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A STUDY ON INDIVIDUALS PERCEPTION TOWARDS CENTRAL BANK DIGITAL CURRENCY

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INTRODUCTION

The Reserve Bank of India (RBI) has been tasked with maintaining monetary and financial stability and promoting broad access to safe and efficient payments. This is achieved through providing central bank money, which is the safest form of money to banks, businesses, and the public. The history of the money goes back thousands of years, from bartering to metal coins and eventually paper money. Money is a form of money that is issued exclusively by the sovereign and is legal tender. It is a liability of the issuing central bank and an asset of the holding public.

Payment systems are changing at an accelerating pace, with systems that offer near instant person-to-person retail payments becoming increasingly prevalent. India has fostered innovation and development in the area of payment and settlement systems, with the Reserve Bank of India taking initiatives since the mid-eighties to bring in technology-based solutions.

India has made impressive progress towards innovation in digital payments, with state-of-the art payment systems such as RTGS and NEFT providing seamless real time or near real time fund transfers. Private virtual currencies have challenged the fundamental notion of money as we know it, claiming the benefits of de-centralisation. The Reserve Bank has played a role in promoting a safe, secure, sound, efficient and interoperable payment system.

The RBI has highlighted the risks of cryptocurrencies, which could undermine India's financial and macroeconomic stability. Central Banks are exploring the feasibility, potential benefits, and risks of CBDCs, with 90% of central banks engaged in some form of CBDC work and more than half now developing them or running experiments.

Digital money issued by a central bank is known as central bank digital currency (CBDC). A CBDC is equivalent to fiat money and can be exchanged for cash or fiat paper money at a 1:1 ratio (Bordo, 2021; Chaum, Grothoff, and Moser, 2021). Only the fact that a CBDC is digital currency makes a difference (Inozemtsev and Nektov, 2022; Kahn, Singh, and Alwazir, 2022). The majority of CBDCs can be stored in either a token-based wallet or an account-based wallet (Xu, 2022).

The RBI set up an Internal Working Group (WG) in October 2020 to undertake a study on appropriate design / implementation architecture for introducing CBDCs in India. The WG recommended a robust legal framework to back the issuance of e₹ (Digital Rupee) as another form of currency, a token-based variant in the retail segment, and pilot projects with phased implementation to serve as a learning experience. It also proposed a phased implementation strategy for the wholesale account-based CBDC model, in securities settlement (outright). Finally, the WG proposed to continue deliberations on CBDC over a longer period to refine and crystallise requirements for the implementation.

The High Level Inter-ministerial committee recommended the introduction of CBDCs as a digital form of sovereign currency in India, and more than 60 central banks have expressed interest in the concept. 105 countries are exploring CBDC, covering 95% of global GDP. China is the first large economy to pilot a CBDC, and it aims for widespread domestic use by 2023.
The RBI is exploring the pros and cons of introducing CBDCs in India, which could provide a convenient, electronic form of central bank money with safety and liquidity, but also pose risks to financial stability, monetary policy, financial market structure and the cost and availability of credit.

The Government of India announced the launch of the Digital Rupee — a Central Bank Digital Currency (CBDC) from FY 2022-23 onwards in the Union Budget. An internal high-level committee was constituted to explore the motivation for the introduction of CBDC, its design features and implications on policy issues, and suggest measures for its successful introduction. The Reserve Bank released a Concept Note to present the background, motivation, choices of design features and other policy frameworks for the e₹ system for the country. The aim is to build an open, inclusive, interoperable and innovative CBDC system which will meet the aspirations of the modern digital economy of India.
The features of CBDC include:

- Expected to lower the cost of issuance of money and transactions.
- Fungible legal tender for which holders do not need a bank account.
- Freely convertible against cash and money issued by commercial banks.

CBDC can be classified into two broad categories: general use, including Retail (CBDC-R) and Wholesale (CBDC-W). Retail CBDC (e₹-R) would be possibly accessible for use by all, viz., Wholesale CBDC (e-W) is intended for restricted access to a select group of financial institutions, in contrast to the private sector, non-financial consumers, and businesses. While Retail CBDC is an electronic version of cash primarily intended for retail transactions, Wholesale CBDC is intended for the settlement of interbank transfers and related wholesale transactions.

