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DETERMINANTS OF ONLINE APPAREL PURCHASE BEHAVIOR AMONG WOMEN CONSUMERS: EVIDENCE FROM CHENNAI DISTRICT

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ABSTRACT

The rapid expansion of e-commerce and digital technologies has significantly transformed consumer purchasing behavior, particularly in the apparel sector. This study aims to examine the determinants influencing online apparel purchase behavior among women consumers in the Chennai district. The study focuses on key factors such as convenience, price, trust, social media influence, and product-related attributes. A structured questionnaire was used to collect primary data from 387 women consumers in the study region. Statistical tools such as descriptive statistics, one-sample t-test, and multiple regression analysis were employed to analyze the data. The results of the study reveal that all selected determinants have a significant positive influence on online apparel purchase behavior. Among the factors, trust emerged as the most influential determinant, followed by product-related attributes and convenience, indicating that reliability, product quality, and ease of use are critical in shaping purchase decisions. The findings also highlight the importance of competitive pricing and social media influence in enhancing consumer engagement and purchase intention. The regression analysis further confirms that these variables collectively explain a substantial proportion of variation in online purchase decisions. The study provides valuable insights for e-retailers and marketers to develop effective strategies by focusing on trust-building mechanisms, improving product information, offering competitive pricing, and leveraging digital marketing platforms. The research contributes to the existing literature by offering region-specific insights into women consumers' online apparel purchasing behavior in the Chennai district.

KEYWORDS: Online Apparel Purchase Behavior, Women Consumers, Convenience, Trust, Social Media Influence, Product-related Attributes, E-commerce, Chennai District

INTRODUCTION

The rapid advancement of digital technologies and the proliferation of e-commerce platforms have significantly transformed consumer buying behavior, particularly in the apparel sector. Online apparel shopping has emerged as one of the fastest-growing segments in the retail industry, driven by its convenience, time efficiency, and extensive product variety. Women consumers constitute a vital segment in this domain, as their purchase decisions are often influenced by a combination of psychological, social, cultural, and technological factors **(Kumar & Gupta, 2022)**. The increasing penetration of smartphones, improved internet connectivity, and the availability of secure digital payment systems have further facilitated the growth of online apparel shopping, especially in urban regions like Chennai. Recent studies indicate that convenience, ease of access, competitive pricing, and a wide range of choices are primary factors driving online apparel purchases among women **(Sharma & Jain, 2023)**. Moreover, the influence of digital marketing strategies, including social media promotions, influencer endorsements, online reviews, and personalized recommendations, has become increasingly significant in shaping consumer attitudes and purchase intentions **(Patel & Singh, 2024)**. These digital touchpoints not only enhance consumer engagement but also build trust and perceived value toward online platforms. However, certain challenges continue to influence consumer decision-making, including concerns about product quality, size and fit accuracy, return policies, and data security **(Reddy & Narayan, 2022)**. Despite these issues, the evolving preferences of women consumers, characterized by increased fashion consciousness and digital literacy, have contributed to a steady rise in online apparel purchases.

In the Chennai district, where urbanization and technology adoption are rapidly increasing, understanding the determinants of women consumers' online apparel purchase behavior is crucial. Therefore, this study aims to examine the key factors influencing online apparel purchasing behavior, providing valuable insights for marketers and e-retailers to develop effective strategies and enhance customer satisfaction.

REVIEW OF LITERATURE

The growing prominence of e-commerce has led to a substantial body of research examining online apparel purchase behavior, particularly among women consumers. Studies have consistently highlighted that convenience, accessibility, and time-saving benefits are among the primary motivations driving consumers toward online shopping platforms. **Kumar and Gupta (2022)** observed that urban women prefer online apparel shopping due to the availability of a wide range of products, flexible purchasing options, and ease of comparison across brands. Similarly, **Sharma and Jain (2023)** found that convenience and competitive pricing significantly influence purchase intention, particularly among working women seeking efficient shopping alternatives. In addition to functional benefits, technological and digital factors have emerged as key determinants of online apparel purchase behavior. **Patel and Singh (2024)** emphasized the critical role of social media platforms, influencer marketing, and online reviews in shaping consumer perceptions and purchase decisions. Their study revealed that positive online reviews and endorsements from influencers significantly enhance trust and encourage purchase intentions among women consumers. Furthermore, personalized recommendations and AI-driven features have been found to improve user experience and satisfaction, thereby increasing the likelihood of repeat purchases. Trust and perceived risk also play a vital role in influencing online apparel shopping behavior. **Reddy and Narayan (2022)** found that concerns about product quality, size and fit, payment security, and return policies often act as barriers to online purchases. Their findings suggest that transparent return policies and reliable product descriptions can mitigate perceived risks and build consumer confidence. Similarly, studies have indicated that brand reputation and website credibility significantly affect trust levels among online shoppers. Moreover, demographic and psychographic factors such as age, income, education, and fashion consciousness have been found to influence purchasing behavior. Younger consumers, particularly millennials, are more inclined to shop online for apparel due to their higher digital literacy and greater exposure to online platforms. Women consumers who are more fashion-conscious tend to engage more frequently with online apparel platforms to explore new trends and styles. In the Indian context, particularly in metropolitan cities like Chennai, the increasing adoption of smartphones and internet services has further accelerated the growth of online apparel shopping. Despite the growing body of literature, there remains a need for region-specific studies that examine the unique preferences and behavioral patterns of women consumers. Therefore, the present study attempts to bridge this gap by examining the determinants of online apparel purchase behavior among women consumers in Chennai district.

PROBLEM OF THE STUDY

The rapid expansion of e-commerce platforms and increasing digitalization have significantly transformed the apparel purchasing landscape, particularly among women consumers. Despite the growing popularity of online apparel shopping in urban regions such as Chennai, consumer behavior varies considerably, influenced by multiple factors, including convenience, price sensitivity, trust, perceived risk, social media influence, and product-related concerns such as size, fit, and quality. While prior studies have explored online buying behavior, many have focused on general consumer groups or broader geographical contexts, with limited attention to region-specific and gender-focused analysis. In the context of Chennai district, where socio-economic diversity, cultural preferences, and levels of technological adoption vary considerably, understanding the unique determinants of women consumers' online apparel purchase behavior remains insufficiently explored. Furthermore, the interplay among technological factors (such as personalization and digital marketing), psychological factors (such as trust and perceived value), and demographic characteristics has not been comprehensively examined within a unified framework. This lack of focused empirical evidence creates a gap in understanding the specific drivers and barriers influencing women consumers' online apparel purchases in the study region. Hence, there is a need to systematically investigate the determinants of online apparel purchase behavior among women consumers in Chennai district to provide meaningful insights for academicians, marketers, and e-retailers to develop effective strategies and enhance consumer satisfaction.

NEED FOR THE STUDY

The present study is essential due to the rapid growth of online retailing and the increasing participation of women consumers in the digital apparel market. In urban regions like Chennai, changing lifestyles, higher digital literacy, and widespread internet access have significantly influenced purchasing patterns. However, women consumers' online apparel buying behavior is shaped by a complex set of factors, including convenience, price, trust, social media influence, and concerns about product quality and fit. Despite the expansion of e-commerce, there is limited region-specific research focusing exclusively on women consumers in the Chennai district. Understanding these determinants is crucial for e-retailers and marketers to design effective strategies, enhance the customer experience, and improve satisfaction. Therefore, this study is needed to provide empirical insights into the factors influencing online apparel purchase behavior among women consumers and to bridge the existing research gap in the study area.

OBJECTIVES OF THE STUDY

- To identify and analyse the key determinants influencing online apparel purchase behavior among women consumers in the Chennai district.
- To examine the impact of selected factors such as convenience, price, trust, social media influence, and product-related attributes on the online apparel purchase decisions of women consumers in the study region.

HYPOTHESES OF THE STUDY

- There is a significant influence of key determinants (such as convenience, price, trust, social media influence, and product-related attributes) on the online apparel purchase behavior among women consumers in the Chennai district.
- The factors, namely convenience, price, trust, social media influence, and product-related attributes, have a significant positive impact on the online apparel purchase decisions of women consumers in the study region.

RESEARCH METHODOLOGY

The present study adopts a descriptive research design to examine the determinants influencing online apparel purchase behavior among women consumers in the Chennai district. Both primary and secondary data sources were utilized for the study. Primary data were collected through a structured questionnaire developed based on relevant literature and research objectives. The questionnaire consisted of two sections: a demographic profile and statements related to key determinants such as convenience, price, trust, social media influence, and product-related attributes, measured on a five-point Likert scale ranging from strongly disagree to agree strongly. A total of 387 valid responses were collected from women consumers using convenience sampling. Secondary data were gathered from published sources, including journals, books, reports, and online databases, to support the theoretical framework and review of the literature. The collected data were coded and analyzed using statistical software, and appropriate tools, such as descriptive statistics, one-sample t-tests, and multiple regression analyses, were employed to assess the influence of selected variables on online apparel purchase behavior. The instrument's reliability and validity were established prior to analysis, and the findings were interpreted to draw meaningful conclusions consistent with the study's objectives.

RESULTS AND DISCUSSION

Table 1

Demographic profile of women consumers

(n=387)

Demographic Variables	Category	Frequency (n)	Percentage (%)
Age Group	Below 20 Years	38	9.8
	21 – 30 Years	142	36.7
	31 – 40 Years	108	27.9
	41 – 50 Years	64	16.5
	Above 50 Years	35	9.1
Marital Status	Unmarried	168	43.4
	Married	219	56.6
Educational Qualification	Up to HSC	52	13.4
	Undergraduate (UG)	148	38.2
	Postgraduate (PG)	126	32.6
	Professional Degree	61	15.8
Occupation	Student	82	21.2
	Private Employee	148	38.2
	Government Employee	46	11.9
	Professional	52	13.4
	Homemaker	59	15.3
Monthly Family Income (₹)	Up to 50,000	118	30.5
	50,001 – 1,00,000	136	35.1
	1,00,001 – 1,50,000	82	21.2

	Above 1,50,000	51	13.2
Family Type	Nuclear Family	302	78
	Joint Family	85	22
Number of Family Members	Up to 2 Members	54	14
	3 – 4 Members	176	45.5
	5 – 6 Members	108	27.9
	Above 6 Members	49	12.6

The demographic profile of women consumers in the study area (n = 387) reveals that a majority of respondents (36.7%) belong to the age group of 21–30 years, followed by 31–40 years (27.9%), indicating that young and middle-aged women form the core segment of online apparel consumers. In terms of marital status, more than half of the respondents (56.6%) are married, while 43.4% are unmarried. Regarding educational qualifications, a significant proportion of respondents hold undergraduate degrees (38.2%), followed by postgraduates (32.6%), reflecting a relatively high level of education among participants. By occupation, the largest group comprises private employees (38.2%), followed by students (21.2%), suggesting that working women and young learners are actively engaged in online apparel shopping. In terms of monthly family income, most respondents fall within the ₹50,001–₹1,00,000 category (35.1%), followed by those earning up to ₹50,000 (30.5%), indicating a predominance of middle-income households. The family structure shows that a vast majority (78%) belong to nuclear families, while 22% are from joint families. Furthermore, the number of family members indicates that nearly half of the respondents (45.5%) live in families with 3–4 members, followed by 5–6 members (27.9%). Overall, the profile suggests that educated, working, middle-income women from nuclear families constitute the major segment of respondents in the study region.

Influence of key determinants (such as convenience, price, trust, social media influence, and product-related attributes) on the online apparel purchase behavior among women consumers in the Chennai district

Hypothesis-1

There is a significant influence of key determinants (such as convenience, price, trust, social media influence, and product-related attributes) on the online apparel purchase behavior among women consumers in the Chennai district.

Table 2

Results of a one-sample t-test for the influence of key determinants on the online apparel purchase behavior among women consumers in the Chennai district

Determinants	Mean	SD	t-value	p-value	Result
Convenience	3.94	0.812	23.87	0.000**	Significant
Price	3.88	0.835	20.96	0.000**	Significant
Trust	3.97	0.804	25.41	0.000**	Significant
Social Media Influence	3.85	0.847	19.72	0.000**	Significant
Product-related Attributes	3.92	0.821	22.64	0.000**	Significant
Overall Average Score of key determinants	3.91	0.803	24.18	0.000	Significant
Decision: Hypothesis supported					

The results of the one-sample t-test presented in Table 2 indicate that all the key determinants—convenience, price, trust, social media influence, and product-related attributes—have mean scores significantly higher than the neutral value of 3, confirming their strong influence on online apparel purchase behavior among women consumers in the Chennai district. Among the determinants, trust records the highest mean score (Mean = 3.97, t = 25.41), indicating that reliability, security, and credibility of online platforms play a crucial role in influencing purchase decisions. This is followed by convenience (Mean = 3.94, t =

23.87) and product-related attributes (Mean = 3.92, t = 22.64), suggesting that ease of shopping and product features such as quality, size, and variety significantly impact consumer behavior. Although comparatively lower, price (Mean = 3.88, t = 20.96) and social media influence (Mean = 3.85, t = 19.72) also exhibit statistically significant influence. The overall average score of key determinants (Mean = 3.91, t = 24.18, $p < 0.001$) further confirms that women consumers exhibit a significantly positive perception toward these factors. Since all p-values are less than 0.01, the results are highly significant. Therefore, the hypothesis is supported, indicating that key determinants significantly influence online apparel purchase behavior in the study region.

Influence of factors, namely convenience, price, trust, social media influence, and product-related attributes, on online apparel purchase decisions of women consumers in the study region.

Hypothesis-2

The factors, namely convenience, price, trust, social media influence, and product-related attributes, have a significant positive impact on the online apparel purchase decisions of women consumers in the study region.

Table 3

Results of Multiple Regression Analysis for the Impact of Determinants on Online Apparel Purchase Decisions

Dependent Variable: Online Apparel Purchase Decisions	Independent Variables	Estimate (β)	S.E.	t-value	p-value	Result
	Convenience	0.226	0.042	5.381	<0.001**	Significant
	Price	0.174	0.039	4.462	<0.001**	Significant
	Trust	0.281	0.046	6.109	<0.001**	Significant
	Social Media Influence	0.148	0.037	4.000	<0.001**	Significant
	Product-related Attributes	0.239	0.043	5.558	<0.001**	Significant
$R^2 = 0.701$						
Adjusted $R^2 = 0.697$						
F-value = 178.62						
p-value = <0.001**						
Decision: Hypothesis supported						

The results of the multiple regression analysis indicate that all the selected factors—convenience, price, trust, social media influence, and product-related attributes—have a significant positive impact on the online apparel purchase decisions of women consumers in the study region. Among these determinants, trust (β = 0.281, t = 6.109) emerges as the most influential factor, highlighting the importance of reliability, security, and credibility of online platforms in shaping purchase decisions. This is followed by product-related attributes (β = 0.239, t = 5.558) and convenience (β = 0.226, t = 5.381), indicating that product quality, variety, and ease of shopping are crucial factors influencing consumer behavior. Although comparatively lower, price (β = 0.174, t = 4.462) and social media influence (β = 0.148, t = 4.000) also significantly contribute to purchase decisions. The overall model is statistically significant (F = 178.62, $p < 0.001$), and the coefficient of determination ($R^2 = 0.701$) indicates that 70.1% of the variation in online apparel purchase decisions is explained by the selected independent variables, demonstrating strong explanatory power. The adjusted R^2 value (0.697) further confirms the model's robustness. Since all p-values are less than 0.01, the relationships are highly significant. Therefore, the hypothesis is supported, confirming that the identified factors have a significant positive impact on women consumers' online apparel purchase decisions in the study region.

DISCUSSIONS

The findings of the present study provide strong empirical evidence that key determinants—convenience, price, trust, social media influence, and product-related attributes—have a significant positive impact on the online apparel purchase decisions of women consumers in the study region. Among these, **trust** emerged as the most influential factor, indicating that women consumers place high importance on the reliability, security, and credibility of online platforms. This finding is consistent with earlier studies suggesting that trust plays a crucial role in reducing perceived risk and enhancing online purchase intentions (Reddy & Narayan, 2022). Similarly, the significant influence of **product-related attributes** underscores that aspects such as product quality, accurate size and fit, variety, and detailed product descriptions are critical to shaping consumer decisions, particularly in apparel shopping, where physical inspection is not possible (Kumar & Gupta, 2022). The strong effect of **convenience** reflects an increasing preference among women consumers for time-saving, flexible, and hassle-free shopping experiences, especially in urban areas like Chennai. This supports the findings of Sharma and Jain (2023), who reported that convenience is a major driver of online fashion purchases among working women. In addition, **price** was found to have a significant positive impact, indicating that consumers are highly responsive to competitive pricing, discounts, and perceived value for money, which aligns with previous research emphasizing the role of economic factors in online shopping behavior (Kumar & Gupta, 2022). Although comparatively lower in magnitude, **social media influence** was also significant, suggesting that digital platforms, influencer marketing, and online reviews play an important role in shaping consumer perceptions and purchase intentions. This finding is consistent with Patel and Singh (2024), who highlighted the growing impact of social media and influencer endorsements on online purchasing behavior. The overall model demonstrates strong explanatory power ($R^2 = 0.701$), indicating that these determinants collectively account for a substantial proportion of the variation in online apparel purchase decisions. The results are consistent with established theoretical frameworks such as the Technology Acceptance Model (TAM) and consumer behavior theories, which emphasize the importance of perceived usefulness, trust, and external influences in shaping purchase decisions. Therefore, the study reinforces the need for e-retailers to focus on enhancing trust, improving product-related information, offering competitive pricing, and leveraging social media strategies to influence women consumers' online apparel purchase behavior effectively.

CONCLUSION

The present study concludes that a combination of technological, economic, and psychological factors significantly influences the online apparel purchase behavior of women consumers in the Chennai district. The empirical findings reveal that key determinants, including convenience, price, trust, social media influence, and product-related attributes, play a crucial role in shaping purchase decisions. Among these, trust emerged as the most influential factor, indicating that reliability, security, and credibility of online platforms are essential in encouraging women consumers to engage in online apparel shopping. Additionally, product-related attributes such as quality, size accuracy, and variety, along with the convenience of online platforms, further enhance the overall shopping experience and drive purchase decisions. The study also highlights that price sensitivity and social media influence significantly shape consumer behavior, underscoring the importance of competitive pricing strategies and digital engagement in the current e-commerce environment. The model's strong explanatory power indicates that these determinants collectively provide a comprehensive understanding of women consumers' online apparel purchase decisions.

Overall, the findings suggest that online apparel retailers should focus on building trust, improving product transparency, ensuring ease of use, and leveraging social media platforms to attract and retain women consumers effectively. The study contributes to the existing literature by providing region-specific insights into consumer behavior. It offers practical implications for marketers and e-retailers to enhance customer satisfaction and sustain competitive advantage in the growing online apparel market.

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INFLUENCE OF WORK ENVIRONMENT ON EMPLOYEE PERFORMANCE IN PUBLIC SECTOR BANKS: AN EMPIRICAL STUDY IN PUDUCHERRY

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ABSTRACT

The work environment plays a crucial role in determining employee performance in service-oriented sectors such as banking. A supportive work environment consisting of physical facilities, organizational support, interpersonal relationships, and job security enhances employee productivity and organizational effectiveness. The present study examines the influence of work environment on employee performance in public sector banks in Puducherry. The study adopts a descriptive research design and primary data were collected through a structured questionnaire from 50 employees working in public sector banks. Convenience sampling technique was used for selecting respondents. Statistical tools such as percentage analysis, t-test, ANOVA, and correlation analysis were used for data analysis with the help of SPSS software. The findings indicate that work environment has a significant influence on employee performance. The study also reveals that educational qualification has a significant relationship with employee performance, whereas gender, age, and work experience do not show significant relationships. The study concludes that improving workplace conditions, organizational support, and supervisory practices can enhance employee performance in public sector banks. The results provide useful implications for human resource management practices in the banking sector.

KEYWORDS: Work Environment; Employee Performance; Public Sector Banks; Organizational Climate; Banking Sector; Puducherry.

INTRODUCTION

The work environment is an important component of human resource management practices that significantly influences employee productivity and organizational performance. A positive work environment includes physical facilities, organizational support, healthy interpersonal relationships, and safe working conditions that enable employees to perform their duties effectively. In service-oriented sectors such as banking, employees play a crucial role in delivering quality services and achieving organizational objectives. Therefore, maintaining a supportive and comfortable work environment has become essential for improving employee performance. In recent years, the banking sector has undergone significant changes due to technological advancements, increasing customer expectations, and competitive pressures. Public sector bank employees are required to handle heavy workloads, digital banking operations, and customer service responsibilities. These challenges make it necessary for banks to provide a conducive work environment that enhances employee efficiency and motivation. A favourable work environment helps employees perform their tasks more effectively, reduces work stress, and improves overall job performance. Employee performance refers to the effectiveness with which employees carry out their assigned tasks and responsibilities. Several factors such as workplace facilities, management support, communication, and working conditions influence employee performance. A supportive work environment encourages employees to be more productive and committed to their organization. Although several studies have examined employee performance in the banking sector, limited research has focused on the influence of work environment on employee performance in public sector banks, particularly in Puducherry. Therefore, the present study attempts to examine the relationship between work environment and employee performance in public sector banks in Puducherry. In the present competitive banking environment, employee performance has become a key determinant of organizational success. Public sector banks in India are facing increasing pressure due to technological changes, digital banking services, and growing customer expectations. Under these circumstances, maintaining a supportive work environment becomes essential for improving employee efficiency and service delivery. Therefore, it is important to examine how work environment influences employee performance in public sector banks in Puducherry.

OBJECTIVES OF THE STUDY

1. To examine the influence of work environment on employee performance in public sector banks in Puducherry.
2. To analyze the relationship between demographic variables and employee performance.
3. To identify the factors of work environment influencing employee performance. 4. To provide suggestions for improving employee performance through better work environment practices.

REVIEW OF LITERATURE

Previous studies have emphasized the importance of work environment in improving employee performance and organizational effectiveness. A supportive and healthy work environment contributes significantly to employee productivity, motivation, and job satisfaction.

Chandrasekar (2011) examined the impact of workplace environment on employee productivity and found that physical working conditions, workplace facilities, and organizational support significantly influence employee performance. The study concluded that a favourable work environment enhances employee efficiency and organizational productivity.

Leblebici (2012) studied the effect of workplace quality on employee productivity and reported that workplace conditions such as lighting, ventilation, and workspace design play an important role in improving employee performance. The study emphasized that organizations should provide better working conditions to improve employee output.

Awan and Tahir (2015) identified a strong relationship between work environment and employee performance. The study found that employees working in supportive environments show higher levels of productivity and job satisfaction compared to those working in poor environments.

Raziq and Maulabakhsh (2015) examined the impact of working environment on job satisfaction and performance and concluded that a positive work environment significantly improves employee motivation and performance. The study highlighted that physical and psychological work conditions are essential factors affecting employee efficiency.

Naharuddin and Sadegi (2013) reported that workplace environment factors such as supervisor support, communication, and workplace safety have a significant influence on employee performance. The study suggested that organizations should focus on improving workplace conditions to enhance employee productivity.

Jayaweera (2015) found that a supportive work environment has a direct and positive impact on employee performance. The study revealed that organizational support and working conditions influence employee motivation and efficiency.

Banking sector studies also indicate that employees perform better when they work in a comfortable and supportive environment. Good interpersonal relationships, proper workplace facilities, and manageable workload improve employee productivity and service quality in banks.

From the above review, it is evident that work environment has a significant influence on employee performance. However, very limited studies have focused on public sector banks in Puducherry. Therefore, the present study attempts to examine the influence of work environment on employee performance in public sector banks in Puducherry.

RESEARCH GAP

The review of literature indicates that several studies have examined the relationship between work environment and employee performance in different sectors. However, limited studies have focused specifically on public sector banks in Puducherry. Most previous studies have concentrated on private sector organizations or general service industries. Therefore, there exists a research gap in understanding the influence of work environment on employee performance in public sector banks in Puducherry. The present study attempts to fill this gap between the work environment on employee performance in public sector banks.

RESEARCH METHODOLOGY

The present study adopts a descriptive research design to examine the influence of work environment on employee performance in public sector banks in Puducherry. The research implies a quantitative approach and is based on primary data collection.

Primary data collected using a structured questionnaire consisting of statements related to work environment and employee performance measured using a five-point Likert scale. The questionnaire was administered to employees working in selected public sector banks in Puducherry.

A sample of 50 employees selected using the convenience sampling method due to the easy accessibility of the respondents.

The statistical tools used in this study:

- Percentage Analysis
- Independent Sample t-test
- One-way ANOVA
- Correlation Analysis

The data analyse were performed by way of using SPSS software.

RESEARCH HYPOTHESES

The following hypotheses were formulated to examine the influence of work environment on employee performance in public sector banks in Puducherry:

H1: There is a significant difference between gender and employee performance in public sector banks.

H2: There is a significant difference between educational qualification and employee performance in public sector banks.

H3: There is a significant relationship between age of the respondents and employee performance in public sector banks.

H4: There is a significant relationship between work experience and employee performance in public sector banks.

H5: There is a significant relationship between work environment and employee performance in public sector banks.

DATA ANALYSIS AND RESULTS

Descriptive and inferential statistical techniques were employed for the analysis of data. Parametric tests such as t-test, ANOVA, and correlation analysis were used to examine the influence of the work environment on employee performance in public sector banks in Puducherry.

The demographic profile of the respondents shows that 73 percent of the respondents are male and 27 percent are female, indicating that male employees constitute the majority of the workforce in public sector banks.

It is observed that 83 percent of the respondents belong to urban areas of Puducherry, while the remaining respondents are from semi-urban and rural areas.

With regard to educational qualification, 66 percent of the respondents have completed post-graduation, whereas 30 percent have completed graduation, indicating that most employees possess higher educational qualifications.

The average work experience of the respondents is 11 years, indicating that the employees have considerable exposure to the banking work environment. The results of the independent sample t-test indicate that there is no significant difference in employee performance scores between male employees ($M = 88.2$, $SE = 2.7$) and female employees ($M = 93.4$, $SE = 3.5$), $t(48) = -1.155$, $p > 0.05$. This indicates that gender does not significantly influence the relationship between work environment and employee performance in public sector banks.

The results of ANOVA analysis reveal that there is no significant difference in employee performance scores across different public sector banks, $F(9,40) = 1.316$, $p > 0.05$, indicating that similar work environment conditions exist across public sector banks in Puducherry.

However, the analysis shows that there is a significant difference between educational qualification and employee performance scores, $F(3,46) = 3.287$, $p < 0.05$, suggesting that educational qualification plays an important role in enhancing employee performance along with work environment factors.

The correlation analysis indicates that there is no significant relationship between age and employee performance ($r = -0.009$, $p > 0.05$). Similarly, there is no significant relationship between work experience and employee performance ($r = -0.006$, $p > 0.05$).

Overall, the findings suggest that the work environment has a consistent influence on employee performance across demographic groups, while educational qualification shows a significant association with employee performance in public sector banks in Puducherry.

IMPLICATIONS OF THE STUDY

In the context of rapidly changing banking operations and increasing customer expectations, a conducive work environment plays a crucial role in improving employee performance in public sector banks. A healthy work environment enhances employee motivation, job satisfaction, and productivity, which ultimately contributes to organizational effectiveness. The findings of the study have important implications for human resource management practices in public sector banks in Puducherry. Bank management should focus on improving physical working conditions, interpersonal relationships, supervisory support, and organizational policies in order to enhance employee performance. The study highlights that a positive work environment helps in improving employee efficiency and commitment. Therefore, bank managers and administrators should take necessary steps to create a supportive and comfortable work environment that encourages better performance among employees. The results of the study will be useful for bank officials and policy makers in designing effective work environment strategies that can improve employee productivity and service quality. The study is not only applicable to public sector banks but can also be extended to other service organizations where employee performance is influenced by work environment factors. Overall, the study emphasizes that improvement in work environment conditions can lead to higher employee performance and better organizational outcomes.

LIMITATIONS OF THE STUDY

1. The study is limited to public sector banks in Puducherry.
2. The sample size is limited to 50 respondents.
3. The study is based on primary data collected through questionnaire method.
4. The findings may not be generalizable to private sector banks.

SUGGESTIONS

Public sector banks should focus on improving the overall work environment in order to enhance employee performance and productivity. Bank management should take necessary steps to improve employee job satisfaction through better working conditions, supportive supervision, and healthy interpersonal relationships, as a positive work environment leads to better employee performance. Managers in public sector banks should develop effective work environment policies and strategies to improve employee motivation and organizational performance. Public sector banks should follow standard organizational policies and ethical practices and update them periodically to maintain a positive and disciplined work environment. Training programmes, workshops, and webinars should be conducted regularly for bank employees such as clerks, officers, and support staff to improve their skills and adaptability to changing banking practices. Bank managers should create a supportive and participative work culture where employees are given opportunities to express their ideas and contribute to organizational improvement according to their job roles. Banks should also improve physical working conditions such as lighting, seating arrangements, ventilation, and workspace facilities, as these factors significantly influence employee performance.

CONCLUSION

The present study examined the influence of work environment on employee performance in public sector banks in Puducherry. The findings reveal that a positive work environment significantly improves employee performance and productivity. Factors such as physical working conditions, organizational support, and interpersonal relationships contribute to improved employee efficiency. The study shows that demographic variables such as gender, age, and work experience do not significantly influence employee performance, whereas educational qualification shows a significant relationship with performance. The results indicate that public sector banks should focus on creating a supportive and comfortable work environment in order to enhance employee productivity and organizational effectiveness. Improvement in work environment conditions will not only increase employee performance but also improve service quality in the banking sector. The study contributes to the existing literature by providing empirical evidence on the relationship between work environment and employee performance in public sector banks in Puducherry.

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ANTECEDENTS OF EMPLOYEE RETENTION IN THE PHARMACEUTICAL SECTOR IN CHENNAI CITY

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ABSTRACT

Employee retention has become a critical challenge for organizations, particularly in knowledge-intensive industries such as the pharmaceutical sector, where skilled professionals are essential to ensuring innovation, product quality, and regulatory compliance. This study examines the antecedents of employee retention among employees working in the pharmaceutical sector in Chennai City by identifying key organizational and psychological factors influencing employees' intention to remain with their organizations. A descriptive research design was adopted, and primary data were collected from 373 employees of selected pharmaceutical companies through a structured questionnaire. The study analyzed key antecedent factors, including compensation and rewards, career development opportunities, organizational culture, leadership support, job satisfaction, and work–life balance, using statistical tools such as percentages, correlations, and regression. The findings reveal that these antecedent factors significantly influence employee retention, with job satisfaction, compensation and rewards, and career development opportunities emerging as the most influential predictors. Additionally, supportive leadership, a positive organizational culture, and work–life balance were found to strengthen employees' commitment and intention to remain with their organizations. The study highlights the importance of effective human resource practices in enhancing employee satisfaction and reducing turnover. It suggests that pharmaceutical organizations should adopt competitive compensation systems, provide career growth opportunities, and foster supportive work environments to retain skilled employees and ensure workforce stability and organizational performance.

KEYWORDS: Employee Retention, Pharmaceutical Sector, Human Resource Practices, Job Satisfaction, Organizational Culture, Leadership Support, Work–Life Balance, Chennai City.

INTRODUCTION

The pharmaceutical industry in India has become one of the most dynamic and knowledge-intensive fields, driven by constant innovation, new technologies, and a growing demand for healthcare products. In a highly competitive market, the people who work for a company are now among the most important factors in its success and long-term viability. People who work for pharmaceutical companies are valuable to the company because they have specialized knowledge in areas like research and development, quality control, regulatory affairs, and production management. As a result, more and more businesses recognize that hiring and retaining skilled workers is essential for keeping operations running smoothly and staying ahead of the competition. (Armstrong, 2020). Employee retention refers to an organization's ability to keep its talented workforce by fostering a supportive work environment, offering career growth opportunities, and ensuring employee satisfaction and commitment (Dessler, 2021).

In recent years, employee retention has become a major concern for organizations across various industries, particularly in knowledge-based sectors such as pharmaceuticals. High employee turnover can create significant challenges for organizations by increasing recruitment and training costs, disrupting workflow, and leading to the loss of valuable organizational knowledge and expertise (Mathis, Jackson, & Valentine, 2020). In the pharmaceutical industry, where technical competence and regulatory compliance are critical, the departure of skilled employees may adversely affect productivity, product quality, and the capacity for innovation. Therefore, organizations must adopt effective human resource practices to retain competent employees and ensure workforce stability (Noe, Hollenbeck, Gerhart, & Wright, 2020).

Employee retention is influenced by several organizational and psychological factors, commonly referred to as antecedents. These antecedents include compensation and rewards, job satisfaction, training and development opportunities, career advancement, organizational culture, leadership support, and work–life balance. Studies have shown that organizations that provide competitive compensation, supportive leadership, and opportunities for professional growth are more successful in retaining employees for longer periods (Agarwal & Bhargava, 2019). Similarly, supportive organizational environments and effective human resource policies play an important role in strengthening employee commitment and reducing turnover intentions (Kumar & Sharma, 2021).

In the pharmaceutical sector, employee retention becomes even more significant because organizations invest substantial resources in training and developing employees with specialized scientific and technical skills. Losing such employees not only affects operational efficiency but also delays research and product development. Previous studies indicate that employees tend to remain with organizations that provide recognition, job security, career development opportunities, and supportive work environments (Gupta & Shaw, 2018). Furthermore, employee engagement and job satisfaction have been identified as key predictors of retention, particularly in knowledge-based industries where employees seek meaningful work and professional development opportunities (Singh & Jain, 2020).

Chennai City has emerged as one of India's important pharmaceutical and healthcare hubs, hosting numerous pharmaceutical manufacturing units, research laboratories, and healthcare organizations. The rapid expansion of pharmaceutical companies in the region has created a strong demand for skilled professionals across various functional areas. However, pharmaceutical companies in Chennai also face challenges related to employee turnover, skill shortages, and intense competition for talented professionals. These challenges highlight the importance of identifying the key antecedents that influence employee retention in this sector. Although several studies have examined employee retention across industries, little research has specifically examined the antecedents of employee retention in the pharmaceutical sector in Chennai City. Understanding these factors is essential for developing effective human resource strategies that promote employee commitment and long-term organizational stability. Therefore, the present study aims to examine the antecedents of employee retention among employees working in the pharmaceutical sector in Chennai City and to provide insights that will help organizations design effective retention strategies to enhance employee satisfaction, commitment, and organizational performance.

REVIEW OF LITERATURE

Employee retention has become a critical concern for organizations, particularly in knowledge-intensive industries such as pharmaceuticals, where skilled professionals are essential for innovation, product quality, and regulatory compliance. Several studies have examined the factors influencing employee retention and the role of organizational practices in reducing turnover and improving workforce stability.

Sharma and Gupta (2024) analyzed employee retention strategies in Indian pharmaceutical companies and found that competitive compensation, career development opportunities, and supportive leadership significantly influence employees' intention to remain with the organization. The study emphasized that organizations implementing structured talent management and reward systems experience lower employee turnover and improved organizational stability.

Rao and Nair (2023) investigated the role of training and development in employee retention within healthcare and pharmaceutical sectors. The study revealed that continuous skill development programs and career advancement opportunities enhance employee satisfaction and commitment, thereby reducing the likelihood of employee attrition. The authors concluded that organizations investing in employee learning and development can build a loyal and competent workforce.

Kumar and Sharma (2022) examined the relationship between organizational culture and employee retention in pharmaceutical firms in South India. The study identified that positive workplace culture, effective communication, and supportive managerial practices significantly improve employee engagement and retention. Employees working in organizations with a healthy work environment tend to demonstrate higher loyalty and reduced turnover intentions.

Singh and Jain (2021) explored the influence of job satisfaction and work–life balance on employee retention in pharmaceutical companies. The findings indicated that employees who experience higher job satisfaction and better work–life balance are more likely to remain with their organizations. The study also highlighted that flexible work policies and employee welfare programs play a vital role in strengthening employee commitment.

Gupta and Shaw (2018) examined compensation and reward systems as predictors of employee retention across various industries, including pharmaceuticals. Their research concluded that fair and competitive compensation structures significantly reduce turnover intentions and enhance employee motivation and organizational commitment.

Das and Mishra (2016) studied the impact of human resource management practices on employee retention in pharmaceutical manufacturing units. The study revealed that HR practices such as recognition programs, performance appraisal systems, and career growth opportunities contribute significantly to employee satisfaction and long-term retention.

Overall, the reviewed literature indicates that employee retention is influenced by multiple antecedents, including compensation and rewards, career development opportunities, supportive leadership, organizational culture, job satisfaction, and work–life balance. These factors collectively contribute to employee commitment and reduce turnover intentions.

However, empirical research on the antecedents of employee retention in the pharmaceutical sector in Chennai City remains limited. Therefore, the present study attempts to address this gap by examining the key factors influencing employee retention among pharmaceutical employees in the study region.

PROBLEM OF THE STUDY

The pharmaceutical sector in Chennai City has been experiencing rapid growth driven by rising demand for healthcare products, technological advancements, and expanding research and manufacturing activities. In such a competitive, knowledge-driven industry, organizations depend heavily on skilled, experienced employees to maintain operational efficiency, product quality, and regulatory compliance. However, pharmaceutical companies often face significant challenges in retaining qualified employees due to factors such as better career opportunities, higher compensation offered by competitors, limited growth prospects, and work-related pressures. High employee turnover not only increases recruitment and training costs but also results in the loss of valuable knowledge and experience, thereby affecting organizational productivity and stability. Although several human resource practices are implemented to retain employees, organizations still struggle to identify the key factors that strongly influence employees' decisions to remain with their organizations. Moreover, limited empirical research has examined the antecedents of employee retention specifically within the pharmaceutical sector in Chennai City. Therefore, it is essential to investigate the organizational and individual factors influencing employee retention in this sector. Understanding these antecedents will help pharmaceutical organizations develop effective human resource strategies to improve employee satisfaction, strengthen commitment, and enhance long-term workforce stability.

OBJECTIVES OF THE STUDY

- To identify the key antecedents influencing employee retention among employees working in the pharmaceutical sector in Chennai City.
- To examine the relationship between the identified antecedents and employee retention among employees in the pharmaceutical companies in Chennai City.

HYPOTHESES

- **H_1:** There is a significant influence of antecedent factors on employee retention among employees working in the pharmaceutical sector in Chennai City.
- **H_2:** There is a significant relationship between the identified antecedent factors and employee retention among employees in pharmaceutical companies in Chennai City.

RESEARCH METHODOLOGY

The present study adopts a descriptive research design to examine the antecedents of employee retention among employees working in the pharmaceutical sector in Chennai City. Both primary and secondary data sources were used in the study. Primary data were collected directly from employees of selected pharmaceutical companies using a structured questionnaire to assess factors influencing employee retention. The questionnaire consisted of statements related to key antecedents, including compensation and rewards, career development opportunities, organizational culture, leadership support, job satisfaction, and work–life balance. Secondary data were obtained from books, research journals, industry reports, and relevant online sources to support the study's conceptual framework. The sample for the study consisted of employees working at different levels in pharmaceutical companies located in Chennai City. A total of 373 respondents were selected as the sample size for the study. The respondents were selected using convenience sampling because obtaining a complete sampling frame of all employees in the pharmaceutical sector was impractical. The collected data were analyzed using appropriate statistical tools, such as percentage, correlation, and regression analyses, with statistical software to examine the relationship between antecedent factors and employee retention. The methodology adopted in the study ensures systematic collection and analysis of data to derive meaningful conclusions regarding the factors influencing employee retention in the pharmaceutical industry.

RESULTS AND DISCUSSIONS

Table 1

Demographic Profile of the Respondents (n = 373)

S. No	Demographic Variable	Category	Frequency (n)	Percentage (%)
1	Gender	Male	214	57.4
		Female	159	42.6

2	Age Group	Below 30 years	96	25.7
		31 – 40 years	148	39.7
		41 – 50 years	84	22.5
		Above 50 years	45	12.1
3	Marital Status	Married	258	69.2
		Unmarried	115	30.8
4	Educational Qualification	Undergraduate	92	24.7
		Postgraduate	186	49.9
		Professional	95	25.4
5	Work Experience	Below 5 years	102	27.3
		5 – 10 years	149	39.9
		11 – 15 years	74	19.8
		Above 15 years	48	12.9
6	Monthly Income	Below ₹25,000	81	21.7
		₹25,001 – ₹50,000	156	41.8
		₹50,001 – ₹75,000	84	22.5
		Above ₹75,000	52	13.9

Table 1 presents the demographic profile of the respondents involved in the study. The results show that the majority of respondents are male (57.4%), while 42.6% are female, indicating that male employees slightly dominate the workforce in the pharmaceutical sector in the study region. With respect to age distribution, a large proportion of employees (39.7%) belong to the 31–40 years age group, followed by 25.7% below 30 years, 22.5% between 41–50 years, and 12.1% above 50 years, suggesting that the pharmaceutical workforce mainly consists of middle-aged and experienced professionals.

Regarding marital status, the majority of respondents (69.2%) are married, while 30.8% are unmarried, indicating that a considerable number of employees have family responsibilities that may influence their job stability and retention decisions. In terms of educational qualifications, nearly half of the respondents (49.9%) possess postgraduate degrees, followed by 25.4% with professional qualifications and 24.7% with undergraduate degrees, reflecting a highly educated workforce in the pharmaceutical sector.

The analysis of work experience reveals that 39.9% of employees have 5–10 years of experience, followed by 27.3% with less than 5 years, 19.8% with 11–15 years, and 12.9% with more than 15 years, indicating that the majority of employees possess moderate professional experience. Finally, the income distribution shows that 41.8% of respondents earn between ₹25,001 and ₹50,000 per month, while 22.5% earn ₹50,001–₹75,000, 21.7% earn below ₹25,000, and 13.9% earn above ₹75,000, suggesting that most employees fall within the middle-income category in the pharmaceutical sector. Overall, the demographic profile indicates that the respondents are well-educated, moderately experienced professionals working in pharmaceutical organizations in Chennai City.

Results of Hypotheses

H_1: There is a significant influence of antecedent factors on employee retention among employees working in the pharmaceutical sector in Chennai City.

Table 2

Results Model Summary

Model Summary	**Value**
R	0.781
R^2	0.610
Adjusted R^2	0.603
F-value	42.68

Significance	0.000**

Table 3
Results of Multiple Regression Analysis Showing the Influence of Antecedent Factors on Employee Retention (n = 373)

Antecedent Factors	Beta (β)	t-value	p-value	Result
Compensation & Rewards	0.29	5.84	0.000**	Significant
Career Development Opportunities	0.24	4.92	0.000**	Significant
Organizational Culture	0.18	3.76	0.001**	Significant
Leadership Support	0.16	3.41	0.002**	Significant
Job Satisfaction	0.31	6.27	0.000**	Significant
Work–Life Balance	0.14	2.95	0.004**	Significant

Source: Primary Data
Note: $p < 0.01$ Significant

The multiple regression analysis was conducted to examine the influence of antecedent factors on employee retention among employees working in pharmaceutical companies in Chennai City. The results show that the regression model is statistically significant ($F = 42.68$, $p < 0.01$). The coefficient of determination ($R^2 = 0.610$) indicates that approximately 61% of the variation in employee retention is explained by the antecedent factors included in the model. Among the variables, job satisfaction ($\beta = 0.31$) and compensation and rewards ($\beta = 0.29$) show the strongest influence on employee retention, followed by career development opportunities, organizational culture, leadership support, and work–life balance. Since all variables have significant p-values ($p < 0.01$), this confirms that antecedent factors significantly influence employee retention in the pharmaceutical sector. Therefore, Hypothesis H_1 is accepted.

H_2: There is a significant relationship between the identified antecedent factors and employee retention among employees in pharmaceutical companies in Chennai City.

Table 4
Results of Correlation Analysis Showing the Relationship Between Antecedent Factors and Employee Retention (n = 373)

Antecedent Factors	Correlation with Employee Retention (r)	p-value	Result
Compensation & Rewards	0.66	0.000**	Significant
Career Development Opportunities	0.63	0.000**	Significant
Organizational Culture	0.58	0.000**	Significant
Leadership Support	0.55	0.000**	Significant
Job Satisfaction	0.71	0.000**	Significant
Work–Life Balance	0.52	0.000**	Significant

Source: Primary Data
Note: $p < 0.01$ Significant

Pearson's correlation analysis was conducted to examine the relationship between antecedent factors and employee retention among employees in pharmaceutical companies in Chennai City. The results reveal that all antecedent variables exhibit positive and statistically significant relationships with employee retention ($p < 0.01$). Among the variables, job satisfaction ($r = 0.71$) has the strongest relationship with employee retention, followed by compensation and rewards ($r = 0.66$) and career development opportunities ($r = 0.63$). Organizational culture, leadership support, and work–life balance also show moderate positive relationships with employee retention. These findings indicate that improvements in HR practices and organizational support significantly enhance employee retention in pharmaceutical companies. Hence, Hypothesis H_2 is accepted.

DISCUSSIONS

The present study examined the antecedents of employee retention among employees working in the pharmaceutical sector in Chennai City. The findings of the study confirm that several organizational and psychological factors significantly influence employees' intention to remain with their organizations. The regression analysis revealed that antecedent factors such as compensation and rewards, career development opportunities, organizational culture, leadership support, job satisfaction, and work–life balance have a significant positive influence on employee retention. Among these factors, job satisfaction and compensation emerged as the strongest predictors of employee retention. These findings support earlier studies which emphasized that employees are more likely to remain with organizations that provide fair compensation, growth opportunities, and supportive work environments (Gupta & Shaw, 2018). In the pharmaceutical industry, where employees possess specialized technical knowledge, organizations must focus on creating motivating and supportive workplace environments to reduce employee turnover and ensure workforce stability.

The correlation analysis further confirmed that all antecedent variables have a positive and significant relationship with employee retention. Job satisfaction showed the strongest association with employee retention, indicating that employees who feel satisfied with their work environment, recognition, and career growth opportunities tend to demonstrate stronger commitment and loyalty toward their organizations. This finding aligns with the study conducted by Singh and Jain (2021), which reported that job satisfaction and work–life balance play a crucial role in strengthening employee retention, particularly in knowledge-intensive industries. Similarly, the positive relationship between compensation and employee retention supports the findings of Sharma and Gupta (2024), who observed that competitive salary structures and reward systems significantly reduce employee turnover in pharmaceutical organizations.

The results also highlight the importance of career development opportunities and training initiatives in retaining skilled employees. Employees who perceive opportunities for professional development and skill enhancement tend to develop higher levels of organizational commitment and are less likely to leave their organizations. This observation is consistent with the findings of Rao and Nair (2023), who reported that continuous training and career advancement programs enhance employee satisfaction and strengthen retention in healthcare and pharmaceutical sectors. Furthermore, organizational culture and leadership support significantly influenced employee retention, indicating that positive workplace relationships, effective communication, and supportive leadership practices foster an environment that encourages employees to remain with the organization. Kumar and Sharma (2022) also emphasized that a healthy organizational culture and managerial support contribute significantly to employee engagement and retention.

Overall, the findings of the study confirm that employee retention in the pharmaceutical sector is influenced by multiple antecedent factors, including organizational practices and employee well-being. Pharmaceutical companies in Chennai City must therefore adopt comprehensive human resource strategies that focus on improving compensation structures, promoting career development, strengthening leadership support, and enhancing job satisfaction. By addressing these antecedent factors, organizations can build a stable and committed workforce capable of contributing to long-term organizational success and competitiveness in the pharmaceutical industry.

IMPLICATIONS OF THE STUDY

The findings of this study have important implications for pharmaceutical organizations, human resource managers, and policymakers in improving employee retention strategies. The study highlights those antecedent factors such as compensation and rewards, career development opportunities, job satisfaction, supportive leadership, organizational culture, and work–life balance significantly influence employee retention. Therefore, pharmaceutical companies should focus on developing effective human resource policies that enhance employee satisfaction and motivation.

From a managerial perspective, organizations should implement competitive compensation structures, recognition programs, and performance-based incentives to retain talented employees. In addition, providing continuous training and career development opportunities can help employees enhance their skills and perceive long-term growth within the organization, thereby reducing turnover intentions. The study also emphasizes the importance of supportive leadership and a positive organizational culture, which foster trust, engagement, and loyalty among employees.

