at 0% CBDC adoption and declines gradually to ₹148, ₹144, and ₹140 lakh crore with increasing CBDC penetration. The moderate decrease in M2 compared to M1 suggests that while liquid funds are shifted to CBDC, savings and short-term deposits remain relatively stable. This indicates a partial but controlled impact on the broader money supply, reflecting that only some bank deposits are being converted into CBDC.

M3 (Broadest Money: M2 + long-term deposits and other time deposits)

M3 declines slightly from ₹180 lakh crore at 0% CBDC adoption to ₹172 lakh crore at 50% adoption. The smaller reduction in M3 compared to M1 and M2 suggests that long-term deposits are largely unaffected by CBDC adoption. This indicates that the overall money supply remains reasonably resilient, even as the central bank introduces digital currency.

Effects on Commercial Bank Credit Creation and Lending Behaviour

Traditionally, commercial banks create credit by mobilizing deposits and extending loans to businesses and households. With the advent of a CBDC, however, a portion of these deposits may shift directly to digital accounts maintained with the Reserve Bank of India, bypassing commercial banks. This potential **disintermediation** could reduce the deposit base available to banks, thereby limiting the funds they can deploy for lending purposes. As a result, banks may face constraints in credit creation, which could have downstream effects on sectors heavily reliant on bank financing, such as small and medium enterprises, housing, and infrastructure projects.

Table 2: Impact of CBDC adoption on commercial bank credit in India

CBDC Adoption	Bank Credit (₹ Lakh Cr)
0%	120
10%	118
30%	113
50%	108

The projected impact of CBDC adoption on commercial bank credit indicates a gradual decline in lending capacity as digital currency usage increases. At the baseline scenario of 0% CBDC adoption, total bank credit stands at ₹120 lakh crore. With a 10% adoption of CBDC, bank credit decreases slightly to ₹118 lakh crore, reflecting an initial shift of deposits from commercial banks to CBDC wallets. As adoption rises to 30%, bank credit falls more noticeably to ₹113 lakh crore, and at 50% CBDC adoption, it further declines to ₹108 lakh crore. This trend demonstrates that as a portion of bank deposits is replaced by CBDC, the funds available for banks to extend loans are reduced, potentially constraining credit creation. The decline is more pronounced at higher levels of adoption, indicating that commercial banks may respond by tightening lending standards, increasing interest rates, or seeking alternative funding sources to maintain profitability. These findings suggest that while CBDC can enhance payment efficiency and financial inclusion, careful policy design is necessary to mitigate adverse effects on bank credit and ensure continued support for economic growth.

Implications for Liquidity Management and Monetary Policy Transmission

The adoption of CBDC has significant implications for both liquidity management and the transmission of monetary policy in India. As CBDC uptake increases, a portion of funds that would traditionally be held as bank deposits shifts into central bank digital wallets. This reduction in commercial bank deposits can lead to a contraction in the funds available for banks to lend, thereby affecting overall liquidity in the financial system.

Implications for Liquidity Management

- **Reduction in Bank Deposits:** CBDC adoption may shift a portion of bank deposits into digital currency wallets, reducing funds available for lending.
- **Impact on Short-term Liquidity:** Lower bank deposits could tighten liquidity in short-term money markets.
- **Adjustment of RBI Tools:** Repo, reverse repo, and other liquidity management tools may need recalibration to maintain financial stability.
- **Need for Real-time Monitoring:** CBDC flows require continuous monitoring to manage liquidity effectively.
- **Phased Rollout Benefits:** Gradual adoption with tiered limits ensures banks retain sufficient deposits while promoting CBDC usage.
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Implications for Monetary Policy Transmission

- **Enhanced Policy Tools:** Interest-bearing CBDC could provide a direct channel for influencing savings and consumption.
- **Credit Channel Weakening:** Reduced bank deposits may limit banks' lending capacity, potentially weakening traditional interest rate transmission.
- **Faster Policy Response:** Digital currency adoption may allow quicker implementation and monitoring of monetary policy effects.
- **Need for Complementary Measures:** RBI may need supplementary tools (e.g., targeted liquidity support) to maintain effective transmission.
- **Financial Stability Considerations:** Careful design is essential to balance CBDC benefits with banking system stability

Lessons from International Experiences

The adoption of Central Bank Digital Currencies (CBDCs) worldwide provides valuable insights for India's digital currency policy. Key lessons from leading examples include:

1. **China – e-CNY (Digital Yuan):**
- China has implemented a controlled, phased rollout of its digital yuan, ensuring that commercial banks continue to play a major role in financial intermediation.
- Dual circulation (CBDC alongside bank deposits) prevents sudden shocks to bank liquidity.
- The e-CNY is designed primarily for retail payments, enhancing efficiency while minimizing disruption to credit creation.