Recent developments in CBDC:
The first pilot in the Digital Rupee - Wholesale segment (e₹-W) commenced on November 1, 2022. The use case for this pilot is the settlement of secondary market transactions in government securities, which is expected to make the interbank market more efficient. RBI has identified four banks for participation in the wholesale pilot project, which are: State Bank of India, ICICI Bank, Yes Bank and IDFC First Bank. The pilot will cover select locations in Closed User Group (CUG) comprising participating customers and merchants, and will be in the form of a digital token that represents legal tender. It will offer features of physical cash like trust, safety and settlement finality, but will not earn any interest and can be converted to other forms of money.

The pilot of the retail e-Rupee was launched on December 1, 2022 in Mumbai, New Delhi, Bengaluru, and Bhubaneswar, comprising participating customers and merchants in a closed user group (CUG). Later other locations including Ahmedabad, Chandigarh, Gangtok, Guwahati, Hyderabad, Indore, Kochi, Lucknow, Patna, and Shimla were added to the pilot programme in phases. The pilot began with four banks including State Bank of India, ICICI Bank, Yes Bank, and IDFC First Bank while four other banks — Bank of Baroda, Union Bank of India, HDFC bank, Kotak Mahindra Bank joined subsequently. Five more banks including Punjab National Bank, Canara Bank, Federal Bank, Axis Bank and IndusInd bank are in the process of joining the pilot phase.

The scope of the pilot of retail Digital Rupee is being expanded gradually to include more banks, users, and locations as needed, the central bank said.

e₹-R can be held or used to carry out transactions, similar to how currency notes can be used in physical form. The retail e-Rupee has been launched in denominations of 50 paise, 1, 2, 5, 10, 20, 50, 100, 200, 500, and 2000, while wholesale e-Rupee does not envisage any denomination, RBI said in its annual report.

The retail Digital Rupee is proposed to be distributed through the two-tier model, according to the concept note released by RBI earlier. The Reserve Bank of India will issue and redeem e₹-R while the distribution and payment services will be delegated to the banks.

As per RBI deputy governor There were 1.3 million customers and 0.3 million merchants, who used CBDC as of June 2023, he said.

REVIEW OF LITERATURE
Kiff, Mr John, et al. "A survey of research on retail central bank digital currency." (2020) reviews some of the processes, roles and responsibilities that would be needed to define for creating, issuing, distributing, freezing, deactivating and destroying digital currency. Paper also considers risks, motivations and policy considerations for CBDC.

Ozili, Peterson K. in the chapter titled "Central bank digital currency in India: the case for a digital rupee.", (2023) in the book *Revolutionizing Financial Services and Markets Through FinTech and Blockchain*. IGI Global explored the benefits and issues surrounding the digital Rupee, also known as the eRupee or the central bank digital currency in India. The study found that Indian people who were interested in ‘cryptocurrency' information were also interested in ‘central bank digital currency' information. The study also showed that the introduction of CBDC has potential benefits such as reduced dependency on cash, higher seigniorage due to lower transaction costs, and reduced settlement risk. However, the India

CBDC has associated risks that need to be carefully evaluated against the potential benefits. The introduction of a digital Rupee or CBDC in India will require legal and regulatory changes to make the phased CBDC implementation possible. Bhowmik, Debesh. "Monetary policy implications of central bank digital currency with special reference to india" (2022) described The merits of CBDC, the digital payment situation in India. They also focused on banking literacy as the prime issue in discussing the several analytical frameworks of central bank digital currency monetary policy avenues as developed by several economists who were involved in the research of CBDC issuances, designs and applications some of which positive impacts are still unexplored.