Furthermore, the study suggests that organizations should promote work–life balance initiatives and employee welfare programs to improve employees' overall well-being and job satisfaction. By addressing these antecedent factors, pharmaceutical companies in Chennai can build a stable, committed workforce, enhance organizational productivity, and achieve sustainable growth in the highly competitive pharmaceutical industry.

CONCLUSION

The study on the antecedents of employee retention in the pharmaceutical sector in Chennai City highlights the importance of organizational and psychological factors in influencing employees' decisions to remain with their organizations. The findings reveal that key antecedents such as compensation and rewards, career development opportunities, organizational culture, leadership support, job satisfaction, and work–life balance significantly contribute to improving employee retention. These factors not only enhance employee satisfaction and commitment but also help organizations maintain a stable and skilled workforce.

The study also confirms that employees are more likely to remain with organizations that provide supportive work environments, fair compensation systems, and opportunities for professional growth. In the highly competitive pharmaceutical industry, retaining experienced, knowledgeable employees is essential to maintaining productivity, ensuring regulatory compliance, and sustaining organizational performance. Therefore, pharmaceutical companies must focus on implementing effective human resource strategies to address these critical retention antecedents. Overall, the study emphasizes that strengthening employee-oriented practices will help pharmaceutical organizations in Chennai City improve workforce stability, enhance employee commitment, and achieve long-term organizational success.

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TO EVALUATE THE FINANCIAL PERFORMANCE OF SCHEDULED COMMERCIAL BANKS IN INDIA

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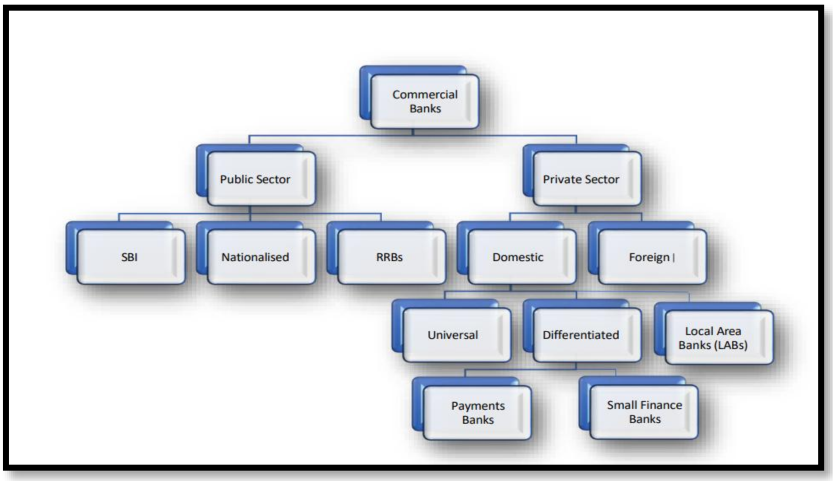
ABSTRACT

The banking system, which is the most important part of the financial sector, is a big part of how monetary policy affects the whole economy. So, the performance evaluation shows how strong and weak the banks are and how it affects economy's growth. The objective of the study is to evaluate the financial performance and trend analysis of select Scheduled Commercial Public and Private Sector Banks in India. The study covers a period of five consecutive financial years from 2020-2021 to 2024-2025. The required data was primarily collected from secondary sources. Based on higher Market Capitalization value ten banks - five from public sector and five from private sector banks were selected. The statistical tools used for the study Descriptive statistics, Ratio analysis and Trend analysis. The study presents how private sector banks demonstrated relatively better financial performance and operational efficiency than public sector banks. However, public sector banks also showed improvement in profitability and capital strength over time. The results imply that maintaining strong capital adequacy, improving asset utilization, and controlling financial leverage are essential for enhancing the financial performance of banks in India.

KEYWORDS: Financial Performance, Public Bank, Private Bank, Profitability, Capital adequacy, Commercial Bank

INTRODUCTION

The banking sector is regarded as the most essential part of the financial sector and is crucial to a nation's economic growth. By directing savings into investments in various economic sectors and promoting economic growth, it plays a critical role in achieving macroeconomic goals and serves as a catalyst for socioeconomic transformation. Due to their significant market share, the Scheduled Commercial Banks have expanded their operations to better meet the demands of business and industry.



Source: rbi.org.in

The process of synthesizing and summarizing financial and operational data in order to gain insight into a commercial enterprise's operational activities is known as financial performance analysis. The financial system that plays a significant part in sending monetary policy impulses to the whole economic system and is the foundation of the financial sector. As a result, the performance review influences economic growth and reveals the banks' strengths and weaknesses.

SCOPE OF THE STUDY

The main goal of the study is to assess the Scheduled Commercial institutions' financial stability using the key metrics that gauge the institutions' soundness. The study scope is broader since the banks and components are chosen by market capitalization of public and private sector banks in India.

STATEMENT OF THE PROBLEM

The main issue facing banks and the regulatory bodies is still financial stability. As a result, the RBI has been strengthening the Indian financial system through a number of initiatives and reorienting the regulatory and supervisory environment. Since a robust economy is reflected in a stable banking system, the regulatory body should keep an eye on the banks' ability to meet needs such as credit disbursement, maintaining asset quality and technology adoption, and enhancing risk management techniques for improved functionality. Therefore, in order to investigate the effectiveness of India's Scheduled Commercial Banks, trend analysis has been taken place in the sturdy.

OBJECTIVES OF THE STUDY

1. To evaluate the financial performance based on capital adequacy ratio and debt equity ratio.
2. To analyse the financial trend between Public Sector and Private Sector banks in India.

REVIEW OF LITERATURE

A literature review is a comprehensive summary and explanation of the current state of knowledge on a specific topic, based on academic books and journal articles. It involves the process of reading, analyzing, evaluating, and synthesizing scholarly materials related to that topic.

Palamalari Srinivasan and John Britto (2017)[1] conducted a study which examined the financial performance of 16 Indian commercial banks from 2012–13 to 2016–17 using financial ratio analysis. It found that private sector banks performed better than public sector banks. Liquidity, solvency, and efficiency ratios had a positive and significant impact on bank profitability.

Natarajan et al. (2018)[2] evaluated the financial performance of major private sector banks listed on NSE and BSE during 2006–2017. Financial indicators such as ROA, ROE, and Tobin's Q were used along with multiple regression analysis. The results showed that bank size, credit risk, operational efficiency, and debt ratio significantly influenced bank performance.

Pawan Kuman et al. (2020)[3] undertook a study that analysed the financial health of ten commercial banks in India using the Analytical Hierarchy Process (AHP) during 2009–2018. Six financial criteria with twenty-four sub-criteria were used to evaluate bank performance. The results showed that Capital Adequacy Ratio was the most important factor and financial ratios had greater influence than bank size.

Suresh and Subhendu Kumar Pradhan (2023)[4] researched the financial performance of selected public and private sector banks in India for the period 2017–2021 on a comparative basis. It analysed stability, liquidity, and profitability using an independent sample t-test. The findings revealed that private sector banks performed better than public sector banks under the CAMEL indicators.

Soumendu Das (2024)[5] studied the role of commercial banks in economic development through financial performance evaluation. It compared one public sector bank and one private sector bank using financial analysis techniques. The findings helped to understand performance differences among banks under RBI regulations.

RESEARCH METHODOLOGY

The secondary data provided the majority of the research purpose. From 2020 to 2025, a total of five years were covered for this study. According to the market capitalization top five banks in public and top five banks in private sector banks in India. The tool used for this study is ratio analysis, specifically the solvency ratio and asset quality ratio, along with trend analysis to evaluate the increase or decrease in overall performance over a five-year period.

ANALYSIS AND INTERPRETATION

Table 1

CAPITAL ADEQUACY RATIO OF SCHEDULED COMMERCIAL BANKS IN INDIA

(in Percent)

Banks	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	Mean	Standard Deviation
Public Sector							
State Bank of India	12.74	12.85	13.13	13.82	13.85	13.28	0.53
Bank of Baroda	14.99	15.84	16.24	16.31	17.19	16.11	0.80
Union Bank of India	12.56	14.52	16.04	16.97	18.02	15.62	2.14
Punjab National Bank	14.32	14.50	15.50	15.97	17.01	15.46	1.11
Canara Bank	13.18	14.90	16.68	16.28	16.33	15.47	1.45
Private Sector							
HDFC Bank	19.11	19.32	19.42	18.80	19.3	19.19	0.25
ICICI Bank	19.12	19.16	18.34	16.33	16.55	17.90	1.37
Axis Bank	19.12	18.54	17.64	16.63	17.07	17.80	1.03
Kotak Mahendra Bank	22.26	22.69	21.80	20.55	23.30	22.12	1.04
IndusInd Bank	15.23	16.65	18.09	17.86	17.23	17.01	1.14

Source: Secondary Data

It is observed from Table 1 that Bank of Baroda recorded the highest average at 16.11 percent followed by Union Bank of India at 15.62 percent ensuring paramount safety to its shareholders in public sector banks. Among Private sector bank Kotak Mahendra held the highest average at 22.12 percent. Both Public and Private bank State Bank of India reported the least average at 13.28 percent with 0.53 percent of standard deviation. The analysis indicates that private sector banks maintained stronger capital adequacy positions compared to public sector banks.

Table 2

DEBT EQUITY RATIO OF SCHEDULED COMMERCIAL BANKS IN INDIA

(in Times)

Banks	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	Mean	Standard Deviation (%)
Public Sector							
State Bank of India	15.12	14.85	13.90	13.59	12.42	13.98	1.08
Banks of Baroda	14.10	14.88	14.85	14.13	13.00	14.19	0.76
Union Bank of India	16.62	16.83	16.35	14.35	13.28	15.49	1.58
Punjab National Bank	13.86	13.77	14.64	14.67	14.28	14.24	0.42
Canara Bank	19.59	18.56	18.28	17.15	16.85	18.09	1.11
Private Sector							
HDFC Bank	8.57	8.62	8.80	8.22	7.80	8.40	0.40
ICICI Bank	8.34	8.28	7.89	7.85	7.25	7.92	0.44
Axis Bank	9.80	10.20	10.50	9.78	8.96	9.85	0.58
Kotak Mahendra Bank	6.02	5.92	5.87	6.21	5.92	5.99	0.14
IndusInd Bank	8.37	8.43	8.38	8.01	8.59	8.36	0.21

Source: Secondary Data

Table 2 reveals that the average debt to equity ratio is found to be higher in Canara Bank at 18.09 times followed by Union Bank of India at 15.49 percent with a standard deviation at 1.11 percent and 1.58 percent. On the other side Kotak Mahendra Bank at 5.99 percent which was lowest in the both public and private in the group with a standard deviation with 0.14 percent signifying that the banks are operating with lowest risk. The analysis indicates that public sector banks relied more heavily on debt financing compared to private sector banks. In contrast, private sector banks maintained lower leverage levels, reflecting stronger capital structures and better financial stability from 2020-2021 to 2024-2025 period.

Table 3

TREND ANALYSIS OF PUBLIC SECTOR IN SCHEDULED COMMERCIAL BANKS IN INDIA

(in Percent)

Banks/ Year	SBI	Trend	Baroda	Trend	Union Bank	Trend	Punjab Bank	Trend	Canara Bank	Trend
2020-2021	8.86	100	12.33	100	16.75	100	17.46	100	17.13	100
2021-2022	1.07	12.08	8.46	68.61	14.36	85.73	15.85	90.78	14.30	83.48
2022-2023	4.87	54.97	7.94	64.40	11.68	69.73	14.94	85.57	15.92	92.94
2023-2024	3.00	33.86	4.26	34.79	3.54	21.13	8.92	51.09	14.80	86.40
2024-2025	5.05	56.10	9.85	79.89	16.03	95.70	18.69	107.04	18.22	106.36

Source: Secondary Data

Table 3 reported that Trend analysis of Return on Equity of select public and private sector scheduled commercial banks in India for the period from 2020-2021 to 2024-2025 shows that Punjab National Bank experienced a gradual decline until 2023-2024 but recorded a substantial increase in 2024-2025 with a trend value of 107.04 which is the highest among the select banks, Canara Bank also showed a positive trend in the last years reaching 106.36 in 2024-2025 indicating strong improvement in profitability

Table 4

TREND ANALYSIS OF PRIVATE SECTOR IN SCHEDULED COMMERCIAL BANKS IN INDIA

(in Percent)

Banks/ Year	HDFC	Trend	ICICI	Trend	Axis	Trend	Kotak	Trend	IndusInd	Trend
2020-2021	15.27	100	15.39	100	15.74	100	13.81	100	13.43	100
2021-2022	11.21	73.41	13.94	90.58	16.13	102.47	17.37	125.78	16.16	120.33
2022-2023	6.48	42.44	11.30	73.42	7.63	48.48	16.45	119.12	14.67	109.23
2023-2024	11.01	72.10	11.90	77.32	13.17	83.67	14.24	103.11	14.03	104.47
2024-2025	6.58	43.09	9.73	63.22	13.60	86.40	14.31	103.62	4.11	30.60

Source: Secondary Data

Table 4 evaluates that the Trend analysis of Return on Equity of selected private sector scheduled commercial banks in India for the period 2020–2021 to 2024–2025, with 2020–2021 taken as the base year (100). private sector banks experienced fluctuations in profitability, Kotak Mahindra Bank maintained relatively stable and positive growth during the study period. The highest trend value was recorded by Kotak Mahindra Bank (125.78) in 2021–2022, whereas the lowest trend value was observed in IndusInd Bank (30.60) in 2024–2025.

Overall, the comparative trend analysis suggests that both public and private sector banks experienced fluctuations in profitability. However, some banks such as Kotak Mahindra Bank, Punjab National Bank and Canara Bank showed notable improvement indicating better financial performance and efficiency during the year 2024-2025.

CONCLUSION

The sustainability, efficiency in managing funds and ability to earn returns by using resources correctly are all ways to measure how well banks are doing. The banks also need to have enough liquid assets to meet the needs of their customers and the economy. Also, the banks need to make sure that the money they give out is safe to avoid bad loan impairment. So, the banks' plans must be able to balance the risks that come with running a business.

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ISSUES AND PROSPECTS OF MICRO, SMALL AND MEDIUM ENTERPRISES IN TAMIL NADU

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ABSTRACT

Micro, Small, and Medium Enterprises (MSMEs) play a crucial role in the industrial and economic advancement of Tamil Nadu, making significant contributions to job creation, regional development, and industrial production. This research investigates the primary challenges and future opportunities for MSMEs operating within the state. Despite their essential contribution to economic progress, MSMEs encounter numerous obstacles, including limited access to financing, technological limitations, insufficient infrastructure, and fierce market competition. Moreover, regulatory complexities, a shortage of skilled labor, and challenges in embracing digital technologies further hinder their growth potential. The research also emphasizes the emerging opportunities accessible to MSMEs through government assistance programs, digital transformation, innovation, and the expansion of both domestic and international markets. By tackling existing challenges and enhancing policy support, MSMEs in Tamil Nadu can improve their productivity and competitiveness. The study concludes that a nurturing ecosystem, better financial access, and technological progress are vital for ensuring the sustainable growth and long-term development of the MSME sector.

KEYWORDS: MSME, finance, marketing, economy, growth, employment, marketing, export.

INTRODUCTION

Micro, Small and Medium Enterprises (MSMEs) are essential for fostering economic growth, generating employment, and advancing industrial development in India. The MSME sector is widely acknowledged as the backbone of the Indian economy due to its substantial contributions to production, exports, and the development of entrepreneurship. In Tamil Nadu, MSMEs hold particular significance as they facilitate inclusive economic growth, promote regional industrialization, and create job opportunities with relatively low capital investment (mntfreeias.com).

Tamil Nadu ranks among the top states in India regarding MSME development. Recent statistics from the Udyam Registration portal and the Tamil Nadu Economic Survey (2024–2025) indicate that the state is home to approximately 35.56 lakh MSMEs, which include 10.69 lakh manufacturing units and 24.87 lakh service enterprises. Collectively, these enterprises employ around 2.56 crore individuals, underscoring the sector's vital role in the state's economy (Tamil Digital Library). Moreover, the MSME sector contributes nearly 30% of Tamil Nadu's industrial output and represents about 15% of India's MSME units, establishing the state as a significant center for small-scale industries (Business Standard).

Numerous studies have highlighted the critical role of MSMEs in bolstering regional economies and fostering entrepreneurship. Researchers point out that MSMEs play a key role in diminishing regional disparities, encouraging innovation, and promoting industrial diversification. Nevertheless, despite their considerable contributions, MSMEs in Tamil Nadu encounter various challenges, including limited access to finance, technological limitations, market competition, regulatory complexities, and infrastructure deficiencies. These challenges frequently impact their productivity and long-term viability.

In recent years, the Government of Tamil Nadu has implemented a range of policies, financial aid programs, and entrepreneurial development initiatives aimed at fostering the growth and competitiveness of MSMEs. Consequently, it is crucial to comprehend the challenges and opportunities encountered by the MSME sector to formulate effective policies and promote sustainable industrial development within the state.

OBJECTIVES OF THE STUDY

- To identify the primary challenges confronting Micro, Small, and Medium Enterprises (MSMEs) in Tamil Nadu.
- To analyze the factors influencing the growth and operational performance of MSMEs in Tamil Nadu.
- To investigate the future prospects and opportunities for the advancement of MSMEs in Tamil Nadu.

REVIEW OF LITERATURE

Velkumar (2024) conducted an examination of the growth and performance of MSMEs in Tamil Nadu, underscoring their crucial role in generating employment and fostering industrial development. The research indicated that MSMEs make substantial contributions to the state's economy, yet they encounter challenges such as restricted financial access and technological limitations. The author stressed the necessity for enhanced government support and modernization efforts to fortify the sector. Raj and Radhika (2024) performed an analysis of the development of MSMEs in Tamil Nadu, focusing on their contributions to entrepreneurship and economic advancement. The study disclosed that MSMEs facilitate regional development and job creation. Nevertheless, obstacles such as market competition, infrastructure deficiencies, and insufficient technological adoption hinder their productivity.

Sankar (2024) investigated the issues and prospects of MSMEs in the Salem District of Tamil Nadu. The research pinpointed significant challenges, including financial shortages, constraints in raw materials, and marketing obstacles. The study proposed that government support, training initiatives, and enhanced financial services could assist MSMEs in overcoming these difficulties. Saranya and Tharani Priya (2024) explored the challenges encountered by MSME exporters in the Coimbatore District. The study revealed that export-oriented MSMEs face logistical challenges, limited access to international markets, and intricate regulations. The authors highlighted the significance of digital platforms and policy support to improve export competitiveness.

Subhasri and Kirthiga (2025) examined the effects of government schemes on the development of MSMEs in Tamil Nadu. Their findings indicated that initiatives such as

PMEGP and UYEGP promote entrepreneurship and provide financial assistance to small enterprises. However, a lack of awareness and procedural delays diminish the effectiveness of these programs. Jamal et al. (2025) investigated the uptake of fintech services among MSMEs in Chennai. Their research demonstrated that digital financial services enhance financial inclusion and operational efficiency. Nonetheless, challenges such as insufficient digital literacy, cybersecurity issues, and regulatory complexities hinder widespread adoption.

Kumar (2024) analyzed the influence of digital transformation on the resilience of MSMEs following the COVID-19 pandemic. The findings suggested that digital tools, including e-commerce platforms and online payment systems, facilitated businesses in adapting to evolving market conditions. However, a lack of digital skills and financial resources continues to pose significant challenges. Praveen Kumar and Jeya Ani (2024) examined the challenges encountered by small-scale industries in the implementation of Human Resource Development (HRD) practices. Their study highlighted that numerous MSMEs do not have structured training programs or managerial expertise. It was recommended to enhance HR development initiatives to boost productivity and organizational efficiency.

Nugraheni, Darma, and Muhammad (2025) explored the effects of adopting digital technology and financial knowledge on the sustainability of MSMEs. Their findings revealed that businesses with superior digital capabilities tend to achieve better performance. However, many small enterprises face difficulties due to technological expenses and a lack of technical expertise. Andiga et al. (2023) investigated the competitiveness of micro, small, and medium enterprises (MSMEs) within the global economic landscape. The study underscored challenges such as inadequate innovation capabilities, obsolete technology, and limited access to financial resources. The authors advocated for the enhancement of infrastructure and innovation systems to bolster MSME competitiveness.

Das (2025) examined sustainability and circular economy practices among small businesses. The research uncovered that numerous MSMEs encounter difficulties in adopting sustainable production methods due to financial limitations and inefficiencies in the supply chain. The author proposed the use of digital technologies as means to enhance sustainability and operational efficiency. Vu, Le, and Nguyen (2025) introduced a conceptual framework that elucidates the integration of artificial intelligence in the financial decision-making processes of SMEs. The research indicated that a lack of technical expertise and substantial implementation costs hinder many enterprises from embracing AI technologies. Recommendations included providing training and technological support to facilitate effective implementation.

Roy, Shukla, and Tripathi (2025) scrutinized research and innovation trends within Indian academic institutions and their significance to entrepreneurial ecosystems. The study highlighted that innovation networks and knowledge sharing can foster MSME growth and technological progress. Pal (2023) investigated regional disparities in industrial development throughout India. The research revealed that variations in infrastructure, technology adoption, and the availability of skilled labor affect MSME productivity. The author recommended targeted policy measures to mitigate regional development disparities.

Vaidehi, Reddy, and Banerjee (2021) explored the digital divide in India and its effects on small enterprises. The study indicated that restricted internet access and low levels of digital literacy hinder the adoption of contemporary technologies by MSMEs. Addressing the digital divide is crucial for enhancing business opportunities. Sharma and Gupta (2024) explored the connection between digital finance and the growth of MSMEs in India. Their research indicated that digital financial services improve operational efficiency and enhance market access for small businesses. Nonetheless, significant obstacles such as security issues and infrastructure constraints persist.

Kumar and Singh (2024) analyzed the accessibility of credit for MSMEs in India. Their findings showed that a considerable number of small enterprises rely predominantly on informal financing due to restricted access to formal credit sources. The study recommended the expansion of financial inclusion initiatives to foster MSME growth. Patel and Shah (2025) investigated the influence of government policies on the competitiveness of MSMEs. Their research underscored that supportive policies, financial incentives, and training programs play a crucial role in boosting MSME performance. However, bureaucratic delays and gaps in policy implementation restrict the advantages.

Thangarajan, Selvaveera Kumar, and Raji (2024) examined the obstacles encountered by women entrepreneurs in the MSME sector of Tamil Nadu. Their study highlighted that insufficient financial support, lack of training opportunities, and social barriers impede business development. They recommended promoting women entrepreneurship through targeted policy measures. Ahmed and Rahman (2024) assessed the adoption of technology among small enterprises and its effects on business performance. Their findings revealed that digital tools and innovations enhance productivity and competitiveness. However, financial constraints and a lack of technical expertise impede technology adoption in numerous MSMEs.

RESEARCH GAP

Despite numerous studies investigating the growth and development of Micro, Small and Medium Enterprises (MSMEs) in India and Tamil Nadu, a significant number primarily emphasize the economic contributions of MSMEs, including job creation, industrial output, and the promotion of entrepreneurship. Prior research has also highlighted challenges such as financial limitations, technological barriers, and market competition. Nevertheless, there is a scarcity of studies that offer a thorough analysis addressing both the key issues and future opportunities for MSMEs, particularly within the context of Tamil Nadu.

Furthermore, many previous studies depend on secondary data and lack current empirical analysis that reflects recent advancements, including digital transformation, government initiatives, and economic shifts following the pandemic. Additionally, there is inadequate attention given to how emerging opportunities such as digitalization, innovation, and policy support can assist MSMEs in overcoming their existing challenges. Consequently, there is a pressing need for a targeted study that identifies the current issues faced by MSMEs in Tamil Nadu while also investigating their potential growth opportunities and future outlook.

NEED FOR THE STUDY

Micro, Small, and Medium Enterprises (MSMEs) are vital to the economic advancement of Tamil Nadu, as they generate employment, foster regional industrialization, and encourage entrepreneurship. This sector makes a substantial contribution to both manufacturing output and service activities, positioning it as a key driver of inclusive economic growth. However, despite their significance, MSMEs encounter various challenges, including limited access to financing, technological limitations, a shortage of skilled labor, inadequate infrastructure, and heightened market competition.

Recognizing these challenges is crucial for developing effective strategies aimed at enhancing the performance and sustainability of MSMEs. Additionally, the swift progress of digital technologies, government assistance programs, and the growth of market opportunities present new avenues for the development of MSMEs. Consequently, this study is essential to examine the obstacles faced by MSMEs in Tamil Nadu and to investigate potential opportunities that could bolster their growth and competitiveness in the future.

SCOPE OF THE STUDY

The current research concentrates on examining the challenges and opportunities faced by Micro, Small, and Medium Enterprises in Tamil Nadu. It investigates the primary obstacles hindering the growth and operational efficiency of MSMEs, which include financial limitations, the adoption of technology, market competition, and infrastructure deficiencies. Additionally, the research delves into the potential opportunities for MSME advancement, such as government assistance programs, digital transformation, innovation, and the expansion of market possibilities. The results of this study will provide valuable insights for policymakers, entrepreneurs, and researchers, enabling them to comprehend the existing conditions of MSMEs and formulate effective strategies to improve their sustainability and competitiveness. Consequently, the study's scope is confined to MSMEs functioning within Tamil Nadu, emphasizing the identification of their significant challenges and future growth opportunities.

ANALYSIS AND INTERPRETATION

Objective 1: To identify the major challenges faced by MSMEs in Tamil Nadu

The Micro, Small and Medium Enterprises (MSME) sector is crucial for the economic advancement of Tamil Nadu. It plays a significant role in industrial production, job creation, and regional economic development. The state has established itself as one of the foremost centers for MSME activities in India, thanks to its robust industrial foundation and favorable government policies. It is essential to comprehend the scale and distribution of MSMEs within the state to identify the primary challenges that hinder their growth and sustainability.

Table 1
Overview of Tamil Nadu MSMEs (2024–25)

Parameter	Manufacturing Units	Service Units	Total Units	Employment (in Crores)	Industrial Output Contribution (%)
Tamil Nadu	10.69 lakh	24.87 lakh	35.56 lakh	2.56	30%

Source: Economic Survey of Tamil Nadu 2024–25

The data indicates that Tamil Nadu boasts a substantial MSME presence, with approximately 35.56 lakh units functioning across both manufacturing and service sectors. Of these, service units (24.87 lakh) represent the largest proportion, while manufacturing units comprise 10.69 lakh enterprises. The sector employs around 2.56 crore individuals, underscoring its critical role in job creation and livelihood enhancement. Furthermore, MSMEs contribute nearly 30% to the state’s industrial output, highlighting their significance in economic progress. Nevertheless, the high number of small-scale enterprises suggests that many businesses operate with constrained resources and workforce capacity. This configuration often limits productivity, innovation, and opportunities for expansion. Consequently, while MSMEs are pivotal to the economy, they encounter numerous operational and structural challenges that require policy intervention.

Objective 2: To analyse the role of the MSME sector in the Tamil Nadu economy

The Micro, Small and Medium Enterprises (MSME) sector is crucial for the economic advancement of Tamil Nadu, as it generates employment, fosters industrial production, and enhances export activities. The state boasts a robust presence of MSMEs in both manufacturing and service sectors, which facilitates inclusive economic growth and regional development. Tamil Nadu represents nearly 15% of the total MSMEs in India, showcasing its strong entrepreneurial foundation and industrial infrastructure. Various sectors, including textiles, engineering, electronics, leather goods, and services, make substantial contributions to the state’s economy through production and job creation. The subsequent table illustrates the distribution of MSMEs, employment figures, and their export contributions across key sectors in Tamil Nadu.

Table 2
Sector-wise Distribution of MSMEs, Employment, and Contribution to Exports in Tamil Nadu

Sector	No. of MSMEs (Lakh)	Employment (Lakh)	Contribution to State Exports (%)
Textiles	5.8	50	12
Engineering & Auto	3.2	38	10
Electronics	1.5	20	8
Leather Products	2.0	30	5
Services	24.87	118	10

Source: Economic Survey of Tamil Nadu 2024–25

The table indicates that the MSME sector plays a significant role in generating employment and enhancing export performance in Tamil Nadu. The service sector leads in the number of MSMEs and accounts for the largest share of employment, underscoring its pivotal role in the state's economy. Within the manufacturing industries, the textile sector is prominent, featuring a high number of enterprises and the greatest contribution to exports, followed by engineering and automobile-related MSMEs. Electronics and leather products also play a role in employment and exports, albeit on a smaller scale. In summary, the data suggests that MSMEs diversify Tamil Nadu's industrial landscape and bolster both domestic production and international trade, thereby reinforcing the state's status as a key industrial hub in India.

Objective 3: To examine the prospects and growth opportunities for MSMEs in Tamil Nadu

The MSME sector in Tamil Nadu presents considerable growth potential, bolstered by favorable government policies, financial assistance initiatives, and the rising integration of digital technologies. The state government actively fosters entrepreneurship and the development of small businesses through financial investments, training programs, and subsidy schemes. These efforts are designed to motivate new entrepreneurs, enhance access to financing, and bolster the competitiveness of existing MSMEs. Concurrently, the digital transformation, the expansion of e-commerce, and the increasing demand for exports are generating new avenues for MSMEs to broaden their markets and boost productivity. The subsequent table outlines the key opportunities available for MSMEs in Tamil Nadu and their possible effects on sectoral growth.

Table 3

Opportunities for MSMEs in Tamil Nadu

Opportunity	Current Status	Potential Impact
Government financial support	₹1,918 crore allocated (2025)	Facilitates entrepreneurship and expansion
Entrepreneurship programs	66,000 new entrepreneurs supported	Encourages innovation and self-employment
Digital adoption	35–40% MSMEs integrated	Improves efficiency, market access, competitiveness
Export opportunities	US$13 billion contribution	Expands global market share

Source: Economic Survey of Tamil Nadu 2024–25

The table illustrates that Tamil Nadu offers a conducive environment for the growth of MSMEs through financial support, entrepreneurship development initiatives, and expanding export possibilities. Government budget allocations and subsidy programs assist entrepreneurs in launching new ventures and scaling existing businesses. The assistance extended to numerous new entrepreneurs underscores the state's commitment to fostering innovation and self-employment. Furthermore, the gradual embrace of digital technologies by MSMEs is enhancing operational efficiency and allowing businesses to access broader markets via online platforms. The substantial contribution of MSMEs to exports further emphasizes their potential for growth in international markets. In summary, these opportunities indicate that the MSME sector in Tamil Nadu holds robust prospects for future expansion, contingent upon businesses continuing to enhance their digital adoption, skills, and readiness for export.

Challenges of the MSME Sector in Tamil Nadu

The MSME sector in Tamil Nadu is crucial for generating employment, producing industrial goods, and promoting exports. Nevertheless, in spite of its substantial contribution to the state's economy, MSMEs encounter numerous structural and operational obstacles that hinder their growth and competitiveness. These obstacles encompass financial limitations, shortages in human resources, inefficiencies in operations, barriers to marketing, technological deficiencies, and challenges related to exports. A significant number of small enterprises find it difficult to secure formal credit, implement modern technologies, hire skilled personnel, and expand into both national and international markets. Recognizing these challenges is vital for formulating effective policies and support systems that can enhance the MSME ecosystem in Tamil Nadu. The subsequent table outlines the primary challenges faced by MSMEs, along with their impacts and the percentage of enterprises affected.

Table 4

Major Challenges Faced by MSMEs in Tamil Nadu

Challenge Category	Specific Challenge	Impact on MSMEs	% of MSMEs Affected
Finance	Limited institutional credit	Restricts working capital and business expansion	65%
	High interest rates	Increases financial burden	45%
	Collateral requirements	Barriers to startup funding	50%
Human Resources	Skill shortage	Reduced productivity	55%
	Lack of training programs	Poor operational efficiency	60%
	High employee turnover	Increased recruitment costs	40%
Operations	Infrastructure limitations	Production delays and inefficiency	50%
	Outdated machinery	Lower product quality	55%
	Supply chain disruptions	Increased production cost	45%
Marketing	Limited brand recognition	Lower sales and market visibility	60%
	Traditional marketing channels	Restricted market reach	65%
	Competition from large companies	Reduced profitability	55%
Technology	Low digital adoption	Inefficient operations	60%
	High cost of technology	Financial strain	50%
	Lack of technical expertise	Reduced competitiveness	55%
Export	Regulatory compliance	Export delays	45%

	High logistics costs	Reduced profitability	50%
	Limited global market knowledge	Missed export opportunities	55%

Source: Compiled from MSME EPC Reports (2023–2024), TNPSC Thervupettagam (2024) and The Times of India (2024–2025).

The table illustrates that MSMEs in Tamil Nadu encounter various interconnected challenges in financial, operational, and strategic domains. Among these, financial limitations seem to be the most pressing concern, with approximately 65% of MSMEs facing restricted access to institutional credit. This limitation hampers their capacity to grow operations, invest in new technologies, and sustain sufficient working capital. Challenges related to human resources, especially the absence of training programs and skill deficiencies, also impact a significant number of enterprises, diminishing productivity and innovation.

Operational issues such as outdated machinery and infrastructure constraints further impair efficiency and product quality. Marketing obstacles, including insufficient brand recognition and dependence on traditional marketing methods, hinder the ability of MSMEs to access wider markets and compete with larger companies. Additionally, technological challenges like low digital adoption rates and elevated technology costs restrict competitiveness in an increasingly digital business landscape. Difficulties related to exports, such as regulatory compliance and high logistics expenses, also inhibit many MSMEs from fully engaging in international trade.

In summary, the analysis suggests that MSMEs need enhanced institutional support in areas such as financial access, skill enhancement, technological advancement, marketing support, and export facilitation. Tackling these challenges through focused policies, financial assistance programs, and infrastructure improvements can significantly boost the growth, competitiveness, and sustainability of the MSME sector in Tamil Nadu.

CONCLUSION

The research on "Issues and Prospects of Micro, Small and Medium Enterprises in Tamil Nadu" underscores the vital role that MSMEs play in the economic advancement of the state. Tamil Nadu, which is home to over 35 lakh MSMEs that provide employment to 2.56 crore individuals, exemplifies the sector's significant contribution to industrial output, export enhancement, and regional entrepreneurship. Nevertheless, MSMEs encounter a variety of challenges. The most pressing issue is finance, with more than 65% of enterprises facing difficulties in accessing credit and meeting collateral requirements. Additional constraints on growth include limitations in human resources, operational inefficiencies, restricted marketing capabilities, low levels of technology adoption, and challenges related to exports.

On a positive note, the study also reveals promising opportunities. Government support initiatives, the adoption of digital technologies, entrepreneurship training programs, and the expansion into global markets present substantial avenues for growth. By capitalizing on these opportunities through strategic financial assistance, skill enhancement, technology integration, and export support, MSMEs can improve their competitiveness, sustainability, and overall contribution to the economic development of Tamil Nadu. Although MSMEs serve as the backbone of Tamil Nadu's economy, focused interventions are essential to address challenges and fully realize the sector's potential.

LIMITATIONS OF THE STUDY

1. Geographical Limitation: This study is exclusively centered on MSMEs located in Tamil Nadu and may not accurately reflect the circumstances in other Indian states
2. Time Constraint: The research utilizes recent yet limited data; any future alterations in policies, market dynamics, or global economic conditions could potentially modify the findings.

3. Sample Limitations: The primary data may have been gathered from a chosen group of MSMEs, which may not entirely represent the experiences of all enterprises.
4. Data Availability: Certain statistics were sourced from secondary references; discrepancies in reporting and classification of MSMEs may affect the accuracy.
5. Focus Area: The study highlights challenges and opportunities but does not conduct an in-depth analysis of performance specific to sectors (for instance, textiles versus engineering).

SCOPE FOR FURTHER RESEARCH

1. Sector-Specific Analysis: Future investigations could delve into the challenges and opportunities faced by MSMEs in particular industries such as textiles, engineering, electronics, or food processing.
2. Digital Transformation Impact: Research may concentrate on the integration of AI, e-commerce, and digital finance tools and their effects on the productivity and profitability of MSMEs.
3. Comparative Studies: Research comparing MSMEs in Tamil Nadu with those in other states could uncover best practices and regional disparities in performance and challenges.
4. Longitudinal Research: Future studies could monitor the growth and challenges of MSMEs over time to evaluate the effectiveness of government policies and support initiatives.
5. Global Competitiveness: Research could investigate how MSMEs in Tamil Nadu can improve their export performance and compete in international markets through innovation, technology, and supportive policies.

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AN EMPIRICAL STUDY ON THE EFFECTIVENESS OF GOVERNMENT SCHEMES IN PROMOTING WOMEN ENTREPRENEURSHIP IN CHENNAI CITY

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ABSTRACT

Women's entrepreneurship plays a vital role in fostering economic growth, generating employment, and promoting social empowerment, particularly in urban regions such as Chennai. The present study aims to examine the role and impact of government schemes in supporting women entrepreneurs in the study region. The study focuses on key dimensions such as awareness, accessibility, and utilization of government schemes and their influence on entrepreneurial outcomes, including growth, performance, and sustainability. A descriptive and empirical research design is adopted, and primary data were collected from 431 women entrepreneurs using a structured questionnaire based on a five-point Likert scale. The study employs statistical tools, including descriptive statistics, multiple regression analysis, t-tests, and ANOVA, to analyze the data and test the hypotheses. The study concludes that awareness, accessibility, and utilization of government schemes significantly enhance their effectiveness, with utilization emerging as the most influential factor. Government schemes positively contribute to the growth, performance, and sustainability of women's entrepreneurship. However, challenges such as limited awareness, procedural complexities, and accessibility barriers hinder their optimal use. Overall, the study emphasizes that improving information dissemination, simplifying procedures, and strengthening institutional support can further enhance the effectiveness of government initiatives for women entrepreneurs.

KEYWORDS: Women Entrepreneurship, Government Schemes, Awareness, Accessibility, Utilization, Entrepreneurial Performance, Sustainability, Chennai City

INTRODUCTION

Women’s entrepreneurship has become a key driver of economic growth, social change, and inclusive development in India. Increasing women's participation in business activities contributes to employment generation, innovation, productivity, and regional development, while also promoting self-reliance and balanced socio-economic progress. According to **NITI Aayog (2023)**, promoting women entrepreneurship is essential for achieving sustainable and inclusive economic growth in India. The concept of women entrepreneurship extends beyond mere business ownership; it encompasses empowerment, financial independence, and the ability to make independent economic decisions. Despite these advantages, women entrepreneurs in India continue to face multiple challenges, including limited access to finance, a lack of entrepreneurial skills, socio-cultural constraints, and restricted mobility. **Ministry of Micro, Small, and Medium Enterprises (2022)** highlights that women entrepreneurs often encounter structural and institutional barriers that hinder their business expansion and sustainability. In response, the government has introduced various schemes to address these challenges through financial assistance, training, and institutional support.

Government initiatives such as the Stand-Up India Scheme and the Pradhan Mantri Mudra Yojana have played a pivotal role in expanding access to credit and promoting women's entrepreneurial ventures. Studies by **Kumar and Sharma (2022)** indicate that such financial schemes have significantly improved women's participation in small and medium-sized enterprises. Similarly, research conducted by **Gupta and Aggarwal (2023)** found that training and skill development programs under government initiatives enhance entrepreneurial competencies and business performance among women entrepreneurs.

Despite the presence of numerous government schemes, their effectiveness in achieving the intended objectives remains an empirical concern. Several studies suggest that the benefits of these schemes are not uniformly distributed due to issues such as lack of awareness, procedural complexities, and inadequate implementation mechanisms. **Rani and Devi (2021)** observed that a significant proportion of women entrepreneurs are either unaware of government schemes or face difficulties in accessing them. Furthermore, **Singh and Kaur (2022)** emphasized that bureaucratic hurdles and limited institutional support often reduce the overall effectiveness of such schemes.

Recent literature also highlights that government schemes contribute positively to women's economic empowerment, social status, and entrepreneurial motivation. According to **Patel and Desai (2024)**, women beneficiaries of government schemes exhibit higher levels of financial independence and business growth compared to non-beneficiaries. Additionally, **Mehta and Joshi (2023)** argue that targeted policy interventions, including mentorship and market linkage support, significantly enhance the sustainability of women-led enterprises. However, the persistence of gender biases, lack of digital literacy, and inadequate support networks continues to pose challenges to women entrepreneurs. In Chennai, a major economic and industrial hub, women's entrepreneurship has seen considerable growth driven by increased educational attainment, urbanization, and access to institutional support systems. The city offers a conducive environment for entrepreneurial activities, supported by a strong MSME sector and various government initiatives. Studies by Sridhar and Priya (2023) indicate that women entrepreneurs in Chennai benefit from both central and state government schemes; however, disparities in awareness and utilization persist. Therefore, the present study titled ***"An Empirical Study on the Effectiveness of Government Schemes in Promoting Women Entrepreneurship in Chennai City"*** seeks to examine the role and impact of government schemes in fostering women entrepreneurship in the study region. The study aims to assess the level of awareness, accessibility, and effectiveness of these schemes and to identify the challenges faced by women entrepreneurs in availing such benefits. By providing empirical insights, the study contributes to the existing literature. It offers valuable recommendations for policymakers to enhance the effectiveness and reach of government initiatives to empower women entrepreneurs.

OPERATIONAL DEFINITIONS

Government Schemes: Government schemes are financial and non-financial initiatives introduced by the Government of India and the Government of Tamil Nadu to support women entrepreneurs through credit facilities, subsidies, training, and institutional assistance. In this study, government schemes are operationalized as awareness, accessibility, and utilization among women entrepreneurs **(Kumar & Sharma, 2022; Gupta & Aggarwal, 2023)**.

Effectiveness of Government Schemes: Effectiveness refers to the extent to which government schemes successfully achieve their objective of promoting women's entrepreneurship. It is measured by perceived improvements in business growth, financial stability, entrepreneurial skills, and overall satisfaction among women entrepreneurs who have availed of these schemes (Patel & Desai, 2024).

Women's Entrepreneurship: Women's entrepreneurship refers to the process by which women initiate, organize, manage, and operate business enterprises independently. In this study, it is operationalized through indicators such as business ownership, level of involvement in decision-making, and engagement in entrepreneurial activities (**Mehta & Joshi, 2023**).

Promotion of Women Entrepreneurship: Promotion of women entrepreneurship refers to the role played by government schemes in encouraging women to start, sustain, and expand their business ventures. It is measured through increased participation in entrepreneurial activities, business expansion, and improved access to financial and institutional support **(Rani & Devi, 2021)**.

REVIEW OF LITERATURE

Sathiya Moorthi and Ramachandran (2026) found that startup-oriented government schemes in India provide women entrepreneurs with financial support, training, mentorship, and market access, and the study concluded that such schemes play an important role in encouraging business formation and small entrepreneurship among women.

Akilanayaki Lingeswaran and Sathya P. (2025) found that women entrepreneurs in Coimbatore were not uniformly aware of available government schemes. They emphasized that improving awareness and accessibility are essential to help women use these schemes to overcome challenges and achieve business growth.

Ritu Kumari and Vinay Pal Singh (2024) found that government policies, such as MSME-linked support schemes, are valuable for women’s empowerment, yet women entrepreneurs still face major growth barriers. The study concluded that stronger policy action is needed to improve women’s entrepreneurship in India.

Saranya and Chandrasekar (2023) found that the Government of India has launched many schemes to promote women entrepreneurs and that these schemes are tailored to regional needs; however, the authors stressed the need for regular evaluation to improve the effectiveness and future planning of such schemes.

Jaitly and Thangallapally (2022) found that central and state government schemes remain a key vehicle for supporting women entrepreneurs in India, especially poorer women who use entrepreneurship as a pathway out of poverty. However, the report also highlighted persistent information and ecosystem gaps that limit the full impact of these schemes.

Lakshmi Priya and Smilee Bose (2021) found that women entrepreneurs in Chennai had growing interest in entrepreneurship, but awareness of government schemes and training programs remained a crucial issue; the study showed that government and non-government agencies play an important role in training, loan disbursement, and entrepreneurial promotion among women in Chennai.

Sathiyabama and Velmurugan (2019) found that women entrepreneurs in the Coimbatore district were aware of schemes such as the Mudra Yojana, the IFCI interest subsidy scheme for women entrepreneurs, and the Annapurna Scheme; the study recommended stronger awareness efforts through banks and agencies.

Seema Singh (2015) found that entrepreneurship development programs and government schemes are crucial for empowering women entrepreneurs by equipping them with the entrepreneurial skills needed to establish and successfully run enterprises.

PROBLEM OF THE STUDY

Women entrepreneurship has gained considerable importance as a catalyst for economic development, employment generation, and social empowerment in India, particularly in urban regions such as Chennai. Despite the introduction of numerous government schemes aimed at promoting women-led enterprises through financial assistance, skill development, and institutional support, the actual effectiveness of these initiatives remains uncertain. Many women entrepreneurs continue to face challenges, including limited awareness of available schemes, difficulties accessing benefits due to complex procedures, inadequate financial support, and a lack of proper guidance and training. Furthermore, there is a significant gap between policy formulation and implementation at the grassroots level, which often prevents the intended benefits from reaching target beneficiaries. In addition, socio-cultural constraints, digital illiteracy, and insufficient institutional coordination further hinder the successful utilization of these schemes. Although several studies have highlighted the existence of government support systems, there is a lack of comprehensive empirical evidence examining how effectively these schemes promote, sustain, and support women's entrepreneurship, particularly in Chennai City. Therefore, it becomes essential to systematically assess the awareness, accessibility, utilization, and overall effectiveness of government schemes in promoting women entrepreneurship in the study region, thereby identifying existing gaps and providing meaningful insights for policymakers and stakeholders to enhance the impact of such initiatives.

OBJECTIVES OF THE STUDY

1. To examine the level of awareness, accessibility, and utilization of government schemes among women entrepreneurs in Chennai.
2. To assess the effectiveness of government schemes in promoting the growth, performance, and sustainability of women entrepreneurship in the study region.

HYPOTHESES

- **H1:** There is a significant relationship between awareness, accessibility, and utilization of government schemes and the effectiveness of these schemes among women entrepreneurs in Chennai.
- **H2:** Government schemes have a significant positive influence on the growth, performance, and sustainability of women entrepreneurship in the study region.

RESEARCH METHODOLOGY

The present study adopts a descriptive and empirical research design to examine the effectiveness of government schemes in promoting women entrepreneurship in Chennai. The study is primarily based on primary data collected from women entrepreneurs through a well-structured questionnaire, supplemented by secondary data gathered from journals, government reports, and official publications. The target population comprises women entrepreneurs operating micro, small, and medium-sized enterprises within the study region. Since the population is large and undefined, a non-probability sampling technique, specifically convenience sampling, is employed. A total sample size of 431 respondents is selected for the study to ensure adequate representation and reliability of results. The questionnaire is designed using a five-point Likert scale ranging from strongly disagree to strongly agree to measure key constructs such as awareness, accessibility, utilization, effectiveness of government schemes, and entrepreneurial performance. The collected data are analyzed using appropriate statistical tools, including descriptive statistics, one-sample t-tests, independent samples t-tests, and analysis of variance (ANOVA), to test the hypotheses and draw meaningful interpretations. The study ensures validity and reliability through pilot testing and standard measurement procedures, thereby providing a comprehensive understanding of the role and effectiveness of government schemes in promoting women entrepreneurship in the study area.

RESULTS

Table 1
Demographic Profile of Women Entrepreneurs
(n=431)

S. No.	Demographic Variable	Category	Frequency (n)	Percentage (%)
1	Age (Years)	Below 30	118	27.4
		31–40	142	32.9
		41–50	104	24.1
		Above 50	67	15.5
2	Marital Status	Married	268	62.2
		Unmarried	163	37.8
3	Educational Qualification	Up to HSC	74	17.2
		Diploma	82	19
		Undergraduate	156	36.2
		Postgraduate & above	119	27.6
4	Nature of Business	Manufacturing	98	22.7
		Trading	142	32.9
		Service	191	44.3
5	Business Experience	Below 3 Years	126	29.2
		3–5 Years	148	34.3
		6–10 Years	94	21.8
		Above 10 Years	63	14.6
6	Monthly Income (₹)	Below 50,000	152	35.3
		50,001–1,00,000	168	39
		1,00,001–1,50,000	71	16.5
		Above 1,50,000	40	9.3

The demographic profile of women entrepreneurs in the study region reveals a diverse representation across age, education, and business characteristics. A majority of respondents (32.9%) are in the 31–40 age group, followed by those under 30 (27.4%), indicating that women in their early and middle adulthood are actively engaged in entrepreneurial activities. Most respondents are married (62.2%), suggesting that marital responsibilities do not hinder entrepreneurial participation. In terms of education, a significant proportion (36.2%) are undergraduates, followed by postgraduates and above (27.6%), reflecting a reasonably educated entrepreneurial base. Regarding the nature of business, the service sector dominates (44.3%), followed by trading (32.9%) and manufacturing (22.7%), indicating a preference for less capital-intensive and flexible business models. In terms of experience, the majority of respondents (34.3%) have 3–5 years of business experience, suggesting a growing, moderately experienced entrepreneurial group. Income distribution shows that most respondents (39%) earn between ₹50,001–₹1,00,000, followed by 35.3% earning below ₹50,000, indicating moderate income levels among women entrepreneurs. Overall, the profile highlights that women entrepreneurs in the study region are relatively young, well-educated, service-oriented, and moderately experienced, with stable incomes.

