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An Analysis of Cryptocurrency: A Survey on the future of Indian Digital Currency

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Abstract:

The 2016 demonetization by the Modi government accelerated digital payment adoption in India, despite the country's heavy reliance on cash transactions. Increased smartphone usage and platforms like Paytm and BHIM UPI further boosted the transition. This paper explores the evolving investment behavior in India with the introduction of Central Bank Digital Currency (CBDC) and examines global trends in digital currencies. CBDC, issued and regulated by the Reserve Bank of India, aims to replicate the function of paper money using secure encryption and blockchain technology. Unlike volatile cryptocurrencies such as Bitcoin, CBDC ensures price stability and consumer protection. Announced in the 2022 Union Budget, India's digital currency initiative promises safer, regulated digital transactions. The study relies on secondary data to assess the implications of CBDC on investor behavior and potential benefits for various sectors of the Indian economy.

Keywords: *Digital currency, Blockchain, Bitcoin, Cryptocurrency*

Introduction

Money must serve three fundamental functions: it must act as a medium of exchange, a store of value, and a unit of account. Firstly, as a medium of exchange, money must facilitate the sale and purchase of goods and services. The seller must accept it with the confidence that it can be used for future transactions. Secondly, money must serve as a store of value by maintaining its purchasing power over time. A sound form of money should not be subject to depreciation or fail to preserve its worth.

Thirdly, as a unit of account, money must serve as a standard for measuring and comparing the value of goods and services, thus aiding economic decision-making. Digital currency functions similarly to email in the realm of financial transactions. It is expected to bypass

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centralized financial infrastructure, offering efficiency and speed. Blockchain technology, the backbone of many digital currencies, is designed to reduce transaction costs, particularly in cross-border payments and securities trading.

There are two types of blockchain: private blockchains, where banks or institutions act as custodians of cryptographic keys, and public blockchains, where every user operates independently. Digital currencies are a critical component of the fintech revolution and are poised to transform payment and settlement systems. Although digital currencies are not yet mainstream, they are expected to evolve and disrupt existing financial processes and institutions.

India's approach to cryptocurrencies has historically been cautious. The Reserve Bank of India (RBI) imposed restrictions on cryptocurrency transactions, which led to the collapse of platforms like ZEBPay, once India’s largest crypto exchange. However, this decision was criticized for lacking adequate research. Furthermore, the report of the committee formed to evaluate the feasibility of digital currencies in India is still pending.

Unlike physical currencies such as banknotes and coins, digital currencies have no tangible form. They exist solely in digital format and are transacted through computers or electronic wallets connected to the internet or specific networks. In contrast, physical currency transactions require the actual possession of money to be completed.

The utility of digital currency is comparable to that of physical currency, as it can be used to pay for both goods and services. However, digital currencies are also used in specific online communities such as gaming platforms, gambling websites, and social networking sites—where their usage may be either encouraged or restricted. Digital currencies enable instant, cross-border transactions. For instance, a user in the United States can transfer digital currency to a counterpart in Singapore, provided both are connected to the same network. These currencies effectively facilitate the transfer of value. However, they also necessitate a shift in the traditional understanding of currency, which has typically been tied to the buying and selling of goods and services. Digital currencies expand this concept—for example, a gaming token might extend a player's life or grant special abilities. While not a conventional commercial exchange, such interactions represent a meaningful value transfer.

While the Reserve Bank of India (RBI) remains cautious about cryptocurrencies, it acknowledges the potential of distributed ledger technologies (DLT) in enhancing payment and settlement systems. It also recognizes the relevance of machine learning and artificial intelligence in financial innovation. Nevertheless, due to limited

understanding and preparedness, the RBI has delayed the launch of its own digital currency. Still, there are signs of progress—11 Indian banks are reportedly collaborating to build a new blockchain system to support MSMEs with financing needs (Economic Times, Jan 28).

