Original Article

Digital rupee- A rival for cryptos?

Abhimanyu Sasi Pavoor[1], N. Ajithkumar[2]

[1] Department of Commerce and Management, School of Arts, Humanities and Commerce,
Amrita Vishwa Vidyapeetham, Kochi, Kerala, India

[2] Department of Commerce and Management, School of Arts, Humanities and Commerce, Amrita Vishwa Vidyapeetham, Kochi, Kerala, India.

Email: abhimanyusasipavoor@gmail.com[1], najithkumar3000@gmail.com[2]

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Abstract

The introduction of Central Bank Digital Currencies (CBDCs) as legal tender in various nations is something that several Central Banks around the world are planning in the near future. Similar intentions have been made public by the Reserve Bank of India (RBI), and an Indian CBDC can be expected soon. For any assessment of the impact, an evaluation of the potentials and difficulties brought on by the adoption of CBDCs is necessary. The current financial system is observing the entry of CBDC. The development of CBDC is accelerating the advancement of blockchain technology and virtual currencies with the support of Central Banks around the world. In this study, we examine the existing research on CBDC's in different countries. This research paper is analysing the differences between India's digital rupee and private Cryptocurrencies. Our current analysis can offer recommendations for the Introduction of Digital rupee in India.

Keywords: Digital rupee, CBDC, Digital currencies, RBI, Monetary policy, Cryptocurrency.

INTRODUCTION

India is emerging as a fastest growing economy in the world. Many innovations took place in banking sector. The Currency used for trade is issued by the central bank of the country. Technology advancements are taking place day by day. India is now making innovations in the digital payment structure. So there is a decline in the role of cash in payment systems. Digital cash idea was introduced by David Chaum in his research paper in 1983. He founded a company named 'Digicash' in 1989 which became the foundation for digital currency. Digicash uses a digital currency called cyberbucks. Ecash was launched by the company in the year 1990.

Recently there is growing importance for Crptocurrency. Cryptocurrency is a private digital currency which uses cryptography to make the transactions secure. Any person, anywhere in the world can make transactions in private cryptocurrencies. Now cryptocurrencies like blockchain are very popular. A digital currency based on blockchain technology was launched by Satoshi Nakamoto in 2008. Bitcoin is a private digital currency. Bitcoin made a breakthrough in private digital currency trade. Many other cryptocurrencies were also developed. Government and the central banks are more concerned about the growth in private Cryptos. People started investing more in the form of Cryptos. This has an effect on the monetary policy of a nation. Central bank will not be able to control the money supply. So many countries were against these private cryptocurrencies. They have introduced central bank digital currencies (CBDC) on their own. The problems with private Cryptos were thus solved. Reserve Bank of India is planning to establish a CBDC named 'Digital Rupee' in the year 2022-23. 'Digital rupee' will become a legal tender like 'Indian rupee'.

Although CBDC is a digital currency, it cannot be compared to the private virtual currencies or cryptocurrencies that have exploded over the past ten years. Since there is no issuer, private virtual currencies do not represent any person's debt or liabilities.

The future of value transmission is likely to be shaped by CBDCs, as a financial service innovation. In contrast to the present mobile wallet system provided by private companies, the Reserve Bank's digital rupee would be able to track all transactions. CBDCs can help the central bank continue to fulfil its mandate of delivering money, preserving financial stability, and ensuring continuous access in a fully digital economy.

The desire for quicker payments, rapid digitalization, and greater risk mitigation for clearing and settlement are driving the need for CBDCs globally. Financial inclusions as well as more effective internal and international value transfers are also in demand. These changes made Central Banks and governments realize the need for making attempts to investigate a digital form of the fiat currency.

In a study conducted in 2021 by the Bank of International Settlements (BIS), it was found that 86 percent were actively investigating the potential of CBDCs, 60 percent were experimenting with the technology, and 14 percent were implementing trial programmes. This research will focus on the differences that will be made after the formation of Digital Rupee. (Livemint, 2022), (Economic Times, 2022)

LITERATURE REVIEW

O Ward, S Rochemont(2019). This research paper gives a deep understanding of Central Bank Digital Currencies (CBDC). Now many central banks are issuing digital currencies. Introduction of CBDC's will have an impact on financial intermediation. Central banks cannot control a private digital currency. In order to investigate the possibility for issuing central bank digital currencies, central banks have started exploratory projects. The impact of a CBDC on interest rates, financial stability, and security needs to be carefully considered. Financial intermediation changes would affect bank funding and liquidity. Cryptocurrencies were made possible by technological advancement. Blockchain permits transactions without the need for a central authority and offers benefits that have been touted as the key to the future expansion of international trade. Central Banks are not sure that the technology is advanced enough to replace present systems to combat with the issues related to performance, interoperability, scalability, and security.

