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Central Bank Digital Currency (CBDC) Can it Replace Notes and Coins in India

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Abstract

In golden old days when notes and coins were still to become medium of exchange, barter system was prevalent. With the growth of economies and trade relationship amongst countries, notes and coins emerged as means of exchange with global acceptability of currency unit of some countries like USD in foreign trade. Major disruption in the present system of use of currencies in settlement of goods and services is glaring in the form of digital currencies, popularly known as Crypto CurrencieslikeBitcoin. In this paper, effort has been made to understand need of Digital Currency from Central Banks (CBDC). The paper is an attempt to explain possibility of CBDC as replacement of actual currency and its advantages and disadvantages for India.In India, cryptocurrency was illegal either as means of exchange or as commodity for storage. After Hon'ble Supreme Court's judgement on the issue, RBI has to explore possibility of usage of cryptocurrencies. A Bill is proposed on the subject in this session of Parliament. Challenges in introduction of CBDC in India, risk associated with CBDC and likely architecture of CBDC has been discussed in the paper. The paper provides idea aboutefforts in introduction of cryptocurrencies around the world so far.Further,the paper explores possibility of Financial Inclusion through CBDC and likely challenges for Central Banks on Monetary Policy front. The paper also explores possibility to make CBDC unique instrument for peer to peer offline transactions without mobile or internet connectivity.

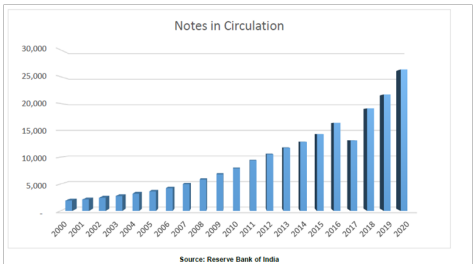
Keywords: Central Bank Digital Currency (CBDC), Crypto Currency, Disruptive Technology, Bitcoin

Introduction

Currency has three main purposes: (i) It is used for the purpose of payment and settlement of goods and services; (ii) It is used for storage purpose; (iii) It provides unit for accounting. In financial system, currency is glorified as most liquid asset and therefore is benchmark to assess liquidity of institution/system. An important feature of currency is its wider acceptability inspite of having 'face value' which is much higher than real value of paper. Therefore, one of the important aspects of currency management is confidence of people in the currency which largely depends upon confidence in Central Bank and the Government. In India, Rupee has wider acceptability and never faced crisis of confidence inspite of its diminishing value

due to inflation. People has not lost interest in Indian Rupee for storage purpose also.There has been a steady increase in the demand for banknotes and coins over the years, despite the increased use of technology-driven non-cash modes of payments. The demand for notes is subject to diverse socio-economic, behavioral and other often unpredictable factors. The primary reasons cited for the high dependence on cash are financial exclusion and the informal or black money economy of our country. Even for customers having bank accounts, distance to bank branches, cost of travel, opportunity cost of time spent, complicated documentation are some significant reasons for low account usage and more usage of cash. The value of banknotes in circulation increased by 22% from June end 2019 to June end 2020to Rs.26,356 billion. (Source: RBI website)

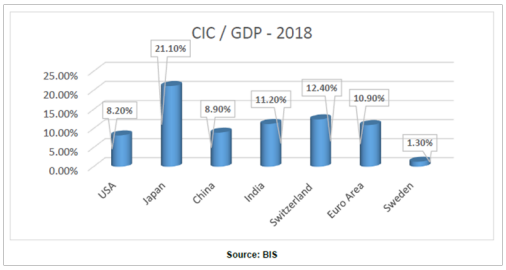
Table 1



(**Source**: BIShttps://stats.bis.org/statx/srs/table/CT2?p=2018&c)

Currency in Circulation (CIC) to GDP ratio gives idea of usage level of currency with respect to GDP growth which also helps in comparative analysis withother countries. GDP growth is one of the primary drivers of CIC. As in 2016, the world average ratio of CIC to GDP was at 9.6% (8.1% in 2011). While Africa, Asia, and Europe are at same level with the global average, North America and especially Oceania are below the world average. South America has the highest cash dependency relative to its GDP. Currency in Circulation vs. GDP is increasing in all continents, indicating a consistent, growing demand for cash across the world. Sweden has the lowest cash dependency with a CIC to GDP ratio of 1.4 percent while Paraguay has a ratio of 38 percent.

