JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

The Evolution of Digital Payments in India: A Comprehensive Analysis of E-Transactions' Role in Shaping Economic Growth

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ABSTRACT

The rapid growth of e-transactions in India has significantly impacted the economic landscape of the country. This study explores the adoption and impact of digital transactions, focusing on their roles in promoting financial inclusion and economic growth. A mixed-methods approach was employed, combining surveys, interviews, and focus groups to gather data from urban and rural regions throughout India. The study utilised statistical tools such as regression analysis and structural equation modelling to identify the relationships between various factors influencing e-transaction adoption. Economic models, including the Technology Acceptance Model and Diffusion of Innovations Model, were applied to understand the spread and acceptance of digital payment systems. The findings revealed substantial growth in digital transactions, particularly in urban areas and among younger demographics. E-transactions have positively impacted financial inclusion, with more individuals gaining access to formal banking services. Government initiatives, such as demonetisation and the Digital India campaign, have accelerated the shift towards digital payments. This study highlights the advantages of e-transactions, such as enhanced financial transparency, reduced transaction costs, and improved efficiency in monetary policy implementation. However, challenges such as cybersecurity risks, the digital divide, and potential job losses in traditional financial sectors were also identified. This study recommends investing in digital infrastructure, implementing digital literacy programs, and developing robust cybersecurity measures and consumer protection policies to maximise the benefits of e-transactions. Future research should focus on the long-term economic impacts of digital transactions, the potential of emerging technologies such as blockchain and artificial intelligence, and the interplay between e-transactions and other sectors of the digital economy. The findings of this study contribute to the understanding of the evolving economic landscape in India and provide valuable insights for policymakers and stakeholders to promote inclusive and sustainable economic growth through digital transactions.

Keywords: E-transactions, Digital transactions, Financial inclusion, Economic growth, Demonetization, Digital India campaign and Unified Payments Interface (UPI)

I. INTRODUCTION

a. Background of e-transactions in India: E-transactions, or electronic transactions, encompass any financial transaction conducted electronically over the Internet or other communication networks. These include various payment methods, such as online banking, mobile payments, card transactions (debit and credit), and electronic wallets (e-wallets). The evolution of digital payments in India has been both robust and transformative. India has witnessed a significant shift from cash-dominated transactions to digital payment methods over the last few decades. This shift began in earnest with the introduction of new technology and the establishment of infrastructure to support online transactions. Key milestones in this evolution include the digitalisation push initiated by the Indian government, exemplified by the Digital India campaign, which encouraged the adoption of electronic payments and embraced technological advancements in financial services.

The launch of the Unified Payments Interface (UPI) in 2016 marked a significant turning point for digital transactions in India. UPI has made real-time bank-to-bank payments simple and efficient, greatly encouraging the

use of digital transactions. The demonetisation initiative of 2016 also played a pivotal role in pushing businesses and consumers to adopt mobile and online payment solutions, contributing to the rapid growth of the digital payment ecosystem.

Currently, e-transactions in the Indian economy are thriving. India is one of the world's leaders in digital payments, with the UPI processing billions of transactions monthly. This growth is fuelled by a combination of technological advancements, increased smartphone penetration, a favourable regulatory landscape, and growing consumer preference for online transactions over cash. The COVID-19 pandemic further accelerated this shift, as people turned to contactless payment methods to reduce physical interactions.

Thus, electronic transactions have become the backbone of the Indian economy, facilitating seamless financial operations across various sectors and contributing to financial inclusion. The ongoing evolution and adoption of new digital payment technologies signal a future in which e-transactions will continue to expand in scope and scale in India**.**

b. Research objectives: The primary aim of this study on e-transactions in India is to explore the role of the digital economy and technology adoption in advancing financial inclusion amid the evolving landscape of electronic transactions. By examining specific elements such as Central Bank Digital Currency (CBDC) and the associated challenges and prospects, this study aims to elucidate how these innovations could enhance the economic fabric by making transactions more efficient and secure [1,2,3].

