

# The Analysis of E-Rupee Growth: A Study of Bank Participation and Voucher Metrics

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## Abstract:

This study aims to provide a critical evaluation of involvement of various participating banks in the growth and development of e-Rupee ecosystem. The study analyses the performance of public and private sector banks in voucher creation and redemption volume using secondary source of data. The study also highlights the growth of e-Rupee usage in both wholesale and retail segment. So the main aim of this study is to provide comprehensive understanding of current status and the potential of e-Rupee based on pilot study data of RBI. The findings of the study are intended to support financial institutions and policymakers in taking well informed decisions. In conclusion, the research emphasizes the overall potential of e-Rupee in India's digital economy.

**Keywords:** e-Rupee, CBDC, Bank participation, Voucher metrics

## Introduction:

The RBI introduced a concept called CBDC (Central Bank Digital Currency) on 7<sup>th</sup> October 2022 to change the digital landscape and create a transparent, cashless economy. The CBDC is commonly called as E-RUPEE. A pilot study has launched by RBI in both wholesale as well as retail segment to check the user's experience of using e-Rupee. E – RUPEE came into existence to replace physical currency that we kept in our wallet. It also known as CBDC (Central Bank Digital Currency) which is actually a digital form of Indian currency issued, managed and regulated by our apex body RBI. It is just like electronic form of cash that we kept in our digital wallet rather than physical wallet and also provide same feature of physical currency. Currently, e- rupee pilot project is going on where selected banks by RBI participating to test it for both retail as well as wholesale segments. In short, main objective of e-Rupee is to provide secure, effective, convenient and efficient digital alternative to physical cash.

On 1<sup>st</sup> November 2022 e-Rupee pilot project began in wholesale segment which is used for settling government securities in secondary market. This is helps to make interbank market more efficient also reduce cost which leads to make transaction more secure and fast. The e-Rupee pilot phase for retail segment was launched on 1<sup>st</sup> December 2022. It is being tested on limited group of customers and merchants. In the first phase four banks participated namely SBI, ICICI, YES BANK and IDFC first bank and later, BOB, Union Bank, HDFC and Kotak Mahindra Bank etc has participated in pilot project. There are total 14 participant consisting both banking and non banking entities involved in the ongoing wholesale CBDC pilot project.

**Research gap:**

The e-Rupee is still in pilot phase therefore there is limited number of research available. The existing studies mostly focus on future prospects, benefits and challenges of e-Rupee. However, no one has specifically examined banks participation in e-Rupee particularly in terms of voucher metrics that is voucher creation and redemption by different participant banks. Hence, this study is conducted addressing that research gap, with modified secondary data collected from NPCI website.

**Objectives:**

- To critically analyze participation of each bank in growth of e-Rupee.
- To analyze and compare the performance of public and private sector banks in voucher creation and redemption.
- To examine the growth of E-RUPEE voucher usage in retail and wholesale sector.

**Key features of E-RUPEE:**

- **E- Wallet:** it is mobile based digital wallet can be used to store and use CBDC which is provided by banks and authorized institutions to carry P2P (person to person) and P2M (person to merchant) transactions using QR code.
- **Safety and security measures:** there is strong cyber security framework to protect e wallet. Suppose if we lose our phone, we can easily recover our e wallet using the same mobile number.
- **Availability:** CBDC is available for both android and IOS users.
- **Participants:** similar to physical currency RBI create e-Rupee and then issues to bank and licensed institutions and then these participants help customers to open e wallet and use digital currency.
- **Aim of pilot project:** the ongoing pilot study help to test e-Rupee system, technology and users experience of e-Rupee like how people use and react on it.
- **Usage:** both customer and merchants who are connected to participating banks and providers can use e-Rupee for making transactions like transfer and redeem e-Rupee anytime means 24/7 availability.
- **Minimum balance requirement:** user doesn't need to maintain any minimum balance requirement in e-Rupee wallet like bank account.
- **Requirement of bank account:** currently e wallet linked to saving account of user for easy KYC and registration process. May be future model of e-Rupee allows account free use of CBDC.
- **Denomination:** e-Rupee is convenient and easy to understand and use because it is available in same denomination of physical coin and currency not in digital form.
- **Exact payment:** change feature of currency is available in e-Rupee. Suppose our wallet has 5 RS coin and we have to pay 4 RS, so after making payment the remaining 1 RS will be returned to our wallet similar to change feature in cash.
- **No transaction charges:** e-Rupee or CBDC is free to use. There is no transaction fees and charges on using e wallet.
- **Customer service available:** users can raise a complaint through wallet app and customer support service where any dispute regarding e-Rupee transaction can be resolved.
- **No interest:** CBDC is just like physical cash but in digital form in wallet therefore no interest will be paid on balance available in e wallet.