Relationship between awareness, accessibility, and utilization of government schemes and the effectiveness of these schemes among the women entrepreneurs

Hypothesis-1

There is a significant relationship between awareness, accessibility, and utilization of government schemes and the effectiveness of these schemes among women entrepreneurs in Chennai.

Table 2
Relationship between awareness, accessibility, and utilization of government schemes and the effectiveness of these schemes among women entrepreneurs in Chennai

S. No.	Independent Variables	Estimate (β)	S.E.	t-value	p-value	Result
1	Awareness of Government Schemes	0.312	0.045	6.933	0.000**	Significant
2	Accessibility of Government Schemes	0.268	0.041	6.537	0.000**	Significant
3	Utilization of Government Schemes	0.354	0.048	7.375	0.000**	Significant
R-value=0.782						
R^2 value=0.611						
F-value=224.315						
p-value=<0.001**						
Decision: Hypothesis supported						

The results of the regression analysis clearly support Hypothesis H1, indicating that awareness, accessibility, and utilization of government schemes are significantly positively related to their effectiveness among women entrepreneurs in Chennai. The model summary shows a strong correlation ($R = 0.782$) and a substantial explanatory power, with $R^2 = 0.611$ and Adjusted $R^2 = 0.607$, implying that approximately 61.1% of the variation in the effectiveness of government schemes is explained by the three independent variables. The overall model is statistically significant ($F = 224.315$, $p < 0.001$), indicating its robustness. Furthermore, all three independent variables exhibit positive, statistically significant effects on effectiveness. Among them, utilization of government schemes has the highest influence ($\beta = 0.354$, $t = 7.375$, $p < 0.001$), followed by awareness ($\beta = 0.312$, $t = 6.933$, $p < 0.001$) and accessibility ($\beta = 0.268$, $t = 6.537$, $p < 0.001$). This indicates that while awareness and accessibility are important, the actual utilization of schemes plays the most critical role in determining their effectiveness. Overall, the findings confirm that improving awareness, enhancing accessibility, and promoting active utilization can significantly strengthen the effectiveness of government schemes for women entrepreneurs in the study region.

Influence of government schemes on the growth, performance, and sustainability of women entrepreneurship in the study region.

Hypothesis-2

Government schemes have a significant positive influence on the growth, performance, and sustainability of women's entrepreneurship in the study region.

Table 3
Influence of government schemes on the growth, performance, and sustainability of women entrepreneurship in the study region

S. No.	Independent Variables	Estimate (β)	S.E.	t-value	p-value	Result
1	Growth of Women Entrepreneurship	0.336	0.047	7.149	0.000**	Significant
2	Performance of Women Entrepreneurship	0.381	0.052	7.327	0.000**	Significant
3	Sustainability of Women Entrepreneurship	0.294	0.044	6.682	0.000**	Significant

R-value=0.801
R^2 value=0.642
F-value=256.478
p-value=<0.001**
Decision: Hypothesis supported

The results of the analysis provide strong support for Hypothesis 2, confirming that government schemes have a significant positive influence on the growth, performance, and sustainability of women's entrepreneurship in the study region. The model demonstrates a high level of correlation (R = 0.801) and substantial explanatory power, with $R^2 = 0.642$, indicating that government schemes explain 64.2% of the variation in women entrepreneurship outcomes. The overall model is statistically significant ($F = 256.478$, $p < 0.001$), confirming its reliability and goodness of fit. Further, all three dimensions—growth, performance, and sustainability—are positively and significantly influenced by government schemes. Among these, performance of women entrepreneurship has the highest impact ($\beta = 0.381$, $t = 7.327$, $p < 0.001$), followed by growth ($\beta = 0.336$, $t = 7.149$, $p < 0.001$) and sustainability ($\beta = 0.294$, $t = 6.682$, $p < 0.001$). This indicates that government schemes contribute most significantly to enhancing the operational efficiency and outcomes of women-owned enterprises, while also supporting their expansion and long-term continuity. Overall, the findings highlight the crucial role of government initiatives in strengthening women entrepreneurship and promoting sustainable economic development in the study region.

DISCUSSION

The findings of the present study provide strong empirical support for the role of government schemes in promoting women entrepreneurship, particularly in an urban context such as Chennai. The results of Hypothesis 1 reveal that the awareness, accessibility, and utilization of government schemes are significantly positively related to the effectiveness of these schemes among women entrepreneurs. This indicates that the success of government initiatives is not solely dependent on their design but largely on how well they are communicated, accessed, and utilized by the target beneficiaries. This finding aligns with the observations of Rani and Devi (2021), who noted that although many women entrepreneurs are aware of government schemes, actual utilization remains comparatively low due to procedural complexities and a lack of guidance. Furthermore, Singh and Kaur (2022) highlighted that ease of access and institutional support significantly influence the degree of scheme utilization, thereby affecting overall effectiveness. The results of Hypothesis 2 further confirm that government schemes have a significant positive influence on the growth, performance, and sustainability of women's entrepreneurship. The strong impact on entrepreneurial performance indicates that government interventions play a crucial role in improving business outcomes, including profitability, productivity, and operational efficiency. This observation is supported by Jaitly and Thangallapally (2022), who argued that sustained mentoring, market linkages, and policy consistency are essential to enhance the durability of women-owned enterprises. Moreover, the study highlights that government schemes contribute not only to economic outcomes but also to social empowerment by increasing women's confidence, decision-making ability, and financial independence. Overall, the findings underscore the importance of strengthening awareness campaigns, simplifying access procedures, and encouraging greater use of government schemes to maximize their effectiveness. The results also indicate that government schemes serve as a vital instrument in fostering women's entrepreneurship by enhancing business performance and ensuring sustainability. However, the persistence of challenges such as bureaucratic hurdles, lack of timely support, and limited digital literacy suggests the need for continuous improvement in policy implementation. Thus, the study contributes to the growing body of literature by providing empirical evidence on the effectiveness of government schemes and offers valuable insights for policymakers to design more inclusive and impactful interventions for women entrepreneurs.

CONCLUSION

The study concludes that government schemes play a vital and transformative role in promoting women entrepreneurship by significantly enhancing business growth, improving operational performance, and ensuring the long-term sustainability of enterprises. It clearly establishes that awareness, accessibility, and utilization are critical determinants of the effectiveness of these schemes, with utilization emerging as the most influential factor, indicating that the real impact of government initiatives is realized only when women entrepreneurs actively engage with and effectively use the available support mechanisms. While the findings indicate a relatively higher level of awareness among women entrepreneurs, they also reveal persistent challenges, including procedural complexities, limited accessibility, and institutional barriers, that hinder optimal utilization of government schemes. These issues underscore the need to simplify administrative procedures, strengthen institutional frameworks, and improve outreach and communication strategies to ensure benefits reach the intended beneficiaries more efficiently. Furthermore, the study highlights the broader socio-economic contributions of government schemes, as they not only support business success but also enhance women's empowerment by improving financial independence, self-confidence, and decision-making capabilities. By facilitating access to financial assistance, training programs, and entrepreneurial support systems, these initiatives act as catalysts for inclusive growth and gender equality. In conclusion, the study affirms that government schemes are instrumental in strengthening the women entrepreneurship ecosystem in the study region. However, their effectiveness can be further amplified through enhanced awareness campaigns, improved accessibility, greater emphasis on utilization, and continuous policy evaluation and refinement. The findings provide valuable implications for policymakers, academics, and practitioners to design more inclusive, responsive, and impactful interventions, thereby contributing to sustainable economic development and advancing women-led enterprises.

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ANIMAL SPRIT AND MARKET BEHAVIOR IN BOND MARKET: LESSONS FROM RBI IN INDIA

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ABSTRACT

George A.Akelrof and Robert J.Shiller in their book called " Animal Spirits" explored how human psychology shapes the economy- how our confidence, sense of fairness, susceptibility to stories, and even illusions about money drives economic outcomes at every level. During the stories of any geopolitical tensions, Government of India will make certain fiscal measures to cool down the market and Reserve Bank of India will do certain conventional and unconventional tools to stabilize the financial market. For example the India has faced India has faced several "mini-crises" or significant economic shocks since 2008. While the Indian banking system remained largely stable during these periods, the economy experienced sharp currency volatility, capital flight, and growth slowdowns. Government and Central Bank must balance creative freedom with rules and oversight, acting as a referee to ensure fair play and limit destructive behvaiour. This paper is going to show cast the lights on the behavioral expectations of market participant's about previous known Government's role in stabilizing the market along with Reserve Bank of India.

INTRODUCTION

The term 'financial shock' generally refers to a disruptive event in the financial system, which manifests in the sudden re-pricing of assets (often in combination with a severe deterioration of economic conditions). Financial shocks are difficult to predict but tend to be more likely when borrowers are vulnerable, such as when they have taken on excessive risk relative to their repayment capacity (e.g. highly leveraged firms that have both uncertain future profits and low liquidity) (Peersman, 2015).

For example, the collapse of the USA sub-prime mortgage market, prior to the 2007-2009 Global Financial Crisis, was largely driven by excessive leverage of borrowers, an overheated housing market, and insufficient transparency when banks re-packed and combined mortgage loans into new financial instruments, through what is referred to as 'securitization' (Jobst, 2008). Recent currency and/or sovereign debt crises also illustrate that unsustainable external imbalance, such as a deteriorating current account (which reflects cross-border economic activities) and rising foreign currency borrowing by public or private sector organizations (if suddenly unwound), can amplify and/or cause fragilities in the financial system. Examples include the cases of the 1997 Asian financial crisis and the 2007-2009 Global Financial Crisis (Claessens et al., 2014).This type of financial shocks will have a negative sentiment, which will affect the market behavior. Even Reserve Bank of India is publishing Financial Condition Index (FCI), the Index aggregates 20 market-based indicators across five key segments:

Money Market: Tracks short-term borrowing costs and liquidity (e.g., call rate spreads).

Government Securities (G-Secs): Reflects government borrowing costs and overall interest rate benchmarks.

Corporate Bonds: Measures the ease and cost for companies to raise capital.

Equities: Uses indices like the Sensex to gauge investor confidence and corporate health.

Foreign Exchange (Forex): Monitors Rupee stability and international capital flows. The FCI index will tell the latest financial condition in the economy and gives suitable ideas to make the appropriate decisions.

A financial conditions index (FCI) is a summary measure that encapsulates the information contained in a broad array of financial variables and helps to gauge the relative tightness or ease in overall financial conditions (by Pulastya Bandyopadhyay, Avnish Kumar, Pankaj Kumar and Indranil Bhattacharyya, RBI Bulletin June 2025)

RESEARCH QUESTION

To what extent has the RBI's 'communication and liquidity backstop' strategy evolved in its ability to anchor irrational animal spirits in the G-Sec market during global crisis episodes (2008–2026)?

REVIEW OF LITERATURE

Decision-makers are often subject to various behavioural biases. Although they may affect both retail investors and professional money managers, behavioural biases are likely to be more severe among retail investors. (Behavioral Biases among Retail and Institutional Investors, Amundi Institute, march 2023). Benartzi and Thaler (1995) introduce the concept of myopic loss aversion (MLA), a combination of a greater sensitivity to losses than to gains and a tendency to evaluate outcomes frequently. This bias results in households' reduced risk participation as it makes risky assets less attractive to investors. It is particularly wealth destroying for long-term investors such as those investing in retirement plans. Behavioral biases amplify short-term reactions to central bank news. Central bank signals reshape uncertainty and cross-asset dependence (Central bank signals, behavioral biases, and information flow, O.M. Ardakani,2026)

RESEARCH GAP

The Stated research were focused on individual investors and mostly oriented towards stock market, as there is a need to study the Indian sovereign bond market in a behavioral way to bridge the research gap.

OBJECTIVES OF THE STUDY

1. To examine the market behavior and bias towards present situation with past episodes and narratives
2. To understand how the market behavior changes in different markets in uncertain times through a qualitative voice interview

SCOPE OF THE STUDY & LIMITATIONS

1. The present study covers the behavioral changes of different market participants
2. This conceptual writing covers only based on the Government of India and Reserve Bank of India measures

3. Timeframe Constraints: While this study covers major episodes from 2008 to 2026, the specific "byline age" of high-frequency data means that the most recent results from early 2026 may be subject to revision as full economic cycles conclude.
4. Specificity: Much of the behavioral data relies on secondary sources and proxies for sentiment; future research would benefit from longitudinal primary surveys to capture real-time cognitive shifts in professional bond traders.
5. Geography and Institutional Focus: The results are heavily influenced by the Indian and U.S. contexts; behavioral biases can vary across different national regulatory environments and cultural backgrounds

RESULTS AND DISCUSSION

Episode- 1- 2008: The Global Financial Crisis (GFC):

The most severe crisis since the Great Depression, characterized by the collapse of the U.S. housing bubble.

Cause: High-risk "subprime" mortgages were bundled into complex securities (MBS) and sold globally; when home prices fell, these assets became toxic.

Episode-2- 2010–2013: The European Debt Crisis:

A multi-year crisis where several Eurozone countries were unable to repay or refinance their government debt.

Cause: High public debt levels in the "PIIGS" nations (Portugal, Ireland, Italy, Greece, and Spain) coupled with the 2008 economic slowdown

Episode- 3- 2020: The COVID-19 Stock Market Crash

A sudden and rapid global market collapse triggered by the onset of the COVID-19 pandemic.

Cause: Mass lockdowns and business shutdowns led to an unprecedented demand shock and recession fears.

Episode-4 - 2022: Global Inflation and Market Downturn:

A period of persistent market decline as central banks aggressively raised interest rates to combat 40-year high inflation.

Cause: Supply chain disruptions from the pandemic and energy price spikes due to the Russia-Ukraine conflict.

Episode-5- 2026: US and Iran War: (Present)

Nuclear Opposition war between US and Iran

Cause: The primary reasons for the 2026 war between the United States and Iran, as stated by the U.S. and Israel, include preventing Iran from acquiring nuclear weapons, eliminating its ballistic missile industry, and countering its regional influence through proxy groups.

How India's Forex reserves played between?

Crisis Year	Reserve Level (Approx. USD)	Status & Movement	Import Cover
2008	~$310 Billion	**Sharp Decline**: Fell from a peak of $315bn (May 2008) to **$246bn** (Nov 2008) as the RBI sold dollars to support the rupee.	~15 months
2013	~$275–290 Billion	**Critical Low**: Dropped below **$300bn** during the "Taper Tantrum," reaching a multi-year low as investors fled emerging markets.	~7 months

2020	~$470–500 Billion	**Resilient Surge**: After a brief $17bn dip in March 2020, reserves surged to cross **$500bn** for the first time in June 2020 due to high FDI and low oil prices.	~12 months
2022	~$525–630 Billion	**High Volatility**: Peaked at $642bn in late 2021 before dropping to **$524.5bn** in Oct 2022 as the RBI defended the rupee against record inflation and US rate hikes.	~9 months
2026	**$697.1 Billion**	**Record Strength**: Reached an all-time high of **$728.5bn** in Feb 2026 before a recent decline due to geopolitical tensions in West Asia.	~11

Source: Web search/RBI

How India's Benchmark yield played between?

Year	Movement and Driver
2008	**Global Financial Crisis (Sharp Fall)** **Movement:** Yields crashed from nearly 9.5% in August 2008 to approximately 5.0%–5.5% by early 2009.**Driver**: In response to the global liquidity crunch, the RBI aggressively cut the repo rate to boost domestic demand, leading to a massive rally in bond prices and a corresponding plunge in yields.
2013	**Taper Tantrum (Extreme Spike)** **Movement:** Yields surged dramatically, reaching an annual high of 8.45% in 2013.**Driver:** Unexpected hints from the U.S. Federal Reserve about reducing bond purchases led to massive capital outflows from India. To defend the rupee and curb inflation, the RBI was forced to sharply hike interest rates, sending yields to multi-year highs.
2020	**COVID-19 Pandemic (Record Lows)** **Movement:** Yields fell roughly 14.3% during the year, dropping from around 6.6% in January to a historic minimum of 5.76% by July 2020.**Driver:** Massive liquidity infusions and emergency rate cuts by the RBI to support the economy during nationwide lockdowns pushed yields to their lowest levels in nearly two decades.
2022	**Inflation and Rate Hikes (Strong Rebound)** **Movement**: Yields climbed steadily, crossing the 7.50% mark in mid-2022 after hovering near 6.0% in early 2021.**Driver:** Surging global commodity prices and high domestic inflation forced the RBI to start an aggressive rate-hiking cycle (including an off-cycle hike in May 2022), which pushed yields higher as central banks pivoted away from pandemic-era support.
2026	**Recent Volatility (Geopolitical Spikes)** **Movement:** Yields have been highly volatile, spiking to a peak of 7.13% in early April 2026 before easing back to 6.93% by April 8, 2026. **Driver:** Recent surges were driven by a 50% gain in Brent crude prices due to the U.S.-Israel-Iran conflict, which stoked inflation fears. Yields eased recently following a neutral policy stance by the RBI and a temporary ceasefire

Source: Web search/Trading economics/RBI

How Economic Performance played between?

Year	Real GDP Growth	CPI Inflation	Fiscal Deficit (% of GDP)	Remarks
2008	~3.1%	~8.3%	~6.0%	**Post-Boom Slump**: Growth fell by over 2% points due to global demand collapse and credit crunch.
2013	~6.4%	~10.0%	~4.5%	**Double-Digit Stress**: High inflation and a widening current account deficit made India one of the "Fragile Five".
2020	-5.8%	~6.6%	~9.2%	**Pandemic Contraction**: First technical recession in decades; massive stimulus pushed deficit to record highs.
2022	~7.0%	~6.7%	~6.4%	**Resilient Recovery**: Strong rebound post-pandemic, though inflation spiked due to the Russia-Ukraine war.
2026	**~7.6% (est.)**	**~2.6% (low)**	**4.4%**	**Fastest Growing G20**: High growth driven by manufacturing (8.4%) and investment.

Source: Web search/Trading economics/RBI

How Rupee Performed between?

Crisis Episode	Opening Rate (Approx.)	Peak/Closing Rate (Approx.)	Magnitude of Depreciation
2008 (Global Crisis)	₹39.4	**₹52.1** (Mar 2009)	**~25% decline** from Jan to Oct 2008 as FIIs pulled out capital.
2013 (Taper Tantrum)	₹54.0	**₹68.8** (Aug 2013)	**~27% crash** in just 4 months, placing India in the "Fragile Five" category.
2020 (COVID-19)	₹71.5	**₹76.9** (Apr 2020)	**~7.5% dip**; outperformed peers due to massive liquidity and RBI's record reserves.
2022 (Inflation War)	₹74.3	**₹83.2** (Oct 2022)	**~10-12% fall**; worst performing Asian currency that year due to U.S. rate hikes.
2026 (Recent Volatility)	₹87.7	**₹99.8** (Mar 2026)	**~13% decline** over 6 months; recently hit a historic low near **₹95/dollar**

Source: Web search/Trading economics/RBI

Behavioral lessons in the past episode:

In each of these financial episodes, behavioral biases have acted as "force multipliers," often turning manageable economic shifts into full-blown crises or volatile market swings.

2008 & 2026: Herd Mentality & FOMO

2008 (The Housing Bubble): Investors and homebuyers exhibited Herd Mentality, assuming real estate prices would never fall because "everyone else was buying." Availability Bias compounded this, where recent high returns made the risk of a crash seem statistically impossible.

2026 (The AI & Tech Surge): Similar to 2008, the 2026 period has seen a massive "Fear of Missing Out" (FOMO) in AI infrastructure and semiconductor stocks. Despite high valuations, investors continue to pile in, often ignoring fundamental red flags in a classic display of Overconfidence Bias.

2013 & 2022: Loss Aversion & Panic Selling

2013 (Taper Tantrum): When the US Fed hinted at tightening, the "Fragile Five" (including India) saw massive capital outflows. Loss Aversion drove this—the pain of losing capital felt twice as strong as the joy of potential gains, leading to irrational, panicked selling of Rupee assets.

2022 (Inflation Spike): As inflation hit 40-year highs, investors suffered from Recency Bias. Having lived through a decade of low interest rates, the sudden pivot to hikes caused a "sticker shock" reaction, leading to a disproportionate sell-off in both bonds and growth stocks.

2020: Black Swan & Hindsight Bias

The Episode: The COVID-19 crash was a "Black Swan" event. Initially, Confirmation Bias led many to dismiss the virus as a "local issue" in early 2020.

The Aftermath: Once the markets rebounded, Hindsight Bias took over. Many investors claimed the recovery was "obvious," leading to excessive risk-taking in late 2020 and 2021 (the "Robinhood trader" era), which eventually set the stage for the 2022 correction.

2026: Anchoring & Geopolitical Stress

Current Bias: Investors are currently Anchored to the high growth rates of 2024–2025. When U.S. tariffs or Middle East tensions cause a 5–10% dip, it triggers an outsized emotional response because it deviates from the "new normal" investors have mentally locked in.

Summary of Behavioral Impact

Crisis Phase	Dominant Bias	Market Impact
The Build-up	Overconfidence / FOMO	Creates unsustainable bubbles (2008, 2026).
The Crash	Loss Aversion / Herding	Accelerates the downward spiral (2013, 2020).
The Recovery	Hindsight Bias	Leads to premature risky behavior in the next cycle.

Source: Google AI

- From the above episodes we can know how the pertinent behaviours changed the financial market performance even though fundamental economic factors doesn't warrant on the respective episodes. Government of India also announced supply side initiatives and frequent media interactions to give a confidence to the public and especially to the market participants.
- Respected Finance Minister had given a media brief that "India has fiscal space, room to expand capex; RBI to cut interest rate and has room to offer targeted support to affected

sectors: FM. Public borrowings will have to be smart in view of global challenges, says Finance Minister. (Press Trust of India- X Post)

- Union Finance Minister Nirmala Sitharaman today said that the government is ensuring that there is no price hike in petrol, diesel and even Aviation Turbine Fuel (ATF). Speaking to the media in New Delhi, Ms Sitharaman said, keeping the West Asia conflict situation in mind, the Prime Minister held a meeting in which it was decided that there should be no shortage of petrol, diesel and ATF, and their prices should not be increased due to the global situation. She said the government has slashed excise duty on petrol and diesel and decided to give support to Oil Marketing Companies so that they can import the material and the common people do not have to face any hike. (Press release 27.03.2026)
- The Government of India and Reserve Bank of India will give supply side measures, conventional and unconventional measures to give confidence to the public and the market participants. This conceptual paper envisages that the market participants will have a recency/availability bias by having a reference to the past trend during any fresh geopolitical or any other uncertainty.

RESULTS AND SUGGESTION

The conceptual paper vocals that there is a imminent behavioural expectation and the market participants behaviour will be biased towards the economy during uncertain periods. The same was referred through a study called "The Adaptive Markets Hypothesis, Andrew W. Lo,2004)" which states that The current version of the EMH can be summarized compactly by the "three Ps of Total Investment Management": prices, probabilities, and preferences (see Lo [1999]). The three Ps have their origins in one of the most basic and central ideas of modern economics, the principle of supply and demand. This principle states that the price of any commodity and the quantity traded are determined by the intersection of supply and demand curves, where the demand curve represents the schedule of quantities desired by consumers at various prices, and the supply curve represents the schedule of quantities producers are willing to supply at various prices. The intersection of these two curves determines an "equilibrium," a price-quantity pair that satisfies both consumers and producers simultaneously. Any other price-quantity pair may serve one group's interests, but not the other's. Even in this simple description of a market, all the elements of modern finance are present. The demand curve is the aggregation of many individual consumers' desires, each derived from optimizing an individual's preferences, subject to a budget constraint that depends on prices and other factors (e.g., income, savings requirements, and borrowing costs). Similarly, the supply curve is the aggregation of many individual producers' outputs, each derived from optimizing an entrepreneur's preferences, subject to a resource constraint that also depends on prices and other factors (e.g., costs of materials, wages, and trade credit). And probabilities affect both consumers and producers as they formulate their consumption and production plans through time and in the face of uncertainty—uncertain income, uncertain costs, and uncertain business conditions. Probabilities that give modern financial economics its richness and depth. Formal models of financial asset prices such as Leroy [1973], Merton [1973], Rubinstein [1976], Lucas [1978], and Breeden [1979] show precisely how the three Ps simultaneously determine a "general equilibrium" in which demand equals supply across all markets in an uncertain world where individuals and corporations act rationally to optimize their own welfare. The three Ps enter into any economic decision under uncertainty. It may be argued that they are fundamental to all forms of decision-making

KEY FINDINGS AND POLICY IMPLICATIONS

"In Past Episodes Reserve bank of India launched Resurgent India Bonds (RIBs - 1998) and India Millennium Deposits (IMDs - 2000) were special foreign currency-denominated instruments issued by SBI to NRIs to boost foreign exchange reserves during liquidity crises, raising approx $4.23 billion and $5.5 billion, respectively. Both offered attractive interest rates, were fully repatriable, and matured successfully". RBI introduced this type of schemes only during the period in which our forex reserves were low .Incase of operation twist also there is no need at the moment of time vs previous episodes, so RBI has announced separate measure to cool off the yield

On April 8, 2026, the RBI announced significant easing of capital norms for banks by proposing to scrap the Investment Fluctuation Reserve (IFR) requirement and allowing the inclusion of quarterly net profits in Capital to Risk-Weighted Assets Ratio (CRAR) calculations, removing previous constraints related to non-performing asset (NPA) provisioning. These measures, aimed at optimizing capital usage and reducing regulatory burden, allow banks to treat IFR balances as Tier 1 capital, potentially freeing up to ₹35,000 crore for lending.

CONCLUSION

This study underscores that while traditional finance theories rely on rational actors and efficient markets, the reality of the government bond market—especially during crisis episodes—is dictated by the complex interplay of central bank signals and investor psychology during uncertain times. By the 2022–2026 period, the effectiveness of central bank "forward guidance" has become increasingly dependent on managing market sentiment rather than just liquidity levels. The proposed 2026 "Stabilisation Fund" serves as a direct policy recognition that future market stability requires pre-emptively addressing behavioral volatility.

FUTURE SCOPE

This conceptual paper has to be studied via qualitative and quantitative basis to expand the scope of the study further.

From the above research paper we are testing the preference/price/probability happens in the present US-Iran Scenario.
Some Web post stating that RBI will introduce FCNR(B) like schemes to save the rupee or Operation twist kind of things to stabilise the bond market as fol1ows:

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- https://www.smetimes.in/smetimes/news/top-stories/2026/Apr/06/rbi-mpc-meet-begins.html
- https://www.livemint.com/economy/rbi-mpc-malhotra-and-co-expected-to-keep-rates-unchanged-in-first-policy-since-us-iran-war-says-sbi-report-11775371326721.html
- RBI may revive FCNR(B) deposits to boost foreign currency inflows amid rupee pressure
- https://financialnewsindia.com/news/rbi-may-revive-fcnrb-deposits-to-boost-foreign-currency-inflows-amid-rupee-pressure/
- FCNR-B Scheme 2.0? Uday Kotak Calls For 'Unconventional Policy Actions' As Rupee Hits Historic Low
- https://www.ndtvprofit.com/markets/uday-kotak-warns-of-pressure-on-rupee-amid-us-iran-tensions-suggests-fcnr-b-scheme-like-policy-steps-11285826

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COMPREHENSIVE STUDY OF BANK AUDIT WITH FOCUS ON LOANS, ADVANCES, AND WORKING CAPITAL

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ABSTRACT

This project titled "Comprehensive Study of Bank Audit with Focus on Loans, Advances, and Working Capital" aims to provide an in-depth understanding of the principles, procedures, and practical aspects of bank auditing. Bank audits play a crucial role in ensuring the accuracy, transparency, and reliability of financial statements, while also safeguarding the financial health of banking institutions. The study emphasizes the practical exposure to audit procedures, including audit planning, risk assessment, and the application of sampling techniques in verifying banking transactions. Special attention is given to the audit of loan and advance accounts, which constitute a significant portion of a bank's assets and involve higher risk. The project examines the classification, documentation, and monitoring of loans, along with the evaluation of non-performing assets (NPAs). Further, the study explores the audit of working capital and business advances, focusing on the assessment of creditworthiness, compliance with sanction terms, and end-use verification of funds. It highlights the importance of internal controls, regulatory guidelines, and proper documentation in minimizing audit risks. The project adopts a practical approach by integrating theoretical concepts with real-world audit procedures, thereby enhancing understanding of challenges faced by auditors in the banking sector. Overall, the study provides valuable insights into effective bank auditing practices and contributes to strengthening financial discipline and accountability within banks.

KEY WORDS: Loan Advance, Working Capital, Non-Performing Assets,

INTRODUCTION

The Bank plays a very important role in functioning of organized financial sector of the economy. A well organized and efficient banking system is a prerequisite for economic growth of the country. The banking system is developing not only geographically but also operationally. It is no more an institution, which used to collect deposits to lend money. Anti-money laundering measures guidelines, submission of different returns of information about excess cash withdrawal, obtaining PAN for certain high value transactions, TDS on interest on Bank deposits and submission of returns, etc. reveal that the Government is thinking of using banking system to streamline and strengthen the economy. The banking sector plays a major role in the development of the economy, as it mobilizes deposits and provides credit to various sectors across India. The banking sector collects surplus funds from customers/ depositors in the form of deposits and channelizes them to borrowers in the form of loans.

The Reserve Bank or RBI is the central banking institution that regulates and operates the banking system in India. It supervises and administers exchange control and banking regulations and administers the government's monetary policy. RBI encompasses commercial banks, co-operative banks and development banks that function according to the guidelines imposed by the RBI. These banks provide various banking services across India from urban and metropolitan areas to the remotest rural areas. Indian banking industry has recently witnessed the roll out of innovative banking models like payments and small finance banks. RBI's new measures may go a long way in helping the restructuring of the domestic banking industry. The digital payments system in India has evolved the most among 25 countries with India's Immediate Payment Service (IMPS) being the only system at level five in the Faster Payments Innovation Index (FPII).

Audit Documentation in Bank Branch Audit

- SBA should ensure that documentation meet the requirements of SA 230 "Audit Documentation" and specific documentation requirements of other SAs and regulatory norms.
- SBA should prepare audit documentation on a real time basis.
- Maintain Documentation w.r.t to planning & risk assessment (nature, timing and extent of audit), audit strategy (risk based, compliance driven, and data driven) for performing the audit, any special audit considerations for risks due to fraud and related party transactions, applicable legal and regulatory framework, materiality levels, results of audit procedures performed and significant matters arising during audit, conclusions reached and significant judgements made
- Documentation include, Audit plan and programs (assigning responsibility of conduct, review and final authorization), final working papers and analysis, Issue-Memorandum, summaries of significant matters discussed with branch management, letters of confirmations and representations, checklists, correspondences (including e-mail) concerning significant matters with the branch or central office.

OBJECTIVES OF THE STUDY

The primary objective of this study is to analyse the practical experience gained during the project at an auditor's firm, with special emphasis on statutory bank audits and compliance-related activities. The project seeks to understand how audit procedures are carried out at the branch level and how regulatory guidelines are implemented in operational environments.

Another objective is to gain an in-depth understanding of loan verification and documentation procedures followed by banks, including the audit of various advances such as jewel loans, cash credit accounts, housing loans, and vehicle loans. The study also aims to examine the role of auditors in ensuring compliance with bank policies, identifying irregularities, and facilitating corrective action through structured audit reporting and follow-up processes.

Additionally, the project seeks to document the practical exposure gained in income tax and GST filings, thereby presenting a comprehensive view of professional accounting practices experienced during the internship.

BANK AUDIT – PRACTICAL EXPOSURE AND PROCEDURES

Introduction to Bank Audit

The bank audit experience formed the core learning component of my internship and constitutes the central theme of this project. During the internship period, I was introduced to the practical aspects of statutory and concurrent bank audits conducted at various bank branches. Unlike general audits of business entities, bank audits are highly structured and strictly regulated due to the nature of banking operations and the involvement of public funds. Through direct participation in audit activities, I was able to understand how auditors systematically examine banking transactions, records, and controls to ensure compliance with regulatory requirements and internal policies.

A bank audit involves a comprehensive examination of the financial and operational aspects of a bank branch. During the audit process, auditors focus on evaluating advances and loans, asset quality, documentation standards, internal control mechanisms, and adherence to regulatory guidelines issued by the **Reserve Bank of India**. Each of these areas plays a critical role in determining the financial health and risk profile of the bank. Through the audit work, I learned that bank audits are not limited to checking numerical accuracy, but also involve assessing whether procedures have been followed correctly and whether risks have been adequately identified and managed.

One of the most important areas of focus during branch audits is the verification of advances. Advances represent a major portion of a bank's assets and are also the primary source of credit risk and a major source of revenue. During the audit, I observed that auditors devote significant time and attention to examining loan accounts, as improper sanctioning, weak documentation, or inadequate monitoring of advances can result in financial losses and regulatory non-compliance. The verification of advances involves checking whether loans have been sanctioned in accordance with bank policies, whether the required documents have been properly executed, whether the loans and advances are given based on the creditworthiness of the borrower and whether the security offered against the loan has been correctly created and recorded.

Asset quality assessment is closely linked to the audit of advances. Through the audit process, I learned how auditors examine loan accounts to determine whether they are performing or non-performing, based on repayment behaviour and regulatory norms. Proper classification of assets is essential, as it directly impacts income recognition and provisioning requirements. Any incorrect classification can lead to misrepresentation of the bank's financial position. Observing this process helped me understand the importance of timely identification and management of stressed and non-performing assets.

Documentation verification formed a crucial part of the audit work. During the audit, I was involved in checking whether loan files contained all mandatory documents, such as application forms, sanction letters, security documents, valuation reports, and legal opinions. Proper documentation serves as legal evidence of the bank's claim over the borrower and the security offered. Through this verification, I understood that even if a loan is regularly serviced, missing or improperly executed documents can expose the bank to significant legal and financial risks.

Compliance with regulatory norms was another key area examined during the bank audit. The audit process involved verifying whether lending practices, interest application, fee charging, and account operations were carried out in line with RBI guidelines and internal bank policies. Through this exposure, I learned how regulatory instructions are translated into operational procedures at the branch level, and how auditors assess compliance by examining records, reports, and system-generated data.

Internal control mechanisms were also reviewed as part of the audit. During the audit, I observed how auditors evaluate whether adequate controls are in place to prevent errors, fraud, and unauthorized transactions. This includes checking authorization procedures, segregation of duties, and monitoring systems within the branch. Understanding internal controls helped me appreciate the role of audits in strengthening governance and accountability within banking institutions.

Overall, the introduction to bank audit during the internship provided a comprehensive understanding of how banks are examined from an auditor's perspective. It highlighted the importance of systematic verification, professional judgment, and regulatory awareness in safeguarding the interests of depositors and ensuring the stability of the banking system. This exposure laid the foundation for my learning in subsequent audit procedures, particularly in the detailed verification of various loan accounts and banking operations.

RBI Guidelines and Regulatory Framework Governing Bank Audits

Bank audits are conducted within the broader regulatory framework prescribed by the Reserve Bank of India (RBI), which functions as the central banking authority responsible for supervising and regulating banking institutions in India. During the course of the internship, I understood that statutory bank audits are not limited to verifying transactions or loan accounts; they are carried out with reference to the regulatory standards and supervisory guidelines issued by the RBI.

RBI guidelines govern multiple dimensions of banking operations, including credit management, asset classification, income recognition, capital adequacy, liquidity maintenance, risk management, and customer service standards. These regulations form the foundation upon which internal bank policies are developed and implemented at the branch level. During audit assignments, compliance with these regulatory instructions is examined to ensure that banking operations are conducted within the prescribed legal and supervisory framework.

In the area of credit and lending, RBI norms influence exposure limits, sanction procedures, asset classification, provisioning requirements, and recognition of income on advances. However, the regulatory scope extends beyond lending activities. RBI guidelines also prescribe norms relating to Know Your Customer (KYC) procedures, Anti-Money Laundering (AML) compliance, maintenance of statutory reserves such as Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR), priority sector lending targets, and reporting requirements to regulatory authorities. During the audit process, I observed how these broader regulatory requirements indirectly influence branch-level documentation, customer verification procedures, and compliance reporting systems.

Another important area governed by RBI guidelines is asset classification and provisioning. Banks are required to classify advances as standard assets, sub-standard assets, doubtful assets, or loss assets based on prescribed norms. This classification directly affects provisioning and financial reporting. During audit verification, loan accounts were examined to ensure that asset classification was carried out in accordance with RBI instructions and that income recognition was properly aligned with regulatory norms.

RBI guidelines also play a crucial role in strengthening governance and internal control systems within banks. Norms relating to related-party transactions, transparency in lending, disclosure requirements, and prevention of conflict of interest are embedded within regulatory instructions. Through audit exposure, I understood how adherence to these norms ensures accountability and financial discipline within banking institutions.

Thus, RBI guidelines serve as the regulatory backbone for banking operations and statutory audits. Every verification step during the audit, whether relating to loan documentation, account classification, interest application, or compliance reporting is ultimately assessed with reference to RBI norms and corresponding internal bank policies. This understanding helped me recognize that statutory bank audits are not merely procedural checks but regulatory compliance evaluations conducted within a structured supervisory framework.

Audit of Loan and Advance Accounts

Jewel Loan Verification

Jewel loans are short-term secured advances granted against the pledge of gold ornaments and constitute a significant component of retail credit portfolios in many banking institutions. Due to their high transaction volume, liquidity of underlying collateral, and exposure to gold price fluctuations, jewel loan accounts were subjected to detailed scrutiny during the statutory bank audit. During the internship, I actively participated in the verification of jewel loan files to ensure that sanction procedures, valuation mechanisms, documentation standards, custody controls, and monitoring practices were aligned with internal bank policies and regulatory expectations.

The audit of jewel loans was approached from multiple dimensions: borrower documentation, valuation accuracy, compliance with lending norms, authorization controls, physical custody of pledged gold, and post-sanction monitoring.

Borrower Documentation and Initial Appraisal

The verification process commenced with examination of the jewel loan application form. This document serves as the foundational record of the transaction and includes borrower identification details, loan amount requested, purpose of loan (where applicable), description of pledged ornaments, and tenure. During audit, it was ensured that the application form was completely filled, duly signed by the borrower, and supported by required Know Your Customer (KYC) documentation.

Incomplete forms, missing signatures, or inconsistencies between identification documents and application details were treated as audit observations. Proper documentation at this stage is essential because it establishes the contractual relationship between the borrower and the bank and supports enforceability in case of dispute.

In addition, the consent letter executed by the borrower was verified. This letter confirms that the borrower has voluntarily pledged the ornaments and accepts the bank's terms and conditions. Proper execution of this document reduces legal ambiguity and strengthens the bank's right over the pledged asset.

Where applicable, verification extended to reviewing the borrower's source of income and repayment capacity. Although jewel loans are primarily collateral-based, banks still evaluate repayment behaviour and earning capacity to minimize default risk. Documentation often included income proof, photographs of the borrower, and photographs of the pledged ornaments. These records enhance transparency and assist in identification during recovery or dispute resolution.

Valuation Mechanism and Appraiser Controls

The most critical aspect of the jewel loan audit was verification of the gold valuation process. The appraiser plays a central role in determining purity (for example, 22K), net weight after deductions for stones or impurities, and overall quality of the pledged ornaments. The certified valuation directly determines the eligible loan limit.

During audit, the following aspects were examined:

- Presence of the appraiser's signature
- Confirmation that the appraiser was authorized or empaneled
- Accuracy of weight and purity assessment
- Compliance with bank-approved valuation methodology
- Consistency in application of loan-to-value norms

Valuation Approaches

Two principal valuation approaches were observed:

Loan-to-Value (LTV) Ratio Method

Under this method, the market value of gold is first computed based on prevailing gold prices. The bank then applies a conservative lending percentage, such as 75% of the market value.

For example:

If 40 grams of 22K gold has a market value of ₹5,81,200, Permissible lending at 75% = ₹4,35,900

The borrower may avail up to this limit, but not beyond it. The remaining 25% functions as a margin of safety against gold price volatility and potential recovery costs.

Fixed Per Gram Lending Rate Method

Under this approach, the bank fixes an internal lending rate per gram that is intentionally lower than the prevailing market rate. For example, if the market rate per gram is ₹14,530, the bank may fix its lending value at ₹10,000 per gram.

For 40 grams: Eligible Loan Amount = 40 × ₹10,000 = ₹4,00,000

This conservative internal pricing mechanism acts as a built-in risk mitigation tool, insulating the bank from short-term market fluctuations and ensuring recoverability.

During audit, it was verified whether the branch consistently followed the prescribed valuation method and whether the sanctioned loan amount exceeded permissible limits under either approach. Any deviation in calculation or excessive sanctioning was treated as a significant audit issue.

For high-value jewel loans exceeding ₹5 lakhs, the presence of two independent appraiser signatures was verified. This dual appraisal mechanism reduces the probability of overvaluation and ensures enhanced reliability in high-exposure accounts.

Authorization and Sanction Controls

Beyond valuation, audit procedures included verification of proper sanction authority. Loan files were examined to confirm that the sanctioning officer's signature and official seal were present and that the loan fell within delegated financial powers.

This verification ensures that internal control systems are functioning effectively and prevents unauthorized or irregular lending practices. Absence of proper authorization indicates weaknesses in governance and control.

Custody, Locker Management, and Physical Controls

An essential operational dimension of jewel loan audit involves physical custody verification. Since gold ornaments are tangible and high-value assets, their safe storage is critical.

During the audit, the following were examined:

- Whether pledged gold was stored in designated secure lockers
- Proper labelling and tagging of gold pouches with loan account numbers
- Sealing and packaging standards
- Maintenance of joint custody registers
- Periodic inspection and verification by authorized officers

The adequacy of locker security and dual control mechanisms was reviewed to prevent misappropriation or substitution of pledged ornaments. Proper custody management is essential not only for security but also for maintaining depositor confidence and regulatory compliance.

Monitoring, Renewal, and Roll-Over Checks

The audit also examined whether jewel loans were being improperly rolled over. Roll-over refers to closing and reopening loans without genuine repayment to avoid classification as overdue or non-performing. Such practices distort asset classification and income recognition.

Verification included reviewing repayment history, checking due dates, and confirming whether renewals were supported by fresh valuation where required. This ensured compliance with prudential norms and prevented artificial improvement of asset quality.

Risk Assessment and Audit Implications

Although jewel loans are secured by a liquid asset, they carry specific risks including valuation risk, price fluctuation risk, operational risk, custody risk, and documentation risk. Improper appraisal, weak locker control, or unauthorized sanctioning can expose the bank to financial loss and reputational damage.

Through audit procedures, these risks were assessed and controlled through structured verification of documentation, valuation methodology, authorization hierarchy, and physical security measures.

Audit of Working Capital and Business Advances

Introduction

Apart from jewel loans and retail credit facilities, a substantial portion of the statutory bank audit was dedicated to the verification of working capital and business-related advances. These advances form a critical component of a bank's asset portfolio and generally involve higher exposure amounts, continuous account operations, and dynamic utilization patterns. Unlike fixed-term retail loans, working capital facilities are revolving in nature and directly linked to the operational cycles of businesses. Therefore, they require ongoing supervision, periodic renewal, strict monitoring of security coverage, and careful assessment of financial performance.

During the internship, I was involved in the examination of multiple categories of such advances, including Cash Credit (CC) accounts, book debt–based working capital facilities, Packing Credit Loan (PCLN) accounts extended to exporters, Secured Overdraft (SOD) accounts secured against immovable property, and other open or term loan accounts granted to business entities. Each category of advance differs in structure, risk exposure, documentation requirements, and monitoring mechanisms, and the audit procedures were tailored accordingly.

The verification of working capital and business advances was approached from several perspectives: sanction compliance, operational conduct of accounts, adequacy and validity of security, monitoring of drawing power, renewal discipline, system accuracy, and regulatory adherence.

Cash Credit (CC) Accounts

Cash Credit accounts are among the most commonly used working capital facilities provided to business entities. These facilities are sanctioned to finance day-to-day operational requirements such as procurement of raw materials, payment of wages, maintenance of inventory, and other business expenses. The borrower is permitted to draw funds up to a sanctioned limit, subject to drawing power calculated based on the value of stock and receivables.

During the audit, verification of CC accounts involved examining whether:

- The sanctioned limit was approved by the competent authority in accordance with delegated powers.
- The outstanding balance at any point exceeded the sanctioned limit.
- Any temporary excess was supported by written approval.
- The facility was renewed within the prescribed time frame.
- Financial statements submitted for renewal were recent and duly reviewed.

One of the key observations during the audit was that expired limits or delayed renewals significantly weaken the bank's legal position and may lead to asset classification concerns. Renewal delays indicate deficiencies in credit monitoring and can expose the bank to regulatory and financial risk.

Through this process, I understood that sanctioning a CC facility is only the beginning; continuous supervision and renewal discipline are critical components of working capital risk management.

Stock Statements and Drawing Power Calculation

A fundamental element of working capital lending is the calculation of drawing power based on stock statements and receivable declarations submitted by the borrower. Drawing power determines the maximum amount that can be withdrawn from the sanctioned limit at any given time.

During audit, I was involved in verifying:

- Timely submission of stock statements (usually monthly).
- Review and approval of stock statements by authorized bank officials.
- Application of margin percentage while computing drawing power.
- Exclusion of obsolete, damaged, or non-moving stock.
- Consistency between stock statements and audited financial statements.

In book debt–based facilities, verification also included checking the ageing analysis of receivables to ensure that overdue or doubtful debts were excluded from eligible drawing power. Failure to properly assess receivables may result in over-financing and increased default risk.

This area of audit highlighted how working capital advances rely heavily on accurate reporting by borrowers and vigilant monitoring by bank officials.

Book Debt–Based Working Capital Facilities

Book debt–based advances are extended against the receivables of a business entity. In such facilities, the bank finances a specified percentage of eligible receivables after applying margin requirements.

During the audit, emphasis was placed on:

- Verification of receivable ageing reports.
- Exclusion of receivables older than the permissible period.
- Consistency between receivables declared and actual financial records.
- Regular monitoring of realization patterns.

This verification process demonstrated that quality of receivables is more important than mere quantum, as aged or doubtful debts weaken the security coverage of the bank.

Packing Credit Loan (PCLN) Accounts

Packing Credit Loan accounts are short-term pre-shipment credit facilities extended to exporters for the purchase, processing, and packing of goods before shipment. These facilities are expected to be liquidated upon realization of export proceeds.

During the audit, verification included:

- Examination of export orders or confirmed contracts.
- Compliance with sanction conditions.
- Timely conversion to post-shipment credit where applicable.
- Adjustment of the loan upon realization of export proceeds.
- Monitoring of overdue export bills.

These accounts are sensitive because delays in export realization may lead to classification issues or increased risk exposure. The audit process emphasized strict monitoring and timely adjustment of export-linked advances.

Secured Overdraft (SOD) Accounts

Secured Overdraft accounts, particularly those backed by immovable property, were examined as part of the audit. These facilities allow borrowers to overdraw funds up to a sanctioned limit secured against property.

Verification included:

- Existence and validity of mortgage creation documents.
- Registration and stamping compliance.
- Valuation reports from approved valuers.
- Legal opinion confirming clear and marketable title.
- Timely renewal and review of the facility.

Since these advances involve long-term exposure and legal enforceability risk, deficiencies in documentation or valuation were treated as significant audit observations.