M Davoodalhosseini, F Rivadeneyra, Y Zhu (2020). This article discusses the CBDC's impact on the monetary policy. After introducing CBDC there may be positive and negative impacts on monetary policy. These facts are discussed in detail. Central banks and many academics are still discussing about the possibility of issuing CBDC. There are numerous justifications towards and against for issuing a CBDC. Here arguments and talks about the limitations and ramifications of CBDC form are discussed. CBDC has an impact on the market deposits.

Alonso, S. L. N., Jorge-Vazquez, J., & Forradellas, R. F. R. (2021). This research paper mainly focuses on the current status of CBDC and how many countries are implementing them after conducting many pilot studies. CBDC is having many advantages and disadvantages. It can be understood only after implementing these currencies for a long period. CBDC became poplular just recently. Central bank would create and support CBDC which would be an electronic form of money that could be used by individuals and organisations to make payments and store value. The 10, 50, or 100 monetary units of a CBDC would always be equivalent to the 10, 50, or 100 monetary units of banknotes or conventional physical coins. A CBDC would be denominated in Dollars, Euros, Yen, or any other currency, just like banknotes or physical coins. While in theory a CBDC may be comparable to a digital banknote, its actual features will depend on its final design and it may differ.

OBJECTIVES OF THE STUDY

1. To study about digital rupee and its effect on private cryptocurrencies.
2. To study the difference between CBDC and Private cryptocurrencies.
3. To study about the drawbacks in introducing CBDC's .

RESEARCH METHODOLOGY

This research is based on objectives stated above. In order to conduct a thorough analysis of the topic, secondary data sources were explored. For this approach, a variety of reviews from websites, journals, and publications were used. Examining the data was made easier through newspaper reports and circulars from several international organisations.

What is CBDC?

Central Bank Digital Currency (CBDC) is a digital currency issued and regulated by central bank of a country. It will provide more safety and security compared to private cryptos. It will promote financial inclusion. Now almost 100 countries are exploring CBDC's.

Merits of CBDC

1) If currency is rolled out, this will ensure public access to legal tender

CBDC is a legal tender issued by central bank in the electronic form. So this will create liquidity for banks.

2) CBDC would improve effectiveness of monetary policy.

Normal short-term interest rate reductions by central banks during recessions aim to increase overall investment and consumption. A CBDC might have an impact on the market for deposits.A CBDC with a non-zero interest rate may act as a floor for deposit rates if bank deposits and CBDC were close substitutes.The CBDC rate may have an impact on the deposit market even if it were not commonly adopted by giving depositors an alternative, increasing competition.An additional weapon for monetary policy may be interest rates on CBDC deposits, although they would need to be adjusted in accordance with existing policy rates.The transmission of monetary policy would be improved as a result of a closer relationship between deposit rates and the CBDC and other policy rates.

3) CBDC's will not go bankrupt

CBDC's will not go bankrupt as it is under the control of a central bank. It ensures liquidity compared to cryptocurrencies.

4) CBDC's are programmable money

They are programmable money. So it can be used for specific purpose.

5) CBDC uses blockchain technology

CBDC uses blockchain technology. So this will increase the security in digital transactions. Since this blockchain is not decentralised, the access to the blockchain will be limited to the approved participants of central bank.

6) Faster payments

Faster settlement is possible by using CBDC payment.

7) No processing delays

There are no unwanted processing delays for CBDC transactions.

8) Cheaper payments

Payments are cheaper. It involves very less cost.

9) Cross border transactions will be easier

CBDC payment platform will help in making cross border payments easier.

10) Reduces settlement risk

CBDC payments will reduce settlement risk.

11) Burden on Cash transactions can be reduced

Cash transactions can be reduced. This digital currency can be used instead of cash.

12) Dependency on dollar can be reduced.

More dependency on US dollar can be reduced.