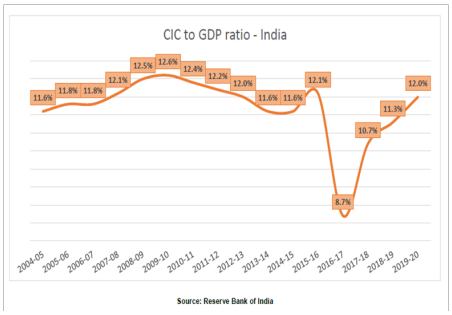
Table 2



In India, the CIC to GDP ratio which had come down to 8.75 percent by March 2017 from 12.09 percent in March 2016 due to demonetization, was higher at 12.0 percent in March 2020. During the last decade, CIC to GDP has shown declining trend from 12.6% in 2010 to 12.0% in 2020. Many experts believe that the figure indicates declining trend in usage of cash. As Table-3 below indicates, usage of cash has consistently declined as percentage of GDP during the period 2010 to 2015 and never reached to highest figure of 12.6% which was in the year 2010. The period also corresponds with consistent high growth in digital payment systems in India, indicating the

fact that people's choice for retail payments has significantly shifted from cash to digital payment, creating a ground for introduction of CBDC.

Table 3



In the background of such developments, the Government of India has proposed to introduce in the Budget-2021 session of Parliament "the Cryptocurrency and Regulation of Official Digital Currency Bill, 2021" with the purpose "to create a facilitative framework for creation of the official digital currency to be issued by the Reserve Bank of India. The Bill also seeks to prohibit all private cryptocurrencies in India, however, it allows for certain exceptions to promote the underlying technology of crypto currency and its uses" (Source: Lok Sabha Bulletin Part-2 January 29, 2021). The ground has been prepared to introduce CBDC. The success or failure of this experiment will depend upon the three factors associated with currency, namely, it's acceptability as a medium of exchange, its security and privacy as a store of value, and its stability as the unit of account for economic and financial transactions. In nutshell, the associated confidence in Indian Rupee should be available with CBDC issued by RBI and therefore the convenience and privacy associated with currency need to be available with CBDC as well.

Background

The idea of currency in virtual space without having a backing of any Central Bank first came in 2008 when one Satoshi Nakamoto, a pseudonym person or group of personscame with a document of first cryptocurrency called Bitcoin defined in the paper as "the publicly used means of exchange to combine decentralized control, user anonymity, record-keeping via a blockchain, and built-in scarcity". In early 2009, first Bitcoin came into existence followed by several other cryptocurrencies like Litecoin, etc. Gradually, acceptance of Bitcoins started growing with platforms like Wordpress, Expedia and even Microsoft started accepting Bitcoins as medium of exchange. Many Bitcoin and other cryptocurrency holders started converting these currencies into fiat currencies and space of cryptocurrency became widely attractive for investors and users both.

Source: cryptoexchange4u.com

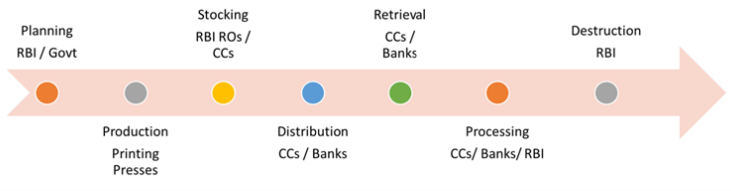
The Facebook project of Libra is still a secret project which has a potential of creating strong