Open Loan and Business Term Loan Accounts

Open loan accounts and business term loans are generally sanctioned for specific business purposes such as machinery purchase, expansion of operations, or capital expenditure.
Audit verification included:

- Comparison of account operations with sanctioned terms.
- Verification of interest rate application.
- Adherence to repayment schedule.
- Monitoring of overdue instalments.
- Adequacy of security documentation.

Any mismatch between sanction terms and actual account conduct was identified and reported.

Verification of Charges and System Accuracy

Across all categories of business advances, the audit included verification of:

- Correct application of interest rates.
- Charging of processing fees and inspection charges.
- Documentation charges and renewal fees.
- Penal interest in case of irregularity.

System-generated interest calculations were cross-verified with sanctioned terms to identify discrepancies. Even minor system errors, when multiplied across several accounts, can result in significant revenue leakage or customer disputes.

Risk Perspective and Audit Importance

Working capital and business advances carry higher operational and credit risk compared to static retail loans. Their dynamic utilization, dependence on borrower declarations, and exposure to market fluctuations require strong internal control systems and vigilant supervision.

Through this audit exposure, I understood that:

- Monitoring of advances is as critical as sanctioning.
- Expired limits and delayed renewals create legal vulnerabilities.
- Drawing power calculations are a key risk control mechanism.
- Weak documentation can severely impact recoverability.
- Auditors play an essential role in identifying weaknesses in credit administration.

CONCLUSION

The audit of the bank provides a comprehensive evaluation of its financial operations, internal controls, and compliance with regulatory requirements. The study highlights that the bank generally maintains proper accounting records and follows established procedures in its day-to-day operations. Internal control systems are largely effective in safeguarding assets, preventing fraud, and ensuring accuracy in financial reporting.

However, certain areas require improvement, such as strengthening risk management practices, enhancing monitoring mechanisms, and ensuring timely reconciliation of accounts. Addressing these gaps will help the bank improve operational efficiency and reduce potential risks.

Overall, the audit confirms that the bank is functioning in a stable and systematic manner, with reasonable assurance of financial reliability. Continuous improvements in internal controls and adherence to regulatory guidelines will further enhance the bank's performance and credibility.

The exposure to bank audits offered valuable insight into the functioning of banking institutions, the importance of regulatory compliance, and the role of auditors in safeguarding public funds. Through verification of loan accounts, documentation, and compliance with regulatory guidelines, I gained a deeper understanding of how risk is identified and managed within banks. The experience also highlighted the importance of structured audit procedures, professional judgment, and effective communication in ensuring audit quality.

In addition to audit work, exposure to income tax and GST filing provided a broader perspective on professional accounting practice. These experiences helped me understand how statutory compliance is managed across different areas of taxation and reinforced the importance of accuracy, confidentiality, and timeliness in professional work.

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A STUDY ON MULTI-DIMENSIONAL ANALYSIS OF CONSUMER ATTITUDE TOWARDS DIGITAL PAYMENT SYSTEMS FROM A TRUST BASED MEDIATION MODEL

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ABSTRACT

This research paper examines the essential factors that are determining the consumer behaviour towards the payment systems digitally in the fast-changing financial ecosystem. The digital payment system has become a very prominent feature with the spread of financial technology (fintech) solutions and the spread of the emphasis on cashless economies through Unified Payments Interface (UPI), mobile wallets and internet banking. Here, consumer perception, and attitude have gained more significance to financial institutions, policymakers and service providers to increase adoption and use. The study uses a model-based approach by bringing together key constructs that are based on the existing technology acceptance theories. In particular, the question of Perceived Ease of Use, Perceived Usefulness, Security and Privacy, Trust and Social Influence is investigated to determine the overall and the specific influence they have on consumer attitude. These constructs have been able to offer a holistic model in understanding both technological and behavioural aspects that affect user perception. The research used primary data to conduct the study by utilizing a structured questionnaire made to participants based on a five points Likert scale. The tool has 40 questions that are applied in dimensions to make the assessment of consumer attitude multidimensional. The data collected are analysed with the help of the statistical procedures such as reliability analysis to test internal consistency, the exploratory factor analysis (EFA) to find out underlying constructs and the regression analysis as a method to assess the strength and direction of the relationship between the variables. The research results should provide meaningful information on behavioural factors, as well as blocks to the acceptance of digital payments. The research findings enhance the current literature in consumer behaviour, digital finance and by highlighting the most prevalent aspects that are likely to influence the consumer attitude. Moreover, the study has its practical inferences to the financial institutions and policymakers in formulating user-friendly, safe and reliable digital *payment systems, which would enhance acceptance and sustainability of digital financial services.*

KEYWORDS: Digital payment systems, UPI, Card payment, Trust on Digital Payments

INTRODUCTION

The world of finances has experienced the significant shift due to the active development of digital technologies, and especially related to the area of payment systems. Electronic cash payment options like Unified Payments Interface (UPI), mobile wallets, online banking and payment by cards have completely changed the behaviour of consumers in terms of transactions. In other developing markets such as India, digital revolution plans such as Digital India and Fintech expansion have ensured that the country is quickly moving towards a cashless economy (Dahlberg et al., 2015; Kaur et al., 2020). Consumer attitude is a one of the significant factors that effects the receipt of digital payment systems and defines the future uptake and usage thereof. According to Davis (1989), his Technology Acceptance Model (TAM) separates perceived usefulness and perceived ease of use as the major factors of user acceptance of new technologies. It has always been verified that users tend to embrace digital payment systems on their condition of feeling efficiency, convenience and ease of use (Venkatesh et al., 2003; Oliveira et al., 2016). Privacy and security issues besides the factors of usability have proven to be critical determinants to consumer attitude. The perceived risks of data breaches and fraud usually prevent the use of online payment surface by users (Kim et al., 2010). On the other hand, improved security solutions and open privacy policies will lead to greater user trust. The element of trust, as such, emerges as a significant element of digital financial transactions as it diminishes the uncertainty element and creates positive attitude towards adoption of technology (Gefen et al., 2003). Moreover, the behaviour of consumers is greatly influenced by the social factors particularly in developing economies where the consumption decisions of an individual are influenced by peer use and social conventions (Venkatesh et al., 2003). Although studies conducted on these factors are numerous, it is strange to note that in most cases, the studies have been done in isolation and this has restricted the ability to gain an in-depth insight on consumer attitude.

In that regard, the current research project will consider the creation of a multidimensional model where the insights of usefulness, easy use of payment system, security and privacy, trust and social stimulus that are incorporated to examine consumer attitude regarding digital payment systems. Empirical approach adopted in the research aims at giving an all-inclusive perspective of behavioural drivers and give practical implication to the improvement of digital payment adoption.

PAST LITERATURE

The fast development of digital payment system has drawn much academic interest especially in the learning of the behavioural as well as the technological aspects that guide user adoption. Through the digital payment platform (including mobile wallets, web banking, and real time payment systems, etc.), payments have digitized transactions making them fast, convenient, and easy. Nevertheless, consumer attitude is also a noteworthy factor to the successful adoption and subsequent use of such technologies. The Technology Acceptance Model (TAM) is one of the most common theoretical frameworks that have been used in the field, the aspect that serves to determine the influence of users in the formation of user behaviour is the presence of perceived usefulness and perceived ease of use (Davis, 1989). The usefulness that is perceived is the grade to which a person believes that they are better off when they utilize a certain system and apparent ease of use is the grade to which a person puts in effort to utilize the system. Empirical research has continuously confirmed that the two constructs have a significant effect on user attitude and intention to digital payment systems (Alalwan et al., 2017). When consumers see electronic payments as easy to use, the probability of their embrace becomes significantly high.

Other than usability, other factors that have brought about critical issues to consumer perception include the security and privacy issues. In the same context of the growing frequency of cyber threats and data breaches, users tend to be fearful of making online financial transactions. Research states that the perceived risk affects user attitude in a negative manner, and strong security and privacy guarantees have favourable effects on trust and adoption (Liebana-Cabanillas et al., 2014). Thus, it is crucial to make transactions safe to boost the trust of consumers towards online payment systems. Another critical variable in consumer attitude concerning the adoption of digital payments is trust. Online transactions do not necessarily involve physical contact as opposed to traditional payment systems, and trust is an important factor in perceived uncertainty reduction. The studies indicate that trust of service providers, technology infrastructure and regulations are important factors that determine the acceptance by the users (Zhou, 2011). The increased trust levels relate to the enhanced willingness to conduct the digital financial transactions, which supports the positive consumer attitudes.

There is also social influence which is also quite important particularly in the developing economies. The Unified Theory of Acceptance and Use of Technology (UTAUT) postulates that people are sensitive to the beliefs and actions of colleagues, family, and the society in terms of implementing emerging technologies (Venkatesh et al., 2003). When the digital payments, extensive use in the context of social networks usually makes people transition to the use of such technologies, thus increasing the speed of diffusion. In addition, recent reports have indicated the significance of incorporating numerous determinants in order to be in a position to comprehend consumer behaviour. As opposed to examining factors in isolation, a multidimensional approach offers a more detailed view of the interaction of technological, psychological, and social factors to influence consumer attitude (Patil et al., 2020). The given integrated frameworks are especially applicable in the sphere of digital payments, where a set of functional advantages and perceived risks creates an impact on user behaviour. Although the body of literature is growing, there is still a necessity to conduct empirical investigations that will analytically study all these major determinants in a single model. The current research fills this gap with respect to the importance of considering the aspects of seeming ease of use, perceived usefulness, security and privacy, trust, and social influence in a single framework in examining the attitude of consumer towards digital payment systems.

RESEARCH METHODOLOGY

The research assumes a quantitative research design and convenience sampling method was adopted in order to study the predictors of consumer attitude towards the digital payment systems. The research will be grounded on the primary data gathered using the structured questionnaire created with the assistance of a 5-point Likert scale and 40 items that will measure the aspects. There are about 200 respondents which will guarantee good representation and validity of findings. Online data collection techniques are used which allow greater coverage as well as efficient data collection. In the first step, the reliability analysis will be carried out based on Cronbach's alpha to examine the internal consistency of the measurement scale. It is then followed by Exploratory Factor Analysis (EFA) was analysed to validate the underlying the factor structure and guarantee construct validity.

The appropriateness of data to perform a factor analysis is reported through the key indicators which include KMO bartlett and to measure and the Test of Sphericity given. Regression analysis was employed to examine the suggested hypotheses. The first one is an investigation of how perceived usefulness, perceived ease of use, security and privacy, and social influence impact the trust. The second model assesses how trust influences the attitude of the consumer. The relationships that are significant help in deriving the mediating role of trust. Such an approach to methodology provides the system and empirical assessment of the determinants of consumer attitude to digital payment systems.

OBJECTIVES

- To investigate the effects of perceived usefulness, perceived ease of use, security and privacy, and social influence impact trust towards digital payment systems.
- To examine the influence of trust in consumer attitude to digital payment systems.
- To analyse the mediating position of trust among the chosen determinants and consumer attitude.
- To formulate an integrated model to describe consumer attitude towards on-line payment systems.

HYPOTHESIS

H1: Perceived ease of use, perceived usefulness, social influence, security and privacy have a significantly influence trust in digital payment systems.

H2: Trust that significantly influences the consumer attitude to digital payment interface systems.

H3: Trust mediates the relationship between the technological, social factors and consumer attitude towards digital payment systems.

ANALYSIS

Table 1
Descriptive Analysis

Statistics						
	Gender	Age	Education level	Occupation	Usage Frequency	Annual Income
N	200	200	200	200	200	200
Mean	1.44	2.25	2.65	2.43	2.82	2.63
Std. Deviation	.498	.995	1.160	1.049	.951	1.372

Inference

The descriptive statistics provide the summary of demographics of the respondents who have been incorporated in the study. There are 200 viable responses that have no missing values and this means that we have a complete set of responses, which can be used to conduct further analysis. The average value of the gender (1.44) indicates the comparison of respondents in a somewhat equal proportion. The mean of the age group (mean =2.25) implies that majority of the respondents lie between the mid ranges. The level of education means 2.65 indicating a medium range of educational qualifications. Likewise, occupation (mean = 2.43) and frequency of use (mean = 2.82) show the even distribution of respondents across the board with a slight bias towards their frequent use of digital payment systems. The average amount of income (2.63) indicates average income distribution. The values of the standard deviations reveal that there is a reasonable variation in the data and they are good enough to be analysed through advanced statistical analysis.

Multiple regression analysis

H1: Perceived ease of use, perceived usefulness, social influence, security and privacy have a significant impact on trust of digital payment systems

Table 2
Table showing Multiple Regression Analysis for Factors of Trust in Digital Payment Systems

Descriptive Statistics			
	Mean	Std. Deviation	N
New Trust mean score	3.2081	1.18296	200
New Perceived Ease of Use mean score	3.1633	1.15735	200

New Security & Privacy mean score	3.1417	1.16466	200
New Social Influence mean score	3.0992	1.10845	200
New Perceived Usefulness mean score	3.2292	1.21633	200

Table 3
Correlations

		Trust Mean score	Mean score of Perceived Ease of Use	Security & Privacy Mean score	Social Influence Mean score	Perceived Usefulness Mean _score
Pearson Correlation	Trust Mean score	1.000	.970	.959	.960	.977
	Perceived Ease of Use mean score	.970	1.000	.964	.965	.969
	Security & Privacy mean score	.959	.964	1.000	.966	.961
	Social Influence mean score	.960	.965	.966	1.000	.956
	Perceived Usefulness mean score	.977	.969	.961	.956	1.000
Sig. (1-tailed)	Trust Mean score	.	.000	.000	.000	.000
	Perceived Ease of Use mean score	.000	.	.000	.000	.000
	Security & Privacy mean score	.000	.000	.	.000	.000
	Social Influence mean score	.000	.000	.000	.	.000
	Perceived Usefulness mean score	.000	.000	.000	.000	.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.983[a]	.966	.966	.21935	.966	1398.232	4	195	.000	1.798

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	269.095	4	67.274	1398.232	.000[b]
	Residual	9.382	195	.048		
	Total	278.477	199			

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.035	.046		.746	.456		
	New Perceived Ease of Use mean score	.272	.066	.266	4.119	.000	.042	24.084
	New Security & Privacy mean score	.050	.061	.049	.814	.417	.048	21.008
	New Social Influence mean score	.156	.063	.146	2.484	.014	.050	20.072
	New Perceived Usefulness mean score	.518	.057	.533	9.082	.000	.050	19.943

Inference

The regression analysis model examined the influence of perceived usefulness, perceived ease of use, security and privacy, and social influence on trust in digital payment systems. According to the model summary, the model demonstrates strong the explanatory power is very high, 0.983 is the R value and 0.966 is the R^2. This means that the model fits fairly well (96.6 percent) with the independent variables that were chosen. Durbin Watson is at 1.798 indicating that there are no significant problems in autocorrelations. Other findings of the ANOVA are also useful in confirming that the total regression equation is not insignificant statistically ($F = 1398.232$, $p = 0.001$), which means that the independent variables collectively have a significant effect on overall affects trust significantly.

Regarding the predictors on the individual level, the positive effects of perceived usefulness ($b = 0.533$, $p < 0.001$) and perceived ease of use ($b = 0.266$, $p < 0.001$) were considered highly important to trust. The social influence ($b= 0.146$, $p=0.014$) also had also exhibited a positive and statistically significant effect, despite the fact that comparatively it was weaker. Nevertheless, it was not found that security and privacy ($b = 0.049$, $p = 0.417$) was a found to be strong predictive and significant predictor variable of trust. Although the model fits very well, the diagnostics of collinearity indicate the severe multicollinearity among the independent variables ($VIF > 10$) meaning the independent predictors are closely related. Therefore, coefficients must be interpreted with caution. In general, the results confirm the hypothesis that any of the factors related to key technological and social factors has considerable effects on the occurrence of trust, and perceived usefulness has proven that it is the most important factor.

Regression Model II

Table 4
Showing Multiple Regression Analysis for Determinants of Trust

Model Summary[b]

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.969[a]	.938	.938	.28932	.938	2997.990	1	198	.000	1.861

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	250.950	1	250.950	2997.990	.000[b]
	Residual	16.574	198	.084		
	Total	267.523	199			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.111	.059		1.870	.063		
	New trust mean score	.949	.017	.969	54.754	.000	1.000	1.000

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions	
				(Constant)	New trust mean score
1	1	1.939	1.000	.03	.03
	2	.061	5.616	.97	.97

Inference

The regression model was developed to examine the influence of trust on consumer attitude towards electronic payment platforms. The model summary indicates with the strong explanatory power, with R and R^2 with the values of 0.969 and 0.938 respectively. It is suggesting that the trust explains approximately 93.8% of the variation in consumer attitude. The Anova results further reveals that the overall model is statistically significant (where F = 2997.990, $p<0.001$) by indicating that the trusts play a important role in determining consumer attitude.

The coefficient results show that the trust is having a strong and positive effect on consumer attitude where Beta = 0.969, $p<0.001$. The unstandardized coefficient where B = 0.949, that suggests that a one-unit increase in trust leads to a corresponding increase in consumer attitude. The high t-value 54.754, further supports the strength and reliability. Addition to this, the collinearity diagnostics (VIF = 1.000) confirm that there are no multi-collinearity concerns. The findings clearly establish trust as important determinant influencing consumer attitude towards electronic payments systems or services

Hypothesis Analysis

Variable	Relationship	Hypothesis	Result	Interpretation
IV → Trust	Significant	H1: Perceived ease of use, perceived usefulness, social influence, security and privacy have a significantly influence trust in digital payment systems.	Accepted	Strongest predictor
Trust → Attitude	Significant	H2: Trust that significantly influences the consumer attitude to digital payment interface systems.	Accepted	Core driver
Trust → relationship between determinants and attitude	Partially Significant	H3: Trust mediates the relationship between the technological, social factors and consumer attitude towards digital payment systems.	Partially accepted	There is a moderating effect of trust between the determinants and consumer attitude of digital payment systems.

RESULTS AND DISCUSSION

The findings of the study provide strong evidence regarding the factors influencing consumer attitude towards digital payment platforms. The regression results indicate that perceived usefulness, perceived ease of use, and social influence significantly contribute to the development of trust, whereas security and privacy were not found to have a statistically significant effect.

Perceived usefulness turned out to be the most significant variable among the variables, indicating that consumers tend to trust digital payment platforms more when they believe that they are efficient and useful in the purpose of transactions. The significant role of perceived ease of use highlights the importance of simplicity and user-friendly design in building consumer confidence.

Social influence also shows a positive effect on trust, showing that peer behaviour, trends in society, and exposure to the digital world are important factors affecting user adoption. The insignificant impact of security and privacy implies that the current security measures must have already provided some level of confidence to users.

Furthermore, the analysis confirms that trust has a strong and positive influence on consumer attitude, reinforcing its critical role in digital payment adoption. The findings agree with earlier research that has highlighted the significance of perceived usefulness, ease of use and trust in technology acceptance models.

DISCUSSION ON MEDIATION

The mediating role of trust was examined by analysing the relationship between the independent variables and consumer attitude. The results indicate that perceived usefulness, perceived ease of use, and social influence significantly influence trust, which in turn has a significant effect on consumer attitude. This confirms that trust functions as an significant mediating variable of the model. However, since security and privacy did not demonstrate a significant relationship with trust, the mediation effect is only partial. This suggests that while trust plays a crucial role in transmitting the influence of key determinants, certain factors may also directly affect consumer attitude without the involvement of trust. Overall, the findings establish trust as a central mechanism linking technological and social factors with consumer attitude towards digital payment platforms.

MANAGERIAL IMPLICATIONS

The findings of the study offer valuable insights for financial institutions, fintech companies, and policymakers aiming to enhance the adoption of digital payment platforms. Perceived usefulness proved to be the most powerful factor of trust, which shows that service providers need to concentrate on enhancing efficiency, speed, and the general functionality of digital payment systems. The perceived ease of use also contributes greatly to trust building and so interfaces should be user friendly, easy to navigate and less complex to enable users with different degrees of technological literacy to access it.

The high influence of social influence is an indication that awareness campaigns, peer recommendations and digital literacy programs can be effective in encouraging adoption. The user engagement can be further enhanced by marketing strategies based on social media and influencers. Security and privacy were not found to be significant in this research but are important to ensure that users have confidence. The long-term trust and adoption can only be maintained through continuous investment in safe infrastructure and a clear communication of safety measures.

CONCLUSION

The paper investigated the main factors influencing consumer attitude to digital payment platforms, combining the perceptions of usefulness, perceived ease of use, security and privacy, social influence, and trust into a single model. The results indicate that social influence, perceived ease of use, and the perceived usefulness are the most important factors that impact trust, and security and privacy are not that influential. Perceived usefulness was found to be the most significant predictor of trust among the variables and, again, functional benefits are significant in terms of the perception of the users. The findings also affirm that trust is a critical factor in adopting digital payments as it has a strong and positive impact on consumer attitude. The mediation analysis shows that trust is an important linking mechanism by revealing a partial mediation between the determinants and consumer attitude. Altogether, the research adds to the current body of knowledge by offering a multidimensional approach toward consumer behaviour in digital finance. Its implications of the results have practical implications to improve user trust and increase the usage of digital payment platforms by enhancing usability, functionality, and social engagement.

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A STUDY ON LIVELIHOOD STATUS OF AGRICULTURAL LABOURERS IN THANJAVUR DISTRICT, TAMIL NADU

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ABSTRACT

The study examines the livelihood status of agricultural labourers in Thanjavur District, Tamul Nadu. The study is *based on primary data collected from 400 agricultural labourers. The study employed descriptive research design, simple random sampling is used select samples, and the data are collected through questionnaire, which is distributed directly among the agricultural labourers. Percentage analysis is used to describe the socio-economic profile, while factor analysis identified major factors influencing their livelihood standing, including economic stability, employment conditions, social background, living conditions, health and welfare, and infrastructure facilities. Multiple linear regression analysis showed that economic stability and employment conditions have strong influence on improving the livelihood of agricultural labourers. In addition, one-sample t-test disclosed major challenges such as low wages, seasonal unemployment, and limited access to basic services. Findings indicated that improving income opportunities, employment stability, and access to welfare measures is essential for enhancing the overall socio-economic condition of agricultural labourers.*

KEY WORDS: Livelihood Status, Agricultural Labourers, Economic Stability, Employment Conditions, Challenges.

INTRODUCTION

India is the world's largest and second most populous nation. However, a large portion of the population has been living in an unstable economic environment as a result of the agricultural sector's employment options not keeping up with the rapidly growing population. In financial revenue of economy, agriculture holds significant portion in terms of employment and output. For Indian farmers, it is both a fundamental trade and a form of social heritage and way of life. Leading industries including cotton, sugar, jute, tobacco, and plantations directly depend on agriculture, which is the foundation of the Indian economy (Karpagam and

Mariappan, 2025). Industrial products like tractors and other machinery are essential to the development of agricultural products. The economic and social standing of agricultural workers in rural communities is referred to as their livelihood status. The economic performance indicators consist of income, education level, occupation, family structure, living circumstances, and access to basic amenities are frequently used to measure the means of support of population including agricultural labourers (Mamathalakshmi et al., 2025). A significant portion of the rural workforce consists of agricultural laborers, who mostly depend on wage jobs to survive. The living circumstances of agricultural laborers frequently reflect lack of resources and opportunity for development. The majority of agricultural labor is seasonal in nature and their income earning capacity is also highly limited. During the planting and harvesting seasons, laborers may receive regular pay, but during the off-season, they may experience underemployment or unemployment (Pushpalatha, 2025).

Financial instability, inadequate savings, and reliance on unofficial credit sources are the results of this erratic revenue pattern. They are less likely to change careers if they have limited access to education, which keeps their wage levels low over time. Agricultural laborers are members of the economically disadvantaged segments of society in many rural places (Yoganandham, 2021). The ability of agricultural laborers to make money is constrained by their lack of land ownership and restricted access to productive assets. Inadequate housing conditions, poor sanitation, and restricted access to clean drinking water are common. They are highly exposed to work in sunlight, rain and even bad weather conditions. Furthermore, agriculture is a low income yielding business. The farmers are experiencing much difficulty to preserve crop along with their seasonal labourers (Janaki and Periyasamy, 2020). The standard of living of agricultural laborers is further impacted by health problems and inadequate medical facilities. It is typical for people to migrate to neighboring villages or cities in search of work, which makes family stability more difficult. Various government initiatives have been implemented to enhance the working conditions of farm laborers by providing welfare assistance and job prospects (Kumar and Singh, 2022). However, different regions have different levels of awareness and access to these programs. A precise evaluation of livelihood position aids in determining the challenges encountered by agricultural laborers. Development of suitable policies to raise their income, standard of living, and general quality of life is made easier with the use of such study.

Life of Agricultural Labours: Daily wage work, seasonal employment, and restricted access to steady income sources typically characterize the lives of agricultural laborers in rural locations. The majority of laborers rely on farming tasks that are only available during particular agricultural seasons, such as plowing, sowing, weeding, and harvesting. The agricultural labourers are mostly engaged in paddy, sugarcane, groundnut, vegetables and other season based cultivations. Agricultural labourers are experienced about unemployment or are compelled to look for other low-paying physical labor job to support their family during off-seasons. The capacity of agricultural labourers to preserve money or enhance their living conditions is hampered by this erratic revenue pattern, which also causes financial insecurity (Patel, 2016). Agricultural laborers are frequently come from households with lower incomes, low levels of education, and few other employment options. There is large number of agricultural labourers put in long hours in physically taxing environments, frequently without the necessary facilities or safety precautions. The agricultural labourers are typically dwell in substandard housing with little access to sanitary facilities, potable water, and medical treatment. Due to reliance on unofficial borrowing amid financial hardships, debt is also prevalent. Agricultural laborers are essential to the rural economy and food production system despite these obstacles. Even though their livelihood circumstances accentuate the need for more access to welfare support systems, stable employment prospects, and higher earnings, their contribution is still important. Due to lack of continuous employment, they are highly deprived to access social along with economic benefits. Moreover, the social recognition is low to agricultural labourers while comparing with other segment labours. The limited earnings potential affects them to access several financial benefits (Kumar and Murugesan, 2018).

STATEMENT OF THE PROBLEM

In rural areas, despite making up a sizable share of the agriculture sector, agricultural labourers' livelihood status is yet unjustifiable. Due to their reliance on seasonal agricultural work, the majority of laborers experience unpredictable income and frequent unemployment during off-seasons. The reliance of agricultural labourers on unofficial credit sources, low pay, and unstable employment all contribute to their financial instability. The quality of life of agricultural labourers is further impacted by subpar housing, insufficient medical services, and restricted educational opportunities. Additionally, social and economic disparities limit their access to opportunities and resources. These problems put agricultural laborers in a never-ending cycle of poverty. As a result, it becomes important to pinpoint the main elements, which affects their livelihood standing and realize the obstacles impeding their general advancement and quality of life.

NEED FOR THE STUDY

The need is brought about by the ongoing livelihood difficulties that rural agricultural workers face. The living conditions of agricultural labourers have not significantly improved despite their contribution to agricultural productivity. Agricultural labourers must recognize the elements affecting their income, employment, and living conditions, to properly address their issues. The study aids to identify important problems like low wage, poor housing, inconsistent work, ignorance about assistance, seasonal unemployment, and lack of alternative employment. It also sheds light on how social and economic variables impact their way of life. The findings support stakeholders and policymakers to develop appropriate policies so as to boost employment prospects, increase income stability, and guarantee agricultural laborers have greater access to essential services.

REVIEW OF LITERATURE

The majority of villagers rely on agriculture and related industries for their livelihood, which greatly influences the nature of work in rural areas (Saranyadevi et al., 2025). The majority of rural households are involved in wage-based agricultural labor, farming, or raising livestock. However, because agricultural operations are seasonal, employment prospects are not consistent throughout the year (Raju, 2017). It reduces the economic stability of rural laborers and causes income swings. A sizable portion of the rural population is made up of landless laborers (Pandian and Valarmathi, 2021). They rely solely on daily wage labor in agricultural fields like plowing, seeding, transplanting, weeding, and harvesting because they do not own any land. Depending on the cropping pattern and weather, their employment is erratic (Naik et al., 2019). The agricultural labourers frequently relocate to other towns in quest of alternate employment during hard times, which has an impact on their social and familial lives. Agricultural labourers are mainly daily wage earners and low-income groups encounter comparable difficulties (Dineshkumar, 2017). Typically, their salary is not enough to cover necessities like food, housing, healthcare, and education. The problems of agricultural labourers are exacerbated by long workdays, physically taxing jobs, and unstable employment. If they faced with financial difficulties, many of them turn to unofficial lenders, which increases their debt (Hatai and Singh, 2019). Rural communities frequently have poor working conditions with little access to social protection and adequate facilities. Additionally, their chances to transition into higher-paying jobs are limited by their low levels of education and skill development (Tiwari and Prawal, 2025).

RESEARCH OBJECTIVES

The study is commenced with the following objectives to test.

- To assess the socio-economic profile of agricultural labourers in Poyyundarkottai Village.
- To examine the factors influencing livelihood status of agricultural labourers.
- To measure the different challenges faced by the agricultural labourers.

METHODOLOGY

The study aimed to analyze the livelihood status of agricultural labourers in Thanjavur District, Tamul Nadu. The study is based on descriptive research design, which helps to present a clear picture of livelihood conditions of agricultural labourers. Primary data is collected through structured questionnaire from the respondents. The questionnaire consists of three parts such as, socio-economic profile of agricultural labourers, factors influencing livelihood status of agricultural labourers, and different challenges faced by the agricultural labourers. The respondents are selected on voluntary basis and their responses are recorded carefully for further analysis. The statistical tools such as percentage analysis used to describe socio-economic characteristics, factor analysis to identify underlying dimensions, multiple linear regression to examine the influence of selected factors on livelihood status, and one-sample t-test to assess the significance of major challenges faced by agricultural labourers. Findings intended to provide clear information about the conditions of agricultural labourers and offer suitable measures to improve their income stability, employment security, and quality of life in rural areas.

RESULTS AND DISCUSSIONS

Analysis of Socio-Economic Profile

The socio-economic profile of agricultural labourers such as, gender, age, academic qualification, monthly income, occupation and family size are taken into account for analysis. The results are discussed in Table 1.

Table 1
Socio-Economic Profile

S. No	Socio-Economic Profile	Variables	Frequency	
			N	%
1.	Gender	Male	229	57.25
		Female	171	42.75
2.	Age	Below 30 years	121	30.25
		30 – 45 years	214	53.50
		Above 45 years	65	16.25
3.	Education	Illiterate	127	31.75
		School education	221	55.25
		Diploma/Degree	52	13.00
4.	Monthly Income	Below ₹5,000	137	34.25
		₹5,000 – ₹10,000	145	36.25
		Above ₹10,000	118	29.50
5.	Timing of work	Below 8 hours	138	34.50
		8 – 10 hours	114	28.50
		Above 10 hours	148	37.00
6.	Family Size	Below 3 members	96	24.00
		3 – 5 members	242	60.50
		Above 5 members	62	15.50
Total			400	100.00

Source: Primary Data

Table 1 reveals the socio-economic characteristics of the agricultural labourers. Gender indicates that 57.25% of the agricultural labourers are male, while 42.75% are female.

Age shows that 30.25% of agricultural labourers are below 30 years, 53.50% of agricultural labourers are in the 30–45 years range, and 16.25% of agricultural labourers are above 45 years. Education shows that 31.75% of agricultural labourers are illiterate, 55.25% completed school education, and 13% have either diploma or undergraduate degree. Monthly income data reveals that 34.25% of agricultural labourers earn below ₹5,000, 29.50% of agricultural labourers earn ₹5,000 – ₹10,000, and 29.50% of agricultural labourers earn above ₹10,000. Timing of work shows that 34.50% of agricultural labourers are engaged in below 8 hours, 28.50% are of agricultural labourers engaged in 8 – 10 hours, and 37% are of agricultural labourers engaged in above 10 hours. Finally, family size reveals that 24% of agricultural labourers belong to families with less than 3 members, 60.50% belong to families with 3 – 5 members, and 15.50% are from families with more than 5 members.

Factors Influencing Livelihood Status of Agricultural Labourers

Agricultural labourers' income, standard of living, and general well-being are all impacted by a number of interconnected factors that influence their livelihood standing. Factor analysis is used to determine the main underlying factors in order to investigate these conditions. The Kaiser-Meyer-Olkin (KMO) measure of sample adequacy and Bartlett's test of sphericity are used to verify the data's appropriateness. The data is suitable for factor analysis, as indicated by the KMO value of 0.873 and the chi-square significance value of 0.000. The extracted factors together with the variables that correspond to them are displayed in table 2.

Table 2
Factor Analysis

Factors	Variables	Factor Loadings	Eigen Value	% of Variance
Economic Stability	Level of daily wages	0.842	9.624	22.864
	Monthly income stability	0.831		
	Availability of year-round employment	0.804		
	Alternative income sources	0.786		
	Savings level	0.768		
	Indebtedness	0.751		
	Access to credit	0.777		
	Ownership of productive assets	0.759		
Employment Conditions	Nature of employment	0.826	7.845	16.932
	Working days per month	0.812		
	Type of agricultural work	0.798		
	Wage payment method	0.774		
	Working hours per day	0.761		
	Local job opportunities	0.752		
	Migration for employment	0.768		
Social Background	Educational level	0.818	5.962	12.745
	Social category	0.804		
	Family size	0.789		
	Dependency ratio	0.776		
	Social participation	0.751		
	Gender of labourer	0.763		
Living Conditions	Type of housing	0.807	4.358	8.564
	Drinking water access	0.795		
	Sanitation facilities	0.781		
	Electricity access	0.768		
	Household assets	0.752		

Health and Welfare	Healthcare access Nutritional status Awareness of schemes Utilization of schemes	0.776 0.759 0.748 0.764	3.528	5.874
Infrastructure Facilities	Transportation access Distance to workplace Market facilities availability	0.751 0.768 0.756	2.684	3.642

Source: Primary Data

Table 2 reveals the factors influencing the livelihood status of agricultural labourers, it explains cumulative variance of 70.621% for 33 variables**.** The most dominant factor is economic stability, which contributes 22.864% of the variance with an Eigen value of 9.624. The factor includes variables such as daily wages, income stability, savings, and access to credit, which directly determine the financial position of labourers. The second factor, employment conditions, accounts for 16.932% of the variance with an Eigen value of 7.845. Variables such as working days, type of employment, and migration indicate the nature and consistency of job opportunities available. The third factor, social background, explains 12.745% of the variance with an Eigen value of 5.962. Educational level, family size, and social category influence the social position and opportunities available to labourers. The fourth factor, living conditions, contributes 8.564% of the variance with an Eigen value of 4.358. Basic amenities such as housing, water, sanitation, and electricity reflect their standard of living. The fifth factor, health and welfare, accounts for 5.874% of the variance with an Eigen value of 3.528, it cares on healthcare access and awareness of welfare schemes. Finally, infrastructure facilities explain 3.642% of the variance with an Eigen value of 2.684, it indicates the importance of transport and market access. It is inferred that economic and employment-related factors have a strong influence on the livelihood status of agricultural labourers.

The multiple regression analysis is used to evaluate the influence of the six factors identified through factor analysis, multiple linear regression analysis has been carried out. The six extracted factors are treated as independent variables, and the livelihood status of agricultural labourers is considered as the dependent variable, the results are exhibited in table 3.

Table 3
Multiple Regression Analysis

Independent Variables	Dependent Variable	Un-standardized Coefficients		Standardized Coefficients	t value	Sig.
		β	Std. Error			
Constant	Livelihood Status of Agricultural Labourers	-0.592	0.614		-1.184	0.004
Economic Stability		0.432	0.071	0.448	6.912	0.003
Employment Conditions		0.256	0.082	0.221	4.126	0.001
Social Background		0.214	0.076	0.198	3.874	0.003
Living Conditions		0.187	0.058	0.176	3.652	0.004
Health and Welfare		0.149	0.064	0.138	3.818	0.003
Infrastructure Facilities		0.118	0.049	0.109	3.604	0.004

	R	0.812
	R^2	0.659
	Adjusted R^2	0.571
	F Value	30.284

Source: Primary Data

Table 3 presents the results of multiple linear regression analysis, it shows the value of R^2 (0.659) shows that 65.9% of the variation in livelihood status is explained through the selected factors, while the Adjusted R^2 (0.571) confirms the overall fit of the model. Among the variables, economic stability records the highest beta coefficient (0.432) with a t-value of 6.912, it confirms strong influence on the livelihood status at 1% significance level. It shows that factors such as income level, savings, access to credit, and asset ownership largely determine the economic position of agricultural labourers. The second important factor is employment conditions, with beta value of 0.256 and t-value of 4.126, it stresses the importance of regular employment, working days, and migration in shaping income security. Social background also shows a notable influence with a beta value of 0.214, it indicates that education, family structure, and social category affect the living conditions of labourers. Further, living conditions (β = 0.187) and health and welfare (β = 0.149) are statistically significant, it proves the importance of housing, sanitation, healthcare access, and awareness of welfare schemes. Infrastructure facilities (β = 0.118) also contribute to livelihood improvement through better transport and market access. The F-value confirms that the overall model is statistically significant. It is inferred that economic and employment-related aspects have strong effect on improving the livelihood status of agricultural labourers.

Challenges of Agricultural Labourers

Agricultural labourers experience several difficulties to maintain stable livelihoods. These challenges were identified during the pilot study; the respondents are asked to rate each issue on a five-point scale ranging from strongly agree to strongly disagree. To examine the significance of these challenges, a one-sample t-test is applied with a test value of 3. The results are presented in Table 4.

Table 4
One-Sample T-Test

Variables	Test Value = 3					
	t	df	Sig.	Mean difference	95% Confidence Interval of the difference	
					Lower	Upper
Lack of alternative employment	14.218	399	.000	0.998	0.876	1.142
High indebtedness	13.507	399	.000	0.954	0.842	1.098
Poor sanitation facilities	8.952	399	.000	0.818	0.702	0.935
Seasonal unemployment	15.376	399	.000	1.046	0.938	1.187
Inadequate healthcare facilities	11.925	399	.000	0.906	0.798	1.045
Poor housing conditions	12.864	399	.000	0.921	0.803	1.064
Limited access to welfare schemes	9.875	399	.000	0.842	0.731	0.964
Low wage levels	16.842	399	.000	1.082	0.964	1.214
Transportation difficulties	7.986	399	.000	0.786	0.674	0.902
Lack of educational opportunities	10.748	399	.000	0.874	0.765	0.998

Source: Primary Data

Table 4 presents the results of the one-sample t-test with a test value of 3, it reveals the perceived severity of challenges faced by agricultural labourers. All the variables show significance at the 1% level, it confirms that these challenges are highly relevant. The low wage levels rank first with the highest mean difference (1.082) and t-value (16.842), it discloses that inadequate income is the most critical problem affecting agricultural labourers. Seasonal unemployment follows closely with a mean difference of 1.046, it shows the impact of irregular job opportunities on their livelihood. Lack of alternative employment and high indebtedness also record high mean differences (0.998 and 0.954), it proves limited income diversification and financial burden. Poor housing conditions and inadequate healthcare facilities further affect their quality of life, with mean differences of 0.921 and 0.906 respectively. Challenges such as lack of educational opportunities, limited access to welfare schemes, and poor sanitation facilities show moderate influence, indicating gaps in social and public service support. Transportation difficulties record the lowest mean difference (0.786), but still remain significant, it highlights issues related to accessibility. It is inferred that economic and employment-related challenges dominate the living conditions of agricultural labourers, while social and infrastructural issues also contribute to their overall socio-economic status.

CONCLUSION

The study evidently discloses the examination of livelihood condition of agricultural labourers. The socio-economic profile of agricultural labourers shows that most of the agricultural labourers are male, belong to middle age group, they are qualified with moderate education, their income is limited, engaged in extended working hours and limited income stability. The factor analysis identified six major dimensions influencing livelihood status, namely economic stability, employment conditions, social background, living conditions, health and welfare, and infrastructure facilities. Among these, economic stability emerges as the most dominant factor, it reveals that income level, wage security, savings, and access to credit strongly shape the living standards of agricultural labourers. Employment conditions also play a major role, it divulges the importance of regular work availability and income continuity in rural areas.

The multiple linear regression analysis further confirms the significance of these factors. The model explains a considerable proportion of variation in livelihood status, it shows that all six factors significantly contribute to the dependent variable. Economic stability records the highest influence, followed by employment conditions, social background, and living conditions. Health and welfare, along with infrastructure facilities, also show meaningful but comparatively lower effects. It clearly designates that economic and employment-related aspects are the primary drivers of socio-economic improvement among agricultural labourers. The one-sample t-test results disclose the major challenges faced by agricultural labourers. Low wage levels, seasonal unemployment, and lack of alternative employment opportunities are identified as the most severe problems. High indebtedness, poor housing conditions, inadequate healthcare, and limited access to welfare schemes further worsen their living conditions. All variables are found to be statistically significant, it proves that these challenges are widely experienced and strongly perceived among agricultural labourers.

PRACTICAL IMPLICATIONS

The government should take proper care on agricultural labourers, the care can be in the form of free ration, medical insurance, free higher education to their kids, and funding support to purchase required implements. In addition to that the development of agriculture through farm mechanization efforts can significantly reduce the harmful use of physical labour to carryout regular work. The agriculture universities and educational institutions should make proper solution to transform the hard working nature of agriculture labourers towards easy working. The government should make monthly pension scheme to both farmers and farm labours so as to fulfill the growing need for food products from agricultural sector.

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A STUDY ON MARKETING CONSTRAINTS FACED BY BANANA GROWERS IN ERODE DISTRICT, TAMIL NADU

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ABSTRACT

Banana is one of the most imperative fruit crops cultivated in India and serves as a major source of income and employment for millions of farmers. India ranks among the world's largest producers of bananas, contributing significantly to both domestic consumption and agricultural economic growth. The crop is valued for its nutritional benefits, year-round availability, and wide market demand. In Tamil Nadu, banana cultivation plays a crucial role in the agricultural sector, providing livelihood opportunities to a large number of farming households.Erode District is one of the prominent banana-producing regions in Tamil Nadu due to its favorable climatic conditions, fertile soil and well-developed irrigation facilities. Farmers in the district cultivate different varieties of bananas and supply their produce to local, regional, and interstate markets. Objectives of the study are (i) to present the socio-economic profile of banana growers in Erode District, (ii) to identify the major marketing constraints faced by banana growers, (iii) to examine the factors influencing the marketing of bananas. (Chi square) and (iv) to assess the impact of marketing constraints on the income of banana growers and (v) to suggest suitable measures for improving the marketing efficiency of banana growers in Erode District.The researcher conducted the study in Erode District, used convenient sampling method for data collection, the data has been collected at farmers banana market, forms and important place where the banana growers meet and share their knowledge. The researcher printed questionnaire in Tamil language and districted for data collection, distributed 275 questionnaires out of them 264 could be collected back for analysis. The researcher have taken three tools, i.e. percentage analysis to present socio economic profile of the respondents, chi square used to find the factors that include the marketing constrains and correlation used to find the relationship between socio marketing constrains and income of banana growers.

Key Words: Banana Growers, Marketing Constrains, Income of Banana Growers and Profitability and Sustainability of Farming Operations.

INTRODUCTION

Banana is one of the most imperative fruit crops cultivated in India and serves as a major source of income and employment for millions of farmers. India ranks among the world's largest producers of bananas, contributing significantly to both domestic consumption and agricultural economic growth. The crop is valued for its nutritional benefits, year-round availability, and wide market demand. In Tamil Nadu, banana cultivation plays a crucial role in the agricultural sector, providing livelihood opportunities to a large number of farming households.Erode District is one of the prominent banana-producing regions in Tamil Nadu due to its favorable climatic conditions, fertile soil and well-developed irrigation facilities. Farmers in the district cultivate different varieties of bananas and supply their produce to local, regional, and interstate markets. The banana industry contributes substantially to rural income generation and economic development in the district.Despite the importance of banana cultivation, growers face numerous challenges in marketing their produce. Marketing is a critical component that determines the profitability and sustainability of farming operations. Banana growers often encounter problems such as price fluctuations, the involvement of multiple intermediaries, inadequate storage facilities, transportation difficulties, lack of market information, high marketing costs and post-harvest losses. Since bananas are highly perishable, delays in transportation and marketing can significantly affect product quality and farmers' earnings.

The increasing competition in agricultural markets, changing consumer preferences, and fluctuations in demand further intensify the marketing challenges faced by banana growers. These constraints often reduce farmers' bargaining power and limit their ability to secure fair prices for their produce. Understanding these marketing constraints is essential for developing effective strategies and policy interventions aimed at improving market efficiency and enhancing farmers' income.The present study titled “A Study on Marketing Constraints Faced by Banana Growers in Erode District, Tamil Nadu” seeks to examine the major marketing problems experienced by banana farmers and identify measures that can improve the marketing system.

REVIEW OF LITERATURE

Nallaraju and Pushpa (2018) examined the socio-economic profile and production constraints of banana growers in Thoothukudi district, Tamil Nadu. The study identified labour shortage, inadequate irrigation facilities, high labour wages, wind damage, and fluctuating market prices as the major constraints. Market price instability significantly reduced farmers' profitability and bargaining power. The authors recommended strengthening extension services and providing effective marketing support to improve farmers' income. Sakthiganesh and Dineshkumar (2022) studied the production and marketing constraints faced by banana growers in Tiruchirappalli district. The research found that commission agents largely influenced price determination, while transportation costs, poor storage facilities, and post-harvest losses reduced marketing efficiency. Farmers also experienced inadequate market information and unstable prices. The study suggested strengthening regulated markets and improving marketing infrastructure. Velavan (2024) analysed the growth and marketing of banana cultivation in Tamil Nadu. The study revealed that inefficient marketing channels, post-harvest losses, inadequate cold storage, and weak stakeholder coordination affected marketing performance. Farmers received a lower share of the consumer price because of multiple intermediaries. The author recommended strengthening value chains and promoting export-oriented marketing.

Dineshkumar et al. (2024) investigated the constraints perceived by banana growers in Theni district. The study highlighted lack of technical guidance, labour scarcity, pest incidence, and inadequate storage as major problems. Marketing-related issues included poor market information and insufficient market-led extension services. The researchers recommended value addition, better storage facilities, and stronger farmer extension support. Vanetha (2025) assessed the socio-economic characteristics and constraints faced by banana growers in Theni district. The study observed that small farmers suffered from poor bargaining power, dependence on intermediaries, labour shortages, and inadequate market facilities. High labour wages and unstable prices significantly affected profitability. The study suggested government subsidies, better market infrastructure, and improved institutional support. Ganesan and Sridhar (2020)analysed the marketing pattern of banana cultivators in Tiruchirappalli district. The study found that cooperative marketing, awareness programmes, and better training could improve marketing efficiency. Farmers depended heavily on local traders due to the absence of organized marketing systems. The authors emphasized strengthening cooperative marketing institutions to increase farmers' income. Shanjeevika et al. (2022) evaluated the constraints encountered by banana growers in adopting improved water management practices. The study reported that labour scarcity, financial limitations, inadequate technical knowledge, and poor institutional support indirectly affected productivity and marketing outcomes. Efficient water management was found to improve both yield and marketable surplus. The authors recommended capacity-building programmes and government assistance.

Kannan and Pohit (2021) investigated agricultural marketing constraints affecting crop profitability in India. The study identified poor market infrastructure, weak producer organizations, price instability, and inefficient market linkages as major barriers. The authors highlighted the importance of Farmer Producer Organizations (FPOs) and improved market connectivity. Their findings are highly relevant for banana marketing systems. An initiative by the ICAR–National Research Centre for Banana (NRCB) proposed satellite-based monitoring of banana cultivation to reduce supply gluts and price crashes in Tamil Nadu. The programme aims to provide accurate cultivation data for better production planning and market forecasting. Such technology can help stabilize prices and reduce marketing risks for banana growers. This demonstrates the role of digital technologies in improving banana marketing. A collaborative initiative by APEDA and the Horticulture Department (2025) promoted banana exports by improving quality standards, packaging, and farmer awareness. The programme focused on creating better export opportunities and expanding market access for growers. Improved institutional support and export promotion were expected to enhance farmers' income and reduce dependence on local markets. The initiative highlights the importance of organized marketing systems.