- **Offline mode of e-Rupee:** offline feature for e-Rupee being developed for users to transact in area where poor or no internet connectivity.

### Literature review:

(Shallu Sehgal, 2024) Highlights in their study the great potential of e-Rupee project in driving financial access and make transactions more efficient and transparent. However, it also address challenges like cyber security, regulatory complexity, data privacy and easy accessibility create need for balanced technological up gradation and strong policies for successful implementation of E-RUPEE project.

(Daravath Vikas Nayak, 2025) Shows in their study the growing interest in understanding user's behavior consist particularly level of awareness, adoption pattern and satisfaction level. The study highlights that introduction of E-RUPEE is an important steps towards digital monetary system especially in context of India. Additionally the study suggests various features which plays significant role in shaping users perception and willingness to adopt e-Rupee and consider bank as key stakeholders for success of e-Rupee digital currency.

(Mushtaq Ahmad Shah, 2025) Find out in their study that the role of block chain and public-private partnership plays a crucial role in successful structure and implementation of CBDCs. Blockchain technology helps to enhance security, privacy and transparency. Additionally, the coordination between private sector and government helps to solve legal and operational challenges and problems which making this systems secure, convenient and more effective to use.

(Md. Asraful Haque, 2023) Reveals in the research that e-Rupee brings both opportunity and challenges which ultimately shows transition of India towards digital currency. The research highlights that e rupee can reduce the cost of paper currency and also improve efficiency of making digital payment which leads to financial inclusion but the success rate is depends on the public acceptance and awareness, cyber security measures, and merchant adoption and efficiency. On the other hand, safe and secure infrastructure and clear government guidelines plays crucial role in its implementation and future success.

(Elcelina Carvalho Silva, 2025), explore that CBDC understood and used by different researchers and professionals in different ways, which leads to create confusion. Various terms like digital cash, digital money, and crypto currency are used to describe CBDC and often used interchangeability which highlights that there is lack of standardized terminology for CBDC.

(Jothish S, 2024), emphasize that e- Rupee has the potential for the growth of economy by reducing dependence on physical cash and improving efficiency of digital transaction. On the other hand, it also brings challenges like security concern and public trust and acceptance. In short study has cover both the aspects positive and negative and show that e-Rupee has potential to grow in India and aims to promote economic growth but requires comprehensive plan and public support and trust.

(Rafee, 2024), focus on global progress and development, opportunities and challenges and impact of e rupee with special reference Indian's CBDC. The research highlights its potential to grow faster, to improve financial inclusion, reduce cost and leads to digitalization. It also addressing challenges like privacy concern, inefficiency of banking sector and facing challenges in public adoption and policy framework.

### Research methodology:

The study is descriptive and analytical in nature as it utilizes secondary data from reliable source to anal-

alyze the participation of bank in CBDC growth by comparing the voucher creation and redemption volume with the help of redemption rate and also compare the performance of public and private banks. The research also evaluates the adoption trend of e-Rupee in both retail and wholesale segment. Additionally the study rely on NPCI statistics of e-Rupee, RBI reports , economic times data and existing literatures based on e-Rupee.

## Participation of each bank in growth of e-Rupee:

The following data consist voucher created and redeemed volume of participating banks and with the help of this data redemption rate is calculated which help us to compare the performance of different banks.

BANK PARTICIPATON IN GROWTH OF E RUPEE (FROM JAN 2024 TO FEB 2025)				
SR. NO	NAME OF BANKS	VOUCHER CREATED VOLUME	VOUCHER REDEEMED VOLUME	REDEMPTION RATE
1	BANK OF BARODA	61403	51650	84.116411
2	BANK OF MAHARASTRA	5748	1561	27.157272
3	HDFC BANK	37248	8237	22.113939
4	ICICI BANK	19520	12787	65.507172
5	INDIAN BANK	2438454	102122	4.1879814
6	STATE BANK OF INDIA	1349915	728155	53.940804
7	CENTRAL BANK OF INDIA	20	0	0
	<b>TOTAL</b>	<b>3912308</b>	<b>904512</b>	<b>23.119652</b>

