Collaborative Intelligence: Building Entrepreneurial Ecosystem in the AI Age

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2026

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About the Conference

With rapid advancements in Artificial Intelligence (AI), the entrepreneurial landscape is undergoing a major transformation. This International Conference on *Collaborative Intelligence – Building Entrepreneurial Ecosystem in the AI Age* aims to explore how collaborative intelligence—the synergy between human creativity and AI capabilities—can build sustainable, innovative, and future-ready entrepreneurial ecosystems.

The conference provides a dynamic platform for academicians, researchers, entrepreneurs, policymakers, industry experts, and students from across the globe to discuss emerging trends, challenges, and opportunities in AI-driven entrepreneurship. It focuses on key areas such as entrepreneurship, finance, marketing, organizational behaviour, and human resource management, emphasizing innovation, sustainability, and inclusive growth.

The event seeks to encourage meaningful dialogue on how AI can enhance decision-making, improve productivity, foster startup development, and create new business opportunities while addressing ethical and policy challenges in the responsible adoption of artificial intelligence.

About the College

Christ College (Autonomous), Irinjalakuda, Thrissur, Kerala, established in 1956, is a premier institution of higher education committed to excellence and holistic development. Reaccredited by NAAC with an outstanding 'A++' Grade and consistently ranked in the NIRF, the college stands among the top institutions in the country. With a vibrant community of over 4,500 students, Christ College offers a wide spectrum of undergraduate, postgraduate, and doctoral programs across Commerce, Science, Arts, Social Sciences, Languages, and Professional Studies, along with value-added and skillbased certificate courses. Supported by state-of-the-art infrastructure, dynamic faculty, and an emphasis on research, innovation, and social responsibility, the institution continues to empower learners to become leaders and changemakers at national and global levels.

About the Department

The Department of Commerce – Taxation (Unaided) serves as a vibrant academic hub in the field of commerce, offering undergraduate programmes with a strong focus on finance and taxation. By integrating theoretical foundations with practical learning experiences, the department prepares students with the essential knowledge and competencies required for professional excellence. Guided by a team of experienced faculty members, students benefit from seminars, workshops, guest lectures, industrial visits, and skill-oriented add-on courses that promote research, innovation, and career readiness. In addition to academic excellence, the department actively encourages participation in co-curricular and extracurricular activities, ensuring the holistic development of students into responsible, skilled, and industry-ready professionals.

Preface

Collaborative intelligence, which represents the synergy between human creativity and Artificial Intelligence (AI), has emerged as a transformative force in shaping modern entrepreneurial ecosystems. The integration of AI into business environments is redefining innovation, decision-making, resource optimization, and value creation, enabling enterprises to become more agile, competitive, and future-ready. In this context, the **International Conference on Collaborative Intelligence – Building Entrepreneurial Ecosystem in the AI Age**, held on **9–10 February 2026** at **Christ College (Autonomous), Irinjalakuda**, serves as a significant academic and professional platform for knowledge sharing and scholarly engagement.

This conference proceedings book brings together a collection of research contributions presented by academicians, researchers, practitioners, entrepreneurs, and students from diverse institutions. The papers reflect contemporary perspectives on collaborative intelligence across key domains such as entrepreneurship, finance, marketing, organizational behaviour, human capital, startup ecosystems, sustainability, and digital transformation. Each contribution highlights how AI-driven innovations are influencing entrepreneurial growth, strategic decision-making, business sustainability, and organizational effectiveness in an increasingly digital world.

The objective of this volume is to disseminate knowledge, promote interdisciplinary research, and encourage meaningful discussions on the responsible and effective integration of AI in entrepreneurial ecosystems. The proceedings not only showcase empirical and conceptual research but also emphasize innovation, ethical responsibility, inclusiveness, and sustainable development in the adoption of intelligent technologies.

We express our sincere gratitude to all authors, reviewers, keynote speakers, organizing committee members, and participants whose valuable contributions made this conference and publication possible. We hope that this proceedings book will serve as a valuable reference for researchers, educators, policymakers, entrepreneurs, and industry professionals, inspiring further research and innovation in the evolving field of collaborative intelligence and AI-driven entrepreneurship.

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DOES FINTECH AMPLIFY OR ABSORB MARKET STRESS? EVIDENCE FROM INDIA

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ABSTRACT

FinTech adoption has provided a better platform to the conventional financial activities and had pave a way for their rapid growth. India saw a surge in the growth of FinTech since demonetisation. A wide class of people started using online systems for payment, purchase since demonetisation. This paper tries to identify the role FinTech on market stress. The study adopted GARCH based models to identify the role of FinTech on market stress. The study concluded that volatility in the FinTech-related sector (proxied by the IT index) is time-varying and is significantly influenced by market stress, as measured by India VIX. The study also identifies that rather than fully absorbing shocks, FinTech-related sectors tend to reflect and potentially amplify stress conditions through increased volatility.

Keywords: FinTech, Market stress, GARCH, Volatility, India VIX

INTRODUCTION

Inclusion of Financial Technology (FinTech) into the traditional financial activities such as payments, lending, and investment services has transformed the whole financial system. This inclusion led the economy to a prosperous growth, still FinTech introduced new channels of risk transformation due to their interconnectedness with capital markets and investor behaviour (Arner et al., 2016). FinTech is considered as a major component in the economy, particularly in emerging economies like India, where the expansion of digital financial structure and technology-based financial services has been strong.

FinTech is largely accepted as the driver of innovation and financial inclusion, still its role in market stability remains under explored. While technological efficiency and diversification help in stabilising market, rapid digitalisation may increase volatility. Vives (2019) argues that digital disruption in financial services can reshape risk dynamics by altering competition, operational structures, and information flows within financial markets. Thus the role of FinTech-related activities needs to be explored.

Volatility based indicators such as implied volatility index (VIX) is commonly used to capture market stress. VIX indicates investor's expectation of market uncertainty. The VIX has been widely recognised as a forward-looking measure of fear and stress in financial markets and is often used to assess how different asset classes respond to changes in risk sentiment (Whaley, 2000). Thus, how FinTech-related sectors respond to market stress needs to be explored.

Past studies have shown that financial markets are interconnected and shocks transfer in between. Diebold and Yilmaz (2012) provided a spillover index that measures both magnitude and direction of risk spillovers, indicating the necessity to estimate how risk is transmitted rather than static analysis. Thus, present study analysing the behaviour of Fin-Tech related sectors to market stress will help in identifying the role of digital finance in the economy.

RESEARCH GAP

Empirical literatures have already established that FinTech is connected to financial market (Buchak et al., 2018; Philippon, 2016; Gomber et al., 2018), also it has been identified that market stress and uncertainty influence volatility dynamics (Bloom, 2009; Baker et al., 2016; Malik & Hammoudeh, 2007). Studies focussed on sectoral spillovers further established that risk transmits from one sector to another especially during stress (Su & Liu, 2021; Tian et al., 2022; Baruník & Křehlík, 2018). Theoretical and empirical studies enlightened the interconnectedness in the financial markets (Allen & Gale, 2000; Billio et al., 2012), particularly in emerging markets (Sahoo & Kumar, 2024; Karuthedath, 2023).

However, the behaviour of FinTech-related sectors to market stress, especially in emerging economies such as India remains underexplored. Thus the involvement of modern technologies – financial technology in the financial market needs to be explored. This motivates the present study to examine the volatility behaviour of FinTech-related activity in India in relation to market stress using a conditional volatility framework.

RESEARCH QUESTION

How does market stress, as measured by India VIX, affect the behaviour of the FinTech-related sector in India?

Does FinTech act as a shock absorber or a shock amplifier during periods of heightened market uncertainty?

OBJECTIVES

To examine the impact of market stress on the return and volatility of the FinTech-related sector in India.

To assess whether FinTech amplifies or absorbs market stress.

REVIEW OF LITERATURE

FINTECH DEVELOPMENT AND FINANCIAL MARKET BEHAVIOUR

Financial intermediation has been transformed by the widespread use of financial technology (FinTech), which offers digital platforms for loan, investment, and payment services. According to Buchak et al. (2018), FinTech lending has significantly increased because of technology advantages and regulatory restrictions, changing risk profiles and credit distribution in financial markets. According to their results, FinTech operations are becoming more and more entwined with market-based finance, which makes them susceptible to shifts in investor opinion.

Philippon (2016) contends that while technical advancements in finance increase efficiency, they also increase competitiveness and exposure to market pressures. This involvement implies that FinTech-related firms are likely to exhibit market-driven volatility rather than being protected from broader financial conditions.

Gomber et al. (2018) highlight that technology-enabled financial services rely heavily on digital infrastructure and platform-based business models, which increases their dependence on market confidence and investor participation. Their study indicates that

FinTech firms are highly responsive to macro-financial conditions, especially in emerging markets where regulatory and institutional frameworks are still evolving.

2.2 Market Stress, Uncertainty, and Volatility Transmission

Increased uncertainty and quick asset re-pricing are intimately linked to market stress. Bloom (2009) demonstrates how uncertainty shocks raise risk premia and postpone investment choices, which have a substantial impact on financial markets. This suggests that industries directly associated with financial markets are susceptible to volatility brought on by uncertainty.

By creating an economic policy uncertainty index, Baker et al. (2016) show that uncertainty shocks lower market efficiency and raise stock market volatility. Their findings support the notion that stress indicators capture significant risk dynamics that go beyond conventional return metrics.

Empirical evidence of volatility transmission between the oil and equity markets is presented by Malik and Hammoudeh (2007), who demonstrate how financial links allow shocks in one market to spread to others. Their findings reinforce the view that volatility is not confined to individual markets but spreads across interconnected systems, particularly during turbulent periods.

SECTORAL AND TIME-VARYING VOLATILITY DYNAMICS

Studies conducted at the sector level show that volatility behavior varies by industry and changes over time. Sectoral volatility spillovers differ substantially depending on the degree of uncertainty, according to Su and Liu (2021), with greater interconnectedness shown during times of high stress. Their findings suggest that industries focused on technology are especially vulnerable to shocks of uncertainty.

Using a GARCH–copula–CoVaR framework, Tian et al. (2022) demonstrate that downside risk spillovers increase during times of crisis. This implies that in times of market stress, risk transmission is more pronounced and asymmetric. These results suggest that during times of increased uncertainty, FinTech-related industries may be more

SYSTEMIC RISK AND EMERGING MARKET EVIDENCE

The interdependence of markets and financial institutions gives rise to systemic risk. Financial ties have the potential to spread liquidity shocks across geographical areas, even in the absence of collective uncertainty, as demonstrated theoretically by Allen and Gale (2000). Their theory offers a basis for comprehending how the integration of emerging financial sectors, like FinTech, into established financial networks may exacerbate .

According to empirical evidence by Billio et al. (2012), financial institutions are crucial in the transmission of systemic risk through linked markets and interlinked balance sheets. The implications extend to FinTech-related industries that increasingly engage with banks and capital markets, despite their study's focus on traditional institutions.

Sectoral volatility spillovers are more pronounced in emerging economies than in developed ones, especially during times of global financial stress, according to Sahoo and Kumar's (2024) study. According to their results, FinTech-related industries in developing nations like India can be more vulnerable to market stress and uncertainty. In his analysis of how investor mood shapes stock market volatility,

Karuthedath (2023) discovers that behavioral factors have a major impact on return variability. This implies that fluctuations in market confidence and uncertainty are likely to have a significant impact on FinTech-related activities, which is highly dependent on digital participation and investor mood.

METHODOLOGY

3.1 Data Description

Daily closing prices collected from NSE official website and investing.com from the period January 2016 to December 2025 is used for the study. NIFTY IT index is used as a proxy for FinTech related activity, which signifies technology-driven firms supporting digital financial services and financial innovation in India. India Volatility Index (India VIX) is used to measure market stress, which shows investors' expectations of near-term market uncertainty. Closing prices are converted into returns by taking the logarithmic first differences of the price indices. This transformation ensures stationarity and simplifies the analysis of volatility dynamics.

3.2 Preliminary Analysis

Descriptive statistics, including mean, standard deviation, skewness, and kurtosis, are calculated to interpret the basic characteristics of the return series. Normality of the data is checked through the Jarque–Bera test. Stationarity of the return series is tested using unit root tests such as the Augmented Dickey–Fuller (ADF) test. The presence of conditional heteroskedasticity is examined using the ARCH-LM test to confirm the presence of volatility clustering.

3.3 Model Specification

To examine the association between FinTech-related activity and market stress, a GARCH model with an exogenous variable is employed. The mean equation is specified as:

$$R_t^{IT} = \alpha + \beta R_t^{VIX} + \varepsilon_t$$

where R_t^{IT} denotes the return of the IT index (FinTech proxy), R_t^{VIX} represents the return of India VIX, and ε_t is the error term.

The conditional variance equation is given by:

$$h_t = \omega + \alpha\varepsilon_{t-1}^2 + \beta h_{t-1} + \gamma R_t^{VIX}$$

where h_t is the conditional variance of FinTech-related returns. The coefficient γ captures the effect of market stress on FinTech volatility.

3.4 Interpretation Strategy

If the coefficient γ is positive and statistically significant, it shows that market stress increases FinTech-related sector volatility, indicating that FinTech acts as a shock amplifier. If γ is negative and significant, it implies that FinTech absorbs market stress and contributes to stabilising market fluctuations. Insignificant values indicate weak transmission of stress.

3.5 Robustness Check

To ensure the reliability of the results, alternative model conditions may be analysed using different lag structures or alternative GARCH-type models. Uniformity of the findings across conditions confirms the robustness of the empirical results.

RESULT AND FINDINGS

According to table 4.1 descriptive statistics both the India VIX returns and the FinTech-related sector returns (as measured by the IT index) have traits common to financial time series, such as excess kurtosis, skewness, and non-normality. This supports the use of conditional heteroskedasticity models by pointing to the existence of extreme data and volatility clustering. According to table 4.2's Augmented Dickey-Fuller (ADF) test results, both the FinTech-related returns and market stress (India VIX returns) are stationary at 1% significance levels. This guarantees that the series is appropriate for time-series modelling and the volatility analysis that follows.

The null hypothesis of homoskedasticity is substantially rejected and shown in the table 4.3 ARCH LM test applied to FinTech-related returns, suggesting the existence of time-varying volatility and large ARCH effects. This result validates the volatility of FinTech-related returns. This finding confirms that FinTech-related returns exhibit volatility clustering and supports the use of a GARCH framework for modelling conditional variance.

The significant ARCH and GARCH parameters in table 4.4 GARCH (1,1) estimation findings show that volatility in the FinTech-related industry is very persistent. More significantly, the variance equation's coefficient of market stress (India VIX) is statistically significant, suggesting that shifts in market stress directly affect the volatility of FinTech-related returns. This suggests that times of increasing uncertainty are linked to higher risk in the FinTech industry.
The GARCH model is well-specified and effectively reflects the volatility dynamics of the FinTech-related sector, as demonstrated by Table 4.5, diagnostic tests based on the Ljung–Box statistics and ARCH LM test on standardized residuals, which indicate no residual serial correlation or ARCH effects.

Overall, the empirical findings show that market stress conditions have a significant impact on the volatility of FinTech-related activities in India. The results imply that FinTech's risk profile reacts strongly to shifts in investor mood and market stress rather than remaining immune to more general market uncertainty. This suggests that rather than acting only as a stabilizing effect during stormy times, FinTech-related activity can operate as a conduit for the transmission of market stress.

The conditional volatility of FinTech-related returns derived from the GARCH model during the study period is shown in Fig. 4.1. The presence of volatility clustering is confirmed by the figure, which makes it evident that volatility is not constant but rather fluctuates over time. While periods of stress are linked to substantial spikes in volatility, periods of more tranquil market circumstances are characterized by decreased volatility. Around 2020, there is a noticeable increase in volatility, which is indicative of the effects of increased market uncertainty during the COVID-19 era. This pattern suggests that FinTech-related activity reacts significantly to periods of market stress and is extremely sensitive to changes in market circumstances.

Fig 4.2 plots FinTech-related returns along with the estimated upper and lower 1% Value-at-Risk limits. Most return observations lie within the VaR bands, indicating that the model adequately captures the risk dynamics of the series. However, several extreme observations breach the VaR limits during turbulent periods, suggesting the presence of tail risk and abnormal market movements. The widening of the VaR bands during high-volatility periods further confirms that market stress is associated with increased downside and upside risk in FinTech-related returns.

Fig. 4.3 depicts the yearly average conditional volatility of FinTech-related returns. The figure reveals that volatility remains relatively moderate during the initial years of the sample period but rises sharply in 2020, indicating the strongest impact of market stress during this year. In the post-2020 period, volatility shows a gradual decline, suggesting partial stabilisation as market conditions normalised. This year-wise pattern highlights that the effect of market stress on FinTech-related activity is not uniform across time and is particularly pronounced during crisis periods.

Overall, the figures provide visual confirmation of the empirical results obtained from the GARCH model. They demonstrate that FinTech-related volatility is time-varying, increases substantially during periods of heightened market stress, and exhibits clustering behaviour. These visual findings support the statistical evidence that market stress plays a significant role in shaping the volatility dynamics of FinTech-related activity in India.

Series	Mean	Std. Dev.	Skewness	Kurtosis	JB Statistic	JB p-value
IT_ret	0.00049	0.01316	-0.3095	8.7391	3437.58***	0
VIX_ret	-0.0002	0.05084	0.8795	12.5268	9682.61***	0

Table 4.1 Descriptive Statistics

Note: JB denotes Jarque–Bera test for normality.
*** indicates significance at the 1% level.

Table 4.3 ARCH Effect

Series	ADF Statistic	p-value
IT_ret	-12.5983***	0.01
VIX_ret	-13.7792***	0.01

Note: Null hypothesis: series has a unit root.
Note: Null hypothesis: no ARCH effect.

*** indicates rejection at 1% level.

Table 4.2 ADF Test

Series	Chi-square	p-value
IT_ret	373.3314***	1.65E-78

*** indicates rejection at 1%level.

Parameter	Estimate	Std. Error	z-statistic	p-value
μ (Mean)	0.00063	0.00023	2.7573**	0.0058
VIX (Mean)	-0.07	0.00492	-14.229***	0
ω (Omega)	4.20E-06	1.20E-08	352.613***	0
α_1 (ARCH)	0.03461	0.0025	13.866***	0
β_1 (GARCH)	0.93645	0.00253	370.429***	0
VIX (Variance)	0.00017	2.30E-05	7.0918***	1.30E-12

Table 4.4 GARCH Effect

Dependent variable: IT sector returns.
***, **, * denote significance at 1%, 5%, and 10% levels respectively.

Test	Statistic	p-value
Ljung–Box (Residuals)	11.8408	0.2959

Ljung–Box (Squared Residuals)	16.7577	0.0799*
ARCH LM (Residuals)	6.2555	0.2822

Table 4.5 GARCH Diagnostic Test

Null hypothesis: no serial correlation / no ARCH effect.
p-values > 0.05 indicate adequacy of model.

*denotes significance at 10% level.

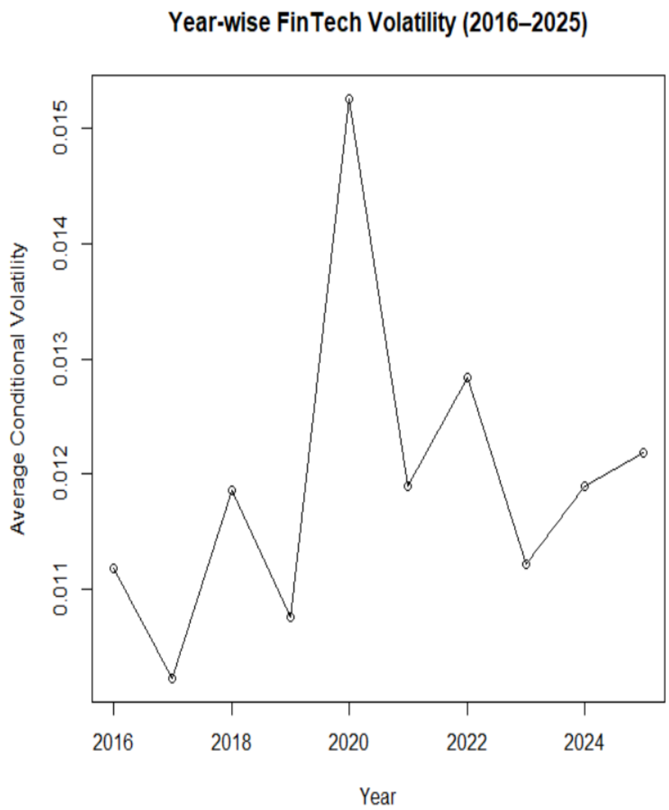

Fig. 4.1 Year-wise FinTech Volatility

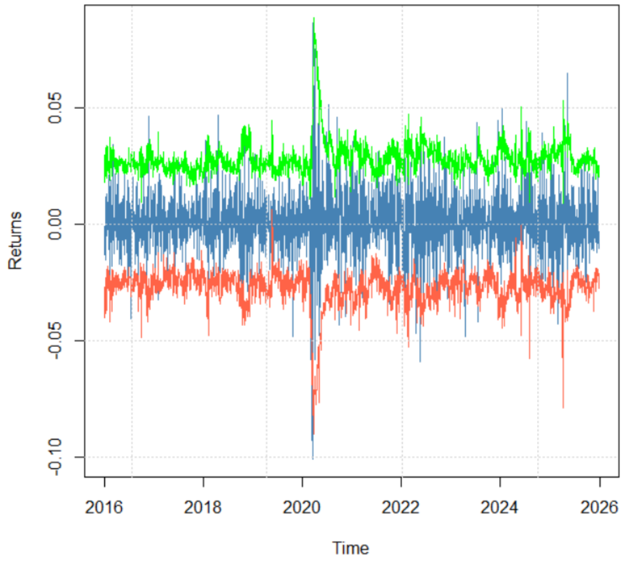

Fig. 4.2 Series with 1% Var Limits

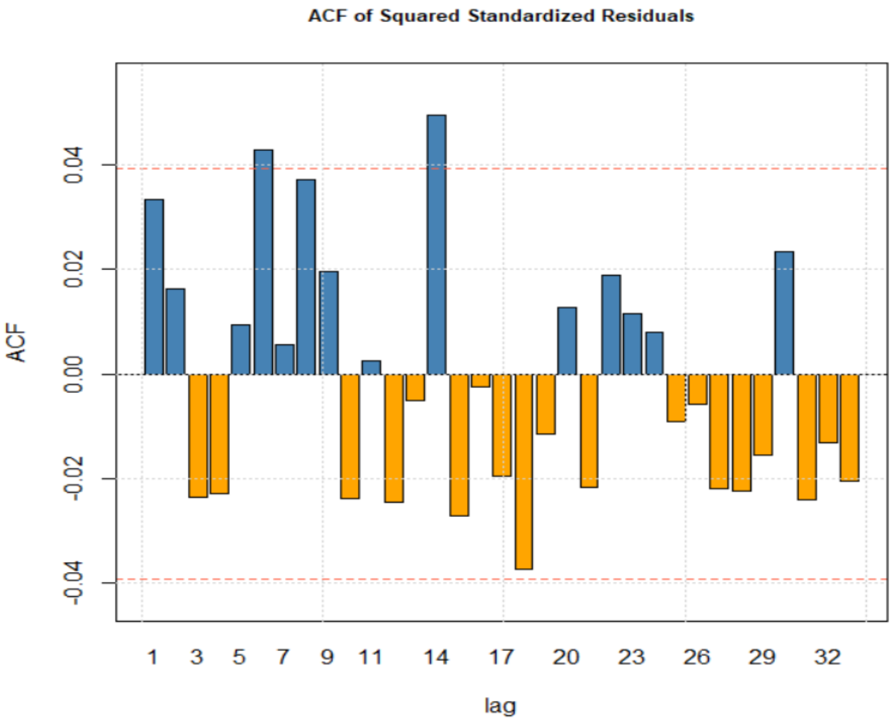

Fig. 4.3 ACF of Squared Standardised Residuals

DISCUSSION

The empirical findings indicate that volatility in the FinTech-related sector (proxied by the IT index) is time-varying and significantly influenced by market stress, as measured by India VIX. The presence of strong ARCH effects and persistent GARCH dynamics confirms that FinTech-related returns exhibit volatility clustering, a feature commonly observed in financial markets. This suggests that risk in the FinTech-related sector does not remain constant but evolves in response to changing market conditions.

More importantly, the significant impact of market stress on the conditional volatility of FinTech-related returns implies that FinTech is closely integrated with broader market sentiment. During periods of heightened uncertainty, such as crisis episodes, volatility in the FinTech-related sector rises noticeably. This indicates that FinTech does not operate independently of market-wide shocks; instead, it reacts strongly to fluctuations in investor fear and uncertainty. Consequently, FinTech-related activity appears more vulnerable during turbulent periods, reflecting its sensitivity to changes in market confidence.

These results highlight that although FinTech is often viewed as a driver of innovation and efficiency, it may also serve as a channel through which market stress is transmitted to technology-driven financial activities. Rather than fully absorbing shocks, FinTech-related sectors tend to reflect and potentially amplify stress conditions through increased volatility. This reinforces the idea that digital financial systems, while beneficial for market development, are not immune to systemic risk.

POLICY IMPLICATIONS

From a regulatory perspective, the findings suggest that policymakers should closely monitor volatility in FinTech-related sectors as part of financial stability surveillance. Since FinTech volatility responds significantly to market stress, stress in financial markets can quickly spill over into technology-driven financial activities. Regulatory authorities should therefore incorporate FinTech-related indicators into early warning systems for market instability.

The results also imply that strengthening the resilience of FinTech firms is essential for maintaining overall market stability. Measures such as enhanced risk management frameworks, cybersecurity safeguards, and operational resilience standards can help mitigate the vulnerability of FinTech-related activities during periods of market stress. Regulators may consider extending prudential oversight and stress-testing frameworks to major FinTech-linked entities, particularly those providing systemically important services such as digital payments and lending platforms.

From an investment and market perspective, the findings indicate that diversification benefits involving FinTech-related assets may weaken during periods of heightened uncertainty. Investors should therefore account for the time-varying risk behaviour of FinTech-related stocks when designing portfolio and hedging strategies, especially during turbulent market phases.

Overall, the study underscores the need for dynamic risk monitoring and forward-looking regulatory policies that recognise the growing interconnectedness between FinTech and financial market stress. By adopting a proactive supervisory approach, policymakers can better anticipate periods of elevated volatility and ensure that the expansion of FinTech contributes to financial innovation without undermining market stability.

CONCLUSION

This study analysed whether FinTech-related activity in India increases or absorbs market stress by analysing the volatility behaviour of the IT sector (as a proxy for FinTech) in relation to India VIX over the period 2016–2025. Using a GARCH framework, the study captured the time-varying nature of volatility and assessed the role of market stress in shaping FinTech-related risk dynamics.

The empirical results show that volatility in the FinTech-related sector is highly constant and significantly affected by market stress. The presence of ARCH effects and strong GARCH dynamics approves that risk in FinTech-related activity evolves over time rather than remaining constant. More importantly, the significant response of FinTech volatility to changes in market stress indicates that FinTech-related sectors are closely integrated with broader financial market conditions.

The findings suggest that FinTech does not remain insulated during periods of heightened uncertainty. Instead, its volatility increases in response to rising market stress, implying that FinTech-related activity tends to reflect and potentially amplify market uncertainty rather than acting as a stabilising force. This highlights the vulnerability of technology-driven financial activity to shifts in investor sentiment and macro-financial shocks.

Overall, the study contributes to the growing literature on FinTech and financial stability by providing evidence from an emerging market context. It underscores the importance of incorporating FinTech-related indicators into market risk monitoring and regulatory frameworks. Future research may extend this analysis by including additional market variables, alternative FinTech proxies, or cross-country comparisons to further understand the role of digital finance in systemic risk transmission.

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A STUDY ON THE IMPACT OF FINTECH ON TRADITIONAL BANKING PERFORMANCE

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Abstract

The rapid advancement of Financial Technology (FinTech) has brought significant changes to the traditional banking system in India, especially in digitally progressive states like Kerala. FinTech innovations such as mobile banking, digital payments, internet banking, and automated financial services have transformed the way banks operate and deliver services. This study aims to analyse the growth and adoption of FinTech services and to examine their impact on the performance of traditional banks in Kerala. The study is based entirely on secondary data collected from reliable sources including Reserve Bank of India (RBI) reports, National Payments Corporation of India (NPCI) statistics, annual reports of selected banks, and published research articles. The period of study covers multiple years to observe trends in FinTech adoption and banking performance. Tools such as trend analysis, percentage analysis, and ratio analysis are employed to evaluate the growth of digital banking services and key performance indicators of traditional banks, including profitability, efficiency, and asset quality. The findings of the study are expected to reveal that increased adoption of FinTech services has improved operational efficiency, reduced transaction costs, and enhanced customer convenience in traditional banks. At the same time, the study also highlights the challenges faced by traditional banks in adapting to rapid technological changes and increasing competition from FinTech firms. The study provides useful insights for bankers, policymakers, and researchers to understand the evolving relationship between FinTech and traditional banking performance. Keywords: FinTech, Traditional Banking, Digital Banking, Banking Performance, Kerala,

INTRODUCTION

The banking sector has undergone significant transformation in recent years due to rapid technological advancements and the emergence of Financial Technology (FinTech). FinTech refers to the use of technology to deliver innovative financial services such as digital payments, mobile banking, online lending, and automated financial solutions. These innovations have reshaped the traditional banking model by improving service delivery, enhancing customer experience, and increasing operational efficiency. In India, the growth of FinTech has accelerated due to increased smartphone penetration, internet connectivity, government initiatives like Digital India, and the expansion of digital payment platforms such as UPI. Kerala, with its high literacy rate and strong digital infrastructure, has witnessed faster adoption of FinTech services compared to many other states. Traditional banks operating in Kerala have increasingly integrated FinTech solutions to remain competitive and meet changing customer expectations. While FinTech offers several advantages, it also poses challenges to traditional banks, including increased competition, cybersecurity risks, and the need for continuous technological investment. Understanding how FinTech influences the performance of traditional banks is therefore essential for both policymakers and banking institutions. Against this background, the present study focuses on analysing the growth and adoption of FinTech services and examining their impact on the performance of traditional banks in Kerala using secondary data. The study seeks to contribute to existing literature by providing insights into how FinTech-driven innovations affect profitability, efficiency, and overall banking performance in a regional context. OBJECTIVES • To study the growth of digital payments in India between 2018 to 2025 using RBI DPI data. • To examine how FinTech affects Kerala's traditional banking performance. METHODOLOGY This study adopts a descriptive research design based entirely on secondary data to analyze the impact of FinTech innovations on traditional banking in India. The research draws on peer-reviewed journal articles, industry reports, RBI publications, and other credible literature to examine trends, adoption, challenges, and opportunities associated with FinTech in the Indian banking sector. The study focuses on key innovations such as UPI, digital lending, blockchain, AI, and IoT, and assesses their influence on operational efficiency, financial inclusion, and customer experience. By synthesizing insights from existing literature, the research provides a comprehensive understanding of how FinTech is transforming traditional banks while highlighting regulatory, cybersecurity, and technological challenges. SOURCES OF DATA • Peer-reviewed journal articles: Research papers published in academic journals covering FinTech innovations, banking transformation, financial inclusion, and emerging technologies. • Reports and publications from regulatory bodies: Data and insights from the Reserve Bank of India (RBI), National Payments Corporation of India (NPCI), and other government publications related to digital banking and FinTech adoption. • Online databases: Articles and research papers retrieved from academic databases. SCOPE OF THE STUDY The study focuses on analysing the impact of FinTech on the performance of traditional banks in Kerala using secondary data. It covers major FinTech services such as digital payments, mobile banking, internet banking, and card transactions, and examines their influence on banking performance indicators like profitability, efficiency, asset quality, and business growth. The study is limited to selected banks operating in Kerala and uses data from RBI reports, NPCI statistics, bank annual reports, and published sources. LIMITATION OF THE STUDY The study is limited to the use of secondary data, which may restrict the depth and accuracy of analysis due to data availability and reliability. It does not include primary data or customer perceptions, which could provide additional insights into FinTech adoption. The study is confined to traditional banks operating in Kerala and selected time periods, and therefore the findings may not be fully generalizable to other regions or banking systems. CONCEPTUAL FRAMEWORK The research model illustrates the relationship between FinTech adoption and the performance of traditional banks in Kerala. FinTech adoption is treated as the independent variable and includes digital payment systems, mobile banking, internet banking, and cardbased transactions. Traditional banking performance is considered the dependent variable and is measured through indicators such as profitability, operational efficiency, asset quality, and business growth. The model assumes that increased adoption of FinTech services enhances service efficiency, reduces operational costs, and improves customer convenience, which in turn positively influences the overall performance of traditional banks. The relationship is analysed using secondary data to understand how FinTech-driven innovations contribute to changes in banking performance in Kerala.

RESEARCH MODEL

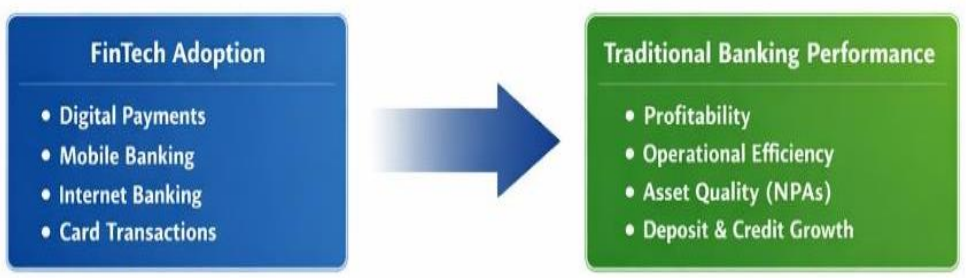
The study uses a FinTech–Banking Performance Model to examine the impact of FinTech adoption on the performance of traditional banks in Kerala using secondary data.

Model Structure

INDEPENDENT VARIABLE (X): FINTECH ADOPTION

- Digital payment transactions (UPI, IMPS, NEFT)

Figure 1: Research Model Showing the Impact of FinTech on Traditional Banking Performance



- Mobile banking usage
- Internet banking transactions
- Card-based transactions

DEPENDENT VARIABLE (Y): TRADITIONAL BANKING PERFORMANCE

- Profitability (ROA, ROE, Net Profit)
- Efficiency (Cost–Income Ratio)
- Asset quality (NPAs)

REVIEW OF LITERATURE

- (Patil & Dhanandhare, 2025) "Using secondary data obtained from academic journals, industry reports, and published studies, the research evaluates the role of digital banking technologies such as mobile banking, artificial intelligence, blockchain, and electronic payment systems in shaping banking efficiency and customer perceptions."
- (Ololade, 2024) "This review paper explores the transformative role of fintech innovations in enhancing financial inclusion across Africa and the U.S., offering a comparative analysis of initiatives, challenges, and opportunities within these diverse economic landscapes."
- (Utkarsh & Pooja, 2025) This study looks at major innovations like the Unified Payments Interface (UPI) and mobile banking, which have transformed financial transactions and reduced transaction costs by 95%, processing over ₹1.5 trillion daily and integrating 358 banks. Mobile banking has reduced branch visits by 65%,

  operational costs by 40%, and increased rural banking access by 85%. The fintech sector is changing India's banking landscape by promoting financial inclusion,

  efficiency, and innovation.
- (Xu et al., 2025) This article contributes to significantly enhancing the understanding of how FinTech is reshaping the banking industry and providing a robust foundation for future research to build upon, making it a valuable resource for both academics and practitioners interested in the intersection of technology and finance."

DATA ANALYSIS AND INTERPRETATION

The analysis of this study is based on secondary data drawn from peer-reviewed journals, industry reports, and regulatory publications. The data were examined to understand the adoption of key FinTech innovations, such as UPI, digital lending, blockchain, AI, and IoT, and their role in transforming traditional banking practices in India. Insights from multiple sources were synthesized to evaluate the impact of these technologies on operational efficiency, financial performance, revenue generation, and customer experience. The study also analyzed the challenges and risks associated with FinTech adoption, including cybersecurity threats, regulatory compliance, and technology integration barriers. By systematically comparing and interpreting findings from various studies and reports, the research identifies trends, opportunities, and gaps in the existing literature, providing a comprehensive understanding of how FinTech innovations are reshaping India's banking sector while highlighting areas that require strategic attention from banks and policymakers.

RBI Digital Payments Index (RBI–DPI): 2018 to 2025 The RBI Digital Payments Index is a composite index that measures the extent of digitalisation of payments. March 2018 is the base with value 100. RBI publishes the complete series in its press releases.

Table 1: Trend in RBI–DPI Values across Different Periods (March 2018–March 2025)

Period	RBI–DPI Value
March 2018	100.00
March 2019	153.47
September 2019	173.49
March 2020	207.84
September 2020	217.74
March 2021	270.59
September 2021	304.06
March 2022	349.30
September 2022	377.46
March 2023	395.57
September 2023	418.77
March 2024	445.50
September 2024	465.33
March 2025	493.22

Source: RBI Digital Payments Index press releases, January 2021, January 2024 and July 2025

.Fig 2: RBI Digital Payments Index

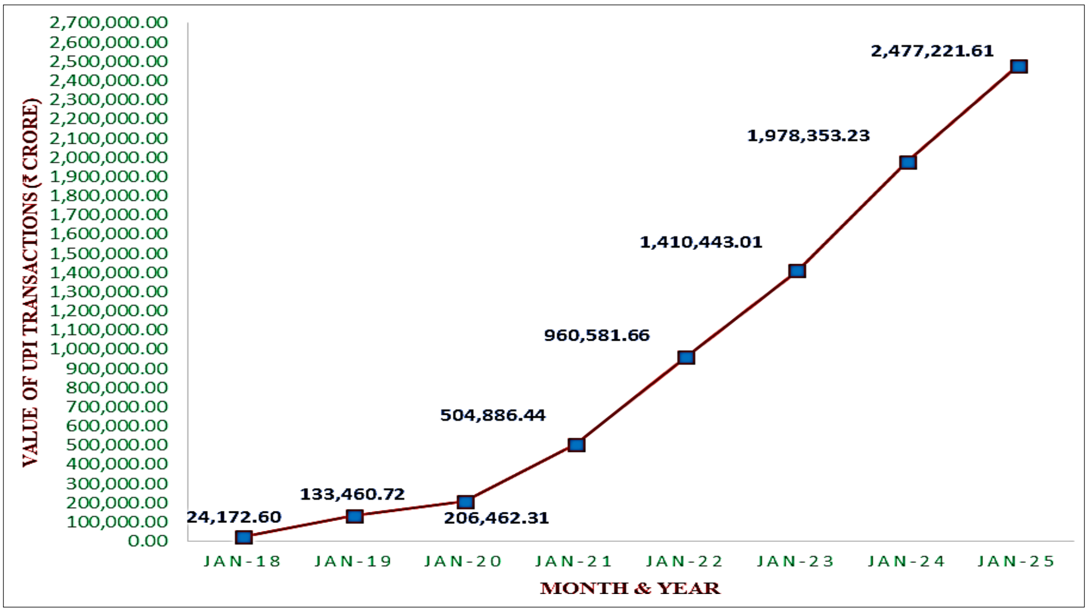
INTERPRETATION

The index increased from 100 in March 2018 to 493.22 in March 2025. This is almost five times rise in seven years. We can see that the index has risen consistently every six months, showing that digital adoption is steady and not just a temporary spike. The strongest jumps are between March 2020 and March 2022, which covers the pandemic and post pandemic period when UPI and other digital channels expanded very fast.

Table 2: UPI Monthly Statistics – Selected Months

Month & Year	Number of UPI transactions (million)	Value of UPI transactions (₹ crore)
March 2018	178.05	24,172.60
March 2019	799.54	1,33,460.72
March 2020	1,246.84	2,06,462.31
March 2021	2,731.68	5,04,886.44
March 2022	5,405.65	9,60,581.66
March 2023	8,685.30	14,10,443.01
March 2024	13,440.00	19,78,353.23
March 2025	18,301.51	24,77,221.61

***source*:** NPCI UPI Product Statistics page



INTERPRETATION

Monthly UPI volume at the end of the financial year increased from 178 million in March 2018 to 18,301.51 million in March 2025. That is more than a hundred-fold increase in seven years. The corresponding value of UPI transactions increased from ₹24,172.60 crore in March 2018 to ₹24,77,221.61 crore in March 2025. This shows that not only the number of transactions but also the total value has grown massively. Both the RBI Bulletin (Table 2) and NPCI monthly data (Table 3) agree on the main point: UPI is the primary digital payment rail in India, and its growth is closely linked to overall digital transformation of banking that from 2018 till now, digital payments have become central to India's payment system, and that this structural change is measured officially by RBI.

FINDINGS

1. The study finds a significant and consistent growth in FinTech adoption in Kerala, particularly in digital payment systems such as UPI, IMPS, and NEFT.
2. Mobile and internet banking usage have increased steadily, indicating a strong shift towards digital banking services among customers.
3. Profitability indicators of traditional banks, including ROA, ROE, and net profit, show noticeable improvement during periods of increased FinTech adoption.

4. The cost–income ratio of traditional banks has declined over the study period, suggesting improved operational efficiency due to digital processes and automation.
5. Non-performing assets (NPAs) show a gradual reduction, indicating better credit monitoring and risk management supported by FinTech solutions.
6. Regression results reveal that digital payments have the strongest positive impact on banking performance, followed by mobile banking and internet banking

SUGGESTIONS

1. Traditional banks should further strengthen FinTech integration, especially in digital payments and mobile banking services, to improve efficiency and profitability.
2. Banks should invest in cybersecurity infrastructure to address rising digital risks associated with increased FinTech usage.
3. Financial institutions should conduct digital literacy programmes to encourage wider adoption of FinTech services, particularly among rural and elderly customers.
4. Policymakers and regulators should continue to support FinTech innovation through flexible regulatory frameworks and digital infrastructure development.
5. Banks should collaborate with FinTech firms to enhance innovation, improve customer experience, and remain competitive in the digital banking environment.

CONCLUSION

The study concludes that FinTech adoption has a positive and significant impact on the performance of traditional banks in Kerala. The growing use of digital payments, mobile banking, and internet banking has contributed to improved profitability, enhanced operational efficiency, and better asset quality. While FinTech presents certain challenges, such as cybersecurity risks and technological adaptation, its overall influence on traditional banking performance is favorable. The findings highlight the importance of strategic FinTech integration and policy support in strengthening the traditional banking system. The study provides valuable insights for banks, regulators, and researchers, emphasizing that FinTech is no longer a complementary service but a critical driver of banking performance in Kerala.

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INTERPLAY OF LIQUIDITY RISK AND SOVEREIGN CREDIT RISK IN EMERGING ASIA

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ABSTRACT

This study examines the impact of market volatility and liquidity on sovereign credit risk in 21 emerging economies, focusing on the term structure of Credit Default Swap (CDS) spreads across short (2-year), medium (5-year), and long-term (10-year) maturities. Employing fixed-effect panel data analysis and sub-sample analysis for the COVID-19 pandemic period (2020–2022), the research provides valuable insights into how these factors shape sovereign credit risk dynamics. The findings reveal that market volatility (VIX) significantly increases sovereign credit risk, with the strongest effect observed in short-term CDS spreads, underscoring heightened sensitivity to uncertainty in the short run. The study also found that market liquidity, measured by logM3, has a strong and significant negative influence on CDS spreads across all term structures. This indicates that higher market liquidity reduces sovereign credit risk, with the effect being most pronounced in short-term maturities. Macroeconomic variables such as GDP growth, inflation, unemployment, and fiscal deficits also play crucial roles, with GDP growth reducing sovereign credit risk and inflation and unemployment amplifying it.

INTRODUCTION

Sovereign credit risk, which represents a nation's capacity to meet its debt obligations, is pivotal in shaping financial stability and global investor confidence. For emerging economies, where fiscal structures are still evolving and financial markets are less developed, the dynamics of sovereign credit risk become even more critical. These nations often rely heavily on external borrowing to finance developmental needs, making them vulnerable to global economic shifts and market conditions. The efficient management of sovereign credit risk is essential not only to ensure economic resilience but also to attract and sustain foreign investments.

Two critical factors influencing sovereign credit risk are volatility and liquidity. Volatility, characterized by unpredictable fluctuations in financial markets, reflects uncertainty that can negatively impact investor sentiment and lead to higher risk premiums on sovereign debt. Emerging markets, given their susceptibility to external shocks such as commodity price fluctuations, currency instability, and changes in global interest rates, often face amplified effects of volatility. For instance, events like the COVID-19 pandemic exposed these economies to sharp capital outflows and heightened borrowing costs, further intensifying their sovereign credit risk.

Liquidity, on the other hand, measures the ease of trading assets without significantly affecting their prices. Liquid markets enhance a country's ability to refinance debt at lower costs and boost investor confidence. Conversely, illiquidity creates refinancing challenges, particularly during times of economic stress, thereby exacerbating sovereign credit risk. Emerging economies often suffer from shallow financial markets and limited domestic investor bases, which exacerbate liquidity constraints. For example, countries such as Turkey and South Africa have faced significant challenges in managing their sovereign credit profiles due to a lack of sufficient liquidity in their bond markets.

This study focuses on understanding the interplay between these two factors—volatility and liquidity—and their combined effect on sovereign credit risk in 21 emerging economies: India, China, Brazil, Chile, Colombia, Czech Republic, Egypt, Greece, Hungary, Indonesia, Malaysia, Mexico, Peru, Philippines, Poland, Qatar, Saudi Arabia, South Africa, South Korea, Thailand, and Turkey. These nations are characterized by their unique economic structures, varying levels of market development, and diverse exposure to external shocks. Despite these differences, they share common vulnerabilities, such as reliance on external debt, sensitivity to global market fluctuations, and weaker financial systems compared to developed economies.

The significance of this research lies in its ability to provide actionable insights for stakeholders. Policymakers can use the findings to design strategies that reduce volatility and improve liquidity, thereby enhancing economic resilience. Institutional investors, who are key participants in sovereign debt markets, will benefit from a deeper understanding of risk factors influencing their portfolios. Additionally, credit rating agencies can incorporate the study's insights into their sovereign credit rating frameworks, thereby improving the accuracy of credit assessments.

By examining the relationship between volatility, liquidity, and sovereign credit risk across a diverse set of emerging economies, this study aims to address critical gaps in existing research. The findings will not only enrich the academic literature but also equip stakeholders with the tools to navigate an increasingly uncertain global financial environment.