The central bank may explore the integration of digital currencies alongside existing financial systems and service providers. In the coming years, blockchain is expected to exert significant influence over global economies—its adoption, whether voluntary or mandated, seems inevitable.

Blockchain technology has already disrupted traditional business processes. Applications and transactions that once relied on centralized architectures or third-party verification can now operate in a decentralized environment with equal reliability. Blockchain's key attributes—transparency, resilience, auditability, and security—make it particularly suitable for the banking sector. Banks can collaborate on a shared blockchain infrastructure to process client transactions securely and efficiently. Technology companies have catalyzed the digital payment revolution, offering innovative solutions that reduce transaction costs, albeit with new types of consumer risks. To maintain the role of sovereign currencies in national financial systems, many central banks are developing Central Bank Digital Currencies (CBDCs). Indeed, Facebook's Libra project significantly accelerated global interest in CBDCs, prompting central banks to take swift action.

The Federal Reserve has initiated a study on the evolving payment landscape, as recently confirmed by Chairman Jerome Powell in his testimony. In response, the Board of Governors of the Federal Reserve System tasked a team of experts with examining the rapid transformation in payments, particularly the rise of stablecoins—cryptocurrencies designed to minimize volatility by pegging their value to a stable financial asset. Federal Reserve staff economists have presented potential frameworks for a U.S. digital fiat currency, commonly referred to as a Central Bank Digital Currency (CBDC). Two primary design models have emerged: "Fedcoin" and "Fedcount." Ongoing internal debates among staff economists focus on which model would better enhance payment efficiency and support monetary policy implementation. Some economists, however, argue that the Federal Reserve should refrain from pursuing any digital currency initiative at this stage.

Literature Review

In India, Bappaditya Mukhopadhyay (2016) investigated the dynamics of cashless payments by developing a theoretical model that analyzed consumer and seller payment decisions. His study concluded that the convenience offered by cashless transactions often outweighs the motivation to avoid taxation.

Rahul Gochhwal (2017) conducted research on payment system advancements and highlighted the Unified Payments Interface (UPI) as one of the most advanced payment systems globally. He emphasized UPI's ability to offer low transaction costs and rapid settlements due to the absence of intermediaries. Moreover, UPI has enabled interoperability among different bank payment systems.

Somanjoli Mohapatra (2017) analyzed the e-transaction process facilitated through UPI, particularly focusing on its core application, BHIM-UPI. Her work detailed the complete payment process, security features, and comparisons with other online payment platforms. She found that UPI was designed to make transactions simple, fast, and secure.

Jayshree Grover highlighted the unique features of the BHIM application, particularly its ability to function without an internet connection. She noted that users could access BHIM services through any phone by dialing a USSD code, provided their mobile number was linked to their bank account. She emphasized that BHIM represents a significant step for India's entry into the digital economy.

In their paper *Bitcoin and the Future of Cryptocurrency*, Rahman and Dawood (2019) examined cryptocurrencies as innovative tools of globalization. They explored the potential of Bitcoin as a cross-border payment mechanism and concluded that, with proper regulation, cryptocurrencies could resolve several existing financial challenges.

Rahul J. Nikam (2018)**,** in his *Model Draft Regulation on Cryptocurrencies in India*, argued for a more receptive stance from the RBI toward cryptocurrency. He emphasized the need for regulatory frameworks to tap into the value and opportunities presented by digital assets.

In their work *Legal Acceptance of Bitcoin in India*, Gunjan Jindal and Sheza Azeen (2018) discussed the importance of legalizing Bitcoin transactions to enhance national economic growth. They contended that without government-backed regulations, the full potential of cryptocurrency could not be realized.