Source: <https://www.npci.org.in/what-we-do/e-rupi/product-statistics>

The above data shows that total 39,12,308 vouchers created by participating banks out of which only 9,04,512 vouchers were redeemed that highlights redemption rate approximately 23%. This figure indicates that created vouchers are either being not used yet or limited adoption of redemption mechanism. From total voucher creation 96.84% voucher created by Indian bank and SBI indicates that these two banks are in dominant position in e-rupee initiative of RBI. The Indian bank emerged as top contributor to voucher creation, followed by SBI where as in voucher redemption Indian bank is much lower and SBI leads with approx 80% of total redemption volume indicating a strong end to end usage system. Despite creating higher number of voucher Indian bank's redemption rate is only 4.2% indicates there is possible issues with user's engagement and system integration where as BOB leads with 84.12% followed by ICICI and SBI. Meanwhile Central bank of India has shown negligible participation and growth in e-Rupee. On the other hand HDFC and Bank of Maharastra shows average growth in terms of redemption rate 22.11% and 27.16% respectively. In short, the voucher metrics of participating banks show a significant gap between voucher creation and voucher redemption volumes.

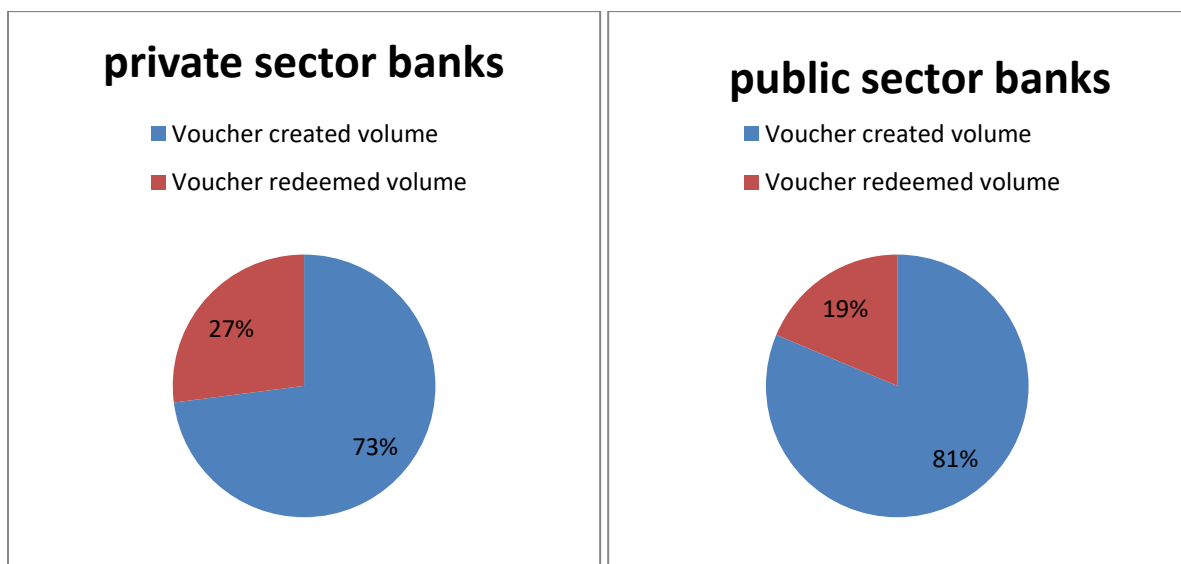
## Possible reasons behind low voucher redemption volume:

- The process of voucher redemption might be not user friendly or complicated for users.
- There might be lack of awareness among users about usage of e-Rupee or its benefit.

- There might be limited merchant acceptance of e-Rupee voucher making it difficult for users to redeem them.
- Users without stable internet access may face difficulty in redeeming vouchers.
- There might be trust and confidence issues among user using e-Rupee.
- Some banks might not have full-fledged integrated system for smooth voucher redemption.

The above data is again separated in private and public sector bank for further analysis.

SECTOR	Voucher created volume	Voucher redeemed volume
private sector banks	56768	21024
public sector banks	3855540	883488



Based on above data and pie chart public sector bank perform better than private sector banks in terms of voucher volume as public sector bank created significantly higher number of voucher than private sector. Similarly, redemption volume is also higher in cash of public sector bank as compare to private sector bank. Hence, the data clearly highlights that public sector banks are leading the initiative and playing significant role in promoting the growth of e-Rupee in terms of overall voucher volume.