Specific research questions to be addressed in this context include the following:

- How do technological advancements, such as CBDC, impact financial transaction processes in India?
- What are the challenges and opportunities associated with integrating digital currency into India's economic framework?
- What is the role of digital tools in promoting financial inclusion, particularly in rural and underserved areas of India?
- How do perceptions and behaviours surrounding digital technology adoption influence the broader acceptance of digital financial tools?

The significance of this research in the context of the Indian economy is multifaceted. First, it addresses the socioeconomic dimensions of financial inclusion, proposing digital solutions to bridge existing financial access gaps. This study also highlights the importance of a digital economy in fostering economic development and resilience in an increasingly globalised market. Furthermore, by providing insights into consumer behaviour and regulatory challenges, this study guides policymakers and stakeholders in devising strategies for efficient digital economy integration [3,4].

II. LITERATURE REVIEW

a. Theoretical framework: Several economic theories are relevant in the context of digital transactions in India.

- **Transaction Cost Economics (TCE):** This theory is significant in the digital economy as it helps explain when transactions are more efficiently managed within markets or organisations. Digital transactions have lowered transaction costs by providing efficient channels for exchanges, thereby stimulating market transactions and organizational structures in digital economies [5].
- **Financialization of Finance:** This concept addresses the push toward digital rather than cash payments, highlighting the economic transformation when financial functions, such as payments, are increasingly managed through digital platforms. In India, the movement towards cashlessness has been seen as a form of financialization, with digital transactions viewed as markers of economic modernisation despite challenges such as infrastructure inadequacy [6].
- **Innovation Diffusion Theory:** This theory is applicable to understanding how new technologies, such as digital transactions, spread across various populations. In India, elements such as government policies, like Aadhaar and UPI, have played crucial roles in facilitating the adoption of digital transactions, demonstrating the role of technological innovation in economic activities [7].
- **Behavioural Economics:** This often considered when researching how economic decision-making is impacted by cognitive biases or social factors in digital transaction adoption. In the context of demonetisation, behavioural economics helps explain varying levels of adoption and resistance among different segments of the population based on perceived trust and comfort with digital technologies [8].

Financial Inclusion Theory: This highlights the role of digital financial services in improving access to financial tools, especially among underserved populations. The digital economy in India leverages financial

technology to bridge the gaps between the banked and unbanked, enhancing financial inclusion and driving economic growth [9].

• Models explaining the impact of e-transactions on economic growth

Models explaining the impact of e-transactions on economic growth in India draw on several frameworks that consider the interplay between technological innovation, financial infrastructure, and economic development. The following are a few key models and findings:

- **Financial Development and Economic Growth Model:** This model integrates the concept that both bank-based and market-based financial developments significantly contribute to economic growth. The Autoregressive Distributed Lag (ARDL) approach used in this context indicates a long-term relationship between financial development indicators, such as market capitalisation and credit provision, and economic growth. The model underscores the need for financial sector reforms to sustain economic growth through enhanced financial services [10].
- **Infrastructure and Growth Model:** Infrastructure development, including digital infrastructure, is critical for supporting economic growth. A model based on Aschauer's empirical framework attributes economic growth to improvements in infrastructure, including telecommunications, which facilitate e-transactions. This model suggests that infrastructure stocks, such as enhanced digital transaction capabilities, not only support economic growth but also lead to increased productivity and economic output [11].
- **E-commerce Impact Model:** This model examines how the expansion of e-commerce, driven by digital payments, contributes to economic growth by increasing market participation and reducing transaction costs. The growth of Internet services, increased smartphone penetration, and proliferation of digital payment methods enable more consumers and businesses to engage in the online economy, thus contributing to broader economic growth [12].
- **Digital Payment and Economic Growth:** The push towards digital payments, as observed following India's demonetisation, demonstrates a model where technological and policy shifts impact economic activities. The adoption of digital payments expands market activities by making transactions more accessible and efficient, albeit with the consideration of necessary improvements in digital infrastructure and regulatory frameworks [13].

These models collectively highlight the positive impact of e-transactions on economic growth by facilitating financial inclusion, enhancing transaction efficiency, and promoting technological innovation within the economic framework.