Trautman (2014) described cryptocurrencies as a subset of digital currencies that may operate through either decentralized networks or centralized institutions. Similarly, Duque (2020) and Hudson & Urquhart (2019) defined cryptocurrencies as digitally created currencies using cryptographic techniques and exchanged over peer-to-peer networks, a concept first introduced by Nakamoto (2008)**.**

Bulut (2018) emphasized the reliance of cryptocurrencies on complex cryptographic processes to ensure secure transactions. The mining process—comprising mathematical algorithms—regulates both the creation of value and the validation of transactions (Adhami et al., 2014; Cennamo et al., 2018; 2020**).** Most cryptocurrencies introduce limited

supply models, differentiating them from state-backed currencies **(**Baur et al., 2015**).**

Unlike fiat currencies governed by central authorities, cryptocurrencies are governed by technology, making them distinct from conventional monetary systems **(**Dodd, 2018**).** As highlighted by numerous scholars (Aslan & Sensoy, 2020; Baumöhl, 2019; Cerqueti et al., 2020; Corbet et al., 2019; Platanakis et al., 2018; Vidal-Tomás et al., 2019**),** cryptocurrencies represent a novel and disruptive financial innovation.

Importance of the study

Central Bank Digital Currencies (CBDCs) are expected to lead to a more efficient and cost-effective currency management system in India. Regulated by the Reserve Bank of India (RBI), CBDCs will mitigate the volatility risks typically associated with unregulated digital currencies. Moreover, digital currency payments are likely to reduce settlement risk within the banking system. The significance of this study lies in its exploration of the transformative impact of digital currency on international trade expansion, financial inclusion, and the broader economic landscape. It seeks to understand how digital currencies could revolutionize the way we shop, save, and conduct business—potentially in ways not yet fully envisioned.

The digital currency will reduce the settlement risk in the financial system. Interbank settlement will not be required as the system will transact the digital currencies instead of bank balances just like the cash is handed over. The study of paper is related to understand the value of the digital currencies is stable as they are accepted worldwide. The sender, receiver and bank are aware about the transaction. The importance of digital currency for Indian economy is very important because it is the safer form of currency, end of paper cash, easier policy implementation and regulation, increased diversity, cost of currency management, overcoming international differences.

Need of the study

This research paper aims to examine the behavior of Indian investors in the context of digital currency adoption. It specifically seeks to assess the potential impact on investors if the Government of India officially introduces a Central Bank Digital Currency (CBDC). Additionally, the study explores the broader implications of CBDC issuance on the cryptocurrency market and its investors in India.

Statement of the problem

Investor awareness of cryptocurrencies is rapidly increasing in India. Today, even small-scale investors are actively investing in foreign digital currencies such as Bitcoin, Ethereum, Tether, Binance Coin, and XRP. However, major concerns remain—particularly regarding the scalability of cryptocurrencies, as their transaction volume is still significantly

lower than that of traditional payment systems like VISA.

Cryptocurrencies are also highly vulnerable to cybersecurity threats and exhibit extreme price volatility. These factors raise important questions about how such risks influence the behavior of Indian investors and the stance of the Government of India. This paper aims to investigate these concerns and analyze the impact of cryptocurrency developments on both investor behavior and government policy in India.

Objectives of the study

The objectives of this research are:

1. To understand the concept of Indian Digital Currency (CBDC) and its benefits in comparison to cryptocurrencies.
2. To examine the investment strategies of Indian investors with respect to Indian Digital Currency.
3. To analyze the shift in investor behavior in India upon the introduction of Indian Digital Currency.

Scope of the Study

Digital currency holds the potential to enhance economic flexibility and promote growth by transcending geographical boundaries. It promises to make financial transactions more economical, faster, and simpler, thereby contributing to the overall efficiency of the economic system.

The scope of this study includes examining how digital currencies can facilitate increased international trade and create new opportunities for nations to strengthen their financial health. However, the study also considers the potential challenges, particularly the impact on the traditional banking system. The introduction of Central Bank Digital Currencies (CBDCs), especially if they offer interest-bearing accounts, could diminish the role of domestic banks as deposit holders and financial intermediaries. A decline in bank deposits could reduce the lending capacity of banks, thereby affecting credit availability to consumers and businesses.