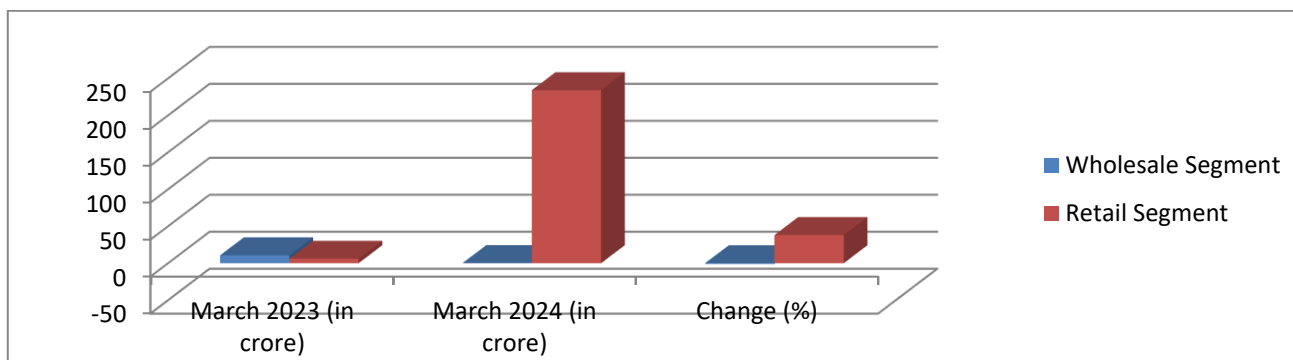
Interestingly, in the above data there is only two private banks and 5 public banks still the redemption efficiency of private bank is higher than public banks. The redemption rate of private bank is about 37% as compare to public banks which is approx 22%, which means that private sector banks redemption efficiency is greater than public banks although public banks are creating more voucher than private.

This highlights that number of private banks participation is less still they perform efficiently and support and guide their customer through the redemption process. This indicates the opportunity that if participation of private bank increases they could contribute significantly in the growth and development of e-Rupee because of better customer engagement.

## The e-Rupee voucher usage in wholesale and retail sector:

Category	March 2023 (in crore)	March 2024 (in crore)	Change (%)
Wholesale Segment	10.6	0.08	-99.20%
Retail Segment	6	234	3800%

Source: <https://m.economictimes.com/news/economy/finance/cbdc-usage-soars-39-fold-among-retail-users-plunges-in-wholesale/articleshow/110573059.cms>



The above data and graph indicates a drastic shift over a period of time. The transaction volume decreased from 10.6 crore to 0.08 crore showing decline of -99.20% in wholesale segment. On the other hand, retail segment highlights dramatic increase of 3800% indicating that merchants and users are adopting and accepting e-Rupee day by day. This reflects a drastic move towards the growth of e-Rupee in the retail segment.

## Conclusion:

The overall study concludes that there is a notable disparity in voucher creation volume and redemption volume among participating banks. Despite a significant gap in voucher creation and redemption volume in public sector banks, SBI and India Bank have played an important role in voucher metrics. On the other side participation rate of private banks is lower but has better redemption efficiency. The drastic shift from wholesale to retail segment highlights a strategic move towards broader user adoption. The reason behind sharp decline in e-Rupee usage in wholesale segment might be the dominance of existing popular digital payment methods or might be the limited functionality of e-Rupee. In short, the findings of the study e-Rupee will take time to get accepted by users. It also important to focus on enhancing system usability, especially in wholesale segments, and to ensure that there is widespread adoption in both public and private sector banks. RBI might involve more banks for the growth of e-Rupee adoption and acceptance across the country. Additionally, to ensure e-Rupee works seamlessly on other digital payment platforms with strong cyber security measures and it is also important to carry awareness campaign for faster adoption by general public.

## Future scope:

- As the e-Rupee is in its pilot phase, after successful implementation of this one can study customer's adoption behavior, perception and awareness level.
- In future the detailed comparative analysis and time series analysis can be possible because recently there are very less number of participating bank.
- One can explore the contribution of e-Rupee in financial inclusion.



- Future study can evaluate the cyber security framework for e-Rupee to protect user's data.

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