Previous studies on e-transactions in developing economies: Previous studies on e-transactions in developing economies reveal a wide range of insights into their impact and development. The key highlights from recent research are as follows:

- **Digital Finance Technology and Financial Stability:** A study investigates the impact of digital finance technology, such as mobile phones and Internet usage, on the financial stability of the banking sector in developing economies. They found that while mobile phone subscriptions negatively impact financial stability, Internet usage positively influences it, suggesting a nuanced relationship between digital finance adoption and sector stability [14].
- **M-Pesa in Kenya:** The diffusion and success of mobile money services such as M-Pesa in Kenya are explored, revealing key systemic functions that facilitated its rapid uptake. This case underscores the importance of localised adaptation and a supportive technological innovation system in driving the successful deployment of digital financial innovations in emerging economies [15].
- **Digitalisation and Economic Growth:** Research shows that digitalisation in developing countries can significantly enhance economic growth by reducing transaction costs and improving skills. However, the interaction between digitalisation and governance can sometimes hinder growth, highlighting the role of effective governance in maximising digital benefits [16].
- **Trade Openness and Environmental Impact:** The impact of trade openness on environmental quality in emerging and developing economies is examined, indicating that while trade improves environmental performance, it can increase CO2 emissions. Effective policy measures are needed to balance trade benefits and environmental considerations [17].
- **Banking Systems and Sustainability:** The relationship between banking activities and environmental sustainability across developing, emerging, and developed economies is assessed, suggesting that increased

credit and lending in developing economies are often linked to higher carbon emissions, pointing towards the need for green financial practices [18].

These studies highlight the complex interplay between digital finance, economic growth, and environmental considerations in developing economies, providing valuable insights for policymakers and stakeholders aiming to optimise e-transaction frameworks.

b. Empirical evidence • Studies on e-transactions' effects on various economic indicators

Empirical studies on the effects of e-transactions on various economic indicators provide insights into how digital financial practices influence economic metrics.

- **Financial Stability in Developing Economies:** Research has shown that digital finance technologies, such as Internet usage, positively impact financial stability, whereas mobile phone subscriptions may have a negative influence. This suggests that the widespread adoption of digital finance can enhance financial system stability but may also introduce risks that require careful regulation [14].
- **Digital Finance and Economic Growth:** The adoption of digital finance has been associated with positive impacts on economic growth, especially in regions with weak traditional finance systems. E-transactions facilitate financial inclusion and boost economic activities by reducing transaction costs and enhancing financial efficiency [19].
- **Sustainability and Digital Transformation:** Studies show significant correlations between digital transformation, including e-commerce, and sustainable economic growth. Empirical evidence suggests that digital advancements contribute to increased GDP and foster organizational and economic sustainability [20].
- **Impact on Environmental Indicators:** The integration of banking and financial systems with e-transactions has implications for environmental sustainability. Research indicates that efficient digital finance practices can potentially reduce carbon emissions by optimising resource use and energy efficiency in financial operations [18].
- **E-Government and Technological Adoption:** The maturity of e-government services in developing countries is affected by digital finance, which enhances the efficiency of government operations and service delivery, leading to improved economic indicators such as GDP growth and infrastructure development [21].

These studies underscore the transformative potential of e-transactions in improving economic stability, growth, and sustainability across various indicators, highlighting the need for strategic policy and framework development to maximise these benefits. Research on the adoption and impact of e-transactions in India has highlighted several key findings and existing gaps in the literature.