Sangeetha and Mothilal Nehru (2010) investigated the constraints in commercial banana cultivation in Kerala. The study revealed that high transportation charges, inadequate marketing facilities, labour scarcity, price fluctuations, and limited credit availability were the major economic constraints. Farmers experienced difficulty in obtaining remunerative prices due to poor market linkages. The authors suggested promoting farmer groups and strengthening market infrastructure to improve marketing efficiency. Patil and Singh (2026) examined marketing efficiency and price spread among banana growers in Maharashtra. The study found that transportation costs, price fluctuations, and labour shortages significantly reduced farmers' income. Direct marketing channels provided the highest producer share, while export channels had the greatest price spread. The researchers recommended Farmer Producer Organizations (FPOs), grading, storage, and collective marketing to improve profitability.

Ma et al. (2018) developed a market price forecasting system for agricultural produce in India. The research demonstrated that timely price information enables farmers to select profitable markets and appropriate selling periods. The system reduced the uncertainty caused by market price fluctuations and improved farmers' decision-making. The study emphasized the role of digital technology in agricultural marketing.

Kannan and Pohit (2021) analysed agricultural marketing constraints affecting crop profitability in India. They identified poor market infrastructure, weak farmer organizations, unstable prices, and inefficient market linkages as major barriers. The study recommended strengthening Farmer Producer Organizations and improving agricultural market connectivity. These findings are applicable to banana growers facing marketing challenges. Chen and colleagues (2017) studied the role of affordable cold storage and market forecasting in reducing post-harvest losses. The research found that inadequate storage facilities force farmers to sell bananas immediately after harvest at lower prices. Improved cold storage and reliable market information increased marketing efficiency and farmer income. The authors recommended integrating technology into agricultural supply chains.

A joint initiative by APEDA and the Horticulture Department (2025) focused on promoting banana exports through quality improvement, packaging, and farmer awareness. The programme encouraged growers to adopt export standards and access international markets. Better institutional support and export promotion were expected to reduce dependence on local traders and increase farm income.

ICAR–National Research Centre for Banana (2025) introduced satellite-based monitoring of banana cultivation to estimate production and avoid market gluts. Accurate production forecasting helps policymakers and traders plan marketing activities effectively. The initiative is expected to stabilize prices and reduce marketing risks faced by banana growers. The study highlights the importance of digital agriculture in marketing management.

Times of India Agricultural Report (2025) A report highlighted that banana growers experienced severe financial losses due to drastic price crashes caused by oversupply and the absence of organized marketing systems. Farmers received very low farm-gate prices despite higher retail prices. The report stressed the importance of government intervention, regulated markets, and improved market intelligence. These issues closely resemble the marketing constraints faced by banana growers in Tamil Nadu.

Banana Export Crisis Study (2026) A study on the impact of export disruptions showed that banana growers suffered heavy losses because international market demand declined, leading to domestic oversupply. Poor storage facilities and high perishability further aggravated farmers' financial difficulties. The researchers suggested diversifying export destinations and improving domestic price support mechanisms. Strengthening supply chain resilience was identified as a priority.

Dineshkumar et al. (2024) reported that lack of technical guidance, labour shortages, pest incidence, and inadequate storage facilities constrained banana cultivation in Theni district. The study also found that poor market information and weak extension support reduced farmers' marketing efficiency. The authors recommended market-led extension services, value addition, and improved storage infrastructure to enhance farmer income. Renuka et al. (2024) examined the economics of banana production and marketing in Tiruchirappalli district, Tamil Nadu. The study found that banana cultivation generated satisfactory returns, but unstable market prices, high transportation costs, and inadequate institutional support reduced farmers' net income. The authors observed that weak marketing infrastructure and dependence on intermediaries negatively affected marketing efficiency. They recommended strengthening regulated markets, improving transportation facilities, and providing better institutional assistance to banana growers. Patil and Singh (2026) analyzed marketing efficiency, price spread, and marketing constraints among banana growers in Maharashtra using Garrett Ranking and marketing efficiency indices. The study revealed that price fluctuation, labour shortage, transportation costs, and inadequate storage facilities were the major marketing constraints. Farmers using direct marketing channels received a higher producer share than those selling through intermediaries. The researchers recommended collective marketing through Farmer Producer Organizations (FPOs), grading, storage, and direct marketing to improve profitability.

Sangeetha and Mothilal Nehru (2010) investigated the constraints in commercial banana cultivation in Kerala. The study reported that inadequate marketing facilities, high transportation charges, price fluctuations, labour scarcity, and limited access to institutional credit were the principal economic constraints affecting banana farmers. The authors emphasized that group farming, farmer cooperatives, and stronger market linkages could substantially improve marketing performance and farm income. Dineshkumar et al. (2024) assessed the constraints perceived by banana growers in Theni district, Tamil Nadu. The research identified lack of technical guidance, labour scarcity, pest incidence, poor storage facilities, and weak market information systems as the major challenges. The study also highlighted the need for market-led extension services, value addition, and affordable storage technologies to reduce post-harvest losses and improve farmers' marketing opportunities. Nallaraju and Pushpa (2018) studied the socio-economic profile and constraints of banana growers in Thoothukudi district, Tamil Nadu. The findings showed that labour shortages, inadequate irrigation facilities, high labour wages, wind damage, and fluctuations in market prices were the primary constraints affecting banana cultivation and marketing. The researchers concluded that improved extension services, better market infrastructure, and effective government support would help increase farmers' income and strengthen banana marketing systems.

RESEARCH GAP

The existing literature has extensively examined the production and marketing constraints faced by banana growers in various districts of Tamil Nadu, including Thoothukudi, Tiruchirappalli, and Theni, as well as in other states such as Kerala and Maharashtra. These studies primarily focused on issues such as price fluctuations, dependence on intermediaries, inadequate storage facilities, transportation problems, labour shortages, post-harvest losses, and weak market infrastructure. Recent research has also highlighted the importance of digital market information systems, Farmer Producer Organizations (FPOs), cold storage facilities, and export promotion in improving banana marketing efficiency.

However, despite the significance of Erode District as one of the major banana-producing regions in Tamil Nadu, there is a noticeable lack of empirical studies specifically investigating the marketing constraints faced by banana growers in this district. Most previous studies have concentrated on production-related issues or have been conducted in other geographical locations, making it difficult to generalize their findings to Erode. Furthermore, limited attention has been given to understanding the influence of market information accessibility, bargaining power, transportation efficiency, institutional support, digital marketing adoption, and marketing channel selection on the marketing performance of banana growers in the district.

Therefore, the present study seeks to bridge this research gap by providing a comprehensive analysis of the marketing constraints experienced by banana growers in Erode District, Tamil Nadu. The study will identify the key factors affecting the marketing of bananas, evaluate the effectiveness of existing marketing practices and institutional support systems, and propose practical recommendations to enhance marketing efficiency, improve farmers' income, and strengthen the sustainability of the banana value chain in the region.

STATEMENT OF PROBLEM

Banana is one of the most important commercial fruit crops cultivated in Erode District, Tamil Nadu, and serves as a major source of income for farmers. Despite its economic significance, banana growers face numerous marketing constraints that adversely affect their profitability and livelihood. The marketing of bananas is particularly challenging due to the perishable nature of the crop, which requires timely transportation, storage and sale.Farmers often encounter problems such as price fluctuations, high transportation costs, inadequate storage facilities, dependence on intermediaries, lack of market intelligence, grading and packaging issues and post-harvest losses. These challenges reduce the bargaining power of growers and result in lower returns from their produce. The market uncertainties and the absence of efficient marketing channels create difficulties for farmers in obtaining fair prices.

There are various government initiatives and agricultural marketing institutions exist to support farmers, many banana growers continue to experience marketing inefficiencies. It is necessary to identify and analyze the marketing constraints faced by banana growers in Erode District. Understanding these constraints will help in formulating appropriate strategies and policy measures to improve the marketing system and enhance the income and welfare of banana farmers.

NEED OF THE STUDY

Agriculture continues to be a vital sector of the Indian economy and banana cultivation plays a significant role in the agricultural development of Erode District. The benefits of increased production can be realized only when farmers have access to efficient marketing systems. Marketing constraints often reduce the income of banana growers and discourage them from expanding their cultivation activities.The need for this study arises from the necessity to understand the specific marketing problems faced by banana growers and their impact on farm profitability.

By identifying the major constraints in the marketing process, the study can help policymakers and agricultural agencies design effective interventions to improve market access, reduce post-harvest losses, strengthen market infrastructure, and enhance farmers' bargaining power.The findings will contribute to the sustainable development of banana cultivation and improve the socio-economic conditions of banana growers in Erode District.

OBJECTIVES OF THE STUDY

1. To present the socio-economic profile of banana growers in Erode District.
2. To identify the major marketing constraints faced by banana growers.
3. To examine the factors influencing the marketing of bananas. (Chi square)
4. To assess the impact of marketing constraints on the income of banana growers. (correlation)
5. To suggest suitable measures for improving the marketing efficiency of banana growers in Erode District.

HYPOTHESIS

H_{01}:There is no significant relationship in marketing constraints among banana growers and income of the banana growers.

SAMPLING DESIGN

The present study conducted in Erode District, the banana cultivation and marketing in Erode District presented in introduction part. The researcher conducted the study in Erode District, used convenient sampling method for data collection, the data has been collected at farmers banana market, forms and important place where the banana growers meet and share their knowledge.

The researcher printed questionnaire in Tamil language and districted for data collection, distributed 275 questionnaires out of them 264 could be collected back for analysis.

TOOLS AND TECHNIQUES

The researcher have taken three tools, i.e. percentage analysis to present socio economic profile of the respondents, chi square used to find the factors that include the marketing constrains and correlation used to find the relationship between socio marketing constrains and income of banana growers.

ANALYSIS AND INTERPRETATION

Percentage analysis

The following variables are taken by the researcher for socio economic profile of the respondents. i.e. (i) Nature of the family, (ii) Number of members and size of family, (iii) Age–wise classification, (iv) Educational level, (v) Annual Family Income and (vi) Family members involved in Agriculture.

Table 1
Nature of the family

Sl. No.	Nature of family	Number of farmers	Percentage
1	Nuclear Family	93	35.23
2	Joint family	171	64.77
	Total	**264**	**100**

Source: Primary Data

The above table indicates the nature of the family. Out of 264 sample respondents, 93 (35.33%) are belongs to nuclear family and the remaining 171 (64.77%) respondents are belongs to joint family. Majority (64.77%) of the respondents are nuclear families.

Number of Members and Size of Family

The respondents were divided into three groups based on the size of their families: small families (those with fewer than 3 members) medium families (those with 3 - 6 members) and large families (those with more than 6 members), as shown below.

Table 2
Number of members and size of family

Sl. No.	Family size	Number of farmers	Percentage
1	Small	50	18.94
2	Medium	116	43.94
3	Large	98	37.12
	Total	**264**	**100**

Source: Primary Data

The above table shows the number of members and size of the family. Out of total 264 sample respondents, 50 (18.94%) respondents are belong to small family, 116 (43.94%) respondents are belong to medium family and remaining 98 (37.12%) respondents are belong to large family. Majority (43.94%) of the respondents are belongs to medium size family.

Age–wise Classification

Age is a measure of a person's maturity, therefore it becomes more significant, and the response may vary based on the age. As shown below, the respondents were divided into three groups: low (under 40 years old), middle (40 – 60 years old), and high (above 60 years old).

Table 3
Age–wise classification

Sl. No.	Age wise classification	Number of farmers	Percentage
1	Up to 40 years	53	20.08
2	41 to 60 years	116	43.94

3	Above 60 years	95	35.98
	Total	**264**	**100**

Source: Primary Data

The above table shows the age wise classification of farmers. Out of the total 264 respondents, 53 (20.08%) respondents are belong to low age group of below 40 years. 116 (43.94%) respondents are belongs to 41 years to 60 years and remaining 95 (35.98%) respondents are belongs to above 60 years old. Majority (43.94%) of the respondents are belongs to 41 years to 60 years.

Educational Level

Table 4
Educational level

Sl. No.	Educational level	Number of farmers	Percentage
1	Primary	76	28.79
2	Elementary	63	23.86
3	High school level	77	29.17
4	Degree level	48	18.18
	Total	**264**	**100**

Source: Primary Data

The above table shows the educational level of the sample respondent farmers. Out of 264 sample respondents, 76 (28.79%) respondent's educational level is primary school level. 63 (23.86%) respondent's educational level is elementary level. 77 (29.17%) respondent's educational level is high school level and remaining 48 (18.18%) respondent's educational level is degree. Majority (29.17%) of the respondents are studied high school level.

Annual Family Income

Table 5
Annual Family Income

Sl. No.	Annual family income	Number of farmers	Percentage
1	Up to Rs. 2,50,000	78	29.55
2	Rs. 2,50,001 to Rs. 5,00,000	129	48.86
3	Above Rs. 5,00,000	57	21.59
	Total	**264**	**100**

Source: Primary Data

The above table represents the annual family income of the farmers. Out of 264 sample farmers, 78 (29.55%) respondent's annual family income from agriculture is up to Rs. 2,50,000. 129 (48.86%) respondent's annual family income from agriculture is Rs. 2,50,000 to Rs. 5,00,000 and remaining 57 (21.59%) respondent's annual family income from agriculture is above Rs. 5,00,000. Majority (48.86%) of the respondents annual family income from agriculture is Rs. 2,50,001 to Rs. 5,00,000.

Number of Family Members Involved in Agriculture

The number of family members that work in agriculture influences how much attention is paid to the crops that are grown, and they also offer the farmer moral support when they are out in the field. The following lists the number of family members working in agriculture by farm size and group.

Table 6
Family members involved in Agriculture

Sl. No.	Members involved	Number of farmers	Percentage
1	One	37	14.02
2	Two	133	50.38
3	Above two	94	35.60
	Total	**264**	**100**

Source: Primary Data

The above table shows the number of family members involved in agriculture. Out of 264 sample respondent's farmers, 37 (14.02%) respondents having one member involved in agriculture. 133 (50.38%) respondent's two family members are involved in agriculture and remaining 94 (35.60%) respondent's having more than two family members are involving in agriculture. Majority (50.38%) of the respondents family members are involving in agriculture are two members.

Marketing Constraints of Banana Growers

The researcher taken ten variables of marketing constrains of banana. i.e. (i) Price fluctuations, (ii) High transportation costs, (iii) Inadequate storage/cold storage facilities, (iv) Post-harvest losses, (v) Dependence on middlemen/intermediaries, (vi) Lack of timely market information, (vii) Poor market infrastructure, (viii) Grading and packaging problems and (ix) Delayed payments from traders and (x) Limited bargaining power of farmers.

The researcher used likert five point scale to find the level of marketing constrains of banana growers. The following table shows the level of constrains.

Table 7
Level of marketing constrains

Sl. No.	Level of marketing constrains	Number of farmers	Percentage
1	Low	37	14.02
2	Medium	73	27.65
3	High	154	58.33
	Total	**264**	**100**
Mean : 41.832. SD : 2.338, Minimum 18, Maximum 46			

Source: Computed data

Likert five point scale used to find the level of marketing constrains, calculated the mean, SD, total score converted into 3 levels, i.e. low, medium and high. Out of 264 sample respondents, 37 (14.02%) respondents felt low level of marketing constrains, 73 (27.65%) respondents felt medium level of marketing constrains and remaining 154 (58.33%) respondents are felt high level of marketing constrains. Majority (58.33%) of the respondents are felt high level of marketing constrains.

Chi Square

Table 8
Chi square test – Factors influencing the marketing of Banana

Sl. No.	Socio economic factors	Chi Square value	DF	P - value	Result
1	Nature of the family	18.739	2	0.001	Significant
2	Number of members and size of family	24.378	4	0.001	Significant
3	Age–wise classification	20.781	4	0.001	Significant
4	Educational level	17.653	6	0.001	Significant
5	Annual Family Income	15.378	2	0.001	Significant
6	Family members involved in Agriculture	14.306	3	0.001	Significant

Source : Computed data

The above table presented the chi square test output, nature of family (0.001), number of members and size of family (0.001), age wise classification (0.001), educational level (0.001), annual family income (0.001) and family members involved in agriculture (0.001) are significantly influence the level of factors influencing the marketing of banana at 5% significant level.

Correlation

Table 9
Relationship between impact of marketing constrains and income of banana growers

		Marketing constrains	Income of banana growers
Marketing constrains	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	264	
Income of banana growers	Pearson Correlation	-0.873**	1
	Sig. (2-tailed)	.001	
	N	264	264

**. Correlation is significant at the 0.01 level (2-tailed).

There is negative relationship between the marketing constrains of banana growers and income of banana growers. If the marketing constrains reduce their income will increase, the same time, if the marketing constrains increase their income automatically reduce. There is negative and significant relationship between marketing constrains (-0.873) and income of banana growers at 1% significant level. Hence, the null hypothesis has been accepted.

FINDINGS

The following are the findings of the study.

1. Majority (64.77%) of the respondents are nuclear families.
2. Majority (43.94%) of the respondents are belongs to medium size family.
3. Majority (43.94%) of the respondents are belongs to 41 years to 60 years.
4. Majority (29.17%) of the respondents are studied high school level.
5. Majority (48.86%) of the respondents annual family income from agriculture is Rs. 2,50,001 to Rs. 5,00,000.

6. Majority (50.38%) of the respondents family members are involving in agriculture are two members.
7. Majority (58.33%) of the respondents are felt high level of marketing constrains.
8. There is negative and significant relationship between marketing constrains (-0.873) and income of banana growers at 1% significant level.

SUGGESTIONS

The following are the suggestions of the study.

1. The government and agricultural marketing authorities should strengthen regulated markets in Erode District to ensure transparent pricing mechanisms and enable banana growers to receive fair prices for their produce. Improved market regulation can reduce exploitation by intermediaries and increase farmers' income.
2. Farmer Producer Organizations (FPOs) and cooperative marketing societies should be encouraged and strengthened to facilitate collective marketing. This will enhance the bargaining power of banana growers and help them negotiate better prices with traders and wholesalers.
3. Adequate cold storage and warehousing facilities should be established in major banana-producing areas to reduce post-harvest losses and allow farmers to store their produce during periods of low market prices.
4. The government should improve transportation infrastructure, including rural roads and logistics facilities, to ensure the quick and efficient movement of bananas from farms to markets, thereby reducing transportation costs and spoilage.
5. Timely and accurate market information regarding prices, demand trends and market opportunities should be provided through mobile applications, agricultural extension services and digital platforms to help farmers make informed marketing decisions.
6. Training programs on scientific post-harvest management, grading, packaging and value addition should be organized regularly to improve the quality and marketability of bananas and increase farmers' returns.
7. Direct marketing channels such as farmers' markets, retail outlets and online marketing platforms should be promoted to reduce the dependence of growers on middlemen and increase their share of the consumer price.
8. Financial assistance and easy access to institutional credit should be provided to banana growers for marketing-related activities such as storage, transportation, packaging and value-addition initiatives.
9. Government agencies should encourage the establishment of banana processing units in Erode District to create value-added products such as banana chips, banana powder and banana puree, thereby increasing market opportunities and reducing wastage.
10. Regular awareness programs should be conducted to educate banana growers about modern marketing practices, government support schemes, crop insurance, and digital marketing tools, enabling them to improve their marketing efficiency and overall profitability.

CONCLUSION

Banana cultivation plays a vital role in the agricultural economy of Erode District, providing income and employment opportunities to a large number of farmers. The study reveals that banana growers face several marketing constraints that adversely affect their profitability and overall economic well-being. Major challenges such as price fluctuations, high transportation costs, inadequate storage facilities, post-harvest losses, lack of timely market information and dependence on intermediaries continue to hinder the efficient marketing of banana produce.The findings indicate that these constraints significantly reduce the income of banana growers by increasing marketing costs and limiting their access to profitable markets. Strengthening Farmer Producer Organizations (FPOs), promoting direct marketing channels, improving storage and transportation facilities and providing timely market information can help farmers obtain better returns for their produce. The government support in the form of financial assistance, marketing infrastructure development, training programs and digital marketing initiatives can contribute significantly to overcoming existing marketing challenges. Addressing these constraints will not only enhance the income and livelihood of banana growers but also contribute to the sustainable development of the banana sector in Erode District.

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A STUDY ON FINANCIAL LITERACY AND INVESTMENT BEHAVIOUR AMONG YOUTH

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ABSTRACT

Financial literacy plays a vital role in shaping the financial decision-making and investment behavior of individuals, particularly among youth. In the context of a rapidly evolving financial environment characterized by digital transactions, diverse investment opportunities, and complex financial products, the need for financial awareness has become increasingly important. This study aims to examine the level of financial literacy among youth and analyze its impact on their investment behavior. The research is based on both primary and secondary data. Primary data was collected from 130 respondents through a structured questionnaire covering aspects such as financial knowledge, awareness of financial instruments, investment preferences, and factors influencing investment decisions. Secondary data was gathered from various reports, journals, and publications to support the analysis. Statistical tools such as percentage analysis, Chi-square test, and ANOVA were employed to analyze the data. The findings reveal that most respondents possess a moderate level of financial literacy, with a noticeable gap in advanced financial knowledge. Traditional investment options such as bank deposits continue to dominate, although there is a gradual shift toward market-linked instruments like mutual funds and stocks. The Chi-square test indicates a significant association between financial literacy and investment behavior, while ANOVA results show significant differences in financial literacy across age groups. The study concludes that financial literacy significantly influences investment decisions and behavior among youth. Enhancing financial education and awareness can promote informed investment practices, improve financial inclusion, and contribute to long-term economic stability.

KEY WORDS: Financial Literacy, Investment Behaviour, Youth, Financial Awareness, Investment Decision Making

INTRODUCTION

Financial literacy has emerged as a critical component in shaping the economic well-being of individuals, particularly among youth. In today's rapidly evolving financial landscape, characterized by digital transactions, diverse investment options, and complex financial products, the ability to make informed financial decisions is essential. Financial literacy refers to the knowledge and understanding of financial concepts such as savings, investments, risk management, and financial planning, which enable individuals to make effective decisions regarding their financial resources.

Youth represent a significant segment of the population and play a vital role in the economic development of a country. Their financial behavior, especially in terms of saving and investing, has long-term implications for both personal financial stability and overall economic growth. However, despite increased access to financial services and information, many young individuals lack adequate financial knowledge, leading to poor investment decisions, low participation in financial markets, and vulnerability to financial risks.

The growing influence of digital financial platforms, such as online trading and mobile banking, has further emphasized the need for financial literacy among youth. While these platforms provide opportunities for wealth creation, they also expose individuals to higher risks if not used responsibly. Therefore, understanding the relationship between financial literacy and investment behavior is essential to promote better financial practices. This study aims to examine the level of financial literacy among youth and analyze its impact on their investment behavior, thereby providing insights for policymakers, educators, and financial institutions.

CONCEPTUAL FRAME WORK

The concept of financial literacy and investment behaviour is grounded in several key theories from economics, finance, and behavioural science. Financial literacy refers to the ability of individuals to understand and effectively use financial knowledge, skills, and attitudes in managing financial resources. It includes awareness of financial products, understanding of risk and return, and the ability to make informed financial decisions. One of the primary theoretical foundations is the Human Capital Theory, which suggests that individuals invest in education and knowledge to improve their decision-making abilities and economic outcomes. In this context, financial literacy is considered a form of human capital that enhances an individual’s capacity to make sound investment decisions and achieve financial well-being.

The Life-Cycle Hypothesis, proposed by Franco Modigliani, explains how individuals plan their consumption, saving, and investment behavior over their lifetime. According to this theory, young individuals tend to save and invest less due to lower income levels, but as their income increases, their investment activities also grow. Financial literacy plays a crucial role in enabling individuals to plan effectively across different stages of life. Another important framework is the Behavioral Finance Theory, which highlights that investment decisions are not always rational but are influenced by psychological factors such as emotions, biases, and social influences. Youth investors may exhibit behaviors such as overconfidence, herd behavior, and risk aversion, which affect their investment choices. Financial literacy helps in reducing these biases and promotes rational decision-making.

The Theory of Planned Behavior (TPB), developed by Icek Ajzen, explains how attitudes, subjective norms, and perceived behavioral control influence an individual’s intention to perform a behavior, such as investing. In this study, financial literacy influences attitudes toward investment, which in turn affects investment behavior.

Additionally, Prospect Theory, introduced by Daniel Kahneman and Amos Tversky, explains how individuals make decisions under risk and uncertainty. It suggests that individuals tend to avoid losses more strongly than they value gains. This theory is particularly relevant in understanding youth investment behavior, as risk perception significantly influences their investment choices. Overall, these theories collectively explain that financial literacy is a crucial determinant of investment behavior. It enhances knowledge, reduces irrational decision-making, and improves the ability of youth to participate effectively in financial markets.

REVIEW OF LITERATURE

Financial literacy has gained significant attention in recent years due to its critical role in influencing individual financial behavior and decision-making. defines financial literacy as a combination of knowledge, skills, and attitudes that enable individuals to make informed financial decisions and achieve financial well-being. Several studies have emphasized that financial literacy is essential for effective participation in financial markets and long-term financial planning.

Early research by highlights that financial literacy levels are generally low across populations, leading to poor financial decisions and limited use of financial services. Similarly, found that financial literacy among youth is particularly low worldwide, and is significantly influenced by demographic factors such as age, education, and income.

A comprehensive review by in the Indian context reveals that financial literacy levels remain moderate to low, with a strong need for policy interventions and educational programs to improve financial awareness and investment participation. Supporting this, states that financial literacy among youth is crucial as it shapes financial attitudes, risk perception, and long-term financial stability.

Several empirical and theoretical studies have established a strong relationship between financial literacy and investment behavior. concludes that financially literate individuals are more capable of analyzing financial information and making informed investment decisions. Likewise, highlights that financial literacy enhances decision-making ability and reduces behavioral biases, thereby improving investment outcomes.

In addition, emphasizes that financial literacy significantly influences investment intentions, particularly in financial assets such as stocks and mutual funds. Individuals with higher financial knowledge are more likely to participate in financial markets and diversify their portfolios effectively.

Behavioral aspects also play a crucial role in investment decisions. identifies factors such as cognitive biases, personality traits, and emotional influences as key determinants of investment behavior, along with financial literacy. This suggests that financial decisions are not purely rational but are shaped by psychological and social factors.

Further, provides a bibliometric analysis indicating a growing research interest in financial literacy and investment behavior, particularly after 2020, due to increased digitalization and accessibility of financial services. The rise of fintech and digital platforms has further influenced youth investment patterns.

Research on financial education programs also highlights their importance in improving financial behavior. found that structured financial education initiatives significantly enhance financial knowledge and attitudes among young individuals, leading to better financial decision-making.

Moreover, recent studies such as emphasize that financial literacy is a key determinant of investment behavior among youth in India, influencing their participation in various financial instruments. The study confirms that higher financial literacy leads to more informed and rational investment choices.

Overall, the literature consistently indicates that financial literacy plays a crucial role in shaping investment behavior among youth. However, gaps still exist in terms of practical application, behavioral biases, and regional differences, highlighting the need for further empirical research.

OBJECTIVES OF THE STUDY

- To assess the level of financial literacy among youth
- To analyze the investment behavior of youth
- To examine the relationship between financial literacy and investment behavior
- To identify factors influencing investment decisions among youth
- To evaluate the awareness of various financial instruments

STATEMENT OF THE PROBLEM

In recent years, the financial environment has become increasingly complex, offering a wide range of investment opportunities such as mutual funds, stocks, and digital assets. While these options provide significant potential for wealth creation, they also require a certain level of financial knowledge to make informed decisions. However, a large segment of youth lacks adequate financial literacy, which affects their ability to understand financial products, assess risks, and make sound investment choices.

Many young individuals rely on informal sources such as peers or social media for financial advice, which may not always be accurate or reliable. This often leads to irrational investment decisions, increased exposure to financial risks, and low participation in structured financial markets. Additionally, the tendency to prioritize consumption over savings and investment further limits long-term financial security.

Despite various initiatives by financial institutions and regulatory bodies to promote financial awareness, the gap in financial literacy among youth remains a major concern. This situation raises important questions about how financial literacy influences investment behavior and whether improving financial knowledge can lead to better financial outcomes.

Therefore, this study seeks to address the problem by analyzing the level of financial literacy among youth and examining its impact on their investment behavior.

RESEARCH METHODOLOGY

The present study is based on both primary and secondary data to analyze the relationship between financial literacy and investment behavior among youth. Primary data was collected through a structured questionnaire administered to 130 respondents belonging to different age groups, educational backgrounds, and demographic profiles. The questionnaire was designed to capture information related to financial knowledge, awareness of financial instruments, investment preferences, and factors influencing investment decisions.

A convenience sampling method was adopted to select respondents, ensuring ease of data collection within the target population. The study focuses on youth aged between 18 and 30 years. Secondary data was collected from various sources such as research journals, government reports, financial publications, and official websites to support the analysis and provide contextual understanding. For data analysis, statistical tools such as percentage analysis, Chi-square test, and ANOVA were used. Percentage analysis was applied to interpret demographic and general response data. The Chi-square test was employed to examine the association between financial literacy and investment behavior, while ANOVA was used to analyze differences in financial literacy levels across age groups. The methodology ensures a systematic and scientific approach to understanding the research problem and deriving meaningful conclusions.

DATA ANALYSIS

Table 1
Financial Literacy Rate in India (Youth %)

Year	Literacy Rate (%)
2018	27
2019	30
2020	33
2021	35
2022	38
2023	42

Source: Secondary Data

The table shows a steady increase in financial literacy among youth in India from 27% in 2018 to 42% in 2023. This consistent upward trend reflects growing awareness of financial concepts due to increased access to education, digital platforms, and government initiatives promoting financial inclusion. The sharp rise after 2020 indicates the role of digital financial services and fintech adoption in improving financial knowledge. Despite this progress, the literacy rate is still below half of the youth population, indicating a significant gap that needs to be addressed.

Table 2

Youth Participation in Investment Instruments

Instrument	2019	2021	2023
Bank Deposits	65	60	55
Mutual Funds	15	20	28
Stocks	10	15	22
Crypto	2	5	10
Gold	8	10	12

Source: Secondary Data

The table highlights a shift in investment preferences among youth over time. Bank deposits, traditionally the most preferred option, show a decline from 65% in 2019 to 55% in 2023, indicating reduced reliance on low-risk instruments. Conversely, mutual funds and stock market participation have increased significantly, reflecting growing risk appetite and financial awareness. Cryptocurrency, though still relatively low, shows notable growth, suggesting emerging interest in alternative investments. Gold investment has also slightly increased, maintaining its position as a safe asset.

Table 3

Growth of Demat Accounts in India

Year	Accounts (Million)
2018	22
2019	33
2020	41
2021	55
2022	80
2023	110

Source: Secondary Data

The number of Demat accounts in India has increased substantially from 22 million in 2018 to 110 million in 2023. This fivefold growth indicates a surge in retail investor participation, particularly among youth. The sharp rise post-2020 can be attributed to increased digitalization, ease of online trading, and heightened awareness of stock market investments. The COVID-19 period also contributed to this growth, as individuals explored alternative income sources. This trend reflects a positive shift toward formal financial markets and increased financial inclusion. However, it also underscores the importance of financial literacy to ensure informed and responsible investment decisions among new investors.

Table 4

Average Savings & Investment Pattern of Youth

Category	Percentage (%)
Savings	40
Investments	35
Consumption	25

Source: Secondary Data

The table reveals that youth allocate 40% of their income to savings, 35% to investments, and 25% to consumption. This indicates a relatively balanced financial behavior, with a slightly higher preference for saving over investing. While the investment proportion is considerable, it suggests that many youth still prioritize financial security over wealth creation. The moderate level of investment may also reflect limited financial literacy or risk aversion. The consumption percentage indicates controlled spending behavior among respondents. Overall, the data suggests that while youth are financially conscious, there is potential to enhance investment participation through improved financial education and awareness programs.

Table 5
Demographic Profile of Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	72	55.4
	Female	58	44.6
Age Group	18–21	40	30.8
	22–25	55	42.3
	26–30	35	26.9
Education	Undergraduate	60	46.2
	Postgraduate	50	38.5
	Professional	20	15.3

Source: Primary Data

The demographic profile shows that 55.4% of respondents are male and 44.6% are female, indicating a fairly balanced gender distribution. The majority of respondents (42.3%) fall within the 22–25 age group, followed by 18–21 (30.8%) and 26–30 (26.9%), suggesting that the study primarily represents young adults in their early career or higher education stages. In terms of education, 46.2% are undergraduates, 38.5% postgraduates, and 15.3% professionals, indicating a well-educated sample. This diversity enhances the reliability of the study, as respondents possess varying levels of knowledge and exposure to financial concepts, making the analysis more comprehensive and representative.

Table 6
Level of Financial Literacy

Level of Literacy	Frequency	Percentage (%)
Low	30	23.1
Moderate	65	50.0
High	35	26.9

Source: Primary Data

The table indicates that 50% of respondents have a moderate level of financial literacy, while 26.9% possess high literacy and 23.1% have low literacy. This suggests that the majority of youth have a basic understanding of financial concepts but may lack advanced knowledge required for complex financial decisions. The relatively lower percentage of highly literate individuals highlights a gap in financial education. The presence of a significant proportion with low literacy is also a concern, as it may lead to poor financial decisions.

Table 7
Awareness of Financial Instruments

Instrument	Aware (%)	Not Aware (%)
Savings Account	100	0
Fixed Deposit	92	8
Mutual Funds	75	25
Stock Market	68	32
Cryptocurrency	55	45
Insurance	80	20

Source: Primary Data

The table shows that awareness is highest for savings accounts (100%) and fixed deposits (92%), indicating strong familiarity with traditional financial instruments. Awareness of mutual funds (75%) and stock markets (68%) is moderate, suggesting growing interest in market-linked investments. However, awareness of cryptocurrency is relatively low at 55%, reflecting its emerging nature and associated risks. Insurance awareness stands at 80%, indicating good knowledge of risk management tools. The data highlights that while basic financial awareness is strong, knowledge of advanced and modern investment options remains limited. This underscores the importance of financial education in broadening awareness across diverse financial instruments.

Table 8

Investment Preference among Youth

Investment Option	Frequency	Percentage (%)
Bank Deposits	35	26.9
Mutual Funds	30	23.1
Stocks	25	19.2
Gold	20	15.4
Cryptocurrency	10	7.7
Others	10	7.7

Source: Primary Data

The table reveals that bank deposits (26.9%) are the most preferred investment option, followed by mutual funds (23.1%) and stocks (19.2%). This indicates that while traditional instruments still dominate, there is a growing inclination toward market-based investments. Gold (15.4%) remains a stable and trusted investment choice. Cryptocurrency and other options have lower preference (7.7% each), reflecting cautious adoption due to volatility and risk. The overall pattern suggests a gradual shift toward diversified investment portfolios among youth, influenced by increasing financial literacy and accessibility to financial markets.

Table 9

Factors Influencing Investment Decisions

Factor	Frequency	Percentage (%)
Safety	40	30.8
Return	35	26.9
Liquidity	20	15.4
Risk	15	11.5
Peer Influence	10	7.7
Financial Knowledge	10	7.7

Source: Primary Data

The table shows that safety (30.8%) is the most important factor influencing investment decisions, followed by return (26.9%). This indicates that youth prioritize capital protection while also seeking reasonable returns. Liquidity (15.4%) and risk (11.5%) are moderately important, suggesting awareness of investment flexibility and uncertainty. Peer influence and financial knowledge have lower impact (7.7% each), indicating that decisions are less socially driven and more individually evaluated. Overall, the findings suggest that youth adopt a cautious yet rational approach to investment, balancing safety and returns.

Table 10

Relationship Between Literacy & Investment Behavior

Literacy Level	High Investment Activity	Low Investment Activity
Low	8	22
Moderate	30	35
High	28	7

Source: Primary Data

The table clearly shows that individuals with higher financial literacy exhibit greater investment activity. Among highly literate respondents, 28 engage in high investment activity compared to only 7 in low activity. In contrast, respondents with low literacy show minimal participation in investments. This pattern indicates a strong positive relationship between financial literacy and investment behavior. It suggests that increased financial knowledge enhances confidence and ability to make informed investment decisions, leading to more active participation in financial markets.

Table 11

Chi Square Test

- **H_0:** There is no significant association between financial literacy level and investment behavior among youth.
- **H_1:** There is a significant association between financial literacy level and investment behavior among youth.

Particulars	Value
Chi-square (χ^2) value	19.48
Degrees of freedom (df)	2
Table value (5% level)	5.99
Result	Significant

The Chi-square test results indicate a calculated value of 19.48, which is greater than the table value of 5.99 at a 5% significance level with 2 degrees of freedom. This leads to the rejection of the null hypothesis and acceptance of the alternative hypothesis. Therefore, there is a significant association between financial literacy and investment behavior among youth.

Table 12

Financial Literacy Scores by Age Group (for ANOVA)

- **H_0:** There is no significant difference in mean financial literacy scores among different age groups of youth.
- **H_1:** There is a significant difference in mean financial literacy scores among different age groups of youth.

Age Group	Number of Respondents	Mean Score	Standard Deviation
18–21	40	52.4	8.5
22–25	55	60.2	7.8
26–30	35	65.6	6.9
Total	**130**	—	—

Source of Variation	SS	df	MS	F
Between Groups	1850	2	925	14.62
Within Groups	8040	127	63.31	-
Total	9890	129	-	-

The ANOVA results show an F-value of 14.62, which is higher than the critical value at the 5% significance level. This indicates a significant difference in financial literacy scores among different age groups. The mean scores increase with age, suggesting that older youth possess higher financial literacy. Therefore, the null hypothesis is rejected, confirming that age significantly influences financial literacy levels.

FINDINGS

The study reveals several important insights regarding financial literacy and investment behavior among youth. It is observed that financial literacy levels among respondents are predominantly moderate, with only a smaller proportion demonstrating high financial knowledge. Despite increasing awareness, a significant gap still exists in advanced financial understanding. The analysis also indicates that traditional financial instruments such as bank deposits remain the most preferred investment option, although there is a gradual shift toward modern investment avenues like mutual funds and stocks. The results further highlight that safety and return are the primary factors influencing investment decisions, suggesting that youth exhibit a cautious approach toward investing. Awareness of basic financial instruments is high; however, knowledge of emerging instruments such as cryptocurrency is relatively limited. The Chi-square test confirms a significant association between financial literacy and investment behavior, indicating that individuals with higher financial literacy are more likely to engage in active and diversified investments. Similarly, the ANOVA results show a significant difference in financial literacy levels across age groups, with older respondents demonstrating higher literacy levels. Secondary data analysis also supports these findings, showing a consistent rise in financial literacy rates and increased participation in financial markets over time. Overall, the study establishes that financial literacy plays a crucial role in shaping the investment behavior of youth and enhancing their financial decision-making capabilities.

SUGGESTIONS

Based on the findings of the study, several recommendations can be made to improve financial literacy and investment behavior among youth. Firstly, educational institutions should incorporate financial education into their curriculum to equip students with essential financial knowledge at an early stage. Practical training programs, workshops, and seminars on financial planning and investment strategies should be conducted regularly.

Secondly, financial institutions and government bodies should design awareness campaigns focusing on modern financial instruments such as mutual funds, stock markets, and digital assets. These initiatives can help bridge the knowledge gap and encourage informed investment decisions. Thirdly, digital platforms and fintech applications should provide simplified and reliable financial information to users, ensuring that young investors can make sound decisions without relying on informal sources. Efforts should also be made to enhance risk awareness and promote long-term investment planning rather than short-term speculative behavior.

Additionally, special attention should be given to improving financial literacy among younger age groups, as the study indicates lower literacy levels among them. By implementing these measures, it is possible to foster a financially informed generation capable of making effective investment decisions.

CONCLUSION

The study concludes that financial literacy is a key determinant of investment behavior among youth. The findings indicate that while financial awareness is gradually improving, a considerable gap still exists in terms of advanced financial knowledge and application. Youth tend to prefer safe investment options, although there is a noticeable shift toward diversified investment avenues due to increased exposure and accessibility. The statistical analysis confirms that financial literacy significantly influences investment behavior, and demographic factors such as age play an important role in determining literacy levels. Higher financial literacy leads to better investment decisions, increased participation in financial markets, and improved financial stability. In the context of a rapidly evolving financial environment, enhancing financial literacy among youth is essential for sustainable economic growth. The study highlights the need for coordinated efforts from educational institutions, policymakers, and financial organizations to promote financial education and awareness. Overall, improving financial literacy will empower youth to make informed financial decisions, manage risks effectively, and achieve long-term financial well-being.

LIMITATION AND SCOPE OF FURTHER RESEARCH

Limitation

Despite its contributions, the study has certain limitations that must be acknowledged. The sample size is limited to 130 respondents, which may not fully represent the entire youth population. The use of convenience sampling may introduce bias, as respondents are selected based on accessibility rather than randomness. The study relies on self-reported data, which may be influenced by personal bias or inaccurate responses. Furthermore, the research is confined to a specific age group (18–30 years), limiting its applicability to other demographic segments. Time and resource constraints have also restricted the scope of data collection and analysis. Additionally, the study does not account for all possible external factors such as economic conditions or cultural influences that may affect financial behavior. These limitations should be considered while interpreting the results and drawing conclusions.

Scope of Further Research

The present study focuses on examining the level of financial literacy and its impact on investment behavior among youth within the age group of 18 to 30 years. It aims to analyze how financial knowledge influences investment decisions, preferences, and participation in various financial instruments. The study covers both traditional investment avenues such as bank deposits and gold, as well as modern options like mutual funds, stocks, and cryptocurrencies. Based on primary data collected from 130 respondents and supported by secondary data, the research provides valuable insights into the financial awareness and behavior of young individuals. The findings of the study can be useful for policymakers, educational institutions, and financial organizations in designing effective financial literacy programs and strategies. Additionally, the study offers a foundation for future research to explore similar aspects across different regions, larger populations, and diverse socio-economic groups.

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A STUDY ON DIGITAL MARKETING ADOPTION AND BUSINESS PERFORMANCE AMONG SMALL ENTERPRISES

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ABSTRACT

Digital marketing has emerged as a transformative tool for enhancing the growth and competitiveness of small enterprises in the modern business environment. This study examines the level of digital marketing adoption and its impact on business performance among small enterprises. The research is based on both primary and secondary data, with primary data collected from 70 respondents using a structured questionnaire. The study employs statistical tools such as percentage analysis, Chi-square test, correlation analysis, and t-test to analyze the data and test the hypotheses. The findings reveal that most small enterprises have either fully or partially adopted digital marketing, with social media being the most widely used tool due to its accessibility and cost-effectiveness. The study also indicates that digital marketing significantly improves sales performance and overall business outcomes. The Chi-square test confirms a significant association between digital marketing adoption and business performance, while the correlation analysis shows a strong positive relationship between digital marketing usage and sales growth. Furthermore, the t-test results indicate a significant difference in performance between enterprises that adopt digital marketing and those that do not. Despite the positive impact, the study identifies challenges such as limited awareness, lack of technical expertise, and resource constraints that hinder effective adoption. The study concludes that digital marketing plays a crucial role in enhancing business performance and recommends increasing digital literacy, promoting advanced marketing tools, and providing financial and technical support to small enterprises.

KEY WORDS: Digital Marketing, Small Enterprises, Business Performance, Sales Growth, Digital Adoption, Social Media Marketing, Digital Transformation

INTRODUCTION

In the contemporary business environment, digital transformation has become a key driver of growth and competitiveness, particularly for small enterprises. The rapid advancement of internet technologies, mobile applications, and social media platforms has significantly changed the way businesses interact with customers, promote their products, and manage operations. Digital marketing, which includes tools such as social media marketing, search engine optimization (SEO), email marketing, and online advertising, has emerged as an effective and cost-efficient strategy for reaching a wider audience and enhancing business visibility. Small enterprises play a crucial role in economic development by generating employment opportunities, fostering innovation, and contributing to national income. However, these businesses often face challenges such as limited financial resources, restricted market access, and intense competition. In this context, digital marketing provides a viable solution by enabling small enterprises to compete with larger firms through targeted marketing strategies and improved customer engagement. Despite its advantages, the adoption of digital marketing among small enterprises varies significantly depending on factors such as awareness, technical knowledge, and perceived benefits. While some businesses have fully integrated digital tools into their operations, others remain hesitant due to lack of expertise or resources. This variation in adoption levels raises important questions regarding the effectiveness of digital marketing in improving business performance.

Therefore, this study aims to examine the level of digital marketing adoption among small enterprises and analyze its impact on business performance. By understanding the relationship between digital marketing practices and organizational outcomes, the study seeks to provide valuable insights for entrepreneurs, policymakers, and researchers to promote digital transformation and sustainable business growth.

BACKGROUND OF THE STUDY

The increasing penetration of the internet and digital technologies has transformed the global business landscape, creating new opportunities and challenges for enterprises of all sizes. In recent years, digital marketing has gained prominence as a strategic tool that enables businesses to reach customers more efficiently and effectively. For small enterprises, which often operate with limited resources, digital marketing offers a cost-effective alternative to traditional marketing methods such as print media and television advertising.

The growth of social media platforms, e-commerce, and mobile applications has further accelerated the adoption of digital marketing practices. Consumers today rely heavily on online platforms for information, product comparison, and purchasing decisions. As a result, businesses are compelled to establish a strong online presence to remain competitive in the market. Small enterprises, in particular, can benefit from digital marketing by enhancing brand awareness, improving customer relationships, and increasing sales performance. However, the level of digital marketing adoption among small enterprises is not uniform. Factors such as lack of digital skills, financial constraints, and resistance to change often hinder the effective implementation of digital strategies.

Moreover, the impact of digital marketing on business performance is still a subject of ongoing research, especially in the context of developing economies. This study is therefore conducted to bridge this gap by analyzing how digital marketing adoption influences business performance among small enterprises.

It provides a deeper understanding of the role of digital tools in improving organizational outcomes and highlights the importance of promoting digital literacy and technological adoption among entrepreneurs.

REVIEW OF LITERATURE

Digital marketing has become a crucial driver of growth and competitiveness among small enterprises. Numerous studies have explored its adoption, effectiveness, and impact on business performance. Chaffey (2019) defines digital marketing as the use of online channels such as websites, social media, and search engines to promote products and services. The study highlights that digital marketing enables businesses to reach a wider audience at lower costs.

Ryan (2016) emphasizes that digital platforms allow small enterprises to compete with larger firms by providing cost-effective marketing tools and measurable outcomes. Tiago and Veríssimo (2014) found that digital marketing adoption is influenced by technological readiness and organizational capabilities. Their study indicates that firms with better digital knowledge are more likely to adopt online marketing strategies. Trainor et al. (2014) observed that the integration of digital marketing capabilities significantly improves customer relationship management and business performance. Felix et al. (2017) proposed a framework for social media marketing, suggesting that effective digital strategies enhance brand engagement and organizational performance.

Dwivedi et al. (2021) highlighted that digital marketing has transformed business operations, especially during the COVID-19 pandemic, by enabling firms to maintain customer engagement and sustain performance. Kannan and Li (2017) emphasized that digital marketing analytics play a vital role in improving marketing effectiveness and decision-making processes.

Kingsnorth (2016) noted that digital marketing tools such as SEO and social media are essential for increasing visibility and attracting customers, particularly for small businesses. Smith (2018) found that businesses using social media platforms experience higher customer engagement and improved sales performance.

Choshin and Ghaffari (2017) identified key barriers to digital marketing adoption, including lack of skills, limited financial resources, and resistance to change. Alford and Page (2015) examined small and medium enterprises (SMEs) and concluded that digital marketing adoption is often gradual, with many firms adopting only basic tools such as social media.

Jones et al. (2015) reported that SMEs using digital marketing experience enhanced competitiveness and improved customer reach. Michaelidou et al. (2011) found that social networking sites are widely used by small businesses for marketing purposes, although their strategic use is still limited.

Taiminen and Karjaluoto (2015) emphasized that digital marketing tools positively influence firm performance, particularly in terms of sales growth and market expansion. Durmaz and Efendioglu (2016) highlighted that digital marketing enhances customer interaction and satisfaction, leading to better business outcomes. Bala and Verma (2018) concluded that digital marketing is essential for business growth, particularly for startups and small enterprises aiming to establish market presence.

Kumar et al. (2020) found that digital marketing adoption significantly improves sales performance and customer acquisition in small businesses. Chatterjee and Kar (2020) emphasized the role of digital transformation in enhancing business resilience and performance. Verhoef et al. (2021) highlighted that digital transformation, including marketing practices, is critical for long-term business sustainability. Kotler et al. (2017) in their concept of Marketing 4.0 emphasized the integration of digital technologies with traditional marketing approaches to improve customer engagement and business performance.