TYPES OF CBDC'S

1. Wholesale CBDC

Financial institutions that are subject to regulation may use wholesale CBDCs. They expand on the current two-tier arrangement, which positions the central bank at the core of the payment system and gives Payment Service Providers responsibility for customer-facing activities. Commercial banks and other Payment Service Providers are given accounts by the central bank, and domestic payments are settled on the balance sheet of the central bank. CBDCs for wholesale transactions are designed to settle interbank transfers and other relevant wholesale transactions, such as payments between financial institutions. They might include international payments or digital assets. Central bank reserves, and wholesale CBDCs function quite similarly. In order to settle a transaction, the bank that has net liabilities to the rest of the system is debited, and the bank that has net claims on the system is credited. Settlement in wholesale CBDCs also enables new types of payment conditionality, necessitating that a payment only settles in exchange for the delivery of another payment or the delivery of an asset. Such conditional payment instructions may improve the RTGS systems' delivery-versus-payment mechanism. (BIS, 2021)

2. Retail CBDC

In simple terms, Retail CBDC is issued by central bank to the public. Retail CBDCs alter the traditional two-tier monetary system by allowing the public to access central bank digital money in the same way that they can access cash as a direct claim on the central bank. Retail CBDCs have the benefit of posing no credit risk to users of the payment system because they constitute a direct claim against the central bank. A retail CBDC is comparable to a digital version of cash, which central banks are primarily responsible for providing. Other types of digital retail money are claims against middlemen. Due to a brief cash shortage or even insolvency, such intermediaries can experience illiquidity, which could also cause payment interruptions. Retail CBDCs would eliminate any remaining risk, even though in the majority of situations, such risks are already significantly reduced through collateralization and other precautions. CBDCs sold in stores come in two varieties.One solution creates a design that resembles cash and permits so-called token-based access and payment anonymity.Using private-public key encryption and a password-like digital signature, this solution would grant certain people access to the CBDC without the need for personal identity.The alternative approach, known as "account-based access," is based on user identification verification and is grounded in a digital identity scheme.The second approach would not preclude protecting privacy and is more conducive to the monitoring of illegal activities in a payment system. Retail CBDCs would eliminate any remaining risk, even though in the majority of situations, such risks are already significantly reduced through collateralization and other precautions. CBDCs come in two varieties. One solution creates a design that resembles cash and permits so-called token-based access and payment anonymity. Using private-public key encryption and a password-like digital signature, this solution would grant certain people access to the CBDC without the need for personal identity. The alternative strategy, known as "account-based access," is based on user identification verification and is grounded in a digital identity scheme. This second approach would not preclude protecting privacy and is more conducive to the monitoring of illegal activities in a payment system. (BIS, 2021)

SOME OF THE COUNTRIES USING CBDC

1. The Bahamas

Bahamas central bank issued Sand Dollar in the year 2020. This was the first CBDC in the world which covers the whole country. This currency is the digital form of Bahamian dollar. All the residents in the country will have access to this currency using mobile apps or payment card. This currency makes steps to control money laundering and other types of frauds. Just recently a face recognition authentication is also provided for sand dollar.

Features of Sand Dollar

1. This currency can be accessed using mobile apps or payment cards.

   It is very convenient for people. They can access this currency using mobile apps or payment cards.

2. This currency has very advanced technology to control money laundering and other such frauds.

   Introduction of this currency has helped to combat with laundering and such other frauds.

3. Blockchain technology is used

Here blockchain technology helps to enable peer to peer transactions. It reduces transaction costs in payments. (Consulting.us, 2021)

2. Nigeria

Nigerian central bank issued e-naira in the year 2021. Nigeria is the first African country which introduced CBDC. The eNaira uses the same blockchain technology that is used many private cryptos. It is stored in digital wallets and is used just like cash. This currency can be transferred digitally. This has increased the financial inclusion and also the monitoring of transactions are also made easier.

Major features of e-Naira currency

1. It uses blockchain technology

   eNaira uses blockchain technology like Ethereum and Bitcoin. Blockchain technology secures using cryptographic algorithms. It uses encryption for securing data.

2. Increased speed for remittance of payments

   There is more speed in remittance of payments.

3. Monitoring of transactions to prevent fraud

   It monitors all the transactions and this will help to prevent frauds.

4. Lower costs

   It has lower costs compared to private digital currency.

5. Inclusion of unbanked Nigerians with phones through the ability to receive salary payments as well as payments for goods and services

   It promoted inclusion of unbanked Nigerians. It also helped to receive and make payments using mobile phones.

6. Option as a new trade mechanism with less expensive and safe transactions

   It is very less expensive and safer compared to private digital currency.

7. Better security with its unique identity and security structure

   It has better security because of its unique identity and security structure.