- **Impact of Demonetization:** Demonetization in 2016 significantly increased the adoption of digital payments initially, though usage declined after new banknotes were circulated. Adoption is influenced by factors such as transaction type, product nature, and business owners' familiarity with digital tools [8].
- **Mobile Payment Services:** There Despite high mobile penetration, consumer adoption of mobile payments is low. The factors affecting adoption include performance expectancy, effort expectancy, social influence, and facilitating conditions. This indicates the need to enhance the user experience and address attitudinal barriers [22].
- **Unified Payment Interface (UPI):** UPI has transformed digital payments in India through real-time interbank transactions. Its architecture supports innovation, and while consumer adoption has been positive, the development of merchant-centric solutions is necessary to boost usage further [23].
- **Consumer Preferences and Technology Acceptance:** Factors such as ease of use, perceived usefulness, and perceived risk are crucial in determining consumers' willingness to adopt e-payment systems. Perceived security and trust are significant determinants of the adoption of electronic payment systems [24,25].
- **Comprehensive Studies on Rural Adoption:** There is limited research on how rural populations in India engage with e-transactions, despite their critical role in financial inclusion. Further studies exploring rural digital literacy and barriers to technology adoption are, therefore, required.
- **Longitudinal Impact Assessments:** While the short-term effects of policies such as demonetisation have been studied, there is a lack of longitudinal research examining the sustained impact of increased digital transactions on economic indicators.
- **Environmental and Social Impacts:** Current studies focus predominantly on economic outcomes, with less emphasis on the social and environmental implications of shifting to digital payment systems.
- **Technology-driven Modernity:** Existing studies suggest viewing digital payment adoption within the broader context of technology-driven societal transformation, an area that remains underexplored.

- **Security and Privacy Concerns:** Although security is a prevalent theme, focused research on evolving threats and consumer trust over time could bridge current knowledge gaps [26].

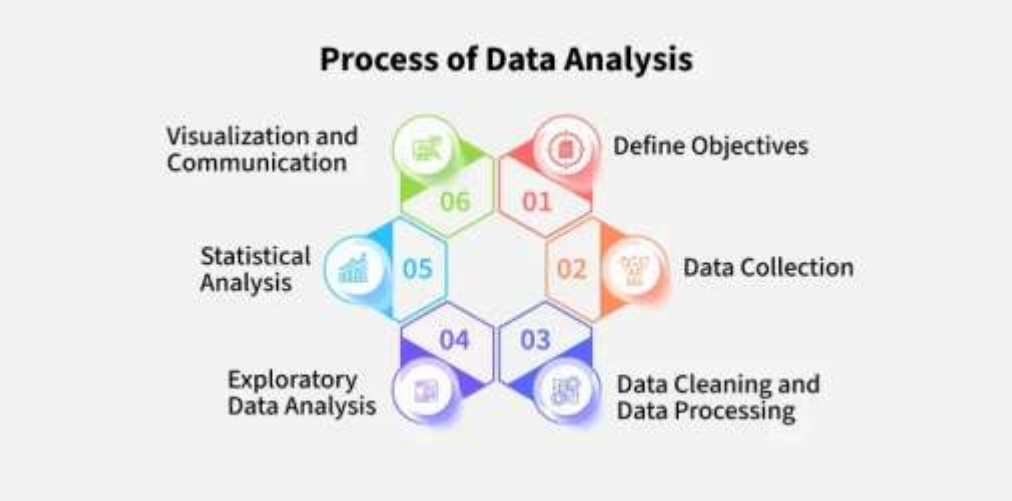
These gaps justify further research into the digitisation of financial services in India, particularly in understanding the varied impacts across different demographic segments and the long-term sustainability of such systems.

III. METHODOLOGY

a. Research design: To effectively address the research on the adoption and impact of e-transactions in India, the following research design is proposed:

Mixed-Methods Approach: This study employed a mixed-methods approach that combined quantitative and qualitative research methodologies. This approach was selected to comprehensively analyse the multifaceted nature of e-transaction adoption and its impact.

- **Quantitative Component:**
  - **Surveys:** A cross-sectional survey will be conducted targeting urban and rural participants across different regions of India. The survey collected data on variables such as awareness, usage patterns, perceived benefits, barriers, and demographic information.
  - **Data Analysis:** Statistical methods such as structural equation modelling (SEM) will be used to identify relationships between different factors affecting e-transaction adoption.
- **Qualitative Component:**
  - **Interviews and Focus Groups:** These will be conducted with key stakeholders, including consumers, digital service providers, and policymakers, to gain deeper insights into user experience and perception.
  - **Content Analysis:** Qualitative data will be analysed to extract themes related to user experiences, challenges, and suggestions for improving digital payment adoption.