RESEARCH GAP

The review indicates that digital marketing significantly influences business performance, customer engagement, and competitiveness. However, many studies highlight that small enterprises still face challenges in fully adopting digital tools due to lack of knowledge, resources, and technical expertise. There is also a need for more empirical research focusing on the relationship between digital marketing adoption and measurable business outcomes, particularly in the context of small enterprises.

OBJECTIVES OF THE STUDY

1. To examine the association between digital marketing adoption and business performance among small enterprises.
2. To analyze the relationship between digital marketing usage and sales growth among small enterprises.
3. To compare the business performance of enterprises that adopt digital marketing with those that do not.

HYPOTHESES OF THE STUDY

1. There is no significant association between digital marketing adoption and business performance among small enterprises.
2. There is no significant relationship between digital marketing usage and sales growth among small enterprises.
3. There is no significant difference in business performance between enterprises that adopt digital marketing and those that do not.

STATEMENT OF THE PROBLEMS

In the modern business environment, digital marketing has emerged as a powerful tool for enhancing business growth and competitiveness. However, despite its increasing importance, many small enterprises face challenges in adopting and effectively utilizing digital marketing strategies. Limited financial resources, lack of technical expertise, and insufficient awareness often hinder small business owners from fully leveraging digital platforms. As a result, many enterprises continue to rely on traditional marketing methods, which may not be as effective in reaching a broader and digitally connected audience.

Furthermore, the rapid shift in consumer behavior toward online platforms has created additional pressure on small enterprises to establish a strong digital presence. Businesses that fail to adapt to these changes risk losing market share and growth opportunities. At the same time, there is a lack of clear understanding regarding how digital marketing adoption directly influences business performance, particularly in the context of small enterprises. This situation highlights the need to systematically examine the level of digital marketing adoption and its impact on business performance.

Therefore, this study seeks to address this problem by analyzing the relationship between digital marketing practices and business outcomes among small enterprises, providing valuable insights for improving their competitiveness and sustainability.

RESEARCH METHODOLOGY

The present study is based on both primary and secondary data to analyze digital marketing adoption and its impact on business performance among small enterprises. Primary data was collected through a structured questionnaire administered to 70 respondents representing different types of small businesses. The questionnaire was designed to gather information on demographic characteristics, awareness of digital marketing, adoption levels, tools used, and perceived impact on sales and overall business performance.

A convenience sampling technique was adopted for selecting respondents due to ease of access and time constraints. The study focuses on small enterprises operating in various sectors such as retail, manufacturing, and services. Secondary data was collected from research journals, books, reports, and reliable online sources to support the study and provide theoretical background. For data analysis, statistical tools such as percentage analysis, Chi-square test, correlation analysis, and t-test were used. Percentage analysis was applied to interpret general responses and demographic data. The Chi-square test was used to examine the association between digital marketing adoption and business performance. Correlation analysis was employed to measure the relationship between digital marketing usage and sales growth, while the t-test was used to compare business performance between adopters and non-adopters. The methodology ensures a systematic and scientific approach to achieving the study objectives.

DATA ANALYSIS

Table 1

Demographic Profile of the Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	42	60.0
	Female	28	40.0
Age Group	Below 25	12	17.1
	25–35	30	42.9
	36–45	18	25.7
	Above 45	10	14.3
Education	School Level	10	14.3
	Undergraduate	30	42.9
	Postgraduate	20	28.6
	Professional	10	14.3
Total		70	100

Source: Primary Data

The demographic profile of respondents indicates a balanced representation across key characteristics. A majority of respondents are male (60%), while females constitute 40%, showing moderate gender diversity. In terms of age, most respondents fall within the 25–35 age group (42.9%), indicating that the study primarily captures insights from young and mid-level entrepreneurs. The 36–45 age group also represents a significant portion (25.7%), while younger (below 25) and older (above 45) groups have relatively smaller representation. Regarding educational qualifications, a large proportion of respondents are undergraduates (42.9%), followed by postgraduates (28.6%), suggesting that most participants have a reasonable level of formal education. A smaller percentage consists of professionals and school-level respondents (14.3% each). Overall, the demographic composition reflects a fairly educated and economically active group, which enhances the reliability of the study in analysing digital marketing adoption and business performance among small enterprises.

Table 2

Type of Business

Type of Enterprise	Frequency	Percentage (%)
Retail	18	25.7
Manufacturing	15	21.4
Service	27	38.6
Others	10	14.3
Total	70	100

Source: Primary Data

The table indicates that the majority of respondents belong to the service sector (38.6%), followed by retail businesses (25.7%) and manufacturing units (21.4%). A smaller proportion (14.3%) falls under other types of enterprises. This distribution shows that service-oriented businesses dominate the sample, reflecting the growing importance of the service sector in small enterprise development. The relatively lower representation of manufacturing businesses may be due to higher capital requirements and operational complexities. Overall, the data suggests that digital marketing adoption is particularly relevant for service and retail sectors, where customer engagement and online visibility play a crucial role.

Table 3

Year of Operation

Years	Frequency	Percentage (%)
Below 2 years	15	21.4
2–5 years	28	40.0
5–10 years	17	24.3
Above 10 years	10	14.3
Total	70	100

Source: Primary Data

The table reveals that a significant portion of businesses (40.0%) have been operating for 2–5 years, indicating that most respondents are relatively young enterprises. Businesses operating for 5–10 years account for 24.3%, while 21.4% have been established for less than 2 years. Only 14.3% of enterprises have more than 10 years of experience. This distribution suggests that the study largely represents emerging and growing businesses, which are more likely to adopt digital marketing strategies. The presence of newer firms also indicates a dynamic business environment where digital tools may be essential for growth and competitiveness.

Table 4

Awareness of Digital Marketing

Awareness Level	Frequency	Percentage (%)
Highly Aware	18	25.7
Moderately Aware	32	45.7

Slightly Aware	15	21.4
Not Aware	5	7.1
Total	70	100

Source: Primary Data

The table shows that the majority of respondents (45.7%) are moderately aware of digital marketing, followed by 25.7% who are highly aware. A notable proportion (21.4%) has only slight awareness, while 7.1% are not aware at all. This indicates that while basic awareness of digital marketing is fairly widespread, there is still a gap in advanced understanding. The presence of respondents with limited or no awareness highlights the need for educational initiatives and training programs. Overall, the findings suggest that increasing awareness could further enhance the adoption and effective use of digital marketing among small enterprises.

Table 5

Adoption of Digital Marketing

Adoption Status	Frequency	Percentage (%)
Fully Adopted	22	31.4
Partially Adopted	30	42.9
Planning to Adopt	12	17.1
Not Adopted	6	8.6
Total	70	100

Source: Primary Data

The table indicates that 42.9% of respondents have partially adopted digital marketing, while 31.4% have fully adopted it. Additionally, 17.1% are planning to adopt digital marketing in the future, and only 8.6% have not adopted it at all. This suggests that digital marketing adoption is already widespread among small enterprises, with a majority either using it or intending to use it. The high proportion of partial adoption implies that many businesses are still in the transition phase and may require further support to fully utilize digital tools. Overall, the data reflects a positive trend toward digital transformation in small businesses.

Table 6

Digital Marketing Tools Used

Tool	Frequency	Percentage (%)
Social Media	28	40.0
Email Marketing	10	14.3
SEO	8	11.4
Paid Ads	12	17.1
Website	12	17.1
Total	70	100

Source: Primary Data

The table shows that social media is the most widely used digital marketing tool (40.0%), highlighting its importance in reaching customers and promoting products. Paid advertisements and websites are used by 17.1% of respondents each, indicating moderate adoption of more structured digital strategies. Email marketing (14.3%) and search engine optimization (SEO) (11.4%) are less commonly used, suggesting limited awareness or technical expertise in these areas. This pattern indicates that small enterprises prefer simple and cost-effective tools like social media, while more advanced techniques remain underutilized. There is significant scope for improving the use of diverse digital marketing tools.

Table 7

Impact on Sales Performance

Impact Level	Frequency	Percentage (%)
High Increase	20	28.6
Moderate Increase	30	42.9
Slight Increase	15	21.4
No Change	5	7.1
Total	70	100

Source: Primary Data

The table reveals that digital marketing has a positive impact on sales performance for most respondents. A majority (42.9%) report a moderate increase in sales, while 28.6% experience a high increase. Additionally, 21.4% observe a slight increase, and only 7.1% report no change. This indicates that digital marketing is effective in enhancing sales outcomes for small enterprises. The dominance of moderate and high increases suggests that businesses are benefiting from improved market reach and customer engagement. Overall, the findings confirm that digital marketing plays a significant role in driving sales growth.

Table 8

Overall Business Performance

Performance Level	Frequency	Percentage (%)
Highly Improved	**18**	**25.7**
Moderately Improved	**32**	**45.7**
Slightly Improved	**15**	**21.4**
No Improvement	**5**	**7.1**
Total	**70**	**100**

Source: Primary Data

The table indicates that digital marketing has contributed to improvements in overall business performance. A majority of respondents (45.7%) report moderate improvement, while 25.7% experience high improvement. Additionally, 21.4% observe a slight improvement, and only 7.1% report no improvement. This suggests that digital marketing has a generally positive impact on business performance, enhancing factors such as sales, customer reach, and brand visibility. The results highlight that while most businesses benefit from digital marketing, the extent of improvement may vary depending on the level of adoption and effectiveness of implementation.

Table 9

Testing of Chi-Square

- **H_0 (Null Hypothesis):** There is no significant association between digital marketing adoption and business performance among small enterprises.
- **H_1 (Alternative Hypothesis):** There is a significant association between digital marketing adoption and business performance among small enterprises.

Factor	χ^2 Value	df	p-value	Result
Digital Marketing Adoption vs Business Performance	27.53	4	< 0.05	Significant

The calculated Chi-square value (27.53) is significant at the 5% level ($p < 0.05$). Therefore, the null hypothesis is rejected, indicating a significant association between digital marketing adoption and business performance among small enterprises.

Table 10

Testing of Correlation Test

- **H_0 (Null Hypothesis):** There is no significant relationship between digital marketing usage and sales growth among small enterprises.
- **H_1 (Alternative Hypothesis):** There is a significant relationship between digital marketing usage and sales growth among small enterprises.

Factor	Correlation (r)	df	p-value	Result
Digital Marketing Usage vs Sales Growth	0.96	—	< 0.05	Significant

The correlation coefficient ($r = 0.96$) shows a strong positive relationship between digital marketing usage and sales growth. Since the p-value is less than 0.05, the relationship is statistically significant, and the null hypothesis is rejected.

Table 11

Testing of t-Test

- **H_0:** There is no significant difference in business performance between enterprises that adopt digital marketing and those that do not.
- **H_1:** There is a significant difference in business performance between enterprises that adopt digital marketing and those that do not.

Factor	t-value	df	p-value	Result
Business Performance (Adopted vs Not Adopted)	6.88	68	< 0.05	Significant

The calculated t-value (6.88) exceeds the critical value at the 5% significance level. Hence, the null hypothesis is rejected, indicating a significant difference in business performance between enterprises that adopt digital marketing and those that do not.

FINDINGS

The study provides significant insights into digital marketing adoption and its impact on business performance among small enterprises. The analysis reveals that the majority of respondents belong to the service sector and are relatively young businesses operating for less than five years, indicating a dynamic and growing entrepreneurial environment. It is observed that most respondents possess moderate awareness of digital marketing, while a smaller proportion demonstrates high awareness, highlighting the presence of a knowledge gap in advanced digital practices. The findings further indicate that digital marketing adoption is widespread, with a majority of enterprises either fully or partially adopting digital tools. Social media emerges as the most commonly used platform, reflecting its accessibility and cost-effectiveness, whereas advanced tools such as SEO and email marketing are less utilized. The study also reveals that digital marketing has a positive impact on sales and overall business performance, with most respondents reporting moderate to high improvements. Statistical analysis strengthens these observations. The Chi-square test confirms a significant association between digital marketing adoption and business performance. The correlation analysis indicates a strong positive relationship between digital marketing usage and sales growth. Additionally, the t-test results show a significant difference in performance between enterprises that adopt digital marketing and those that do not. Overall, the findings establish that digital marketing plays a crucial role in enhancing the competitiveness, growth, and sustainability of small enterprises.

SUGGESTION

Based on the findings, several recommendations can be made to improve digital marketing adoption among small enterprises. Firstly, there is a need to enhance awareness and knowledge of digital marketing through training programs, workshops, and educational initiatives. Government agencies and business development organizations should actively promote digital literacy among entrepreneurs. Secondly, small enterprises should be encouraged to move beyond basic tools such as social media and adopt advanced digital marketing techniques like SEO, email marketing, and paid advertising. This will help in improving online visibility and targeting a broader customer base. Thirdly, financial and technical support should be provided to small businesses to overcome resource constraints. Subsidies, affordable digital tools, and access to professional guidance can facilitate effective implementation of digital strategies. Furthermore, enterprises should focus on data-driven decision-making by utilizing digital analytics to measure marketing performance and customer behavior. Continuous monitoring and evaluation can enhance the effectiveness of digital campaigns. Lastly, fostering a positive attitude toward technological change is essential. Entrepreneurs should be encouraged to embrace innovation and digital transformation to remain competitive in the evolving business environment.

CONCLUSION

The study concludes that digital marketing plays a vital role in improving business performance among small enterprises. The findings highlight that while awareness and adoption levels are gradually increasing, there is still a need for greater understanding and effective utilization of digital marketing tools. Small enterprises that adopt digital marketing strategies experience significant improvements in sales, customer engagement, and overall business performance compared to those that rely solely on traditional methods.

The statistical analysis confirms that digital marketing adoption is significantly associated with business performance and has a strong positive relationship with sales growth. Additionally, enterprises that actively use digital marketing demonstrate better performance outcomes than non-adopters. These results emphasize the importance of digital transformation in enhancing competitiveness and sustainability in the modern business environment.

In conclusion, promoting digital marketing adoption among small enterprises is essential for achieving long-term growth and success. Collaborative efforts from policymakers, financial institutions, and business organizations are required to support entrepreneurs in adopting digital tools. By improving digital literacy and encouraging innovation, small enterprises can effectively leverage digital marketing to thrive in an increasingly competitive market.

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A STUDY ON THE RETIREMENT PENSION SYSTEM IN PRACTICE ACROSS SELECTED COUNTRIES

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ABSTRACT

Retirement pension system is diverse and often involve several different programs and schemes. A comparison of the different pension systems around the world can be invaluable for policy makers, governments, and the pension industry itself. The study provides a brief reference of retirement provisions in practice across countries such as the Netherlands, Denmark, China, Malaysia, Singapore, South Korea, Australia, United States of America, United Kingdom, Switzerland, France, and Canada

Keywords: Retirement pension systems, retirement age, pension sources, pension index.

INTRODUCTION

Sustaining after sixty years of age or post-retirement is becoming a global challenge due to a troubled global economy accompanied by a longer life expectancy due to advanced medical facilities available across the globe. We can find certain countries providing the social security measure, certain other countries implementing senior citizen schemes and pension system that are in practice. Many other countries lack facilities supporting and serving the old age citizens. The quality of pension system available to workers varies greatly across the globe. Many governments have increased the age when citizens can receive money from the social security plans to minimize the number of people in the system. Retirement is handled differently depending on where you lived across the globe. The study focuses on the schemes or provisions implemented or in force in selected countries to support the old agers.

PURPOSE OF STUDY

The study aims to throw light on the various retirement income systems in practice across the globe and to get insight on the features of the retirement income systems adopted by countries and the variation in fixation of retirement for the countries under study.

Following are the countries under study.

The Netherlands

The Netherlands is one of the best places in the world for retirees due to its robust and sustainable pension system. Around 30% of Netherland residents are at the age of 65.The Netherlands pension system frequently tops the Mercer's 2024 Global Pension Index with high ratings for adequacy, sustainability and integrity. Netherland's pension age is 67 as for the year 2024. The Netherlands pension system has three pillars namely state, workplace and private pensions governed by the General Old Age Pensions Act referred to as Algemene Ouderdomswet or AOW. For each year you live or work in the Netherlands, you build 2% towards your state pension. To receive the full pension, the retiree must have 50 years of contribution. If full allocation is not achieved, pension is calculated based on number of years of contribution. Occupational or company pension funded by employer and employee contribution and Private Pension schemes funded by voluntary personal contribution are other sources of retirement income system. Netherlands have planned to introduce pension lumpsum withdrawal which will allow retirees to withdraw a maximum of ten percent of their accrued retirement pension on their retirement date.

Denmark

The Danish pension system is divided into three different kinds of pensions: the statutory pension, the labour market pension, and the individual pensions. The statutory pension consists of state pension and disability pension. There is also ATP livslang Pension which is a lifelong pension which covers most of the Danish population. The state pension is a regular pension paid by the Danish government. State pension is called Folkepension. Denmark's present pension age is 69 years based on future indexation. The general rule for receiving Danish State Pension is to be a Danish Citizen. Denmark's pension system is in close resemblance to the pension system encouraged by the world bank way back in 1994 which signifies multifaceted pension system.

China

China's pension system is centered upon three pillars: The first pillar is the state endorsed public pension established in 1990, the second pillar was enterprise annuities introduced in 2004, and to supplement both the pillars, the third pillar personal pension also called as individual retirement accounts was set up in 2022. In China, the national council for social security fund was established to operate and manage the national social security fund. On December 15, 2024 China announced the implementation of Private Pension scheme. The statutory retirement age for Chinese national will be 63 years for men and 58 years for women in managerial and technical roles. Women in ordinary workforce will retire at the age of 55 years. Within two decades, China's retirement age population is projected to surpass the entire population of the United States.

Malayasia

This country in Southeast Asia enforces a compulsory retirement age of 60 for public sector employees. Early retirement is an option at age 40 after at least 10 years of government service. Public sector workers are provided with two types of retirement schemes, including the pension scheme, which entails a monthly fixed income, a service gratuity, and a free medical treatment at government hospitals. The Employees Provident Fund scheme provides for retirement through a mandatory savings account in which employees and employers make monthly contributions.

The employee provident fund is the basic provision for the Malaysian pension system. It is governed by the Employees Provident Fund Act of 1991 and provides defined contribution type benefits to members. To enhance the financial security several changes were made by the Malaysian government to the EPF known as 'Beyond Savings' initiative. Source: Allianz Global Investors. Malaysian government has introduced Pension cards under section 23, Pension Rules 1980 for pensioners or recipients of pension under the public service. The pension cards are personal identification which enables the pensioner to obtain medical facilities at government clinics or hospitals. The minimum retirement age in Malaysia is 60 years. The Malaysian pension scheme has a single, compulsory, defined -contribution fund called the employees provident fund which covers most of the private sector workers.

The government has a mandatory retirement savings scheme for all Malaysians working in the private sector. The retirement age in the private sector is 60.

The percentage of retirement income that comes from pensions is much lower in Malaysia than in many other countries, with public and private pensions combining to comprise a mere 30% of all retirement income.

Singapore

Singapore's pension system is one of the oldest and refined schemes considering Asia. The system has the Central Provident fund in which the funds accumulate in individual accounts of the scheme beneficiaries. In addition, a non -contributory pay -as-you -go pension scheme exist from the government known as government pension scheme for certain categories of civil servants. The Singaporean system operates on a fully funded basis financed by the employer and employee contributions credited to the account. Retirement age is 63 years for Singaporean nationals. Singapore's retirement income system ranks seventh out of forty-seven retirement income systems reviewed in the 15th annual Mercer CFA institute Global Pension Index .

South Korea

South Korea's retirement pension system is called the National Pension system that provides social insurance coverage for senior citizens. The NPS provides basic pension and an earnings-related pension. The official retirement age in south Korea is 60 years of age. South Korea has social security number known as Korean Social Security Number which is connected to the National Pension Scheme. To qualify for a pension, a person must have contributed to the NPS for at least 10 years and be at least 62 years old.

Australia

The modern Australian retirement income system comprises three elements referred to as three pillars. Publicly provided means tested age pension, mandatory private superannuation saving and voluntary saving schemes. Australia has a full centre link age pension. The age pension age in Australia is 67 years for both men and women and be an Australian citizen. The age pension is a regular fortnightly payment from the Australian government.

In Australia the social security program is called Age Pension. To receive Age Pension you must be at least 66 and meet the 10-year qualifying Australian residence requirements.8

Income, assets, and other circumstances affect how much pension an Australian worker will get. As of October 2020, the qualifying age for Age Pension is 66 years. It raised by six months every two years, reaching 67 by July 1, 2023.

Australia has a relatively conservative and mandatory retirement saving system for its citizens, which requires them to put away 9.5% of their salaries every year into a private/public account called a superannuation account. This amount will be raised to 12% between 2021 and 2025.

Australia's Minimum drawdown requirement for account-based pensions

Current drawdown requirements

The annual minimum drawdown requirement is the key regulatory requirement for account-based pensions in australia. It aims to ensure that account-based pensions are used to provide income in retirement.

The annual minimum drawdown amount is determined by multiplying the value of the pension account balance at 1 July by an age-based rate that increases from 4 per cent for those aged under 65 to 14 per cent for those aged 95 or more (see table below).

Age	Minimum payment percentage
Under 65	4
65-74	5
75-79	6
80-84	7
85-89	9
90-94	11
95 or more	14

These rates aim to ensure that funds are withdrawn from the tax-free environment over time. Earnings on assets supporting superannuation pensions are tax free, as is the pension income for people aged 60 or over.

United States of America

The American state pension system OASDI- (Old age, survivors, and disability insurance program) functions on a pay-as-you-go basis and is financed through social security taxes paid by employers and employees, tax revenues paid by upper income social security beneficiaries and interest earned on accumulated trust funds reserves. The statutory retirement age depends on the retiree's year of birth and is between the age of 65 to 67. The pension plan that's more popular in America is the 401(K) plan . 401(K) plans enables employees and employers to make tax deferred contributions from their salaries to their plans.

United Kingdom

In United Kingdom , the statutory state pension system consists of a basic state pension and an earnings related additional pension known as the state second pension .These are financed through earnings related national insurance contributions. Participation in the state pension system is mandatory. The pension age in UK is fixed at 66 years. individuals of state pension age have access to pension credit., a means tested benefit comprising Guarantee Credit, a top-up which is based on a weekly minimum income and savings credit, for those aged 65 years who are rewarded for making some savings towards their retirement.UK follows automatic enrolment where citizens are automatically included in pension programme unless they opt out.

Switzerland

The pension system in Switzerland comprises of three pillars namely basic state old-age and survivor's insurance scheme, mandatory occupational pension, and private pensions. It is one of the countries where the three pillars contribute equally to old-age income. The old age and survivor pension insurance is otherwise called as Alters- und Hinterlassenenversicherung. This insurance scheme is obligatory and covers all persons domiciled in Switzerland. A person is eligible for the public pension when he or she pays contribution for one full year. Pension age is 65 for men and 64 for women. The benefits of the pension is based on the years of contribution and the average income during the insurance period.

France

France pension system is made up of three pillars: The French state pension, compulsory supplementary pensions and voluntary occupational and personal arrangements. The basic state pension can never exceed a maximum French pension rate of 50% of the social security ceiling. The legal retirement age is 65 for men and women. The funds are financed according to a pay-as- you- go system, based on employer and employee contributions. Annual contributions are immediately redistributed to current pensioners instead of investing

Canada

Canada's pension system is characterized by public and private pension system schemes. Most of the Canadians depend on the public pension system made up of two tiers. Tier 1 isa flat rate pension from the old age security programme and tier 2 is an earnings-related pension from the mandatory Canada pension plan. The third tier of Canada's retirement income system is made up of voluntary pension savings. Here the pension age is 65 years.

FINDINGS

Many countries have very effective retirement income system in practice whereas some of the countries need to improve on its parameters of supportive retirement income system. Common challenges pension systems around the world need to address include increasing the average retirement age due to rising life expectancy, encouraging more savings, and limiting access to funds before retirement. There is no perfect social security system. All pension systems require good government and good management to function well. All systems must cope with macroeconomic uncertainties--inflation, unemployment, wage growth rate, changes in demographics, and changes in interest rates.

CONCLUSION

To conclude retirement pension systems in practice across the globe are wide and vivid but centred mostly on the governments contribution schemes and plans in practice. As a provident fund or accumulated corpus fund, senior citizens benefit from the contributions made purely for post-retirement income needs.Retirement income systems across the globe vary in retirement policies opted and in delivering the benefits of comfortable retirement life to its citizens.

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AN EMPIRICAL STUDY ON IMPACT INVESTMENT IN THE AGRICULTURAL SECTOR IN INDIA

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ABSTRACT

India, known for its vast reserves of natural resources, abundance of skilled and unskilled workforce, upcoming modern infrastructure and emergence of entrepreneurship and start-up culture is predicted to become a global super power by 2050, alongside other developed countries. This has made India a target for investments, being one of the largest emerging market economies in the world. The increase in investments into India has caused the financial system to grow at an even faster phase ultimately leading to a growth in National Income. However, the growth of the nation should go hand in hand with conservation of the depleting natural resources that makes up the ecology of the country. India is globally criticized for being vastly polluted. More than half its pollution resulting from Industrial waste let into the air and water. This calls for a need to reduce over consumption of natural resources and preserve the same in India for future generations. This paper is an attempt to blend Finance and ecology. Agriculture has always been a main source of employment in

India usually financed by self-reliant farmers or through loans taken from zamindars. However, the returns in agriculture are vastly dependent on the climate, leading to huge risks involved in the business of agriculture. It also can be very beneficial because agricultural gains are exempted from tax in India. This study is conducted considering agriculture as a business idea that has the power to be a profitable business venture especially sought after by impact investors. The investment attitude and pattern of these investors is analysed in this paper.

KEYWORDS: Investment, Agriculture, Finance, Impact investors.

INTRODUCTION

India is the fifth largest economy in the world (World GDP Ranking 2024 list) with as many has 16,91,495 active companies registered as on 31th March 2024 (Ministry of Corporate affairs – March 2024 – Monthly Information Bulletin). Alongside running successful businesses, most Indian companies deplete the natural resources in the environment. Almost 51% of air pollution is said to be due to Industries. (Sharma, Chauhan, Kumar.2022). The Companies Act 2013 mandates companies to use 2% of their net profits to substitute the effluence caused by most industries. But should successful business ventures be allowed to cause harm to the environment just to push economic growth.

The destruction caused by global warming and climate change can be seen all around the globe and many investors now look to invest in projects which not only make profit but also helps the environment and society. This type of investments is famously called as impact investment and can be defined by the GIIN (Global Impact Investment Network) as "**Investments made with the intention to generate positive, measurable social and environmental impact alongside a financial return".** Impact investments can be made in both emerging and developed markets, and target a range of returns from below market to market rate, depending on investors' strategic goals.

The Sustainable Economic Goals developed by the United Nations (UN) in 2012 go hand in hand with impact investment targets due to which the ideology had become quite popular and there is a huge increase in investment made in socially and economically impact projects. The GIIN estimates the impact industry is managing assets under management worth USD 1.164 Trillion worldwide (Hand, Ringel, Danel 2022).

In India, the Impact investment trend had increased in leaps and bounds over the past decade. An analysis conducted by the Impact Investors Council (IIC) shows that equity investments into Indian impact enterprises reached an all-time high of USD 7 Billion in 2021 with more than USD 31 billion invested over the last three years itself. (Pai, Batra, Dewan 2022). This proves that the Impact Investment growth prospects in India looks very positive, considering the availability opportunities for investment in various sectors such as Agriculture, Health care, education, waste management etc., to name a few.

In this paper, a study is conducted to analyse impact investment in India in the agriculture sector. It is attempt to study the impact investment trends in the agricultural sector and to understand the challenges faced by impact investors in India.

REVIEW OF LITERATURE

Agriculture has been the single most vital occupation in the Indian sub-continent since time immemorial. There is historical evidence to show that ancient Indians grew agricultural produce and exported the same to different empires of the world especially, cotton and spices. Even today, more than 50% of the Indian population are involved in agriculture (Indian Economic Survey data - 2022-23). There is huge demand for agricultural products produced in India within the country due to India being the most populated country in the world. International demand for agricultural produce is also evident as Indian harvest is considered among the best in the world and is currently the world's second largest producer of agricultural products. The Agricultural sector contributed to almost 20% of Indian GDP in the year 2021-22. These conditions make India a successful investment avenue in the field of agriculture.

According to Ravi, Wright, Sharma, Jones (2019), there are many entry points for impact investors to invest in agriculture in India, which further helps reduce agricultural price volatility and improves better management. Nearly 67% of respondents in the study conducted by them felt agriculture as the top sector for investment. Investment in agricultural technology gained favour even though future investment into the segment is still not clear. It was further observed that small farmers rarely adopted new technologies or solutions for farming. This indicates that amount for investment in the agricultural sector is minimal in India.

Based on a paper by Puri, Hooda, Khanna, Sen (2025), Sustainable agriculture tagging, Monitoring and reporting systems for comprehensive and granular data, Boosting and diversifying financial flows in lagging sectors, Capacity building for sustainable agriculture are the four pillars and key actions for enhancing sustainable agriculture finance. Further 67% of finance into agricultural sector was through the private sector funding. Indian agriculture. Domestic source of finance outweighed International source of investment into Indian agriculture with 99.5% of total investments being from domestic sources.

Dr. Sundhari (2023), found three major challenges in the overall development of agriculture in Tamil Nadu. They were: Raising agricultural productivity per unit of land; Reduction of rural poverty through agricultural improvement and a socially inclusive strategy that comprises both farm as well as non-farm employment and Ensuring that agricultural growth responds to food security needs. She concluded her research stating that Investment in the agriculture sector in India has the power to alleviate poverty but its success depends on financial support together with improvements in infrastructure, market access, education, and sustainability.

Bhowmik (2022), states that FDI inflows in agriculture and agricultural services have had a positive impact on the gross value added in agriculture. However not without volatile fluctuations. The researcher further adds that FDI in retail in agriculture may have negative impact on small farmers in India because Indian agriculture is dominated by small farms which constituted 83% of total farms which are less likely to have access to technology in order to meet the quality standard required by corporations and thus may worse off in income.

Rani, Siwach and Sheran (2023) in their study states that FDI in the Indian agricultural sector has played a vital role in the growth of the economy by increasing employment opportunities. This had led to an increase in GDP and sufficient flow of capital into rural economies which benefit the farmers and consumers. The government has taken initiatives to increase FDI in horticulture and floriculture since the topography of India helps in cultivation of these plants. Introduction of 100% relaxation in investment in agricultural sector related to the above field and change in agricultural policy regulation has also become a boon to the agricultural sector in India.

NEED FOR THE STUDY

As promising as the returns are in the agricultural sector, there are also a lot of risk and challenges involved. Indian agriculture is mostly dependent on the Monsoon. A shortfall or excess of rain can lead to huge financial losses due to drought or flooding which adversely affect the harvest. If the monsoon season is favourable and there is a good harvest, there is a risk of getting less or no returns for the hard work and effort put in by farmers due to competition, existence of the middle man, illiteracy, other transactional costs. Due to this most farmers are quitting agriculture and moving to cities to find better employment opportunities.

This paper is an attempt to study impact investing in the agricultural sector made by institutional or private investors and an attempt to analyse their investment pattern and attitude behind such investments in order to encourage future investment in the respective sector with an aim to improve the agricultural investments and make it more attractive.

OBJECTIVES OF THE STUDY

1. To study the Impact investment trend in the agricultural sector for the 7 years in India from 2019 to 2025 in terms of amount invested and deals claimed.
2. To study segment wise investment trend in the agricultural sector to understand investors attitude.

RESEARCH METHODOLOGY

The area of study for the above research is India. Secondary data has been collected for understanding impact investment trends in the agricultural sector for 7 years from 2019 to 2025. The same is analysed graphically using Bar diagram. Data collected is converted to Indian rupees to make the analysis more relatable. The rate considered for the study is INR/USD = Rs. 93.17/1 USD (April 15TH 2026).

A comparative study is also made to identify the agricultural segment that received the most investment. This is done to further understand the investors attitude towards the investment segment, so as to predict future investment pattern by investors in the agricultural sector. Investors for the purpose of the study refers to investments that have been made into the mainstream agricultural sector by commercial investors, not for profit investors and investments made in collaboration by Commercial and not for profit investors.

ANALYSIS ON INVESTMENT MADE IN THE AGRICULTURAL SECTOR IN INDIA IN THE PAST 7 YEARS:

The below table shows investments made in the agricultural from 1st of January 2019 to 31st of December 2025.

Table 1

Table showing Investment volume in the Agricultural sector from 2019 to 2025.

Year	Deal Value ($ - Mn)	Deal Value (Rupees – Mn)
2019	485	45187
2020	412	38386
2021	875	81524
2022	831	77424
2023	314	29255
2024	403	37548
2025	270	25156

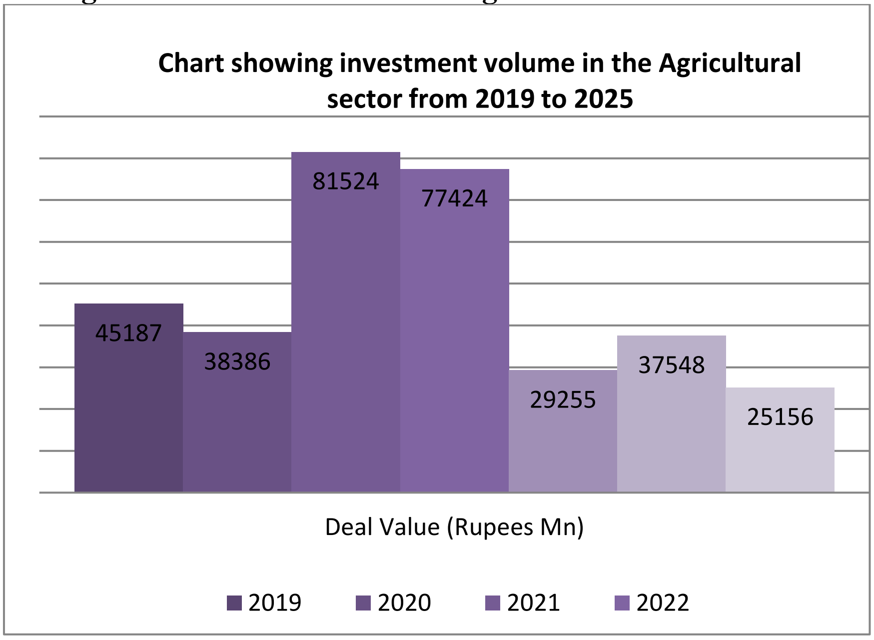
* INR/USD = Rs.93.17/1 USD . (Apr. 15th 2026)

(Source: Retrospect - Impact Investment Council 2021, 2022, 2023, 2025)

Interpretation: In the above table, It can be seen that in 2019 the investment made in the agricultural sector was Rs.45,187 million. In 2020, investment reduced to Rs.38,386 million only. However, In 2021, Investment in the sector doubled to Rs.81,524 million, reducing marginally in 2022 to Rs.77,424 million. In 2023, the investments in the agricultural sector has fallen to Rs.29,255 million, less than half of its investments in the previous year. The subsequent year, i.e in 2024 there was an increase in investments to Rs.37,548 million. However in 2025, the sector received investments of only Rs.25,156 million. Overall investments in the sector has been fluctuating in the past 7 years.

Chart 1

Chart showing Investment volume in the Agricultural sector from 2019 to 2023.



Analyses: In the chart above, it can be observed that during 2019, that is the pre – covid period, the investment in the agricultural sector was average. In 2020, there was a lot of restriction posed on the agricultural sector by the government due to which the investment reduced to Rs.38,386 million. In 2021 and 2022, when entire India was facing a lock down during co-vid, agricultural sector managed to secure maximum funding almost double the investment of 2020, i.e, Rs.81,524 million and Rs.77,424 million respectively. This can be due to the fact that new technological practices were introduced into the sector to make agriculture adaptable to contactless deliveries. However, it can be noticed that this increment was only for 2 years and there is a major drop in investment made to Rs.29,255 million in 2023. The sector tried to make a recovery in 2024, with a marginal increase in investment, but received its lowest investment in the past 7 years in 2025 with only Rs.25,156 million. Even lower than pre-covid times. This implies that farmers are required to finance themselves, due to the sudden decrease in investments.

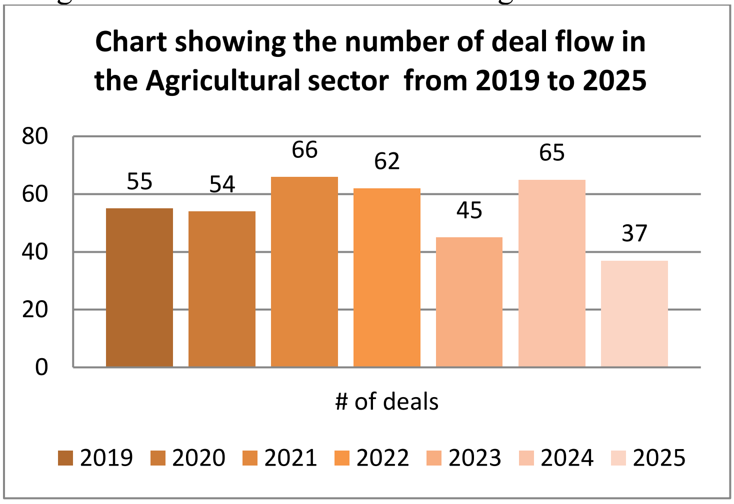
Table 2

Table showing the number of deal flow in the Agricultural sector from 2019 to 2025

Year	# of deals
2019	55
2020	54
2021	66
2022	62
2023	45
2024	65
2025	37

Interpretation: In the above table, It can be seen that in 2019 the number of investments secured in the agricultural sector was 55. In 2020, This investment reduced by only one deal to 54. However, In 2021, number of deals in the sector rose to 66, reducing marginally in 2022 to 62. In 2023 there was a sharp fall in the number of deals to 45 as compared to the previous years. In 2024 there was a recovery to 65 number if deals in the sector but in 2025, the sector managed to get only 37 deals.

Chart 2: Chart showing the number of deal flow in the Agricultural sector from 2019 to 2025



Analyses: In the chart above, it can be observed that during 2019, that is the pre – co-vid period, the number of deals flowing into the agriculture sector was 55 deals. The momentum was maintained even in 2020 during co-vid lock down with 54 deals, which shows very little change. In 2021 and 2022, due to technological advancement promoted in the agricultural sector during the lock down, the number of deals increased to 66 and 62 respectively. However, post co-vid the numbers of deals have reduced drastically to 45 in 2023. This shows that co-vid actually helped investment into the agricultural sector; this could also be attributed to the fact that during lock down agriculture was one of the few sectors that could carry out its activities with proper authorization and protection. In 2024, the deals in the sector increased to its highest in 65 numbers. This showed that there was a recovery in the investments in the sector even though the amount invested was less compared to the number of deals as compared to previous years, but in 2025, this number of deals invested was only 37. The lowest in 7 years.

ANALYSIS ON INVESTMENT MADE IN EACH SEGMENT OF THE AGRICULTURAL SECTOR IN INDIA IN THE PAST 7 YEARS:

In order to understand the total investment made into the agricultural sector, by various investors, institutional investors, entrepreneurs, social investors and individual investors and the understand their attitude for investing, the various segments in which investment has been made in the agricultural sector has been analysed. For this purpose the agricultural sector is divided into 9 segments they are:

1. Investment in procuring Agricultural Equipment,
2. Investment in getting agricultural Inputs or Advisory from professionals,
3. Investment in the Dairy segment,
4. Investment in procuring Farm Management and Enterprise Software,
5. Investment in Financial Services provision for agricultural sector such as insurance etc,
6. Investment in Food Processing,
7. Investment in Market Linkage that is expanding the reach of agricultural produce to the consumers,
8. Others Agricultural segments and
9. Installation and Maintenance of Storage and Warehousing for agricultural produce.

Table 3: Table showing the segments in the Agricultural sector with the highest investment and No. of deals in the past 7 years

Sl.No	Year	2019			2020			2021			2022			2023			2024			2025		
	Sector	$ value (mn)	Rs. value (mn)	No of deals	$ value (mn)	Rs. value (mn)	No of deals	$ value (mn)	Rs. value (mn)	No of deals	$ value (mn)	Rs. value (mn)	No of deals	$ value (mn)	Rs. value (mn)	No of deals	$ value (mn)	Rs. value (mn)	No of deals	$ value (mn)	Rs. value (mn)	No of deals
1	Agri Equipment	3	280	1	3	280	3	1	93	1	1	93	1	4	373	6	67	6,242	14	4	373	4
2	Agri Inputs or Advisory	96	8,944	10	27	2,516	11	177	16,491	11	110	10,249	14	70	6,522	5	47	4,379	14	39	3,634	8
3	Dairy	25	2,329	4	24	2,236	4	49	4,565	6	111	10,342	3	3	280	7	40	3,727	4	62	5,777	4
4	Farm Management and Enterprise Software	17	1,584	7	11	1,025	6	165	15,373	12	142	13,230	11	7	652	5	43	4,006	7	50	4,659	4
5	Financial Services	57	5,311	3	5	466	2	60	5,590	5	50	4,659	1	6	559	1	18	1,677	3	31	2,888	5
6	Food Processing	45	4,193	9	126	11,739	6	18	1,677	2	7	652	3	113	10,528	5	50	4,659	3	2	186	2
7	Market Linkage	164	15,280	15	153	14,255	16	370	34,473	25	408	38,013	24	101	9,410	14	109	10,156	19	82	7,640	10
8	Others	1	93	1	0	0	0	32	2,981	3	1	93	3	0	0	0	0	0	0	0	0	0
9	Storage and Warehousing	77	7,174	5	63	5,870	6	3	280	1	1	93	2	10	932	2	29	2,702	1	0	0	0
	Total	**485**	**45,187**	**55**	**412**	**38,386**	**54**	**875**	**81,524**	**66**	**831**	**77,424**	**62**	**314**	**29,255**	**45**	**403**	**37,548**	**65**	**270**	**25,156**	**37**

In the above table, It can be seen that the segment that received the maximum deals and also the maximum investment from 2019 to 2025 is in the market linkage segment. In 2019, 15 deals with an investment of Rs.15,280 million was made in market linkage. In 2020, the no. of deals made were 16, even though there was a marginal decrease in the amount invested. In 2021 the no. of deals in the segment increased to 25. Even the investments in the segment increased to Rs.34,473 million. In 2022, The volume of investment increased even though there was a marginal decrease in the no. of deals. In 2023, the no. of deals reduced drastically alongside amount invested into the segment. But it still managed to lead the other segment by a huge margin both in terms of no. of deals and amount invested. In 2024, there was an increase to 19 deals in the segment with an investment of Rs.10,156 million. In 2025, this reduced to 10 deals in the segment with a total investment of Rs.7,640 million,

Market Linkage dominated the entire period. It brought in the most money in six out of seven years and made up almost 40% of all investment since 2019. This shows that Investors have found it necessary to ensure that the agricultural produce reach the intended customers in the given time and at the earliest hence they invested heavily in the market linkage segment. The necessity of connecting the farmers with the customers was felt more during the co-vid era, hence this lead to a sudden spike in investment and the no. of deals especially in 2021 and 2022. It peaked in 2022, then declined every single year after. Even though market linkage is the highest of any segment in 2025, it is an 80% drop from its peak. The second segment to have received the maximum investment and the max no. of deals is the advisory segment. In 2019, 10 deals valued at Rs.8,944 million were received in this segment. In 2020 & 2021, 11 deals were invested in the segment valued at Rs.2,516 million and Rs.16,491 million respectively. In 2022, the segment secured 14 deals valued at Rs.10,249 million and in 2023, there were only 5 deals valued at Rs.6,522 million. In 2024, the segment secured 14 deals though its value of Investment was less when compared to previous years. In 2025, a total of 8 deals were secured totalling Rs.3,564 million in investment.

From 2020 to 2021, there was a major increase of investment into the segment. This could be to the fact that during co-vid a phenomenon not experienced in modern day agriculture, many farmers and agents who deal in agricultural produce required advise on how to go about marketing their produce in such trying times. This lead to a lot of advisory firms setting up businesses. The increase in advisory segment deals from 2019, all through to 2022 shows that they were encouraged by impact investors who were willing to invest. However, after lockdown the need for such service has reduced which can be seen in the fluctuation in the no. of deals in the subsequent years. However, the deal activity has stayed steady at 8 to 14 deals most years, so investors are still interested, but they are writing smaller cheques. From 2019 to 2025 it shrank about 14% per year.

Farm Management and Enterprise software was another segment that received major investments and deals from 2019 to 2025. In 2019, 7 deals valued at Rs.1,584 million were made. In 2020, there was a slight reduction to 6 deals valued at Rs.1,025 million. In 2021 and 2022, the deals increased to 12 deals and 11 deals valued at Rs.15,373 million and Rs.13,230 million respectively. In 2023, the investment into the segment had reduced to 5 deals at Rs.652 million only. The segment got an investment of Rs.4,006 million and Rs.4,659 million in 2024 and 2025 respectively even though there were only 4 deals in 2025.

It can be seen that investors are interested in investing in technology and computers in the agricultural industry. This interest alongside Co-vid made the segment perform really well in 2021 and 2022, even though it collapsed in 2023 it can be seen that it has recovered in 2025, it has given a nearly 20% annual growth since 2019.

Investments were also made in the Food Processing segment. However, in the past 7 years we can see that there is a decrease in the number of deals in this segment. In 2019, Investments into this segment were Rs. 4,193 million with 9 deals. In 2020, Rs.11,739 million was invested in a total of 6 deals. In 2021, only 2 deals with an investment of Rs.1,677 million was received. In 2022, 3 deals valued at only Rs. 652 million and in 2023, 5 deals valued at Rs. 10,528 million were made. In 2024, the segment managed to get only 3 deals with the total investment amounting to Rs.4,659 million and in 2025, only 2 deals valued at Rs.186 million.

We can observe that while all the other segment mentioned previously did well during the co-vid years this segment did not follow the same trend. It had good investments before

co-vid, and immediately at the start of 2020 the no. of deals reduced but the investment made was high. In 2021 and 2022, this segment had very minimal deals and investment but in 2023 again there is a reversal in the trend and deals made though only 5, its investment increased. However in the subsequent years the investment have been very less, especially in 2025.
In other segments the investment more or less remained constant and the observation made on them are as follows:

The number of deals in diary product remained constant in 2019 and 2020. It increased marginally to 6 deals valued at Rs.4,565 million in 2021 and though the no. of deals reduced in the subsequent year, the value invested almost doubled to Rs.10,342 million. In 2023, this trend reduced drastically to only Rs.280 million investment. In 2024 and 2025, the deals the segment received was 4 each year with the amount invested being Rs.3,727 million and Rs.5,777 million respectively. It was noticed that dairy is getting more volatile year to year, but the trend is upward. Its best year was 2022 and 2025 is its second best. In 2025, Dairy also had the largest deals on average.

Agriculture Equipment segment had less growth for the five years with deals ranging from 1 to 3 no. There was a sudden spike in 2024 with 14 deals and an investment of Rs. 6,242 million. It fell back to Rs.373 million again in 2025. In the storage and warehousing segment, there was good investment in as it started off as the third largest segment with 5 deals and 6 deals respectively in 2019 and 2020 valued at Rs.7,174 million and Rs.5,870 million, But from 2021 this investment declined steadily and hit zero investment in 2025.
Financial Services was cyclical. It peaked at Rs.5,590 million in 2021, dropped to Rs.559 million in 2023, and came back to Rs.2,888 million in 2025. It can be noted that in the financial service segment given to the agricultural sector we can see constant fluctuation especially during 2021 and 2022, when co-vid was at its peak hinting at the requirement of finance by farmers and other agricultural agents which attracted investments into the segment. The “Others” segment disappeared after 2022 and received no investments in 2025.

FINDINGS AND SUGGESTIONS

The agricultural sector has managed to secure active investment from 2019 to 2027, even though there have been fluctuations in the investments and the no. of deals. The agricultural investment sector went through a full boom-and-bust cycle. 2019 started at a healthy Rs.45,187 million investment received across 55 deals. 2020 dipped slightly during Covid to Rs.38,386 million. Then 2021 and 2022 were clear boom years, with investment jumping to Rs.81,524 million and Rs.77,424 million respectively. Deal count also peaked in 2021 at 66.. After 2022 the market corrected hard. 2023 fell to just Rs.29,255 million and 45 deals, which is less than half of 2021 levels. 2024 looked like a recovery in deal count with 65 deals, but the total money only rose to Rs.37,548 million. That means investors were doing far more deals, but much smaller investments were coming in.. 2025 is the weakest year overall. It recorded only Rs.25,156 million across 37 deals, which is 44% lower than 2019 on Investments and 33% lower on deal count. So the sector in 2025 is smaller than it was seven years ago, and momentum is clearly down.