REVIEW OF LITERATURE

The relationship between volatility, liquidity, and sovereign credit risk has been a focal point of financial research. Bouri et al. (2008) examined the role of oil price volatility in influencing sovereign risk among BRICS countries. Their study revealed that oil volatility acts as a critical determinant, with low volatility being associated with reduced sovereign credit risk. This finding underscores the dependence of both oil-exporting and importing nations on stable oil markets to maintain fiscal and economic stability. Subrahmanyam-Davide, L. P. M. G., & Uno, T. J (2013) explored the Italian government bond market, highlighting the significant impact of widening sovereign credit default swap (CDS) spreads— particularly when they exceed 500 basis points— on market liquidity. This study emphasizes how heightened credit risk leads to liquidity constraints, which can exacerbate financial instability in sovereign debt markets. Similarly, Monfort and Renne (2014) introduced an innovative arbitrage-free model to assess euro-area sovereign bond spreads. Their research demonstrated that liquidity shortages significantly influenced yield differentials during financial crises, indicating the necessity of addressing both liquidity risks and credit risk to accurately estimate sovereign default probabilities.

Hassan and Wu (2015) provided a broader macroeconomic perspective by examining the interplay between sovereign credit ratings and economic stability. They found that higher sovereign ratings reduce GDP growth volatility, thereby stabilizing economies. However, this relationship was notably disrupted during the global financial crisis, as changes in CDS spreads amplified economic instability, highlighting the fragility of emerging markets under adverse global conditions. Silva, Vieira, and Vieira (2016) offered a regulatory dimension by studying the European Union's 2012 ban on CDS trading. Their findings indicated that the prohibition led to increased bid-ask spreads and reduced price informativeness, ultimately harming market liquidity and increasing volatility. This research draws attention to the unintended consequences of regulatory interventions on sovereign credit markets.

Building upon these foundational studies, Dieckmann and Plank (2012) explored the spillover effects of global financial crises on sovereign risk in emerging markets. Their research highlighted that heightened global risk aversion leads to significant increases in sovereign credit spreads, illustrating how external shocks can propagate through interconnected financial systems. Acharya and Rajan (2013) investigated the nexus between sovereign credit risk and banking sector stability. They concluded that sovereign defaults often trigger banking crises, creating a feedback loop that exacerbates systemic risk. This finding is particularly relevant for emerging markets with underdeveloped financial systems, where the interconnectedness between sovereign and banking risks is pronounced.

Broner, Lorenzoni, and Schmukler (2014) delved into the sustainability of sovereign debt in emerging markets, identifying the dual role of liquidity shocks and investor expectations in driving sovereign bond yields. Their study underscored the importance of maintaining market confidence to mitigate credit risk. Fabozzi et al. (2015) examined liquidity premia in sovereign bond markets, demonstrating that liquidity constraints during financial crises significantly increase borrowing costs for governments. This research highlights the critical role of liquidity in shaping sovereign credit risk, particularly in times of market stress. Finally, Beirne and Fratzscher (2013) analysed the influence of portfolio flows on sovereign risk, finding a strong correlation between capital flow volatility and credit risk in emerging markets. Their findings underscore the vulnerability of these markets to external financial conditions and the importance of stable capital inflows for maintaining creditworthiness.

RESEARCH METHODOLOGY

Objectives

To analyse the impact of market volatility on sovereign credit risk in emerging countries.

To evaluate the role of market liquidity in influencing sovereign credit risk in these economies.

To compare the effect of volatility and liquidity on sovereign credit risk across term structure.

Hypotheses

H0-1 - Market volatility does not have a significant impact on sovereign credit risk in emerging countries.

H0-2 – Market Liquidity do not significantly influence sovereign credit risk in emerging economies.

H0-3 - The effects of volatility and liquidity on sovereign credit risk has no significant relationship across term structure.

Variables

Independent Variables

Volatility: Measured using Volatility index of a country.

Liquidity: Measured through liquidity indicators of a country (M3).

Dependent Variable

Sovereign Credit Risk: Measured using sovereign credit default swap (CDS) spreads i.e. the cost creditors pay to protect against a borrower's default risk, reflecting perceived creditworthiness and market risk.

Control Variables

International Reserves (logintlres): Measured by the natural logarithm of a country's foreign reserves.

Inflation: Measured by the annual percentage change in the Consumer Price Index

(CPI).

Real GDP Growth: Measured by the annual percentage change in real GDP.

Unemployment: Measured by the percentage of the labour force that is unemployed and actively seeking work.

US 10-Year Bond Yield: Measured by the yield on U.S. government bonds with a 10-year maturity.

Debt-to-GDP Ratio: Calculated by dividing a country's total national debt by GDP or Gross Domestic Product.

Current Account Balance-to-GDP: Calculated by dividing a country's Current Account Balance by GDP or Gross Domestic Product.

Operational definition of variables

Dependent Variable

Sovereign Credit Risk: Sovereign credit risk refers to the risk that a government will default on its debt or fail to meet its financial obligations. It is typically assessed by the sovereign CDS spread, which reflects the cost of insuring against such default. Sovereign credit risk is affected by a variety of macroeconomic variables, including economic growth, fiscal health, and global financial stability. When a country's credit risk is perceived to be higher, its CDS spreads increase, indicating greater default risk. This risk is influenced by various factors, such as political instability, economic shocks, and the government's ability to manage its debt and fiscal policies. Understanding the dynamics of sovereign credit risk is critical for investors and policymakers alike, as it reflects the financial health and stability of a nation's economy.

Independent Variable

Liquidity, M3: Liquidity is the ability of a country to meet its short-term financial obligations and also measures the ease of trading assets without significantly affecting their prices, often measured through liquidity indicators like M3 (a broad money supply indicator). Higher liquidity indicates that a country has sufficient assets to handle financial obligations, such as debt servicing, without requiring external assistance. In contrast, a lack of liquidity increases the likelihood of a country defaulting on its debts, as it may struggle to raise funds or pay creditors. Therefore, liquidity plays a crucial role in sovereign credit risk: countries with low liquidity face a higher risk of default, which is directly linked to rising CDS spread.

VIX: Volatility, typically measured by the Volatility Index (VIX), reflects the level of uncertainty or risk in a country's financial market. It represents the fluctuations in asset prices or economic indicators, signalling potential economic instability. Higher volatility often leads to higher perceived sovereign credit risk, as markets become more sensitive to external shocks, such as political instability, economic downturns, or global financial crises. For sovereign credit risk, an increase in volatility means greater uncertainty around a country's financial health, leading investors to demand higher premiums on sovereign debt, reflected in higher credit default swap (CDS) spreads. This rise in spreads signals increased risk of default and a weakened creditworthiness of the government.

Conceptual Model

log CDSi, t = α+β1VIXt+β2logm3i, t+β3USDt+β4UERi, t+β5INFLi, t+β6logintlresi, t +β7RGDPi, t+β8DGDPi, t+β9CGDPi, t+Ui, t

Where,

CDSi, t is the Credit Default Swap Spread of the country i for the year t.

VIXt is the Volatility Index for the year t

logm3i, t is the money supply of the country i for the year t.

USDt is the United States ten-year \`bond yields for the year t.

UERi, t is the Unemployment Rate of the country I for the year t.

INFLi, t is the Inflation Index of the country i for the year t.

logintlresi, t is the International reserves of the country i for the year t.

RGDPi, t is the real GDP growth rate of the country i for the year t.

DGDPi, t is the ratio of debt to its gross domestic product of the country i for the year t.

CGDPi, t is the ratio of current account balance to the gross domestic product of the country i for the year t.

Ui, t is the error term of this model.

Data Source and Data collection method

The data for this research will be collected from secondary sources such as:

Reuters for financial market data (CDS spreads, bond yields, stock indices)

World Bank and IMF databases for macroeconomic data

Data analysis tool

The data analysis will be conducted using econometric tools, focusing on regression models to assess the impact of volatility and liquidity on sovereign credit risk. The plan includes:

Descriptive analysis to summarize the data

Correlation analysis to identify relationships between variables

Panel data regression to evaluate the influence of volatility and liquidity on sovereign credit risk across different countries.

RESULTS

Descriptive Statistics

The descriptive statistics table provides an overview of the key variables used in the study. These statistics are critical for understanding the central tendencies (mean), variability (standard deviation), and range (minimum and maximum values) of each variable, laying the foundation for subsequent analyses. This step ensures that the data is suitable for panel regression and highlights any preliminary patterns across the term structures (2-year, 5-year, and 10-year CDS spreads)

Table 4.1.1 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
cds2year	332	118.713	1656.479	6.8	29082.711

cds5year	331	165.993	2105.509	21.97	37030.488
cds10year	332	192.235	3022.254	34.75	53128.102
logintlres	344	10.96	.633	9.257	12.586
logm3	301	11.656	.631	10.668	14.264
inflation	354	4.895	6.406	-3.8	65.452
realgdpgrowth	315	.05	.115	-.268	.443
unemployment	340	.075	.056	.002	.288
vix	357	19.579	6.557	11.04	40
us10yearbondyield	357	2.594	.899	.916	4.035
currentacgdp	336	.007	.071	-.217	.332
debtgdp	331	.532	.594	.014	3.07

INTERPRETATION

For the **2-year CDS (cds2year)**, the mean value is 118.713, which indicates that on average, the credit default swap spread for 2-year maturities is 118.713 basis points. The standard deviation of 1656.479 highlights a significant variation in the 2-year CDS values, indicating that the credit risk measured over a 2-year period fluctuates widely. The minimum value of 6.8 and the maximum value of 29082.711 suggest that while most countries had lower CDS spreads, some faced very high levels of sovereign risk.

For the **5-year CDS (cds5year)**, the mean is 165.993, reflecting the average credit risk spread for a 5-year period. The standard deviation of 2105.509 indicates even more variation in the 5-year CDS compared to the 2-year CDS, suggesting that longer-term credit risk can be more volatile. The minimum value of 21.97 and the maximum value of 37030.488 show a wide range of credit risk exposure, from relatively stable to extremely high levels.

The **10-year CDS (cds10year)** has a mean value of 192.235, indicating that the average credit risk for a 10-year period is 192.235 basis points. With a standard deviation of 3022.254, it reflects considerable variability in the long-term sovereign credit risk across countries. The range, with a minimum of 34.75 and a maximum of 53128.102, demonstrates that, like the 2-year and 5-year CDS, the long-term CDS spreads can vary significantly, showing both stable and highly risky sovereign environments.

Fixed Effect Panel Data Analysis

Table 4.2.2.1 Comparison across the Term Structure

VARIABLES	(2-year) logcds	(5-year) logcds	(10-year) logcds
logintlres	-0.0367	-0.232	-0.262
	(0.427)	(0.335)	(0.292)
logm3	-2.806***	-1.993***	-1.303***
	(0.520)	(0.408)	(0.356)
inflation	0.0380***	0.0286***	0.0239***
	(0.00983)	(0.00774)	(0.00673)
realgdpgrowth	-0.258	-0.460	-0.362
	(0.429)	(0.340)	(0.294)
unemployment	10.97***	8.760***	7.832***
	(2.441)	(1.924)	(1.672)
vix	0.0414***	0.0197***	0.0117**
	(0.00753)	(0.00601)	(0.00516)
us10yearbondyield	0.133**	0.0463	0.000606
	(0.0586)	(0.0461)	(0.0401)
debtgdp	0.139	0.197	0.293
	(0.370)	(0.291)	(0.254)
currentacgdp	-2.384*	-2.346**	-1.447
	(1.282)	(1.063)	(0.878)
Constant	35.10***	29.24***	22.10***
	(5.992)	(4.706)	(4.103)
Observations	237	236	237
R-squared	0.478	0.400	0.328
Number of codes	17	17	17

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Fixed Effect Panel Data Regression is a statistical technique used to analyse panel data, where multiple observations of the same entities (e.g., countries) are collected over time.

It controls for time-invariant characteristics within each entity, ensuring that the analysis isolates the effect of independent variables (e.g., volatility and liquidity) on the dependent variable (sovereign credit risk). In this study, this method evaluates whether market volatility and liquidity significantly impact sovereign credit risk in emerging countries. Fixed effects eliminate biases caused by omitted variables unique to each country, offering precise insights into how changes in volatility and liquidity influence credit risk dynamics.

Interpretation

The table **"Comparison across the Term Structure"** provides a clear breakdown of the relationships between several macroeconomic and financial indicators with **sovereign credit risk** (logcds), measured across **2-year, 5-year, and 10-year CDS spreads**. These spreads reflect sovereign credit risk over short-, medium-, and long-term horizons. Key variables like **volatility (vix)** and **liquidity (logm3)** are central to the study and hypotheses.

IMPACT OF MARKET VOLATILITY ON SOVEREIGN CREDIT RISK

The coefficient for vix is statistically significant across all term structures (2-year, 5-year, and 10-year CDS spreads), indicating a positive relationship between market volatility and sovereign credit risk.

- For **2-year CDS**, the coefficient is **0.0414** ($p < 0.05$), suggesting that an increase in volatility leads to an increase in short-term sovereign credit risk.
- For **5-year CDS**, the coefficient drops to **0.0197** ($p < 0.05$)
- For **10-year CDS**, it decreases further to **0.0117** ($p < 0.1$).

The results indicate that volatility (vix) has a stronger effect on short-term sovereign credit risk than on medium and longer-term risk. This supports the idea that in times of higher market uncertainty, short-term investor sentiment becomes more sensitive to volatility, causing short-term CDS spreads to rise more significantly. This aligns with the hypothesis **H0-1**, which can be rejected since volatility **significantly impacts sovereign credit risk**.

- This finding indicates that **Volatility increases sovereign credit risk**, especially in the short-term, due to heightened investor concerns and risk aversion.

ROLE OF MARKET LIQUIDITY IN SOVEREIGN CREDIT RISK

The variable **logm3** (a proxy for market liquidity) shows a statistically significant negative relationship with sovereign credit risk across all term structures.

- For **2-year CDS**, the coefficient is **-2.806** ($p < 0.01$), showing a strong inverse relationship.
- For **5-year CDS**, the effect reduces slightly to **-1.993** ($p < 0.01$).
- For **10-year CDS**, the coefficient decreases further to **-1.303** ($p < 0.01$).

Interpretation: These results highlight that as liquidity improves (e.g., through higher money supply), sovereign credit risk declines across all term structures. The strongest impact is observed for short-term CDS spreads (2-year), while the effect diminishes over medium and longer terms (5- and 10-year).

- This provides strong evidence to reject the hypothesis **H0-2**: Market liquidity **does influence sovereign credit risk significantly**.
- The findings indicate that **improved liquidity reduces sovereign credit risk**, particularly in the short term, by providing investors with confidence and reducing funding stress in markets.

COMPARING VOLATILITY AND LIQUIDITY ACROSS TERM STRUCTURES

- **Volatility(vix):**

  The impact of volatility decreases progressively across the term structure. The strongest effect is on short-term sovereign risk (2-year CDS), reflecting investor sensitivity to immediate uncertainty. Over longer horizons (5- and 10-year), volatility has a smaller, though still significant, effect.

LIQUIDITY(LOGM3):

Similarly, the effect of liquidity weakens as the term structure lengthens. Short-term risk is most responsive to liquidity conditions, highlighting the importance of immediate market access and cash flow in alleviating credit concerns. These findings partially reject hypothesis **H0-3**: The effects of volatility and liquidity on sovereign credit risk **differ significantly across the term structure**. Volatility and liquidity both play critical roles in short-term risk but have diminishing impacts on longer-term spreads. This comparative analysis underscores the importance of monitoring short-term market conditions to manage sovereign credit risk effectively.

The **log of international reserves** has a negative but insignificant relationship with CDS spreads across all maturities. For the **2-year CDS**, the coefficient is **-0.0367**, while for the **5-year CDS**, it is **-0.232**, and for the **10-year CDS**, it is **-0.262**. The negative signs suggest that higher international reserves are associated with lower sovereign credit risk, as reserves provide a cushion against external shocks. However, the lack of statistical significance ($p > 0.1$) indicates that reserves do not strongly influence credit spreads in this sample.

Inflation has a positive and statistically significant effect on CDS spreads, with coefficients of **0.0380** ($p < 0.01$) for the **2-year CDS**, **0.0286** ($p < 0.01$) for the **5- year CDS**, and **0.0239** ($p < 0.01$) for the **10-year CDS**. This indicates that higher inflation increases sovereign credit risk, as rising prices erode economic stability and investor confidence. The magnitude of the impact decreases with maturity, reflecting market expectations that inflationary pressures might stabilize over the long term.

The **real GDP growth rate** shows a negative but statistically insignificant relationship with CDS spreads across all horizons. For the **2-year CDS**, the coefficient is **-0.258**, while for the **5-year** and **10-year CDS**, the coefficients are **-**

0.460 and **-0.362**, respectively. Although economic growth theoretically reduces default risk by strengthening fiscal stability, the lack of significance implies that other factors dominate credit risk perceptions in this context.

The **unemployment rate** has a strong and positive effect on CDS spreads across all maturities, with coefficients of **10.97** ($p < 0.01$) for the **2-year CDS**, **8.760** ($p < 0.01$)

for the **5-year CDS**, and **7.832** ($p < 0.01$) for the **10-year CDS**. This result underscores that rising unemployment increases credit risk, as it signals economic weakness and deteriorating fiscal health. The magnitude decreases over longer maturities, suggesting markets expect labour markets to recover over time.

The **US 10-year bond yield** has a significant positive effect on short-term CDS spreads, with a coefficient of **0.133** ($p < 0.05$) for the **2-year CDS**. This suggests that rising global interest rates increase borrowing costs for emerging markets, thereby raising credit risk. However, the relationship becomes insignificant for the **5-year** (**0.0463**) and **10-year CDS** (**0.000606**), indicating that long-term spreads are less sensitive to shifts in US yields.

The **debt-to-GDP ratio** has a positive but statistically insignificant relationship with CDS spreads. For the **2-year CDS**, the coefficient is **0.139**, while for the **5- year CDS** and **10-year CDS**, the coefficients are **0.197** and **0.293**, respectively. The positive sign aligns with theoretical expectations that higher debt levels increase concerns about fiscal sustainability. However, the lack of statistical significance suggests that markets may already price in these risks or focus on other variables.

The **current account deficit as a percentage of GDP** shows a significant and negative relationship with CDS spreads for shorter maturities. For the **2-year CDS**, the coefficient is **-2.384** ($p < 0.1$), indicating that larger deficits raise short-term credit risk by increasing reliance on external financing. This effect remains significant for the **5-year CDS** (**-2.346**, $p < 0.05$) but becomes insignificant for the **10-year CDS** (**-1.447**). The diminishing significance suggests that markets expect adjustments in external imbalances over longer horizons.

FINDINGS

1. *Findings on Fixed-Effect Panel Data Analysis*

   The coefficient for VIX is positive and statistically significant across all term structures, signifying that higher market volatility increases sovereign credit risk. For the 2-year CDS spread, the coefficient is 0.0414 ($p < 0.05$), indicating a stronger short-term impact, while the effect diminishes for 5-year (0.0197, $p < 0.05$) and 10-year CDS spreads (0.0117, $p < 0.1$). This pattern suggests that market participants perceive short-term risks to be more sensitive to fluctuations in volatility, aligning with heightened risk aversion during periods of market uncertainty.

On the other hand, logM3 demonstrates a statistically significant negative relationship with CDS spreads across all term structures, implying that improved market liquidity reduces sovereign credit risk. The coefficients for 2-year, 5-year, and 10-year CDS spreads are -2.806 ($p < 0.01$), -1.993 ($p < 0.01$), and -1.303 ($p < 0.01$), respectively, reflecting a stronger influence of liquidity on short-term risks. This emphasizes the crucial role of liquidity in alleviating credit concerns, particularly over shorter horizons, by ensuring smoother market functioning and reducing funding stress.

Among the macroeconomic variables, **inflation** has a significant positive impact on CDS spreads across all maturities, with coefficients of 0.0380 ($p < 0.01$) for the 2-year CDS, 0.0286 ($p < 0.01$) for the 5-year CDS, and 0.0239 ($p < 0.01$) for the 10-year CDS. This indicates that rising inflation elevates sovereign credit risk by destabilizing the economy and eroding investor confidence. In contrast, **GDP growth** shows a negative but statistically insignificant relationship with CDS spreads across all term structures, with coefficients of -0.258 (2-year), -0.460 (5- year), and -0.362 (10-year). While economic growth typically reduces default risk, its lack of statistical significance in this study suggests that other factors are more influential in driving sovereign credit risk.

Similarly, the **unemployment rate** has a strong positive and significant relationship with CDS spreads, with coefficients of 10.97 ($p < 0.01$) for the 2-year CDS, 8.760 ($p < 0.01$) for the 5-year CDS, and 7.832 ($p < 0.01$) for the 10-year CDS. This underscores that rising unemployment signals fiscal stress and amplifies sovereign credit risk, particularly in the short term.

Fiscal and global financial variables also influence sovereign credit risk. The **US 10-year bond yield** shows a significant positive effect on short-term CDS spreads, with a coefficient of 0.133 ($p < 0.05$) for the 2-year CDS, but the relationship becomes insignificant for longer maturities (5-year: 0.0463; 10-year: 0.000606). This finding suggests that global interest rate movements primarily affect short- term borrowing costs.

The **current account deficit (as a percentage of GDP)** exhibits a significant negative relationship with CDS spreads for shorter maturities (-2.384, $p < 0.1$ for 2-year; -2.346, p < 0.05 for 5-year), while the relationship is insignificant for longer maturities (-1.447 for 10-year CDS). Lastly, the **debt-to-GDP ratio** has a positive but statistically insignificant relationship with CDS spreads across all term structures, suggesting that while fiscal sustainability concerns exist, they are not the primary determinants of sovereign credit risk in this study.

Summary of Findings

1. **To analyse the impact of market volatility on sovereign credit risk in emerging countries:**

- **Achieved**. The findings reveal that market volatility (VIX) has a significant and positive impact on sovereign credit risk. The effect is strongest on short-term CDS spreads (2-year: 0.0414, p < 0.05) and diminishes over longer maturities (5-year: 0.0197, p < 0.05; 10- year: 0.0117, p < 0.1). This demonstrates that higher market volatility amplifies credit risk, particularly in the short term.

2. *To evaluate the role of market liquidity in influencing sovereign credit risk in these economies:*

- **Achieved**. The results show that improved market liquidity (logM3) significantly reduces sovereign credit risk across all term structures. The strongest impact is observed on 2-year CDS spreads (coefficient: -2.806, p < 0.01), with the effect gradually weakening for 5-year (-1.993, p < 0.01) and 10-year CDS spreads (-1.303, p < 0.01).

3. *To compare the effect of volatility and liquidity on sovereign credit risk across term structures:*

- **Achieved**. The analysis confirms that the impacts of volatility and liquidity vary across term structures. Volatility has a more pronounced effect on short-term sovereign credit risk, while liquidity's impact, although strong across all maturities, is most significant in the short term.

Hypotheses Testing

1. **H0-1: Market volatility does not have a significant impact on sovereign credit risk in emerging countries.**

- **Rejected**. Market volatility (VIX) is shown to have a significant positive impact on CDS spreads across all term structures, with the strongest effect on short-term spreads (2-year: 0.0414, p < 0.05).

2. *H0-2: Market liquidity does not significantly influence sovereign credit risk in emerging economies.*

- **Rejected**. Market liquidity (logM3) exhibits a significant negative relationship with CDS spreads across all maturities, particularly in the short term (2-year: -2.806, $p < 0.01$).

3. *H0-3: The effects of volatility and liquidity on sovereign credit risk have no significant relationship across term structure.*

- **Rejected**. The findings demonstrate that both volatility and liquidity have differential impacts across term structures. Volatility's effect is strongest in the short term, while liquidity significantly reduces risk across all terms but is most effective in the short term.

The study successfully addresses the objectives and rejects all null hypotheses, affirming the importance of market volatility and liquidity in shaping sovereign credit risk in emerging economies.

2. *Findings on Sub-Sample Analysis*

The sub-sample analysis during the COVID-19 period reveals significant changes in the determinants of sovereign credit risk, reflecting the unique economic and financial conditions during the pandemic. The analysis shows that logM3, representing money supply, had a pronounced negative and statistically significant effect on CDS spreads across all term structures. The coefficients for 2-year, 5- year, and 10-year CDS spreads were -8.565, -6.912, and -5.333, respectively, all at the 1% significance level. This underscores the pivotal role of liquidity during crises, as higher money supply reduced sovereign credit risk by alleviating funding pressures and providing market stability.

In contrast, VIX, inflation, GDP growth, unemployment, and debt-to-GDP ratios did not exhibit statistically significant relationships with CDS spreads during the sub-sample period, indicating that traditional macroeconomic indicators played a muted role in determining sovereign credit risk amid pandemic-induced uncertainties. For instance, the coefficients for inflation were near zero (-0.00353 for 2-year, -0.000594 for 5-year, and 0.00301 for 10-year), signifying a negligible influence. Similarly, real GDP growth and unemployment showed weak and statistically insignificant effects, reflecting the widespread and uniform impact of the pandemic on economic conditions across countries.

However, the US 10-year bond yield remained a significant determinant of sovereign credit risk, with coefficients of 0.329 (2-year), 0.211 (5-year), and 0.148 (10-year) at statistically significant levels. This indicates that global financial conditions, particularly rising US interest rates, continued to shape sovereign risk perceptions during the pandemic. Additionally, the current account to GDP and debt-to-GDP ratios were not significant predictors of CDS spreads in this period, further highlighting the distinctiveness of the COVID-19 context.

Overall, the findings underscore the heightened importance of liquidity (logM3) and global interest rates (US 10-year bond yield) in mitigating sovereign credit risk during the pandemic, while other macroeconomic variables took a backseat due to the unprecedented nature of the crisis. This analysis highlights the need for policymakers and investors to adapt their risk assessment frameworks during extraordinary global events.

- **Monitor Short-Term Sovereign Risk Closely:** Both volatility and liquidity exhibit the strongest effects on short-term CDS spreads. Policymakers and investors should prioritize monitoring short-term risks, particularly during crises, and develop rapid-response mechanisms to address liquidity constraints and volatility spikes.
- **Develop Crisis-Specific Strategies:** During crises like the COVID- 19 pandemic, traditional macroeconomic variables such as inflation and GDP growth showed reduced significance. Government and Policymakers should adopt adaptive strategies that focus on liquidity measures and managing external vulnerabilities during such periods of global uncertainty.
- **Global Spillover Risk Management:** Global financial shocks severely impact developing markets, as seen by the favourable correlation between global volatility indices (VIX), US bond yields, and sovereign credit risk. Policymakers should limit external capital market dependency and diversify funding sources to reduce spillover effects. Foreign exchange reserves, trade balances, and regional financial cooperation frameworks can protect emerging economies from external shocks. Policies that encourage long-term investments like infrastructure and green financing help stabilize sovereign spreads and reduce short-term volatility.

- **Enhance Sovereign Debt Management Practices:** Improving debt management through transparency, efficient debt servicing policies, and balanced fiscal deficits can reduce long-term credit risks. Fiscal discipline will be crucial to mitigating the impact of rising fiscal deficits on CDS spreads.

CONCLUSION

This study, titled "Assessing the Impact of Volatility and Liquidity on Sovereign Credit Risk: Insights from Emerging Countries," comprehensively examines the critical determinants of sovereign credit risk in 21 emerging economies. Through an extensive analysis utilizing fixed-effect panel regression and sub-sample evaluations, this study sheds light on how market volatility, liquidity, and other macroeconomic factors influence sovereign credit risk across short, medium, and long-term horizons.

The findings emphasize that both volatility and liquidity play pivotal roles in shaping sovereign credit risk. Market volatility, measured by the Volatility Index (VIX), is positively associated with CDS spreads, with the strongest impact observed in short-term spreads. This highlights the heightened sensitivity of sovereign credit risk to market uncertainties in the short term. Conversely, market liquidity, represented by logM3, demonstrates a significant negative relationship with CDS spreads across all maturities. Improved liquidity reduces sovereign credit risk, with the effect most pronounced in the short term, indicating its stabilizing influence on market conditions.

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IMPACT OF INSTAGRAM IN PURCHASE DECISIONS OF COLLEGE GOING STUDENTS

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INTRODUCTION

The rapid proliferation of social media has fundamentally transformed consumer behaviour globally. Among social platforms, Instagram has emerged as a powerful driver of consumer engagement and purchase decisions, particularly among younger cohorts such as college and university students. With its visual appeal and interactive features, Instagram shapes not only awareness and preference but also the intention to purchase and actual buying behaviour. This literature review synthesizes a wide range of scholarly insights on how Instagram influences the purchase decisions of college students, incorporating theoretical perspectives, empirical evidence, behavioural mechanisms, and contextual examples.

Instagram's influence on purchasing behaviour is a multifaceted phenomenon involving marketing content, influencer endorsements, peer recommendations, visual storytelling, and interactive commerce features. College students, as digital natives, are especially susceptible to such influences due to their high engagement with social media, peer networks, and trend adoption behaviour. Understanding this dynamic is critical for marketers, educators, and policymakers concerned with ethical digital marketing and consumer literacy.

Instagram's core design emphasizes images and short videos, which naturally attract attention and stimulate interest among viewers. Research shows that visually appealing content such as high-quality photos, eye-catching graphics, and trending video formats significantly captures college students' attention. For example, a study found that visually rich posts not only increase engagement but also enhance the likelihood of discovering and considering products for purchase.

Visual content matters more than mere exposure. When students scroll through their feeds, striking visuals can interrupt habitual browsing patterns and influence initial stages of the purchase decision process (problem recognition and information search). In real life, a student might see a stylish sneaker featured in an Instagram Reel, feel an emotional pull based on aesthetics, and note the brand for future consideration.

Instagram features such as polls, question boxes, and shoppable tags create interactive consumer experiences. These features not only increase the time users spend engaging with a brand but also provide actionable cues (e.g., "Swipe Up to Shop"). Scholars have reported that interactive content enhances perceived value, provides social proof, and reduces friction in the purchase journey, ultimately increasing purchase likelihood.

For example, an online retailer might use stories where followers vote on their favourite product colour. This not only involves college student audiences in decision-making but also fosters psychological ownership making them more inclined to purchase the product they helped choose.

Multiple quantitative studies have demonstrated a significant positive relationship between Instagram marketing efforts and purchase decisions. In a study among Indonesian consumers, researchers found that Instagram social media marketing variables such as entertainment, interaction, trendiness, customization, and electronic word of mouth (e-WOM) positively influenced purchase decisions.

Similarly, research focused on food products marketed through Instagram suggests that social media marketing and influencer marketing both positively and significantly affect student consumers' purchase decisions. These findings underline that Instagram functions as both a promotional and transactional catalyst.

Instagram's integration of shopping functionality (e.g., product tags, Instagram Shops) blurs the boundary between inspiration and purchase. This seamless pathway reduces the effort required to transition from intention to purchase. For instance, when a travel blogger features a backpack with direct shopping links, a college student inspired by the aesthetic can make a purchase without leaving the app. These features have contributed to Instagram's evolution from a mere marketing channel into a maturing social commerce platform.

Influencers play a pivotal role in shaping the purchase decisions of younger consumers. Studies show that credibility (trustworthiness, expertise, relatability) of Instagram influencers significantly affects students' buying intentions. Authentic influencer recommendations often carry more persuasive power than traditional advertising because they appear personal and relatable.

For example, a beauty influencer who demonstrates how a skincare product improved their complexion can create strong social proof, prompting college students to trust and try the product themselves. Similarly, lifestyle influencers promoting fitness gear may spark aspirational buying by presenting products as essential to a desired lifestyle.

Instagram influencers often function like peers rather than celebrities, making their recommendations feel trustworthy. As research shows, the degree of interaction between college students and influencer content (e.g., likes, comments, shares) correlates with higher purchase intention.

Imagine a student sees ten friends or influencers post about a new eco-friendly water bottle. The repeated social proofs and hashtags create a perception of popularity and acceptance, increasing the likelihood of purchase through normative influence.

Research also highlights that consumer trust can mediate the relationship between influencer marketing and purchase decisions. This means influencers enhance purchase likelihood not just through visibility, but by building trust in the product or brand. D

For instance, when an influencer transparently discloses sponsorships and offers honest reviews, college students may interpret such transparency as a trust signal, strengthening their intention to buy.

Brand awareness often strengthens the impact of Instagram marketing on purchase decisions. Consumers who already recognize and recall a brand are more responsive to targeted content. Studies show that brand awareness can moderate the effectiveness of social media marketing on purchasing decisions, although sometimes in complex ways higher awareness may reduce the novelty effect of ads while still reinforcing preferences.

For example, a company that consistently uses Instagram to promote eco-friendly backpacks may build strong brand recall among college students, making them more likely to purchase when they see new product launches on the platform.

Brand image constructed through Instagram content including visuals, narratives, and influencer associations also plays a critical role. A positive brand image fostered via engaging and consistent messaging can increase perceived product value, trust, and preference among college students, which in turn influences purchase decisions.

A case in point is a sustainable fashion brand that uses Instagram stories to highlight ethical sourcing. Over time, the brand image cultivated through these narratives can convert followers into loyal buyers.

e-WOM on Instagram user reviews, comments, and shared experiences can strengthen or weaken purchase intentions. Positive e-WOM complements official marketing content and often influences college students' decisions more than direct advertising.

In practical terms, when students share their unboxing experiences or reviews of tech gadgets on Instagram, these genuine posts are viewed as peer recommendations that guide other students' purchasing deliberations.

Instagram's design fosters frequent and spontaneous engagement. Impulse buying occurs when users make unplanned purchases triggered by stimuli like limited-time offers, visually appealing ads, or influencer recommendations. Research indicates that Instagram marketing activities significantly influence online impulse buying, particularly through influencer content that enhances attractiveness and trust.

For example, a student might initially open Instagram to check messages but end up buying a trendy hoodie after watching a fashion influencer's live shopping session a clear illustration of how impulse buying is triggered by situational stimuli on social media.

The cognitive processes underpinning purchase decisions on Instagram involve emotional engagement, perceived social norms, and perceived usefulness. Instagram's constant stream of aspirational content can evoke emotions such as desire, fear of missing out (FOMO), and social aspiration, which influence purchasing intentions and decisions.

College students' responsiveness to Instagram varies across cultural contexts. In India, students are highly active users and often follow influencers who shape lifestyle and fashion trends. Studies focusing on Indian college students, such as research in Chandigarh, reveal that influencer credibility, content interaction, and promotion strategies have pronounced effects on students' purchase behaviour.

In contrast, other regions may show different patterns where cultural norms, economic constraints, and platform usage habits modulate the influence of Instagram on purchase decisions. These contextual nuances highlight the need for localized research.

While Instagram marketing can be a powerful tool, it also raises ethical concerns. The persuasive nature of influencer content can sometimes blur the line between authentic recommendation and commercial persuasion. Marketers and educational institutions should promote ethical practices, such as clear sponsorship disclosures and digital literacy among students, to prevent exploitation and impulsive consumption.

REVIEW OF LITERATURE

Several studies highlight the central role of Instagram and influencers in shaping young consumers' purchase-related attitudes and intentions. One study on female students in Jordanian universities finds that Instagram influencer advertisements significantly affect purchase intentions, especially for clothing, food, and beauty products. Realistic images, logical product information, and clear pricing emerge as the most persuasive elements, whereas lack of trust in influencers constrains the translation of intention into actual purchase behaviour. This work therefore underscores the importance of transparency, credibility, and ethical practices in influencer campaigns to strengthen consumer trust. Another study focusing on an Instagram-based shop (@nanarfshop) and FISIPOL students at Ekasakti University in Padang reports that Instagram utilization has a strong and statistically significant influence on students' buying interest, explaining about 97% of the variance in interest. Visual content quality, effective two-way communication, and the use of engagement features (likes, comments, direct messages) are identified as core drivers of buying interest in this context. The authors recommend that businesses optimize creative visual communication and interactive strategies on Instagram to deepen consumer interest and encourage purchase decisions.

A separate Indonesian study examines social media influencers in the local cosmetics market and finds that influencers significantly shape brand image and self-concept among consumers. In this model, brand image exerts a strong positive effect on purchase intention, but influencers and self-concept do not directly influence purchase intention. The results suggest that influencers are most effective when they contribute to a favourable brand image, which in turn motivates purchasing, rather than when they are treated as isolated persuasive agents. The authors suggest that cosmetic marketers work with credible influencers to build a compelling and congruent brand image, and propose further research on specific influencer characteristics and additional attitudinal variables. A recurring theme in the reviewed studies is that social media marketing often affects purchase intention indirectly through mediating constructs such as consumer engagement, brand engagement, brand awareness, and brand loyalty. One study on social network marketing among Generation Y university students shows that social network marketing significantly influences both purchase intention and consumer engagement, with consumer engagement partially mediating the relationship between social network marketing and purchase intention. Using SPSS and Partial Least Squares Structural Equation Modeling (PLS-SEM), the authors demonstrate that engagement functions as a psychological bridge between exposure to social media marketing and the formation of purchase intentions.

Another study, conducted in a broader social media user sample, focuses on social media marketing activities particularly interactive, informative, and entertaining content and finds that these activities significantly enhance brand engagement, which subsequently has a positive effect on purchase intention. Brand engagement is identified as a mediating variable between social media marketing activities and purchase intention, suggesting that engagement is a key relational outcome that transforms marketing exposure into purchase-related motivations. The authors recommend that marketers concentrate on crafting engaging, interactive content to strengthen brand consumer relationships and thereby improve purchasing outcomes. Research in a transition economy (Kosovo) further refines this mediating perspective by examining brand awareness and brand engagement as mediators between social media marketing and purchase intention. Structural Equation Modeling with bootstrapping indicates that social media marketing positively influences both brand awareness and brand engagement but does not have a direct effect on purchase intention. In this model, brand engagement fully mediates the link between social media marketing and purchase intention, while brand awareness does not play a significant mediating role. This finding emphasizes that mere awareness is insufficient; sustained, interactive engagement with the brand is crucial for converting social media efforts into purchase intentions, especially in emerging markets.

A related study among university students who follow brands on social media analyses the impact of social media marketing on electronic word of mouth (E-WOM), brand loyalty, and purchase intention. The results show that social media marketing positively affects both brand loyalty and E-WOM, but again has no direct effect on purchase intention. Instead, brand loyalty exerts a significant positive influence on purchase intention, whereas E-WOM does not significantly predict purchase intention in this sample. The authors argue that firms should focus on strengthening brand loyalty through consistent social media strategies and suggest expanding future research to include more diverse samples and additional branding variables. Collectively, these studies indicate that social media marketing's effect on purchase intention is often mediated rather than direct, with consumer/brand engagement and brand loyalty emerging as particularly important pathways. They also highlight the need to understand contextual factors such as market maturity and product category that shape which mediators (e.g., brand awareness, E-WOM, self-concept) are most influential.

Several studies in the file examine specific social media platforms and content types to identify which are most effective in driving purchase intentions among students and young adults. Research on university students in Kuala Lumpur's fashion industry context finds that Facebook, Instagram, and YouTube marketing all significantly and positively influence purchase intention, with Instagram exerting the strongest effect. The visual and interactive affordances of Instagram are highlighted as particularly suited to fashion-related decision-making. In contrast, user-generated content in this study shows a weak and statistically insignificant effect on purchase intention, suggesting that unmanaged or low-credibility content contributed by users may not necessarily enhance buying intentions. Consequently, the authors advise fashion marketers to prioritize visually engaging, interactive platforms especially Instagram while simultaneously improving the credibility and management of user-generated content. Another study centered on social media sites and students' purchase intention in online shopping focuses specifically on e-advertising and word of mouth (WOM) on social media. Using a quantitative descriptive design with SPSS-based analyses, the authors report that social media e-advertising has a significant positive impact on students' purchase intention. However, word of mouth does not have a significant effect on purchase intention in this sample, diverging from some traditional marketing assumptions about the power of WOM. The study recommends that marketers strengthen their social media e-advertising strategies and calls for future research using larger samples, additional explanatory variables, and specific product categories to clarify these relationships.

The Indonesian study on skincare products among young adults, grounded in the Theory of Planned Behaviour (TPB), further elaborates on content and activity characteristics by conceptualizing "social media marketing activities" as interactive, informative, and engaging communications. The findings show that these activities significantly influence purchase intention both directly and indirectly via subjective norms, perceived behavioural control, brand awareness, and social brand engagement. This supports the TPB-based view that attitudes, perceived social expectations, and perceived control shaped by well-designed social media content interact to determine purchase intention. The authors suggest that skincare marketers strengthen interactive and informative social media strategies to enhance trust, engagement, and intention to purchase. Across these studies, visually rich, interactive, and informative content consistently emerges as more influential than simple or unstructured user-generated content or informal word of mouth. Instagram, as a highly visual and engagement-oriented platform, repeatedly appears as particularly effective in fashion and youth-oriented markets.

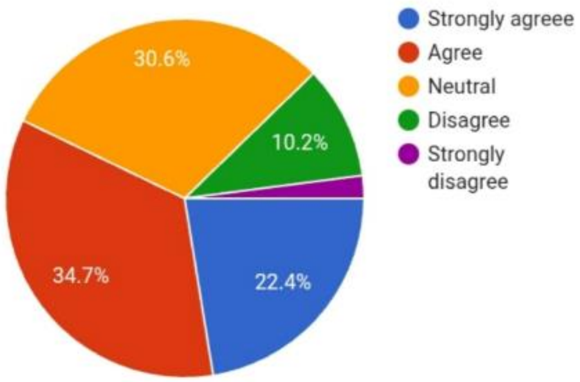
All the studies summarized in the file employ quantitative research designs, typically cross-sectional surveys analysed using software such as SPSS, PLS-SEM, or other structural equation modelling tools. Samples generally consist of university students or young adults, often recruited via online questionnaires, and selected through methods ranging from stratified random sampling to convenience and proportional random sampling. Sample sizes vary, with studies reporting between 71 and 375 respondents, reflecting both small, context-specific investigations and moderately sized structural modelling studies. The widespread reliance on cross-sectional, self-report survey data limits the ability to draw strong causal inferences about the relationships between social media marketing, influencers, engagement, and purchase intention. Many studies explicitly acknowledge the constraints posed by non-probability sampling (such as convenience sampling), which restricts the generalizability of their findings beyond the specific university or regional contexts studied. Others call for broader and more diverse samples, including different cultures, industries, and market segments, to test the robustness of the observed relationships.

A further limitation is the frequent omission of actual purchase behaviour measures; most studies focus on purchase intention, buying interest, or related attitudinal constructs. For example, the study on Jordanian female students notes that while influencer ads significantly affect purchase intention, lack of trust reduces the conversion of intention into actual purchases, indicating a gap between intention and behaviour that remains underexplored. Similarly, studies that find no direct effect of social media marketing on purchase intention but strong effects via brand engagement or loyalty highlight the need for more nuanced, longitudinal designs that can track how social media interactions translate into long-term consumer behaviours. Future research directions proposed across the studies include incorporating additional variables (such as personality traits, perceived risk, and specific influencer characteristics), examining different product categories and cultural settings, and employing more robust sampling and longitudinal designs. Together, these methodological reflections suggest that while the current literature provides strong evidence for the importance of social media and influencers in shaping student and young adult purchase intentions, it also points to the need for more comprehensive models and research designs to capture the full complexity of these relationships.

OBJECTIVES OF THE STUDY

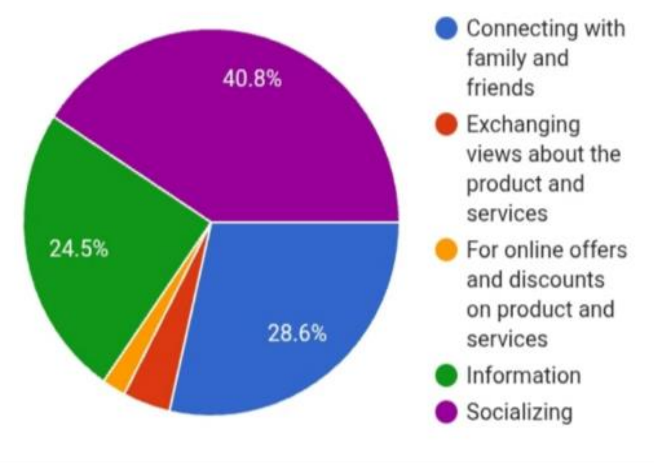
1. To examine the impact of Instagram influencer advertisements on the purchase intention of university students, with specific reference to key product categories such as clothing, food, and beauty products.
2. To assess how advertising elements in Instagram influencer content (including realism of images, clarity of information, and transparency of pricing) influence students' trust and their intention to purchase the promoted products.
3. To analyse the relationship between students' level of engagement with Instagram influencers (e.g., following, liking, commenting, sharing) and their purchase intention towards brands or products endorsed by those influencers.

ANALYSIS AND FINDINGS



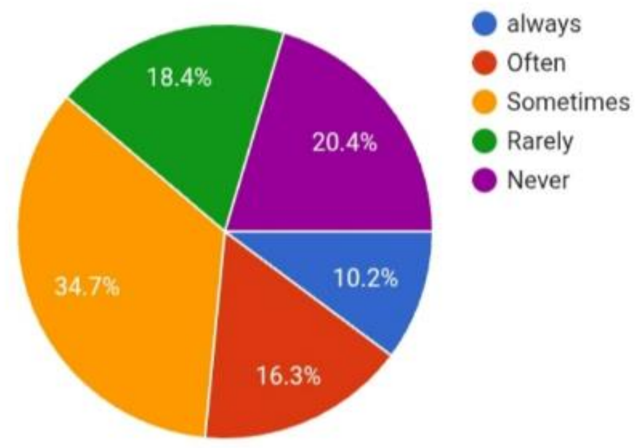
Confidentiality & Privacy of Information

57.1% agree or strongly agree with the statement, indicating broad acceptance. A significant neutral group (30.6%) suggests many are undecided or lack strong feelings, representing an opportunity for further persuasion. Only 13.2% disagree, meaning there is minimal active opposition. The distribution is moderately skewed toward agreement, but not overwhelmingly so. overall, the topic is viewed favourably by most respondents



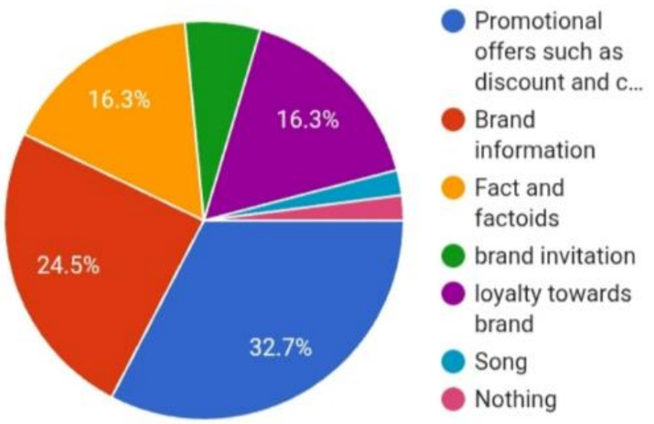
Purpose of using Instagram

This data reveals why people follow brands/organizations on social media. The top reason by far is personal connection (40.8% – "Connecting with family and friends"), suggesting users primarily see these platforms as social tools, not commercial channels. Direct brand engagement is secondary: 28.6% follow to exchange views and 24.5% for offers/discounts, together forming a significant commercial intent (53.1%). Minimal interest is shown in generic "Information" (3%) or "Socializing" (2.5%).