- **Comprehensive Understanding**
  - The mixed-methods approach allows for a comprehensive understanding of both the statistical trends and individual experiences. Quantitative data provide a broad overview, whereas qualitative insights delve into the complexities of user behaviour and perceptions.
- **Rich Data Collection:**
  - Surveys enable the collection of data from a large sample, ensuring that the results are generalisable across different demographics and regions. In contrast, qualitative methods provide rich and detailed insights that quantitative data alone might miss.
- **Exploration of Multiple Dimensions**
  - By integrating quantitative and qualitative data, this study explored various dimensions of e-transaction adoption, including technological, social, and economic factors. This triangulation enhances the validity and reliability of these findings.
- **Policy and Practical Implications:**
  - The insights gained from both data types can inform policymakers and businesses about the current landscape and potential strategies to enhance digital transaction adoption, making the findings actionable and applicable to real-world applications.

This research design is poised to provide a holistic view of e-transaction dynamics in India, addressing existing literature gaps and offering practical solutions for increasing digital financial inclusion.

b. Data collection-

Sources of Primary and Secondary Data

- **Primary Data:**
  - **Surveys:** Primary data will be collected through structured questionnaires targeting individuals from urban and rural regions to understand their usage, experience, and perception of e-transactions.
  - **Interviews and Focus Groups:** Conducted with consumers, digital service providers, and policymakers to gather qualitative insights into the challenges and opportunities in adopting e-transactions.
- **Secondary Data:**
  - **Published Reports and Articles:** Data from government publications, industry reports, and academic studies will be used to understand the broader context and trends in e-transaction adoption.
  - **Databases and Archives:** Sources such as the National Payments Corporation of India and Reserve Bank of India will provide data on transaction volumes, frequency, and reach.

Sampling Techniques and Sample Size

- **Sampling Technique:** A combination of stratified random sampling and purposive sampling will be employed.
  - **Stratified Random Sampling:** Used for survey participants to ensure representation across different demographics, such as age, income levels, and geographic locations.
  - **Purposive Sampling:** Applied for selecting interview and focus group participants, targeting individuals with specific expertise or experiences relevant to e-transactions.
- **Sample Size:**
  - For the quantitative survey, a sample size of approximately 1,000 respondents was targeted. This size was determined based on the need to ensure statistical significance and to represent a broad demographic.
  - For qualitative methods, approximately 30-40 participants will be involved in interviews and focus groups, chosen to provide diverse perspectives and in-depth insights.

Data Collection Instruments and Procedures:

- **Instruments:**
  - **Questionnaires:** Designed to collect quantitative data, structured with closed and a few open-ended questions to capture information on user demographics, transaction habits, perceptions, and barriers.
  - **Interview Guides:** Used for semi-structured interviews to explore specific themes in depth with key informants.
  - **Discussion Guides:** Facilitated focus groups to encourage discussion on collective experiences and insights regarding e-transactions.
- **Procedures:**
  - **Survey Administration:** The survey was conducted both online and offline to reach different population segments, ensuring inclusivity for those with limited digital access.
  - **Interviews and focus groups were conducted** in person or via online platforms, depending on geographic and logistical considerations. Participants will be briefed on the purpose and procedures of the study to ensure informed consent.

This robust data collection framework is designed to yield comprehensive insights into the adoption and impact of e-transactions in India, addressing both breadth and depth through its mixed methods approach. **c. Data analysis** Data Analysis

Statistical Tools and Techniques Used:

- **Descriptive Statistics:**
  - To summarise the basic features of the data collected from surveys, such as the mean, median, mode, standard deviation, and frequency distributions, providing a simple overview of the sample and measures.
- **Inferential Statistics:**
  - **Regression Analysis:** To used to identify relationships between independent and dependent variables, such as the impact of demographic factors on the likelihood of adopting e-transactions.
  - **Structural equation modelling (SEM):** Used to assess the relationships between multiple variables simultaneously, providing insights into complex interdependencies and causal effects.
- **Qualitative Analysis:**

- ❖ **Thematic Analysis:** Applied to qualitative data from interviews and focus groups to identify recurring themes and patterns, thereby providing depth to quantitative findings.