Mehlkop, G., Neumann, R., von Hermanni, H. (2023) in paper "Privacy and the acceptance of centralized digital currencies in the U.S., India and Germany" conducted a survey in the United States of America, Germany and India to investigate the acceptance of an app-based monthly digital payment similar to a Universal Basic Income and investigate its adoption across income levels. Control variables of the study were privacy features and short-term vs. long-term incentives to adopt the digital payment app. They used data from 1194 interviews from the United States, 1172 from India and 1166 from Germany. The study found strong reservations with regard to the involvement of multinational tech companies in establishing new digital mediums of exchange, while also finding contextual differences in acceptance levels between the studied populations. Gupta, S., Pandey, D.K., El Ammari, A. Sahu, G.P. in their paper "Do perceived risks and benefits impact trust and willingness to adopt CBDCs?" investigated how risks and benefits impact trust and the digital rupee (or CBDC) adoption in India. They used six perceived risk factors and four perceived benefits factors. The willingness to adopt the digital rupee can be significantly predicted by all the constructs except perceived usefulness. The study also shows the partial mediation effect of trust to bridge the impact of perceived risk on willingness. However, perceived ease of use, innovativeness, and inertia do not significantly impact trust to adopt the digital rupee.

Kaur, J. in the study " Central Bank Digital Currency - The 'digital rupee' in India" shed light on what digital currency is, how it differs from cryptocurrencies, why it has had such a surge in popularity recently, as well as the problems and risks that come with using it. With the rising demand for cryptocurrencies, there is a rise in the government's concerns about the risks associated with the same and its tendency to facilitate money laundering and other forms of criminal financing, and thus the concept of CBDC is gaining momentum. Even though the RBI supports the growth of virtual and online currencies, it does not support ones like bitcoin because it is impossible to monitor their end-use. It is preferred to introduce CBDC in order to track end-to-end virtual currency usage.

Banerjee, S., Sinha, M in the study "Promoting Financial Inclusion through Central Bank Digital Currency: An Evaluation of Payment System Viability in India" established the potential role of RBI in the smooth functionality of implementing CBDC. The study brought out the trend of the payment system in India that opens up the possibility of positive implementation of CBDC and its welfare to percolate among consumers.

The business and technological risks and difficulties related to the implementation of CBDC are examined by Samudrala and Yerchuru, 2021 in the research paper "Central bank digital currency: risks, challenges and design considerations for India". Important design factors for CBDC exploration in India are also suggested in this paper.

B Eichengreen et al (2022) in "A central bank digital currency for India?" discussed the justifications for issuing CBDCs in India. These include lowering reliance on the dollar-dominated global payments system, facilitating cross-border transactions, improving financial inclusion, allowing the government and central bank to maintain control over the payments system, and offering a comprehensive platform for digital financial innovation.

Priyadarshini and Kar (2021) in "Central bank digital currency (CBDC): critical issues and the Indian perspective" discussed these topics conceptually and particularly in relation to India. They observed that the conceptual issues can be divided into three categories: issues pertaining to national sovereignty, issues pertaining to monetary sovereignty, and issues pertaining to development.

Alora et al (2024) in "Central bank digital currency adoption challenges-The case of an emerging nation" discusses about the growing interest in non-fungible tokens, virtual currencies, and cashless societies which has increased as a result of the introduction of cryptocurrencies and the advancement of blockchain technology and the skepticism faced by many due to its various forms, sophisticated technologies, and private nature.

Kumari, J. M. (2021) in "Central Bank Digital Currency (CBDC) can it replace notes and coins in India" attempted to comprehend the necessity of digital currency from central banks (CBDC) in this paper. This paper aims to explain the potential for CBDC to replace physical currency as well as its benefits and drawbacks for India.

Kalal, J. et all (2023) in "CBDC–An Alternative to Cryptocurrency in the Metaverse: An Indian Perspective" recognises the connection between the Central Bank Digital Currencies (CBDCs), which are issued by a few central governments worldwide, and the Meta-verse.

RESEARCH QUESTIONS

This study is conducted to determine insight in respect of following questions.

- If Individuals are aware of digital currency launched by the Reserve Bank of India?
- If individuals have a positive attitude towards use for digital currency?
- What are the motives of an individual for use of digital currency?