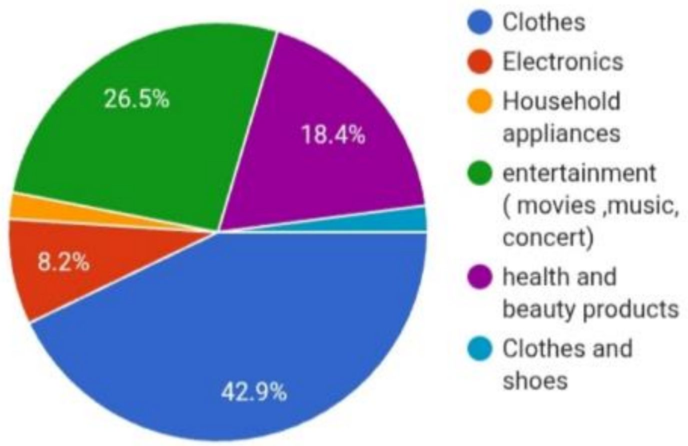
Frequency of Use

This data shows low consistent engagement with a behaviour, action, or product. Only 26.5% ("Always" + "Often") are regular users/participants, while a majority (73.5%) engage only "Sometimes," "Rarely," or "Never." The largest single group is "Sometimes" (34.7%), indicating occasional or situational use. The significant "Never" (20.4%) segment shows notable resistance or lack of need.



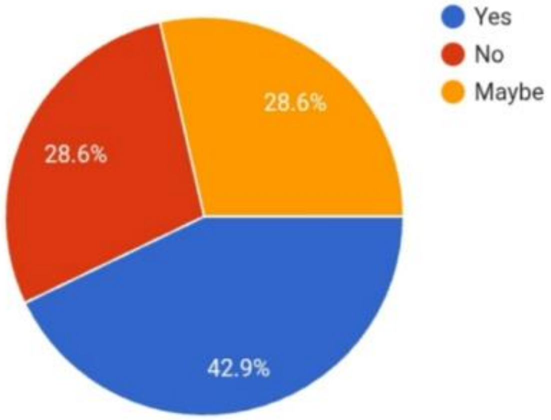
Attraction towards brand

This data reveals what motivates social media users to share brand content. Promotional offers (32.7%) are the strongest driver, indicating users share content that provides tangible value, like discounts. Brand information (24.5%) is also key, showing interest in updates or news. Facts and invitations (16.3% each) perform equally, suggesting educational or interactive content encourages participation. Notably, emotional factors like "loyalty" or unrelated content like "Song" were negligible here.



Purchase made using information from Insta

This data shows online shopping category preferences. Clothes (42.9%) are by far the most popular, dominating consumer interest. Household appliances (26.5%) are a significant second, indicating a practical investment in home goods. Entertainment (18.4%) holds a notable share for digital/experience purchases. Electronics (8.2%) is less favored here, possibly due to higher cost or longer purchase cycles. Categories like "health and beauty" and redundant entries ("Clothes and shoes") were minimal. Overall, fashion and home goods drive e-commerce, suggesting marketing and inventory should prioritize these high-demand areas to capture the largest online shopping audience.



Purchase decision using Insta

This data shows a divided but leaning-positive response to a question (likely about intent, agreement, or future action). A plurality (42.9%) answered "Yes," indicating the largest segment is favourable or committed. However, the remaining majority is split evenly between "No" (28.6%) and "Maybe" (28.6%). This reveals significant uncertainty and opposition combined, 57.2% are not definite yeses. The nearly equal "No" and "Maybe" groups suggest the topic is not polarizing but unconvincing for many. To succeed, efforts should focus on converting the hesitant "Maybe" group by addressing concerns and clarifying value, rather than just reinforcing the existing "Yes" base.

Based on the collected survey data, a nuanced portrait of contemporary consumer engagement emerges, revealing both opportunities and critical gaps for brands operating in digital spaces. Overall sentiment leans positive, with 57.1% of respondents expressing agreement with brand-related statements, yet a substantial 30.6% remain neutral, signalling acceptance without strong conviction. This foundational ambivalence is mirrored in engagement habits, where only 26.5% of users frequently interact with brand content, while the overwhelming majority (73.5%) do so only sometimes, rarely, or never. This indicates that while brand presence is acknowledged, it has not successfully translated into routine participation for most. The core driver for social media use remains fundamentally personal, with 40.8% of users primarily seeking connection with friends and family. Commercial motivations, while present, are secondary; users follow brands to exchange views (28.6%) and access offers (24.5%), but the platform is first a social venue. This context is crucial for understanding what content resonates. The primary catalyst for users to share brand-related material is clear, tangible value: promotional offers (32.7%) and practical brand information (24.5%) are top motivators, whereas abstract concepts like brand loyalty fail to inspire similar advocacy.

When this digital engagement translates to purchasing intent, the data shows a market dominated by specific categories. Online shopping interest is heavily skewed toward clothes (42.9%) and household appliances (26.5%), with electronics and entertainment trailing significantly. This preference provides clear direction for inventory and marketing focus. However, converting interest into committed action remains a challenge. When probed on intent, only a plurality (42.9%) responds with a definite "Yes," while the majority are evenly split between "No" and "Maybe" (28.6% each), underscoring widespread hesitation at the point of decision.

The synthesis of these findings points to a central theme: consumers are pragmatic participants in the brand ecosystem. They are open to engagement but are not loyalists; they use social platforms for personal reasons but will respond to commercial value; they browse specific categories frequently but often pause before final commitment. Therefore, brand strategies must pivot from broadcast messaging to integrated value creation. Success hinges on respecting the user's primary motive for social connection by blending into the community with relatable, interactive content, while simultaneously offering the concrete utility exclusive discounts, useful facts, compelling product news that prompts sharing and purchase consideration. Efforts should concentrate on nurturing the large middle segments the neutrals, the occasional engagers, and the maybes through targeted education, social proof, and low-risk offers that build confidence. By aligning content strategy with these demonstrated preferences, particularly in high-demand sectors like apparel and home goods, and by systematically addressing the barriers that cause hesitation, brands can build more habitual engagement, foster genuine advocacy, and convert cautious interest into confident action.

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A STUDY ON MOTHER ENTREPRENEURS WITH SPECIAL REFERENCE TO IRINJALAKUDA

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Abstract

Presently women entrepreneurs comprise about 20% of the total entrepreneurs in India. Recent data shows that female entrepreneurs are growing at 71% per year. If prevailing trends continues it is likely that in another 5 years women will comprise about 20% of the entrepreneurial force in India. In this context the question of Mompreneurs assume a new significance. This study is very significant because the contributions made by the mompreneurs are very important.

INTRODUCTION

Mompreneurs are those women who think of business enterprise, initiate it, organize it, operate it and undertake risks and uncertainties involved in it. Moms who are interested in entrepreneurship combine their commercial skills and creative passion and turn their talent into a thriving business.

STATEMENT OF PROBLEM

Women constitute about 50% of the world population. In traditional societies, they are confirmed to performing household activities. Hence women are called home makers. But today the entrepreneurial world is open to the women folk. A couple of decade ago number of working women was very less. But now, as the cost of living has increased,they have keenly felt the need to work outside. This study focuses to examine the entrepreneurial spirit of women in Irinjalakuda Town.

OBJECTIVES OF STUDY

To examine the Entrepreneurial spirit of Mothers (Home Makers) in Irinjalakuda Town

To know the challenges faced by the mompreneurs

SCOPE OF STUDY

Study covers an analysis of mompreneurs in Irinjalakuda Town for giving an idea to the public about entreprenurship abilities in mothers.

METHODOLOGY

Study is based on the primary data collection from Irinjalakuda Town. Direct personal interview was made using schedules and data has been collected from Journals and magazines.

LIMITATION OF STUDY

Time factor is one of the important limitations.

Detailed study is not possible due to lack of time.

Entrepreneurship

The word entrepreneur derives from the French word entreprendre (to undertake). In the early 16th century it was applied to person engaged in military expeditions and extended to cover construction and civil engineering activities in the 17th century. But during 18th century, the word entrepreneur was used to refer economic activities. Generally an entrepreneur is a person who combines capital and labour for production.

The Indian economy has been witnessing a drastic change since mid-1991. With new policies of economic liberalization, globalization and privatization initiated by Indian government. India has great entrepreneurial potential. At present, women involvement in economic activities are marked by a low mark participation rate, excessive concentration in the unorganized sector and employment in less skilled jobs. Evidence has unequally established that entrepreneurial spirit is not a male prerogative. Women entrepreneurship has gained momentum in the last three decades with the increase in the number of women enterprise and their substantial contribution to economic growth.

In this dynamic world women entrepreneurs are an important part of the global quest for sustained economic development and social progress. In India, though women have played a key role in the society, their entrepreneurial ability has not been properly tapped due to the lower status of women in the society. The development of women entrepreneurship has become an important aspect of our plan priorities. In the words of president APJ Abdul Kalam, "Empowering women is a prerequisite for creating a good nation". When women are empowered, a society with stability is assured. Empowerment of women is essential as their thoughts and their value system that lead to the development of a good family, good society and ultimately a good nation.

Mompreneur is a new trend in entrepreneurship. Mompreneur movement is an interesting one, expressing the changing attitude towards staying at home. Mompreneur is a newly coined term for women who establish business at home while also acting as the full time parent of their children. The moms may run day care, create product, design Jewellery or sell products from the home. Not every mom make products to sell but all of them reinvest the way that they can do business.

Case Study 1

Bhuwaneshwari Swaminathan

Bhuwaneshwari Swaminathan a house wife, she is a Thrissur based entrepreneur. She started her journey as an entrepreneur at the age of 36. Bhuwaneshwari wanted to be independent and be her own master. It was in 2000 she decided to start a business of homemade products especially Murukku. Together husband and wife started a small scale unit for home made products like murukku, pickle etc. in their home at Irinjalakuda.

As a first step, she sold two hundred pieces of murukku among neighbors. Their appreciations increased the confidence in Bhuwaneshwari and her husband and encouraged them to step into the real world of business. She named her dream business venture Swamis Food. She raised the startup capital from her family and friends. She used to purchase raw materials from the nearest supermarket.

They make products according to the orders. They sell their products among the relatives, neighbours and also to some retail shops in the city. They receive the services of some middle men also. Those who buy the product become their regular customers.

Women entrepreneurs find it difficult to balance work with family. But she doesn't have such problem; her family gave full support to her. She said that one of the problems she has to face is marketing the product. But this challenge was overcome with her husband's help. Without any advertisement and promotional strategies her products got big demand due to the best quality and reasonable price. Now she has an income of Rs.6000 per month.

Bhuwaneshwari Swaminathan is truly an inspiration to all those who dream of becoming self-sufficient.

Case Study 2

Philomina Antony

Philomina Antony is a women entrepreneur at the age of 55. Her husband Antony Manjooran is a businessman and she has 3 children shabin, jibin and ebin. Before marriage of her son she was busy with her family life, but now she is free from her family responsibilities. So she started to think about a self-employment. She turned spiritual beliefs into business. She started a production outlet for making Rosary.

Handicraft is one of the suitable fields for women who have primary education like Philomena Antony. Materials required for making rosary will be supplied by the suppliers. Her only duty is to make rosary with supplied materials and she will get Rs.2 per rosary. Distribution, marketing and all other related areas are managed by the concerned people. She doesn't want to bother about capital distribution, promotion etc. Her family members also took active part in her business. And now she has a monthly income of Rs.15000. The most successful mompreneur can make exceptional salaries.

Case Study 3

Annie Vincent

Annie Vincent Kanjirathinkal is an entrepreneur in Edathirinji at the age of 45. She has a son and daughter. After the death of her husband her life became difficult and she forced to do a job. It was difficult to get a job for a woman having educational Qualification of SSLC.

Like any other housewife she is also expert in cooking. So she decided to start a production outlet for homemade food items especially for UzhunnuVada.

It was in 2002 she started her business by rising room from South Indian Bank. Production Unit is near by their house. Ingredients required for the production are purchased from nearest retail shops. Price of the product is Rs.100/- per Kilogram Major portion of the production are sold among the Bakeries and households. Without any promotional activities and Marketing techniques she earned a monthly Income of around 5000. In future she decided to expand their business by opening new branches in different localities.

DATA ANALYSIS

Cases	Names	Age	Business	Investment	Education	Earnings
Case 1	Bhuvaneswari Swamy Nathan	36	Muruku	50000	Higher Secondary	6000
Case 2	Philomina Antony	55	Handicraft-rosary making	25000	SSLC	15000
Case 3	Annie Vincent	45	Home made food	200000	SSLC	5000

FINDINGS

From the Primary date collected. It is observed that participation of women's in entrepreneurship is increasing.

The Idea of starting a venture gives a regular source of income.

Most of the Mompreneurs are Concentrated on small scale cottage industry.

Mompreneurs use less promotional activities and make available the products in limited market.

Mompreneurs find it difficult to raise the fund from financial institution; they use their own fund for investment.

Mompreneurs have low level of risk taking attitude. They are not concerned with higher production volume and higher profit.

SUGGESTIONS

Consider the women as a group for developmental programmes.

Provide better educational facilities.

Adequate training programmes should be provided to women.

Financial institutions should provide more working Capital assistance both for small and Large Scale Ventures.

Exhibitions and melas should set up for the display and sale of products made by women.

Training programmes and assistance should provide in all related field of business with Special reference to Marketing and promoting activities.

Awareness programmes should be start from school level.

Making provisions of Marketing and sales assistances from Govt. press.

CONCLUSION

From the study on Mompreneurs in Irinjalakuda town, it is found that Mompreneurs has good Space and growth rate. Entrepreneurship among women no doubt, improves the wealth of the nation in general and of the family in particular.

Entrepreneurial Spirit among women must be moulded properly with entrepreneurial traits. And skills to meet changes in trend and challenges faced by them and also are competent enough to sustain and strive for excellence in the entrepreneurial area.

THE RISE OF MID-RANGE INNOVATORS: A REVIEW STUDY ON EMERGING ENTREPRENEURS OFFERING PREMIUM QUALITY PRODUCTS AT ACCESSIBLE PRICE POINTS

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ABSTRACT

The rise of mid-range innovators is becoming a significant trend in modern markets, where emerging entrepreneurs are offering premium-quality products at comparatively affordable price points. This review paper explores how mid-range innovators balance quality, branding, pricing strategy, and customer experience to attract value-conscious consumers. The study synthesizes existing literature related to consumer perception, premiumisation, affordable luxury, innovation in SMEs, branding strategies, and entrepreneurial growth. The review identifies key drivers such as changing consumer preferences, digital marketing influence, social media branding, cost effective innovation, and competitive market pressure. It also highlights challenges such as scaling, maintaining quality consistency, supply chain management, and building trust in competitive segments. Finally, the paper proposes future research directions regarding sustainability, technology adoption, and long-term brand loyalty among mid-range innovative firms.

Keywords: Mid-range innovators, Premiumization, Masstige, Emerging entrepreneurs, D2C brands, Affordable luxury, Consumer behaviour.

INTRODUCTION

In recent years, the marketplace has experienced a strong rise in mid-range innovators, especially emerging entrepreneurs who offer premium-quality products at accessible price points. These businesses position themselves between mass-market low-cost offerings and high-end luxury products by delivering superior materials, functional value, modern aesthetics, and better customer experience while remaining affordable for aspirational consumers. This shift is closely connected with the broader trend of premiumization, where consumers increasingly "trade up" to better quality products because of rising awareness, lifestyle upgrades, and the desire for enhanced value (Mitsui & Co., 2025; Wright Research, 2024).

A key factor supporting the growth of this segment is the increasing appeal of affordable luxury, where customers seek quality, sophistication, and brand value but remain careful about overspending. In India, affordable luxury has become a prominent consumption pattern across categories such as FMCG, beauty, fashion, and consumer goods, creating a strong opportunity for emerging entrepreneurs to compete through smart product differentiation and value-driven branding (India Brand Equity Foundation [IBEF], 2025). Additionally, changes in global luxury and premium markets indicate that consumer expectations are evolving, and brands must focus on meaningful value creation rather than relying only on high pricing strategies (McKinsey & Company, 2025). Therefore, the rise of mid-range innovators represents an important contemporary entrepreneurial trend that reshapes competition, strengthens customer-centric innovation, and highlights the growing importance of premium quality at attainable price point

STATEMENT OF THE PROBLEM

The rapid rise of mid-range innovators—emerging entrepreneurs offering premium-quality products at affordable price points—has created a noticeable shift in modern markets, positioned between low-cost mass brands and high-end luxury offerings. Although this trend is expanding across sectors such as FMCG, fashion, beauty, and consumer goods, existing research remains fragmented across themes like premiumisation, affordable luxury (masstige), SME innovation, branding strategies, and consumer perception. As a result, there is limited consolidated understanding of how these entrepreneurs successfully balance premium quality, competitive pricing, branding, and customer experience while sustaining growth in highly competitive markets. Moreover, mid-range innovative firms face critical challenges such as scaling operations, maintaining consistent product quality, managing supply chains, and building long-term customer trust and brand loyalty. Therefore, a comprehensive review is required to synthesize existing literature, identify key drivers and constraints, and highlight future research directions for understanding the sustainability and long-term success of mid-range innovators.

OBJECTIVES OF THE REVIEW PAPER

To review existing studies on mid-range innovators and premium quality entrepreneurship.

To identify major factors driving the growth of emerging entrepreneurs in mid-range premium markets.

To analyze challenges and opportunities faced by such entrepreneurs in sustaining premium quality and affordable pricing.

REVIEW OF LITERATURE

Review 1: Premiumization and Mid-Range Innovation

Recent literature highlights premiumization as a major trend influencing mid-range innovation, where firms improve product quality and experience to attract value-conscious consumers. Mitsui & Co. Global Strategic Studies Institute (2025) explains that premiumization is increasingly reshaping consumer markets by encouraging brands to offer better-quality alternatives at slightly higher but acceptable prices. This supports the idea that mid-range innovators emerge by aligning premium quality with affordability.

Review 2: Affordable Luxury and Premium Quality Positioning

Studies indicate that “affordable luxury” plays an essential role in the growth of mid-range innovators, as consumers seek premium features without luxury pricing. India Brand Equity Foundation (2025) highlights that premiumisation in India is accelerating, with consumers preferring superior quality and aspirational value even in mass categories. This suggests that emerging entrepreneurs can strategically position their offerings as premium-quality alternatives for the middle-income segment.

Review 3: Masstige as a Key Concept for Mid-Range Entrepreneurs

Masstige (mass + prestige) literature strongly supports the idea that mid-range brands succeed by combining prestige cues with affordability. Park (2025) explains that masstige brand perception and equity formation influence consumer responses, showing that customers value premium image even when the product is not fully luxury. This indicates that entrepreneurs can create a premium identity through branding and perceived exclusivity while keeping products within reach.

Review 4: Premium Value Perception and Brand Price Premiumness

Research on pricing and brand perception shows that mid-range entrepreneurs can signal superior quality through moderate premium pricing. Dwivedi (2025) discusses how "brand price premiumness" impacts consumer outcomes and brand strength by acting as a cue for quality and trust. This supports the argument that mid-range innovators depend not only on low price but also on "smart premium pricing" to communicate higher value.

Review 5: Market Shifts Supporting Premium Yet Accessible Products

Studies also show that consumer markets are moving toward better-quality segments, supporting mid-range innovators. Wright Research (2024) reports that premiumization and urbanization trends are shaping India's consumer story, where demand for better products rises along with lifestyle upgrades and consumption changes. This indicates that premium-quality entrepreneurship is increasingly feasible in emerging markets because consumers prioritize value and quality.

Review 6: Urbanisation and Aspiration as Major Growth Drivers

Recent studies show that the rapid growth of mid-range premium markets is strongly influenced by urbanisation and the expansion of aspirational consumers. Wright Research (2024) explains that premiumization is closely connected with lifestyle changes in urban India, where consumers increasingly prefer quality and branded products. This supports the growth of emerging entrepreneurs who provide premium-quality offerings at accessible prices to meet aspirational demand.

Review 7: Premium Consumption Trends Strengthening Mid-Range Markets

Evidence suggests that premium consumption is expanding across multiple sectors in India, including electronics, automobiles, and home appliances. The Economic Times (2024) reports that premiumisation in consumption continued strongly during the first half of 2024, reflecting that consumers are willing to pay more for better quality and improved features. This environment creates strong business opportunities for emerging entrepreneurs to innovate in the mid-range premium segment.

Review 8: D2C Ecosystem and Digital Business Models Supporting Entrepreneurs

Digital commerce and D2C business models play a significant role in enabling emerging entrepreneurs to grow in mid-range premium markets. Tracxn (2025) highlights India's active D2C ecosystem and brand-building opportunities even when funding conditions fluctuate. This indicates that D2C platforms help entrepreneurs connect directly with consumers, improve brand engagement, and expand markets efficiently with relatively lower distribution barriers.

Review 9: Social Media and New Consumer Engagement Patterns

Research and market evidence show that social media-based engagement has become a powerful driver for emerging entrepreneurs. Inc42 (2025) highlights the role of new-age D2C brands that leverage social media visibility, influencer marketing, and digital storytelling to attract and retain customers. Such strategies support mid-range innovators in shaping premium perception and building trust quickly among quality-conscious consumers.

Review 10: Changing Luxury Market Dynamics and Value Seeking

Recent market trends indicate that premium consumption is evolving toward value-driven decision-making, strengthening mid-range opportunities. McKinsey & Company (2025) observes that premium and luxury markets face changing consumer expectations and market pressures, which encourages customers to look for meaningful value rather than only brand prestige. This shift benefits emerging entrepreneurs, as mid-range innovators can provide premium-quality alternatives with stronger value justification compared to high-priced luxury products.

Review 11: Quality Consistency as a Major Challenge

Literature indicates that sustaining premium quality becomes challenging when emerging entrepreneurs scale operations. Maintaining consistent product standards across batches, suppliers, and distribution channels is essential for trust-building in mid-range premium markets. Mitsui & Co. Global Strategic Studies Institute (2025) notes that premiumization requires continuous quality improvement, implying that firms must invest in quality control systems and product upgrades to retain premium positioning while managing costs.

Review 12: Pricing Pressure and the Need for "Value Justification

Mid-range innovators face significant pressure in balancing premium quality with affordable pricing because consumers compare prices across brands easily. Dwivedi (2025) highlights that price premiumness influences consumer perception and brand outcomes, meaning that even midrange businesses must price strategically to communicate quality without losing price-sensitive customers. This shows that entrepreneurs must justify their pricing through strong quality signals, branding, and customer experience.

Review 13: Opportunities from Luxury Market Slowdown

Recent studies suggest that global luxury markets are experiencing slower growth and changing consumer preferences. McKinsey & Company (2025) reports that luxury brands face uncertainty due to economic pressures and evolving demand patterns. This creates an opportunity for midrange innovators because consumers may shift from expensive luxury options toward premiumquality alternatives that provide stronger value for money. Thus, mid-range entrepreneurs can benefit by positioning products as "premium equivalents" at better prices.

Review 14: Market Uncertainty and Demand Volatility

Emerging entrepreneurs in mid-range premium markets also experience challenges from uncertain demand and changing market conditions. AP News (2025), citing the Bain luxury study, indicates that global luxury sales are expected to slow, influenced by economic and geopolitical factors. Such uncertainty can affect consumer spending, making it difficult for mid-range businesses to forecast demand and manage inventory. However, it also encourages businesses to adopt flexible pricing and supply chain strategies.

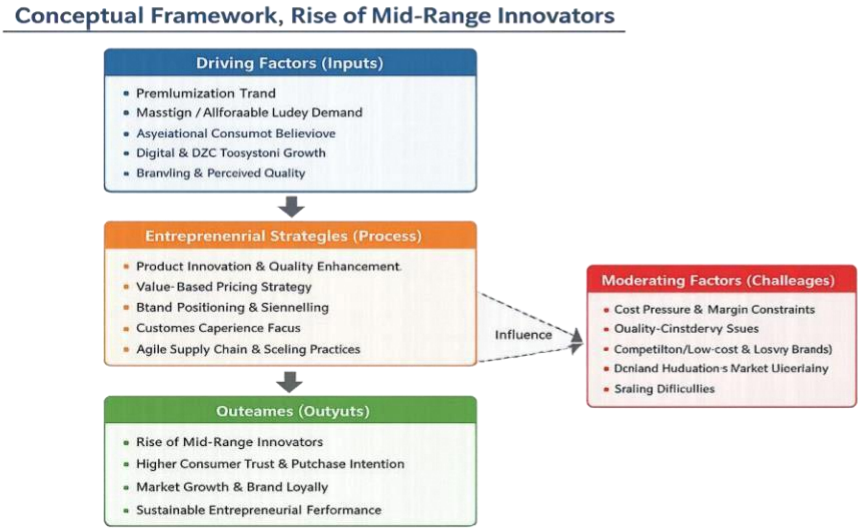
Review 15: Competition and Brand Loyalty Challenges

Mid-range innovators face competition from both low-cost brands and premium players. Building long-term customer loyalty requires strong brand identity, reliable quality, and consistent customer satisfaction. India Brand Equity Foundation (2025) highlights that affordable luxury growth depends on sustained consumer trust and perceived premium value, suggesting that entrepreneurs must continuously strengthen branding and quality to remain competitive. This indicates that competitive advantage in this segment is achieved through continuous innovation, customer engagement, and strong value delivery.

RESEARCH GAP

Although existing studies discuss premiumization, masstige consumption, branding, and the rapid growth of D2C businesses, limited research specifically focuses on “mid-range innovators” as a distinct entrepreneurial segment offering premium quality at accessible price points. Most literature either concentrates on traditional luxury brands and high-end premium markets or examines low-cost mass-market entrepreneurship, leaving a gap in understanding how emerging entrepreneurs successfully balance premium quality, affordability, and scalability simultaneously (McKinsey & Company, 2025; Mitsui & Co. Global Strategic Studies Institute, 2025). Further, while digital transformation and D2C growth are widely studied, there is insufficient academic synthesis on how social media branding, perceived quality, and value-based pricing together shape consumer trust and repeat purchase behavior in mid-range premium markets (Tracxn, 2025; Wright Research, 2024). Therefore, more research is needed to develop a clearer conceptual understanding of the drivers, strategies, and sustainability challenges faced by mid-range innovators, particularly in emerging markets like India, where aspirational consumption is accelerating.

CONCEPTUAL FRAMEWORK



RESEARCH METHODOLOGY

This study adopted a systematic review research design to examine the rise of mid-range innovators and the increasing role of emerging entrepreneurs in offering premium-quality products at accessible price points. A systematic review method was selected because it enables the structured identification, selection, evaluation, and synthesis of existing scholarly and industry based research on the topic. This approach ensures that the review is transparent, objective, and aligned with the study objectives, allowing the research to develop a comprehensive understanding of the key drivers, strategies, and challenges shaping the mid-range premium segment.

The literature for this review was collected from both academic and credible industry sources in order to obtain theoretical and market-based evidence. The major academic databases used for sourcing literature included Google Scholar, ScienceDirect, Emerald Insight, SpringerLink, JSTOR, and ResearchGate. In addition, key industry reports and market insights were considered from reliable sources such as McKinsey & Company, India Brand Equity Foundation (IBEF), Deloitte, and Tracxn, as these provide updated information on premium consumption trends, D2C growth, and consumer behaviour in emerging markets. The search process was conducted using relevant keywords such as mid-range innovators, premium quality entrepreneurship, premiumization, masstige, affordable luxury, emerging entrepreneurs, direct-to-consumer (D2C), value-based pricing, brand positioning, and consumer purchase intention. To ensure recent and contemporary relevance, the review mainly focused on studies published during 2020–2026, while also considering earlier foundational concepts where necessary.

To maintain the quality and relevance of the selected studies, the review followed clearly defined inclusion and exclusion criteria. Studies were included if they directly addressed themes such as premiumization, affordable luxury and masstige consumption, brand-building and perceived quality, consumer aspiration, digital growth and D2C models, or challenges related to maintaining premium quality at competitive prices. Peer-reviewed journal articles, scholarly research papers, and well-recognized industry reports were prioritised. Studies were excluded if they were duplicates, general opinion-based sources, or articles that focused only on traditional luxury branding without relevance to mid-range premium entrepreneurship. Additionally, sources with limited conceptual contribution or weak linkage to the objectives of the present review were not considered for final analysis.

The selection of studies was organized using a PRISMA-style screening process (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) to ensure a clear and systematic flow of identification and eligibility assessment. Initially, 45 records were identified from academic databases and industry reports. After removing 10 duplicate studies, 35 records remained for title and abstract screening. At this stage, 12 studies were excluded due to limited relevance to the research focus. The remaining 23 full-text studies were then assessed for eligibility, after which 8 studies were excluded because they were either too broad, lacked direct linkage to mid-range premium entrepreneurship, or did not support theme-based synthesis. Finally, 15 studies were selected for detailed review and were used to structure the literature synthesis and conceptual framework of the paper.

The final set of selected studies were analysed using a theme-wise narrative synthesis method. Under this approach, the findings from previous studies were not only summarized but also grouped into meaningful themes such as premiumization trends, masstige and affordable luxury consumption, differentiation and brand value creation, digital and D2C support for emerging entrepreneurs, and challenges such as cost pressure, quality consistency, competition, and scaling difficulties. This thematic analysis helped the study to generate structured insights that align with the objectives of the review and supported the development of a conceptual framework representing the rise of mid-range innovators.

Since the study is based entirely on secondary data from published research and industry sources, it does not involve direct data collection from human participants. Therefore, no ethical risks such as privacy concerns or informed consent requirements were applicable. However, academic integrity was ensured by properly citing and acknowledging all sources using APA 7th edition referencing style, and by presenting reviewed findings in an original and synthesized manner.

4. Findings and Discussion (Objective-wise)

Objective 1: To review existing studies on mid-range innovators and premium quality entrepreneurship

The review reveals that mid-range innovators are increasingly recognized as an emerging entrepreneurial segment that strategically combines premium quality with accessible pricing. Existing literature largely explains this segment through concepts such as premiumization, affordable luxury, and masstige branding, where consumers seek higher-quality products without paying luxury-level prices. Studies indicate that premium quality entrepreneurship is not limited to high-end markets but is also expanding in mid-range segments due to increased consumer awareness and preference for value-based premium offerings. The review also shows that midrange innovators often rely on differentiation strategies such as improved design, enhanced features, superior packaging, and better service experience. As a result, premium quality entrepreneurship in the mid-range category is evolving as an important business model, allowing emerging entrepreneurs to compete successfully by balancing value, quality, and affordability.

Objective 2: To identify major factors driving the growth of emerging entrepreneurs in midrange premium markets

The review highlights that the growth of mid-range innovators is driven by multiple market and consumer-related factors. One major driver is the rise of aspirational consumption, where middle income consumers increasingly desire premium products that provide better performance, status, and satisfaction. Premiumization trends across categories such as personal care, lifestyle, FMCG, electronics, and services reflect a shift from price-only decision-making toward quality and experience-based purchasing. Additionally, digital transformation and the growth of D2C ecosystems strongly support emerging entrepreneurs by enabling direct market access, reduced dependence on intermediaries, and faster brand-building through social media and influencer engagement. The review also finds that branding and perceived quality play a crucial role in influencing consumer trust and purchase intention, particularly when customers associate slightly premium pricing with better quality and reliability. Overall, these factors collectively create a favourable ecosystem where emerging entrepreneurs can enter mid-range premium markets and expand rapidly.

Objective 3: To analyze challenges and opportunities faced by such entrepreneurs in sustaining premium quality and affordable pricing

The review identifies that sustaining premium quality at affordable price points remains one of the biggest challenges for mid-range innovators. Entrepreneurs often face cost pressure due to raw material price fluctuations, operational constraints, and the need to maintain quality consistency while scaling production. Another challenge is pricing pressure, as consumers compare product prices across competing brands and demand strong value justification. The review also indicates that competition comes from both sides—low-cost mass-market brands competing on price and established premium brands competing on reputation and trust. However, the review also highlights significant opportunities for mid-range innovators. Market uncertainty and the slowdown in high-end luxury spending may encourage consumers to shift towards mid-range premium options that offer "premium experience at a better price." Moreover, strong digital reach and changing consumer loyalty patterns provide emerging entrepreneurs opportunities to build long-term trust through consistent quality, improved customer experience, and transparent branding. Therefore, mid-range innovators have strong growth potential if they effectively manage cost, maintain quality standards, and strengthen brand differentiation.

DIRECTIONS FOR FUTURE RESEARCH

The present review highlights several areas where further research is required to strengthen academic understanding of mid-range innovators and premium quality entrepreneurship. Future studies can focus on identifying the most influential factors that determine consumer purchase decisions in mid-range premium markets, such as perceived quality, brand trust, digital influence, and value-based pricing. Researchers can also examine how emerging entrepreneurs successfully maintain premium quality consistency while scaling operations, especially in categories such as FMCG, fashion, personal care, and consumer electronics. Additionally, more empirical studies are needed to understand the role of digital strategies like influencer marketing, social commerce, and D2C platforms in building brand loyalty and long-term customer retention within this segment.

Further research may also explore the sustainability and long-term performance of mid-range innovators by evaluating how operational efficiency, supply chain management, innovation capability, and customer experience contribute to competitive advantage. Since most studies provide general insights into premiumization and luxury markets, future research can specifically develop models that explain the success and failure factors unique to mid-range innovators, particularly in emerging economies like India. Comparative studies between rural and urban markets, regional consumer behaviour patterns, and the impact of economic uncertainty on premium spending could provide deeper insights. Therefore, expanding research into these areas will improve conceptual clarity and offer stronger practical recommendations for entrepreneurs aiming to sustain premium-quality offerings at accessible price points.

CONCLUSION

This review concludes that the rise of mid-range innovators represents a major shift in modern markets, where emerging entrepreneurs successfully combine premium-quality offerings with affordable and attainable pricing. The literature highlights that this growth is mainly driven by premiumization, aspirational consumer behaviour, masstige demand, and the increasing influence of digital and D2C ecosystems. Mid-range innovators are able to create strong market presence by focusing on differentiation strategies such as product innovation, quality enhancement, value based pricing, branding, and superior customer experience. Therefore, the mid-range premium segment has become a highly relevant space for entrepreneurial growth and market disruption across industries.

At the same time, the review identifies that sustaining premium quality with affordability is a challenging task for emerging entrepreneurs due to cost pressures, quality consistency issues, intense competition, and scaling difficulties. However, the segment also provides strong opportunities, particularly as consumers increasingly seek meaningful value and premium experience without luxury-level spending. The study concludes that mid-range innovators have significant long-term potential if they effectively manage quality assurance, pricing decisions, brand trust, and operational scalability. Hence, further research is recommended to develop more focused frameworks and empirical evidence on mid-range premium entrepreneurship, especially in emerging markets like India.

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A Study of the Financial Statements of Maruti Suzuki India

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Abstract

This study examines the financial performance of Maruti Suzuki India Limited over a five-year period from 2020–21 to 2024–25 using secondary data from published financial statements. The study uses ratio analysis, trend analysis, and comparative analysis to evaluate the company's profitability, liquidity, solvency, and overall financial position. The results show steady growth in revenue and profits due to better cost control and improved efficiency. While the company experienced some liquidity issues in the middle years, recent performance indicates improved working capital management. Overall, Maruti Suzuki maintained a strong solvency position with very low debt, achieving a zero debt–equity ratio in the final year, which highlights its financial stability and long-term growth prospects.

Keywords: Financial statement analysis, Profitability, liquidity, Solvency, Trend analysis, Maruti Suzuki India Limited.

INTRODUCTION

The Indian automobile industry is one of the most significant contributors to the country's economic development, generating large-scale employment, encouraging industrial growth, and contributing substantially to the national GDP. Among the leading companies operating in this sector, Maruti Suzuki India Limited occupies a dominant position as the largest passenger car manufacturer in India. The company offers a wide range of vehicles, including entry-level cars, hatchbacks, sedans, SUVs, and utility vehicles, catering to diverse customer segments across the country. With its strong brand image, extensive distribution network, and focus on fuel efficiency and affordability, Maruti Suzuki has maintained a leadership position in the Indian automobile market for several decades.

In recent years, Maruti Suzuki India Limited has experienced notable changes in its financial performance due to evolving market conditions, changing consumer preferences, rising input costs, and increased competition from domestic and global automobile manufacturers. Factors such as fluctuations in demand, regulatory changes, technological advancements, and the transition towards electric and hybrid vehicles have had a direct impact on the company's revenues, costs, and profitability. At the same time, economic uncertainties and supply-chain challenges have influenced the overall financial stability of the company.

In this context, the present study aims to analyze the financial statements of Maruti Suzuki India Limited over a period of five years. The study focuses on examining the company's profitability, liquidity, solvency, and operational efficiency through systematic analysis of its Balance Sheet and Profit and Loss Account. By evaluating financial trends and key ratios, the study seeks to understand the financial strength and performance of the company and its ability to sustain long-term growth. The findings of this study are expected to be useful to students, researchers, investors, and management for understanding the financial position of Maruti Suzuki India Limited.

STATEMENT OF THE PROBLEM

Despite its strong market leadership and brand reputation, Maruti Suzuki India Limited faces several challenges that affect its financial performance. Intense competition from other automobile manufacturers has increased pressure on pricing and profit margins.

Rising costs of raw materials, fuel price volatility, and supply-chain disruptions have added to production expenses. Additionally, changing government regulations related to emission norms and safety standards require continuous investment, which impacts overall profitability. Economic fluctuations and shifts in consumer preferences towards technologically advanced and electric vehicles further influence sales performance. These challenges highlight the need for a detailed analysis of the company's financial statements to assess its financial performance, stability, and ability to adapt to changing market conditions.

SCOPE OF THE STUDY

The study is confined to the analysis of the financial statements of Maruti Suzuki India Limited. It focuses on evaluating revenue, expenses, profitability, liquidity, solvency, and efficiency based on secondary financial data. The analysis covers a period of five financial years to identify trends and performance patterns.

OBJECTIVES OF THE STUDY

To analyze the financial performance of Maruti Suzuki India Limited using its Profit and Loss Account over a period of five years.

To evaluate the liquidity, solvency, and profitability position of the company through appropriate financial ratio analysis.

To assess the overall financial position and stability of Maruti Suzuki India Limited by examining Balance Sheet and income statement trends.

RESEARCH METHODOLOGY

a) Research Design

The present study adopts a descriptive and analytical research design to examine the financial performance and stability of Maruti Suzuki India Limited. The descriptive aspect of the research focuses on systematically presenting and explaining the financial information disclosed in the company's published financial statements. This helps in understanding the nature, structure, and composition of various financial elements such as assets, liabilities, income, expenditure, and profits over the selected period of study.

The analytical aspect of the research involves an in-depth examination of financial data using appropriate accounting and financial management tools. Financial ratio analysis, trend analysis, and comparative analysis are applied to evaluate the company's profitability, liquidity, solvency, and operational efficiency. By analyzing data over a period of five financial years, the study identifies trends, variations, and patterns in financial performance and highlights areas of strength and weakness.

b) Data Collection

The study is based on secondary data collected from:

Annual reports of Maruti Suzuki India Limited

Published financial statements

Company websites and financial databases

Relevant journals and industry reports

c) Period of Study

● The research covers a period of five financial years, which provides sufficient data to evaluate trends and assess long-term financial performance. This period allows for the analysis of fluctuations, growth patterns, and financial stability of the company.

d) Tools and Techniques for Analysis

The study uses various financial analysis tools and techniques to evaluate the financial performance and position of Maruti Suzuki India Limited. The following tools are applied for systematic analysis:

FINANCIAL RATIO ANALYSIS

Financial ratio analysis is used to examine the relationship between different items of the Balance Sheet and Profit and Loss Account. The ratios help in assessing the financial strength and efficiency of the company. The major ratios used in the study include:

Profitability Ratios – These ratios are used to measure the company's ability to generate profits from its operations and overall business activities.

Liquidity Ratios – These ratios are used to assess the short-term financial position of the company and its ability to meet current liabilities.

Solvency Ratios – These ratios help in evaluating the long-term financial stability of the company and its capacity to meet long-term obligations.

Efficiency Ratios – These ratios are used to measure how efficiently the company utilizes its assets and resources in generating revenue.

➢ Trend Analysis

Trend analysis is used to study the changes in financial performance of the company over a period of five years. This technique helps in identifying upward or downward trends in revenue, expenses, profits, and other key financial indicators.

➢ Comparative Analysis

Comparative analysis involves the comparison of financial data of Maruti Suzuki India Limited for different financial years. This technique helps in understanding year-wise changes in financial performance and financial position and aids in evaluating overall growth and stability.

RESULT AND ANALYSIS

Table 4.1

Table showing Revenue Trend of Maruti Suzuki India

Financial Year	Total Revenue (₹Crore)
2020-21	73,308.30
2021-22	90,074.50
2022-23	1,19,712.00
2023-24	1,45,951.70
2024-25	1,57,935.20

Source: (Secondary data)

Table no 4.1 reveals Maruti Suzuki's total revenue has shown a consistent upward trend over the five-year period from 2020–21 to 2024–25. Revenue increased from ₹73,308.30 crore to ₹1,57,935.20 crore, indicating strong sales growth. This reflects improved market demand, successful product launches, and overall business expansion.

Table 4.86

Table showing Total Expenses Trend (₹ Crore)

Financial Year	Total Expenses (₹Crore)
2020-21	68,156.30
2021-22	85,539.20
2022-23	1,09,566.30
2023-24	1,28,781.30
2024-25	1,38,559.10

Source: (Secondary data)

Table 4.2 reveals Maruti Suzuki's total expenses have increased steadily from ₹68,156.30 crore in 2020–21 to ₹1,38,559.10 crore in 2024–25, in line with rising production and sales volumes. However, the growth in expenses has been proportionate to revenue growth, indicating effective cost control and efficient operational management.

Table 4.3

Financial Year	Net Profit / Loss (₹Crore)
2020-21	68,156.30
2021-22	85,539.20
2022-23	1,09,566.30
2023-24	1,28,781.30
2024-25	1,38,559.10

Table showing Profit/Loss Trend (₹ Crore)

Source: (Secondary data)

Table 4.3 reveals Maruti Suzuki's net profit of the company has increased steadily from 2020–21 to 2024–25. This shows that the company's financial performance has improved year after year, indicating better sales, controlled costs, and overall growth in business operations.

Table 4.4

Table showing Liquidity Position

Financial Year	Current Assets(Cr.)	Current Liabilities(Cr.)	Current Ratio
2020-21	18,544.30	16,120.50	1.15
2021-22	16,793.40	17,023.50	0.99
2022-23	11,615.60	20,107.30	0.58
2023-24	22,633.80	25,951.80	0.87
2024-25	29,524.20	30,570.50	0.97

Source: (Secondary data)

Table 4.4 reveals Maruti Suzuki had a comfortable short-term financial position in 2020–21, but its liquidity weakened in the next few years, especially in 2022–23 when current liabilities were much higher than current assets. In the recent years (2023–24 and 2024–25), the situation has improved, showing that Maruti Suzuki is managing its working capital better, though its liquidity is still just below the ideal level.

Table 4.5

Table showing Solvency Position

Years	Total Debt (₹ Cr)	Shareholders' Fund (₹ Cr)	Debt-Equity Ratio
2020-21	491.6	52,500.60	0.01
2021-22	381.9	55,333.50	0.01
2022-23	1,215.80	61,791.30	0.02
2023-24	33.1	85,636.00	0
2024-25	0	96,239.90	0

Source: (Secondary data)

Table 4.5 reveals Maruti Suzuki has maintained an extremely low debt level, relying mostly on its own funds for growth. The company's shareholders' funds have steadily increased, while debt has almost vanished by 2024-25. This shows Maruti is financially very strong, safe, and flexible for future investments.

Table 4.6

Table showing Profitability Position

Year	Net Profit (₹ Cr)	Revenue (₹ Cr)	Net Profit Margin (%)
2020-21	4,220.10	66,571.80	6.34%
2021-22	3,717.60	83,799.80	4.44%
2022-23	8,033.60	112,511.30	7.14%
2023-24	13,234.10	134,921.70	9.81%
2024-25	14,256.30	145,109.90	9.83%

Source: (Secondary data)

Table 4.6 reveals Maruti Suzuki's profits have grown steadily over the last five years, from ₹4,220 Cr in 2020-21 to ₹14,256 Cr in 2024-25. Revenue also increased consistently, showing strong business growth. Net profit margin improved from 6.34% to nearly 9.83%, indicating the company is becoming more efficient and profitable over time.

Table 4.7

TABLE SHOWING OVERALL FINANCIAL POSITION AND STABILITY OF MARUTI SUZUKI INDIA LIMITED (FIVE-YEAR TREND ANALYSIS)

Aspect Analyzed	Observation from Balance Sheet / P&L	Trend Identified	Interpretation
Revenue Growth	Sales revenue increased steadily over five years due to rising passenger vehicle demand and new model launches	Upward trend	Indicates strong market acceptance and continuous business expansion

Profitability	Net profit improved significantly after earlier slowdown, supported by higher sales and cost control	Improving trend	Shows recovery and better operational efficiency
Operating Performance	Operating margins strengthened due to improved capacity utilization and cost optimisation	Positive trend	Reflects efficient management and better production planning
Cost Management	Manufacturing and operating expenses grew at a slower rate than revenue	Controlled cost trend	Demonstrates effective expense and cost management
Shareholders' Funds	Equity share capital and reserves increased consistently	Upward trend	Shows strong internal fund generation and growing investor confidence
Debt Position	Total borrowings reduced gradually and became negligible in recent years	Downward trend	Indicates improved solvency and lower financial risk
Debt-Equity Ratio	Ratio declined due to reduction in debt and increase in equity	Improving trend	Reflects a stronger and more stable capital structure
Liquidity Position	Current assets increased and remained close to or above current liabilities	Positive trend	Indicates satisfactory short-term solvency and liquidity
Cash & Cash Equivalents	Cash balances improved steadily over the period	Increasing trend	Ensures better working capital management and financial flexibility Asset Base
Asset Base	Fixed assets increased due to investments in plants, capacity expansion, and technology	Upward trend	Indicates expansion, modernization, and long-term growth focus
Return on Equity	ROE improved in recent years due to higher profitability	Rising trend	Reflects better returns and value creation for shareholders
Overall Financial Stability	Improved profits, negligible debt, higher reserves, and strong liquidity	Strong upward trend	Company is financially stable, resilient, and sustainable

Findings

- Maruti Suzuki's total revenue increased continuously from ₹73,308.30 crore in 2020– 21 to ₹1,57,935.20 crore in 2024–25, indicating strong sales growth and improved market demand over the five-year period.
- The rise in revenue was more pronounced after 2021–22, reflecting recovery from earlier slowdown and the impact of higher vehicle demand and successful product introductions.
- Total expenses rose from ₹68,156.30 crore in 2020–21 to ₹1,38,559.10 crore in 2024– 25, showing higher production and operating activity in line with expanding business operations.
- Although expenses increased every year, they grew at a controlled and proportionate rate compared to revenue growth, indicating effective cost control and operational efficiency.
- The company's profit trend shows a steady improvement across the five years, reflecting better utilization of resources and improved operational performance as revenues consistently exceeded expenses.
- In recent years, especially from 2022–23 onwards, the gap between revenue and total expenses widened, signifying improved profitability and stronger financial.
- After moderate performance in the initial years, Maruti Suzuki demonstrated strong recovery in profits during 2022–23 to 2024–25, supported by higher sales volumes and improved cost management.
- The combined trend of rising revenue, controlled expenses, and increasing profits over the five-year period indicates that Maruti Suzuki India Limited has strengthened its financial performance and profitability position through effective management of its Profit and Loss Account.
- In 2020–21, Maruti Suzuki maintained a healthy current ratio of 1.15, indicating a comfortable ability to meet short-term obligations using current assets.
- The current ratio declined in subsequent years and reached a low of 0.58 in 2022–23, showing pressure on short-term liquidity due to higher current liabilities compared to current assets.