cryptocurrency across the border all over the world. (Source: libraproject.com) Many websites have started promoting gamble by use of cryptocurrencies while International watchdog agencies like Financial Action Task Force (FATF) has started issuing globally binding instructions to prevent misuse of cryptocurrencies in money laundering and terrorist financing. In India, dealing in cryptocurrencies by banks was not recognized as legal activity in terms of RBI circular of April 2018 but on 4th March, 2020, the Hon'ble Supreme Court lifted ban on cryptocurrencies and asked RBI to use its power to regulate and prohibit after exhausting all other alternative options. It gave some legitimacy to cryptocurrency exchanges in India but although cryptocurrency exchanges are functional, their presence is insignificant in the world of virtual currency. If the proposed Cryptocurrency Bill-2021 comes into effect, all such exchanges are likely to become illegal again while CBDC may come into existence with use of underlying technologies which makes such virtual currencies popular. However, the promise of 'built in scarcity' made by founders of Bitcoins may not be available in CBDC if it reflects the character of cash. In India, availability of cash is demand driven and one of the objectives of currency management is to provide adequate cash in all regions of the country as per the demand and requirement of people. Therefore, to the extent of demand, CBDC has to be made available which also prevents use of CBDC as scarce commodity with fluctuating and highly volatile price with respect to popular fiat currencies like USD. Although the commodity character of cryptocurrencies can be eliminated in CBDC with wider availability, the underlying distributed ledger technology (DLT) does not provide support for such move as mining of cryptocurrencies becomes more difficult with larger user base. In a country like India, selection of technology is going to be a major challenge in introduction of cryptocurrency.

Challenges in Introduction of CBDC in India

Currency Management is a core central banking function. Reserve Bank of India ensures fulfilment of the legitimate demands of the public for notes and coins. The Currency Management architecture in India comprises of 19 RBI offices spread all over the country which supply notes and coins to its receptacles of currency called Currency Chests (CCs) which are managed by commercial banks, cooperative banks and Regional Rural Banks. As on 31st March, 2020, there were 3367 such currency chests playing active role in supply of fresh currency in far flung areas and withdrawing soiled notes from all over the country. Almost all branches of banks are linked with these CCs and these branches deposit or withdraw money from these CC as per public demand. At the end of the day, these CCs report total deposit and withdrawal to RBI through its CBS packageafter which RBI arrives at the figure of total currency in circulation. As on 22nd January, 2021, total value of currency in circulation was Rs.27,84,535 crore (Source: RBI website). Effort in introduction of CBDC need to factor the requirement of currency in India and architecture required to meet such demand. Development of robust and secure technology to count for and account for transactions in CBDC will be a big challenge.

Cash Management Logistics in India



Another challenge in introduction of CBDC in India will come from digital platforms and digital mode of payments which have started gaining popularity in recent years. Being a digital currency issued by central bank, CBDC should not become one of the many products available in virtual payment space. It has to have a distinct character providing novation and uniqueness to common man in its usage.

Connectivity of mobile and internet and related issues have been a challenge in far flung and hilly areas due to which efforts related to financial inclusion have not been quite successful. CBDC should also not become victim of connectivity related issues which will be a major hurdle in providing CBDC a true character of currency note. If CBDC depends upon any kind of connectivity, it will be depriving a part of our population with its advantage.

Last but not the least, while currency remains a requirement of every citizen of the country, not every citizen is financially and technologically literate and therefore creating ease of usage is going to be a major challenge for introduction of CBDC.

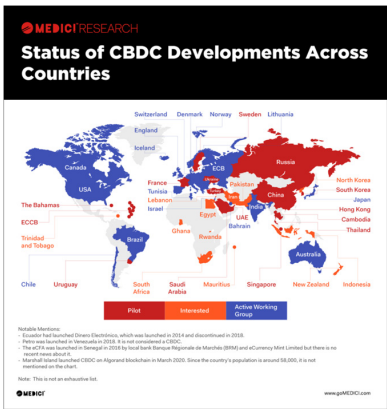
In nutshell, geographical and financial diversity, availability of technology and ease of usage are important factors in developing idea of CBDC in India.