Market Linkage is the undisputed long-lasting segment of the sector. It attracted the most money in 6 out of 7 years and accounted for nearly 40% of all investment since 2019. It peaked dramatically in 2022 at fell every year after. Even in 2025 it still led the sector but at an 80% drop from its peak. So when Market Linkage slows, the whole sector feels it.

Agricultural advisory and Inputs is the second largest segment overall. It had a huge year in 2021but has been on a steady decline since. It’s still one of the most active segments for deals, with 8 to 14 deals every year except 2023.The only three segments that actually grew from 2019 to 2025 are Farm Management and Software, Financial Services and Dairy. Farm Management had a massive spike in 2021 and 2022, crashed in 2023, then recovered by 2025. That gives it almost 20% annual growth since 2019. Dairy is volatile but trending up.

It also had the largest average deal size in 2025.Food Processing and Storage & Warehousing are the biggest casualties.

The boom of 2021-2022 looks like it was driven by Market Linkage and tech-enabled Farm Management platforms. As that funding cooled, the sector hasn't found a new growth engine yet. Dairy and Farm Management are holding up, and Agricultural Equipment showed one strong year, but they're not big enough to offset the decline in Market Linkage and the collapse in Food Processing and Storage.

The most important finding is that Co-vid had a positive impact on investments in the agricultural sector. Even though the number of deals had increased by only 10 extra deals, the investment made were almost Rs.40,000 million more that the pre-covid and post co-vid times.

To get clarity has to why co-vid years benefitted the agriculture sector and to understand the attitude of investors an analysis on the different agricultural sector was made. In the study, it can be seen that market linkage secured the highest funding. This implies that during co-vid the most important task for farmers was getting the product available to the end users before the yield got spoilt. This in turn led to a need of various middle men who could do the job during co-vid. Many start-ups like Fresh to Home etc, came into existence where they procured the yield directly from the farmers, processed and packed the food and distributed it to the consumers at their door step by tie up with different aps. These starts ups received good funding from investors.

Another segment that benefitted was the advisory segment. Most farmers had to grow and supply food under lock down. A scenario which has never been seen or faced before. As such most of them were unaware how to handle the difficulties. Hence, there was a need for advisory services in the agricultural sector who could guide the farmers in getting the best returns for the crops in challenging times.

Use of computer and technology in agriculture such as farm management software was also another segment that attracted investments in the last seven years. This shows that farmers are more techy savvy and as such they want to make use of this knowledge to ensure it will lead to smarter and faster work and good yield. Food processing was also another popular segment that investors found attractive as an investment opportunity. They were investing in units that stored food and ensured food never perished overnight.

The post co-vid investments made in the agricultural sector was very low. There has been a sharp fall in investments and in the number of deals.

CONCLUSION

The agricultural investment landscape went through a clear boom-and-bust cycle over these 7 years. 2019 and 2020 were steady but modest. Then 2021 and 2022 were the boom years. Investment more than doubled in 2021and stayed high in 2022. Deal count also peaked at 66 in 2021. After that, the market corrected sharply. 2023 the sector investments fell drastically. 2024 saw a rebound in deal count to 65, but the Investment value only recovered modestly with 2025 being its weakest year in the entire period.

The rules of investing capital have changed in the agricultural sector. Average deal size halved from 2021-2022 to 2025. Only 4 segments crossed Rs. 2500 million in 2025. Market Linkage, is still the largest but no longer drives sector growth. Capital has rotated to segments with proven fundamentals. Dairy,Farm Management, Financial Services are the sectors that grew since 2019, showing resilience in the sector. Agri Equipment spike in 2024 hints at a potential third pillar around mechanization, though it needs confirmation.

The cause for the agricultural cycle was not agri-specific. It was driven by global venture capital attitude and liquidity and the covid thesis, then got reversed by macro tightening. Segments that got funded in 2021 did not get funded in 2025, as it was noticed.

The easy-money era of 2021-2022 is over. The next wave of agricultural segment winners will be built on cash flow, not narrative.

The agricultural sector has shrunk back to its 2019 size, but it's healthier — leaner, more disciplined, and concentrated in segments where India has a real structural advantage. Thereby, creating an opportunity to impact investors in backing the "Resilient" archetypes at reset valuations.

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MACHINE LEARNING-DRIVEN MATHEMATICAL MODELING FOR CLIMATE-RESILIENT CROP ROTATION AND NUTRIENT MANAGEMENT

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ABSTRACT

The upsurge in global population and the alarming rate of soil degradation due to over-reliance on only one type of crop have called for sustainable agricultural practices. This paper proposes a Machine Learning Approach for Mathematical Model of Climate Adapted Crop Rotation and Nutrient Management using advanced machine-learning skills. The system taps into soil nutrient status, history of farming activities, climatic history, and the enhanced vegetation index to suggest the required crops and the cropping pattern, which is aimed at improving soil health and increasing crop yield. The Bayaesian Ridge Multiple Imputation by Chained Equations (BRMICE) method is used to cope with the missing data, assisting in data improvement and making accurate forecasting to be more viable. The model also uses Recursive Feature Elimination (RFE) for selecting the relevant variables and applies Random Forest (RF) to predicting climate change and its likely effect on crop growth. The proposed system had an R^2 score of 0.92, the RMSE (Root Mean Square Error) was 2.8 and MAE 1.9 all of which demonstrated a very high predictive performance. This performance is much better than the baseline models like Random Forest, Linear Regression, and K-Nearest Neighbors which have higher error rates. Involvement of climate resilient areas and soil nutrient applications in the crop recommendation enables flexibility for regions like Tamil Nadu Delta which have diverse agriculture and changing climatic regimes that require a more systematic sustainability goal in farming practices. As a result, this system also marks a remarkable improvement in precision agriculture, enhancing crop yield and at the same time retaining the soil health and sustainability in the long term. This numerical model involves a systematic, organized and productive means of managing crop rotation systems aimed at enhancing soil health, yields and climate change adaptation.

KEYWORDS: Crop rotation, nutrient analysis, climate resilience, machine learning, sustainable agriculture, crop yield prediction, soil fertility.

INTRODUCTION

Agriculture is one of the most important occupations in India, especially as it accounts for approximately 42.6% of the workforce and is also responsible for about 18% of the country's GDP [1] as in Fig.1.

Fig. 1 India's Agriculture Economy

Tamil Nadu has been productive in the agricultural sector as most of its labour force is rural with over 60% of workers engaging in farming sectors focused on sugarcane, rice, pulses, and cotton[2]. Nonetheless, the state is confronted with several agricultural issues that are detrimental to productivity as well as sustainability. The factors and the reason for such unsustainable practices of agriculture include erosion, soil degradation, and climate change which continues to disturb the weather patterns. The decrease in nutrient levels is attributed to traditional monocropping, while temperature increase, and existing erratic patterns as a result of climate change would require diversification in crop types and varieties for resilience[3]. Crop rotation has emerged to be sustainable and focuses on restoring nutrients in soil but in the absence of climate resilient practices, farmers remain exposed to weather extremes which lead to crop losses (Fig. 2.)

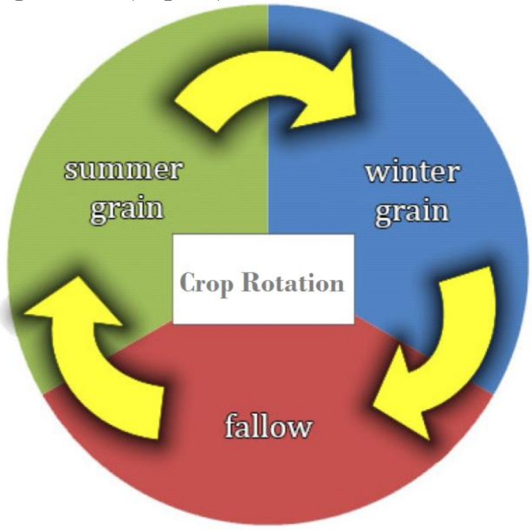

Fig .2 Crop Rotation

Monoculture farming, including rice cultivation which is favored in specific areas like the Cauvery Delta, features on the list of one of the main problems that characterizes agriculture in Tamil Nadu. In a recent study conducted by farmers in the Cauvery Delta area, TN agricultural university, about a shocking 75% of farmers were into monoculture farming as well as rice farming. This practice, however, has some short-term benefits of growing more crops, but it resulted in the depletion of all important nutrients within the soil itself, including Nitrogen, Phosphorus, and Potassium. Rice monoculture rotation has caused adverse effects on the soil because of the imbalance present within the nutrient provision in the soil. Nutrients are being used at a faster rate, and their replenishment is slower, creating a system that cannot be improved. Similarly, the same surveys reported that Tamil Nadu's agricultural landscape has a hunger for nutrients, and a third or more than forty percent of it is already lost. Organic matter content is going out dangerously fast. And if that was not enough drama in the theatre of challenges for agriculture in Tamil Nadu, climate change is bringing more. The state has seen a disruptive trend in rainfall, where over the last decade there has been a 20 percent decrease during the northeast monsoon. For example, districts like Ramanathapuram and Thoothukudi are worst affected, with drought every alternate year. In such areas, in which more than 70 per cent of agriculture is rain-fed, the absence of assured supply of water particularly makes the farmer vulnerable to crop failure[7]. Under these circumstances, monocropping added to the vagaries of the monsoon patterns threaten Tamil Nadu's farmers. Crop rotation has been suggested as an alternative sustainable practice to monocropping. This approach involves alternating crops depending upon the difference in nutrient requirements and characteristics to replenish soil fertility and enhance yields[8]. However, the traditional crop rotation needs optimization with modern data-driven approaches for consideration of soil health and climate resilience. Therefore, to overcome these challenges, this paper introduces a Crop Rotation-based Crop Recommendation System that integrates nutrient analysis and climate resilience using machine learning techniques. The crop recommendation system will be constructed to integrate crop rotation with soil nutrient analysis and climate resilience practices based on machine learning techniques. This data-based approach may yield 15-20% more crops, which was the result of pilot studies in drought-prone areas in Tamil Nadu where drought-tolerant crop varieties were introduced. The system provides solutions that will enhance both the fertility of the soil and the adaptability to changing climate conditions, hence enabling more robust agricultural practices, by incorporating climate predictions into crop recommendations.

LITERATURE REVIEW

Crop rotation remains a key tactic for soil fertility management and nutrient depletion prevention. Studies have shown that crop alternation using crops that typically replenish nitrogen in the soil with nutrient demanding crops can make soils healthy and yield rich. ML algorithms enable farmers to predict the levels of nutrients, pH, and organic matter present in the soil so that farmers can plan ahead for fertilization and crop choice [9]. With ML-based systems, it analyses meteorological and soil data in order to recommend crop selection, which enhances its yield and quality [10]. A prototype combining real-time data and ML techniques has proven more significant improvements in crop selection pertaining to the soil conditions. However, in order for long-term sustainability, climate factors must be included in crop rotation strategies.

In the meantime, through assessing nutrient content in the soil, farmers can efficiently manage their resources. Further recent progresses also point out the centrality of incorporating climate factors since extreme temperatures and drought conditions can make nutrient depletion worse [11]. Climate change resilient crops are important for addressing food and nutrition insecurity in marginal lands. Underutilized and neglected crops offer promise due to a high nutritional profile and tolerance to abiotic stressors [12]. Climate-resilient crop selection research highlights the need for integrated approaches that account for both nutrient and climate variability.

Machine learning approaches are demonstrated to be very efficient tools for processing big data in precision farming. Random Forest, Support Vector Machines, and Neural Networks are all popular techniques used for predicting soil conditions and crop yields

[13]. Machine learning models are also being created to forecast the weather pattern impact on crop health so as to assist in climate-adaptive crop recommendation systems [14]. These improve crop yield prediction models based on historical weather patterns and help in supporting sustainable agriculture and resource optimization. [15].

SYSTEM DESIGN

In the proposed Crop Recommendation System, three main modules crop rotation, nutrient analysis, and climate resilience are included and employed using machine learning algorithms. All these components combine to offer crop recommendations that optimize soil health and improve their resilience towards adverse climatic conditions.

Data Collection The module collects data from government of India Data ports across multiple sources in the form of soil nutrient levels [16], history climate data [17], and real-time environmental conditions NDVI[18] crop history. IoT sensors and remote sensing technologies play a vital role in such data collection in real time.

Nutrient Analysis: This module conducts in-depth analysis of soil nutrient levels and climate trends to predict potential nutrient depletion and the likelihood of climate stressors such as droughts and heat waves. Continuous monocropping, particularly in rice-based farming systems, has depleted the soil nutrients substantially in Tamil Nadu's Cauvery Delta regions. Studies by Tamil Nadu Agricultural University (TNAU) indicate that there is increasing deficiency of organic carbon and other essential nutrients in soils within this region. Without replenishing these, crop yields will continue to decline. In Nagapattinam and Tiruvarur, soil tests have confirmed a substantial drop in potassium levels, which is a critical component in rice cultivation. In such cases, alternative crops that require less potassium, or methods to replenish the soil, can be recommended.

Climate Resilience Analysis: This module prescribes crops based on soil nutrient analysis, climate patterns, and historical cropping sequences. In addition to this, the Cauvery Delta is also vulnerable to climatic stressors like irregular rainfall, droughts, and floods. According to IMD data, northeast monsoon has been declining by 20% for the delta over the last decade. Again, areas such as Nagapattinam have been experiencing recurrent drought, which affects considerably crop cycles and yields. It considers crops' tolerance toward climate factors such as drought and heat stress as well as irregular rainfall patterns. Climate data-both historical and real-time-is used to train machine learning models in predicting the probability of adverse weather events. For example, a periodic cycle of low rainfall in the area will evince water-loving crop suggestions or even timing changes for sowing seasons.

The core of the system will use Random Forest (RF) to predict the impact of certain crops on soil nutrients considering climate variations. Recursive feature elimination, RFE, will be used for feature selection. Models will then undergo cross-validation to ensure the ultimate accuracy of crop recommendation.

METHODOLOGY

The proposed model comprises of different phases from data collection such as soil health data, climate data, previous crop history data and nutrient data to prediction of crop rotation patterns and recommending crop which is high climate resistant. Architecture of the proposed model consists of phases that integrate various components such as soil health data, climate data, and machine learning algorithms which are depicted in Fig. 4.1.The model's architecture can be tailored to the unique challenges of Tamil Nadu’s delta region. By using soil health data from the delta, the system can identify nutrient depletion trends caused by paddy monocropping and suggest leguminous crops to restore fertility. The model can recommend crops based on climate stress data (e.g., drought-resistant crops for regions facing water shortages), helping farmers adapt to changing weather patterns.

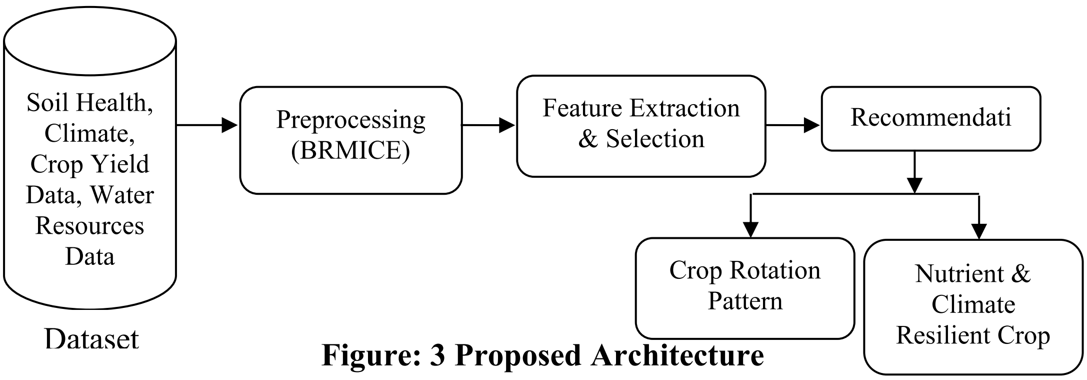

Figure: 3 Proposed Architecture

DATA PREPROCESSING

Many soil health datasets contain missing entries for critical parameters like nitrogen (N), phosphorus (P), potassium (K), or pH levels. Missing values complicate the training of machine learning models, as they lead to biased predictions or inaccurate insights. The SHC Scheme data is usually updated every three years. This low temporal resolution means that significant changes in soil quality or nutrient levels between cycles are not captured. While NDVI is a widely used index, its limitations in regions like the Tamil Nadu delta necessitate the use of alternative indices and technologies. Enhanced Vegetation Index (EVI) improves upon NDVI by correcting for atmospheric conditions and soil background noise, making it more reliable in areas with dense vegetation and high atmospheric aerosols. It is Ideal for monitoring crops like rice and sugarcane in the delta region. It performs better than NDVI in areas with dense vegetation and high humidity. It is mathematically understand through the give Equ. 3.

$$EVI = G \times ((NIR - Red))/((NIR + C1 \times Red - C2 \times Blue + L)) \quad \text{--- Equ. (3.1)}$$

Where, NIR is Near-Infrared reflectance, Red is Red reflectance, Blue is Blue reflectance, G is Gain factor (typically 2.5), C1&C2 are Aerosol resistance coefficients (usually C1=6, C2=7.5), L is Canopy background adjustment factor (usually 1). Dataset are normalized, to handle missing data in the soil health dataset (for example, missing values for nitrogen, phosphorus, potassium, or pH levels), several preprocessing techniques can be applied. One such common method is Data Imputation, where missing values are replaced by plausible estimates based on other data points. It preserves the underlying structure of the data, making it more suitable for predictive modeling in agriculture. In traditional MICE, the imputation method is static. When dealing with high-dimensional data like soil health variables, where multicollinearity between variables may exist, Bayesian Ridge Multiple Imputation by Chained Equations (BRMICE) can improve the robustness of imputations by introducing a prior distribution over the regression coefficients. This allows for flexibility in handling different types of variables (categorical, continuous) and relationships in the dataset. It reduces bias by adapting to different feature relationships. Given that relationships between variables such as soil nutrients and NDVI can be non-linear, traditional MICE using linear regression may not be sufficient.

The imputation is performed by modeling the coefficients with a Gaussian prior as in Equ. (3.2).

$$\hat{\beta} = (X^T X + \lambda I)^{-1} X^T y \quad \text{--- Equ. (3.2)}$$

Where, X is the matrix of input features (e.g., soil nutrients, weather data, crop history), λ is the regularization parameter (controls overfitting), I is the identity matrix, β is the vector of regression coefficients. The posterior distribution is calculated, and missing values are imputed based on Equ. (3.3) updated distribution.

$$P(\beta \mid X) \propto P(X \mid \beta) P(\beta) \quad --- \text{Equ. (3.3)}$$

This method is especially useful when the soil dataset has a large number of correlated features. Weather data missing values over a time computed using the formula in the Equ. (3.4).

$$X_t = \alpha + {}_{i=1}^{p}\phi_i X_{t-i} + {}_{j=1}^{q}\emptyset_j \in_{t-j} + \in_t \qquad \text{--- Equ. (3.4)}$$

Where, Xt is the weather variable (e.g., temperature) at time t and α, ϕi, θj are model parameters. This accounts for the temporal correlation in weather data, ensuring consistent imputation over time.

For the spatial imputation of missing values of EVI, use the following Equ. (3.5).

$$\mathrm{EVI}(s_0) = {}_{i=1}^{n}\lambda_i \mathrm{EVI}(s_i) \qquad \text{--- Equ. (3.5)}$$

The location with missing EVI is s0, and λi will be a set of weights calculated from variograms that represent spatial correlation.

FEATURE SELECTION AND MODEL TRAINING

The main features are nutrient levels, climate variables (for example, temperature anomalies and precipitation variance), and crop data. The technique of Recursive Feature Elimination (RFE) is applied to optimize feature selection and train machine learning models on datasets made up of parameters of soil and climate [19]. RFE forms the basis of crop recommendation systems by sequentially peeling away irrelevant features to improve prediction accuracy [20]. The system is trained to discern patterns in nutrient depletion and crop resilience to climate extremes. Along with nutrient analysis, the system includes data from climate models, such as projections of future changes in weather variability. These data determine which crops are better suited in the light of changes expected in weather. For example, drought-tolerant varieties can be advised to places that are witnessing decreasing rainfall, while heat-resistant varieties are suggested for areas that are warming up.

CROP RECOMMENDATION ALGORITHM

The recommendation algorithm takes into account: Soil nutrient levels, Predicted weather conditions, previous crop and crop rotation principles and Vegetation health. The system optimizes for yield and sustainability, ensuring that nutrient depletion is minimized and crop rotation principles are followed as in Equ. (3.6).

$$\mathrm{Maximize}_{i=1}^{n}(\mathrm{Yield}_i \times \mathrm{Profit}_i) - {}_{j=1}^{m}\left(\mathrm{SoilNutrientDepletion}_j\right) \qquad \text{--- Equ. (3.6)}$$

Where, Yield_i is the yield of crop i, Profit_i is the profit per unit of crop i, $\mathrm{SoilNutrientDepletion}_j$ is the nutrient depletion caused by growing crop j. The system optimizes for yield (measured in terms of productivity and profit) while minimizing soil nutrient depletion. The objective function takes into account multiple variables that influence crop selection, such as soil nutrient content, climate conditions, and historical crop data. The optimization is subject to certain constraints related to soil health, weather forecasts, and crop rotation. Crops must be selected such that soil nutrient levels (N, P, K) remain within acceptable ranges. For instance, growing high nitrogen-consuming crops like maize would need to be balanced with nitrogen-fixing crops like legumes in subsequent seasons. Crops must be suitable for the predicted weather patterns (rainfall, temperature). Model helps ensure that the recommended crops are resilient to upcoming climatic conditions. A crop cannot be recommended if it violates crop rotation principles (e.g., planting the same crop consecutively in the same field), to prevent soil degradation and pest buildup.

RESULTS AND DISCUSSION

MODEL ACCURACY AND PERFORMANCE

The integration of nutrient depletion and climate resilience into the crop recommendation system significantly improved model performance. Performance of the proposed model is estimated through the R2, Root Mean Square Error (RMSE) and Mean Absolute Error (MAE).

TABLE 1
COMPARISON OF PERFORMANCE OF PROPOSED MODEL WITH BASELINE MODELS

Model	R^2 Score	RMSE	MAE
Proposed Model (Enhanced MICE + RFE+ Random Forest)	0.92	2.8	1.9
Random Forest (RF)	0.88	3.5	2.5
K-Nearest Neighbors (kNN)	0.81	4.7	3.9
Linear Regression (LR)	0.78	5	4.3

The Proposed model achieves a high R^2 of 0.92, low RMSE of 2.8 and MAE of 1.9 which indicates a strong correlation between recommended crops and actual yield outcomes in varied climate scenarios compare to baseline models RF, kNN and LR. The inclusion of climate data improved the system's ability to recommend drought-resistant and heat-tolerant crops, enhancing its utility for climate-impacted regions.

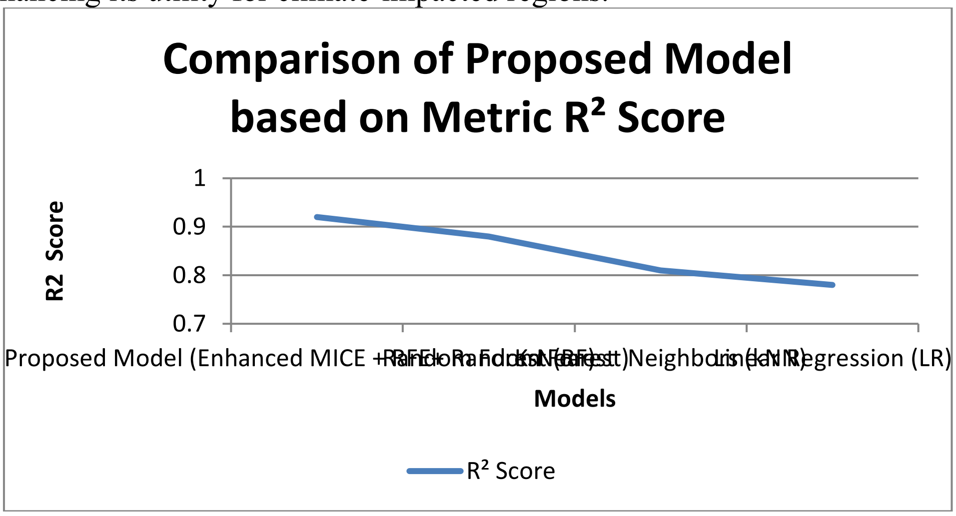

FIG 4 Comparison of Proposed Model based on Metric R^2 Score

Figure 4 shows a pictorial representation of comparison of proposed model based on the metric R2 and it is clear that the proposed model shows a high R2 of 0.92 compare to the baseline model RF, kNN, and LR with the value of 0.88, 0.81, and 0.78 respectively. This difference in R^2 score highlights the proposed model's superior predictive performance and robustness in diverse agricultural environments.

Figure. 5 shows a pictorial representation of comparison of proposed model based on the metric RMSE and MAE, from that it is clear that the proposed model shows a low RMSE of 2.8 and Low MAE of 1.9 respectively compare to the baseline model RF, kNN, and LR with the value of 3.5, 4.7, and 5 of RMSE and 2.5, 3.9, and 4.3 of MAE respectively. This result shows that the proposed model showing the model's ability to minimize average prediction error, making it highly effective and indicating better prediction accuracy, especially in terms of larger errors.

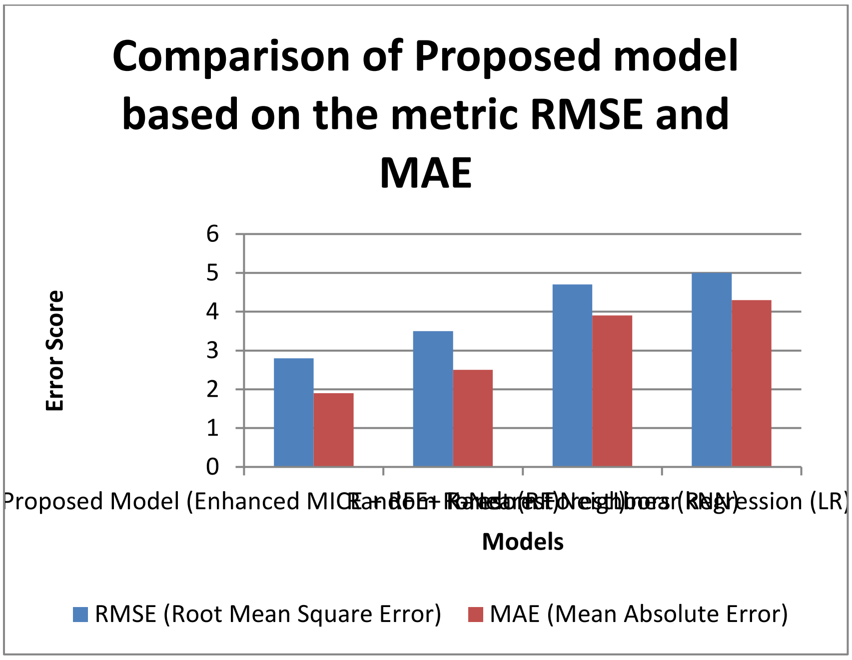

Fig: 5 Comparison of Proposed Model based on Metric RMSE and MAE

IMPACT OF CLIMATE-RESILIENT CROP ROTATION

Fields that implemented the system's recommendations experienced better adaptation to climate stress. Yield improvements of 15-20% were observed in regions prone to drought, where the system recommended drought-tolerant crops. Crop rotation was well implemented as to ensure nutrient balance in the soil and thus prevent further degradation under challenging climate conditions.

LIMITATIONS AND FUTURE WORK

While the system shows promise in integrating climate resilience, its reliance on accurate and localized climate data is a limitation. Variability in climate data quality, especially for smallholder farms, can affect recommendation accuracy. Future enhancements will focus on real-time climate forecasting integration and the inclusion of pest and disease resilience in the recommendation algorithm. This will enhance the capabilities of the model in tracing and forecasting long-term changes in soil health along patterns of crop rotation to encourage sustainable farming practices.

CONCLUSION

The proposed Machine Learning-Driven Mathematical Modeling for Climate-Resilient Crop Rotation and Nutrient Management offers a comprehensive solution towards sustainable agriculture. By benefiting from machine learning, the system provides intelligent crop recommendations balancing the soil nutrient needs and improving adaptability to varied climate conditions. The model achieves superior accuracy with an R^2 score of 0.92 and RMSE and MAE of 2.8 and 1.9, respectively, by combining Recursive Feature Elimination for feature selection, Random Forest for crop recommendation, and BRMICE for handling missing data. These are such results that would sustain the system while handling complex information like agricultural soil health, crop history, weather data, and climate resilience indices, which are still tough to handle in environments like the Tamil Nadu Delta Regions. The potential of this system would prove useful to farmers when they would seek improved yield as well as soil health before the impact of climate change. The model's dual approach of using both RFE and RF ensures that key factors such as nutrient levels, historical cropping data, and climatic conditions are initially prioritized to enable more accurate and sustainable crop rotation planning. Moreover, the introduction of the RF model to predict climate increases the flexibility of the system toward unpredictable weather conditions and is very useful for farmers who seek maximum crop productivity along with soil health. Future versions of the model could include data on pest and disease resistance, which might assist farmers in the selection of crops best suited to soil and climate conditions while also being more resilient against possible biotic threats.

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UNDERSTANDING JOB SATISFACTION AMONG SEMI-URBAN COLLEGE FACULTY: THE INFLUENCE OF WORK-LIFE BALANCE, AGE AND WORK EXPERIENCE

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ABSTRACT

Work-life balance (WLB) is an important determinant influencing faculty members' attitudes, well-being, and quality of life in contemporary workplaces. The present study examines how WLB, job satisfaction (JS), Age and work experience (WE) are associated among college faculty members. The proposed model was analysed using Structural Equation Modelling. The required information was obtained from faculty members through a structured survey instrument. The study employed Confirmatory Factor Analysis (CFA) to test the measurement model, which yielded acceptable construct reliability and validity. The structural model findings showed that WLB significantly and positively affects JS. Additionally, WE significantly and positively affects JS, suggesting that faculty members with greater professional experience tend to report greater JS. The findings also reveal that Age significantly influences WE, indicating that older faculty members generally accumulate greater professional experience over time. Overall, the research emphasizes the need to promote WLB and acknowledge the contribution of professional experience toward improving faculty members' JS and workplace effectiveness within higher educational institutions.

KEYWORDS: Work-Life Balance, Job Satisfaction, Work Experience, Age, Structural Equation Modelling, Employee Well-Being.

INTRODUCTION

Achieving work-life balance (WLB) remains a significant challenge in the modern workplace owing to changing employee priorities and dynamic organizational environment. In a highly competitive and globalized economy, achieving WLB is crucial not only for the employee well-being but also for the sustained success of organizations (Nayal et al., 2022). WLB denotes the capacity of employees to manage both professional and personal obligations and due to its strong impact on employees and organizational performance, it has gained significant attention (Haar et al., 2014; Maertz & Boyar, 2011; Kossek et al., 2014; Greenhaus

& Allen, 2011; Gaur and Tarkar, 2025). The ability of employees to balance their personal and professional obligations is closely linked to job satisfaction (JS), which plays a crucial role in employee engagement and retention (Vavasseur, 2024). According to Olawale et al. (2024), Changes in workforce demographics, digital innovation, and new cultural perspectives have increased the importance of understanding employee WLB.

Over the past few decades, scholarly attention has focused on the impact of WLB on workers' welfare and occupational outcomes (Wood et al., 2020). However, increasing work pressures, long hours of work and heavy responsibilities often interfere with family life and personal activities (Brough et al., 2020). Moreover, in modern workplaces, boundaries between work as well as personal life have become less clear, leading professionals to work harder than previous generations (Ljungkvist & Moore, 2023). Varatharaj and Vedanta S. (2012) found that more than 60 percent of employees experience difficulties in sustaining WLB. Similarly, Subha (2013) reported that most workers face difficult decisions when work and personal life conflict.

Modern employees are exposed to increased stress due to increased unemployment, inflation, and long working hours. Many individuals prioritize work over their personal lives resulting in poor WLB (Maeran et al., 2013). Numerous studies have examined how WLB influences JS and organizational performance, however existing research has largely concentrated on developed nations. In Indian cities Chennai, WLB is often affected by long working hours, excessive workload, and unfavourable work environment. This issue is evident in the education sector. Where faculty members are required to manage teaching, research, administration, and technology-related tasks. Such duties are stressful and hinder the effective management of WLB. JS generally declines when WLB is adversely affected (Nadeem & Abbas, 2009).

Although previous research has explored association between WLB and JS, comparatively little attention has been given to the Indian higher education sector, particularly in semi-urban regions. Furthermore, limited research has explored how WLB influences JS. Hence, this study investigates how WLB affects JS among college faculty in Tirupattur District, Tamil Nadu, by considering age and work experience as control variables. This study includes faculty from government, aided and self-financing colleges. The work of a faculty is so demanding and it is not easy to achieve a WLB. Enhancing JS improves performance and employee stability. Findings can help colleges develop improved policy and environment to enhance the education standards in the district.

THEORETICAL FRAMEWORK

Work-Life Balance (WLB)

WLB reflects employees' perception and evaluation of how effectively work responsibilities are integrated with personal life. Previous research consistently stresses on the importance of WLB in improving workers' attitudes, well-being and organizational outcomes. Naeem and Abbes (2009) examined how work-life conflict (WLC) relates to JS within governmental and non-governmental organizations in Pakistan. Their findings showed that JS and WLC are inversely related at all hierarchical levels, indicating that employee JS decreases as work and family responsibilities become more conflicting.

To assist workers in handling occupational and family responsibilities, organizations frequently address WLC through WLB initiatives. Lazar (2010) emphasized that achieving a healthy WLB benefits both employees and employers by enhancing interpersonal relationships and improving overall organizational performance. Employees who perceive greater control over their occupational and family roles generally experience greater JS and welfare.

Employee JS is an important factor in achieving WLB. Susi (2010) noted that organizations with strong WLB practices are more successful in retaining skilled employees, reducing WLC as well as improving employee welfare and JS. WLB is also crucial for employee productivity and performance. Asiedu-Appiah (2013) highlighted that WLB significantly enhances productivity in both occupational and personal spheres. Recent research further emphasises the importance of WLB within human resource management. Wolor et al. (2020) identified WLB as a critical issue that strongly influences employees' attitudes and organizational outcomes.

The concept of WLB is closely related to Role Theory, which suggests that individuals perform multiple occupational and personal roles that can create conflict when role expectations clash. The theory explains that employees often struggle to balance professional and personal responsibilities because both domains require time, energy, and commitment. Effective balance between these roles can reduce stress, improve psychological well-being, and promote favourable workplace outcomes, including JS and employee commitment.

According to Greenhaus et al. (2003) "Work-family balance involves equal participation as well as satisfaction in work and family roles, comprising three dimensions: time balance, involvement balance, and satisfaction balance." Similarly, Hill et al. (2001) defined WLB as "the ability to simultaneously manage emotional, behavioural, and personal responsibilities across life domains."

Despite its recognized importance, achieving WLB remains challenging due to competing work and personal demands (Bataineh, 2019). Inadequate WLB often results in heightened stress levels (Emslie & Hunt, 2009) and negatively affects employees' welfare, productivity, and work outcomes (Meenakshi et al., 2013; Bataineh, 2019).

Job Satisfaction (JS)

JS describes how workers generally feel and think about their work. It's strongly associated with productivity, personal welfare, and institutional outcome (Kaliski, 2007; Aziri, 2011). Employee JS depends on various factors such as type of work, colleagues, supervisors, salary, workplace conditions, etc. (George & Jones, 2008). JS reflects workers' overall attitude and feelings regarding their jobs. It not only influences professional success but also affects employees' welfare, covering family bonds, social interactions, and health. Recent research shows that higher JS is closely associated with a more fulfilling personal life (Malek et al., 2025). Motivational styles and leadership approaches also influence the feelings of satisfied employees and their performance (Raziq & Maulabakhsh, 2015).

The concept of JS has strong foundations in motivational and organizational theories, particularly Herzberg's Two-Factor Theory, which classifies the determinants of employee satisfaction into motivational and hygiene components (Herzberg et al., 1959). Achievement, recognition, responsibility, and career advancement function as motivating elements that enhance employee satisfaction, while salary, workplace environment, and organizational regulations act as hygiene factors reducing dissatisfaction.

The theory suggests that employees experience higher JS when organizations provide supportive working environments and opportunities for career advancement and self-development.

Employees with high JS are generally more engaged, committed, and efficient, benefiting both individuals and the organizations (Judge et al., 2001; Shepherd & Mathews, 2000; Yalabik et al., 2013; Kelidbari et al., 2011; Bin Shmailan, 2016). On the contrary, dissatisfied employees may avoid responsibilities, take more leave, and negatively affect organizational performance.

Modern management emphasizes recognizing employees' unique needs and aspirations, highlighting the importance of JS in organizational effectiveness (Aziri, 2011). JS is also influenced by emotional states, personal achievement, recognition, and integration of job activities with individual values (Bakker et al., 2011; Wexley & Yukl, 1984; Herzberg et al., 1959).

Association between Work-life Balance and Job Satisfaction

The number of organizations implementing WLB programs to enhance employees' JS and organizational loyalty is increasing. Human resource strategies, including flexible working arrangements, supportive policies, and employee recognition, help employees achieve better WLB, which in turn improves JS (Sakthivel, 2011). Maintaining a healthy WLB is considered a key determinant of JS. Employees who maintain a better WLB generally experience higher levels of JS (Qodrizana & Al Musadieq, 2018). Similarly, employees with good WLB often show greater motivation, enthusiasm, and positive attitudes toward their work and organization (Nilawati et al., 2019; Yusnita et al., 2022).

The association of WLB with JS may also be understood through Role Theory and Social Exchange Theory. Role Theory suggests that imbalance between work and personal responsibilities creates stress and conflict, which may reduce worker JS and welfare (Kahn et al., 1964). In contrast, employees who successfully balance multiple roles tend to experience favourable workplace attitudes and greater JS. Social Exchange Theory further explains that employees tend to respond positively when organizations provide supportive work environments and WLB initiatives, leading to improved commitment, loyalty, and JS (Blau, 1964).

Several researches have demonstrated that WLB has a favourable impact on JS. While stress, work-family conflict, and heavy workloads reduce employee JS, flexible work arrangements and supportive work environments increase it (Shujat et al., 2011; Arunika & Kottawatta, 2015). Research also shows that better WLB can reduce employee turnover and absenteeism while improving JS (Agha et al., 2017; Frame & Hartog, 2003; Rifadha & Sangarandeniya, 2015; Yusnita et al., 2022). These findings provide empirical evidence that effective WLB practices contribute positively to employee welfare as well as institutional performance.

Within higher educational institutions, college faculty often face challenges such as long working hours, administrative duties, and research responsibilities and personal obligations, which may lead to stress and reduced JS. Although WLB is widely recognized as important for employee well-being and productivity, its impact on JS among colleges in Tirupattur District has received limited scholarly attention. Moreover, limited research has explored how demographic factors such as age and work experience jointly affect WLB and JS among faculty members in semi-urban educational institutions. Therefore, the present study investigates the association between WLB and JS while also examining the role of age and work experience in influencing WLB among college faculty.

Age and Job Satisfaction

Research indicates a slight favourable link between age and JS, suggesting older employees often report slightly higher JS than younger employees (Herzberg et al., 1957; Hunt & Saul, 1975; Glenn et al., 1977). One explanation is that with age, employees typically acquire greater experience, higher income, and more responsible positions, which can increase their JS. Jobs held by older workers may also provide more opportunities for skill utilization, influence, and variety to improve JS (O'Brien 1980). Another explanation relates to differences between generations. Younger employees usually have higher education levels and greater expectations regarding meaningful work, skill utilization, and opportunities for growth. When these expectations are not met, younger workers may experience lower JS than older workers (Levitan & Johnston, 1973; Sheppard & Herrick, 1972). Therefore, both work-related determinants like experience, income, job characteristics, along with generational differences in work values, may influence the age and JS relationship (O'Brien & Dowling, 1980).

Career Stage Theory explains age-JS patterns, suggesting that employee satisfaction changes across different career phases (Super, 1980). Older employees are generally more experienced, adaptable, and stable in their careers, which may contribute to higher levels of JS. In contrast, younger employees may face uncertainty, role adjustment challenges, and unmet career expectations, which can negatively affect their JS (Levinson, 1986).

Work Experience and Job Satisfaction

Prior studies suggest that work experience (WE) plays an important role in JS. Workers with longer WE tend to exhibit higher JS and productivity because they develop better skills, confidence, and a stronger understanding of their job duties. Experienced employees are also better able to manage work challenges and responsibilities (Paraskevopoulos et al., 2025).

Prior research has highlighted that age, as well as WE have a positive relationship with JS. In the context of Nigeria primary school teachers, Bodur (2002) observed that older and greater experienced teachers generally reported higher JS, although the relationship was small but significant. Other studies also suggest that factors like age, WE, education and salary can influence employees' level of JS (Mosadeghrad et al., 2008). However, some studies found that younger and less experienced employees may also report higher JS in certain situations (Clark et al., 1996; Perie et al., 1997). The positive relationship between WE and JS may be explained by the fact that experienced employees generally possess greater professional competence, job security, confidence, and coping abilities. Over time, employees become more familiar with organizational expectations and work responsibilities, which can enhance their comfort and satisfaction at work. These outcomes indicate that age as well as WE affect employees' JS across different organizational contexts.

HYPOTHESES

H_1: Age positively affects work experience.

H_2: Age positively influences work-life balance.

H_3: Work-life balance positively impacts job satisfaction.

H_4: Work experience positively predicts job satisfaction.

METHODOLOGY

This section describes the methodologies utilized for the study. It highlights instruments as well as strategies employed to gather data as well as the analytical techniques applied to interpret the results.

Sample Size and Data Collection

A quantitative descriptive approach using a simple random sampling technique was adopted in this study. The primary study sample consisted of 150 faculty members from different colleges in Tirupattur District. Data were collected using a structured questionnaire with a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The pilot study involving 50 participants produced a Cronbach's Alpha value of 0.821 which indicated good instrument reliability. On the basis of the pilot study output, a few modifications were carried out before administering the final survey to faculty members of different genders and academic designations. The dataset used in this study forms part of a broader research project conducted among college faculty in Tirupattur District. Portions of the dataset have been utilized in another study addressing different research objectives, variables, and analytical models. However, the present study is distinct in its theoretical framework, hypotheses, and findings.

Measurement Tool

The works of Hayman (2005), Brintha (2010), Herlin (2010) and Subhadra (2018) were referred to in framing the WLB scale within the higher education context in the present study. Initially, eight items were used to measure WLB. However, four items were excluded because of low factor loadings in order to improve the Average Variance Extracted (AVE) and overall model fit. Finally, four items were retained in the final measurement model such as "impact of teaching responsibilities on personal life, impact of personal responsibilities on teaching performance and meeting deadlines, conflict between teaching responsibilities and personal and family time, and adverse effect of family responsibilities on teaching schedules and its commitments." JS was assessed using the measures developed by Judge et al. (2005) and Dale Thro & Ganga Prasad Prasain (2024), which consisted of six items related to satisfaction with salary, bonuses, and leave policies, etc. The measurement scales were used to assess faculty perceptions of WLB and JS in higher education institutions.

ANALYSIS AND RESULTS

1. Descriptive Statistics of Study Variables

Table 1
Descriptive Statistics of Study Variables

Variables	Mean	Std. Deviation
Work-Life Balance	14.68	3.748
Job Satisfaction	26.63	3.199
Age	2.69	.962
Work Experience	3.52	1.294

Descriptive statistics (see Table 1) summarise the study variables. The findings show a mean WLB score of 14.68 (SD = 3.748), while JS recorded a mean value of 26.63 (SD = 3.199). The mean values for Age and Work Experience were 2.69 (SD = .962) and 3.52 (SD = 1.294), respectively. The relatively higher mean values of WLB and JS indicate that faculty members generally maintain relatively balanced work-life conditions, which may contribute positively to their level of JS. Overall, the descriptive findings demonstrate moderate to high levels of WLB and JS among faculty members in higher education institutions.

2. Reliability and Validity Analysis

The scale items showed satisfactory reliability, as the Cronbach's alpha value of 0.821 was higher than the recommended value of 0.70. Furthermore, descriptive statistics were calculated for each measurement item to understand the distribution of responses among the participants. The mean values of the WLB items ranged from 3.49 to 3.93, while the JS items ranged from 4.23 to 4.55. These values suggest that the respondents generally reported positive perceptions regarding their WLB and JS. Overall, the reliability results indicate that the measurement items are consistent and suitable for further CFA and SEM analysis.

Table 2
Reliability and Validity of Constructs

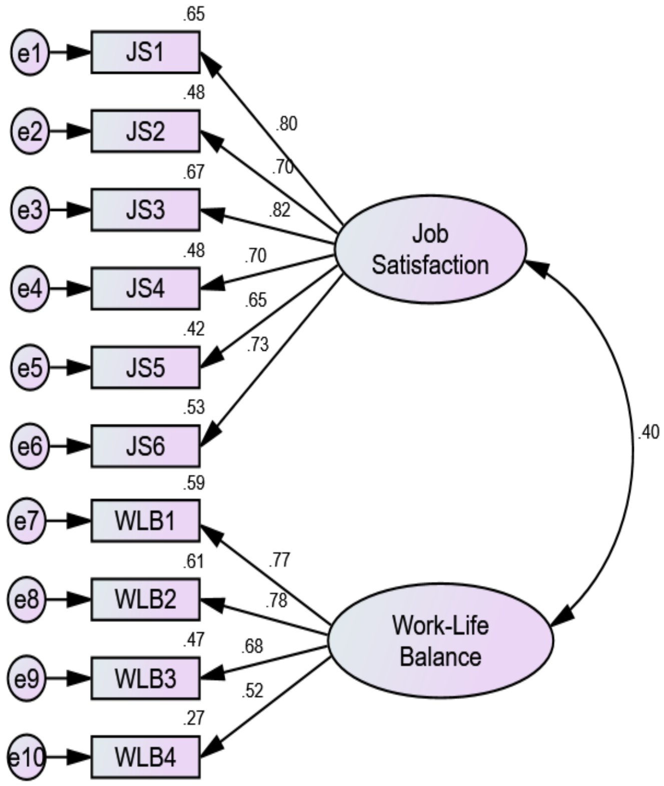
Construct	Items	Factor Loading Range	CR	AVE	√AVE
WLB	WLB1	0.771	0.790	0.487	0.698
	WLB2	0.784			
	WLB3	0.683			
	WLB4	0.522			
JS	JS1	0.805	0.876	0.541	0.736
	JS2	0.696			
	JS3	0.817			
	JS4	0.695			
	JS5	0.652			
	JS6	0.726			

The MM shows SFLs for the latent constructs WLB and JS. Every indicator had a strong correlation with the corresponding constructs.

3. Measurement Model (CFA)

CFA was performed in AMOS to examine the proposed model comprising two constructs, namely WLB and JS. The standardized factor loadings (SFL) of the indicators varied between 0.522 and 0.817 and remained above the suggested minimum values of 0.50, suggesting adequate association between the indicators and their corresponding factors. These findings confirm that the MM demonstrates acceptable indicator reliability.

Figure 1. Confirmatory Factor Analysis (CFA) Measurement Model



CFA was used to assess the MM, and Figure 1 presents the SFLs of the indicators on their respective constructs.

4 Convergent Validity (CV)

Factor loadings, composite reliability (CR), and average variance extracted (AVE), were employed to assess convergent validity (CV). CR scores for WLB (0.790) and JS (0.876) exceeded the recommended limit of 0.70, which reflected adequate internal consistency, while the AVE scores for WLB (0.487) and JS (0.541) were at or above 0.50, showing sufficient variance explanation by the respective constructs. According to Claes Fornell and David F. Larcker (1981), if the CR is greater than 0.70, the construct's CV is considered acceptable even when AVE is slightly below 0.50. Therefore, the results indicate acceptable CV of the MM.