- During 2023–24 and 2024–25, the current ratio improved to 0.87 and 0.97 respectively, indicating better working capital management, though it remained slightly below the ideal standard.
- Shareholders' funds increased consistently over the years, strengthening the capital base and enhancing long-term financial stability and solvency.

- The company maintained a very low debt–equity ratio throughout the five-year period, ranging between 0.00 and 0.02, reflecting minimal dependence on external borrowings.
- By 2024–25, total debt was eliminated, resulting in a debt–equity ratio of zero, which indicates very low financial risk and high financial flexibility.
- Net profit margin improved significantly from 6.34% in 2020–21 to 9.83% in 2024–25, showing enhanced profitability due to higher revenues and effective cost control.
- The combined analysis of liquidity, solvency, and profitability ratios indicates that Maruti Suzuki India Limited is financially sound, with strong profitability, excellent solvency, and gradually improving liquidity over the study period.
- In 2020–21, Maruti Suzuki maintained a healthy current ratio of 1.15, indicating a comfortable ability to meet short-term obligations using current assets.
- The current ratio declined in subsequent years and reached a low of 0.58 in 2022–23, showing pressure on short-term liquidity due to higher current liabilities compared to current assets.
- During 2023–24 and 2024–25, the current ratio improved to 0.87 and 0.97 respectively, indicating better working capital management, though it remained slightly below the ideal standard.
- The company maintained a very low debt–equity ratio throughout the five-year period, ranging between 0.00 and 0.02, reflecting minimal dependence on external borrowings.
- Shareholders' funds increased consistently over the years, strengthening the capital base and enhancing long-term financial stability and solvency.
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- The combined analysis of liquidity, solvency, and profitability ratios indicates that Maruti Suzuki India Limited is financially sound, with strong profitability, excellent solvency, and gradually improving liquidity over the study period.

SUGGESTIONS

- Maruti Suzuki should focus on better management of current assets and liabilities to maintain comfortable short-term liquidity.
- Since expenses have grown in a controlled manner compared to revenue, the company should continue its efficient cost management strategies to sustain profitability.
- With zero debt in 2024–25, the company has high financial flexibility. It can cautiously use low-cost borrowing in the future for expansion or technological upgrades if needed.
- The decline in the current ratio during earlier years indicates the need for tighter control over inventory, receivables, and payables to avoid future liquidity pressure.
- The strong increase in revenue after 2021–22 should be sustained through continuous product innovation, market expansion, and customer-focused strategies.
- Since net profit margins have improved significantly, the company should focus on highervalue products and operational efficiency to push margins even higher.
- The steady increase in shareholders' funds reflects financial stability. Retaining a portion of profits for reinvestment will further strengthen the capital base.
- Past fluctuations in liquidity show that external factors can affect performance. The company should build adequate reserves to handle economic slowdowns or industry challenges.

- Improved profitability suggests better resource utilization. Continued investment in automation, technology, and process improvement will support long-term efficiency.
- While expanding operations, Maruti Suzuki should ensure that growth does not negatively impact liquidity, maintaining its strong solvency and profitability position.

Conclusion

The "A Study of the Financial Statements of Maruti Suzuki India Limited" was conducted with the objective of examining the company's financial performance, liquidity position, solvency status, profitability, and overall financial stability over a five-year period from 2020–21 to 2024–25. The analysis was based on secondary data collected from the Profit and Loss Account and Balance Sheet, using tools such as trend analysis, comparative statements, and financial ratio analysis to derive meaningful insights.

The results of the study clearly indicate that Maruti Suzuki India Limited has recorded steady and consistent financial growth during the period under review. Total revenue exhibited a continuous upward trend, reflecting increasing market demand, recovery from earlier economic slowdowns, and the positive impact of new product introductions. Although total expenses also rose year after year due to expanding production and operational activities, this increase remained proportionate to revenue growth. This demonstrates the company's effective cost control measures and sound operational management. Consequently, profitability improved steadily, particularly from 2022–23 onwards, highlighting enhanced operational efficiency and better utilisation of available resources.

Liquidity analysis reveals that while the company maintained a healthy current ratio in 2020–21, it faced short-term liquidity pressure during the middle years of the study, reaching its lowest point in 2022–23 due to higher current liabilities compared to current assets. However, the subsequent improvement in 2023–24 and 2024–25 suggests better working capital management. Although the current ratio remains slightly below the ideal benchmark, the recent positive trend indicates that corrective steps are being taken to strengthen the company's short-term financial position.Solvency analysis highlights one of Maruti Suzuki's most notable financial strengths. Throughout the five-year period, the company maintained an exceptionally low debt–equity ratio, relying primarily on internal funds rather than external borrowings. By 2024–25, total debt was completely eliminated, resulting in a zero debt–equity ratio. This reflects strong financial discipline, minimal financial risk, and high financial flexibility. Simultaneously, shareholders' funds increased consistently, strengthening the capital base and reinforcing long-term financial stability.The combined evaluation of profitability, liquidity, and solvency ratios confirms that Maruti Suzuki India Limited is financially sound, with strong profitability, excellent solvency, and gradually improving liquidity. Trend analysis further shows positive movements in operating margins, shareholders' funds, asset base, and cash balances, indicating ongoing expansion, modernization, and a clear long-term growth strategy.

The findings of the study suggest that Maruti Suzuki has effectively managed its financial resources to achieve sustainable growth. However, certain areas require continuous monitoring. Greater emphasis on managing current assets and liabilities is necessary to maintain comfortable liquidity levels. Continued cost-control initiatives are essential to sustain profitability, while cautious utilization of low-cost borrowing may be considered for future expansion and technological upgrades. Retaining a portion of profits for reinvestment, building adequate reserves, and focusing on innovation, automation, and process improvements will further enhance long-term efficiency and help the company withstand economic uncertainties.

In conclusion, Maruti Suzuki India Limited emerges as a financially stable, profitable, and well-managed organization with strong future growth prospects. The company's consistent revenue growth, improving profitability, negligible debt, and strengthening shareholders' funds reflect a robust financial position and sound managerial practices. The objectives of the study have been successfully achieved by evaluating financial performance through Profit and Loss trends, assessing liquidity, solvency, and profitability using ratio analysis, and examining overall financial stability through comparative and trend analysis. The study ultimately concludes that Maruti Suzuki India Limited is well positioned for sustainable future growth and continues to create long-term value for its stakeholders through prudent financial management and strategic business operations.

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Groww – Maruti Suzuki India Company Financials Page (Detailed Financial Tables) https://groww.in/stocks/maruti-suzuki-india-ltd/company-financial

AI Adoption Readiness in Disability Entrepreneurship: Opportunities and Barriers A review study

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Abstract

The rapid growth of Artificial Intelligence (AI) has created new opportunities for entrepreneurship by improving decision-making, automation, customer engagement, and business efficiency. However, the extent to which entrepreneurs with disabilities are prepared to adopt AI remains an emerging area of research. This literature study examines AI adoption readiness in disability entrepreneurship by reviewing 20 research studies published between 2015 and 2025, sourced from Google Scholar, Scopus, and Web of Science. The review highlights key opportunities of AI adoption such as enhanced accessibility, assistive digital tools, market expansion through online platforms, and improved productivity in business operations. At the same time, significant barriers are identified, including limited digital infrastructure, lack of AI training, high implementation costs, accessibility challenges in AI-based platforms, and inadequate institutional support. The study also discusses the role of government policies, inclusive technology design, and entrepreneurial training programs in bridging the adoption gap. Overall, the findings indicate that while AI can serve as a strong enabler for inclusive entrepreneurship, readiness among disability-led ventures depends heavily on skill development, financial support, and accessible AI solutions. The paper concludes by proposing future research directions focused on inclusive AI frameworks and policy-driven interventions to support sustainable disability entrepreneurship.

Keywords: Artificial Intelligence, AI Adoption, Disability Entrepreneurship, Inclusive Entrepreneurship, Digital Accessibility, Opportunities and Barriers, Technology Readiness

INTRODUCTION

Artificial Intelligence (AI) has emerged as a transformative technology reshaping modern business practices by supporting automation, predictive decision-making, personalization, and operational efficiency across industries. AI systems are increasingly used in entrepreneurship to improve customer engagement, optimize resource allocation, and enhance business competitiveness. The OECD defines an AI system as a machine-based system that infers from inputs to generate outputs such as predictions, recommendations, or decisions that influence physical or virtual environments, highlighting its relevance in digital business ecosystems [1].

Entrepreneurship, as a tool for socio-economic empowerment, has gained increasing attention in the context of persons with disabilities. Disability is not only associated with an individual's health condition but is also shaped by the interaction between personal and environmental factors such as accessibility barriers, social attitudes, and limited institutional support [2]. The World Health Organization (WHO) also emphasizes disability as a multidimensional phenomenon affecting functioning and participation in society [3]. In this context, disability entrepreneurship has become an important pathway for financial independence, inclusive development, and self-employment opportunities.

However, the adoption of AI technologies is not equally accessible to all entrepreneurs. Entrepreneurs with disabilities may experience unique challenges such as limited access to digital infrastructure, affordability constraints, lack of AI-specific training, accessibility limitations in technology design, and insufficient support mechanisms. Existing disability entrepreneurship research highlights that structural barriers and systemic exclusion continue to influence entrepreneurial opportunities and outcomes for persons with disabilities [4]. Therefore, understanding AI adoption readiness becomes essential to explore whether disability-led ventures are prepared to integrate AI tools meaningfully into business operations.

From the perspective of technology adoption, models such as the Technology Acceptance Model (TAM) suggest that perceived usefulness and perceived ease of use are key factors that influence an individual's willingness to accept and use new technology [5]. Applying such theoretical insights to disability entrepreneurship can help examine how disabled entrepreneurs perceive AI tools, what opportunities AI provides, and what barriers restrict adoption.

Hence, this literature study reviews 20 scholarly studies published between 2015 and 2025, sourced from Google Scholar, Scopus, and Web of Science, to analyse the opportunities and barriers related to AI adoption readiness in disability entrepreneurship. The study aims to consolidate existing evidence, identify key themes, and highlight research gaps for policy and future research directions.

OBJECTIVES OF THE STUDY

The main objectives of this literature study are:

- To review existing literature on AI adoption in disability entrepreneurship during the period 2015–2025.
- To identify major opportunities provided by AI for entrepreneurs with disabilities.
- To examine the key barriers affecting AI adoption readiness among disability entrepreneurs.

REVIEW METHODOLOGY

This study follows a structured literature review approach to examine AI adoption readiness in disability entrepreneurship, focusing on opportunities and barriers. The review includes 20 research studies published between 2015 and 2025. Relevant literature was collected from reliable academic databases such as Google Scholar, Scopus, and Web of Science to ensure quality and scholarly relevance.

DATA SOURCES

The studies were identified from the following sources:

Google Scholar

- Scopus
- Web of Science

SEARCH KEYWORDS

To locate relevant research articles, key terms and combinations were used, including:

"Artificial Intelligence adoption"

"AI readiness"

"Technology adoption in entrepreneurship"

"Disability entrepreneurship"

"Entrepreneurs with disabilities"

"Inclusive entrepreneurship"

"Assistive technology and AI

INCLUSION CRITERIA

The selection of literature was based on the following criteria:

Published between 2015 and 2025

Peer-reviewed journal articles, conference papers, and scholarly reports

Studies focusing on AI adoption, technology readiness, and digital inclusion

Studies related to entrepreneurship among persons with disabilities

Articles available in English with accessible full text

EXCLUSION CRITERIA

The review excluded:

Studies published before 2015

Non-academic blogs, opinion articles, and non-scholarly content

- Studies unrelated to entrepreneurship or disability context
- Articles with incomplete information or inaccessible full text

METHOD OF ANALYSIS

The selected studies were analysed using a thematic approach. The reviewed literature was categorized into key themes such as:

AI-related opportunities for disability entrepreneurship

Barriers and challenges in AI adoption

Training and skill readiness

Accessibility and inclusive technology design

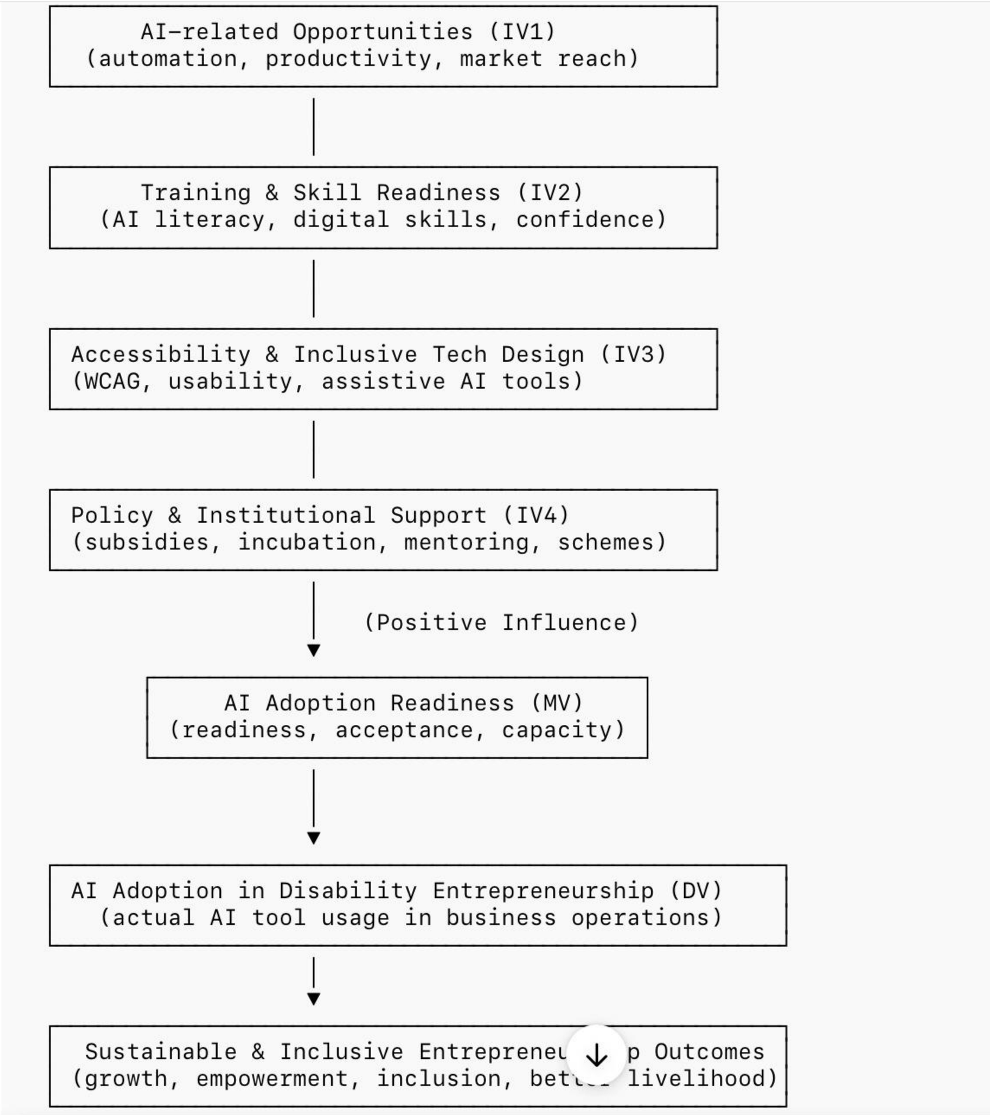
Policy and institutional support mechanism

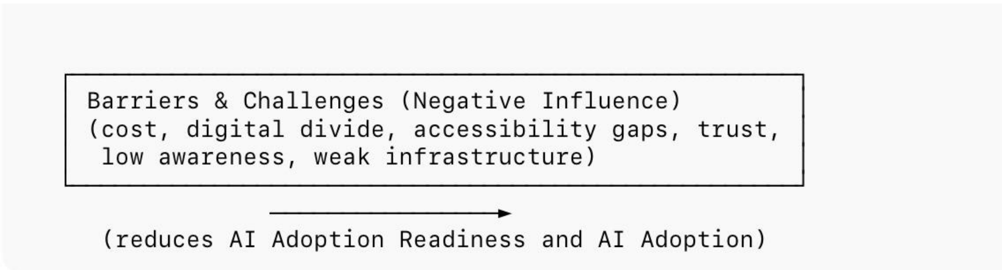
RESEARCH GAP (FOR YOUR REVIEW PAPER)

Although existing studies discuss technology readiness, digital inclusion, accessibility standards, and AI adoption challenges, there is still a limited number of studies that specifically examine AI adoption readiness among entrepreneurs with disabilities in an integrated manner. Most literature focuses either on general technology adoption models and readiness measures [1,10], or on disability inclusion and assistive technology from a broader socio-economic perspective [12,15], without directly linking these factors to entrepreneurship outcomes. Moreover, disability entrepreneurship research highlights structural and ecosystem barriers such as stigma, limited institutional support, and resource constraints [14], but lacks strong empirical investigation on how these barriers affect the adoption of AI tools in disability-led ventures. Additionally, while accessibility guidelines and inclusive design frameworks are available [2,5], research remains insufficient in evaluating whether AI-based platforms and business applications fully meet accessibility requirements for diverse disability needs. Therefore, there is a clear research gap in developing a comprehensive framework that combines AI opportunities, adoption barriers, skill readiness, accessibility design, and policy support to understand and strengthen AI adoption readiness in disability entrepreneurship, particularly in developing economy contexts.

Figure 1: Conceptual Framework Model – AI Adoption Readiness in Disability Entrepreneurship

The model illustrates the factors influencing AI adoption readiness and actual AI adoption among entrepreneurs with disabilities, highlighting enabling drivers and barriers affecting inclusive entrepreneurship outcomes.


AI-related Opportunities (IV1)
(automation, productivity, market reach)
Training & Skill Readiness (IV2)
(AI literacy, digital skills, confidence)
Accessibility & Inclusive Tech Design (IV3)
(WCAG, usability, assistive AI tools)
Policy & Institutional Support (IV4)
(subsidies, incubation, mentoring, schemes)
(Positive Influence)
AI Adoption Readiness (MV)
(readiness, acceptance, capacity)
AI Adoption in Disability Entrepreneurship (DV)
(actual AI tool usage in business operations)
Sustainable & Inclusive Entrepreneu p Outcomes
(growth, empowerment, inclusion, bet livelihood)


Barriers & Challenges (Negative Influence)
(cost, digital divide, accessibility gaps, trust,
low awareness, weak infrastructure)
(reduces AI Adoption Readiness and AI Adoption)

1) AI-related Opportunities for Disability Entrepreneurship

Sl. No	Author(s) & Year	Title / Focus	Method	Key Opportunity Highlighted
1	Bughin et al. (2018)	Notes from the AI Frontier	Report	AI increases productivity, efficiency, and business growth potential
2	WHO & UNICEF (2022)	Global Report on Assistive Technology	Global report	Assistive technologies improve independence and functional capability
3	ILO (2020)	Teleworking during the COVID-19 pandemic and beyond	Report	Remote work enables flexible participation for persons with disabilities

2) Barriers and Challenges in AI Adoption (Table)

Sl. No	Author(s) & Year	Title / Focus	Method	Key Barrier Identified
1	Tamilmani et al. (2021)	UTAUT2 Meta-analysis	Meta-analysis	Adoption depends on enabling conditions; barriers reduce usage
2	Dwivedi et al. (2021)	AI challenges & research agenda	Review	Ethical, governance, skill and implementation challenges exist
3	United Nations (2019)	Disability and Development Report	Global report	Structural inequality and digital divide restrict inclusion
4	World Bank (2016)	Digital Dividends	Global report	Digital exclusion continues without access and affordability

3) Training and Skill Readiness (Table)

Sl. No	Author(s) & Year	Title / Focus	Method	Skill/Readiness Finding
1	Parasuraman & Colby (2015)	TRI 2.0	Scale development	Technology readiness predicts adoption willingness
2	World Economic Forum (2020)	Future of Jobs Report	Report	Skill development is essential for future technology adoption
3	OECD (2019)	OECD AI Principles	Policy principles	Trustworthy AI requires capability building and preparedness

4) Accessibility and Inclusive Technology Design (Table)

Sl. No	Author(s) & Year	Title / Focus	Method	Accessibility Insight
1	W3C (2018)	WCAG 2.1	Standard	Accessibility standards improve digital inclusion
2	Lazar et al. (2015)	Ensuring Digital Accessibility…	Book/framework	Accessibility must be built through process + policy integration
3	WHO & UNICEF (2022)	Assistive Technology Report	Global report	Inclusive design improves functional independence

5) Policy and Institutional Support Mechanisms (Table)

Sl. No	Author(s) & Year	Title / Focus	Method	Policy/Institutional Support Finding
1	ILO & Fundación ONCE (2021)	Inclusive Digital Economy for PwD	Report review	Inclusion requires accessibility, skills and ecosystem support
2	UNESCO (2021)	Ethics of AI Recommendation	Policy	Ethical AI frameworks reduce exclusion and discrimination risk
3	Klangboonkrong & Baines (2022)	Disability entrepreneurship research	Review	Structural barriers need stronger institutional ecosystem support

FINDINGS (THEME-WISE)

1) AI-related Opportunities for Disability Entrepreneurship

The reviewed literature shows that AI and digital technologies create major opportunities for entrepreneurship among persons with disabilities by improving productivity, independence, and business reach. AI-driven innovations are capable of increasing efficiency and supporting business growth by enabling automation, customer handling, and operational improvements [4]. Assistive technologies play a crucial enabling role by improving functional independence, making business activities easier for entrepreneurs with disabilities, especially in communication and task execution [15]. Moreover, digital work systems such as teleworking and remote entrepreneurship increase flexibility and reduce physical mobility constraints, allowing entrepreneurs with disabilities to participate more actively in economic activities [8]. Overall, AI-based applications and digital platforms can strengthen disability entrepreneurship by enabling inclusive self-employment, better market access, and improved business sustainability when combined with supportive conditions [4,8,15].

2) Barriers and Challenges in AI Adoption

Despite the strong opportunities, the literature highlights several challenges that limit AI adoption readiness, particularly for entrepreneurs with disabilities. Adoption evidence indicates that while intention to use technology is important, actual adoption depends heavily on facilitating conditions, usability, and support systems [10]. Large-scale research also points out that AI adoption is associated with risks such as lack of trust, governance issues, ethical concerns, and unequal distribution of benefits, which can discourage usage among vulnerable groups [11]. Digital inequality remains a significant barrier, as access to devices, internet connectivity, and affordability still restrict participation in the digital economy [3,6]. Therefore, barriers such as high cost, low accessibility, weak infrastructure, and lack of trust continue to prevent disability entrepreneurs from fully benefiting from AI-enabled business solutions [3,6,10,11].

3) Training and Skill Readiness

The findings show that training and skill readiness are essential determinants of AI adoption readiness. Technology readiness studies confirm that individuals with high optimism and innovativeness are more likely to adopt new digital tools, while discomfort and insecurity reduce readiness [1]. In addition, evidence indicates that AI adoption requires reskilling and continuous learning due to rapid technological change, especially as future jobs demand advanced digital skills and adaptability [9]. Policy-level principles also highlight that building trustworthy AI requires human capacity building, awareness, and preparedness so that users can engage confidently with AI systems [7]. Hence, strengthening AI literacy, digital skills, and technology confidence is critical to ensuring that disability entrepreneurs can adopt AI tools effectively and sustainably [1,7,9].

4) Accessibility and Inclusive Technology Design

A major finding from the literature is that accessibility and inclusive design are central to ensuring AI adoption among persons with disabilities. International accessibility guidelines emphasize that digital platforms must follow structured accessibility standards to ensure equal access for users with diverse needs [5]. Research also highlights that accessibility must be integrated into digital design processes and institutional policies, rather than being treated as a separate or optional feature [2]. Assistive technology reports further show that inclusive tools are essential for independence and participation, but gaps in accessibility design continue to affect full adoption and usability [15]. Therefore, inclusive AI adoption requires accessible digital interfaces, universal design thinking, and consistent implementation of accessibility practices in AI tools and business platforms [2,5,15].

5) Policy and Institutional Support Mechanisms

The findings indicate that AI adoption readiness in disability entrepreneurship is strongly influenced by supportive policies and institutional mechanisms. Studies on digital inclusion stress that disability inclusion is possible only when accessibility, digital skills, and ecosystem-level support are provided through coordinated interventions [12]. Ethical AI policy frameworks highlight the importance of fairness, transparency, and human rights-based AI development to prevent discrimination and exclusion of vulnerable groups [13]. Disability entrepreneurship literature also emphasizes that structural barriers can be reduced through improved ecosystem support, institutional backing, and inclusive entrepreneurial opportunities [14]. Overall, strong policy frameworks, inclusive institutional support systems, and ethical AI governance are necessary to ensure that AI adoption supports disability entrepreneurship rather than widening inequality [12–14].

SUGGESTIONS

To improve AI adoption readiness in disability entrepreneurship, it is essential to strengthen skill development and awareness among entrepreneurs with disabilities. Entrepreneurship development agencies, educational institutions, and training providers should conduct structured programs on AI literacy, digital entrepreneurship, and practical usage of AI tools in business activities such as marketing, customer support, and decision-making. Awareness campaigns and mentorship-based learning can also help disabled entrepreneurs understand the real benefits of AI and build confidence to adopt new technologies. Future initiatives should focus on making training inclusive, affordable, and accessible, so that disability entrepreneurs can actively participate and apply AI solutions effectively in their ventures.

In addition, financial support, accessibility improvements, and institutional backing are crucial for long-term adoption. Governments and supporting institutions should provide subsidies, startup grants, and low-interest credit facilities to help disability-led enterprises invest in AI tools, assistive technologies, and digital infrastructure. Accessibility standards such as WCAG should be followed in AI platforms to ensure usability across different disability needs, while ethical AI governance must be strengthened to reduce bias and ensure fairness. Inclusive incubation centres, business support cells, and collaborations between government, NGOs, and technology companies can further create a supportive ecosystem, enabling sustainable AI adoption and promoting inclusive entrepreneurship outcomes.

CONCLUSION (EXPANDED VERSION)

This literature study reviewed research published between 2015 and 2025 to examine AI adoption readiness in disability entrepreneurship with specific focus on opportunities, barriers, accessibility concerns, training readiness, and policy support mechanisms. The review confirms that AI has the potential to serve as a strong enabler of inclusive entrepreneurship by improving productivity, supporting automation of routine tasks, strengthening customer engagement through digital platforms, and enhancing business decision-making through data-driven solutions. In particular, assistive and accessibility-oriented AI tools can increase independence and improve the ability of entrepreneurs with disabilities to participate effectively in business activities, thereby supporting economic empowerment and sustainable self-employment.

At the same time, the findings clearly show that AI adoption readiness among disability entrepreneurs is not uniform and is affected by several interrelated challenges. Major barriers include low AI literacy, inadequate training opportunities, high technology costs, weak digital infrastructure, and accessibility limitations in many AI-based systems and platforms. In addition, institutional support systems such as inclusive incubation centres, mentorship networks, government assistance programs, and accessibility enforcement mechanisms remain insufficient in many contexts. These challenges highlight that AI adoption is not only a technological matter but also a social, economic, and policy-driven issue that requires ecosystem-wide intervention.

Therefore, the study concludes that the successful adoption of AI in disability entrepreneurship depends on creating a supportive environment that combines accessible technology design, financial support, skill development, ethical AI governance, and inclusive policy implementation. Future research should focus on conducting more empirical studies to measure AI readiness among different disability groups, sectors, and regional contexts, and should develop integrated frameworks that connect technology readiness, accessibility, and entrepreneurship ecosystem support. Overall, AI can contribute significantly to inclusive and sustainable disability entrepreneurship when adoption barriers are systematically addressed and equal digital opportunities are ensured.

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A STUDY ON THE ROLE OF GOVERNMENT SCHEMES IN PROMOTING WOMEN ENTREPRENEURSHIP IN INDIA

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Abstract

Women's entrepreneurship plays a vital role in promoting economic growth, employmentgeneration, and social empowerment in India. Recognizing this, the Government of India has introduced several schemes such as Stand-Up India, Mudra Yojana, Startup India, Mahila E-Haat, TREAD, and Annapurna Scheme to support women entrepreneurs through financial assistance, training, and market access. Despite these initiatives, women entrepreneurs continue to face challenges including limited awareness of schemes, restricted access to credit, inadequate skills, social barriers, and bureaucratic hurdles, particularly in rural and semi-urban areas. This study aims to evaluate the effectiveness of government schemes in promoting women entrepreneurship in India and to analyze their impact on business growth, sustainability, and economic empowerment. The study adopts a descriptive and analytical research design using both primary and secondary data collected through surveys, observations, reports, and literature. Basic statistical tools are employed for data analysis.The findings highlight gaps between policy objectives and implementation outcomes and identify key challenges faced by women entrepreneurs. The study concludes with suggestions to improve the reach, accessibility, and effectiveness of government schemes for enhancing women's entrepreneurial development and inclusive growth

Keywords: Women Entrepreneurship, Government Schemes, Economic Empowerment, Financial Assistance

INTRODUCTION

Women's entrepreneurship is essential to a country's social and economic advancement.Women's involvement in entrepreneurship has been rising steadily in India thanks to supportive policies, increased awareness, and improved education. Notwithstanding their potential, a lot of female entrepreneurs encounter obstacles like restricted financial resources, inadequate training, social constraints, and a lack of market connections. The Indian government has implemented a number of policies and initiatives to empower women to launch and grow their own enterprises in order to address these problems. Aspiring female entrepreneurs have benefited from financial aid, training, mentorship, and marketing support through programs like Stand-Up India, Mudra Yojana, Startup India, Mahila E-Haat, andTREAD (Trade Related Entrepreneurship Assistance and Development). The purpose of this study is to evaluate how well these government initiatives support women entrepreneurs in India. It aims to comprehend how these programs support women's economic autonomy, job creation, and inclusive growth. The study also seeks to make recommendations for ways to increase the success and reach of such programs by assessing the effects and difficulties of implementation.

STATEMENT OF THE PROBLEM

Women’s involvement in entrepreneurship is still quite low in India, despite a plethora ofgovernment programs and financial incentives designed to encourage women entrepreneurs. Many women still encounter challenges like restricted credit availability, low knowledge of government programs, a lack of technical skills and training, social and cultural barriers, and trouble marketing their goods. Despite the introduction of initiatives such as Stand-Up India, Mudra Yojana, Startup India, and TREAD Scheme to assist female entrepreneurs, thereremains a notable discrepancy between the goals of policy and its actual results. Women in rural and semi-urban areas frequently do not benefit from these programs because of a lack of institutional support, bureaucratic obstacles, and inadequate information dissemination.Thus, the issue this study attempts to solve is to analyze the extent to which government programs have aided in the growth and advancement of women’s entrepreneurship in India, as well as to pinpoint the obstacles and constraints that stand in their way. The study seeks to analyze the impact of these initiatives on empowering women economically and socially, and to suggest ways to enhance their implementation and accessibility.

SCOPE OF THE STUDY

The study's main goal is to comprehend how government initiatives support women entrepreneurs in India. It discusses the different programs that the federal and stategovernments have put in place to help women launch and grow their businesses. In addition to identifying current obstacles, the study attempts to evaluate women's awareness,

involvement, and advantages of these programs. The results will aid in making recommendations for how to improve women's economic empowerment and fortify government programs.

OBJECTIVES OF THE STUDY

To assess the level of awareness of government schemes among women entrepreneurs.

To evaluate the role of financial institutions in implementing government schemes for women entrepreneurs.

To analyse the impact of government schemes on business growth and sustainability of women-owned enterprises.

To identify the challenges faced by women entrepreneurs in accessing government schemes.

. RESEARCH METHODOLOGY

Nature of the study: The study's nature is both descriptive and analytical. It seeks to outline the current government programs for female entrepreneurs and assess how they affect the

development of women entrepreneurs.

Data Collection: Both primary and secondary data served as the foundation for the study.

Primary Data: Obtained by means of surveys and direct observation of particular female

entrepreneurs. Secondary Data: Gathered from books, journals, websites, government reports, and earlier research projects.

Data Analysis Tools and Techniques: To properly interpret the results, collected data was analysed using basic statistical tools like percentages, averages, and charts.

Study Period: The study focuses on current trends and advancements in Indian government programs for women entrepreneurs, analysing data and information from the previous five

Years

FINDINGS

- The largest proportion of respondents (47.7%) falls in the below 25 years age group, indicating higher participation of younger respondents.
- Respondents aged 35–44 years constitute 24.6% of the total, making them the second-largest age group.
- The 45–54 years age group accounts for 16.9% of respondents, showing moderate representation.
- No respondents belong to the 55 years and above category, reflecting absence of older participants in the study.
- Nearly half of the respondents (47.7%) are undergraduates, making this the largest educational group in the study.
- About 26.2% of respondents have educational qualifications up to higher secondary level, indicating a substantial representation of this group.
- Postgraduates account for 15.4% of the respondents, reflecting moderate participation from higher education levels.
- Diploma holders (4.6%) and those with professional or technical qualifications (6.2%) together form a relatively small proportion of the sample.
- Married respondents form the majority with 52.3%, indicating higher participation among married individuals.
- Single respondents constitute 44.6% of the sample, showing a significant proportion of unmarried participants.
- Widowed respondents represent only 1.5% of the total, reflecting very

minimal representation.

- Divorced or separated respondents also account for 1.5%, indicating negligible participation from this group.
- A vast majority of respondents (84.6%) belong to nuclear families, indicating the predominance of this family structure.
- Only 15.4% of respondents come from joint families, showing relatively lower representation.
- The large difference between nuclear and joint family respondents highlights a clear preference or prevalence of nuclear families among the sample.
- The findings suggest that most participants are likely to experience greater individual decision-making due to nuclear family settings.
- The majority of respondents belong to semi-urban areas, accounting for 32 respondents (50%) of the total sample. This indicates that the study is largely influenced by semi-urban population characteristics. Semi-urban areas form the dominant residential background of the respondents.
- Rural respondents constitute 22 respondents (34.4%), representing a significant portion of the sample. This shows that rural participation in the study is fairly substantial. Rural perspectives therefore play an important role in the analysis.
- The urban category has the lowest representation with only 10 respondents (15.6%). This indicates comparatively limited participation from urban areas. Urban viewpoints have lesser influence on the overall findings.
- Overall, the data reveals that respondents are more concentrated in non-urban regions (rural and semi-urban). Together, these two categories account for 84.4% of the total respondents. This suggests the study primarily reflects rural and semi-urban residential patterns.
- Home -based enterprises form the largest category with 31 respondents (50.8%). This shows that more than half of the respondents are engaged in home-based business activities. Home-based enterprises dominate the nature of business among the respondents.
- The service sector includes 12 respondents (19.7%), making it the second-

largest group. This indicates a moderate involvement of respondents in service-oriented businesses. Service activities play a significant role in the business structure.

- The manufacturing sector accounts for only 6 respondents (9.8%). This reflects limited participation of respondents in manufacturing activities. Manufacturing businesses have a smaller presence in the study.
- Trading and other businesses together represent 12 respondents (19.6%). Trading has the lowest share with 3 respondents (4.9%), while other businesses account for 14.7%. This shows that trading and miscellaneous activities have relatively less influence overall.
- The majority of respondents have less than 2 years of business experience, accounting for 32 respondents (52.5%). This indicates that more than half of the businesses are relatively new. The study is therefore dominated by early-stage entrepreneurs.
- Respondents with 2–5 years of experience constitute 16 respondents (26.2%). This shows a moderate level of business continuity among the respondents. A significant portion of entrepreneurs are in the growth phase of business.
- Only 5 respondents (8.2%) fall under the 6–10 years of experience category. This reflects a comparatively low presence of mid-term experienced business owners. Businesses with moderate experience are limited in the sample.
- 8 respondents (13.1%) have more than 10 years of business experience. This indicates the presence of a smaller but stable group of long-established businesses. Experienced entrepreneurs contribute long-term business insights to the study.
- A majority of respondents agree that PMMY helps women entrepreneurs access collateral-free loans, with 30 respondents (46.9%). This indicates a positive perception of the PMMY scheme among the respondents. The scheme is widely viewed as supportive of women entrepreneurs.
- 12 respondents (18.8%) strongly agree with the statement regarding PMMY assistance. This reflects strong confidence among a section of

respondents in the effectiveness of the scheme. PMMY is considered highly beneficial by a notable group.

- A considerable portion of respondents remain neutral, accounting for 19 respondents (29.7%). This suggests that some respondents may lack sufficient awareness or experience with the scheme. Neutral responses indicate scope for better information dissemination.
- Only 3 respondents (4.7%) disagree, while none strongly disagree with the statement. This shows minimal negative perception towards the PMMY scheme. Overall, the scheme enjoys broad acceptance among the respondents.
- A majority of respondents agree that the Stand-Up India scheme supports women entrepreneurs, with 38 respondents (59.4%). This reflects a strong positive perception of the scheme among the respondents. Stand-Up India is widely viewed as beneficial for women entrepreneurship.
- 8 respondents (12.5%) strongly agree with the statement regarding Stand-Up India support. This indicates high confidence in the effectiveness of the scheme among some respondents. The scheme has earned strong approval from a section of women entrepreneurs.
- A significant number of respondents remain neutral, accounting for 16 respondents (25%).This suggests limited awareness or mixed experiences with the Stand-Up India scheme. Neutral responses highlight the need for better outreach and guidance.
- A small proportion of respondents disagree or strongly disagree, together making up 15.6% of responses. This indicates that some respondents face challenges or dissatisfaction with the scheme. Despite this, overall perception of Stand-Up India remains largely positive.
- A majority of respondents perceive PMEGP positively, as 62.5% (50% agree and 12.5% strongly agree) believe that PMEGP encourages women's self-employment. This indicates that the scheme is largely viewed as supportive. Overall, favorable opinion outweighs unfavorable responses.
- 50% of the respondents agree that PMEGP encourages women's self-employment, which is the highest percentage among all categories. This

shows strong general acceptance of the scheme. It reflects confidence in PMEGP's role in promoting self-employment among women.

- A considerable portion of respondents (34.4%) remain neutral regarding PMEGP's encouragement of women's self-employment. This suggests a lack of clear awareness or mixed experiences with the scheme. There is scope for better outreach and information dissemination.
- Only 15.6% of respondents (3.1% disagree and 12.5% strongly disagree) express a negative opinion about PMEGP. This indicates limited dissatisfaction with the programme. Negative perceptions are significantly lower compared to positive responses.
- A large majority of the respondents expressed a positive opinion about the Annapurna Scheme, as 64.1% agreed and 14.1% strongly agreed that it supports women in small food businesses. This indicates a strong overall acceptance of the scheme. The scheme is largely perceived as beneficial by women entrepreneurs.
- Nearly one-fifth of the respondents (18.8%) remained neutral regarding the support provided by the Annapurna Scheme. This suggests that a noticeable section of beneficiaries may be uncertain or have mixed experiences. Further awareness or guidance may be needed for this group.
- Only a very small proportion of respondents showed disagreement with the scheme, with 3.1% disagreeing and 14.1% strongly disagreeing. This indicates limited dissatisfaction among the participants. Negative perception toward the scheme is relatively low.
- The combined positive responses significantly outweigh the negative responses, highlighting the effectiveness of the Annapurna Scheme. Most women entrepreneurs believe it plays an important role in supporting small food businesses. Overall, the scheme demonstrates a favorable impact on women entrepreneurship.
- A clear majority of the respondents have a positive opinion about Mahila Udyam Nidhi supporting women-owned enterprises. About 62.5% agreed and 14.1% strongly agreed, showing strong acceptance of the scheme. This indicates that the scheme is largely perceived as beneficial by women

entrepreneurs.

- A considerable portion of respondents (20.3%) expressed a neutral opinion regarding the support provided. This suggests that some beneficiaries may not have experienced clear benefits or challenges. It highlights the need for better awareness or effective implementation of the scheme.
- Only a small percentage of respondents showed disagreement with the statement. Around 3.1% disagreed, indicating minimal dissatisfaction among participants. This reflects relatively low resistance or negative perception of the scheme.
- An equal proportion of respondents (14.1%) strongly disagreed with the support provided. This signifies that a notable minority faced significant issues or unmet expectations. Policymakers may need to address these concerns to improve overall effectiveness.
- A majority of respondents (58.4%) either agree or strongly agree that the STEP scheme improves entrepreneurial and vocational skills among women.
- Nearly one-third of the respondents (36.9%) expressed a neutral opinion, indicating mixed experiences or limited awareness of the programme.
- Only a small proportion of respondents (4.6%) disagreed with the statement, suggesting low levels of dissatisfaction.
- An equal percentage of respondents (9.2% each) strongly agreed and strongly disagreed, reflecting polarized views at the extremes.
- A majority of respondents (56.3%) either agree or strongly agree that bank officials provide information about eligibility and procedures of schemes.A considerable proportion of respondents (35.9%) remain neutral, indicating partial awareness or inconsistent communication from banks.
- Only a small percentage of respondents (4.7%) disagree with the statement, suggesting limited dissatisfaction.
- Very few respondents (3.1%) strongly disagree, reflecting minimal negative perception regarding the role of bank officials.
- A majority of respondents (57.2%) agree or strongly agree that financial

institutions ensure timely loan approval and disbursement under government schemes.

- A sizeable proportion of respondents (36.5%) express a neutral opinion, suggesting mixed experiences with loan processing timelines.
- Only a small percentage of respondents (3.2%) disagree with the statement, indicating limited dissatisfaction.
- An equally small proportion (3.2%) strongly disagree, reflecting minimal negative perception regarding loan sanction and disbursement efficiency.
- Nearly half of the respondents (51.6%) either strongly agree or agree that the documentation process followed by financial institutions is simple and transparent.
- A considerable proportion of respondents (35.9%) expressed a neutral opinion, indicating mixed experiences or limited clarity regarding the documentation process.
- A small segment of respondents (12.5%) disagreed or strongly disagreed, suggesting some dissatisfaction with the complexity or transparency of documentation procedures.
- Overall, the findings reveal a generally positive perception of the documentation process, though there is scope for further simplification and improved transparency.
- A majority of respondents (42.3%) either strongly agree or agree that SIDBI provides effective financial support to women entrepreneurs through government-supported programmes.
- A substantial proportion of respondents (35.4%) expressed a neutral opinion, indicating uncertainty or lack of adequate awareness about SIDBI's financial assistance.
- Very few respondents (6.2%) disagreed or strongly disagreed, suggesting minimal dissatisfaction with SIDBI's role in supporting women entrepreneurs.Overall, the responses indicate a generally positive perception of SIDBI's financial support, though there remains scope to improve awareness and outreach among women entrepreneurs.
- A clear majority of respondents (63.1%) either strongly agree or agree that

the schemes have helped in increasing employment opportunities.

- More than one-fourth of the respondents (27.7%) expressed a neutral opinion, indicating moderate or unclear impact of the schemes on employment generation.
- Only a small proportion of respondents (9.2%) disagreed or strongly disagreed, suggesting minimal negative perception regarding employment creation through the schemes.
- Overall, the findings highlight a positive role of the schemes in enhancing employment opportunities, with limited dissatisfaction among respondents.
- A majority of respondents (42.3%) either strongly agree or agree that SIDBI provides effective financial support to women entrepreneurs through government-supported programmes.
- A substantial proportion of respondents (35.4%) expressed a neutral opinion, indicating uncertainty or lack of adequate awareness about SIDBI's financial assistance.
- Very few respondents (6.2%) disagreed or strongly disagreed, suggesting minimal dissatisfaction with SIDBI's role in supporting women entrepreneurs.
- Overall, the responses indicate a generally positive perception of SIDBI's financial support, though there remains scope to improve awareness and outreach among women entrepreneurs.
- A clear majority of respondents (63.1%) either strongly agree or agree that the schemes have helped in increasing employment opportunities.
- More than one-fourth of the respondents (27.7%) expressed a neutral opinion, indicating moderate or unclear impact of the schemes on employment generation.
- Only a small proportion of respondents (9.2%) disagreed or strongly disagreed, suggesting minimal negative perception regarding employment creation through the schemes.
- Overall, the findings highlight a positive role of the schemes in enhancing employment opportunities, with limited dissatisfaction among

respondents.A strong majority of respondents (65.7%) either strongly agree or agree that the schemes helped in sustaining businesses during difficult periods.

- Nearly one-third of the respondents (31.3%) expressed a neutral opinion, indicating mixed experiences or uncertainty about the schemes' effectiveness in crisis situations.
- Very few respondents (3.1%) disagreed, and none strongly disagreed, showing negligible negative perception toward the schemes.
- Overall, the findings suggest that the schemes played a significant role in supporting business continuity during challenging times.
- A majority of respondents (66.2%) either strongly agree or agree that overall government schemes have positively influenced business growth.
- More than one-fourth of the respondents (27.7%) expressed a neutral opinion, indicating moderate or uncertain impact of government schemes on business growth.
- Only a small proportion of respondents (6.1%) disagreed or strongly disagreed, reflecting minimal dissatisfaction with the effectiveness of the schemes.
- Overall, the findings demonstrate a largely positive perception of government schemes in supporting and promoting business growth.
- A large proportion of respondents agreed that lengthy procedures discourage women from applying for government schemes. The combined percentage of those who strongly agreed and agreed shows that procedural complexity is a major barrier. This highlights the need for simplified application processes.
- A noticeable percentage of respondents remained neutral regarding the impact of lengthy procedures. This neutrality may indicate lack of direct experience or uncertainty in understanding the process. It suggests inconsistency in awareness or accessibility of scheme procedures.
- Only a small number of respondents disagreed with the statement. The low disagreement percentage indicates that very few respondents believe procedures are not a hindrance. This further confirms the widespread

perception of procedural difficulties.