8. Promotes cashless policies among merchants while helping mitigate the risk of carrying cash

   This currency promotes cashless society and this can reduce the usage of cash. (IMF, 2021)

3. Eastern Caribbean Union

To facilitate quick transactions and provide assistance to those without bank accounts, seven Eastern Caribbean Union nations developed their own digital money. The seven nations are Antigua and Barbuda, Dominica, Grenada, Montserrat, Saint Lucia, St. Kitts and Nevis, and St. Vincent and the Grenadines. Several nations are currently testing pilot CBDCs. On March 12, 2019, the Eastern Caribbean Central Bank (ECCB) debuted its illustrious DXCDCaribe pilot. To the international currency code for the euro (XCD), the prefix "D" stands for digital. A digitally issued and securely minted variant of the EC currency DCash is used in the pilot. This pilot's goal is to evaluate the efficiency and welfare improvements that could be made in the areas of increased financial inclusion, economic development, resilience, and competitiveness in the ECCU from introduction of DCash. (ECCB,2022)

4. Russia

The Bank of Russia stated plans to begin consumer tests in April 2023 rather than 2024 and is already conducting a trial for its digital ruble with 12 institutions. The central bank claimed that it is more likely that it will have the launch roadmap by 2023, however the central bank digital currency (CBDC) may become fully operational in 2023. It was also confirmed that the virtual ruble might serve as a SWIFT substitute. Incorporation with the digital yuan, which China has been testing with consumers since October 2020, has been the subject of reports.One of the initial drivers for the Pilot's introduction in June 2021 was to address worries about bank concentration.But their intensified attempts might be explained by the current SWIFT prohibition. (Ledger Insights, 2022)

5. Sweden

Sweden’s central bank developed a CBDC named ‘e-krona’ in 2017. This digital currency is now in a testing stage. The asset is now technically prepared to be incorporated into banking networks and ease transactions, according to Riksbank, the country's national bank. The CBDC was examined about its technological capability to operate within the nation's current digital banking infrastructure during the second part of the e-krona pilot project, which started in February 2021.The participating banks included Tietoevry and Handelsbanken.

According to the study, it was possible to convert the e-krona into fiat currency and utilise it in both online and offline purchases. (Cointelegraph, 2022)

6. China

China is the largest country to test a digital currency. This was tested in April 2020.In April 2020, China became the world's first large economy to test a digital currency. China’s central bank issued Digital Yuan as CBDC. It is cheaper and faster. E-CNY app was launched by china in android devices. This app helps users to transfer money from bank accounts to top up the electronic wallet and to select the apps which they should use for e-CNY trade. (China Briefing, 2022)

7. Jamaica

Jamaican central bank is planning to launch Jamaican Digital Exchange as CBDC. It is in the pilot testing stage. Bank of Jamaica legalized JAM-DEX.(Outlook India,2022)

8. Canada

Canada has been trying to work on CBDC's from last 2020. They are planning to launch 'Digital Loonie'. It is now in a developmental stage. Canada is not providing any timeline for establishing CBDC (Financial post, 2021)

9. U.S.A

Here the development CBDC is under research. U.S.A. is planning to build a CBDC using Digital Dollar which provides cheaper and faster settlement of transactions. (CNBC, 2022)

10. United Kingdom

UK is planning to build a CBDC with pounds sterling as denomination. They are of the opinion that CBDC will make faster, efficient and cheaper payments. Formation of CBDC will make Financial System of United Kingdom more resilient. (Bank of England, 2022)

11. Mexico

Mexico plans to launch CBDC in 2025. It will become one of the first countries to launch CBDC in Latin America. Now it is under research. (Ledger Insights, 2022)

WHAT IS DIGITAL RUPEE?