Risks associated with CBDC

In virtual world, major risk is of cyber attack on infrastructure and end users both. With technology reaching at every hand, such threat will be universal. Secondly, the operational failures can lead to devastating effect for many CBDC users. Connectivity issues, electric outage and natural disasters are major risks leading to operational failures. Thirdly, every system has a limited capacity at any point of time and volume of transactions in CBDC can pose major challenge for end users in ease of usage. Fourthly, just like currency in India, CBDC needs to have legal standing to give it a character of fiat currency for wider acceptance.

CBDC in Other Countries

Popularity of cryptocurrencies like Bitcoins, which is reported to be all time high at USD 35,000 (Source-The Week, January 16, 2021), has created enough interest in virtual currencies across the globe. The Governments all over the world have started thinking in terms of having its own cryptocurrencies, mainly to counter popularity of Bitcoins and other such currencies and also to counter use of virtual currencies in money laundering and terrorist funding. Presently, no country has officially adopted the CBDC, but some of the countries like Russia, Japan, USA, China, and UK are planning to launch CBDC and have initiated pilot projects. The picture below is an assessment of position of CBDC across the globe.



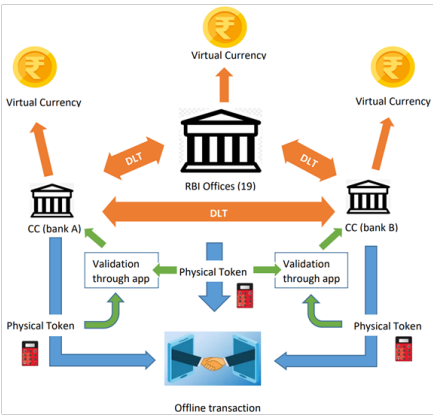
Ideal Model of Indian CBDC

The architecture of logistics for cash management provides immediate and readymade architecture for introduction of CBDC. As indicated elsewhere in the study, currency chests provide major interface between public and RBI for providing cash to common man. Banks withdraw money from CCs for their cash requirements and to meet public demand. In a country like India, the same model can work for CBDC also. While RBI can issue CBDC from its counters across 19 locations, it can also issue CBDC through its CCs across the country, which can be managed physically and digitally by banks.These CCs can act as CBDC exchanges.

CBDC can be in the form of token currency as well as digital currency just like Bitcoins. Those who understand and like to use virtual currency can subscribe to digital currency and have their money in digital form. That will provide ease of payment and settlement in the virtual world across the border. The end user should have a mechanism to verify the authenticity of CBDC and therefore DLT can be best choice for digital form of CBDC. Each CC can act as exchange for digital currency and therefore manage its own set of users through DLT. All CCs can be linked through common technology platform and provide real time volume of CBDC at any point of time.

The above model provides solution for across the border trade in virtual space just like Bitcoin. However, in a country like India, success of CBDC cannot be ensured by way of digital currency alone. Therefore, Indian model of CBDC should also use token currency just like plastic cards with screen to provide information on face value of unit at any point of time. Token currency should essentially have a feature to provide offline peer to peer transaction either through touch points on card or through touchless frequency based transactions or both, as in case of many plastic cards. Ability to connect for transactions with other cards without data or mobile can be a new feature in Indian CBDC. This will provide wider acceptability to such tokens and can emerge as an alternative to cash even in small remote places. Such tokens can have an upper limit of value and can be authenticated for further use periodically either through app or through device once connectivity is available. In the process of such authentication, value of CBDC can be recorded in centralized server for the purpose of accounting. However, keeping in view the huge volume of currency tokens, DLT may not be an ideal choice of technology for accounting for physical token currency. CBDC needs to have hybrid of blockchain and other ledger technologies to provide online as well as offline exchange facilities. The diagram indicates possible architecture for CBDC in India.

Possible Architecture of CBDC in India



Every CC, being an exchange, shouldhave information about user of virtual currency to comply with FATF guidelines to prevent money laundering and terrorist funding. Virtual currency user cannot transact or deal in illegal goods or services. However, CBDC can be used for any value for payment and settlement in legal means of transactions across border. It can also be swapped with other legal virtual currencies issued by other central banks. This will facilitate usage of CBDC in cross border trade with adequate safety. The exchange value of such swap can be determined by the market.