- No respondents strongly disagreed with the statement. This reflects a general consensus that lengthy procedures negatively influence women's participation in schemes. Overall, the findings emphasize the importance of reducing procedural delays to improve participation.
- A majority of respondents agreed that delay in sanctioning loans affects business plans. Nearly half of the respondents expressed agreement, indicating that timely loan approval is crucial for business operations. This highlights delays as a major concern.
- A significant number of respondents strongly agreed with the statement. The combined percentage of agreement shows that loan delays have a serious impact on business planning and execution. Very few respondents disagreed with this view.
- Almost one-third of the respondents remained neutral regarding the impact of loan delays. This neutrality may reflect mixed experiences or uncertainty in accessing financial assistance. It suggests inconsistency in loan processing systems.
- Only a very small percentage of respondents disagreed, and none strongly disagreed with the statement. This indicates a broad consensus that delays in loan sanctioning negatively influence business plans. Overall, the findings emphasize the need for faster loan approval processes.
- A considerable proportion of respondents agreed that gender bias affects the approval of financial assistance. Nearly half of the respondents either strongly agreed or agreed with this statement. This indicates that gender-related barriers still exist in accessing financial support.
- An equal percentage of respondents expressed agreement and neutrality regarding gender bias in financial approval. This suggests that while many have experienced or perceived bias, others may be uncertain or have not directly encountered such issues.
- A smaller section of respondents disagreed that gender bias hinders financial approval. This shows that not all respondents perceive gender discrimination as a significant obstacle. However, the disagreement

percentage is comparatively low.

- Very few respondents strongly disagreed with the statement, indicating minimal rejection of the idea of gender bias. Overall, the findings highlight that gender bias remains a relevant concern in the approval of financial assistance
- A majority of the respondents agreed that lack of proper guidance is a major issue. More than half of the respondents expressed agreement, indicating that inadequate guidance significantly affects awareness and utilization of available schemes. This shows guidance as a critical challenge.
- A notable proportion of respondents strongly agreed with the statement, further reinforcing the seriousness of the problem. The combined percentage of agreement highlights strong concern among respondents. Very few participants expressed disagreement.
- A considerable number of respondents remained neutral regarding the lack of guidance. This neutrality suggests uncertainty or limited exposure to proper information channels. It indicates a gap in communication and support systems.
- Almost no respondents disagreed or strongly disagreed with the statement. This reflects a broad consensus that lack of proper guidance is a common challenge. Overall, the findings emphasize the need for better guidance mechanisms.

SUGGESTION

- Government agencies and financial institutions should simplify application and documentation procedures for women entrepreneurship schemes. Lengthy and complex processes discourage participation, especially among first-time and less-educated entrepreneurs
- Timely approval and disbursement of loans should be ensured, as delays significantly affect business planning and operations. Introducing time-bound processing systems and digital tracking mechanisms can improve efficiency.

- A large proportion of respondents expressed neutral opinions due to lack of awareness. Regular awareness campaigns, workshops, and community-level programmes should be conducted, particularly in rural and semi-urban areas
- Proper guidance at every stage—from application to utilization of funds—is essential. Dedicated help desks, mentorship programmes, and counselling services should be provided to assist women entrepreneurs.
- Skill development programmes like STEP should be strengthened with practical, market-oriented training. Continuous entrepreneurial and vocational training will improve confidence and sustainability of women-owned enterprises
- Sensitization programmes should be conducted for bank officials to reduce gender bias in loan approval and financial assistance. Equal and fair treatment of women entrepreneurs must be ensur
- Banks should proactively provide clear information regarding eligibility, benefits, and procedures of various schemes. Improved communication will reduce confusion and increase scheme utilisation Since most respondents are new entrepreneurs, special support such as incubation facilities, flexible repayment options, and start-up mentoring should be provided to strengthen business survival in the initial years
- As home-based businesses form the majority, schemes should be tailored to their needs, including flexible loan limits, marketing assistance, and digital platform access.
- Regular monitoring and feedback mechanisms should be introduced to assess the effectiveness of schemes like PMMY, PMEGP, Stand-Up India, and Annapurna Scheme. This will help in improving policy implementation.

CONCLUSION

The present study was undertaken to examine the socio-economic profile of women entrepreneurs and to analyze their perception of various government schemes designed to promote women entrepreneurship in India. Women entrepreneurship plays a crucial role in economic development, employment generation, and social empowerment. The findings of this study highlight both the progress achieved through government interventions and the challenges that continue to hinder the effective participation of women in entrepreneurial activities.

The demographic analysis of the respondents reveals that women entrepreneurs are largely young and belong to the below-25 and 35–44 age groups. This indicates an increasing inclination among younger women toward entrepreneurship, reflecting changing social attitudes, improved educational attainment, and growing awareness of self-employment opportunities. The educational profile shows that most respondents are undergraduates or have completed higher secondary education, suggesting that education plays an important role in encouraging women to start businesses. However, the relatively lower participation of postgraduates and professionally qualified women indicates the need to better utilize higher educational skills in entrepreneurial ventures.

Marital status analysis reveals that married women form the majority of the respondents, highlighting the balancing of entrepreneurial responsibilities alongside family commitments. The predominance of nuclear families suggests greater individual decision-making capacity, which may positively influence women's ability to start and manage businesses. The residential distribution shows that most respondents belong to rural and semi-urban areas, indicating that women entrepreneurship is gaining momentum beyond urban centers. Thalso implies that government schemes are reaching non-urban regions, though urban participation remains comparatively limited.

With regard to the nature of enterprises, home-based businesses constitute the largest segment, followed by service-oriented activities. This reflects women's preference for enterprises that can be managed alongside household responsibilities and with limited initial investment. Manufacturing and trading activities show relatively lower participation, indicating potential areas for policy support and encouragement. The study further reveals that a majority of respondents are early-stage entrepreneurs with less than two years of business experience. This highlights the emerging nature of women entrepreneurship and the need for sustained support during the initial years of business operation.

An important aspect of the study is the evaluation of women entrepreneurs' perceptions of various government schemes. The findings show an overall positive attitude toward schemes such as Pradhan Mantri Mudra Yojana (PMMY), Stand-Up India, Prime Minister'sEmployment Generation Programme (PMEGP), Annapurna Scheme, Mahila Udyam Nidhi, and STEP. Most respondents believe that these schemes facilitate access to finance, promote self-employment, enhance entrepreneurial skills, and support business sustainability. The positive perception indcates that government initiatives have been largely successful in creating opportunities for women entrepreneurs.

At the same time, a significant proportion of respondents expressed neutral opinionsregarding many schemes, which suggests gaps in awareness, understanding, or direct experience. This neutrality points toward the need for improved communication, outreach, and guidance mechanisms. Financial institutions and agencies such as SIDBI are generally viewed positively for their support, yet limited awareness about their role remains a concern. The role of banks in providing information about eligibility, procedures, and documentation is appreciated by many respondents, although inconsistencies in communication are evident.

The study also highlights several challenges faced by women entrepreneurs in accessing government schemes. Lengthy procedures and complex documentation processes areidentified as major deterrents, discouraging women from applying for financial assistance.Delays in loan sanctioning and disbursement significantly affect business planning and execution, particularly for small and early-stage enterprises. These procedural issues reduce the overall effectiveness of otherwise well-designed schem Furthermore, the findings indicate that lack of proper guidance and support is a critical issue.Many women entrepreneurs struggle to navigate application processes and scheme requirements due to insufficient counselling and mentorship. Gender bias in financial assistance approval is also perceived by a considerable proportion of respondents, indicating that social and institutional barriers continue to affect women's access to finance. Although not all respondents experienced discrimination, its presence remains a significant concern.

Despite these challenges, the study clearly demonstrates that government schemes have contributed positively to business growth, employment generation, and business sustainability. A majority of respondents agree that the schemes have helped them sustain their enterprises during difficult periods and have created additional employment opportunities. This highlights the important role of government support in strengthening women-led enterprises and promoting inclusive economic development.

In conclusion, the study establishes that government schemes play a vital role in empowering women entrepreneurs and fostering entrepreneurial growth. While the overall perception of these schemes is positive, their impact can be further enhanced through simplifiedprocedures, timely financial assistance, improved awareness, effective guidance, and gender-sensitive implementation. Strengthening these areas will not only improve the participation of women entrepreneurs but also contribute significantly to economic growth, social empowerment, and sustainable development.

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Employee Competency Development in Industry 5.0 A Systematic Literature Review

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Abstract

Industry 5.0 is emerging as a major industrial paradigm that emphasises human-centricity, sustainability, and resilience alongside advanced digital technologies. This shift has increased the importance of employee competency development, as organisations now require a workforce capable of collaborating effectively with intelligent systems while maintaining creativity, ethical responsibility, and continuous learning. The purpose of this systematic literature review is to synthesise existing research on employee competency development in the context of Industry 5.0 and to identify key competency trends, organisational practices, and research gaps. Using a structured review approach, relevant studies were identified through academic databases and screened based on predefined inclusion and exclusion criteria. The review highlights that Industry 5.0 competency development is increasingly shaped by digital upskilling, interdisciplinary skill requirements, human–machine collaboration, and competency-based training initiatives. Findings also show a growing focus on soft skills such as adaptability, problem-solving, critical thinking, emotional intelligence, and innovation, along with technical competencies such as AI awareness, data literacy, and digital fluency. The study concludes by outlining the practical implications for HR and organizational learning strategies and suggesting future research directions, including the need for validated competency frameworks, sector-specific competency models, and empirical evidence on competency development outcomes in Industry 5.0 workplaces.

Key words: Industry 5.0, competency development, workforce skills, human–machine collaboration, upskilling, reskilling, systematic literature review.

INTRODUCTION

Industry 5.0 represents a major shift in industrial development by emphasizing human-centricity, sustainability, and resilience along with advanced technologies. Unlike Industry 4.0, which mainly focused on automation, digitalization, and smart manufacturing, Industry 5.0 highlights the importance of human–machine collaboration, employee well-being, and value- driven production systems. This transition is redefining workplace requirements by demanding employees who possess not only technical and digital competencies, but also creativity, adaptability, ethical responsibility, and continuous learning capabilities [1], [2].

Employee competency development has therefore become a critical strategic priority for organizations seeking long-term competitiveness in the Industry 5.0 era. Modern workplaces increasingly demand competencies such as digital literacy, problem-solving ability, communication skills, innovation mindset, emotional intelligence, and resilience. These competencies are necessary for employees to effectively engage with advanced technologies such as artificial intelligence, cyber-physical systems, automation tools, and data-driven decision-making platforms [3], [4]. At the same time, organizations face significant challenges in identifying competency gaps, designing competency-based training frameworks, and building learning ecosystems that align with the dynamic needs of Industry 5.0 environments [5].

In this context, a systematic literature review becomes essential to consolidate existing studies, capture emerging competency trends, and identify research gaps. By synthesizing scholarly evidence on employee competency development in Industry 5.0, this study provides a structured understanding of the core competencies required, the organizational approaches adopted, and the future directions needed for workforce transformation [1], [3].

OBJECTIVES

- To identify the key employee competencies required in Industry 5.0 workplaces.
- To analyze the major trends and strategies used for employee competency development in Industry 5.0.
- To highlight research gaps and propose future directions for competency

development in the Industry 5.0 context.

RESEARCH QUESTIONS

RQ1: What are the key employee competencies required in the Industry 5.0 environment?

RQ2: What major trends and strategies are discussed in the literature for developing employee competencies in Industry 5.0?

RQ3: What research gaps exist in current studies on employee competency development in Industry 5.0, and what future research directions are suggested?

RESEARCH METHODOLOGY

This study adopts a Systematic Literature Review (SLR) methodology to synthesize and evaluate existing scholarly research on employee competency development in the context of Industry 5.0. A systematic approach was selected to ensure transparency, replicability, and reduced bias in the selection and analysis of literature. The review process was conducted using a structured procedure inspired by PRISMA guidelines, involving identification of studies, screening, eligibility assessment, and final inclusion for detailed review.

Data Sources and Search Strategy

To collect relevant studies, a comprehensive search was conducted across major academic databases such as Scopus, Web of Science, Google Scholar, and ScienceDirect. These databases were selected due to their wide coverage of peer-reviewed research in management, human resource development, industrial transformation, and emerging technologies. The search was performed using a combination of keywords related to Industry 5.0 and employee competency development. The search string included terms such as “Industry 5.0,” “employee competency,” “skill development,” “workforce upskilling,” “reskilling,” “human-machine collaboration,” “future skills,” “HRD,” and “training and development.” Boolean operators (AND/OR) were used to enhance the accuracy and relevance of the search results.

Inclusion and Exclusion Criteria

To ensure relevance and quality, the review followed predefined inclusion and exclusion criteria. Studies were included if they (i) focused on employee competencies or workforce skills in relation to Industry 5.0 or closely linked themes such as advanced manufacturing and human-centric digital transformation, (ii) were published in peer-reviewed journals, conference proceedings, or reputable reports, and (iii) were written in English. Studies were excluded if they were unrelated to competency development, focused purely on technical design without workforce implications, were duplicates, or lacked adequate conceptual or empirical contribution.

Screening and Selection Process

The screening process was conducted in multiple stages. First, titles and abstracts were reviewed to remove irrelevant papers and duplicates. Second, full-text screening was carried out to confirm alignment with the objectives and research questions of the study. Only studies that clearly addressed employee competency requirements, competency development strategies, or workforce transformation under Industry 5.0 were retained for final analysis. This structured screening ensured that the selected studies were relevant, credible, and aligned with the study scope.

d) Data Extraction and Analysis

After finalizing the selected studies, key information was extracted systematically. The extracted data included author details, year of publication, study context, competency categories discussed, competency development approaches, major findings, and implications. The analysis was performed using a thematic synthesis method, where recurring competency themes and development trends were grouped into broader categories. This enabled the identification of major competency clusters such as technical competencies, digital competencies, cognitive competencies, and behavioral or soft-skill competencies. Thematic analysis also supported the identification of research gaps and the formulation of future research directions.

Reliability and Validity of the Review Process

To maintain the reliability and validity of this review, clear criteria were used at each stage of selection and analysis. The use of multiple databases, structured screening, and consistent data extraction enhanced the robustness of the methodology. Further, the thematic grouping approach supported systematic interpretation and ensured that conclusions were derived from recurring evidence in the existing literature.

LITERATURE REVIEWS

Theme 1: Employee Competency Development in Industry 5.0

As part of the systematic literature review process, the selected studies were analysed through a structured data extraction method. The extracted data included author details, year of publication, study context, competency categories discussed, competency development approaches, major findings, and implications. This helped in organizing the literature under a thematic framework and enabled a clear synthesis of evidence related to employee competency development in Industry 5.0 workplaces.

The European Commission report on Industry 5.0 establishes that the future of industry must integrate human-centricity, sustainability, and resilience as core pillars of industrial transformation. It emphasizes that employees should not be treated merely as “resources” supporting machines, but as central contributors whose wellbeing, skills, and creativity are essential for long-term industrial success. The report also highlights the importance of workforce readiness through skill transformation, strongly positioning competency development as a key strategic priority in Industry 5.0 implementation [1].

Van Erp et al. propose a structured Industry 5.0 strategy framework that integrates sustainability, resilience, and human-centricity within industrial value creation processes. The study explains that Industry 5.0 transition is not only a technological shift, but also an organizational capability transformation, requiring employees to adapt to complex systems and contribute through judgment and engagement. This supports the argument that competency development must align with strategic transformation efforts, making skill readiness essential for Industry 5.0 success [2].

Hecklau et al. provide a strong foundation for competency development by discussing holistic human resource management within Industry 4.0 environments. The authors argue that automation increases the complexity of work roles, thereby demanding higher levels of employee competence and structured HR approaches to skill development. This study is highly relevant to Industry 5.0 because it supports the need for continuous learning and competency- based HR strategies to prepare employees for changing industrial requirements [3].

Carminati contributes directly to Industry 5.0 workforce literature by developing an integrative skills framework based on systematic review evidence. The study highlights that Industry 5.0 skill requirements extend beyond technical capability and include a balanced combination of digital competencies, sustainability orientation, resilience, and human-centric skills. It argues that human capital development is essential for Industry 5.0 transformation and provides useful insights for organizations and education systems to design competency development programs aligned with future workforce expectations [4].

Bernhard et al. present a dedicated Industry 5.0 competence model focused on production environments such as manufacturing, logistics, maintenance, and assembly. The study emphasizes that workers must undergo continuous retraining to meet growing technological complexity and evolving job roles. It also highlights structured competence modeling as a practical tool for identifying competency gaps and implementing targeted upskilling strategies. This strengthens the argument that Industry 5.0 competency development must be systematic, role-specific, and continuously updated for effective workforce readiness [5].

Theme 2: Digital Competencies For Workforce in Industry 5.0

Breque, De Nul, and Petridis (2021) present the Industry 5.0 framework from a European Commission policy perspective. In this context, the study highlights digital literacy and digital readiness as essential competency categories for employees working in technology- rich environments. The framework implies that digital competency development should be supported through strategic skill transformation initiatives to ensure workforce preparedness. The major finding is that Industry 5.0 requires employees to interpret digital workflows while ensuring human-centric and resilient industrial outcomes. This suggests that organizations must prioritize digital competency building as a foundational requirement for Industry 5.0 implementation [1].

Hecklau, Galeitzke, Flachs, and Kohl (2016), in the context of holistic HR management within Industry 4.0, explain that increasing digitalization transforms job roles and competency demands. The competency categories discussed include digital skills, smart system interaction, and technology-based problem-solving. The authors emphasize competency- based HR models and structured training approaches as key methods for continuous digital competency development. Their major finding is that employee digital capability is directly linked with operational efficiency and performance in digitalized workplaces. This indicates that building digital competencies is essential for organizations transitioning toward Industry

5.0 workforce readiness [2].

Li (2022), focusing on future-ready workforce development and skill transitions, highlights that technology adoption leads to major workforce skill shifts. In this study context, key competency categories include digital literacy, analytical thinking, and employability- related digital capability. The competency development approach emphasizes continuous reskilling and upskilling initiatives to prepare employees for evolving job requirements. The study finds that employees must continuously improve their digital skills to remain employable in technology-driven work environments. This implies that organizations must strengthen digital learning and upskilling strategies to support long-term workforce sustainability [6].

Carminati (2025) contributes to Industry 5.0 research through a systematic literature review focusing on future competency frameworks. The study discusses competency categories such as digital fluency, adaptability, and digital integration across job functions. It suggests that competency development should not focus only on technical usage, but also on building digital confidence and flexibility for employees across multiple roles. The key finding is that digital competencies act as enabling skills supporting multiple competency domains in Industry 5.0. This indicates that organizations should adopt integrated training models that develop digital competence as a strategic multi-functional capability [5].

Leon et al. (2023), in the context of Industry 5.0 workforce reskilling and upskilling strategies, highlight digital competencies as a critical requirement for adapting to changing job roles. The competency categories include technology readiness, digital collaboration skills, and continuous learning capability. The authors propose competency development approaches such as structured reskilling models, collaborative learning environments, and technology- enabled development platforms.

Their findings show that digital competency must be embedded into professional development systems because digital skill gaps directly affect workforce readiness. This implies that organizations must design digital development programs aligned with real operational and job requirements in Industry 5.0 workplaces [3].

Kolade (2022), discussing Employment 5.0 and the future of work transformation, explains that workplaces are increasingly influenced by digital disruption and automation. The competency categories emphasized include digital adaptability, technology awareness, and continuous learning orientation. The approach suggested is long-term workforce readiness planning supported through reskilling and capability building. The study's findings show that digital competency development reduces job displacement risks and strengthens workforce participation in digital economies. This implies that digital competencies are essential not only for productivity but also for sustainable employability in Industry 5.0 contexts [4].

Theme 3: Human-Centric & Soft Skills

Breque, De Nul, and Petridis (2021), through the European Commission's Industry 5.0 framework, strongly emphasize a shift from technology-first industrialization toward human- centric development. In this context, the competency categories discussed include collaboration, communication, creativity, and employee well-being related capabilities. The framework suggests that competency development should focus on strengthening human abilities that complement intelligent technologies, rather than replacing human roles. The major finding is that Industry 5.0 requires employees to build soft skills to enhance human–machine synergy and improve workplace effectiveness. This implies that organizations must design training systems that support interpersonal competence along with technical progress [1].

Carminati (2025), in a systematic review context, highlights that Industry 5.0 workforce transformation requires employees to develop strong human-centric competencies. The study discusses competency categories such as teamwork, leadership, adaptability, and decision- making skills. Carminati proposes that competency development approaches must integrate human-centric capabilities with technical readiness to achieve sustainable transformation. The major finding is that soft skills are equally important as technical skills, especially for achieving resilience and sustainability in Industry 5.0

workplaces. This implies that organizations should build balanced competency development models that prioritize both people-centered and technology-centered capability building [5].

Kolade (2022), in the context of Employment 5.0 and future-of-work transitions, explains that the workforce must adapt to technology-driven environments while maintaining creativity and autonomy. The study focuses on competency categories such as creativity, innovative behavior, adaptability, and independent problem-solving. It emphasizes competency development through

continuous learning and workplace empowerment strategies that allow employees to work effectively alongside automation. The major finding is that soft skills and innovative behavior are essential for long-term job success in future workplaces. This implies that organizations must encourage creative work cultures and support soft skill development as a key employability strategy [4].

Leon et al. (2023), in the context of reskilling and upskilling for Industry 5.0, suggest that competency development methods should promote teamwork-based learning and interactive development systems. The study highlights competency categories such as collaboration, communication, cooperative problem-solving, and social learning capability. The development approaches recommended include online communities of practice, workplace learning systems, and social learning tools that strengthen interpersonal competencies. The major finding is that collaborative skills and communication are critical mechanisms for effective workforce development in Industry 5.0. This implies that organizations should implement learning ecosystems that develop employees through shared knowledge, teamwork, and continuous interaction [3].

The European Commission's Industry 5.0 framework (Breque, De Nul, and Petridis, 2021) also identifies employee well-being as a central part of industrial transformation. In this study context, competency categories such as empathy, adaptability, and resilience are emphasized as key human-centric competencies. The framework implies that competency development must not only improve productivity but also ensure sustainable workplace culture and employee welfare. The major finding is that well-being oriented competencies help employees remain effective and engaged in high-change environments. This suggests that organizations must include resilience and emotional competency development as part of Industry 5.0 workforce strategy [1].

Li (2022), through Future of Jobs oriented workforce analysis, emphasizes that soft skills are increasingly demanded across industries due to automation and digitization. The study highlights competency categories such as critical thinking, creativity, and emotional intelligence as emerging employability requirements. It recommends competency development through continuous learning, reskilling programs, and workplace adaptability training. The major finding is that the future workforce must strengthen both interpersonal and cognitive soft skills to remain employable and effective. This implies that Industry 5.0 competency development must integrate human-centric skill building with technology skill readiness to support workforce sustainability [6].

Breque, De Nul, and Petridis (2021), through the European Commission’s Industry 5.0 framework, position sustainability and resilience as core industrial priorities. In this policy and industrial transformation context, the competency categories discussed include responsible decision-making, sustainability awareness, and ethical workplace behavior within technology- enabled systems. The framework implies that competency development must go beyond productivity goals and include responsibility-driven capability building in employees. The major finding is that Industry 5.0 requires employees who can work with advanced technologies while ensuring ethical and sustainable practices. This indicates that organizations should integrate sustainability and ethics training into workforce development strategies [1].

Carminati (2025), based on a systematic review of Industry 5.0 skills and competencies, highlights sustainability competencies as essential for future workforce readiness. The study context focuses on building integrative skill frameworks aligned with Industry 5.0 transformation. The competency categories emphasized include sustainability-oriented skills, environmental awareness, responsible work mindset, and resilience-linked employee capability. The review suggests that competency development approaches should incorporate sustainability-oriented learning and mindset development along with technical training. The major finding is that organizations must meet environmental and social expectations alongside productivity, making sustainability competency development unavoidable. This implies that sustainability competence should be treated as a core workforce capability rather than a secondary organizational initiative [5].

The European Commission's Industry 5.0 framework (Breque, De Nul, and Petridis, 2021) also stresses that employee competencies must align with responsible innovation and stakeholder value creation. In this industrial policy context, the competency categories discussed include ethical judgment, accountability, responsible technology use, and socially aligned decision-making. The framework suggests that competency development should support employees in balancing technological efficiency with societal and stakeholder needs. The major finding is that ethical competencies are essential in modern industrial transformation because Industry 5.0 emphasizes value-driven growth over purely profit-centered goals. This implies that organizations should embed ethical skill-building into leadership, HR policies, and competency development programs [1].

Li (2022), within the context of future workforce requirements and global skill transition trends, highlights that sustainability transitions and green economy goals are reshaping workforce skill demands. The competency categories identified include sustainability awareness, ethical judgment, adaptability to green work roles, and responsible decision- making. The study suggests that competency development approaches must include reskilling initiatives aligned with sustainability transitions and workforce readiness planning. The major finding indicates that employees require a combination of technology competence and sustainability awareness to remain relevant in future jobs. This implies that Industry 5.0 workforce development must integrate ethical and sustainability learning components into training and upskilling systems [6].

Kolade (2022), in the context of Employment 5.0 and socio-technical change, emphasizes that automation and digital transformation create social and ethical implications for work and employment. The competency categories discussed include ethical competence, social responsibility, adaptability, and awareness of technology-driven workforce impact. The study supports workforce development approaches that focus on continuous learning and responsible adaptation to technological change. The major finding is that ethical competence is required to manage the human impact of automation and ensure employee inclusion in future work systems. This implies that organizations must prepare employees not only with skills but also with ethical awareness to handle socio-technical workplace challenges [4].

The European Commission's Industry 5.0 framework (Breque, De Nul, and Petridis, 2021) further argues that industrial systems must respect planetary boundaries while supporting employee well-being. In this sustainability-driven transformation context, competency categories include sustainability competence, ethical workplace practices, resilience-building capabilities, and well-being supportive behavior. The framework implies that competency development should incorporate sustainable work practices and ethical performance standards as long-term workforce goals. The key finding is that sustainability and ethics are not optional in Industry 5.0, but essential for resilient and responsible industrial growth. This indicates that organizations must build workforce competencies that ensure environmental responsibility and ethical decision-making within daily operations [1].

Results and Discussion (Based on Themes, Objectives & Research Questions)

This systematic literature review analyzed employee competency development in the Industry 5.0 era by organizing findings into four major themes: technical competencies, digital competencies, human-centric and soft skills, and sustainability and ethical competencies. The results clearly show that Industry 5.0 competency development is not limited to advanced technologies alone, but requires an integrated workforce capability model that balances human well-being, productivity, and responsible industrial outcomes [1]. The discussion below is structured in alignment with the study objectives and research questions.

A. Results for RQ1: What are the key employee competencies required in Industry 5.0?

Technical competencies emerged as a fundamental requirement across the reviewed literature. Employees must be capable of handling smart production environments, automation workflows, and human–robot collaboration systems. These competencies enable individuals to perform effectively in technology-intensive workplaces and remain employable during rapid industrial change [1], [4]. The results also indicate that technical competency is closely linked with process understanding, interdisciplinary knowledge, and production technology familiarity, suggesting that future employees must possess strong operational and system-based technical awareness rather than only task-specific skills [2].

Digital competencies were strongly emphasized as an essential readiness factor for Industry 5.0. The reviewed studies highlight that employees must demonstrate digital literacy, digital fluency, and the ability to interpret digital workflows in technology-rich workplace contexts [1], [6]. In addition, research suggests that competency development must include analytical skills and adaptability to emerging systems, because digital transformation continuously redefines job roles and performance expectations [2], [5].

Furthermore, human-centric and soft skill competencies were consistently identified as equally important as technical skills. The results show a clear shift from technology-first industrial transformation to people-centered development, where collaboration, creativity, communication, emotional intelligence, and resilience are increasingly prioritized [1], [5]. These competencies strengthen human–machine synergy and help employees contribute value in complex decision-making, teamwork environments, and innovation-driven tasks [4].

Finally, the review confirms that sustainability and ethical competencies have become key competency requirements in Industry 5.0 workplaces. Employees are expected to develop responsible decision-making abilities, sustainability awareness, and ethical behavior while working with technology-enabled systems [1], [6]. These findings indicate that the Industry 5.0 workforce must not only be efficient and skilled, but also socially responsible and aligned with environmental priorities [5].

Results for RQ2: What trends and strategies are used for competency development in Industry 5.0?

The literature indicates a major shift in workforce development strategies from traditional training to continuous and structured competency development. A dominant trend is the rise of upskilling and reskilling programs, supported by strategic workforce planning. Studies stress that Industry 5.0 competency development requires structured decision-making models and training interventions aligned with real job requirements rather than generic skill programs [3]. This suggests that organizations are increasingly adopting competency mapping and targeted development pathways to ensure job-specific readiness in evolving work environments [2].

Another key trend identified is the growing integration of technical and digital competencies within a broader capability framework. Competency development is increasingly viewed as interdisciplinary, where technical knowledge must be supported with digital proficiency, adaptability, and continuous learning capabilities [5]. This supports the argument that Industry

5.0 demands hybrid competency profiles, not isolated skill sets.

Additionally, competency development strategies are shifting toward collaborative learning approaches such as teamwork-based learning, communities of practice, and social learning tools. These approaches are particularly important for developing communication, leadership, and collaborative competencies required for human-centric industrial systems [3]. The literature further highlights that employee well-being is being recognized as part of capability building, indicating that competency development strategies must support sustainable work cultures and not only productivity outcomes [1].

Results for RQ3: What gaps exist in the literature and what future directions are suggested?

Although the reviewed literature provides strong evidence on competency requirements, several gaps remain. First, studies frequently mention competency categories such as technical, digital, and soft skills, but there is limited agreement on a universally accepted, validated competency framework specifically designed for Industry 5.0 [1], [5]. This indicates the need for future research to develop standardized models that can be applied across industries while allowing contextual flexibility.

Second, the literature highlights the importance of sustainability and ethical competencies, yet limited empirical studies measure how effectively such competencies are developed through organizational training systems. Ethical competency development is often discussed conceptually, but real-world evidence on employee-level outcomes remains insufficient [6].

Third, many competency development discussions focus on future workforce needs, but fewer studies provide industry-specific competency models for sectors such as manufacturing, service, banking, healthcare, or education. Since Industry 5.0 impacts sectors differently, future research should focus on domain-specific competency frameworks and measurable competency indicators [4].

DISCUSSION (OBJECTIVE-WISE INTERPRETATION)

In line with the first objective, the review confirms that Industry 5.0 requires a balanced competency model where technical and digital competencies function as core capabilities, while human-centric and ethical competencies function as differentiating competencies that strengthen sustainability and resilience [1], [5]. This highlights that Industry 5.0 is not a replacement of Industry 4.0, but an extension that adds a stronger human and sustainability dimension to workforce readiness.

Regarding the second objective, the review shows that competency development trends emphasize continuous learning, structured reskilling, and collaborative training systems aligned with evolving job roles [3]. This suggests that organizations must invest in long-term workforce development strategies and move away from one-time training approaches.

Finally, consistent with the third objective, the review identifies gaps related to limited standardization of competency frameworks and insufficient empirical validation of competency development outcomes. Future studies should focus on measuring the effectiveness of competency development interventions, integrating employee well-being indicators, and exploring sector-wise competency differences in Industry 5.0 adoption [1], [6].

RESEARCH GAP (BASED ON SLR FINDINGS)

Lack of a standardized Industry 5.0 competency framework:

Although studies highlight technical, digital, and human-centric competencies, there is no universally accepted and validated competency model specifically designed for Industry 5.0 workplaces [1], [5].

Limited empirical validation of competency development outcomes:

Most literature discusses competency needs conceptually, but fewer studies provide measurable evidence on how competency development initiatives improve performance, productivity, or employability in Industry 5.0 contexts [3], [6].

mInsufficient sector-wise competency mapping:

Existing research often presents general skill requirements, while sector-specific competency models (manufacturing, service, healthcare, banking, etc.) remain limited, reducing practical applicability across industries [4].

Underexplored sustainability and ethical competency development practices: Sustainability and ethics are frequently emphasized as key Industry 5.0 pillars, but studies rarely explain how organizations practically train employees in ethical decision-making, responsible AI use, and sustainable behaviors [1], [6].

Weak integration between human-centric skills and technology skills:

Literature identifies both digital/technical skills and soft skills as essential, but there is limited research explaining how organizations integrate these competencies effectively into a single competency development system [5].

Lack of longitudinal research on continuous upskilling:

Many studies recommend lifelong learning and continuous reskilling, yet there is a shortage of long-term studies tracking competency development progress and workforce adaptation over time [3].

Limited focus on employee well-being as a competency indicator:

While Industry 5.0 stresses human-centricity and employee well-being, research rarely includes well-being metrics in competency development models or workforce performance evaluation [1].

FUTURE RESEARCH DIRECTIONS

Develop a standardized Industry 5.0 competency framework: Future studies should propose and validate a comprehensive competency model covering technical, digital, human-centric, and sustainability competencies specifically aligned to Industry 5.0 principles [1], [5].

Conduct empirical studies to measure competency outcomes:

Researchers should test how Industry 5.0 competency development programs impact employee performance, productivity, innovation, and employability using quantitative and mixed-method approaches [3], [6]. Design sector-specific competency models: Future research should create industry-wise competency frameworks for sectors like manufacturing, banking, healthcare, education, and services to improve practical relevance and implementation accuracy [4].

Explore effective reskilling and upskilling strategies:

More research is needed on structured training models, learning pathways, and digital learning interventions that support continuous competency development in Industry 5.0 workplaces [3].

Study the integration of human-centric skills with digital skills:

Researchers should investigate how organisations can effectively combine soft skills (creativity, empathy, teamwork) with digital skills (AI, analytics, automation) to create hybrid competency development systems [5].

Focus on sustainability and ethical skill-building mechanisms:

Future studies should explore how organisations can train employees in sustainability practices, ethical decision-making, responsible AI use, and data privacy awareness in real work settings [1], [6].

Conduct longitudinal and workforce transition studies:

Long-term research is required to track how employees adapt to Industry 5.0 job changes over time, including career progression, continuous learning behavior, and competency retention [3].

Include employee well-being and resilience indicators: Future competency research should incorporate well-being, resilience, and work-life balance as measurable outcomes, since Industry 5.0 emphasizes human-centric and sustainable workplaces[1].

CONCLUSION

This systematic literature review examined employee competency development in the context of Industry 5.0 by synthesizing evidence across four key competency themes: technical competencies, digital competencies, human-centric and soft skills, and sustainability and ethical competencies. The review confirms that Industry 5.0 demands a new workforce competency profile where employees must not only operate within advanced technological environments, but also contribute through creativity, collaboration, adaptability, and responsible decision-making. The findings clearly indicate that technical and digital competencies form the foundation for Industry 5.0 readiness, while human-centric and sustainability-oriented competencies ensure long-term organizational resilience and value- driven performance. Thus, competency development in Industry 5.0 represents a shift from traditional skill-building to integrated capability development aligned with both productivity and well-being priorities. Moreover, this review highlights that organizations must adopt continuous upskilling and reskilling strategies to address evolving job requirements shaped by automation, AI, and human–machine collaboration. However, gaps remain in terms of standardized competency frameworks, limited empirical validation, and insufficient sector-specific competency mapping. Future research should focus on developing validated Industry 5.0 competency models, evaluating training outcomes through empirical studies, and integrating sustainability, ethics, and employee well-being into workforce competency frameworks. Overall, employee competency development will remain a decisive factor in ensuring that Industry 5.0 transformation is not only technologically advanced, but also human-centered, sustainable, and socially responsible.

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Gamification in Tourism Marketing: Turning Travel into a Game to Attract Genz

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Abstract

This study examines the role of gamification in tourism marketing, with special focus on its impact on Gen Z travellers. In today's digital era, traditional marketing strategies are becoming less effective in attracting young travellers who prefer interactive, personalized, and engaging experiences. Gamification, which involves the use of game-like elements such as rewards, points, badges, and challenges, has emerged as an innovative marketing tool to enhance customer engagement in the tourism industry. The study aims to analyse how gamified features influence the travel decisions, engagement, and loyalty of Gen Z tourists. A descriptive research design was adopted, and primary data was collected through a structured questionnaire distributed via Google Forms. The study used convenience and snowball sampling techniques, and a total of 136 valid responses were collected from Gen Z respondents aged 18–26. Data was analysed using graphical tools such as bar charts, pie charts, and line charts. The findings reveal that gamification moderately influences travel choices and customer engagement among Gen Z travellers. Social media platforms, especially Instagram, play a significant role in tourism-related information sharing. Although awareness of gamification is moderate, game-based promotions positively impact brand interest and customer interaction. The study concludes that gamification is an effective and innovative marketing strategy that helps tourism businesses attract, engage, and retain Gen Z travellers by creating enjoyable and memorable digital experiences.

Key words: Gamification ,Tourism Marketing ,Gen Z Travellers ,Customer Engagement

INTRODUCTION

In today's competitive tourism industry, attracting and retaining the attention of travellers has become a major challenge for tourism businesses. With the rapid growth of digital technology and social media, traditional marketing methods are no longer sufficient to appeal to modern tourists, especially younger generations. Today's travellers seek unique, engaging, and memorable experiences rather than simple advertisements. As a result, tourism marketers are increasingly adopting innovative strategies to connect with customers in more meaningful ways.

One such modern strategy is gamification. Gamification involves the use of game-like elements such as points, rewards, challenges, badges, and leaderboards in non-game contexts to motivate and engage users. In tourism marketing, gamification transforms travel planning and travel experiences into enjoyable and interactive activities. Through mobile applications, virtual tours, loyalty programs, and social media campaigns, tourism companies encourage tourists to actively participate and feel engaged even before their journey begins.

Gamification is particularly effective in attracting Gen Z and millennial travellers, as they are highly comfortable with digital technology and prefer personalized and interactive experiences. By encouraging participation, competition, and rewards, gamification helps tourism businesses improve customer satisfaction, build brand loyalty, and increase repeat visits. It also allows companies to better understand customer preferences and creatively promote destinations.

This project aims to study the role of gamification in tourism marketing, with a special focus on its impact on Gen Z travellers. As Gen Z prefers digital, engaging, and interactive experiences, gamification helps tourism companies meet their expectations more effectively. By using game elements such as rewards, challenges, and virtual engagement, tourism marketers can increase customer interest, influence travel decisions, and encourage repeat visits among young tourists. Thus, gamification plays a vital role in strengthening tourism marketing strategies and enhancing competitiveness in the modern tourism industry. The study highlights the importance of gamification as an innovative marketing approach in the rapidly evolving tourism sector.

STATEMENT OF THE PROBLEM

Earlier studies have shown that gamification is an emerging marketing tool in the tourism industry that helps increase customer engagement through game-based elements such as rewards, points, and challenges. Research also suggests that young travellers, especially Gen Z, are more attracted to interactive and digital experiences. However, many studies highlight that there is limited understanding of how effectively gamification influences the travel decisions, engagement, and loyalty of Gen Z tourists. Most tourism businesses are still unsure about the practical impact of gamification strategies on this generation. Therefore, this study focuses on examining the role of gamification in tourism marketing and its effectiveness in attracting and engaging Gen Z travellers.

OBJECTIVES

To study the role of gamification in attracting and engaging Gen Z travellers.

To analyze how game-based features such as rewards, points, and challenges influence the travel choices of Gen Z tourists.

To examine the impact of gamification on customer engagement, brand loyalty, and repeat visits in the tourism industry.

SCOPE OF THE STUDY

This study focuses on understanding the role of gamification in tourism marketing, with special attention given to Gen Z travellers. It mainly examines how game-based elements such as rewards, points, and challenges influence travel decisions and customer engagement among young tourists. The study is limited to the tourism industry and considers only digital marketing platforms where gamification is commonly used. Other age groups and traditional marketing methods are not covered, as the study specifically aims to analyze the impact of gamification on Gen Z in the current digital environment.

SIGNIFICANCE OF THE STUDY

This study is significant as it highlights the growing importance of gamification in modern tourism marketing. With Gen-Z becoming a major segment of travelers, understanding their preferences for digital and interactive experiences is essential for tourism businesses. The study helps explain how turning travel into a game can increase customer engagement, influence travel decisions, and improve brand loyalty among Gen-Z tourists. It also provides useful insights for tourism marketers to design effective and innovative marketing strategies in the digital era. Overall, the study contributes to better understanding of gamification as a valuable tool for attracting and retaining young travelers in the competitive tourism industry.

RESEARCH METHODOLOGY

The study follows a descriptive research approach to understand how game-based marketing practices influence the behaviour and preferences of Gen Z travellers in the tourism industry. The research makes use of primary sources of data to gain a practical understanding of the topic. Primary data is collected through a structured questionnaire and distributed to Gen Z respondents through google form who regularly engage with digital platforms for travel planning and information.

DATA COLLECTION

The study relies on primary data collection to gain a direct and realistic understanding of how gamification influences Gen Z travelers in the tourism industry. A structured questionnaire was carefully designed to capture respondent's opinions, preferences, and engagement with gamebased marketing practices such as rewards, challenges, and interactive digital content. It consisted of both closed-ended and Likert scale questions, allowing respondents to express their level of agreement or disagreement with statements. The questionnaire was circulated through Google Forms, making it easily accessible to Gen Z respondents who frequently use digital platforms for travel planning, inspiration, and information. This approach allowed the researcher to collect responses from the target audience, ensuring that the data reflects real experiences and behaviors. By using primary data, the study aims to provide practical and relevant insights into the effectiveness of gamification in modern tourism marketing.

RESEARCH DESIGN

The study adopts a descriptive research design to gain a detailed understanding of how gamification is used in tourism marketing and how it influences the behaviour and preferences of Gen Z travelers. This approach is appropriate as it helps describe existing game-based marketing practices and examine how young tourists engage with elements such as rewards, points, challenges, and interactive digital platforms. The study does not involve controlling or manipulating variables; instead, it focuses on analysing real responses to reflect actual market conditions. Respondents were selected using convenience sampling and snowball sampling methods, which made it easier to reach Gen Z individuals familiar with digital travel platforms and gamified content. Convenience sampling allowed quick access to readily available participants, while snowball sampling helped expand the sample through participant referrals. The collected data was analysed using graphical analysis techniques, including bar charts, line charts, and pie charts, to clearly identify patterns, trends, and variations in engagement, preferences, and behaviour. This combined approach ensures that the findings are practical, realistic, and easy to interpret within the current digital tourism environment.

SAMPLE DESIGN

The sample design outlines the procedure adopted for selecting respondents for the study. Since the research focuses on understanding the impact of gamification in tourism marketing on Gen Z travelers, the sample was carefully selected to ensure that respondents were relevant to the objectives of the study. This helped in collecting reliable and meaningful data that accurately reflects Gen Z's behaviour, preferences, and engagement with gamified tourism marketing practices.

Target Population

The target population for this study includes Gen Z travelers, generally falling within the age group of 18–26 years, who regularly engage with digital media for travel inspiration, planning, and decision-making. This population is selected because of their strong connection with technology and preference for interactive and engaging online experiences. Studying this group helps in understanding the effectiveness of gamification as a marketing strategy in influencing young tourists.

Sampling Unit

The sampling unit comprises individual Gen Z respondents who:

Actively use digital platforms for travel planning and information.

Are familiar with gamified features such as rewards and interactive content.

Engage with digital media for travel inspiration and decision-making.

Sampling Technique

The study adopts convenience sampling and snowball sampling techniques to select respondents. Convenience sampling was used to reach easily accessible Gen Z individuals who actively engage with digital travel platforms, while snowball sampling helped in identifying additional respondents through referrals. These techniques enabled the collection of relevant and reliable data from participants who are familiar with gamified tourism marketing experiences.

Sample Size

The study considered a minimum sample size of 100 respondents to ensure adequate representation of Gen Z travelers. However, a total of 136 valid responses were collected, which improved the reliability and accuracy of the findings. The larger sample size helped in gaining a better understanding of Gen Z's engagement with gamification in tourism marketing.

Tools For Analysis

The study uses graphical analysis tools to analyse the data collected from the respondents. Visual techniques such as pie charts, line charts, and bar charts are used to present the data in a simple and understandable manner. These tools help in clearly identifying patterns, trends, and differences in the preferences, engagement levels, and behaviour of Gen Z travelers. Graphical representation also makes the findings easier to interpret and supports effective comparison of responses, ensuring that the results are practical and meaningful.

LIMITATIONS OF THE STUDY

- The study is limited to Gen Z travellers and does not include the views of other age groups.
- The data collected is based on respondents' personal opinions, which may vary from person to person.
- The study is based on primary data hence there are chances of personal bias.
- The study mainly focuses on gamification in digital tourism marketing and does not cover traditional marketing methods in detail.

FINDINGS

- The majority of respondents (58.8%) belong to the 18–20 age group, showing that the study largely represents young Gen Z individuals.
- Female respondents dominate the sample (68.4%), indicating higher participation of Gen Z women in tourism-related surveys.
- Most respondents are students (80.9%), which significantly influences travel behavior and digital engagement patterns.
- Most respondents (76.5%) have undertaken leisure travel in the past 12 months, with the majority traveling either once a year (44.3%) or 2–3 times a year (39.1%), indicating a generally moderate level of travel activity among Gen Z.
- Instagram is the most preferred digital platform for travel information (50.7%), highlighting the dominance of visual social media.
- Usage of travel apps and websites is generally low, with 32.4% rarely using them and 22.8% never using them.
- Awareness of gamification is moderate, with 39.7% aware, while a significant proportion are either unaware or unsure.
- Nearly half of the respondents (44.9%) have not noticed game-like features in travel apps, showing limited visibility of gamification.

- Game-based promotions moderately increase interest in tourism brands, though many respondents remain undecided.

SUGGESTIONS

- Tourism companies should increase awareness of gamification by clearly explaining gamebased features on their platforms.
- Since Gen Z prefers visual platforms, tourism marketers should focus more on gamified promotions through Instagram and social media.
- Travel apps and websites should introduce simple and user-friendly gamified features to increase usage frequency.
- Gamified elements should be made more visible to ensure users easily recognize rewards, points, and challenges.
- Gamified strategies should be designed creatively and made more visible to reduce neutral attitudes and increase user interest
- Gamification should be combined with traditional marketing methods to attract both interested and neutral users.
- Personalized gamified experiences should be offered to improve user satisfaction and brand loyalty.
- Easy and secure social-sharing options with privacy controls should be provided to encourage voluntary sharing of gamified travel achievements.
- Regular updates and user feedback should be used to continuously improve gamified tourism strategies.