This study aims to explore both the opportunities and risks associated with digital currency in the Indian context, focusing on its implications for financial institutions, investors, and the broader economy.

Research Methodology

This study is primarily based on secondary data. Relevant information was collected from various credible sources, including news articles, academic journals, periodicals, research papers, official websites, and other internet-based resources. Statistical data related to digital currency and investor behaviour were compiled from these sources to support the research objectives.

Basic analytical tools such as mean and percentage calculations were employed to analyze the data. The results have been presented in graphical form where appropriate, to facilitate better

understanding and interpretation of the findings.

Discussion

While there is growing global interest in Central Bank Digital Currencies (CBDCs), only a few countries have moved beyond the pilot stage in their development. According to a 2021 survey by the Bank for International Settlements (BIS), 86% of central banks were actively researching the potential of CBDCs, 60% were engaged in technological experimentation, and 14% were conducting pilot programs.

This surge in interest can be attributed to several factors:

1. Central banks in countries like Sweden aim to promote a widely accepted electronic form of currency.
2. Nations with high physical cash usage—such as Denmark, Germany, Japan, and the United States—seek to make currency issuance more efficient.
3. Central banks wish to meet public demand for digital currencies, as reflected in the increasing popularity of cryptocurrencies like Bitcoin.

CBDCs offer several distinct advantages over other digital payment systems. One of the key benefits is that payments made using CBDCs are final and irrevocable, significantly reducing settlement risk in the financial system. For instance, imagine a UPI transaction where CBDC is exchanged instead of bank balances—similar to handing over physical cash. This eliminates the need for interbank settlements, improving efficiency and reducing systemic risks.

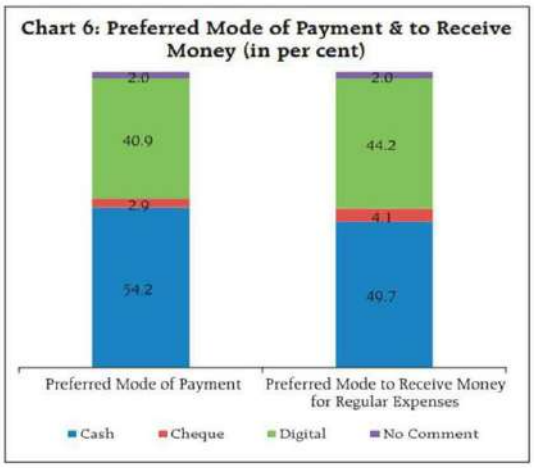
Additionally, CBDCs could help globalize payments by enabling real-time, cost-effective cross-border transactions. For example, an Indian importer could pay an American exporter directly in digital dollars, without involving intermediaries or depending on the operational hours of the U.S. Federal Reserve. This would resemble handing over physical cash and complete the transaction instantly.

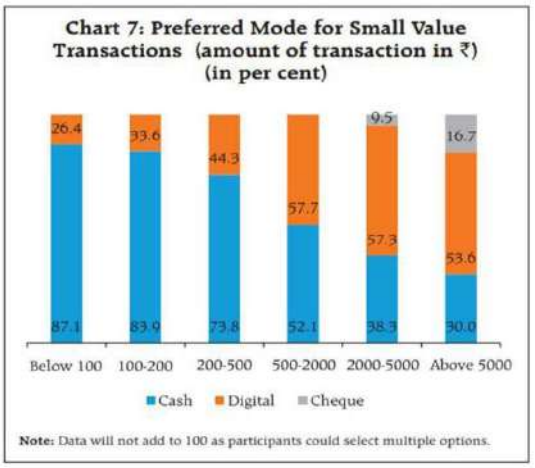
India currently stands at the forefront of digital payment innovation. Its payment infrastructure operates 24/7 for both retail and wholesale users, supports real-time settlements, and boasts some of the world's lowest transaction costs. The growth of digital payments in India is impressive, with a compound annual growth rate of 55% over the past five years. The Unified Payments Interface (UPI) even supports micro-transactions as low as one rupee—an unparalleled feature globally.