Token currency can have relaxed norms to provide comfort of cash. Tokens can have different colours with different upper limits and can be freely exchanged amongst users subject to periodical authentication through universal apps for the purpose. Tokens will continue to remain linked with issuing CC which will act as an exchange for settlement and validation through apps. Every time the user will validate physical token through app, the CC will capture the present value of token and ledger value will get updated. Finally, ledger value of all CCs and RBI offices will be updated through distributed ledger technology.

Financial Inclusion and CBDC

During the last decade, India has made huge progress in the area of Financial Inclusion (FI). The number of Basic Savings Bank Deposit Accounts (BSBDA) has increased from 7.35 crore in end March 2010 to 60.04 crore in end March 2020 (Source: Annual Report 2020-RBI). The figure also indicates that still huge part of population is not availing benefits from structured financial system and they are not financially included. There can be several reasons of such exclusion like lack of trust in banking system, digital illiteracy, access to internet and connectivity issues, etc. CBDC provides opportunity to bring in missing population under ambit of FI and make them use token currencies without connectivity issues in offline mode. Therefore, CBDC provides huge opportunity for taking India's FI programme towards universal inclusion. CBDC in token forms can be used for direct benefit and fund transfer purposes as each token can have unique identity number. Although CBDC can not give any interest on balances just like currency, it provides a wonderful opportunity to securely store money, use tokens for the purpose of exchange and use the same as an alternative to bank account. Thus, CBDC has potential to include the entire adult population in digital payment system.

Possible Impact on Financial Stability and Monetary Policy

CBDC has potential to dislodge financial intermediation and reduce the role of banking in financial system. Many analysts have recommended interest bearing CBDC for faster dissemination of goals of Monetary Policy. There is a possibility to create demand for goods in the economy by direct transfers to public benefits from the Government. During the lockdown period, such benefits were passed through BSBDA accounts and through CBDC, fund transfers can be more effective in creating demand. Moreover, interest bearing CBDC can be used as a tool of Monetary Policy to manage demand by manipulating interest rates on CBDC. However, interest bearing CBDC takes away the very nature of cash from it and therefore is not desirable. The primary reason of introduction of CBDC should be replacement of cash by more advanced and digital currency. With widespread use of virtual currencies and possible threat on monetary sovereignty of Central Banks, introduction of CBDC has become a necessity due to which Central Banks all over the world are experimenting with introduction of CBDC in different ways. Protecting monetary sovereignty is a major motivation for such a move. Many Central Banksmay also have an ambition to make their digital currency widely acceptable international currency. CBDC provides exciting possibilities to all Central Banks and monetary authorities.

Conclusions

Cash is still a king in India in payments and settlements system inspite of huge growth in digital payments. The volume of CIC is too large for replacement by CBDC. Therefore, even after introduction of CBDC in India, the necessity of cash will continue in medium term. In the initial phase of CBDC, the volume can be restricted to 1-2% of CIC to monitor its usage. Growth of CIC needs to be driven by technology as seamless experience in transactions can lead to its popularity and wider acceptance. Therefore for success of CBDC in India, robust technology and secure environment are key elements. CBDC has a potential to become largest digital transactions platform in any country so challenges related to cyber threats may become manifold more than any existing digital transactions platform in that country. Cautious growth with adequate safety and security is key to success of CBDC. The rewards of CBDC for users include ease of storage and transactions, privacy and security, bank account in pocket without financial intermediary and easy access to benefits and subsidy. For Central Banks, major motivation is continuation of monetary sovereignty and cost benefits in comparison to printing the notes and other associated expenses on cash management. Moreover, CBDC provides exciting possibilities in implementation of Monetary Policy. In combating money laundering and terrorist finance, CBDC provides better opportunity of tracing movement of funds.CBDC appears to be more attractive and promising than cash for all stakeholders and it has a real potential to replace notes and coins in long run.

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