CONCLUSION

The study concludes that gamification is an effective and innovative strategy in tourism marketing, particularly for attracting and engaging Gen-Z travelers. As Gen-Z is highly influenced by digital technology, mobile apps, and social media, traditional marketing methods alone are not sufficient to capture their interest. Gamification adds game-based elements such as rewards, points, challenges, and interactive activities, making travel planning and experiences more enjoyable and engaging.

The study shows that turning travel into a game increases customer participation and positively influences the travel decisions of Gen-Z tourists. Gamified tourism platforms help improve customer engagement, brand awareness, and loyalty by creating memorable and personalized experiences. Moreover, gamification enables tourism businesses to stay competitive in the digital era by offering creative and interactive marketing approaches. Overall, the study highlights that gamification is a valuable marketing tool that can enhance customer satisfaction, encourage repeat visits, and support the long-term growth of the tourism industry by effectively connecting with Gen-Z travelers

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Study on the "De-influencing" Trend and Its Impact on Gen Z Purchase Intentions

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Abstract

Social media significantly influences the purchasing behavior of Generation Z consumers. Recently, the de-influencing trend has emerged as a response to concerns about overconsumption, misleading promotions, and lack of authenticity in influencer marketing. This study examines the impact of de-influencing on Gen Z purchase intentions. Primary data were collected from 125 Gen Z respondents through a structured online questionnaire. The findings indicate that de-influencing increases awareness of misleading advertisements, encourages informed decision-making, and reduces impulsive buying behavior. Respondents reported greater caution before purchasing trending products and improved ability to identify paid endorsements and exaggerated claims. The study also reveals that de-influencing promotes responsible consumption and healthier spending habits. Overall, de-influencing plays a significant role in shaping Gen Z consumer attitudes by fostering critical thinking, transparency, and mindful purchasing decisions in the digital marketplace.

De-influencing ,Generation Z (Gen Z) ,Purchase Intention ,Social Media Marketing

INTRODUCTION

Social media has become an integral part of everyday life, especially for young people. Platforms such as Instagram, TikTok, and YouTube do more than entertain—they influence opinions, lifestyles, and buying decisions. Over the years, influencer marketing has grown rapidly, with content creators regularly promoting products and encouraging followers to try the latest trends. While this has helped brands reach wider audiences, it has also contributed to impulsive buying, overconsumption, and growing distrust toward paid promotions.

In response to these concerns, a new trend known as *de-influencing* has begun to gain attention. De-influencing involves influencers openly advising their followers not to buy certain products. Instead of promoting consumption, creators share honest reviews, point out misleading marketing claims, and highlight products that may be unnecessary, overpriced, or harmful to the environment. This trend, which has become especially popular on TikTok, encourages people to think more carefully before making purchase decisions.

Generation Z, often referred to as Gen Z, is particularly relevant to this discussion. As digital natives, Gen Z consumers spend a significant amount of time on social media and are constantly exposed to influencer content. At the same time, this generation is known for valuing authenticity, transparency, and social responsibility. Many Gen Z individuals are sceptical of traditional advertising and are more likely to trust content that feels honest and relatable. Because de-influencing aligns with these values, it has the potential to strongly influence how Gen Z consumers perceive products and decide whether to purchase them.

Studying the impact of de-influencing on Gen Z's purchase intentions is important for both academics and marketers. While influencer marketing has been widely researched, de-influencing is still a relatively new concept with limited scholarly attention. Understanding how and why de-influencing affects consumer behavior can help brands rethink their marketing strategies and encourage more ethical and transparent communication.

This study aims to explore the de-influencing trend and examine its influence on Gen Z's purchase intentions. By focusing on this emerging movement, the research seeks to provide insights into changing consumer attitudes and contribute to a better understanding of modern digital marketing in an age where mindful consumption is becoming increasingly important.

STATEMENT OF THE PROBLEM

Social Media Has Become A Powerful Influence On Consumer Buying Behavior, Particularly Among Generation Z. Influencer Marketing Has Traditionally Encouraged

Consumption By Promoting Products Through Sponsored Content And Endorsements. However, Increasing Concerns About Overconsumption, Misleading Promotions, And Lack Of Authenticity Have Led To Growing Scepticism Among Young Consumers.

In Response, The De-Influencing Trend Has Emerged, Where Content Creators Actively Discourage Audiences From Purchasing Certain Products By Sharing Honest Opinions And Highlighting Negative Aspects Of Consumption. While This Trend Is Gaining Popularity On Social Media Platforms, Especially Among Gen Z Users, There Is Limited Empirical Research Examining How De-Influencing Affects Their Purchase Intentions.

The Problem Addressed In This Study Is The Lack Of Clear Understanding Of Whether And How De-Influencing Content Influences Gen Z's Attitudes Toward Products And Their Intention To Purchase. Without Such Understanding, Marketers And Brands May Struggle To Adapt Their Strategies, And Researchers May Overlook An Important Shift In Digital Consumer Behavior. Therefore, This Study Seeks To Analyse The Impact Of The De-Influencing Trend On Gen Z Purchase Intentions And Identify The Key Factors That Shape This.

OBJECTIVES OF THE STUDY

- To examine the level of awareness of de-influencing among Gen Z consumers.
- To evaluate whether de-influencing leads to reduced impulse buying and overconsumption among Gen Z.
- To examine whether de-influencing helps Gen Z spot misleading promotions and paid endorsements

SCOPE OF THE STUDY

This study focuses on the de-influencing trend on social media and how it affects the purchase intentions of Generation Z consumers. The research specifically looks at Gen Z individuals, as they are highly active on platforms like Instagram, TikTok, and YouTube and are frequently exposed to influencer and de-influencer content.

The study examines how de-influencing messages influence Gen Z's attitudes toward products and buying decisions, with attention given to factors such as trust, authenticity, and ethical awareness. The research is limited to purchase intentions rather than actual buying behavior and does not focus on any specific brand or product category.

Due to time and sample limitations, the findings may not be applicable to all age groups or regions. However, the study aims to provide useful insights into how de-influencing is shaping consumer decision-making among Gen Z.

SIGNIFICANCE OF THE STUDY

This study is significant as it explores the growing de-influencing trend, an emerging concept in digital marketing that has received limited academic attention. By focusing on Generation Z, the research helps in understanding how this socially conscious and digitally active generation responds to content that discourages consumption rather than promotes it.

The findings of this study are valuable for marketers and brands, as they provide insights into changing consumer attitudes toward authenticity, trust, and ethical communication. Understanding the impact of de-influencing can help brands design more transparent and responsible marketing strategies that align with Gen Z's values.

From an academic perspective, this research contributes to existing literature

on influencer marketing and consumer behavior by introducing de-influencing as a distinct and relevant phenomenon. Additionally, the study may help policymakers and educators promote mindful consumption and responsible media use among young consumers.

Overall, the study offers practical and theoretical insights into how de-influencing influences Gen Z's purchase intentions in an evolving digital landscape.

RESEARCH METHODOLOGY

The study uses a descriptive and ploratory research design to understand the de-influencing trend and its impact on purchase intentions among Generation Z. This involves collecting first-hand information from respondents and analysing attitudes, behaviours, motivations, and opinions related to de-influencing content.

The primary data for this study was gathered through an online structured questionnaire administered to a purposive sample of Gen Z participants. The research design ensured detailed insights into how the de-influencing trend affects their purchase intention, with careful emphasis on ethical collection, reliability, testing, and appropriate analytical methods.

DATA COLLECTION

The present study is based on primary data collected specifically to understand the de-influencing trend and its impact on purchase intentions of Generation Z consumers. Primary data was gathered directly from respondents using a structured questionnaire, as it is the most effective method to capture opinions, attitudes, and behavioural intentions of Gen Z individuals.

The questionnaire was designed carefully to ensure clarity, relevance, and ease of understanding. It consisted of both closed-ended and Likert scale questions, allowing respondents to express their level of agreement or disagreement with statements related to influencer marketing and de-influencing content.

The survey was administered in online mode using platforms such as Google Forms, as Gen Z respondents are highly active on digital and social media platforms. The questionnaire link was circulated through social media platforms, WhatsApp groups, and college networks to ensure wider reach and better response rates.

The respondents selected for the study belong to the Gen Z age group and are

active users of social media platforms such as Instagram, TikTok, and YouTube, where de-influencing content is commonly observed. Participation in the survey was voluntary, and respondents were informed about the purpose of the study before answering the questionnaire.

RESEARCH DESIGN

The present study adopts a **descriptive research design** to examine the de-influencing trend on social media and its impact on the purchase intentions of Generation Z consumers. Descriptive research is appropriate for this study as it helps in understanding opinions, perceptions, and behavioural intentions of respondents related to a new and emerging phenomenon.

The study is **quantitative in nature** and relies on **primary data** collected through a structured questionnaire. The questionnaire is designed to measure respondents' exposure to de-influencing content, their perceptions of credibility and authenticity, and the influence of such content on their purchase intentions.

The target population for the study consists of **Gen Z individuals**, who are active users of social media platforms such as Instagram, TikTok, and YouTube. A **convenience sampling method** is used due to time and accessibility constraints.

The collected data are analyzed using appropriate statistical tools such as percentage analysis, mean scores, and correlation analysis to identify patterns and relationships between de-influencing and purchase intention.

Overall, this research design allows for a systematic and structured examination of how de-influencing content influences Gen Z consumers, while keeping the study feasible within the given time and resource limitations.

Sample Design

The sample design defines the procedure adopted for selecting respondents for the study. Since the research focuses on understanding the impact of the de-influencing trend on Generation Z, the sample was chosen carefully to ensure relevance and reliability of the data collected.

Target Population

The target population of the study consists of Generation Z consumers, generally falling within the age group of 18–27 years, who are active users of social media platforms such as Instagram, TikTok, and YouTube and are exposed to influencer and de-influencing content.

Sampling Unit

The sampling unit comprises individual Gen Z respondents who:

Regularly use social media

Are aware of influencer marketing or de-influencing content

Have experience in making online or offline purchase decisions

Sampling Technique

The study adopts a non-probability purposive sampling method.

This technique was chosen because:

The study specifically targets Gen Z consumers

Respondents needed prior exposure to social media content related to influencers

It allows the researcher to collect data from relevant and easily accessible participants within limited time and resources

Sample Size

A total of 125 respondents were selected for the study.

The sample size was considered adequate to:

Represent the opinions of Gen Z consumers

Provide meaningful insights into the de-influencing trend

Enable effective statistical analysis

Tools For Analysis

The data collected through the structured questionnaire was coded, classified, and analyzed using appropriate statistical and analytical tools to achieve the objectives of the study. The tools selected helped in simplifying the data, identifying patterns, and interpreting the impact of the de-influencing trend on Gen Z purchase intentions.

An appropriate statistical tool is used for analysis. Descriptive analysis is applied, with percentage analysis presented through pie chart to interpret the data effectively.

LIMITATIONS OF THE STUDY

This study has certain limitations that should be considered while interpreting the findings. The research focuses only on Generation Z, and therefore the results cannot be generalized to other age groups. The study is limited to understanding purchase intentions rather than actual buying behaviour, which may differ in real-life situations.

The findings are based on respondents' self-reported opinions, which may be influenced by personal bias or social desirability. The study also does not focus on a specific social media platform, product category, or brand, which may limit deeper insights into platform-specific or product-specific effects.

Additionally, the research is constrained by time and sample size, which may affect the overall representation of the

Population. Since de-influencing is a relatively new and evolving trend, changes in social media dynamics over time may also influence the relevance of the findings

FINDINGS

- Among the total respondents, the majority (55.4%) belong to the age group of 18–20 years, indicating that early Gen Z forms the major sample of the study.
- The study reveals that female respondents constitute 66.9% of the total respondents, while males account for 33.1%.
- The data shows a well-educated population, with 66.2% of respondents being undergraduates and 17.7% postgraduates.
- Majority of respondents (76.2%) have a monthly personal spending capacity below ₹5,000, indicating limited discretionary spending power.
- Instagram is the most frequently used social media platform, used by 79.2% of respondents, followed by YouTube with 19.2%.
- Most respondents watch product-related content on social media either sometimes (36.9%) or often (31.5%).
- Half of the respondents (50%) are aware of the term de-influencing, while a significant portion are either unaware or unsure.
- A majority of respondents (46.9%) reported that they do not feel strong social media pressure to purchase trending products.
- Instagram (64.6%) is the primary platform where respondents are exposed to de-influencing content.
- A considerable number of respondents (43.8%) agree or strongly agree that they understand the concept of de-influencing.
- Many respondents (36.9%) agree that they frequently encounter de-influencing content on social media.

- The majority of respondents (62.3%) check reviews or de-influencing content before making online purchases.
- A significant proportion of respondents believe that de-influencing supports informed buying decisions.
- The study reveals that many respondents pay attention to content explaining why certain products are not worth buying.
- De-influencing content has increased awareness of misleading promotions among respondents.
- A large number of respondents reconsider or skip buying trending products after watching de-influencing content.
- Respondents report identifying unnecessary products and spending less on popular but non-useful gadgets.
- The majority of respondents (62.3%) check reviews or de-influencing content before making online purchases.
- A significant proportion of respondents believe that de-influencing supports informed buying decisions.
- The study reveals that many respondents pay attention to content explaining why certain products are not worth buying.
- De-influencing content has increased awareness of misleading promotions among respondents.
- A large number of respondents reconsider or skip buying trending products after watching de-influencing content.
- Respondents report identifying unnecessary products and spending less on popular but non-useful gadgets.
- The study shows a reduction in impulsive purchasing and wasteful spending due to de-influencing.
- Respondents have developed healthier buying habits and greater awareness of overconsumption.
- Many respondents are able to identify hidden paid promotions, misleading claims, and fake demonstrations.

* The findings reveal reduced blind trust in influencer endorsements and lower chances of falling for overhyped or scam products.
* Overall, de-influencing has increased awareness of unethical and misleading marketing practices among Gen Z consumers.

SUGGESTIONS

* Influencers should focus on transparency and honesty while discussing both positive and negative aspects of products.
* Brands should adopt ethical marketing practices and avoid misleading or exaggerated promotional strategies.
* Educational institutions can promote digital literacy to help Gen Z critically evaluate online content.
* Social media platforms should strengthen guidelines for disclosure of paid promotions and sponsored content.
* Content creators should continue producing informative de-influencing content to support responsible consumption.
* Consumers should be encouraged to verify information from multiple sources before making purchase decisions

CONCLUSION

The study on the de-influencing trend and its impact on Gen Z purchase intentions highlights the growing shift towards conscious and informed consumption among young consumers. De-influencing has emerged as an effective counterforce to traditional influencer marketing by encouraging Gen Z to question promotional messages, identify misleading claims, and avoid unnecessary purchases. The findings reveal that exposure to de-influencing content has reduced impulsive buying behaviour, increased awareness of overconsumption, and promoted healthier purchasing habits. Gen Z consumers increasingly value authenticity, transparency, and honest product evaluations, leading to reduced blind trust in influencer endorsements. Overall, the study concludes that de-influencing plays a significant role in shaping Gen Z’s purchase intentions by fostering critical thinking and responsible consumer behaviour in the digital marketplace.

Dr.BGR Publications

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AI-Powered Robo-Advisors in Financial Services: A Systematic Literature Review

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ABSTRACT

Artificial Intelligence (AI)-powered robo-advisors have emerged as a major FinTech innovation that is reshaping financial services by automating portfolio management, investment recommendations, and wealth advisory functions. These digital advisory platforms combine AI algorithms, machine learning, and data-driven decision-making to deliver personalized and low-cost investment solutions, thereby expanding access to wealth management services beyond traditional high-net-worth segments. However, the fast growth of robo-advisory has also raised significant concerns related to customer trust, algorithmic transparency, financial risk governance, regulatory compliance, and ethical use of customer data. This study presents a systematic literature review to synthesize and structure existing research on AI-powered roboadvisors in financial services. Following a PRISMA-guided screening approach, the review identifies and classifies prior studies into key thematic areas including adoption drivers, investor behaviour, service quality, portfolio outcomes, risk

management, and regulatory challenges. The findings highlight that perceived usefulness, cost efficiency, ease of use, and trust are major determinants of adoption, while issues such as explainability, cybersecurity threats, and limited human interaction remain critical barriers. The paper concludes by outlining future research directions focusing on hybrid advisory models, explainable AI, stronger regulatory frameworks, and inclusive digital wealth strategies in emergingmarkets.

Keywords: Artificial Intelligence (AI), Robo-Advisors, FinTech, Wealth Management, Digital Financial Services, Investor Behaviour, Trust, Systematic Literature Review

INTRODUCTION

Financial services form the backbone of economic systems, covering banking, insurance, investment, asset management, and advisory services (Gomber et al., 2018). Traditionally, wealth management has depended on human financial advisors who provide personalized planning, risk alignment, and support during market uncertainty (Shetty et al., 2026). However, human-centric advisory models face challenges such as behavioural biases, limited scalability, inconsistent service quality, and affordability barriers for small investors (Jung et al., 2019; Kahneman, 2011). As a result, many individuals remain underserved due to time, location, and cost constraints associated with traditional advisory services (Jung et al., 2018).

In response, the financial sector has increasingly adopted digital transformation through AI and data-driven platforms (Gomber et al., 2018). Artificial intelligence enhances automation, efficiency, and personalization across financial applications such as fraud detection, customer engagement, and portfolio management (Davenport et al., 2020; Verma et al., 2021). A major outcome of this shift is the emergence of robo-advisors, which provide automated investment recommendations and portfolio services using algorithm-based models (Jung et al., 2018). Robo-advisors offer scalable and low-cost wealth management solutions, and their adoption is influenced by factors such as perceived usefulness, ease of use, and trust (Nourallah et al., 2023; Seiler & Fanenbruck, 2021).

Despite their advantages, robo-advisors raise concerns related to transparency, cybersecurity, privacy, and the "black box" nature of AI decision-making, which can reduce investor confidence (Buhmann et al., 2020; Nourallah et al., 2023). Additionally, the existing literature remains fragmented, with limited synthesis of outcomes such as risk minimization, performance, and inclusion across different markets (Fatima & Chakraborty, 2024; Nain & Rajan, 2024). Therefore, this study conducts a systematic literature review on AI-powered robo-advisors in financial services to consolidate key themes, identify research gaps, and propose future directions focusing on explainable AI, governance mechanisms, and hybrid advisory models in emerging markets (Boreiko & Massarotti, 2020; Reher & Sokolinski, 2024).

PROBLEM STATEMENT

Although AI-powered robo-advisors are increasingly adopted in financial services as a costeffective and scalable alternative to traditional human advisory, there remains limited consolidated understanding of how these platforms influence wealth management outcomes and investor decision-making. Existing studies are fragmented across themes such as technology acceptance, trust formation, behavioural responses, portfolio performance, and regulatory concerns, making it difficult to draw a holistic conclusion about the effectiveness and risks of robo-advisory systems. Moreover, concerns related to algorithmic transparency, data privacy, cybersecurity threats, and potential bias in automated recommendations continue to challenge user confidence and regulatory readiness. These issues are more critical in emerging markets, where digital literacy and institutional support vary widely, creating uncertainty regarding the sustainable adoption and governance of robo-advisors. Therefore, a systematic synthesis of prior research is required to clarify key adoption drivers, outcomes, and

challenges of AI-powered robo-advisors in wealth management and to identify future research directions for building reliable, transparent, and inclusive digital advisory systems.

Objectives of the Study

- To systematically review existing research on AI-powered robo-advisors in financial services and wealth management.
- To identify and synthesize key themes such as adoption drivers, trust, service quality, and investment outcomes related to robo-advisory platforms.
- To highlight research gaps and propose future research directions.

Research Methodology

RESEARCH DESIGN

This study adopts a Systematic Literature Review (SLR) approach to examine the existing body of research on AI-powered robo-advisors in financial services, with a specific focus on their role in wealth management. A systematic review method is appropriate because it allows the researcher to identify, evaluate, and synthesize academic studies using a structured and transparent process. Since robo-advisory research is multidisciplinary, covering finance, technology, consumer behaviour, and regulation, the SLR method helps in organizing fragmented studies into meaningful themes and drawing evidence-based conclusions. To strengthen the review process and ensure clarity in reporting, the study follows a PRISMAguided screening approach for selecting relevant articles.

Data Sources and Literature Search

The literature for this review was collected from reputed academic databases such as Scopus, Web of Science, and Google Scholar, as these sources provide wide coverage of peer-reviewed studies in finance, management, information systems, and fintech research. These databases were chosen to ensure that the selected studies were credible and academically valid. In addition to database searching, backward reference searching was also applied, where the reference lists of shortlisted papers were checked to identify additional relevant articles that could contribute to the review. This combined search approach helped to capture both foundational studies and recent research related to robo-advisors and artificial intelligence in wealth management.

SEARCH STRATEGY AND KEYWORDS

A structured keyword-based search strategy was used to retrieve studies directly related to the research topic. Keywords and search strings were selected based on common terminology used in the robo-advisory and fintech literature. The major search terms included “robo-advisor,” “robo-advisory,” “artificial intelligence,” “AI in wealth management,” “automated financial advice,” “digital investment platforms,” and “algorithmic advisory services.” These keywords were applied individually as well as in combinations using Boolean operators such as AND and OR to refine the search output. For example, combinations such as “robo-advisor AND artificial intelligence” and “robo-advisory AND wealth management” helped in filtering studies that specifically addressed AI-enabled advisory services in investment and wealth management settings.

INCLUSION AND EXCLUSION CRITERIA

To maintain quality and relevance, clear inclusion and exclusion criteria were applied during the selection of research articles. Studies were included only if they primarily focused on roboadvisors or AI-based advisory platforms within financial services and wealth management contexts. Preference was given to peer-reviewed journal articles written in English, as they ensure academic reliability and standardized reporting. At the same time, studies were excluded if they were duplicated records, irrelevant to robo-advisory or AI-driven financial advice, or lacked clear academic contribution. Articles such as editorials, opinion pieces, and conference abstracts were not considered because they may not provide sufficient depth, empirical evidence, or validated findings required for systematic analysis.

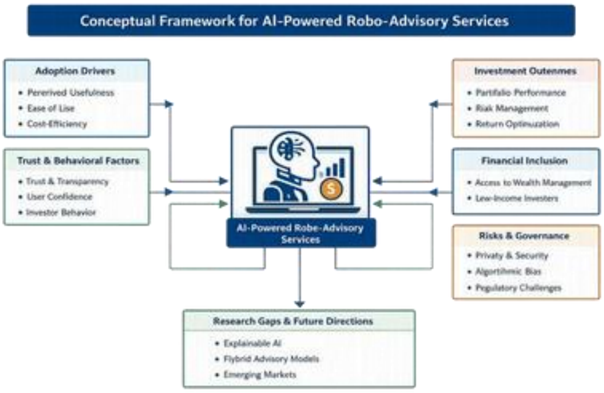
SCREENING AND SELECTION PROCESS (PRISMA APPROACH)

The study followed a systematic screening and selection process aligned with PRISMA guidelines to finalize the literature sample. During the identification stage, articles were collected from multiple databases using the selected keywords. After removal of duplicates, the remaining studies were screened using their titles and abstracts to check whether they were relevant to the research focus. Articles that appeared relevant were then subjected to full-text review in the eligibility stage to confirm their suitability based on the inclusion criteria. Only those studies that met the criteria and contributed directly to understanding AI-powered roboadvisors in financial services were retained for the final analysis. This staged procedure ensured that the final selection of papers was methodologically sound and closely aligned with the objectives of the review.

DATA EXTRACTION AND THEMATIC ANALYSIS

After selecting the final set of studies, data extraction was carried out to capture essential information from each article in a consistent manner. This included author name and publication year, research objectives, methodological approach, key findings, and major themes addressed. The extracted information was then analyzed using thematic analysis, where patterns and repeated concepts across studies were grouped into broader categories. The themes identified in this study include the evolution and role of robo-advisors in wealth management, the impact of AI and automation on advisory services, adoption factors such as trust and perceived usefulness, investment outcomes including risk and portfolio performance, and challenges related to privacy, transparency, and regulation. This thematic structure enabled the study to provide a clear and organized synthesis of the existing literature.

CONCEPTUAL REVIEW



This conceptual framework explains that **AI-powered robo-advisory services** act as the central digital system transforming wealth management by providing automated, data-driven investment guidance. The model highlights that the adoption of robo-advisors is primarily influenced by **adoption drivers** such as perceived usefulness, ease of use, and cost efficiency, while **trust and behavioural factors** like transparency, user confidence, and investor behaviour play a crucial role in strengthening acceptance and continued usage. As users engage

with robo-advisory platforms, the expected outcomes include improved **investment performance**, better **risk management**, and enhanced **return optimization**, alongside broader benefits such as **financial inclusion** by expanding access to wealth management for small and low-income investors. However, the effectiveness and sustainability of robo-advisors are challenged by **risks and governance issues** including privacy and security concerns, algorithmic bias, and regulatory uncertainties, indicating the need for stronger safeguards. Finally, the framework emphasizes future research directions such as **explainable AI**, **hybrid advisory models**, and deeper examination of robo-advisor adoption in **emerging markets** to support more transparent, reliable, and inclusive digital wealth management systems.

LITERATURE REVIEW

Jung, Dorner, Glaser, and Morana (2018) explained robo-advisory as a major outcome of digitalization in financial advisory services, where automation and algorithm-based processes replace or support traditional financial advisors. Their work highlights the foundational role of robo-advisors in offering scalable and efficient advisory services and establishes the conceptual base for studying technology-driven wealth management models.

Jung, Glaser, and Köpplin (2019) expanded the discussion by emphasizing the opportunities and risks of robo-advisory for the future of financial services. They pointed out that while roboadvisors improve accessibility and efficiency, they also introduce concerns related to trust, privacy, system reliability, and changes in the advisor–client relationship. Their study supports the argument that robo-advisory adoption is not only a technological issue but also a behavioural and risk-based issue.

Seiler and Fanenbruck (2021) examined the acceptance of robo-advisory solutions in Germany and found that user adoption depends strongly on technology acceptance elements such as perceived usefulness, perceived ease of use, and confidence in digital investment platforms. Their work contributes to understanding the factors that influence customer intention to adopt robo-advisors, particularly in retail investment contexts. Nourallah, Öhman, and Amin (2023) strongly emphasized that trust is essential for robo-

advisory usage and adoption, as customers may refuse algorithmic financial advice when trustbuilding mechanisms are weak. Their research highlights that trust-building factors such as transparency, platform reliability, and security perceptions directly shape user willingness to engage with robo-advisory services.

Belanche, Casaló, Flavián, and Loureiro (2025) proposed a behavioural model that explains robo-advisor usage through benefit–risk evaluation by investors. Their findings suggest that users adopt robo-advisors when perceived benefits such as convenience and cost efficiency outweigh perceived risks such as privacy concerns and lack of human judgement. This work supports the inclusion of behavioural drivers in robo-advisory adoption frameworks.

Bashir, Ali, Munir, and Takreem (2023) used bibliometric mapping to study the intersection of finance, investment behaviour, and robo-advisory research. Their analysis shows that roboadvisory has become an expanding field, especially focusing on household investors, digital investment platforms, and technology-based decision-making. This paper helps justify the need for systematic reviews to consolidate scattered findings in robo-advisory research. Bashir,

Farooq, Iqbal, and Aamir (2025) studied robo-advisor adoption among young retail investors in Pakistan and identified trust as a key mediating variable between platform features and adoption outcomes. Their research indicates that trust strengthens continued usage intention and investor participation, especially in emerging economies where technology growth may exceed financial literacy. This supports the relevance of trust as a central mechanism in robo-advisory success.

Boreiko and Massarotti (2020) analyzed how investor risk profiles affect robo-advised portfolios and highlighted that robo-advisors can produce different portfolio outcomes depending on investor risk tolerance and behavioural traits. Their study reinforces the role of algorithmic portfolio design in matching investments with risk preferences and contributes to robo-advisory performance discussion in wealth management. D’Hondt, De Winne, Ghysels, and Raymond (2020) explored who benefits most from robo-

investing and showed that AI-based advisory systems can support better investment decisions by reducing bias and improving decision consistency. Their study suggests that some investors—especially those prone to emotional or biased investing—may benefit more from algorithmic support than from traditional advisory models.

Capponi, Olafsson, and Zariphopoulou (2020) contributed to robo-advisory research by discussing personalized robo-advising through client interactions and emphasizing that effective robo-advisors should incorporate client-specific information into automated investment decision processes. Their work supports the idea that AI-powered advisory becomes more valuable when personalization is strengthened using interactive and adaptive systems.

Reher and Sokolinski (2024) studied robo-advisors and access to wealth management, showing that robo-advisory can improve inclusion by reducing traditional barriers such as high minimum investment requirements and high advisory fees. Their work is important for understanding robo-advisors as tools for expanding wealth management participation and promoting access among underserved groups.

Fatima and Chakraborty (2024) focused on the adoption of AI-based robo-advisors in India and explained how factors such as perceived value, digital readiness, and risk concerns shape customer acceptance. Their study provides emerging-market evidence and indicates that adoption patterns in India are influenced by both technological benefits and concerns about privacy and trust, making it relevant for strengthening regional research contributions. Nain and

Rajan (2023) explored the landscape of robo-advisors in India using a qualitative approach and highlighted that robo-advisory adoption depends on market awareness, digital capability, and trust in algorithm-driven investment tools. Their study adds context-specific insights on how robo-advisors are viewed in developing markets and supports the inclusion of emerging-market perspective in robo-advisory research.

Buhmann, Paßmann, and Fieseler (2020) discussed algorithmic accountability and highlighted the importance of transparency and responsible governance in algorithm-driven systems. Their work is highly relevant for robo-advisory services because investment recommendations require accountability and trust, and AI systems must be designed to reduce reputational and ethical risks arising from opaque decision-making. Zhu, Han, Liu, Li, and Che (2025) presented evidence of AI-driven financial innovation through a robo-advisor system designed for robust returns across diversified markets. Their work emphasizes the potential of AI to optimize investment outcomes using advanced algorithms and supports the argument that robo-advisors can enhance performance through data-driven diversification and market responsiveness.

Findings and Discussion Theme 1: Evolution and Growing Role of Robo-Advisors in Financial Services

The literature indicates that robo-advisors have emerged as one of the most significant digital transformations in financial advisory services, mainly driven by FinTech innovation and increasing demand for technology-enabled investment solutions. Research highlights that roboadvisors represent the automation of traditional advisory tasks such as investor profiling, asset allocation, and portfolio rebalancing using algorithmic systems (Jung et al., 2018). Scholars note that robo-advisory has evolved beyond a basic automation tool into an advanced wealth management platform supported by AI and data analytics, which enables scalable service delivery and greater operational efficiency (Gomber et al., 2018). At the same time, studies argue that robo-advisors are reshaping advisory practices by reducing dependence on human advisors and enabling more standardized, structured portfolio decisions (Jung et al., 2019). Overall, the development of robo-advisors reflects the financial industry's shift toward digitally driven models that can expand investment access and reduce advisory costs.

THEME 2: AI INTEGRATION AND ALGORITHMIC DECISION-MAKING IN ROBO-ADVISORY

A major theme across the reviewed studies is the role of artificial intelligence in strengthening robo-advisory services through automation, personalization, and analytical decision-making. AI-powered systems are increasingly used to analyze investor data, generate personalized recommendations, and optimize portfolios based on risk-return profiles (Capponi et al., 2020). Scholars emphasize that machine learning and predictive analytics enhance robo-advisory performance by improving customer profiling and helping platforms deliver investment strategies that match investor goals (Davenport et al., 2020). The literature also highlights that AI reduces behavioural inconsistency by offering structured advice supported by data, which may improve portfolio discipline among investors (D'Hondt et al., 2020). However, studies note that algorithmic decision-making also introduces concerns related to explainability, as many AI models operate like "black box" systems where investors may not understand why certain recommendations are provided (Buhmann et al., 2020). Thus, AI integration is seen both as a driver of robo-advisory innovation and as a factor creating new trust and governance requirements.

THEME 3: ADOPTION DRIVERS AND TECHNOLOGY ACCEPTANCE

Another key finding is that customer adoption of robo-advisors is strongly shaped by technology acceptance and perceived value factors. Research indicates that perceived usefulness, ease of use, and cost efficiency are major determinants of user intention to adopt robo-advisory platforms, particularly among retail investors (Seiler & Fanenbruck, 2021). Studies show that robo-advisors appeal to customers who prefer convenient, digital investment services that are affordable and available without extensive human interaction (Belanche et al., 2025). The literature also suggests that adoption is influenced by financial experience and individual familiarity with digital technologies, meaning that digitally confident users are more likely to accept robo-advisory recommendations (Nourallah et al., 2023). In emerging markets, studies reveal that awareness and digital readiness can become decisive factors, as many potential investors may still lack exposure to robo-advisory solutions (Fatima & Chakraborty, 2024; Nain & Rajan, 2023). Therefore, the findings confirm that adoption is not purely determined by technological availability but also by perceived value and customer capability.

THEME 4: TRUST, RISK PERCEPTION, AND INVESTOR BEHAVIOUR

Trust emerges as one of the most important themes in robo-advisory research, as investors often hesitate to rely on AI-driven advice for high-stake financial decisions. Several studies highlight that trust significantly affects adoption intention and continued usage, especially when users perceive robo-advisors as reliable, transparent, and secure (Nourallah et al., 2023). In particular, research suggests that trust can function as a mediating factor connecting platform features with investor adoption outcomes, meaning that even advanced robo-advisor features may not lead to adoption unless trust is developed (Bashir et al., 2025). Behavioural finance perspectives further suggest that robo-advisors may reduce emotional investing and encourage disciplined decisionmaking, which can benefit investors who are susceptible to behavioural biases

(D’Hondt et al., 2020). However, the lack of human reassurance and relationship-based engagement can still act as a barrier, especially for conservative or older investors (Jung et al., 2019). Overall, the literature demonstrates that trust and behavioural perception are central to robo-advisory success and must be addressed through transparency and customer confidence- building mechanisms.

THEME 5: WEALTH MANAGEMENT OUTCOMES AND PORTFOLIO PERFORMANCE

The reviewed studies also discuss the potential of robo-advisors to improve investment outcomes through structured portfolio management practices. Robo-advisors are reported to support risk-based asset allocation and systematic portfolio rebalancing, which can improve long-term investment discipline and diversification outcomes (Boreiko & Massarotti, 2020). Scholars argue that automated systems may help investors avoid impulsive market reactions by maintaining consistent investment strategies aligned with risk tolerance levels (D’Hondt et al., 2020). Some studies highlight that AI-based advisory models can generate robust investment outcomes by applying advanced portfolio optimization and diversified allocation mechanisms (Zhu et al., 2025). However, the literature also indicates that the performance of robo-advisors can vary depending on system design, risk profiling accuracy, and market conditions, suggesting that robo-advisors are not universally superior to human advisory services in all situations (Jung et al., 2019). Therefore, robo-advisory outcomes are generally positive in terms of discipline and diversification, but effectiveness depends on model reliability and investor compatibility.

THEME 6: FINANCIAL INCLUSION, CHALLENGES, AND REGULATORY CONCERNS

A significant contribution of robo-advisory services is their potential to expand financial inclusion by providing low-cost access to wealth management for underserved investors. Studies argue that robo-advisors reduce traditional entry barriers such as high advisory fees and minimum investment requirements, thereby enabling broader participation in investment markets (Reher & Sokolinski, 2024). This inclusive impact is particularly relevant in emerging economies where many individuals lack access to professional financial guidance (Fatima & Chakraborty, 2024). However, the literature also highlights key challenges that limit sustainable expansion, including privacy risks, cybersecurity threats, algorithmic bias, and regulatory uncertainty (Buhmann et al., 2020; Jung et al., 2019). Researchers emphasize that governance mechanisms and regulatory frameworks must evolve to ensure accountability, fairness, and transparency in robo-advisory services (Buhmann et al., 2020). Hence, while robo-advisors offer opportunities for inclusion and efficiency, responsible regulation and risk management remain essential for long-term adoption and trust.

RESEARCH GAP

Although existing studies provide valuable insights into the evolution, adoption, and operational efficiency of AI-powered robo-advisors, the literature remains fragmented across technological, behavioural, and regulatory dimensions. A major gap is the limited focus on **explainable AI (XAI)** and transparency mechanisms that help investors understand how roboadvisors generate recommendations, which is critical for strengthening trust and long-term adoption (Buhmann et al., 2020; Nourallah et al., 2023). Furthermore, while many studies emphasize adoption factors such as perceived usefulness and ease of use, comparatively fewer studies offer strong evidence on **investment outcomes** such as risk-adjusted performance, portfolio stability, and long-term wealth creation across diverse market conditions (Boreiko & Massarotti, 2020; Jung et al., 2019). In addition, research in **emerging markets** is still limited, even though contexts such as India and other developing economies have different levels of digital literacy, risk perception, and regulatory maturity, which may significantly influence robo-advisory acceptance (Fatima & Chakraborty, 2024; Nain & Rajan, 2023). These gaps indicate the need for more comprehensive research on transparency, governance, and contextual adoption patterns to support reliable and inclusive robo-advisory systems.

FUTURE SCOPE

Future research should strengthen the understanding of how robo-advisors can be designed to improve **trust and transparency**, especially through explainable AI tools that make algorithmic decisions easier for investors to interpret. Enhancing transparency can reduce perceptions of “black box” decision-making and can improve investor confidence, particularly when financial decisions involve risk and uncertainty

(Buhmann et al., 2020; Nourallah et al., 2023). Researchers should also explore how robo-advisors can incorporate behavioural finance principles in a more advanced manner, such as identifying investor biases, encouraging longterm discipline, and supporting goal-based investing through personalized nudges and adaptive decision support (D'Hondt et al., 2020). In addition, more empirical studies are required to evaluate the comparative effectiveness of robo-advisors under volatile market conditions, including the role of AI in portfolio rebalancing, risk management, and return optimization (Zhu et al., 2025).

Another promising direction is the development and evaluation of **hybrid advisory models**, where human expertise is combined with AI-based advisory systems to offer a balanced wealth management approach. Hybrid models may address customer concerns related to emotional support and relationship-based guidance while retaining the efficiency and scalability of roboadvisors (Jung et al., 2019). Future research should also focus on the robo-advisory ecosystem in emerging markets by examining adoption barriers such as digital competence, awareness, trust-building, and financial literacy, along with the role of institutions and regulators in strengthening consumer protection (Fatima & Chakraborty, 2024; Reher & Sokolinski, 2024). Finally, regulatory research should emphasize ethical governance, algorithmic accountability, and data privacy standards to ensure responsible AI usage in financial advisory services and to improve the sustainability of robo-advisory platforms (Buhmann et al., 2020).

CONCLUSION

AI-powered robo-advisors have become a significant innovation in financial services by offering automated, scalable, and cost-efficient wealth management solutions. The reviewed literature indicates that robo-advisors are reshaping investment advisory practices through algorithmic portfolio management, risk-based asset allocation, and technology-driven personalization. Factors such as perceived usefulness, ease of use, and affordability influence adoption, while trust and transparency remain critical in determining user acceptance and continued engagement. Robo-advisors are also linked with improved investment discipline and expanded access to advisory support, particularly for retail and underserved investors.

However, the literature also highlights challenges that limit the sustainable growth of roboadvisory services, including cybersecurity risks, privacy concerns, algorithmic bias, and regulatory uncertainty. These issues raise important concerns regarding accountability, transparency, and governance in AI-driven financial decision-making. Therefore, future advancement of robo-advisors requires stronger explainable AI mechanisms, ethical governance, and more inclusive advisory frameworks. Overall, this systematic literature review contributes by synthesizing key themes, identifying research gaps, and proposing future research directions to support transparent, trustworthy, and inclusive AI-powered roboadvisory services in both developed and emerging financial markets.

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A STUDY ON FINANCIAL PERFORMANCE AND STABILITY OF TATA MOTORS PASSENGERS VEHICLES LIMITED

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Abstract

The Indian automobile industry plays a crucial role in economic growth, and Tata Motors Limited has emerged as one of the leading manufacturers in the passenger vehicle segment. Tata Motors Passenger Vehicles has shown significant improvement in its financial and operational performance in recent years due to increasing demand for safer and technologically advanced vehicles, government support for electric mobility, and a strong product portfolio. However, the company faces challenges such as intense market competition, rising production costs, supply chain disruptions, and the need for continuous investment in new technologies. This study analyzes the financial performance and stability of Tata Motors Passenger Vehicles Limited over a period of five years by examining profitability, liquidity, solvency, and efficiency through financial statements and ratio analysis. The study aims to assess the overall financial health of the company and provide useful insights for investors, management, and researchers regarding its ability to sustain growth in a competitive environment.

Keywords: Financial Performance, Passenger Vehicles, Tata Motors Limited, Ratio Analysis

INTRODUCTION

The Indian automobile industry plays a vital role in the country's economic growth by generating employment, supporting industrial development, and contributing significantly to GDP. Among the major players in this sector, Tata Motors Limited has established a strong reputation as one of India's leading automobile manufacturers. The Passenger Vehicles division of Tata Motors focuses on the production of cars, SUVs, and electric vehicles that emphasize safety, innovation, and quality. With popular models such as Nexon, Punch, Altroz, and Tiago EV, the company has gained a strong presence in the Indian market and continues to attract a wide range of customers.

In recent years, Tata Motors Passenger Vehicles has shown notable improvement in both operational and financial performance. The company has benefited from increasing demand for passenger vehicles, growing consumer preference for safer and technologically advanced cars, and a strategic shift towards electric mobility. Government initiatives promoting electric vehicles and sustainable transportation have further supported this growth. At the same time, the company faces several challenges such as intense market competition, rising production costs, supply chain disruptions, and the need for heavy investment in new technologies. These factors have a direct impact on the financial performance and stability of the company.

In this context, the present study aims to analyze the financial performance and overall financial health of Tata Motors Passenger Vehicles over a period of five years. The study focuses on evaluating profitability, liquidity, solvency, and efficiency through the use of financial statements and ratio analysis. By examining trends and financial indicators, the research seeks to understand how effectively the company has managed its resources and how well it is positioned to face future challenges. The findings of this study are expected to provide useful insights for investors, management, researchers, and students interested in the financial performance of companies in the Indian automobile industry.

STATEMENT OF THE PROBLEM

Despite its strong brand image and growing presence in the Indian automobile market, Tata Motors Passenger Vehicles faces several challenges that affect its financial performance and long-term stability. Intense competition from domestic and global automobile manufacturers has increased pressure on pricing, market share, and profitability. Rising production costs due to higher raw-material prices and semiconductor shortages have further reduced operating margins. Frequent supply-chain disruptions have caused production delays and affected timely delivery of vehicles, leading to customer dissatisfaction. At the same time, rapidly changing consumer preferences towards technologically advanced and electric vehicles require continuous innovation and heavy investment. These high investments in research, battery technology, and infrastructure place additional strain on financial resources. Fluctuating market conditions, policy changes, and economic uncertainties further add to the complexity of maintaining consistent financial performance. As a result, Tata Motors Passenger Vehicles finds it challenging to achieve stable growth while balancing costs, competition, and future-oriented investments. Hence, a detailed study of the company's financial performance is necessary to understand its strengths, weaknesses, and ability to sustain long-term growth.

SCOPE OF THE STUDY

The study focuses exclusively on the Passenger Vehicles division of Tata Motors, covering all models under this segment, including cars, SUVs, and electric vehicles. The financial performance analysis emphasizes revenue generation, profitability, liquidity, solvency, and operational efficiency.

OBJECTIVES OF THE STUDY

- To analyze the financial performance of Tata Motors Passenger Vehicles Limited by examining revenue, expenses, and profit trends using the Profit and Loss Account over a period of five years.
- To evaluate the liquidity, solvency, and profitability position of the company with the help of Balance Sheet and Profit and Loss Account data through appropriate financial ratio analysis.
- To assess the overall financial position and stability of Tata Motors Passenger Vehicles Limited based on a comparative and trend analysis of Balance Sheet and Profit and Loss Account figures.

RESEARCH METHODOLOGY

Research Design

The study adopts a descriptive and analytical research design. It aims to provide a detailed evaluation of the financial performance and stability of Tata Motors Passenger Vehicles Limited over a five-year period. The research focuses on collecting, organizing, and analyzing financial data to identify trends, patterns, and areas of strength or weakness.

Data Collection

The study uses secondary data obtained from authentic sources, including:

Annual reports of Tata Motors Passenger Vehicles Limited for the last five financial years.

Financial statements, including the Balance Sheet and Profit and Loss Account.

Reports from financial databases, stock exchanges, and company websites.

Relevant literature, industry reports, and research papers on the Indian automobile sector.

a) Period of Study

The research covers a period of five financial years, which provides sufficient data to evaluate trends and assess long-term financial performance. This period allows for the analysis

of fluctuations, growth patterns, and financial stability of the company.

b) Tools and Techniques for Analysis

The study employs quantitative financial analysis tools, including:

Financial Ratio Analysis:

Profitability Ratios (e.g., Net Profit Margin, Return on Assets, Return

on Equity) to assess the company's ability to generate profits.

Liquidity Ratios (e.g., Current Ratio, Quick Ratio) to measure short-term financial stability.

Solvency Ratios (e.g., Debt to Equity Ratio, Interest Coverage Ratio) to evaluate long-term financial obligations.

Efficiency Ratios (e.g., Asset Turnover Ratio, Inventory Turnover Ratio) to analyze resource utilization and operational efficiency.

Trend Analysis:

Comparative study of revenue, expenses, and profits over the five-year period.

Graphical representation of financial trends to identify growth patterns or declines.

Comparative Analysis:

Year-on-year comparison of key financial indicators to understand changes in performance and stability

RESULT AND ANALYSIS

Table 4.1

Table showing Revenue Trend of Tata Motors Passengers Vehicles

Year	**Total Revenue (₹ Cr)**
2020–21	2,52,437.94
2021–22	2,81,507.25
2022–23	3,50,600.15
2023–24	4,43,877.69
2024–25	4,45,939.00

Source : (Secondary data)

Table 4.1 reveals the **continuous increase in revenue** over the five-year period, indicating strong sales growth and improved market demand for Tata Motors Passenger Vehicles

Table 4.2

Table showing Total Expenses Trend (₹ Crore)

Year	**Total Expenses (₹ Cr)**
2020–21	2,49,151.20
2021–22	2,87,881.08
2022–23	3,49,133.13
2023–24	4,15,645.32
2024–25	4,11,896.00

Source:(Secondary data)

Table 4.2 revels total expenses increased during the study period due to rising raw material costs, employee expenses, and operational costs. However, expense growth was **lower than revenue growth in recent years**, indicating improved cost control.