STATEMENT OF PROBLEM

The Reserve Bank of India has recently launched digital currency. This step could be successful only if it is widely used by the public for financial transactions. The problem this research attempts to address is - What perception an individual has towards digital currencies and understand his motives for the use of digital currency.

RESEARCH GAP

CBDC is a relatively new concept in the Indian Economy. Many of the past studies on CBDCs of other economies of the world are conducted. As far as our country is concerned, not much literature is available for CBDC. Even majority studies are based on secondary data. Very few previous studies are based on primary data. While digital currencies are gaining attention globally, there is limited research examining how awareness of Central Bank Digital Currency (CBDC) varies across age groups. Understanding this age-based awareness gap is crucial for targeted education and outreach strategies to ensure broader public knowledge and adoption. The attributes of CBDCs such as convenience, trustworthiness, safety, and liquidity are critical for public acceptance. However, existing literature often lacks a focused exploration of how these perceptions vary by age. This study fills this gap by investigating whether age impacts individuals' views on these key aspects, which can help in tailoring CBDC designs to meet the needs of different age demographics. Mumbai being the financial capital of the country has a major role to play as far as CBDC is concerned. No previous study has been done on primary data on CBDC for the city of Mumbai. Even no study is being done post launch of pilot CBDC by RBI.

OBJECTIVE OF THE STUDY

1. To assess awareness levels among individuals regarding Central Bank Digital Currency (CBDC).
2. To understand factors influencing individuals' perceptions of CBDCs, such as trust, usability, security, and privacy.
3. To evaluate the perceived benefits and drawbacks of CBDC from the perspective of individuals.
4. To analyze demographic variations in the perception and acceptance of CBDCs.

HYPOTHESIS

H0: There is no significant relationship between age and awareness of Central Bank Digital Currency.
H1: There is a significant relationship between age and awareness of Central Bank Digital Currency
H0: There is no significant relationship between perception and Age as CBDC is convenient, trustworthy, safe and liquid.
H1: There is a significant relationship between perception and Age as CBDC is convenient, trustworthy, safe and liquid.
H1: There is significant relationship between age and individuals perception towards ability of CBDC to bring efficiency in the payment and settlement system.
H0: There is no significant relationship between age and individuals perception towards ability of CBDC to bring efficiency in the payment and settlement system.

SCOPE OF THE STUDY

This study would be helpful for studying individuals' perception towards Central Bank Digital Currency only. This study is limited to examining age-related differences in awareness and perception of CBDC's attributes and benefits. It aims to provide actionable insights that can guide targeted educational, design, and promotional strategies to enhance CBDC adoption across diverse age demographics.

LIMITATIONS

1. The study is limited to Central Bank Digital currency of the RBI only.
2. The study is limited to only Mumbai City.

SAMPLING TECHNIQUE

Simple random sampling technique was used for selection of sample.

SAMPLE SIZE

Population of Mumbai City is estimated at 1,71,00,000 (Ref https://www.census2011.co.in/) applying 95% confidence level and 10% margin of error sample size is determined to be 100 adult individuals residing in Mumbai city.

METHODS

Primary Data is collected through Questionnaires and personal interviews of the respondents by the researchers.

DISCUSSION OF THE RESULT

Hypothesis Testing:

Table No 1. T-Test Paired Two Sample for Means for awareness of Central Bank Digital Currency

t-Test: Paired Two Sample for Means		
	Code	*Yes*
Mean	2.5	23.5
Variance	1.666667	399
Observations	4	4
Pearson Correlation	0.659232	
Hypothesized Mean Difference	0	
Df	3	
t Stat	-2.19338	
P(T<=t) one-tail	0.057944	
t Critical one-tail	2.353363	
P(T<=t) two-tail	0.115887	
t Critical two-tail	3.182446	

Interpretation:

- **t Critical one-tail**: 2.353363
  The critical t-value for a one-tailed test at the given degrees of freedom and chosen significance level. Since the absolute value of t Stat (2.19338) is less than the t Critical value (2.353363), we **fail to reject the null hypothesis** for a one-tailed test.
- **P(T<=t) two-tail**: 0.115887
  This is the two-tailed p-value. A p-value of 0.1159 is **greater than 0.05**, meaning that the difference is not statistically significant in a two-tailed test either.
- The p-values (0.0579 for one-tail, 0.1159 for two-tail) are greater than the typical significance level ($\alpha = 0.05$).
- The t Stat is smaller than the corresponding critical t-values for both tests.