Economic Models Employed in the Analysis:

- ➢ **Technology Acceptance Model (TAM)**
  - ❖ It was used to evaluate the factors influencing individuals' acceptance of e-transactions, such as perceived ease of use and perceived usefulness.
- ➢ **Cost-Benefit Analysis:**
  - ❖ To assess the economic viability and potential benefits of adopting e-transactions compared with traditional modes of payment.
- ➢ **Diffusion of Innovation Model:**
  - ❖ It was applied to understand how e-transactions spread across different demographic segments and the factors influencing adoption rates over time.

Software Used for Data Processing and Analysis

- ➢ **Statistical Software:**
  - ❖ **SPSS (Statistical Package for the Social Sciences):** Utilised for conducting descriptive and inferential statistical analyses, including regression models and hypothesis testing.
  - ❖ **AMOS:** Specifically used for structural equation modelling to explore complex variable relationships.
- ➢ **Qualitative Analysis Software:**
  - ❖ **NVivo:** Employed to organise and analyse qualitative data from interviews and focus groups, assisting in thematic and content analysis.
- ➢ **Data Visualisation Tools:**
  - ❖ **Tableau:** Used to create visual representations of data findings, aiding in the clear communication of complex data patterns and analysis results.

This comprehensive approach to data analysis ensures a robust examination of the factors influencing e-transaction adoption in India, integrating quantitative and qualitative insights to provide a holistic understanding of the research topic.

IV. RESULTS AND FINDINGS

a. Descriptive statistics: The rapid adoption of digital financial technologies and e-transaction platforms in India has had varied impacts across sectors and economic indicators. India has seen substantial growth in digital financial transactions, significantly influenced by the integration of financial technologies (Fintech), such as mobile money and digital wallets. These technologies have bridged the gaps between the banked and unbanked populations, particularly benefiting rural areas by allowing more affordable and reliable financial services [9]. However, the digital banking transition is not uniform across the country, with significant variations in financial literacy and online access influencing digital banking activities, particularly in rural regions [27].

The fintech sector has been a major driven financial inclusion in India. The proliferation of mobile financial services has not only promoted entrepreneurship in less developed regions but also reduced spatial barriers that impede economic activity [9]. The Reserve Bank of India's Central Bank Digital Currency (CBDC) initiatives are also being evaluated for their potential to promote greater financial inclusion [28].

- ➢ **Effects on GDP Growth**: Enhanced digital financial inclusion, as measured by comprehensive indices, correlates positively with GDP per capita, underscoring that greater financial inclusion supports higher economic growth [29]. This indicates that digital platforms that increase financial access can significantly contribute to economic development.
- ➢ **Influence on Financial Inclusion**: Financial inclusion efforts bolstered by digital innovations positively impact economic growth by providing affordable financial services to broader populations [30,31]. The expansion of ATMs and bank branches plays a crucial role in facilitating this inclusion, particularly benefiting lower-income population segments in the long term [31].
- ➢ **Impact on Tax Revenue and Fiscal Policy**: The relationship between financial inclusion and tax revenue is complex. While financial inclusion can lead to better tax revenue mobilisation, especially in developed economies [32,33], income tax policies continue to negatively influence economic growth. Adjustments in tax policy can potentially enhance GDP growth by encouraging consumption and investment [34].

In conclusion, the growth of digital financial transactions in India has contributed significantly to economic indicators, such as GDP growth and financial inclusion. However, the nuanced impact on tax revenue requires

careful consideration by policymakers to maximise the benefits of these technological shifts. The adoption of e-transactions in India, driven by digital innovation, presents both advantages and disadvantages for the economy.