Table 4.3

Table showing Profit/Loss Trend (₹ Crore)

Year	**Net Profit / Loss (₹ Cr)**
2020–21	13,016.14
2021–22	11,234.70
2022–23	2,353.49
2023–24	31,106.95

2024–25	27,862.00

Source : (Secondary data)

Table 4.3 reveals the company suffered losses during 2020–21 and 2021–22, but showed a strong turnaround from 2022–23 onwards. Substantial profits in the last two years reflect improved operational efficiency and financial performance.

Table 4.4

Table showing Liquidity Position

Year	Current Assets (₹ Cr.)	Current Liabilities (₹ Cr.)	Current Ratio
2020–21	1,46,887.64	1,57,749.18	0.93
2021–22	1,46,977.54	1,50,682.81	0.98
2022–23	1,51,528.47	1,55,027.33	0.98
2023–24	1,68,392.15	1,73,617.00	0.97
2024–25	1,60,325.00	1,66,684.00	0.96

Source:(Secondarydata)

Table 4.4 reveals the current ratio remained below the ideal standard of 2:1 throughout the study period, indicating moderate liquidity pressure. However, the ratio stayed close to 1, suggesting that the company was able to meet short-term obligations with careful working- capital management.

Table 4.5

Table showing Solvency Position

Year	Total Debt (₹ Cr.)	Shareholders' Funds (₹ Cr.)	Debt–Equity Ratio
2020–21	1,14,775.56	55,246.72	2.08
2021–22	1,39,677.04	44,554.85	3.13
2022–23	1,25,660.47	47,819.33	2.63
2023–24	98,500.09	87,464.19	1.13
2024–25	62,499.00	1,18,607.00	0.53

Source : (Secondary data)

Table 4.5 reveals that the debt–equity ratio shows a significant improvement over time. High leverage in earlier years declined sharply by 2024–25 due to reduced borrowings and increased shareholders' funds, indicating strong improvement in long-term solvency and financial stability.

Table 4.6

Table showing Profitability Position

Year	Net Profit (₹ Cr.)	Revenue (₹ Cr.)	Net Profit Margin (%)
2020–21	13,016.14	2,52,437.94	5.16
2021–22	11,234.70	2,81,507.25	3.99
2022–23	2,353.49	3,50,600.15	0.67
2023–24	31,106.95	4,43,877.69	7.01
2024–25	27,862.00	4,45,939.00	6.25

Source : (Secondary data)

Table 4.6 reveals that the company recorded losses in the initial two years, but profitability improved significantly from 2022–23 onwards. The sharp rise in net profit margin during 2023–24 and 2024–25 reflects effective cost control, better pricing strategy, and improved operational efficiency

Table 4.7

Table showing the Overall Financial Position and Stability of Tata Motors Passenger Vehicles Limited (Five-Year Trend Analysis)

Aspect	Observation from Balance Sheet / P&L	Trend Identified	Interpretation
Shareholders Funds	Increased significantly in recent years due to rise in reserves and surplus	Upward trend	Indicates strengthening of equity base and improved financial stability
Long-term Borrowings	Declined sharply over the study period	Downward trend	Shows reduced dependence on debt and improved solvency stability position
Total Assets	Steady increase over five years	Upward trend	Reflects expansion, asset creation, and investment in future growth
Revenue from Operations	Consistent growth year after year	Strong upward trend	Indicates rising sales, market acceptance, and competitive strength
Net Profit / Loss	Shift from losses to substantial profits	Positive turnaround	Demonstrates recovery, better cost control, and improved efficiency
Expense Management	Expenses increased but at a slower rate than revenue in recent years	Controlled growth	Shows effective operational and financial management

Overall position	Financial	Improved capital structure and profitability	Stable and strengthening	Confirms improved long-term financial healthlong-term financial health

FINDINGS

- Tata Motors' passenger vehicle revenue shows a consistent year-on-year growth from 2020– 21 to 2024–25, indicating steady business expansion.
- Revenue increased significantly from ₹2,52,437.94 Cr in 2020–21 to ₹4,45,939.00 Cr in 2024–25, reflecting strong overall performance.
- The highest growth jump is observed between 2022–23 and 2023–24, suggesting improved market demand and sales momentum during this period.
- Although growth continued in 2024–25, the increase was marginal compared to the previous year, indicating a possible stabilization phase after rapid expansion.
- Tata Motors' total expenses show an overall upward trend from 2020–21 to 2023–24, reflecting business expansion and higher operational activity.
- Expenses increased from ₹2,49,151.20 Cr in 2020–21 to ₹4,15,645.32 Cr in 2023–24, indicating a substantial rise in cost structure over the years.
- The sharpest increase in expenses occurred between 2021–22 and 2022–23, suggesting higher production, input, or operating costs during this period.
- In 2024–25, total expenses declined to ₹4,11,896.00 Cr, showing improved cost control and operational efficiency compared to the previous year.
- Tata Motors recorded positive net profits in all five years, indicating consistent profitability without any loss during the period.

- Net profit declined steadily from ₹13,016.14 Cr in 2020–21 to ₹2,353.49 Cr in 2022–23, reflecting pressure on margins in the initial years.
- A sharp turnaround is observed in 2023–24, with profit rising significantly to ₹31,106.95 Cr, the highest in the study period.
- Although profit slightly decreased to ₹27,862.00 Cr in 2024–25, it remained substantially higher than earlier years, showing sustained financial improvement
- The current ratio of Tata Motors remained below 1 throughout the period, indicating that current liabilities consistently exceeded current assets.
- There was a slight improvement in liquidity from 0.93 in 2020–21 to 0.98 in 2021–22 and 2022–23, showing better short-term financial management.
- The current ratio declined marginally after 2022–23, falling to 0.97 in 2023–24 and 0.96 in 2024–25, suggesting minor pressure on liquidity.
- Overall, the liquidity position remained relatively stable but weak, highlighting the need for stronger short-term solvency and working capital management.
- The debt–equity ratio was very high in the initial years, peaking at 3.13 in 2021–22 indicating heavy dependence on borrowed funds.
- From 2022–23 onwards, a continuous decline in the debt–equity ratio is observed, reflecting improved capital structure and reduced financial risk.
- The sharp fall in the ratio to 1.13 in 2023–24 and further to 0.53 in 2024–25 indicates

  significant debt reduction and strengthening of shareholders' funds.
- By 2024–25, Tata Motors achieved a conservative and healthy leverage position, suggesting improved financial stability and lower solvency risk.
- The net profit margin showed a declining trend from 2020–21 (5.16%) to 2022–23 (0.67%), indicating significant pressure on profitability in the initial years.

- Despite rising revenue, profitability weakened sharply in 2022–23, reflecting higher costs and lower operational efficiency.
- A strong recovery in profitability is observed in 2023–24, with the net profit margin increasing to 7.01%, the highest during the study period.
- In 2024–25, the net profit margin slightly declined to 6.25%, but it remained robust, suggesting sustained improvement in overall profitability.

SUGGESTIONS

Based on the study's findings, here are some suggestions

- Tata Motors should strengthen its liquidity position by increasing current assets or reducing short-term liabilities, as the current ratio remains below the ideal level of 1.
- Continued focus on cost control and expense management is recommended to prevent expenses from rising faster than revenue in future years.
- The company should maintain its improved debt–equity structure by avoiding excessive borrowing and prioritizing internal funding sources.
- Efforts should be made to stabilize net profit margins, especially after the sharp fluctuations observed during the study period.
- Tata Motors can enhance profitability by improving operational efficiency through better supply chain management and production optimization.
- The strong revenue growth trend should be supported by market expansion and product innovation, particularly in electric and passenger vehicles.

- The company should build adequate working capital reserves to ensure smooth day-to-day operations and meet short-term obligations comfortably.
- Greater emphasis on cost-efficient technologies and automation can help sustain profit growth while controlling operating expenses.
- Management should closely monitor financial ratios periodically to identify early warning signals and take corrective measures in time.
- A balanced approach between growth, profitability, and financial stability should be adopted to ensure long-term sustainability and shareholder value creation

CONCLUSION

In conclusion, the study reveals that Tata Motors Passenger Vehicles Limited has shown considerable improvement in its financial performance during the five-year period from 2020–21 to 2024–25. The company achieved steady growth in revenue, improved profitability, strengthened solvency position, and enhanced overall financial stability through effective management practices and efficient utilization of resources. Although the liquidity position remained moderate, the company was able to manage its short-term obligations effectively. The reduction in debt dependence and improvement in profit margins indicate strong operational efficiency and sound financial planning. Overall, the study confirms that Tata Motors Passenger Vehicles Limited is financially stable and well-positioned for future growth and sustainability in the Indian automobile industry.

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Effect of Online Flash Discounts on Consumer Purchase Intentions in Online Clothing Shopping: A Regional Study

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Abstract

The rapid digital transformation of retail markets has fundamentally altered consumer purchasing behavior, particularly in the online apparel segment. Online clothing shopping has witnessed exponential growth due to increased internet penetration, smartphone usage, digital payment systems, and changing consumer lifestyles. In this highly competitive digital environment, online retailers continuously employ various promotional strategies to attract consumers, among which online flash discounts have emerged as one of the most influential and widely adopted tools. Flash discounts are typically characterized by substantial price reductions offered for a very limited time, often accompanied by scarcity cues such as limited stock availability, thereby creating urgency and stimulating quick purchase decisions. This study examines the effect of online flash discounts on consumer purchase intentions in online clothing shopping, with specific reference to a regional context. The research seeks to understand how consumers perceive flash discounts, the extent to which such promotions influence their buying intentions, and the post-purchase experiences associated with flash discount purchases. The study also explores critical factors such as discount depth, price sensitivity, impulse buying behaviour, product quality perceptions, and consumer satisfaction levels in the context of online apparel shopping. A descriptive research design was adopted for the study. Primary data were collected from 100 respondents using a structured questionnaire designed to capture demographic characteristics, online clothing shopping habits, awareness and exposure to flash discounts, motivations for purchase, satisfaction levels, and challenges faced during flash sale transactions. Secondary data were sourced from academic journals, research articles, conference proceedings, and authoritative online publications to establish a theoretical foundation and support the empirical findings. The collected data were analyzed using percentage analysis and interpretative methods to derive meaningful insights. The findings reveal that online flash discounts have a significant influence on consumer purchase intentions, particularly among young, student-based, and price-sensitive consumers. Higher discount percentages strongly motivate purchases by enhancing perceived value and encouraging impulse buying behavior. However, the study also identifies several challenges associated with flash discount purchases, including concerns about product quality, limited availability of preferred sizes or designs, and issues related to returns and refunds. While flash discounts are effective in driving short-term sales and attracting consumer attention, they do not consistently ensure postpurchase satisfaction or long-term customer loyalty. The study concludes that online flash discounts are a powerful short-term promotional strategy in online clothing shopping, but their long-term effectiveness depends on maintaining product quality, transparency, and consumer trust. The insights derived from this research are valuable for academicians, researchers, and industry practitioners seeking to understand consumer behavior and design sustainable promotional strategies in the evolving digital apparel market.

Keywords: Online Clothing Shopping; Flash Discounts; Consumer Purchase Intention; Ecommerce Promotions; Apparel Retailing

INTRODUCTION

The rapid expansion of e-commerce has significantly transformed consumer purchasing behaviour, particularly in the online clothing segment. Increased internet penetration, widespread use of smartphones, and the convenience of digital payment systems have encouraged consumers to shift from traditional brick-and-mortar stores to online platforms for purchasing apparel. Online clothing shopping offers consumers several advantages such as convenience, access to a wide range of brands and styles, competitive pricing, and the ability to compare products across multiple platforms. Consequently, the apparel segment has emerged as one of the most dynamic and competitive categories in the online retail industry. Despite its growth, online clothing shopping involves a higher level of perceived risk compared to other online product categories. Consumers often face uncertainties related to size, fit, fabric quality, color accuracy, and post-purchase services such as returns and refunds. To reduce such uncertainties and stimulate demand, online apparel retailers increasingly rely on promotional strategies. Among these, online flash discounts have gained significant importance. Flash discounts are time-bound promotional offers that provide substantial price reductions for a limited period and are often accompanied by scarcity cues such as limited stock availability and countdown timers. These features create a sense of urgency and encourage consumers to make quick purchase decisions. Consumer purchase intention plays a crucial role in understanding online buying behaviour, as it reflects the likelihood or willingness of a consumer to purchase a

product. In online clothing shopping, purchase intention is influenced by multiple factors including price sensitivity, discount depth, perceived value, brand trust, customer reviews, and previous shopping experiences. Flash discounts intensify these influences by combining economic incentives with psychological triggers such as fear of missing out (FOMO) and impulse motivation. While flash discounts are effective in encouraging immediate purchases, their impact on consumer satisfaction and long-term loyalty remains uncertain. Several studies suggest that although flash discounts successfully drive short-term sales, they may also result in post-purchase dissatisfaction if product quality does not meet consumer expectations or if return and refund policies are restrictive. In the online clothing segment, such dissatisfaction can be more pronounced due to the experiential nature of apparel products. Therefore, it becomes essential to examine not only the influence of flash discounts on purchase intentions but also consumers' post-purchase perceptions and overall satisfaction. In this context, the present study aims to examine the effect of online flash discounts on consumer purchase intentions in online clothing shopping within a specific regional context. The study adopts a descriptive research design to analyze consumer perceptions and behavioral responses toward flash discount promotions. Primary data were collected through a structured questionnaire administered to 100 respondents. Judgemental sampling technique was employed to select respondents who had prior experience with online clothing shopping and exposure to online flash discount offers, ensuring that the participants possessed relevant knowledge to provide meaningful responses. Secondary data were sourced from academic journals, research articles, books, conference proceedings, and credible online sources to support the theoretical framework of the study. The collected primary data were analyzed using percentage analysis and interpretative methods, supported by tables and graphical representations to facilitate clarity and understanding of consumer responses. Although the study provides valuable insights, it is subject to certain limitations. The sample size of 100 respondents may not fully represent the entire population of online clothing shoppers. The use of judgemental sampling involves researcher discretion, which may introduce selection bias and limit the generalizability of the findings. Furthermore, the

study is confined to a specific geographical region, and the reliance on self-reported data may be influenced by respondent subjectivity and recall bias. The use of descriptive analytical tools also restricts the ability to establish causal relationships between online flash discounts and consumer purchase intentions. Despite these limitations, the study contributes meaningful insights into consumer behavior in the online clothing segment and provides a foundation for future research. By examining consumer awareness, purchase motivations, satisfaction levels, and challenges associated with flash discount purchases, the study offers valuable implications for both academic research and managerial decision-making. The findings are expected to assist online apparel retailers in designing promotional strategies that balance short-term sales objectives with long-term consumer trust and satisfaction

REVIEW OF LITERATURE

Previous studies on online consumer behavior emphasize the significant role of price promotions in influencing purchase intentions. Researchers have consistently found that discounts act as a powerful external stimulus that attracts consumers and encourages trial purchases, particularly in online retail environments.

1.Ilmah, Pebrianggara, and Yani (2024) conducted an empirical study focusing on flash sale strategies adopted by the apparel brand Uniqlo. Their research examined the combined effects of online advertising, search engine optimization, and time pressure on consumer purchase intention during flash sale events. The study found that digital marketing tools such as targeted online advertisements and optimized search visibility significantly enhance consumer awareness and interest in flash sales. Although time pressure alone did not show a strong direct effect in this specific case, the authors noted that when combined with brand trust and promotional communication, flash sales effectively influence purchase intention. This study is particularly relevant to the online clothing segment, as it demonstrates that flash discounts are more effective when supported by strong brand positioning and marketing communication, rather than relying solely on urgency.

2.Katiman, Tamengkel, and Walangitan (2025) focused on the impact of flash sales and price discounts on impulsive buying behavior among university students using the Shopee platform. The findings revealed that flash sales have a significant and positive influence on impulsive purchasing behavior, whereas ordinary price discounts showed a comparatively weaker effect. The authors explain that the success of flash sales lies in their ability to create psychological pressure through scarcity and limited availability, which encourages consumers to act quickly without extensive evaluation. This study reinforces the idea that flash discounts are particularly effective among young, student-based consumers who are highly active online and sensitive to promotional cues. The relevance of this research to the present study lies in its emphasis on urgency-driven buying behavior in online retail environments.

3.Martaleni et al. (2022) examined the role of consumer emotions in the relationship between flash sales and online impulse buying. Their study revealed that flash sales significantly intensify emotional responses such as excitement, fear of missing out (FOMO), and pleasure, which in turn lead to impulsive purchase behavior. Interestingly, the authors found that flash sales do not always directly cause impulsive buying unless emotional responses are triggered, highlighting the mediating role of emotions. This study contributes an important psychological perspective to flash discount research, suggesting that consumer purchase intention is not influenced by price reductions alone, but also by emotional stimulation. In the context of online clothing shopping, where visual appeal and emotional engagement are critical, this finding is particularly significant.

4.Vongurai (2021) investigated factors influencing consumer attitudes and purchase intentions toward flash sales using the Theory of Planned Behavior. The study identified attitude toward flash sales as the strongest predictor of purchase intention, followed by subjective norms and perceived behavioral control. The author emphasized that consumers who view flash sales as beneficial and trustworthy are more likely to engage in such promotions. This study highlights the importance of psychological and attitudinal factors in shaping purchase intentions during flash sales. It also suggests that repeated exposure to unreliable or low-quality flash discount experiences may negatively affect consumer attitudes, thereby reducing future purchase intentions.

Collectively, the reviewed studies indicate that online flash discounts significantly influence consumer purchase intentions by combining economic incentives with psychological triggers such as urgency, scarcity, and emotional arousal. While flash discounts are effective in driving immediate sales, several studies also point out potential drawbacks, including post-purchase dissatisfaction and declining trust if quality expectations are not met. Despite extensive research on flash sales in general e-commerce, limited studies focus exclusively on online clothing shopping within specific regional contexts. This research attempts to address this gap by examining how online flash discounts influence consumer purchase intentions in the apparel segment at a regional level.

OBJECTIVES:

1. To examine consumer awareness of online flash discounts in online clothing shopping.
2. To analyze the effect of online flash discounts on consumer purchase intentions.
3. To identify preferred discount levels influencing clothing purchase decisions.
4. To study consumer satisfaction and post-purchase perceptions

5. To identify challenges faced by consumers during online flash discount purchases

RESEARCH METHODOLOGY

The study adopts a descriptive research design to analyze consumer behavior related to online flash discounts in online clothing shopping. Primary data were collected using a structured questionnaire administered to 100 respondents within the selected region. The questionnaire included questions related to demographic characteristics, online clothing shopping frequency, awareness of flash discounts, discount preferences, satisfaction levels, and challenges faced during flash sales.

Secondary data were collected from academic journals, books, research articles, and reputable online sources to support the conceptual framework of the study. Judgemental sampling was employed due to accessibility and time constraints. The collected data were analyzed using percentage analysis and interpretative techniques. Tables and graphical representations were used to present the data clearly and derive meaningful conclusions

DATA ANALYSIS AND INTERPRETATION

The analysis indicates that the majority of respondents are young consumers, predominantly students, who engage in online clothing shopping on an occasional basis. Most respondents are aware of flash discounts and frequently encounter them on e-commerce platforms and social media. Higher discount percentages significantly influence purchase intentions, with discounts above 21% attracting the highest consumer response. Price savings emerged as the primary motivation behind flash discount purchases. However, many respondents reported relying heavily on product reviews and platform reputation before making purchase decisions.Postpurchase responses reveal mixed satisfaction levels.

While consumers appreciate the cost savings offered by flash discounts, concerns regarding product quality, limited stock availability, and return-related issues negatively affect overall satisfaction. These findings suggest that flash discounts attract consumers but do not always deliver consistent value

FINDINGS OF THE STUDY

- Online flash discounts significantly influence consumer purchase intentions in online clothing shopping.
- Young and price-sensitive consumers are the most responsive to flash discount offers.
- Higher discount percentages attract greater attention and motivation to purchase.
- Price savings is the primary reason for participating in flash discount sales
- Flash discounts encourage impulse buying behavior
- Product reviews play a crucial role in purchase decisions
- Many consumers experience quality-related concerns after flash discount purchases
- Limited stock availability and return issues are common challenges
- Flash discounts do not consistently lead to repeat purchases or long-term loyalty

CONCLUSION

The study concludes that online flash discounts are an effective promotional strategy in the online clothing shopping segment. They significantly influence consumer purchase intentions by creating urgency and offering attractive price reductions, particularly among young and budget conscious consumers .However, the findings also reveal that flash discounts alone are insufficient to ensure long-term customer satisfaction. Concerns related to product quality, limited availability, and return policies often reduce the overall consumer experience. As a result, while flash discounts may successfully drive short-term sales, they do not always translate into sustained customer loyalty. Online apparel retailers must therefore adopt a balanced approach that combines attractive flash discounts with consistent product quality, transparent pricing, and customer-friendly return policies. Such an approach can help transform short-term promotional success into long-term consumer trust and sustainable growth

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A STUDY ON FINANCIAL PERFORMANCE AND STABILITY OF TATA CONSULTANCY SERVICES

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Abstract

The Indian information technology industry plays a significant role in economic development, and Tata Consultancy Services (TCS) stands as one of its leading contributors. This study aims to analyze the financial performance and overall financial health of TCS over a five-year period from 2020 to 2025. The research evaluates key financial aspects such as profitability, liquidity, solvency, and operational efficiency using secondary data collected from published financial statements, annual reports, and reliable financial databases. Financial ratio analysis and trend analysis are used as major analytical tools to identify performance patterns and financial stability. The study also considers the impact of growing competition, rising operational costs, technological advancements, and changing client demands on the company's performance. By examining financial trends and indicators, the research assesses how effectively TCS has managed its resources and financial obligations. The findings of the study provide meaningful insights into the company's strengths, weaknesses, and sustainability. This research is useful to investors for decision-making, to management for strategic planning, and to students and researchers for understanding practical financial analysis in the IT services sector.

Keywords: Financial Performance, Ratio Analysis, Trend Analysis, Tata Consultancy Services (TCS)

INTRODUCTION

The Indian information technology (IT) industry plays a vital role in the country's economic growth by generating employment, supporting digital transformation, and contributing significantly to GDP. Among the major players in this sector, Tata Consultancy Services (TCS) has established a strong reputation as one of India's leading IT services and consulting companies. TCS focuses on providing a wide range of services including IT consulting, software development, digital solutions, cloud computing, and business process services, with an emphasis on innovation, quality, and customer-centric solutions. With a strong global presence and a diversified service portfolio, the company continues to attract clients across various industries worldwide.

In recent years, Tata Consultancy Services has shown notable improvement in both operational and financial performance. The company has benefited from increasing demand for digital transformation services, growing adoption of cloud computing and artificial intelligence, and the rapid expansion of technology-driven business models. Government initiatives promoting digitalization, data security, and IT infrastructure development have further supported this growth. At the same time, the company faces several challenges such as intense global competition, rising employee costs, talent retention issues, and the need for continuous investment in emerging technologies. These factors have a direct impact on the financial performance and long-term stability of the company.

In this context, the present study aims to analyze the financial performance and overall financial health of Tata Consultancy Services over a period of five years. The study focuses on evaluating profitability, liquidity, solvency, and efficiency through the use of financial statements and ratio analysis. By examining trends and financial indicators, the research seeks to understand how effectively the company has managed its resources and how well it is positioned to face future challenges. The findings of this study are expected to provide useful insights for investors, management, researchers, and students interested in the financial performance of companies in the Indian IT industry.

STATEMENT OF THE PROBLEM

Despite its strong brand image and global presence, Tata Consultancy Services (TCS) faces several challenges that affect its financial performance and long-term sustainability. Intense competition from domestic and international IT firms increases pressure on pricing, client retention, and profit margins. Rising operational costs such as employee compensation, infrastructure expenses, and digital investments reduce operating margins. Project delays, talent attrition, and shortage of skilled manpower can disrupt service quality and customer satisfaction. At the same time, changing client demands for cloud computing, AI, cybersecurity, and digital solutions require continuous innovation. Heavy spending on R&D, employee upskilling, and digital infrastructure adds further financial burden. Global economic fluctuations and regulatory changes also create uncertainty in performance. Therefore, maintaining stable growth becomes challenging while balancing costs and future investments. Hence, a detailed study of TCS financial performance is necessary to assess its strengths, weaknesses, and long-term growth sustainability.

SIGNIFICANCE OF THE STUDY

This study is significant as it provides a detailed understanding of the financial performance and stability of Tata Consultancy Services (TCS) over a five-year period. By using financial statements, ratio analysis, and trend analysis, the study helps evaluate the company’s profitability, liquidity, solvency, and operational efficiency. The findings of this research are useful to investors in assessing the company’s financial strength and investment potential. It also benefits management by identifying financial strengths, weaknesses, and areas requiring improvement to support effective decision-making. Students and researchers can use this study as a reference for understanding practical financial analysis in the IT services industry. Additionally, the study contributes to academic knowledge by highlighting the financial challenges faced by IT companies in a highly competitive and technology-driven global market. Overall, the study helps explain how financial performance influences sustainability and long-term growth in the Indian IT services sector.

SCOPE OF THE STUDY

The research centers on the financial performance of Tata Consultancy Services over a five-year period from 2020 to 2025. Financial statement analysis tools such as ratio analysis and trend analysis will be used to understand the company's performance regarding profitability, liquidity, and solvency. The research is limited to secondary data obtained from published financial statements, annual reports, and reputable online financial databases. The research is primarily focused on financial indicators, not qualitative factors like employee performance, market positioning, or customer satisfaction. This research will aid in understanding TCS's growth trajectories, financial policies, and financial health in an uncertain world. The findings may also help students, investors, and other financial professionals.

RESEARCH GAP

Most existing studies on TCS focus mainly on general growth and profitability, but there is limited recent research that fully examines its financial stability using a combined analysis of profitability, liquidity, solvency, and efficiency over the last five years. This study fills the gap by providing an updated and detailed financial evaluation of TCS using ratio and trend analysis.

OBJECTIVES OF THE STUDY

1. To examine the financial performance of Tata Motors Passenger Vehicles Limited by studying the trends in revenue, expenses, and profits from the Profit and Loss Account over the last five years.

2. To assess the company's liquidity, solvency, and profitability status using Balance Sheet and Profit and Loss Account data with the help of suitable financial ratio analysis.

3. To evaluate the overall financial position and stability of Tata Motors Passenger Vehicles Limited through comparative and trend analysis of Balance Sheet and Profit and Loss Account figures.

RESEARCH METHODOLOGY

1. Research Design

The study adopts a descriptive and analytical research design. It aims to provide a detailed evaluation of the financial performance and stability of Tata Consultancy Services over a five-year period. The research focuses on collecting, organising, and analyzing financial data to identify trends, patterns, and areas of strength or weakness.

2. Data Collection

The study uses **secondary data** obtained from authentic sources, including:

- Annual reports of Tata Consultancy Service Passenger Vehicles Limited for the last five financial years.
- Financial statements, including the Balance Sheet and Profit and Loss Account.
- Reports from financial databases, stock exchanges, and company websites.
- Relevant literature, industry reports, and research papers on the Indian automobile sector.

3. Period of Study

The research covers a period of five financial years, which provides sufficient data to evaluate trends and assess long-term financial performance. This period allows for the analysis of fluctuations, growth patterns, and financial stability of the company.

4. Tools and Techniques for Analysis

The study employs quantitative financial analysis tools, including:

1. Financial Ratio Analysis:

- Profitability Ratios (e.g., Net Profit Margin, Return on Assets, Return on Equity) to assess the company's ability to generate profits.

- Liquidity Ratios (e.g., Current Ratio, Quick Ratio) to measure short-term financial stability.
- Solvency Ratios (e.g., Debt to Equity Ratio, Interest Coverage Ratio) to evaluate long-term financial obligations.
- Efficiency Ratios (e.g., Asset Turnover Ratio, Inventory Turnover Ratio) to analyze resource utilization and operational efficiency.

7. Statistical Tools

The study uses basic statistical and financial tools for analysis, including:

- Percentage analysis to measure growth rates.
- Ratios and proportions for liquidity, profitability, solvency, and efficiency.
- Graphs and charts for clear visualization of trends.

RESULT AND ANALYSIS

Table 4.1

Table showing Revenue Trend of Tata Consultancy Services

Year	Total Revenue (₹ Cr)
2020-21	1,66,022
2021-22	1,96,052
2022-23	2,29,182
2023-24	2,44,344
2024-25	2,59,286

Source: (Secondary data)

Table 4.1 reveals Tata Consultancy Services has steady growth in revenue over the last five years. This continuous rise shows strong demand for TCS services and successful business expansion. The company is consistently improving its market position**.**

Table 4.2

Table showing Total Expenses Trend (₹ Crore)

Year	Total Expenses (₹ Cr)
2020-21	1,17,631
2021-22	1,38,697
2022-23	1,66,199
2023-24	1,76,597
2024-25	1,87,917

Source: (Secondary data)

Table 4.2 reveals TCS expenses increased every year, mainly due to higher employee costs and business expansion. However, the expense growth is controlled and justified as it supports company growth and service quality.

Table 4.3

Table showing Profit/Loss Trend (₹ Crore)

Year	Net Profit (₹ Cr)
2020-21	32,430
2021-22	38,327
2022-23	42,147
2023-24	45,908
2023-25	48,797

Source: (Secondary data)

Table 4.3 reveals TCS net profit increased consistently over the years, indicates strong financial health and good business strategy. TCS is generating higher returns for its shareholders every year.

Table 4.4

Table showing Liquidity Position

Current Year	Current Assets (₹ Cr)	Current Liabilities (₹ Cr)	Current Ratio
2020-21	99,280	34,155	2.91
021-22	1,08,310	42,351	2.56
2022-23	1,10,270	43,558	2.53
2023-24	1,12,984	46,104	2.45
2024-25	1,23,012	53,001	2.32

Source: (Secondary data)

Table 4.4 reveals TCS maintains a strong liquidity position across all five years. The current ratio remains well above 2, indicating the company can easily meet its short-term obligations. Although the ratio slightly declined over time, it is still healthy and shows efficient working capital management.

Table 4.5

Table showing Solvency Position

Years	Total Debt (₹ Cr)	Shareholders' Fund (₹ Cr)	Debt-Equity Ratio
2020-21	9,496	86,433	0.11
2021-22	9,317	89,139	0.10
2022-23	8,887	90,424	0.10

2023-24	9,026	90,489	0.10
2024-25	10,857	94,756	0.11

Source: (Secondary data)

Table 4.5 reveals TCS maintains a very low debt-equity ratio in all five years, showing that the company depends more on shareholders' funds than borrowed capital. This reflects strong longterm solvency and low financial risk.

Table 4.6

Table showing Profitability Position

Year	Net Profit (₹ Cr)	Revenue (₹ Cr)	Net Profit Margin(%)
2020-21	32,430	1,66,022	19.5%
2021-22	38,327	1,96,052	19.5%
2022-23	42,147	2,29,182	18.4%
2023-24	45,908	2,44,344	18.8%
2024-25	48,797	2,59,286	18.8%

Source:(Secondary data)

Table 4.6 reveals TCS maintains a consistently high net profit margin across all five years, indicating strong operational efficiency and effective cost management. The company is generating healthy profits from its revenue.

Table 4.7

Table showing the Overall Financial Position and Stability of Tata Consultancy Services (Five-Year Trend Analysis)

Aspect Analyzed	Observation from Balance Sheet / P&L	Trend Identified	Interpretation
Revenue Growth	Sales revenue has shown a steady increase over five years due to rising demand for passenger vehicles and new model launches	Upward trend	Indicates strong market acceptance and business expansion
Profitability	Net profit has improved significantly after earlier losses, supported by cost control and higher sales	Improving trend	Shows recovery and better operational efficiency
Operating Performance	Operating margins have strengthened due to improved capacity utilization and cost optimization	Positive trend	Reflects better management efficiency and production planning
Cost Management	Manufacturing and operating expenses have grown at a slower rate than revenue	Controlled cost trend	Demonstrates effective expense management
Shareholders' Funds	Equity and reserves have increased consistently	Upward trend	Shows strong internal fund generation and investor confidence

Debt Position	Total borrowings have reduced gradually over the period	Downward trend	Indicates improved solvency and lower financial risk
Debt-Equity Ratio	Ratio has declined due to reduced debt and increased equity	Improving trend	Shows stronger capital structure and stability
Liquidity Position	Current assets have increased more than current liabilities	Positive trend	Company has strong short-term payment capacity
Cash & Cash Equivalents	Cash balances have improved steadily	Increasing trend	Ensures better working capital management
Asset Base	Fixed assets have increased due to investments in new plants and technology	Upward trend	Indicates expansion and modernization
Return on Equity	ROE has improved in recent years	Rising trend	Reflects better profitability for shareholders
Overall Financial Stability	Improved profits, lower debt, and higher reserves	Strong upward trend	The company is financially stable and sustainable

FINDINGS

- TCS revenue has shown a steady increasing trend from 2020–21 to 2024–25. There is continuous growth in revenue every year without decline. This indicates strong business performance and market demand. The company has expanded its operations consistently. Overall, it reflects a positive growth pattern.

- The highest revenue is recorded in the year 2024–25. This shows the company's improved operational efficiency. It also reflects successful adoption of digital technologies. Customer base and project volume have increased. Hence, revenue performance is at its peak.

- Revenue growth is consistent year after year. No financial year shows a decrease in income. This highlights effective management strategies. Market position of TCS remains strong. Business sustainability is clearly visible.

- The continuous revenue rise shows financial stability. The company maintains steady cash inflows. It supports future expansion plans. Investor confidence is strengthened. Overall financial health is strong.

- Total expenses of TCS show a continuous increasing trend from 2020–21 to 2024–25. Expenses increased every year without any decline. This reflects business expansion and higher operational activities. The company is investing more in employee and operating costs. Overall expense growth follows business growth.

- The lowest total expenses were recorded in the year 2020–21. This year shows minimum operational spending. Subsequent years show gradual increases. It indicates increased scale of operations. Cost structure has expanded over time.

- The highest total expenses are observed in 2024–25. This reflects increased workforce and project execution. Higher expenses indicate business expansion. The company invested more in resources. Operational scale reached its peak.

- Expenses growth is consistent year after year. No year shows a decrease in spending. This indicates stable business operations. Cost control is maintained along with growth. Company manages rising costs effectively.

- Net profit of TCS shows a continuous increasing trend from 2020–21 to 2024–25. Profit has grown every year without any decline. This indicates strong financial performance. The company is managing its costs effectively. Overall profitability has improved steadily.

- The lowest net profit was recorded in the year 2020–21. This year shows the base level of earnings. From this point, profit keeps increasing. It reflects business recovery and growth. Financial performance has strengthened over time.

- The highest net profit is observed in 2024–25. This shows the best financial performance. Profit reached ₹48,797 crore in this year. It reflects operational efficiency. The company achieved strong earnings growth.

- Year-on-year profit growth is consistent. No year shows a decline in net profit. This indicates stable business operations. Management strategies are effective. The company maintains sustainable growth.

- Current assets of TCS show a steady increasing trend from 2020–21 to 2024–25. Assets increased every year without any decline. This indicates strong working capital management. The company is maintaining good liquidity. Short-term financial strength is improving.

- Current liabilities have also increased gradually over the years. This reflects expansion in business operations. Higher liabilities show increased operational scale. However, assets are still higher than liabilities. Company maintains balance in obligations.

- The current ratio shows a declining trend from 2.91 to 2.32. Although decreasing, it remains above the ideal ratio of 2. This indicates the company can meet short-term obligations. Liquidity position is still strong. Financial stability is maintained.

- The highest current ratio was recorded in 2020–21. After that, it shows a gradual decline each year. This reflects better utilization of current assets. Company is efficiently managing working capital. Overall liquidity position remains healthy.

- Total debt of TCS remains low throughout the five-year period. Debt shows minor fluctuations but stays within a narrow range. This indicates controlled borrowing. The company is not highly dependent on external funds. Financial risk is very low.

- Shareholders' fund shows a continuous increasing trend. It increased from ₹86,433 crore in 2020–21 to ₹94,756 crore in 2024–25. This reflects strong internal fund generation. Reserves and surplus are growing steadily. Equity base of the company is strengthening.

- The debt-equity ratio remains stable around 0.10–0.11. This indicates a healthy capital structure. The company relies more on equity than debt. Financial stability is well maintained. Risk to investors is minimal.

- The lowest debt-equity ratio was observed in 2021–22 and 2022–23. This shows the strongest solvency position. Low leverage reflects sound financial management. The company can easily meet long-term obligations. Overall solvency position is strong.

- Net profit of TCS shows a continuous increasing trend from 2020–21 to 2024–25. Profit increased every year without any decline. This indicates strong financial performance. Revenue growth supported profit growth. Overall earnings position is improving.

- Net profit margin remained stable at 19.5% during 2020–21 and 2021–22. It slightly declined to 18.4% in 2022–23. Later it improved to 18.8% in

2023–24 and 2024–25. This shows effective cost control. Profitability level is well maintained.

- Revenue increased steadily from ₹1,66,022 crore to ₹2,59,286 crore. This reflects strong business expansion. Higher revenue helped improve profits. Market demand for TCS services increased. Overall business performance is strong and stable.
- Overall, the company maintains high profitability alongside revenue expansion. Net profit growth is consistent and sustainable. Profit margins indicate strong cost control measures. The company demonstrates effective financial management. TCS shows stable earnings with good return on revenue.

SUGGESTIONS

Based on the study's findings, here are some suggestions

- TCS should continue focusing on revenue expansion strategies. Entering new global markets will support growth. More digital service offerings should be introduced. Client diversification can increase income. This will strengthen long-term stability.
- Cost control measures should be strengthened further. Operating expenses must be monitored regularly. Automation can reduce unnecessary costs. Efficient resource utilization should be ensured. This will improve profit margins.
- The company should maintain its low debt position. Avoid excessive external borrowing. Use internal funds for expansion. This will reduce financial risk. Capital structure will remain strong.
- Working capital management must be improved continuously. Current assets should be used efficiently. Receivables collection period should be reduced. This will improve cash flow. Liquidity position will remain healthy.

- TCS should invest more in innovation and technology. Focus on AI, cloud computing, and cybersecurity. This will attract new clients. Competitive advantage can be maintained. Future growth will be supported.
- Employee productivity programs should be enhanced. Training and skill development must be increased. This improves service quality. Motivated employees increase performance. Profitability will improve.
- Dividend policy can be reviewed periodically. Shareholders should be rewarded consistently. This increases investor confidence. Market value of shares can rise. Brand image improves.
- Risk management practices should be strengthened. Economic and market risks must be analysed. Contingency plans should be prepared. This ensures business continuity. Stability is maintained.
- Customer satisfaction should remain a priority. High-quality service delivery must be ensured. Client feedback should be reviewed. Long-term relationships can be built. Repeat business will increase.
- Long-term strategic planning should be improved. Future projects must be well evaluated. Expansion decisions should be data-driven. This avoids financial losses. Sustainable growth will be achieved.

CONCLUSION

The study on the financial performance and stability of Tata Consultancy Services clearly shows that the company has maintained strong financial health and efficient management over the five-year period. The analysis reveals steady growth in revenue and profit, supported by effective cost control, strong operational efficiency, and a solid market position in the global IT industry. The company's diversified services and global presence have helped maintain stable revenue and reduced business risk.

The study also highlights TCS's strong liquidity, low debt levels, and high profitability, which together reflect a stable financial foundation and long-term sustainability. The company has successfully managed challenges such as rising costs and technological changes while continuing its growth journey. Overall, TCS emerges as a financially stable, reliable, and future-oriented organization, making it a trustworthy company for investors, stakeholders, and researchers in the Indian IT services industry.

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Impact of Digital Marketing Strategies on Customer Loyalty: A Review of Literature

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Abstract

In the modern business environment, digital marketing has become a key driver of customer engagement, relationship building, and long-term brand success. This review paper examines the relationship between digital marketing strategies and customer loyalty by synthesizing findings from existing scholarly research. The study highlights how various digital marketing tools such as social media marketing, email marketing, content marketing, influencer marketing, search engine marketing, and personalized online advertisements contribute to customer trust, satisfaction, and repeated purchase intentions. The review also identifies major factors that strengthen the effectiveness of digital marketing in loyalty creation, including customer experience, perceived value, brand interaction, and digital service quality. Further, this paper discusses major challenges such as privacy concerns, ad fatigue, and low customer engagement that may weaken loyalty outcomes. Finally, the review provides insights for marketers and future researchers by identifying research gaps and suggesting directions for further empirical and industry-based studies.

Keywords: Digital Marketing, Customer Loyalty, Social Media Marketing, Customer Engagement, Brand Trust, Relationship Marketing,

INTRODUCTION

Digital marketing has emerged as a dominant force in modern business due to the rapid growth of the internet, mobile technology, and social media platforms, which have transformed the way firms communicate and engage with customers. Digital marketing is widely understood as the process of achieving marketing goals through the use of digital technologies and online media, enabling organizations to reach consumers in a faster, more interactive, and measurable manner (Chaffey, 2019). Unlike traditional marketing approaches, digital marketing encourages two-way

communication and supports relationship building by allowing firms to deliver personalized messages and maintain continuous customer interaction across multiple online platforms. From a customer perspective, these digital interactions strongly influence decision-making by improving convenience, product awareness, andengagement, which ultimately shape customer perceptions toward brands. In competitive markets, organizations increasingly focus on customer loyalty as a strategic outcome because loyal customers contribute to repeated purchases, positive word-of-mouth, and long-term profitability. Customer loyalty is commonly defined as a deeply held commitment to repurchase or repatronize a preferred product or service consistently in the future, even when alternative options and competitive marketing efforts exist (Oliver, 1999). Since loyalty is strongly influenced by trust, satisfaction, and relationship commitment, digital marketing strategies such as social media marketing, content marketing, email marketing, and personalized advertisements play a vital role in strengthening customer–brand relationships. Relationship marketing theory suggests that trust and commitment are central factors in maintaining long-term customer relationships and loyalty outcomes (Morgan & Hunt, 1994). Therefore, understanding how digital marketing strategies influence customer loyalty has become an important research area, and this review paper synthesizes existing literature to identify major pathways, key drivers, and research gaps in the digital marketing–loyalty relationship.

OBJECTIVES OF THE STUDY

1. To review and synthesize existing literature on the impact of digital marketing strategies on customer loyalty.

2. To identify key digital marketing practices (such as social media marketing, content marketing, email marketing, and personalization) that influence customer loyalty outcomes.

3. To examine major mediating factors (such as customer engagement, satisfaction, and brand trust) that strengthen the relationship between digital marketing and customer loyalty.

STATEMENT OF THE PROBLEM

In today's highly competitive and digitally driven marketplace, businesses increasingly rely on digital marketing strategies such as social media marketing, content marketing, email marketing, and personalized online

promotions to attract and retain customers. However, despite heavy investment in these digital tools, many organizations still struggle to build long-term customer loyalty, as customers can easily switch to alternative brands due to abundant online options, price comparisons, and changing preferences. Additionally, the

effectiveness of digital marketing in creating loyalty is influenced by factors such as customer engagement, satisfaction, trust, and digital service quality, which vary across industries and customer segments. Therefore, there is a need to systematically review and understand how different digital marketing strategies contribute to customer loyalty and what key factors strengthen or weaken this relationship, in order to help businesses design more effective loyalty-building digital marketing approaches.

RESEARCH QUESTIONS

1.How do digital marketing strategies influence customer loyalty based on findings from previous studies?

2. Which digital marketing strategies are most effective in building and sustaining customer loyalty in competitive markets?

3. What factors mediate or explain the link between digital marketing strategies and

customer loyalty (e.g., engagement, satisfaction, trust)?

RESEARCH METHODOLOGY

This study adopts a systematic literature review methodology to examine the relationship between digital marketing strategies and customer loyalty. The review process was conducted using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to ensure transparency and reduce selection bias. In the identification stage, relevant studies were collected from academic databases such as Google Scholar, Scopus, Web of Science,

ScienceDirect, Emerald Insight, and SpringerLink. The search was carried out using key terms including digital marketing strategies, customer loyalty, e-loyalty, customer engagement, brand trust, online customer retention, social media marketing, and content marketing.

In the screening stage, duplicate records were removed and the remaining studies were filtered based on their titles and abstracts to ensure alignment with the research objective. During the eligibility stage, full-text papers were assessed using inclusion criteria such as (i) published in English, (ii) focused on digital marketing tools or strategies, (iii) examined customer loyalty or loyalty-related variables (trust, satisfaction, engagement, retention), and (iv) published mainly within the last 10 years, while including a few highly-cited foundational studies. Studies that were not peer-reviewed, lacked full-text availability, or focused only on traditional marketing approaches were excluded.

Finally, in the included stage, selected articles were analyzed using thematic analysis, where the findings were grouped into key themes such as social media marketing and loyalty, personalization and customer retention, content marketing and brand trust, digital customer experience, and e- service quality effects on loyalty. The results were then synthesized to identify major patterns, consistent findings, and research gaps, leading to meaningful conclusions and directions for future research.

THEMATIC REVIEW OF LITERATURE

Theme 1: Social Media Marketing and Customer Loyalty

Social media marketing has become one of the most influential digital marketing strategies for building strong customer–brand relationships. Platforms such as Instagram, Facebook, and YouTube allow firms to engage customers through interactive communication, brand storytelling, and real-time responses. Studies highlight that social media activities improve customer engagement and brand attachment, which gradually leads to loyalty formation (Laroche et al., 2012). Similarly, social media communities create a sense of belonging among customers and strengthen brand relationships through interactions and shared experiences (Habibi et al., 2014). In addition, social media content that is informative and entertaining increases customer attention and encourages repeated brand interactions, which positively influences loyalty intentions (Kim & Ko, 2012). Overall, the literature supports the view that social media marketing plays a significant role in improving customer loyalty by increasing engagement, emotional connection, and customer satisfaction.

Theme 2: Content Marketing and Trust Building

Content marketing is widely regarded as a strategic tool for delivering valuable and relevant information to customers to influence purchase decisions and loyalty outcomes. High-quality content such as blogs, videos, reviews, and educational posts supports customer learning and helps in reducing uncertainty about products and services. Researchers argue that content marketing strengthens brand credibility and supports trust-based relationships, which are essential for loyalty development (Pulizzi, 2012). Moreover, the perceived usefulness and authenticity of content improves customer satisfaction and enhances repeat buying behavior. When customers receive consistent value through content, they develop stronger brand preference and long-term relationship commitment (Hollebeek & Macky, 2019). Thus, content marketing contributes to customer loyalty mainly through trust generation, perceived value creation, and customer engagement.