Given this high level of digital payment sophistication, one may question the necessity of CBDCs in India. However, despite the success of systems like UPI, cash still dominates as the preferred method for day-to-day small-value transactions. According to a pilot survey conducted by the Reserve Bank of India between December 2018 and

January 2019 (published in the April 2021 RBI Bulletin), cash continues to be widely used for transactions below ₹500.

This suggests that while digital infrastructure in India is robust, a gap still exists in transitioning small cash-based transactions to digital alternatives. CBDCs may serve as a bridge to address this gap and further accelerate the shift toward a truly cash-lite economy.





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As a result, India presents a unique scenario where the widespread adoption of digital payments coexists with a persistent preference for cash—particularly for small-value transactions. While CBDCs are unlikely to fully replace cash, especially in cases where the convenience of cash outweighs the benefits of digital alternatives, there is potential for CBDCs to gain traction if they can replicate one of cash's most valued features: anonymity. If CBDCs can guarantee user privacy, they may effectively satisfy the same demand for confidentiality that currently drives the preference for physical cash.

Another compelling reason for adopting CBDCs in India is the country's high currency-to-GDP ratio. Replacing a portion of physical cash with digital currency could reduce the significant costs associated with printing, storing, transporting, and distributing currency. This transition could bring about substantial savings in currency management.

Additionally, the growing presence of private virtual currencies (VCs) presents another rationale for introducing CBDCs. While the exact utility these private VCs offer over sovereign currencies remains unclear, their increasing popularity poses a potential threat—especially in countries

with less convertible or unstable national currencies. If widely adopted, such private currencies could undermine the use and trust in national currencies. Although major global currencies like the US Dollar may be less affected—especially since many VCs are denominated in dollars—smaller or emerging economies may face greater risks.

As Randal Quarles has noted, some virtual currencies could even reinforce the dominance of the US Dollar. In this context, issuing a CBDC could help safeguard public trust in the Rupee by offering a secure, government-backed alternative that fulfills monetary functions without the volatility and speculative risks associated with private cryptocurrencies. In fact, the extreme price volatility of private virtual currencies is one of the key factors dissuading central banks from endorsing them as reliable forms of money.

For central banks to successfully explore and implement CBDCs, they must not only strengthen domestic research and testing but also engage in close international collaboration. Establishing credible standards and shared principles is essential to fostering responsible innovation.

The rationale for CBDCs is particularly strong in emerging economies like India—not only because of their ability to enhance payment systems, but also because they may become essential tools to protect the public from the risks posed by volatile, unregulated virtual currencies.

Conclusion

The introduction of Central Bank Digital Currency (CBDC) holds significant promise for India's financial ecosystem. Potential benefits include reduced dependence on cash, increased seigniorage through lower transaction costs, and minimized settlement risk. CBDCs could pave the way for a more reliable, efficient, secure, and regulated payment system rooted in legal tender. While the adoption of CBDC does carry certain risks—such as technological challenges, cybersecurity threats, and potential disruptions to traditional banking—these must be carefully assessed against the wide-ranging advantages. As India advances toward the launch of its own CBDC, it will be the responsibility of the Reserve Bank of India (RBI) to ensure a cautious and well-planned implementation strategy that upholds India's leadership in digital payment innovation. CBDCs are likely to become an essential tool in the monetary policy arsenal of central banks around the world. However, their successful integration will require meticulous planning, stakeholder collaboration, and sensitivity to technical, regulatory, and economic nuances. As the global financial landscape evolves, CBDCs may no longer be just a futuristic concept—they are becoming a present-day necessity, waiting for the right moment to be fully realized.

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