2. **Sweden – e-Krona:**

- Sweden's Riksbank emphasizes gradual adoption to avoid destabilizing the banking sector.
- The e-Krona aims to complement existing payment systems, preserving commercial banks' role in lending.
- Lessons include the importance of legal clarity, privacy safeguards, and robust technology infrastructure.

3. **Bahamas – Sand Dollar:**
   - The Sand Dollar promotes financial inclusion, particularly in remote areas, showing CBDC's potential to extend banking services.
   - However, significant adoption requires safeguards to prevent bank deposit outflows that could disrupt lending.
   - The experience highlights the need for strong regulatory and operational frameworks to ensure stability.

4. **Key Takeaways for India:**

1. **Phased Rollout:** Gradual implementation with adoption limits can prevent sudden liquidity shocks.
2. **Complementarity with Banks:** CBDC should coexist with commercial bank deposits to maintain lending capacity.
3. **Financial Inclusion:** CBDC can expand access to digital payments, especially in rural and underserved areas.
4. **Monetary Policy Support:** Interest-bearing CBDCs could enhance policy transmission if designed carefully.
5. **Robust Technology & Legal Framework:** Ensures security, privacy, and operational reliability.

Table 3: Major findings and policy suggestions of the study

Area	Findings	Policy Suggestions
Monetary Aggregates (M1, M2, M3)	M1 and M2 decline as CBDC adoption rises; M3 remains relatively stable. Liquidity in bank deposits decreases but overall money supply stays resilient.	Phased rollout to prevent abrupt liquidity shocks; continuous monitoring of M1 and M2.
Commercial Bank Credit Creation	Bank credit declines gradually with higher CBDC adoption, reducing lending capacity.	Ensure CBDC complements bank deposits; encourage banks to remain intermediaries; consider alternative funding channels.
Liquidity Management	Short-term liquidity in money markets may tighten; traditional RBI tools need recalibration.	Adjust repo, reverse repo, and other liquidity tools; implement real-time monitoring of CBDC flows; phased adoption.
Monetary Policy Transmission	Direct central bank interaction strengthens policy transmission; interest-bearing CBDC can influence consumption and savings. Credit channel may weaken if bank deposits fall.	Design interest-bearing CBDC; implement complementary measures to support credit channels; leverage CBDC for faster, precise policy response.
Financial Inclusion	CBDC can provide access to banking services for unbanked populations, particularly in rural areas.	Expand mobile wallet access, offline functionality; strengthen digital infrastructure.
Regulatory & Legal Framework	Risks include deposit outflows, financial instability, and cybersecurity concerns.	Establish legal clarity, privacy safeguards, cybersecurity standards; create safeguards against rapid deposit shifts.
International Lessons	Phased rollout, bank coexistence, and robust technology ensure stability and inclusion (China, Sweden, Bahamas).	Continuously adapt global best practices; design CBDC to complement banks and maintain financial stability.

Conclusion

The adoption of a Central Bank Digital Currency in India is poised to reshape the country's monetary landscape by enhancing payment efficiency, expanding financial inclusion, and improving the reach and effectiveness of monetary policy. While the digital rupee is likely to reduce M1 and M2 moderately and slightly affect M3, it may also constrain commercial bank credit creation if not carefully managed. Drawing lessons from international experiences, a phased and well-monitored rollout is essential to ensure that CBDC coexists with traditional banking, preserving liquidity and lending capacity. Interest-bearing features and tiered adoption limits can help the Reserve Bank of India manage liquidity and influence economic behavior effectively. Robust legal, technological, and operational frameworks are crucial to maintain security, privacy, and public confidence. By combining careful design, gradual implementation, and continuous monitoring, India can leverage the digital rupee as a transformative tool that modernizes the monetary system while safeguarding financial stability.

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