Digital rupee is a digital currency which is going to be launched by Reserve bank of India (RBI) in 2022-23. This digital currency is used digitally instead of physical cash and it is controlled by Reserve Bank of India (RBI). It is a form of Central Bank Digital Currency (CBDC). This currency is same as that of fiat currency. Introduction of this currency will boost the digital economy. The CBDC guarantees that people are prepared for future change and gives much-needed sovereignty. With regard to the future of global trade, the Digital Rupee, which was the initial attempt, will undoubtedly give way to multi-currency CBDCs, allowing India to trade alongside other powerful and reliable trading partners. The digital rupee is equivalent to physical rupee. Plan to issue Digital rupee was announced in a budgetary speech by the finance minister of India on February 1, 2022. It will be cheaper than credit and debit cards. There is no need to carry digital rupee like cash. It will also increase the speed of transactions. Digital rupee uses Distributed Ledger Technology (DLT) i.e. Blockchain technology. Based on blockchain technology, the Reserve Bank of India's (RBI) digital rupee will ensure that the general public can benefit from cryptocurrency without having to worry about its potential drawbacks. The Digital Rupee gives users more flexibility compared to riskier virtual digital assets because it always ensures trustworthy transactions. Additionally, this currency won't be impacted by the erratic market fluctuations. Because it is governed and observed by the RBI, the Digital Rupee will withstand unfavourable market conditions even during unusual times like the pandemic. RBI said "The Reserve Bank proposes to adopt a graded approach to the introduction of CBDC, going step by step through stages of Proof of Concept, pilots and the launch," The initial stage starts with the proof of concept. The idea is tested in the proof-of-concept phase, and the test findings are confirmed to make sure the implementation will produce the same outcomes as expected.Proof of concept is the initial stage where the idea is put to the test, and the test result is verified to ensure that the implementation would yield results the same as intended. (Economic Times, Feb 2022), (CNBC, Feb 2022), (Economic Times, May 2022).

Merits of Digital rupee

1) Central banks cannot control a private digital currency.

Central banks issue a CBDC to control the demand and supply. If there is widespread adoption of private digital currencies it may effect the financial system. This will effect financial instability. This will be controlled to an extent by CBDC.

2) Reduce transaction costs

Digital rupee will reduce transaction costs as the transactions are entered in real time. So it can reduce transaction costs.

3. It will be available 24 * 7

Transactions can be done 24*7. There is no need of physical currency in hand to make purchases.

4. There is no risk of volatility

As digital rupee is backed by the banker's bank of India there is no volatility risk.

5. No physical damage of the currency

There is no ware and tear of digital currency. So there is no risk of physical damage of the currency. (CNBC, Feb 2022),

LIMITATIONS

1. Traceability of transactions

The central bank will be able to trace all the transactions done by the customer. Like all the online transactions through debit and credit cards, these transactions will also be traceable. Transactions cannot be done anonymously.

2. Negative interest rates

Customers cannot hoard money. Central banks will implement negative interest rates. This will promote over spending among customers.

3. Operational burden among central banks to maintain CBDC

Since everything will be digitalized. Banks have concern about the money which is digitally kept in the account of the customer. They have to check the vulnerabilities in networks and make secured networks. This requires a huge amount to maintain.

4. Cyber attacks

If banking network is compromised it will be a huge problem. The whole money is kept digital. So the risk is very high. (Economic Times, May 2022).

DIFFERENCE BETWEEN CRYPTOCURRENCY AND CBDC

1. Regulatory organisation

Cryprocurrency are stored on a decentralised blockchain network. CBDC is totally controlled by the central bank of that nation.

2. Form of money

Cryptocurrency is a store of value. CBDC is the digital form of Fiat currency.

3. Value of underlying asset

Cryptocurrency has no intrinsic value. There is no value for underlying asset. CBDC's are digital assets.

4. Information shared

In cryptocurrency, the transactions are available on a decentralised ledger. But in CBDC, transactions are known only to the sender, receiver and the banking institution.

5. Security

Cryptocurrencies are secured by encryption method whereas CBDC's are secured by strong passwords (CNBC,2022)

CONCLUSION

Introduction of digital rupee will help to expand the digital economy and also will strengthen the banking system. There can be positive or negative Impacts on introducing digital rupee. Usage of Cash should be managed. People would probably look for CBDC alternatives precisely when central banks are seeking negative interest rates. Alternatives might come in the form of foreign money or personal cryptocurrencies, raising the risk of broad adoption. Because these alternatives are not expressed in terms of the domestic unit of account, this would ultimately decrease the effectiveness of monetary policy. So policymakers must carefully assess the potential of the Digital Rupee in India while taking into account its effects on the macroeconomy and liquidity, banking systems, and money markets.

AUTHOR CONTRIBUTIONS

Conceptualization, A.S.P.; Methodology, A.S.P. ; Formal Analysis, A.S.P.; Investigation, A.S.P. and N.A. ; Resources, A.S.P. and N.A ; Data Curation, A.S.P; Writing – Original Draft Preparation, A.S.P and N.A.; Writing – Review & Editing, A.S.P and N.A.; Project Administration, A.S.P. Both Authors have read and agreed to the final published version of the manuscript.

CONFLICT OF INTERESTS

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