Theme 3: Personalization and Customer Retention

Personalization is one of the most effective digital marketing strategies for improving customer experience and loyalty. Digital platforms allow companies to customize product recommendations, advertisements, emails, and offers based on customer preferences and browsing behavior. Personalized marketing improves customer satisfaction by making the shopping experience more convenient and relevant.

Researchers suggest that personalized digital experiences enhance perceived usefulness and emotional bonding, which strongly

influences customer retention and loyalty (Arora et al., 2008). Additionally, personalization helps organizationsbuild long-term customer relationships by improving service quality and delivering tailored experiences (Kumar & Reinartz, 2016). Therefore, personalization functions as a loyalty- building strategy by improving customer experience, satisfaction, and repeat purchase intentions.

Theme 4: Customer Engagement as a Key Link Between Digital Marketing and Loyalty

Customer engagement is one of the most frequently discussed mediating factors in the digital marketing–loyalty relationship. Engagement reflects the level of customer involvement, interaction, and emotional connection with the brand. Research emphasizes that digital marketing strategies such as interactive ads, influencer marketing, and brand communities lead to higher engagement, which results in improved loyalty intentions (Brodie et al., 2011). Additionally, engaged customers show stronger commitment, participate in brand-related conversations, and promote brands through word-of-mouth, contributing to loyalty outcomes (Vivek et al., 2012). Many studies agree that engagement acts as an important pathway through which digital marketing efforts translate into long-term loyalty.

Theme 5: E-Service Quality, Satisfaction, and E-Loyalty

In online platforms, service quality plays an essential role in determining customer loyalty. E- service quality includes website performance, ease of navigation, speed, security, and responsiveness. When customers experience smooth and reliable digital services, their satisfaction increases and it leads to higher loyalty levels. Researchers propose that satisfaction is a major predictor of loyalty, and it operates strongly in digital environments where customer switching costs are low (Anderson & Srinivasan, 2003). Similarly, effective digital service quality builds trust and encourages customers to continue using the same brand, leading to e-loyalty (Zeithaml et al., 2002). Hence, customer loyalty in digital markets depends not only on marketing communication but also on the quality of digital service delivery.

FINDINGS AND DISCUSSION

Objective 1: To review and synthesize existing literature on the impact of digital marketing strategies on customer loyalty

The reviewed studies consistently confirm that digital marketing strategies have a strong and positive influence on customer loyalty formation. Across different industries such as retail, banking, hospitality, and e-commerce, digital channels are found to improve customer connectivity with brands by increasing communication frequency, accessibility, and engagement. Manyresearchers argue that customer loyalty is no longer built only through product quality and pricing, but also through customer experience delivered via digital platforms (Anderson & Srinivasan, 2003). Digital marketing provides continuous brand exposure and enhances customer–brand interaction, which strengthens relationship quality and long-term loyalty intentions. In addition, literature indicates that digital marketing increases customers' willingness to repurchase and recommend brands, especially when online interactions create satisfaction and trust (Zeithaml et al., 2002). Overall, the synthesis shows that digital marketing is a critical driver of loyalty in modern competitive markets due to its ability to create interactive and relationship-oriented experiences.

Objective 2: To identify key digital marketing practices that influence customer loyalty outcomes

The findings reveal that not all digital marketing strategies influence loyalty equally, and some tools are more effective in sustaining loyalty. Social media marketing emerges as a major contributor because it promotes relationship-building through communication, community interaction, and customer participation in brand-related activities (Laroche et al., 2012). Content marketing is found to strengthen loyalty by offering useful, informative, and engaging content that builds credibility and trust, improving the long-term relationship between customers and firms (Hollebeek & Macky, 2019). Personalization also appears highly influential, as tailored advertisements, product recommendations, and customized offers increase customer satisfaction and reduce search effort, encouraging repeat purchase behavior (Arora et al., 2008). Furthermore, studies highlight that influencer marketing and online reviews act as modern digital trust mechanisms by shaping perceptions and purchase confidence. Therefore, the discussion suggests that digital marketing strategies that offer value, relevance, and strong engagement are more successful in creating customer loyalty compared to generic online promotions.

Objective 3: To examine major mediating factors that strengthen the relationship between digital marketing strategies and customer loyalty

The literature emphasises that the impact of digital marketing on customer loyalty is often indirect, operating through key mediating variables such as customer engagement, satisfaction, and brand trust. Customer engagement is frequently identified as a major pathway through which digital marketing efforts lead to loyalty outcomes, because engaged customers tend to develop emotional attachment, participate in interactions, and show commitment beyond purchasing behavior (Brodie et al., 2011). Similarly, customer satisfaction is found to be a powerful predictor of loyalty in digital markets, as positive digital experiences enhance customer confidence and willingness to continue with the brand (Anderson & Srinivasan, 2003). Brand trust also plays a crucial role since loyalty is difficult to sustain without trust, especially in online environments where customers are more sensitive to risk, privacy, and service reliability (Habibi et al., 2014). Hence, the Findings show that loyalty is not produced simply by digital marketing presence, but by how effectively digital strategies create meaningful experiences, engagement, and trust-building interactions.Overall Discussion Summary

In summary, the findings of this review indicate that digital marketing significantly influences customer loyalty, but its effectiveness depends on the type of strategy and the strength of mediators such as trust, satisfaction, and engagement. Social media marketing, personalization, and content marketing emerge as the most influential strategies in the reviewed literature. At the same time, maintaining loyalty in digital environments requires consistency, transparency, and customer- centric communication, as modern customers are highly informed and have multiple alternatives available online. Therefore, organizations that focus on interactive experiences and relationship- building digital strategies are more likely to achieve long-term customer loyalty.

RESEARCH GAPS

- Limited sector-specific studies

Many studies discuss digital marketing and loyalty in general, but there are fewer focused studies in specific

sectors like banking, healthcare, education, tourism, and local SMEs, where customer loyalty drivers may differ.

- Lack of clarity on "most effective" strategy

While social media marketing, personalization, and content marketing are frequently

highlighted, the literature does not clearly conclude which strategy contributes the highest loyalty impact across different customer groups and markets.

- Insufficient focus on rural and semi-urban customers

Most research is concentrated in urban and digitally advanced consumer groups. There is a noticeable gap in studies involving rural/semi-urban consumers, especially in developing countries like India.

- Limited longitudinal research (time-based loyalty measurement)

Many studies use cross-sectional survey data (one-time data collection). Very few studies measure loyalty formation over time, making it hard to understand how loyalty changes through continuous digital interactions.

- Under-exploration of negative effects of digital marketing

Research focuses mainly on the positive relationship, but fewer studies examine negative factors like privacy concerns, ad fatigue, fake reviews, excessive promotions, and distrust, which may reduce loyalty.

- Few studies on AI-driven digital marketing and loyalty

Emerging practices like AI personalization, chatbots, voice search marketing, and automated recommendation systems are not deeply explored in relation to customer loyalty in many existing papers.

- Lack of comparative studies across platformsThere is limited research comparing loyalty outcomes across major platforms such as Instagram vs Facebook vs

YouTube vs WhatsApp marketing, even though customer responses vary widely across platforms.

SUGGESTIONS FOR FUTURE RESEARCH (FUTURE SCOPE)

Conduct sector-wise empirical studies

Future researchers can examine the digital marketing–customer loyalty relationship across specific industries such as banking, tourism, healthcare, education, FMCG, and e- commerce to identify industry-specific loyalty drivers and best-performing digital strategies.

Focus on AI-driven and emerging digital marketing tools

More studies are needed on how modern technologies like AI-based personalization, chatbots, virtual assistants, influencer AI, voice search marketing, and recommendation algorithms influence customer trust and loyalty in digital environments.

Explore customer loyalty formation through longitudinal studies

Future research should adopt long-term and time-based designs to observe how customer loyalty develops gradually through repeated digital interactions, rather than relying only on one-time survey data.

Test mediators and moderators in a stronger model

Researchers can build advanced models by testing mediators such as customer engagement, satisfaction, perceived value, and brand trust, and moderators like age, gender, digital literacy, culture, income, and frequency of online purchases.

Examine the negative side of digital marketing

Future studies should explore challenges such as privacy risks, data security concerns, ad overload, misleading influencer promotions, fake reviews, and customer irritation, and how these factors reduce loyalty or increase switching behavior.

Comparative studies across digital platforms

More comparative studies can evaluate the effectiveness of different platforms like Instagram, Facebook, YouTube, WhatsApp, and email marketing, to understand which platform creates stronger customer loyalty in various customer segments.

Include rural and semi-urban customer perspectives

Future research can expand the scope by studying rural and semi-urban consumers, especially in developing markets, to understand how digital awareness, trust issues, and accessibility affect loyalty.

Use mixed methods for deeper understandingResearchers can use mixed-method approaches (survey + interview/focus group) to gain both statistical evidence and deeper qualitative insights into customer attitudes, emotions, and loyalty behaviors.

CONCLUSION

This review paper examined the relationship between digital marketing strategies and customer loyalty by synthesizing findings from existing literature. The review highlights that digital marketing plays a significant role in strengthening customer loyalty by improving customer–brand interaction, enhancing convenience, and creating engaging brand experiences through online platforms. Strategies such as social media marketing, content marketing, personalization, and digital customer engagement were found to be highly effective in influencing loyalty-related outcomes like repeat purchase intention, positive word-of-mouth, and long-term brand preference. Overall, the literature confirms that digital marketing has moved beyond promotional communication and has become a relationship-building tool that supports customer retention in competitive markets.

Further, the review identified that the impact of digital marketing on loyalty is strongly supported by key mediating factors such as customer satisfaction, brand trust, and customer engagement, which act as important pathways linking digital strategies to loyalty outcomes. However, challenges such as privacy concerns, ad fatigue, and changing consumer expectations may weaken loyalty if not managed effectively. The study

concludes that organizations should focus on providing value-driven and customer-centric digital experiences to sustain loyalty. At the same time, future research should explore emerging AI-based marketing practices,

platform-specific comparisons, and long-term customer loyalty development to strengthen academic and practical understanding of loyalty building in the digital era.

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TREND AND VOLATILITY BEHAVIOUR OF SHARE PRICES OF SELECTED PUBLIC SECTOR COMPANIES

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Abstract

The Indian capital market plays a significant role in mobilizing savings and supporting economic growth, with public sector companies contributing prominently to key sectors such as banking, energy, power generation, and heavy engineering. The present study aims to analyse the trend and volatility behaviour of share prices of selected public sector companies, namely State Bank of India (SBI), Oil and Natural Gas Corporation (ONGC), Coal India Limited, Bharat Heavy Electricals Limited (BHEL), and NTPC Limited. The study is based on secondary data collected from reliable sources such as the National Stock Exchange (NSE), Bombay Stock Exchange (BSE), and financial websites for a period of five years. Trend analysis has been employed to study the movement of share prices over time, while volatility analysis has been carried out using statistical tools such as mean, standard deviation, and coefficient of variation to assess risk. In addition, the study attempts to forecast future share price behaviour based on

past trends. The findings indicate that most of the selected public sector companies exhibit an overall upward trend in their share prices, though the degree of volatility differs among them. Companies like ONGC and NTPC show relatively stable price behaviour, whereas BHEL experiences higher volatility. The study provides useful insights for investors in understanding risk and return characteristics of public sector stocks and supports informed investment decision-making.

Keywords:: Indian Capital Market, Share Price Trend, Volatility Analysis, Public Sector Companies

INTRODUCTION

The Indian capital market plays a vital role in channelising savings into productive investments and supporting the country's economic growth. Public sector companies form a significant segment of this market, as they operate in key sectors such as banking, energy, power generation, and heavy engineering. Among them, State Bank of India (SBI), Oil and Natural Gas Corporation (ONGC), Coal India Limited, Bharat Heavy Electricals Limited (BHEL), and NTPC Limited are major public sector enterprises with substantial market capitalisation and strong government participation. Shares of these companies are widely traded and closely followed by investors due to their strategic importance and perceived stability.

The movement of share prices of public sector companies reflects both company-specific performance and broader economic and policy-related factors. Trend analysis helps in understanding the long-term direction of share prices, indicating growth prospects and investor confidence, while volatility analysis measures the extent of price fluctuations, highlighting the level of risk associated with these stocks. For companies like SBI, ONGC, Coal India Ltd., BHEL, and NTPC, share price behaviour is influenced by factors such as government reforms, changes in interest rates, global crude oil and coal prices, infrastructure spending, and overall market conditions.

In this context, analysing the trend and volatility behaviour of share prices of selected public sector companies—SBI, ONGC, Coal India Ltd., BHEL, and NTPC—**is both relevant and timely. A comparative examination of these companies provides insights into how different public sector industries respond to market dynamics and economic changes. The study is useful for investors in assessing risk and return, for policymakers in understanding market reactions to policy decisions, and for researchers in gaining a deeper understanding of price behaviour in the public sector segment of the Indian stock market.

STATEMENT OF THE PROBLEM

Public sector companies play a crucial role in the Indian economy and occupy a prominent position in the stock market. Shares of major public sector enterprises such as State Bank of India (SBI), Oil and Natural Gas Corporation (ONGC), Coal India Limited, Bharat Heavy Electricals Limited (BHEL), and NTPC Limited are actively traded and widely held by investors. Despite their economic importance and government ownership, the share prices of these companies often experience fluctuations due to market forces, policy decisions,

sector-specific developments, and macroeconomic changes. Such price movements create uncertainty among investors regarding the stability and risk associated with investing in public sector stocks.

Understanding the trend and volatility behaviour of share prices of selected public sector companies is therefore essential for informed decision-making. However, there is a lack of systematic and comparative analysis focusing on the price behaviour of these companies over a period of time. Without a clear understanding of long-term trends and volatility patterns, investors may find it difficult to evaluate risk and return, and policymakers may face challenges in assessing market responses to public sector reforms. This study seeks to address this gap by analysing and comparing the trend and volatility of share prices of SBI, ONGC, Coal India Ltd., BHEL, and NTPC, thereby providing meaningful insights into the behaviour of public sector stocks in the Indian capital market.

SIGNIFICANCE OF THE STUDY

The present study is significant as it provides a systematic analysis of the trend and volatility behaviour of share prices of selected public sector companies—SBI, ONGC, Coal India Ltd., BHEL, and NTPC. By examining price movements over a period of time, the study helps in understanding the stability and risk associated with these public sector stocks. This is particularly important for investors who consider public sector companies as relatively safe investment options and seek reliable information on their price behaviour for effective portfolio selection and risk management.

The study is also useful for policymakers and government authorities, as it offers insights into how public sector companies' share prices respond to market conditions, economic changes, and policy decisions. Understanding volatility patterns can help in assessing investor confidence and the effectiveness of reforms undertaken in the public sector. Additionally, the study contributes to academic research by enriching existing literature on stock price behaviour in the Indian capital market, especially with reference to public sector enterprises, and serves as a reference for future researchers undertaking similar studies.

RESEARCH GAP

Several studies have examined stock price movements and volatility in the Indian capital market; however, most of them focus either on the overall market, private sector companies, or a single industry or firm. Limited research has been conducted on a comparative analysis of multiple public sector companies operating in different strategic sectors such as banking, energy, power, and heavy engineering. As a result, there is inadequate understanding of how share price trends and volatility differ across major public sector enterprises like SBI, ONGC, Coal India Ltd., BHEL, and NTPC.

Moreover, existing studies often emphasise short-term price fluctuations or general performance indicators, without giving sufficient attention to long-term trend analysis combined with volatility measurement. There is also a lack of empirical evidence that integrates sector-specific influences and market dynamics while analysing public sector stocks. This study aims to bridge these gaps by providing a comprehensive and comparative analysis of the trend and volatility behaviour of selected public sector companies, thereby offering deeper insights into their share price behaviour in the Indian stock market.

OBJECTIVES OF THE STUDY

1. To analyse the trend of share prices of selected public sector companies, namely SBI, ONGC, Coal India Ltd., BHEL, and NTPC, over the selected study period.

2. To measure and compare the volatility of share prices of the selected public sector companies in order to assess the level of risk associated with each stock.

3. To forecast the future share price behaviour of selected public sector companies usin Research

METHODOLOGY RESEARCH DESIGN

The study adopts a descriptive and analytical research design. It aims to examine and compare the trend and volatility behaviour of share prices of selected public sector companies in India. The analytical approach is used to evaluate price movements, returns, and volatility patterns over the selected period.

Selection of Sample

The study is based on five major public sector companies listed on the Indian stock exchanges, selected on the basis of their market significance and sectoral representation. The companies selected for the study are:

- State Bank of India (SBI)
- Oil and Natural Gas Corporation (ONGC)
- Coal India Limited
- Bharat Heavy Electricals Limited (BHEL)
- NTPC Limited

These companies represent key sectors such as banking, energy, power, and heavy engineering.

Period of the Study

The study covers a period of five years (for example, from 2021–22 to 2025–26). This period is considered adequate to analyse long-term trends and volatility in share prices and to capture the impact of market fluctuations and economic changes.

Nature and Sources of Data

The study is based exclusively on secondary data. Daily closing share price data of the selected companies have been collected from reliable and publicly available sources such as:

- National Stock Exchange (NSE)
- Bombay Stock Exchange (BSE)
- Official company websites
- Financial databases such as Yahoo Finance and Investing.com

Relevant literature has been collected from journals, books, research articles, reports, and websites.

Tools and Techniques of Analysis

The following statistical and analytical tools have been used to analyse the data:

- Trend Analysis: To examine the long-term movement of share prices.
- Descriptive Statistics: Mean, standard deviation, minimum, and maximum values are used to understand price behaviour.
- Volatility Analysis: Standard deviation of returns is used as a measure of volatility.
- Comparative Analysis: To compare trends and volatility across the selected public sector companies.

Software Used

The collected data are analysed using MS Excel and/or statistical software such as R for calculation, graphical representation, and interpretation.

RESULT AND ANALYSIS

OBJECTIVE 1: To analyse the trend of share prices of selected public sector companies, namely SBI, ONGC,Coal India Ltd., BHEL, and NTPC, over the selected study period.

Table 4.1

Table showing Monthly Closing Share Prices of SBI for the Study Period (2021–2025) State Bank of India (SBIN.NS)

Month	2021	2022	2023	2024	2025
January	285.10	543.95	561.40	642.75	774.80
February	395.10	483.20	523.65	752.00	690.15
March	367.30	491.00	524.75	759.05	766.80
April	349.80	492.65	578.30	826.25	788.65
May	426.05	468.00	581.80	863.33	812.85
June	420.30	463.35	574.50	849.35	820.00
July	434.75	529.05	620.20	877.80	795.70
August	427.50	522.55	562.70	817.30	803.10
September	448.50	527.80	598.25	788.00	872.30
October	508.50	576.35	566.25	822.40	938.75
November	464.45	607.85	567.00	838.95	985.45
December	462.00	614.95	642.20	795.55	983.20

Table 4.2

Table showing Monthly Closing Share Prices of ONGC for the Study Period

(2021–2025)

Oil And Natural Gas Corporation (ONGC.NS)

MONTHS	2021	2022	2023	2024	2025
JAN	89	174	145.8	254.65	259.55
FEB	114.3	160.65	152	266.5	224.75
MAR	103	163.9	154.5	268.05	247
APR	108.15	158.15	158.95	282.85	244.45
MAY	114.35	151.2	154.7	277.95	239
JUN	117.75	148.95	160.3	275	245.3
JUL	114.95	134.1	175.3	337.8	240.1
AUG	121.8	135	175.4	330	234
SEP	145.2	131.7	191.85	297	238.6
OCT	150	134.1	186.15	269.8	255
NOV	142.4	141.45	195.25	255.5	244.05
DEC	142.35	147.3	206	237.81	240.9

Table 4.3

Table showing Monthly Closing Share Prices of Coal India Limited for the Study Period (2021–2025)

Coal India Limited (COALINDIA.NS)

MONTHS	2021	2022	2023	2024	2025
JAN	126.4	162	228	408.8	395
FEB	155.5	169	215.4	438	370
MAR	131.45	183.8	214.1	436.7	397.8
APR	133	182.7	233.1	454.3	385.3
MAY	148.55	194.5	230.4	515	398.95
JUN	146.6	185	231.5	473.35	392.5
JUL	144.3	212.5	230	535	375
AUG	146.6	234.35	230.7	527	375.3
SEP	185.4	213	295.2	512	389.8
OCT	165	247	313.2	454.65	390.55
NOV	153.6	228.4	343.8	418.4	376.9
DEC	147.25	226.75	377.8	383.55	399

Table 4.4

Table showing Monthly Closing Share Prices of BHEL for the Study Period (2021–2025) Bharat Heavy Electricals Limited (BHEL.NS)

MONTHS	2021	2022	2023	2024	2025
JAN	36.5	58.3	79.15	230.5	209.56
FEB	48.7	49.85	69.75	230	180.1
MAR	49	49.5	71	249	215.15
APR	47.85	52.2	78.4	281.7	226.84
MAY	71.65	51.5	82	320	261.05
JUN	65.85	44.8	87.65	301.95	267.75
JUL	58.1	54.45	104.7	314.7	238.45
AUG	54.5	58.6	122	291	209.5
SEP	64.3	60.3	131	280.4	239
OCT	68.8	74	121.3	240.9	265
NOV	59.25	84	171.35	249.75	291.1
DEC	59	79.55	199	230.01	288.5

Table 4.5

Table showing Monthly Closing Share Prices of NTPC for the Study Period (2021–2025) National Thermal Power Corporation (NTPC.NS)

MONTHS	2021	2022	2023	2024	2025
JAN	89.35	144	172.25	320.05	326.05
FEB	109.5	1335	170.95	335.6	311.3
MAR	107.5	138	175.6	339	352.35
APR	101.4	154.6	172	363.2	354.55
MAY	110.95	156.45	173.6	385	333.9
JUN	116.8	142	190	381.75	335.25
JUL	118.6	152.9	219.55	419.9	333
AUG	116	161.5	217.85	417.8	328
SEP	140.95	159.85	245.55	446	340
OCT	133.2	174	236.7	412	336.85
NOV	130	173.5	262.35	363.65	327.1
DEC	125.4	167.05	312	333	329.8

Statistical Tools Used for Volatility Measurement

Mean (Average Share Price)	$\bar{X} = \frac{\sum X}{N}$	**Measures the average monthly share price of a company during the study period.**

Standard Deviation (SD)	$SD = \sqrt{\frac{\sum(X-\bar{X})^2}{N}}$	Measures the dispersion or fluctuation of share prices around the mean. A higher SD indicates greater volatility and higher investment risk.
Coefficient of Variation (CV)	$CV(\%) = \frac{SD}{\bar{X}} \times 100$	Measures the relative volatility by comparing the standard deviation with the mean. A higher CV indicates greater relative risk, while a lower CV indicates more stable share prices.

Table 4.6

Table showing Mean, Standard Deviation, and Coefficient of Variation of SBI Share Prices

State Bank of India (SBIN.NS)

Year	Mean (₹)	SD	CV%	Interpretation
2021	415.78	57.01	13.71	Volatility increased in value terms (SD↑) but relative risk reduced (CV↓).
2022	526.72	49.11	9.32	SBI became more stable compared to earlier years
2023	575.11	32.67	5.68	Most stable year for SBI (lowest SD & CV)
2024	802.75	60.77	7.57	Price level increased strongly; volatility rose again (SD↑), but CV still moderate.
2025	806.31	62.13	7.71	SBI shows moderate volatility till Oct 2025

Table 4.7

Table showing Mean, Standard Deviation, and Coefficient of Variation of ONGC Share Prices

Oil And Natural Gas Corporation (ONGC.NS)

Year	Mean (₹)	SD	CV%	Interpretation
2021	121.94	18.21	14.94	Volatility increased slightly; risk remained almost same as 2020
2022	148.38	13.12	8.84	ONGC became more stable, showing reduced volatility
023	171.35	18.95	11.06	Moderate volatility again due to upward movement in prices.
2024	279.41	28.31	10.13	Higher average price with moderate risk (CV not very high).
2025	242.78	9.48	3.90	ONGC is highly stable in 2025 (lowest CV).

Table 4.8

Table showing Mean, Standard Deviation, and Coefficient of Variation of Coal India Share Prices

Coal India Limited (COALINDIA.NS)

Year	Mean (₹)	SD	CV%	Interpretation
2021	148.64	15.15	10.19	Stability improved (SD & CV reduced).
2022	203.25	26.35	12.96	Volatility increased due to stronger price movements
2023	261.93	53.40	20.39	Highly volatile year (sharp rise and fluctuations). High risk
2024	463.06	47.60	10.28	Prices increased a lot but relative risk reduced (CV lower than 2023)
2025	387.11	9.81	2.53	Very low volatility → most stable year

Table 4.9

Table showing Mean, Standard Deviation, and Coefficient of Variation of BHEL Share Prices

Bharat Heavy Electricals Limited (BHEL.NS)

Year	Mean (₹)	SD	CV%	Interpretation
2021	56.96	9.74	17.10	Risk reduced slightly but volatility still high
2022	59.75	12.13	20.31	Volatility increased again (high fluctuations).

2023	109.78	39.58	36.06	Highest risk year for BHEL (maximum CV). Very unstable
2024	268.33	32.44	12.09	Prices increased strongly; volatility reduced compared to 2023
2025	231.24	27.04	11.69	Moderate volatility with improving stability

Table 4.10

Table showing Mean, Standard Deviation, and Coefficient of Variation of NTPC Share Prices

National Thermal Power Corporation (NTPC.NS)

Year	Mean (₹)	SD	CV%	Interpretation
2021	116.64	13.75	11.79	Volatility increased slightly → moderate risk
2022	154.78	12.79	8.26	Stable again, low volatility
2023	212.37	43.31	20.39	Very high volatility due to sharp price increase → high risk year
024	376.41	39.03	10.37	High mean price with moderate volatility (risk reduced from 2023)
2025	335.12	11.86	3.54	Very stable and low risk in 2025 till Oct

OBJECTIVE 3

To forecast the future share price behaviour of selected public sector companies using past trend.

Table 4.11

Table showing Forecasted Share Prices of State Bank of India

Month	Price	Low (80%chance)	High (80%chance)	Low (95%chance)	High (95%chance)
Jan 2026	1003.067	948.2322	1057.902	919.2043	1086.93
Feb 2026	1032.048	954.4999	1109.597	913.4482	1150.649
Mar 2026	1028.546	933.5691	1123.523	883.2913	1173.801
Apr 2026	1033.872	924.2014	1143.542	866.1455	1201.598
May 2026	1040.897	918.2819	1163.512	853.3734	1228.42
Jun 2026	1054.767	920.4493	1189.085	849.3457	1260.189
Jul 2026	1072.761	927.681	1217.841	850.8803	1294.642
Aug 2026	1089.691	934.5935	1244.788	852.4901	1326.891
Sep 2026	1089.411	924.9056	1253.916	837.8217	1341
Oct 2026	1087.047	913.6428	1260.45	821.8484	1352.245
Nov 2026	1089.921	908.0536	1271.788	811.7788	1368.063
Dec 2026	1106.475	916.5211	1296.43	815.9653	1396.985

Table 4.12

Table showing Forecasted Share Prices of Oil And Natural Gas Corporation

Month	Price	Low (80%chance)	High (80%chance)	Low (95%chance)	High (95%chance)
Jan 2026	243.46	219.75415	267.1698	270.203996	279.7199
Feb 2026	244.0145	216.92811	281.101	187.295736	300.7333
Mar 2026	241.133	211.78322	292.4828	162.600288	319.6657
Apr 2026	240.6641	210.28303	309.0451	166.084308	345.2438
May 2026	240.6353	204.13093	329.1397	154.279537	375.9911
Jun 2026	239.7967	203.49861	349.0928	123.639703	406.9537
Jul 2026	238.7665	201.26104	370.2719	127.646276	439.8867
Aug 2026	238.2197	200.91613	393.5233	124.7388	475.736
Sep 2026	237.5924	194.1318	418.053	118.3809	513.583
Oct 2026	236.8142	190.097	443.5314	112.32474	552.9609
Nov 2026	236.0802	195.517	470.2552	111.9592	594.22
Dec 2026	235.4129	197.3788	498.2046	106.2422	637.3182

Table 4.13

Table showing Forecasted Share Prices of Coal India Limited

Month	Price	Low (80%chance)	High (80%chance)	Low (95%chance)	High (95%chance)
Jan 2026	401.687	371.9471	431.4269	356.2038	447.1703
Feb 2026	415.5576	373.4991	457.6162	351.2346	479.8806

Mar 2026	413.7273	362.2163	465.2383	334.948	492.5066
Apr 2026	423.68	364.2002	483.1598	332.7135	514.6465
May 2026	425.9869	359.4865	492.4874	324.2833	527.6906
Jun 2026	434.1707	361.3232	507.0183	322.76	545.5815
ul 2026	445.5853	366.901	524.2697	325.248	565.9227
Aug 2026	451.7955	367.6784	535.9127	323.1495	580.4416
Sep 2026	453.8539	364.6342	543.0736	317.4042	590.3037
Oct 2026	459.9326	365.8868	553.9784	316.1019	603.7632
Nov 2026	470.2215	371.5854	568.8576	319.3706	621.0724
Dec 2026	470.0578	367.0358	573.0798	312.4992	627.6164

Table 4.14

Table showing Forecasted Share Prices of Bharat Heavy Electricals Limited

Month	Price	Low (80%chance)	High (80%chance)	Low (95%chance)	High (95%chance)
Jan 2026	294.378	270.0786	318.6774	257.21529	331.5407
Feb 2026	300.04	259.9415	340.1385	238.71465	361.3654
Mar 2026	321.9456	265.6629	378.2283	235.86865	408.0225
Apr 2026	336.5964	263.2107	409.9821	224.36266	448.8302
May 2026	356.9299	265.4066	448.4531	216.95707	496.9027
Jun 2026	373.9817	263.2734	484.69	204.66789	543.2955

Jul 2026	379.1138	248.1925	510.0351	178.88689	579.3407
Aug 2026	387.0731	234.9411	539.205	154.40731	619.7388
Sep 2026	409.8136	235.5064	584.1208	143.23369	676.3934
Oct 2026	433.2895	235.8751	630.704	131.37022	735.2089
Nov 2026	454.4217	232.9992	675.8443	115.78513	793.0583
Dec 2026	469.5079	223.2053	715.8104	92.82064	846.1951

Table 4.15

Table showing Forecasted Share Prices of National Thermal Power Corporation

Month	Price	Low (80%chance)	High (80%chance)	Low (95%chance)	High (95%chance)
Jan 2026	333.8754	311.5217	356.2291	299.6884	368.0624
Feb 2026	337.9508	306.338	369.5637	289.6031	386.2986
Mar 2026	342.0263	303.3086	380.744	282.8127	401.2399
Apr 2026	346.1017	301.3943	390.809	277.7277	414.4757
May 2026	350.1771	300.1928	400.1615	273.7327	426.6216
Jun 2026	354.2525	299.4974	409.0076	270.5118	437.9932
Jul 2026	358.328	299.1857	417.4702	267.8777	448.7783
Aug 2026	362.4034	299.1776	425.6291	265.708	459.0988
Sep 2026	366.4788	299.4178	433.5398	263.9178	469.0398

Oct 2026	370.5542	299.8657	441.2428	262.4455	478.663
Nov 2026	374.6297	300.4909	448.7684	261.2442	488.0151
Dec 2026	378.7051	301.2697	456.1405	260.2778	497.1323

FINDINGS AND SUGGESTIONS FINDINGS

- The share prices of selected public sector companies show a long-term upward trend over the study period, indicating overall growth in investor confidence. This reflects gradual improvement in the performance and market perception of PSUs.
- Short-term fluctuations are observed in all selected companies due to market news, economic changes, and global factors affecting the stock market. These fluctuations make short-term prediction of share prices difficult.
- Volatility is higher during periods of economic uncertainty such as budget announcements, interest rate changes, and global financial disturbances. This shows that macroeconomic factors have a strong influence on PSU share prices.
- ome public sector companies show more stable price movements compared to others, reflecting differences in business nature and financial performance. This indicates that stability varies across sectors and companies.
- Banking sector PSUs show comparatively higher volatility due to sensitivity to interest rates, NPAs, and regulatory changes. This makes banking stocks more reactive to economic and policy changes.
- Energy and infrastructure PSUs exhibit relatively stable trends because of consistent demand and government support. This stability attracts long-term investors seeking steady returns.
- Sudden spikes and falls in share prices are observed during major policy announcements and government reforms related to public sector enterprises. This indicates that PSU stocks are highly influenced by government decisions.
- The trend analysis shows that PSU stocks have improved performance in recent

years compared to earlier years. This improvement suggests growing investor interest in public sector companies.

- Volatility is higher during market downturns and crises, showing that PSU stocks are not completely immune to overall market risk. This highlights the importance of understanding market conditions before investing.
- Monthly price movements show more volatility than annual average prices, indicating short-term trading risks. This proves that frequent trading in PSU stocks can be riskier.
- The selected companies show different levels of volatility, proving that not all PSU stocks behave in the same manner. This emphasizes the need for company-wise analysis rather than general assumptions.
- Share prices react positively to good financial results and dividend announcements made by public sector companies. This shows that investors value strong financial performance and returns.
- Negative news such as losses, declining profits, or regulatory issues leads to a fall in share prices and increased volatility. This indicates that bad news quickly affects investor sentiment.
- Trend patterns indicate that PSU stocks are suitable for medium to long-term investment rather than short-term speculation. This suits investors with long-term financial goals.
- Overall analysis shows that while PSU stocks provide relatively stable returns, they are still influenced by market movements and external economic factors. This means investors should not assume PSU stocks are risk-free.

SUGGESTIONS

- Investors should focus on long-term investment in public sector companies as they show stable growth over a period of time. Long-term holding can help in earning better returns with lower risk.
- Short-term traders should be cautious while investing in PSU stocks due to frequent price fluctuations and volatility. Proper market analysis is essential

before taking short-term positions.

- Diversification of investment across different public sector companies is advisable to reduce overall risk. This helps in balancing losses in one stock with gains in another.
- Investors should analyze financial statements and performance indicators before investing in any PSU stock. This enables informed decision-making and reduces the chance of losses.
- Government policy changes and budget announcements should be closely monitored as they significantly impact PSU share prices. Staying updated helps investors anticipate possible price movements.
- Investors should avoid making investment decisions based solely on short-term market rumours and news. Decisions based on reliable information lead to better investment outcomes.
- Regular monitoring of market trends can help investors make better entry and exit decisions. This improves timing of investment and profit realization.
- Risk-averse investors can prefer PSUs with stable price movements and consistent dividend history. Such stocks provide relatively secure and regular income.
- Technical analysis tools can be used along with fundamental analysis to understand price trends and volatility better. Using both approaches provides a more complete view of the stock's behaviour.
- Investors should invest systematically rather than making lump sum investments during highly volatile periods. This reduces the impact of market timing risk.
- Awareness programs can be conducted to educate small investors about the nature of PSU stocks and market risks. This can improve financial literacy and responsible investing behaviour.
- ublic sector companies should improve transparency and timely disclosure of financial information to reduce uncertainty among investors. This can

strengthen trust and stabilize share price movements.

- PSU management should focus on improving operational efficiency to enhance investor confidence and reduce volatility. Better performance leads to positive market perception.
- The government should frame stable and consistent policies for PSUs to ensure steady growth in their market performance. Policy stability can reduce uncertainty in the stock market.
- Future researchers can extend the study by including more companies and longer time periods for more comprehensive results. This will provide deeper insights into long-term trends and volatility patterns.

CONCLUSIONS

This study on the trend and volatility behaviour of share prices of selected public sector companies was undertaken with the objective of understanding the long-term movement, short-term fluctuations, and risk characteristics associated with PSU stocks in the Indian stock market. Public sector enterprises play a significant role in the Indian economy, and their performance in the capital market reflects not only company-specific factors but also government policies and overall economic conditions. The analysis of share price trends and volatility provided valuable insights into the nature of investment opportunities and risks associated with PSU stocks. The findings of the study reveal that the selected public sector companies have shown a general upward trend in share prices over the study period, indicating gradual growth in investor confidence and improvement in the performance of these enterprises. Although the long-term trend is positive, the share prices have experienced noticeable short-term fluctuations due to various internal and external factors. Market news, financial results, government policy changes, budget announcements, and global economic events were found to influence the movement of PSU stock prices significantly. This indicates that PSU stocks, like private sector stocks, are sensitive to overall market conditions and are not completely insulated from market risks.he volatility analysis highlighted that PSU stocks experience varying degrees of price fluctuations. Certain sectors, especially banking and finance-related public sector companies, exhibit higher volatility due to their exposure to interest rate changes, regulatory policies, non-performing assets, and macroeconomic developments. On the other hand, PSUs operating in sectors such as energy, power, and infrastructure tend to show relatively stable price movements owing to consistent demand, long-term projects, and government support. This sectoral variation in volatility suggests that investors cannot treat all public sector companies as having similar risk profiles and must evaluate each company individually.

Another important conclusion drawn from the study is that volatility tends to increase during periods of economic uncertainty, financial crises, and major policy changes. Events such as changes in interest rates, government reforms related to disinvestment or privatization, and global economic disturbances lead to sudden increases in price fluctuations. This highlights the strong influence of macroeconomic and policy-related factors on the performance of PSU stocks. The study also shows that monthly price movements are more volatile compared to annual average prices, indicating that short-term trading in PSU stocks involves higher risk, while long-term holding may provide relatively stable returns.

The study further reveals that investor reactions to financial performance and corporate announcements play a crucial role in determining share price movements. Positive financial results, profit growth, and dividend announcements generally lead to a rise in share prices, while negative news such as losses, declining profitability, or regulatory issues result in price declines and increased volatility. This indicates that despite being government-owned, public sector companies are closely monitored by investors and are evaluated based on their financial performance and growth prospects.

Based on the findings, the suggestions put forward in the study emphasize the importance of long-term investment strategies, diversification, and informed decision-making for investors. PSU stocks appear to be more suitable for medium to long-term investment rather than short-term speculative trading, especially for risk-averse investors seeking relatively stable returns. The study also highlights the need for investors to use both fundamental and technical analysis to understand the trend and volatility patterns of PSU stocks. Monitoring government policies, economic indicators, and company-specific performance can help investors make better investment decisions and manage risk effectively.

rom the perspective of public sector companies and policymakers, the study suggests that improving transparency, timely disclosure of financial information, and operational efficiency can enhance investor confidence and reduce uncertainty in the market. Stable and consistent government policies regarding public sector enterprises can contribute to reducing volatility and promoting steady growth in share prices. The role of awareness programs and investor education is also emphasized, as informed investors are better equipped to understand market risks and opportunities associated with PSU stocks.

In conclusion, the study establishes that while public sector companies provide relatively stable investment opportunities compared to highly speculative stocks, they are still exposed to market volatility and economic uncertainties. The trend and volatility behaviour of PSU share prices is influenced by a combination of company performance, sector-specific characteristics, government policies, and overall market conditions. Therefore, investors should not consider PSU stocks as risk-free but should adopt a balanced and informed approach while investing in them. The study also provides a foundation for future research, which can be extended by including a larger sample of companies, longer time periods, and advanced statistical tools for more comprehensive analysis. Overall, the research contributes to a better understanding of the behaviour of PSU share prices and offers useful insights for investors, policymakers, and future researchers.

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IMPACT OF FINANCIAL TECHNOLOGY ON FINANCIAL INCLUSION: AN EMPIRICAL STUDY WITH SPECIAL REFERENCE TO RURAL BANKING

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Abstract

Financial Technology (FinTech) has transformed the delivery of financial services by improving accessibility, affordability, and efficiency, particularly in rural areas. This study examines the impact of FinTech on financial inclusion with special reference to rural banking. Using a descriptive and analytical research design, primary data were collected from 250 respondents through a structured questionnaire. The data were analyzed using SPSS with correlation and regression techniques to evaluate the relationship between FinTech adoption and financial inclusion. The findings reveal a strong positive correlation (r = 0.742) between FinTech adoption and financial inclusion, while regression analysis indicates that FinTech adoption explains 55.1% of the variation in financial inclusion. The study concludes that increased use of digital financial services significantly enhances access to banking, credit, and payment systems, while reducing dependence on physical bank branches. It also highlights the

need to improve digital literacy, internet connectivity, and cybersecurity awareness to maximize the benefits of FinTech. The research emphasizes that with appropriate policy support and infrastructure development, FinTech can serve as a powerful tool for promoting inclusive and sustainable economic growth in rural India

INTRODUCTION

Financial inclusion is recognized as a cornerstone of sustainable economic growth, ensuring equitable access to essential financial services such as savings, credit, insurance, and payment systems. In developing economies like India, rural populations often face exclusion from formal banking due to geographical constraints, lack of financial literacy, and high transaction costs. Financial Technology (FinTech) has emerged as a disruptive innovation addressing these challenges by leveraging digital platforms, mobile applications, and internet-based services. FinTech enables individuals in rural areas to access financial services without reliance on physical bank branches. Government initiatives such as Jan Dhan Yojana, Digital India, Aadhaar enabled Payment Systems (AePS), and UPI have further accelerated FinTech adoption. Despite these advancements, challenges related to digital literacy, cybersecurity, and infrastructure persist. Therefore, this study empirically investigates the role of FinTech in promoting financial inclusion through rural banking

REVIEW OF LITERATURE KEYWORDS

FinTech, Financial Inclusion, Rural Banking, Digital Payments, SPSS, Correlation, Regression

Previous studies indicate that FinTech significantly enhances financial inclusion by improving accessibility and reducing transaction costs (Goswami et al., 2022). Jena (2025) found that perceived ease of use and trust significantly influence FinTech adoption in rural India. Kandpal and Mehrotra (2019) emphasized the role of digital payments in transitioning towards a cashless economy.However, several studies also highlight barriers such as low digital literacy and cybersecurity concerns (Amnas et al., 2024; Raj & Upadhyay, 2020). While extensive literature exists on FinTech adoption, empirical studies using primary data focusing specifically on rural banking remain limited, thereby justifying the present study.

RESEARCH GAP

- Limited empirical studies using primary data on FinTech and rural financial inclusion ●Lack of statistical validation using correlation and regression tools
- Insufficient focus on user perception and satisfaction in rural banking contexts

OBJECTIVES OF THE STUDY

- To analyze the level of FinTech usage among rural banking users
- To examine the relationship between FinTech adoption and financial inclusion
- To study the impact of FinTech services on access to financial services

HYPOTHESES

H_0: There is no significant relationship between FinTech usage and financial inclusion

H_1: There is a significant relationship between FinTech usage and financial inclusion

RESEARCH METHODOLOGY

Particulars	Description
Research Design	Descriptive & Analytical
Sample Size	250 Respondents
Sampling Technique	Convenience Sampling
Data Source	Primary Data (Questionnaire)
Tools Used	Correlation & Regression, SPSS

VARIABLES USED FOR ANALYSIS

Independent Variable (FinTech Adoption Index)

Frequency of FinTech usage

Ease of use Digital payments usage

Access to online banking

Cost & time efficiency

Dependent Variable (Financial Inclusion Index)

Access to banking services

Access to credit

Reduction in bank visits

Financial participation

Overall satisfaction

DATA ANALYSIS AND INTERPRETATION

Correlation Analysis

Table 1: Correlation between FinTech Adoption and Financial Inclusion (n = 250)

VARIABLE	FINTECH ADOPTION	FINANCIAL INCLUSION
FINTECH ADOPTION	1	
FINANCIAL INCLUSION	0.742	1

Interpretation:

The Pearson correlation coefficient (r = 0.742) indicates a strong positive relationship between FinTech adoption and financial inclusion.

This implies that increased use of FinTech services significantly improves financial inclusion among rural users.

REGRESSION ANALYSIS

Dependent Variable: Financial Inclusion

Independent Variable: FinTech Adoption

Model Summary

RR²	Adjusted	R²	Std. Error

0.742	0.551	0.549	0.43

Interpretation:

The R^2 value of 0.551 indicates that 55.1% of the variation in financial inclusion is explained by FinTech adoption

ANOVA TABLE

Model F	Sig
Regression	303.450.00

Interpretation:

Since $p < 0.05$, the regression model is statistically significant

COEFFICIENTS TABLE

Variable Beta

	T-value sig	
Constant	1.214	6.32
FinTech Adoption	0.687	17.42

Interpretation:

FinTech adoption has a significant positive impact on financial inclusion.

A one-unit increase in FinTech adoption increases financial inclusion by 0.687 units.

HYPOTHESIS TESTING

Since p-value < 0.05, H_0 is rejected H_1 is accepted

There is a significant relationship between FinTech adoption and financial inclusion

FINDINGS

●Majority of respondents use FinTech services frequently

●FinTech significantly improves access to banking and credit services

●Reduction in bank visits observed among rural users

●Strong positive relationship between FinTech usage and financial inclusion

SUGGESTIONS

●Conduct digital literacy programs in rural areas

●Improve internet connectivity infrastructure

●Strengthen cybersecurity awareness

●Promote government-led FinTech awareness campaigns

CONCLUSION

The study concludes that Financial Technology (FinTech) has emerged as a transformative force in promoting financial inclusion, particularly in rural banking. The empirical analysis demonstrates a significant positive relationship between FinTech adoption and financial inclusion, indicating that greater use of digital financial services improves access to essential banking facilities, credit, savings, and digital payment systems. The findings reveal that FinTech has reduced the dependence on physical bank branches by enabling users to perform financial transactions conveniently through mobile applications, internet banking, Unified Payments Interface (UPI), and other digital platforms.

The statistical analysis using correlation and regression confirms that FinTech adoption has a meaningful impact on financial inclusion, with more than half of the variation in financial inclusion being explained by the adoption of FinTech services. This highlights the effectiveness of digital financial technologies in enhancing financial participation among rural populations. Increased accessibility, reduced transaction costs, faster service delivery, and greater convenience have encouraged more people to engage with the formal financial system, thereby supporting inclusive economic development.

Despite these positive outcomes, the study also recognizes several challenges that hinder the full potential of FinTech in rural areas. Limited digital literacy, inadequate internet connectivity, cybersecurity concerns, and a lack of awareness regarding digital financial services continue to restrict widespread adoption. Addressing these issues requires coordinated efforts from the government, financial institutions, FinTech companies, and educational organizations. Digital literacy programmes, infrastructure development, awareness campaigns, and stronger cybersecurity measures are essential to build trust and encourage the safe use of digital financial services.

FinTech plays a crucial role in enhancing financial inclusion through rural banking. The empirical evidence confirms that digital financial services significantly improve accessibility, efficiency, and participation in the formal financial system. With appropriate policy support and infrastructure development, FinTech can serve as a powerful instrument for inclusive economic growth

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