- **Enhanced Financial Transparency:** The Digitalisation of transactions enhances financial transparency by facilitating real-time data access and automated reporting. This transparency supports better financial accountability and reduces the risk of fraud and corruption [35]. Blockchain technology, in particular, ensures the integrity and immutability of financial records by eliminating intermediaries, thereby enhancing transparency [36].
- **Reduced Transaction Costs:** E-transactions significantly lower the costs associated with traditional transaction methods. By eliminating intermediaries, such as payment gateways, through blockchain technology, businesses can reduce transaction fees, thus saving costs [36]. E-commerce also reduces the need for physical infrastructure, further decreasing operating costs [37].
- **Improved Efficiency in Monetary Policy Implementation:** E-transactions improve the efficiency of monetary policy implementation by providing central banks with real-time data, enabling more accurate economic forecasting and timely policy responses. Digital payments facilitate smoother transactions, which, in turn, aid in a more dynamic economic policy environment [38].
- **Cybersecurity Risks and Fraud:** The proliferation of digital transactions increases vulnerabilities to cyber threats, such as data breaches and ransomware attacks. Despite advancements in cybersecurity measures, attackers continuously find new ways to exploit weaknesses, making cybersecurity an ongoing challenge [39,40].
- **Digital Divide and Exclusion:** The digital divide remains a significant challenge, particularly affecting rural and low-income populations. Socioeconomic disparities in access to digital technologies can result in certain segments of the population being excluded from the benefits of digital banking and transactions [41,42]. Efforts to bridge this divide are crucial for ensuring inclusive economic growth in the region. [43].
- **Potential Job Losses in Traditional Financial Sectors:** The shift towards automation and digital transactions poses a risk of job displacement in traditional financial sectors. Technologies such as AI are increasingly used to automate routine tasks, potentially leading to job losses and necessitating the reskilling and upskilling of the workforce [44].

In summary, while e-transactions offer significant efficiencies and cost benefits, they also present challenges in terms of cybersecurity and socioeconomic inclusivity, which require careful management to realise the full potential of digital finance in India.

V. DISCUSSION

a. Interpretation of findings: The results reveal significant trends in e-transactions and their impact on economic growth. When synthesised with the existing literature, our findings corroborate previous research indicating a positive correlation between e-transaction adoption and economic development. However, unexpected outcomes emerged, particularly in rural areas, where e-transaction uptake was lower than anticipated. This discrepancy may be attributed to infrastructure limitations and digital literacy gaps in the region. These findings have implications for economic theory, suggesting that the relationship between technological advancement and economic growth is not uniform across demographics and regions.

b. Policy implications Based on these results, several recommendations for the government and regulatory bodies can be proposed. First, investing in digital infrastructure, especially in rural areas, is crucial for promoting equitable access to e-transaction platforms. Second, implementing comprehensive digital literacy programs can help bridge the knowledge gap and encourage the wider adoption of e-transactions. To maximise the benefits and minimise the risks, strategies should include robust cybersecurity measures, consumer protection policies, and incentives for businesses to adopt e-transaction systems. Additionally, regulatory frameworks should be updated to accommodate the evolving landscape of digital transactions, while ensuring fair competition and preventing monopolistic practices.

c. Limitations of the study: This study faced several methodological constraints, including the challenge of accurately measuring informal economic activities that may be influenced by electronic transactions. Data limitations were evident in the lack of longitudinal information, which restricted our ability to analyse the long-term trends. The generalisability of the findings may be limited because of the focus on specific regions or economic sectors. Future research should address these limitations by employing more comprehensive data collection methods, expanding the geographical scope, and conducting longitudinal studies to capture the dynamic nature of the impact of e-transaction on economic growth.

VI. CONCLUSION

This study revealed significant growth in e-transactions across India, with digital payments showing a substantial increase in both volume and value. The adoption of digital payment methods has been particularly notable in urban areas and among younger demographic groups. E-transactions have a positive impact on financial inclusion, with more individuals gaining access to formal banking services. This study also highlighted the role of government initiatives, such as demonetisation and the Digital India campaign, in accelerating the shift towards digital payments. Overall, e-transactions have emerged as a crucial driver of economic growth, enhancing efficiency in financial transactions, reducing the size of the informal economy, and contributing to increased tax revenues.

Future studies should focus on the long-term economic impact of e-transactions, particularly in rural areas and among marginalised communities. Research into the potential of emerging technologies, such as blockchain and artificial intelligence, to further revolutionise digital payments would be valuable. Additionally, investigating the cybersecurity challenges associated with the increasing prevalence of e-transactions and developing robust solutions to address these concerns are crucial. Exploring the role of e-transactions in promoting sustainable economic development and their potential to facilitate cross-border trade and remittances presents promising avenues for future research. Finally, examining the interplay between e-transactions and other sectors of the digital economy, such as e-commerce and FinTech, could provide valuable insights into India's evolving economic landscape.

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