Thus, **there is not enough evidence to reject the null hypothesis**. This means that we do not have sufficient evidence to conclude that there is a significant difference between the means of the two groups. Thus in this case we **reject the null hypothesis.**

Table 2: T-Test Paired Two Sample for Means for perception of CBDC is convenient, trustworthy, safe and liquid.

t-Test: Paired Two Sample for Means		
	Age	*Rate your perception on convenience offered by Digital Currency [Introduction of CBDC gives alternate to Cash, Cheque and going to bank.]*
Mean	3.072	4.08
Variance	1.535097	0.719355
Observations	125	125
Pearson Correlation	0.147961	
Hypothesized Mean Difference	0	
Df	124	
t Stat	-8.08398	
P(T<=t) one-tail	2.4-13	
t Critical one-tail	1.657235	
P(T<=t) two-tail	4.79-13	

t Critical two-tail	1.97928	

Interpretation: t-Test Results:

- **P(T<=t) two-tail**: 4.79E-13
  The two-tailed p-value is 4.79E-13, again an extremely small number. This indicates that the difference is statistically significant in a two-tailed test as well.
- **t Critical two-tail**: 1.97928
  The critical value for a two-tailed test is 1.979. Again, the t-statistic (8.084) is far beyond the critical value, meaning we reject the null hypothesis for the two-tailed test as well.
- Both the **one-tailed** and **two-tailed** p-values are **extremely small** (significantly less than 0.05), indicating that the difference between the mean age and the mean perception of the convenience of CBDC is **statistically significant**.
- Since the **t-statistic** (-8.084) is much larger in absolute value than the critical t-values for both tests, we **reject the null hypothesis**.

This means there **is a significant difference between the means** of age and perception of the convenience of CBDC.

Table No. 3: Single Factor ANOVA for perception on convenience offered by Digital Currency [Introduction of CBDC gives alternate to Cash, Cheque and going to bank.]

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Agree	4	59	14.75	264.25
Disagree	4	8	2	2
Neither agree nor Disagree	4	16	4	12.66667
Strongly Agree	4	42	10.5	95

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	414.6875	3	138.2291667	1.478716	0.026991	3.490295
Within Groups	1121.75	12	93.47916667			
Total	1536.4375	15				

Interpretation:

- P-value: 0.026991. This is the probability of observing an F-value this large under the null hypothesis (that all group means are equal). Since the P-value is less than the typical alpha level of 0.05, we reject the null hypothesis, suggesting that there is a statistically significant difference between at least one pair of group means.
- The P-value (0.026991) indicates some evidence of a significant difference between the means of the four groups. Thus in this case we will accept the Null hypothesis.

CONCLUSION

Hypotheses testing applying ANOVA presented following results.

1. Individuals are generally aware of Central Bank Digital Currency. - **Accepted**
2. Individuals fail to perceive CBDC as convenient, trustworthy, safe and liquid. - **Rejected**
3. Individuals do not recognise the ability of CBDC to bring efficiency in the payment and settlement system. - **Accepted**

CBDC is an innovative and competitive tool introduced by the Government of India. It offers a lot of flexibility and huge potential in reforming the entire mechanism of Banking Industry. However at present CBDC is at nascent stage and will require more time to mature and evolve further to materialise its full potential. The above analysis clearly indicate population is generally aware of CBDC and have positive perception towards CBDC however individuals do not see how it will bring benefit while using it in business transactions. The lawmakers and concerned authorities need to make efforts to convey advantages of using CBDC over other digital currencies.

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