5. Discriminant Validity (DV)

Table 3
Discriminant Validity

Construct	WLB	JS
WLB	0.698	
JS	0.25	0.736

Note: The square root of AVE is reflected in the diagonal values.

The Fornell-Larcker criterion was applied to assess DV by verifying that the square root of AVE for each construct remained greater than its inter-construct correlations. The square root values of AVE for WLB (0.698) and JS (0.736) were higher than the correlation observed between the constructs (0.25). This result suggests greater shared variance between each construct and its indicators compared to other constructs, confirming appropriate DV.

Normality assessment showed acceptable skewness and kurtosis values across the study variables, which supported an approximately normal data distribution appropriate for SEM.

6. Structural Model and Hypothesis Testing

Table 4
Structural Path Results

Hypothesized Path	Estimate (β)	S.E	C.R	p-value	Result
Age → WE	1.058	0.068	15.560	<0.001	Supported
Age → WLB	0.909	0.310	2.928	0.003	Supported
WLB → Job Satisfaction	0.281	0.065	4.311	<0.001	Supported
WE → Job Satisfaction	0.419	0.189	2.219	0.026	Supported

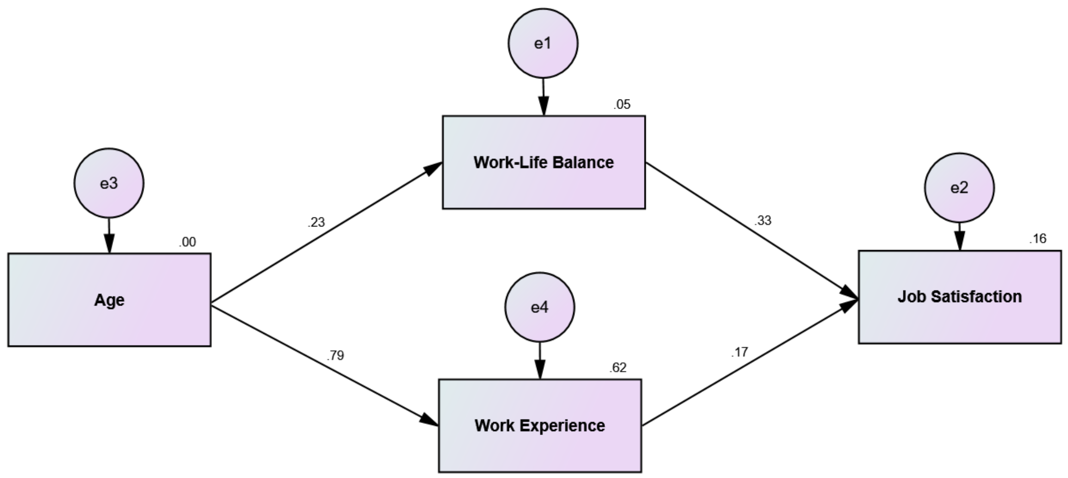
Table 5
Goodness-of-Fit Indices of the Structural Model

Fit Index	Value	Recommended Threshold	Interpretation
Chi-square Value	0.245	–	–
DF	2	–	–
P value	0.885	> 0.05 (Hair et al., 1998)	Good fit
CMIN/DF	0.123	< 5.00 (Hair et al., 1998)	Excellent fit
Comparative Fit Index (CFI)	1.000	> 0.90 (Hu & Bentler, 1999)	Good fit
Goodness of Fit Index (GFI)	0.999	> 0.90 (Hair et al., 2006)	Good fit
Adjusted Goodness of Fit Index (AGFI)	0.996	> 0.90 (Daire et al., 2008)	Excellent
Normed Fit Index (NFI)	0.999	> 0.90 (Hu & Bentler, 1999)	Excellent
Incremental Fit Index (IFI)	1.010	Approaches 1	Excellent
Tucker Lewis Index (TLI)	1.031	> 0.95 (Hair et al., 1998)	Excellent
Root Mean Square Error of Approximation (RMSEA)	0.000	< 0.08 (Hair et al., 2006)	Excellent (PCLOSE = 0.919)

Table 5 shows that the SM was assessed using multiple fit indices, all of which meet the recommended threshold, indicating a good model fit.

Figure 2. Structural Equation Model Results

SM illustrates the relationship among Age, Work Experience, WLB and JS. Standardised path coefficients are presented along the arrows.



The finalised structural model (SM) and its standardized path coefficients is presented in Figure 2. The SM was analysed using AMOS. The model demonstrated satisfactory fit indices, as indicated by $\chi 2 = 0.245$, df = 2 ($p = 0.885$). Indices such as CFI further reinforced the suitability of the proposed model, with CFI = 1.000, GFI = 0.999, TLI = 1.031, and RMSEA = 0.000, all of which exceeded the recommended threshold values. The path analysis results indicate that Age significantly influences WE ($\beta = 1.058$, $p < 0.001$) and WLB ($\beta = 0.909$, $p = 0.003$). Furthermore, both WLB ($\beta = 0.281$, $p < 0.001$) and WE ($\beta = 0.419$, $p = 0.026$) significantly influence JS, highlighting their important role in shaping faculty JS within higher educational institutions. The Squared Multiple Correlations (R^2) indicate that the SM explained 61.9% of the variance in WE, 5.4% of the variance in WLB, and 15.8% of the variance in JS.

DISCUSSION

This present study examined the relationships among Age, WE, WLB and JS among college faculty members. The findings provide important insights into the factors influencing faculty JS within higher educational institutions. First, Age showed a positive and statistically significant association with WE. This finding is expected because WE generally increases with age as individuals spend more time in their professional careers. Older employees tend to accumulate greater knowledge, skills, and institutional familiarity, which may help them perform their job responsibilities more effectively. Previous studies have similarly reported that age is positively associated with WE and professional competence in organizational settings (Ng & Feldman, 2010).

Second, the study found that Age significantly influences WLB. This suggests that older faculty members may be better able to achieve and maintain WLB. With increasing age and WE, individuals often develop more effective coping strategies, emotional maturity and time-management skills that support balance between personal and personal obligations. Previous scholarly studies have also shown that experienced employees are generally better able to manage WLB due to their familiarity with job demands and organizational expectations (Greenhaus & Allen, 2011).

The results further show that WLB significantly affects JS. Faculty members who maintain better WLB tend to report greater JS. This finding remains consistent with earlier studies identifying WLB as a key predictor of employee JS, well-being and commitment toward the organization (Allen et al., 2000; Haar et al., 2014). A support WE that enables employees to effectively balance professional and personal responsibilities may therefore contribute positively to faculty satisfaction.

Finally, the results show that WE significantly influences JS. Employees with greater WE often possess stronger job-related skills, higher confidence, and a deeper understanding of organizational processes, which may enhance their level of JS. Prior studies show that WE positively influences JS among employees in educational and organizational contexts (Ng & Feldman, 2010).

Overall, the results indicate that WLB and WE play key roles in shaping faculty JS. Higher education institutions should therefore focus on developing supportive organizational policies that promote WLB while also recognizing the value of WE in enhancing JS and overall organizational performance.

CONCLUSION

The present study examined the relationships among WLB, JS, Age and WE using a SEM. The outcome of the study shows that WLB positively influences employees' JS. Employees who maintain a better WLB generally report higher levels of JS. The results also demonstrate that WE positively influences JS, which suggests that employees with greater experience may develop better coping strategies, workplace competence, and organizational understanding, which contribute to higher levels of JS. In addition, Age was found to significantly influence WE, which indicates that older employees generally accumulate greater professional experience over time. Overall, the findings emphasize that promoting WLB and recognizing the value of WE can improve employees' JS. The results support previous research on employee well-being and the relationships among these workplace factors. Furthermore, the study highlights the significance of fostering supportive WE which promote WLB and recognise the contribution of WE in improving employees' JS. These insights may assist higher education institutions in developing effective human resource practices that contribute to employee well-being and institutional effectiveness.

IMPLICATIONS

The study findings have practical and theoretical implications. Practically, higher educational institutions should focus on promoting WLB initiatives to improve employees' JS. Policies such as flexible working arrangements, supportive management practices, and effective workload management may enhance employees achieve better WLB. Implementing such strategies may help institutions improve employees' quality of work life, performance and institutional efficiency. Furthermore, the positive association between WE and JS suggests that institutions should support employee development through training, mentoring, and career advancement opportunities. These initiatives may help employees accumulate valuable experience and professional skill, leading to greater JS and stronger commitment toward the organization. From a theoretical perspective, this study adds to the current understanding of workplace well-being and employee attitudes through an empirical examination of the association between WLB and JS alongside demographic factors including Age and WE. The findings also support the usefulness of SEM in examining complex relationships among workplace variables.

LIMITATIONS AND FUTURE RESEARCH

This study has certain limitations. First, the cross-sectional design restricts the ability to determine causal relationships among the variables. Future studies may use longitudinal methods to better understand changes in WLB and JS over time. Second, the study concentrated mainly on WLB, JS, Age and WE. Future studies may include additional factors such as organizational support, leadership style, job stress and employee engagement to get a broader understanding of employee attitudes and workplace well-being. Third, the findings are based on a specific sample of faculty members from colleges in Tirupattur District, which may limit the generalizability of the results. Future research conducted across different organizational, geographical and social settings may help broaden and confirm the outcomes of the study.

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INFLUENCE OF HR PRACTICES IN HIGHER EDUCATION INSTITUTIONS ON MENTORS QUALITY ENHANCEMENT IN SELECTED BENGALURU HEIS –A STUDY ON THE EFFECTIVENESS OF SELECTION PROCESS IN HEI IN BENGALURU

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ABSTRACT

Higher Education Institutions are becoming increasingly concerned with mentor retention. Top management policy makers at HEIs have recognized the importance of mentor retention for both institutional reputation and educational quality, therefore using Bayesian posterior distribution analysis for pairwise correlations, this study investigates the connections between mentor selection processes and important aspects of mentorship efficacy in Higher Education Institutions (HEIs). Mentor friendliness and encouragement, institutional promotion of mentorship opportunities, selection criteria alignment with mentorship aims, and mentor quality as established by selection methods are among the *factors taken into account. A unique pattern of relationships is demonstrated by the outcomes. There could possibly be a gap between formal selection processes and anticipated mentoring outcomes since mentor quality, as assessed by current selection techniques, exhibits moderately negative relationships with both mentor friendliness and institutional advancement. On the other hand, alignment between selection criteria and mentorship objectives shows favorable correlations with program visibility and mentor conduct, underscoring its significance in guaranteeing successful mentoring. Certain relationships have weaker correlations with credible intervals that cross zero, indicating some degree of uncertainty. Overall, the findings show that although organized selection processes are in place, they might not sufficiently enhance program awareness or capture interpersonal traits. The study comes to the conclusion that improving mentorship efficacy in HEIs requires matching selection criteria with mentorship objectives and integrating behavioral abilities into the selection process*.

KEY WORDS: Higher Education Institutions (HEIs), Mentor Retention, Mentorship Effectiveness, Mentor Selection Process, Bayesian Posterior Distribution Analysis.

INTRODUCTION

In Higher Education Institutions (HEIs), mentoring has become an essential part of improving student growth and academic achievement. A successful mentorship program helps students improve both personally and professionally in addition to academically. The caliber of mentors, the method used to choose them, and the degree to which mentorship opportunities are disseminated within the organization all play a significant role in the success of such programs. It is anticipated that a well-organized mentor selection process will find people with both subject-matter expertise and interpersonal abilities, such as being personable, encouraging, and helpful. To guarantee that mentors are able to achieve the desired outcomes, it is also crucial to match the selection criteria with the particular aims of the mentorship program. Increasing student knowledge and participation is also greatly aided by institutional initiatives like aggressively promoting mentorship opportunities. There may be discrepancies between the desired results of mentorship programs and the real traits exhibited by chosen mentors, even though many HEIs have official selection procedures. This calls into question the efficacy of the current selection processes and their capacity to find mentors who satisfy both behavioral and technical requirements. In this regard, the current study seeks to examine the connections between institutional promotion of mentorship opportunities, mentor attributes, alignment with mentorship objectives, and mentor selection processes. The study aims to shed further light on how these variables interact and affect the general efficacy of mentorship programs in HEIs by using Bayesian posterior distribution analysis for pairwise correlations.

REVIEW OF THE LITERATURE

Jimmy Alemiga, Martha Kibukamusoke (27 Aug. 2019)-According to the study's findings, PUs typically include policies for hiring academic staff, promoting staff, developing staff, and terminating staff. However, it's possible that the execution of these regulations won't be sufficient to significantly alter the teaching and learning process. As the regulator of HEIs, the NCHE has merely depended on the institutional component at each individual university level and the regulatory component at the NCHE level. Although there is a structure for quality assurance policies, they are not strictly enforced. Additionally, no university has established explicit, publicly accessible policies and procedures for hiring, promoting, and dismissing academic staff's (degradation) in the whole system of higher education.

Mohammed Ali Ashraf (29th August 2024) : The findings show that faculty academic freedom and learning quality in the tested HEIs are significantly impacted negatively by the accrediting procedure. Academic freedom has a major mediating effect as well.

Anup Sharma1 , Nilesh Sabale2, Kajal Gill2, Vedika Jaiswal2 , Ayush Thakur2 (April 2024) A mixed-method approach can be used to effectively study HRM issues that Indian Higher Education Institutions (HEIs) confront, such as employee motivation, work-life balance, and retirement planning. Employee satisfaction, productivity, and retention are increased by establishing robust engagement and incentive programs and ensuring work-life balance.

Odoch Hojops, Monica Mirembe Mukoza, Barbara N. Kayondo and Rehema Namono (6th September 2024) - Since employees are the foundation of any firm, private higher education institutions in Ethiopia should abandon traditional HR procedures in favor of fresh, creative approaches to hiring and retaining skilled personnel who will boost their competitiveness.

P. S. Aithal, It is suggested that faculty salaries be based on research performance in a variable pay model that is connected to annual API scores. It encourages teachers to actively participate in publications, research, and teamwork with students and peers. This helps HEIs develop become research-focused universities by increasing institutional research output and intellectual property.

Sonali Khurjekar and Ranpreet, According to his study that although faculty members' work is being evaluated by institutions, there are no tangible results in the shape of raises, promotions, or other benefits.

Ankaiah Batta and Shamshad Ahamed Shaik, The goal of this study was to comprehend how organisational structures and larger constellations of human, technological, emotional, and existential resources influence stress among university teachers, which is frequently presented as an individual burden. The results, which are based on data from Indian HEIs, show that HPHRPs function as entry points into a more intricate ecosystem that influences faculty members' ability to handle uncertainty, mobilize internal resources, and make sense of demands.

Pradip Kumar DasHigher - education hrm is evolving to meet the changing demands and challenges of academies. It is essential for attracting talent, enforcing anti-discrimination laws, and maintaining passivity. For HRM in higher education to remain competent and enthusiastic about the demands of academia, it is essential to leverage technology and adapt to innovation. These developments reflect a broader movement away from creating a strong, expansive, and encouraging environment for scholars, enabling Indian higher education to more effectively compete on the global stage.

Sahil Verma This study looks at faculty retention in indian higher education institutions and demonstrates how organizational commitment and trust in the hr climate greatly enhance retention. In order to improve faculty engagement and retention, it identifies a research gap and suggests formal hr procedures and additional study. Faculty Retention Dynamics: Investigating the Role of HR Climate, Trust, and Organizational Commitment in Higher Education Context

Jagdish Kumar Mishra, Anil M Bisen, and Girish Kumar Painoli's career planning has a significant impact on faculty performance, supporting the notion that well-defined professional advancement possibilities support long-term staff engagement and retention. It has been demonstrated that career advancement frameworks that provide internal promotions, leadership training, and mentorship programs improve job satisfaction and institutional loyalty (Singh et al., 2023). Faculty motivation and professional development can be preserved by institutions that fund career planning efforts.

RESEARCH METHODOLOGY

- Primary Data: The Primary data is collected from Structured questionnaire through google form.

- Secondary Data: The Secondary data was collected from Journals and Published articles. Respondents: The teaching fraternity who are playing the role of mentors in HEI were selected as target respondents and the data was collected from 104 respondents,
- Statistical tools selected Bayesian posterior distribution analysis for pairwise correlations
- Questionnaire design: All the questions were measured on a 5-point rating scale.

LIMITATIONS OF THE STUDY

- The study is restricted to assessing only the aspects of the selection procedure of Mentors in HEI
- The study focus on the Mentors quality in HEI in Bengaluru only.

OBJECTIVES

- To evaluate how mentor quality is determined by the HEI's selection process.
- To determine whether the selection criteria for mentors are in line with the program's particular goals.
- To assess how well the selection procedure finds mentors who are amiable, encouraging, and supporting.
- To evaluate how the organization advertises and promotes mentorship opportunities.

HYPOTHESIS

The study formulated the following Hypothesis

H0: There is **no significant relationship** between mentor selection procedures, mentor qualities, alignment with objectives, and advertisement of mentorship opportunities in HEIs.

H1: There is a **significant relationship** between mentor selection procedures, mentor qualities, alignment with objectives, and advertisement of mentorship opportunities in HEIs.

ANALYSIS AND INTERPRETATION

Posterior Distribution Characterization for Pairwise Correlations

			The mentor's quality is determined by the selection procedure adopted in HEI.	**The criteria used to choose mentors correspond with the particular objectives of the mentorship**	**The selection procedure finds mentors who are seen as friendly and encouraging.**	**The organization prominently advertises mentorship opportunities.**
The mentor's competency is successfully determined by the selection procedure.	Posterior	Mode		-.075	-.516	-.355
		Mean		-.073	-.505	-.346
		Variance		.009	.005	.007
	95% Credible Interval	Lower Bound		-.259	-.642	-.510
		Upper Bound		.115	-.362	-.178
	N		105	105	105	105
The criteria used to choose mentors	Posterior	Mode	-.075		.145	.359
		Mean	-.073		.141	.350
		Variance	.009		.009	.007

correspond with the particular objectives of the mentorship	95% Credible Interval	Lower Bound	-.259		-.045	.182
		Upper Bound	.115		.324	.512
	N		105	105	105	105
The selection procedure finds mentors who are thought to be friendly and encouraging	Posterior	Mode	-.516	.145		.186
		Mean	-.505	.141		.181
		Variance	.005	.009		.009
	95% Credible Interval	Lower Bound	-.642	-.045		-.002
		Upper Bound	-.362	.324		.362
	N		105	105	105	105
The organization prominently advertises mentorship opportunities.	Posterior	Mode	-.355	.359	.186	
		Mean	-.346	.350	.181	
		Variance	.007	.007	.009	
	95% Credible Interval	Lower Bound	-.510	.182	-.002	
		Upper Bound	-.178	.512	.362	
	N		105	105	105	105

a. The analyses assume reference priors (c = 0).

The findings of the Bayesian pairwise correlation analysis display uncertainty through the 95% credible intervals, as well as the direction (positive or negative) and intensity of connections between important mentorship variables.

Mentor Quality and Selection Process in Relation to Other Elements

- Mentor quality (as assessed by the selection process) and the other characteristics have negative correlations:
- When criteria and objectives align (Mean ≈ -0.073), there is a very weak negative association.
- Mentors who are amiable and supportive (Mean ≈ -0.505) → somewhat negative relationship
- Opportunity advertising (Mean ≈ -0.346) → moderately negative relationship

Criteria and Objective Alignment

- demonstrates a favorable rapport with amiable mentors (Mean = 0.141) → weak positive
- demonstrates a somewhat favorable correlation with advertising (Mean ≈ 0.350).
- The majority of credible intervals, particularly for advertisements, are positive, indicating a significant positive correlation.

Friendly and Motivating Mentors

- Advertisement-related (Mean ≈ 0.181) → weak to moderate
- There is a relationship, but it is less clear because the interval barely passes zero.
- Stable posterior estimates are indicated by all variances being low (0.005–0.009).
- Variance Analysis
- The final two relationships have totally negative credible intervals, which show statistically significant negative correlations.

Interpretation of the above table

There may be an disparity between formal selection processes and desired mentoring characteristics or visibility since the selection process (as viewed for assessing mentor quality) exhibits negative connections with interpersonal qualities (friendliness) and institutional promotion.

On the other hand, mentor behavior (friendliness) and institutional advancement are positively correlated with congruence between selection criteria and mentorship objectives, underscoring it as a crucial component of a successful mentorship system.

The findings imply that while institutions may have structured selection procedures, these may not always translate into supportive mentor behavior or effective program visibility.

Overall, improving alignment of selection criteria with mentorship goals and incorporating interpersonal qualities into mentor selection could strengthen the effectiveness of mentorship programs in HEIs.

FINDINGS

- ❖ Competency-based selection may ignore interpersonal traits, as seen by the mentor selection process's strong negative correlation with mentors' friendliness and encouragement.
- ❖ The promotion of mentorship opportunities and mentor skill are moderately negatively correlated, indicating a disconnect between internal selection procedures and outward visibility.
- ❖ There is inconsistent definition and application of competency, as evidenced by the poor and non-statistically significant association between mentor competency and alignment of selection criteria with mentorship objectives.
- ❖ There is a substantial positive correlation between the advertising of mentorship opportunities and the alignment of criteria, suggesting that greater program promotion results from clearly specified objectives.
- ❖ There is no evidence that objective-based selection guarantees supportive mentor conduct, despite the positive but small correlation between friendly mentors and criterion alignment.
- ❖ Additionally, there is a weak and marginal correlation between the promotion of mentorship opportunities and friendly mentors, suggesting that program awareness is not much impacted by having approachable mentors.

SUGGESTIONS

Academic and technical proficiency should not be the sole factors considered by HEIs. Since the results indicate a deficit in this area, interpersonal qualities like communication, empathy, and approachability must be equally taken into account during the selection process.

CONCLUSION

The analysis indicates that there are significant correlations between institutional promotion, alignment with objectives, mentor qualities, and mentor selection methods. The associations, however, are both positive and negative, suggesting that although certain factors (such as alignment with aims) enhance the effectiveness of mentoring, others (such as the existing selection processes) might not necessarily result in the desired mentoring outcomes. Overall, the alternative hypothesis (H_1) is supported, indicating that effective mentorship programs in HEIs require better selection criteria that are in line with mentorship objectives.

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A STUDY ON THE ROLE OF PMMY IN PROMOTING WOMEN ENTREPRENEURSHIP

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ABSTRACT

This study explores the impact of the Pradhan Mantri Mudra Yojana (PMMY) in promoting women entrepreneurs. It analyzes awareness levels, credit access, satisfaction, and business outcomes for women entrepreneurs. Data were gathered from 150 respondents through a structured questionnaire. The analysis used tools such as percentage analysis, cross-tabulation, Chi-square test, ANOVA, and Structural Equation Modeling (SEM). Results indicate that awareness and credit access significantly enhance business performance and women's empowerment, whereas obstacles reduce credit access. The study concludes that PMMY is crucial in advancing financial inclusion for women and supporting entrepreneurial development.

KEYWORDS: Women Entrepreneurship, Pradhan Mantri Mudra Yojana (PMMY), Loan Accessibility, Financial Inclusion, Business Performance

INTRODUCTION

Women's entrepreneurship has become a crucial driver of economic and social progress in India. Recently, the government has launched several programs to financially empower women and encourage self-employment. A key initiative is the Pradhan Mantri MUDRA Yojana (PMMY), which offers financial assistance to micro and small enterprises, especially benefiting women entrepreneurs. A primary challenge for women in starting and growing businesses is limited access to finance. PMMY addresses this by providing collateral-free loans and promoting inclusive growth. This study examines how PMMY raises awareness among women entrepreneurs, improves access to credit, and enhances business performance and empowerment.

BACKGROUND OF THE STUDY

Women entrepreneurs in India often encounter challenges like limited financial resources, low awareness of government schemes, and socio-economic barriers. To tackle these issues, the Indian government launched the PMMY scheme in 2015 to help micro-enterprises access easy credit. The scheme classifies loans into 'Shishu', 'Kishore', and 'Tarun' according to the business growth stage. Over time, improvements in financial access and a push for entrepreneurship have helped PMMY significantly support women-led startups. However, disparities remain in awareness levels, credit use, and satisfaction among women. It is essential to study how demographic factors impact these aspects and to assess the scheme's overall success in empowering women entrepreneurs.

REVIEW OF LITERATURE

Dhanalakshmi (2025) underscores PMMY as an important program that encourages women entrepreneurship by providing micro-finance support. It stresses that this scheme assists women in overcoming financial hurdles and launching small businesses.

Bolla, Jahan and Kumar (2025) The study analyzed the performance of loans under the Pradhan Mantri Mudra Yojana focusing on women entrepreneurs. It found that PMMY loans under the Shishu, Kishor and Tarun categories significantly increased financial inclusion and business opportunities for women. The research highlighted that women constitute a large share of PMMY beneficiaries and the scheme plays a major role in promoting micro-enterprise development in India.

Tomer (2025) The study examined the role of MSMEs in empowering women entrepreneurs in India. It highlighted that government initiatives and financial support programs encourage women to establish businesses and contribute to economic growth. The research emphasized that access to institutional credit and supportive policies are essential for strengthening women entrepreneurship in the MSME sector.

Gahlot et al. (2025) The study focuses on awareness and financial inclusion among women entrepreneurs under PMMY. It finds that awareness significantly influences loan access and financial empowerment. The results confirm that PMMY has a strong positive impact on women's economic participation.

Surath Sheba & Vasanthi (2024) The research evaluates the impact of PMMY on rural entrepreneurship development. It finds that the scheme significantly improves access to credit, income generation, and employment opportunities. The study concludes that PMMY plays a vital role in strengthening rural women entrepreneurship.

Tejaswini Bastray et al. (2024) highlight that many women enter entrepreneurship to gain social status and personal confidence. Women-led enterprises often rely on internal capabilities, creativity, and personal resources to survive in competitive markets. The study further indicates that women entrepreneurs contribute significantly to employment generation, economic growth, and social welfare.

Saini, Malhotra and Bhushan (2024) The study analyzed the impact of government support programs on women entrepreneurs. It found that financial assistance schemes and training programs significantly improve women's entrepreneurial participation and socioeconomic status. The study also emphasizes that policy support and financial inclusion are key factors for strengthening women-led enterprises.

Sheba and Vasanthi (2024) This study evaluated the impact of PMMY on rural entrepreneurship development. The findings reveal that access to Mudra loans has improved income generation, employment opportunities, and entrepreneurial activities in rural areas. The study also indicates that the scheme has helped many small entrepreneurs start and expand businesses through institutional credit.

Laxmi Devi (2023) identifies several barriers such as lack of proper guidance, restrictive social norms, high production costs, and limited leadership opportunities in a male-dominated society.

Vosuri Sandhya Rani and Natarajan Sundaram (2023) emphasize that social participation and financial inclusion play a critical role in entrepreneurial success. Their study highlights the importance of Self-Help Groups (SHGs) in promoting financial access, savings habits, and business opportunities for women.

Salma Bano (2023) observes that many women have successfully established businesses and achieved organizational goals. However, the representation of women in top managerial or leadership positions remains limited. The study suggests that greater support from government institutions, families, and society is essential for encouraging women's entrepreneurial participation.

Subbarayudu C. H. and Srinivasa Rao C. H. (2021) state that women entrepreneurs introduce new ideas and problem-solving approaches in business, thereby strengthening economic growth. Nevertheless, women still represent a smaller proportion of entrepreneurs compared to men, highlighting the need for equal participation in economic activities.

Ritwik Saraswat and Remya Lathabhavan (2020) stress that inspirational stories, motivational strategies, and entrepreneurial training programs can encourage women to break traditional barriers and explore business opportunities.

Jostna Kumar Gantepogu and Priyanka Moola (2019) highlight that women entrepreneurship is essential for socio-economic transformation and inclusive development. However, women often encounter financial constraints, marketing difficulties, high production costs, and the dual responsibility of balancing family and work. Addressing these structural barriers is crucial for strengthening women's participation in the economy.

Vanita Yadav and Jeemol Unni (2016). Their review of three decades of literature reveals that the field is still evolving and lacks a strong theoretical base. They recommend integrating feminist perspectives with mainstream entrepreneurship theories to develop a deeper understanding of women's entrepreneurial experiences.

Meenu Maheshwari and Priya Sodani (2015) emphasize that women entrepreneurship serves as a powerful instrument for empowerment and socio-economic upliftment. Their work highlights that cultural, political, and economic conditions influence women's participation in entrepreneurship across different regions. The study encourages policymakers and researchers to develop supportive frameworks that promote women-owned enterprises.

RESEARCH GAP

While many studies have explored women entrepreneurship and the effects of PMMY, some gaps remain. Most focus on general financial inclusion and broad outcomes, with limited detailed analysis of awareness, loan access, and satisfaction among women entrepreneurs. There is also a lack of research that combines demographic factors with advanced methods like SEM to uncover causal links. Additionally, region-specific studies, particularly in Tamil Nadu, are scarce. Previous research has not sufficiently examined how awareness, loan support, and challenges collectively impact business performance and empowerment, highlighting the need for a more thorough and empirical investigation.

STATEMENT OF THE PROBLEM

Women entrepreneurs are essential for economic growth but face challenges like limited access to finance, lack of awareness about financial schemes, and operational hurdles. While the Pradhan Mantri Mudra Yojana (PMMY) was created to support small and micro enterprises, many women still cannot fully benefit from it. There is a gap in understanding how demographic factors affect awareness, loan access, and satisfaction among women entrepreneurs. This study aims to evaluate PMMY's effectiveness in encouraging women entrepreneurship and to identify the main factors influencing its use.

OBJECTIVES OF THE STUDY

1. To analyse the demographic profile of women entrepreneurs.
2. To analyze how demographic variables relate to women's awareness of PMMY.
3. To analyze how demographic variables relate to loan availability under PMMY.
4. To evaluate the difference in business performance among women entrepreneurs across different experience levels.
5. To assess the impact of awareness, loan support, and challenges on business performance and women empowerment.

SCOPE OF THE STUDY

This study centers on women entrepreneurs who benefit from or may benefit from PMMY. It analyzes key factors such as demographic details, awareness of the scheme, access to loans, satisfaction levels, and business performance. Additionally, it investigates how these variables interrelate and assesses PMMY's role in women empowerment. Although focused on a specific sample and region, the research offers important insights into how effectively PMMY supports women entrepreneurs and fosters inclusive growth.

HYPOTHESES OF THE STUDY

$H0_1$: There is no significant relationship between demographic variables and awareness of PMMY.

$H0_2$: There is no significant relationship between demographic variables and loan availability under PMMY.

$H0_3$: There is no significant difference in business performance among different experience groups.

SEM Hypotheses

- **H1:** Awareness → Loan Support
- **H2:** Loan Support → Business Performance
- **H3:** Loan Support → Women Empowerment
- **H4:** Challenges → Loan Support (Negative)
- **H5:** Business Performance → Women Empowerment

RESEARCH METHODOLOGY

The study utilizes both primary and secondary data sources. Primary data were obtained from 150 women entrepreneurs through a structured questionnaire. Secondary data were collected from journals, reports, and government publications related to PMMY. Respondents were selected using a convenience sampling method. The analysis involved statistical techniques including percentage analysis, cross-tabulation, Chi-square test, ANOVA, and Structural Equation Modeling (SEM). This approach aimed to explore the relationship between demographic variables and key factors like awareness, loan access, satisfaction, and business performance.

LIMITATIONS OF THE STUDY

The study has some limitations to keep in mind when interpreting the findings. The sample size of 150 respondents may not fully represent all women entrepreneurs. Data was gathered from a specific geographic area, which limits how broadly the results can be applied to other regions. Since responses are self-reported, they may be influenced by bias or inaccuracies. Time constraints also affected the extent of data collection and analysis. Moreover, the study only examines the effects of PMMY and does not account for other financial schemes available to women entrepreneurs.

ANALYSIS AND INTERPRETATION

Table 1

Demographic Profile of the Women Respondents

S. No.	Variables	Category	Frequency	%
1	Age	Below 25	28	19
		25–35	52	35
		36–45	42	28
		Above 45	28	18
		Total	**150**	**100**
2	Educational Qualification	School Level	30	20
		Undergraduate	54	36
		Postgraduate	48	32
		Others	18	12
		Total	**150**	**100**
3	Area of Residence	Rural	55	37
		Semi-Urban	49	33
		Urban	46	30
		Total	**150**	**100**
4	Year of Experience	Less than 1 Year	35	23
		1 - 3 Years	56	38
		3 – 5 Years	35	23
		Above 5 Years	24	16
		Total	**150**	**100**
5	Type of Business	Manufacturing	40	27
		Trading	52	35
		Service	58	38
		Total	**150**	**100**
6	Awareness of PMMY	Yes	112	75
		No	38	25
		Total	**150**	**100**
7	Loan Availed under PMMY	Yes	98	65
		No	52	35
		Total	**150**	**100**
8	Satisfaction Level	Neutral	28	19
		Satisfied	64	43
		Very Satisfied	58	38
		Total	**150**	**100**

(Source: Primary Data)

Table 1 displays the demographic details of 150 women respondents in the study. The age distribution reveals that most (35%) are aged 25–35, followed by 36–45 years (28%). Respondents under 25 and over 45 each make up 19% and 18%, respectively, showing a balanced age range with a slight focus on middle age. Regarding education, the majority are undergraduates (36%) and postgraduates (32%), with school-level education at 20% and 12%

in other categories, indicating many women entrepreneurs have higher education. In residence, 37% are rural, 33% semi-urban, and 30% urban, reflecting diverse geographic representation. About 38% have 1–3 years of business experience, with 23% each for less than 1 year and 3–5 years. Only 16% have over 5 years, suggesting many are relatively new to business. Service sector enterprises dominate (38%), followed by trading (35%) and manufacturing (27%), showing a preference for service-oriented businesses. Awareness of PMMY is high, with 75% familiar with the scheme and 65% having availed loans, indicating significant utilization. Satisfaction is generally positive, with 43% satisfied and 38% very satisfied; 19% are neutral, indicating overall favorable perceptions of PMMY among women beneficiaries.

CROSS TABULATION ANALYSIS

Table – 2

Cross Tabulation on Awareness, Area and Experience to Loan Availability

S. No.	Awareness	Loan Yes	Loan No	Total
Awareness Vs. Loan Availed	Yes	90	22	112
	No	8	30	38
	Total	**98**	**52**	**150**
Area Vs. Loan Availed	Rural	30	25	55
	Semi-Urban	34	15	49
	Urban	34	12	46
	Total	**98**	**52**	**150**
Experience Vs. Loan Availed	Less than 1 Year	20	15	35
	1–3 Years	38	18	56
	3–5 Years	25	10	35
	Above 5 Years	15	9	24
	Total	**98**	**52**	**150**

(Source: Primary Data)

Table 2 illustrates the connection between awareness, residence area, and business experience in women respondents' loan taking under PMMY.

The cross-tabulation of awareness and loan usage clearly indicates a strong link. Of those aware of PMMY, 90 out of 112 have taken loans, while only 22 have not. Conversely, among those unaware, only 8 have availed loans, whereas 30 out of 38 have not. This suggests that being aware of PMMY greatly influences loan access, and greater awareness markedly boosts the chances of using the loans.

The link between residence area and loan usage indicates that respondents from urban and semi-urban regions tend to have better access to loans than those from rural areas. Specifically, in urban regions, 34 of 46 respondents have taken out loans, while in semi-urban areas, the same number, 34 out of 49, have done so. Conversely, only 30 of 55 rural respondents have availed themselves of loans, leaving 25 without any. This pattern suggests that women in rural areas may encounter more obstacles, such as limited access to information, fewer financial institutions, or procedural difficulties.

The cross-tabulation between business experience and loan uptake indicates that women with moderate experience (1–3 years) constitute the largest group of loan recipients, with 38 out of 56. Those with 3–5 years of experience also show strong participation, accounting for 25 out of 35. Conversely, women with less than 1 year of experience and those with over 5 years participate less in loan availing. This suggests that women with some business experience are more inclined to seek and secure loans, likely due to increased confidence, knowledge, and business stability. Overall, the data shows that factors such as awareness, proximity to urban areas, and moderate experience positively affect women entrepreneurs' likelihood of obtaining PMMY loans.

Table 3

Education vs. Awareness

Education	Aware	Not Aware	Total
School Level	18	12	30
Undergraduate	44	10	54
Postgraduate	40	8	48
Others	10	8	18

(Source: Primary Data)

Table 3 illustrates the connection between educational qualification and awareness of PMMY among women respondents. Awareness tends to rise with higher education levels. For those with school-level education, only 18 of 30 are aware, while 12 are not, reflecting lower awareness. In contrast, among undergraduates, a majority—44 out of 54—are aware, with only 10 unaware. Similarly, postgraduate respondents exhibit a high awareness rate, with 40 out of 48 being aware and 8 not. In the "others" category, awareness is comparatively lower, with 10 aware and 8 not aware.

Overall, the table clearly shows that higher levels of education are linked to increased awareness of PMMY. This highlights the important role of education in improving women entrepreneurs' understanding of government financial programs.

Table 4

Business Type vs Satisfaction

Type of Business	Neutral	Satisfied	Very Satisfied	Total
Manufacturing	10	18	12	40
Trading	8	24	20	52
Service	10	22	26	58
Total	28	64	58	150

(Source: Primary Data)

Table 4 illustrates the relationship between business type and satisfaction with PMMY. The data reveals differences in satisfaction levels among various sectors. In manufacturing, most respondents are satisfied (18 out of 40), with 12 very satisfied, and 10 neutral. The trading sector reports higher satisfaction, with 24 satisfied, 20 very satisfied, and only 8 neutral respondents. This implies that trading businesses benefit significantly from PMMY support. The service sector exhibits the highest satisfaction, with 26 very satisfied, 22 satisfied, and 10 neutral respondents. This suggests that women involved in service-based enterprises tend to experience better outcomes from PMMY. Overall, the results indicate generally positive satisfaction with PMMY across all sectors, with the highest satisfaction in the service sector, followed by trading and manufacturing.

TESTING OF HYPOTHESIS

A. Demographic Profile vs. Awareness of PMMY

Null Hypothesis ($H0_1$): There is no significant association between demographic variables and awareness of PMMY among women respondents.

Alternative Hypothesis ($H1_1$): There is a significant association between demographic variables and awareness of PMMY among women respondents.

Variables	Chi-Square Value	df	p-value	Remarks
Age	10.52	3	0.015	Significant
Educational Qualification	14.36	3	0.002	Significant
Area of Residence	6.85	2	0.032	Significant
Year of Experience	9.18	3	0.027	Significant

The Chi-square test results analyze the relationship between certain demographic variables and women's awareness of PMMY. The results show that age ($\chi^2 = 10.52$, $p = 0.015$) is significantly linked to awareness, indicating variations across different age groups. This means some age groups of women are more informed about PMMY than others. Likewise, educational qualification ($\chi^2 = 14.36$, $p = 0.002$) has a strong correlation with awareness, suggesting that women with higher education levels generally have better knowledge of PMMY schemes. The type of residence ($\chi^2 = 6.85$, $p = 0.032$) is also significantly associated with awareness, with women from urban and semi-urban areas usually being more aware than those from rural regions, likely due to easier access to information and institutional support. Additionally, years of experience ($\chi^2 = 9.18$, $p = 0.027$) show a significant relationship, implying that women with more business experience tend to be more aware of PMMY, probably because of greater exposure to financial schemes over time.

Because all the chosen variables have p-values below 0.05, we reject the null hypothesis ($H0_1$). This indicates that demographic factors like age, education level, residence area, and experience play a significant role in shaping women respondents' awareness of PMMY.

B. Demographic Profile vs. Loan Availability

Null Hypothesis ($H0_2$): There is no significant association between demographic variables and loan availability under PMMY among women respondents.

Alternative Hypothesis ($H1_2$): There is a significant association between demographic variables and loan availability under PMMY among women respondents.

Variables	Chi-Square Value	df	p-value	Remarks
Age	8.64	3	0.034	Significant
Educational Qualification	9.72	3	0.021	Significant
Area of Residence	7.96	2	0.019	Significant
Year of Experience	8.27	3	0.041	Significant

The Chi-square test evaluates the relationship between demographic factors and loan access under PMMY among women respondents. The findings reveal that age ($\chi^2 = 8.64$, $p = 0.034$) significantly influences loan availability, indicating variations across different age groups and suggesting that some age categories are more likely to obtain loans. Likewise, educational qualification ($\chi^2 = 9.72$, $p = 0.021$) shows a significant link with loan access, implying women with higher education are more likely to secure loans—possibly due to increased awareness, financial literacy, and ability to handle formal procedures. The area of residence ($\chi^2 = 7.96$, $p = 0.019$) also significantly correlates with loan access, implying that respondents from urban and semi-urban areas have better chances of obtaining PMMY loans than rural residents, likely due to a greater availability of financial institutions and support services. Additionally, the year of experience ($\chi^2 = 8.27$, $p = 0.041$) is significantly associated with loan access, suggesting women with more business experience are more likely to access loans owing to better knowledge of financial schemes and enhanced business credibility.

Because all variables have p-values below 0.05, the null hypothesis ($H0_2$) is rejected. This indicates that demographic factors such as age, educational qualifications, area of residence, and experience significantly affect loan availability under PMMY among women respondents.

ANOVA Test

Hypotheses

- **H_0 (Null Hypothesis):** There is no significant difference in business performance among different experience groups of women entrepreneurs.
- **H_1 (Alternative Hypothesis):** There is a significant difference in business performance among different experience groups.

Experience Level	No. of Respondents	Mean Score
< 1 Year	35	3.8
1–3 Years	56	4.2
3–5 Years	35	4.3
> 5 Years	24	4.1
Total	150	—

Source of Variation	Sum of Squares (SS)	df	Mean Square (MS)	F Value
Between Groups	4.82	3	1.61	5.12
Within Groups	45.90	146	0.31	
Total	50.72	149		

The ANOVA results present an F value of 5.12, demonstrating a significant difference in business performance across various experience groups. The average scores indicate that women with 3–5 years (4.3) and 1–3 years (4.2) of experience outperform others, whereas those with less than 1 year (3.8) have lower performance. The larger variation between groups leads to the rejection of the null hypothesis, confirming that experience significantly influences business performance.

STRUCTURAL EQUATION MODEL (SEM)

Conceptual Model

Independent Variables:

- Awareness (AW)
- PMMY Loan Support (LS)
- Challenges (CH)

Dependent Variables:

- Business Performance (BP)
- Women Empowerment (WE)

Hypotheses in SEM

- H1: Awareness → Loan Support
- H2: Loan Support → Business Performance
- H3: Loan Support → Women Empowerment
- H4: Challenges → Loan Support (Negative)
- H5: Business Performance → Women Empowerment

Measurement Model (Factor Loadings)

Construct	Indicators	Loading
Awareness	AW1	0.78
	AW2	0.81
Loan Support	LS1	0.84
	LS2	0.79

Business Performance	BP1	0.85
	BP2	0.82
Women Empowerment	WE1	0.80
	WE2	0.83
Challenges	CH1	0.76
	CH2	0.74

All factor loadings are above 0.7, indicating good construct validity.

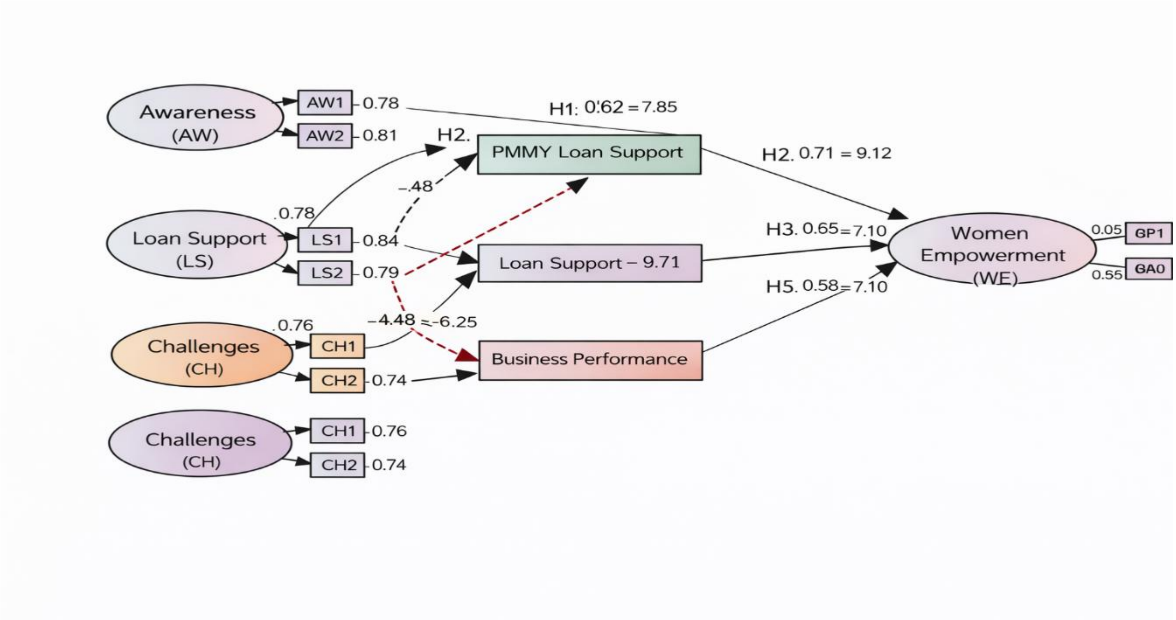
Model Fit Indices

Fit Index	Value	Acceptable Level
Chi-square (χ^2)	112.45	—
df	80	—
χ^2/df	1.40	< 3
GFI	0.92	> 0.90
CFI	0.95	> 0.90
RMSEA	0.045	< 0.08

All model fit indices are within acceptable limits, indicating a good model fit.

Structural Model Results

Path	Coefficient	t-value	Result
Awareness → Loan Support	0.62	7.85	**Significant**
Loan Support → Business Performance	0.71	9.12	**Significant**
Loan Support → Women Empowerment	0.65	8.40	**Significant**
Challenges → Loan Support	-0.48	-6.25	**Significant**
Business Performance → Women Empowerment	0.58	7.10	**Significant**



Interpretation

The SEM results show that awareness has a significant impact on loan support, which then positively affects business performance and women's empowerment. Challenges hinder access to loans. Additionally, business performance is crucial for boosting empowerment. The model verifies that PMMY effectively promotes women entrepreneurship.

FINDINGS

The study indicates that most women entrepreneurs are aged 25–35 and hold undergraduate or postgraduate degrees, showing a relatively educated sample. Many respondents hail from rural and semi-urban areas, emphasizing PMMY's reach across various regions. The majority have 1–3 years of business experience, suggesting PMMY mainly supports emerging entrepreneurs. The service sector is the most common industry, reflecting a preference for low-investment, flexible ventures. The results show high awareness levels (75%) and substantial loan use (65%) under PMMY. Cross-tabulation reveals that awareness significantly influences loan uptake, with urban and semi-urban women accessing loans more easily than rural women. Experience also affects loan use, with those moderately experienced benefiting more. Chi-square tests confirm that demographic factors significantly impact awareness and loan access. ANOVA indicates that business performance differs notably across experience levels. SEM analysis shows that awareness positively influences loan support, which enhances business performance and women empowerment, while challenges reduce loan accessibility.

SUGGESTION

The findings suggest that government agencies should boost awareness of PMMY, especially in rural regions, by organizing workshops, digital campaigns, and financial literacy programs. Making loan procedures simpler and cutting down on documentation can motivate more women to take out loans. Financial institutions need to offer guidance and assistance to first-time entrepreneurs to improve access. Additional support should target women with limited business experience through training, mentorship, and skills development. Improving infrastructure and banking facilities in rural areas can help close regional gaps in loan access. Furthermore, tackling issues like processing delays and lack of information will enhance scheme effectiveness. Ongoing monitoring and evaluation of PMMY implementation are essential for achieving better results and fostering sustainable women entrepreneurship.

CONCLUSION

The study finds that PMMY significantly supports women entrepreneurship by improving access to finance and aiding business growth. The results show that awareness and loan support are crucial factors affecting business success and women's empowerment. Demographic factors like age, education, residence area, and experience greatly influence awareness and loan access. Additionally, women with moderate business experience tend to perform better, and the service sector reports higher satisfaction. Despite these achievements, challenges such as limited awareness in rural regions and procedural hurdles remain. SEM analysis confirms that PMMY effectively promotes financial inclusion and women's entrepreneurship. Overall, PMMY has positively contributed to women's entrepreneurial development, though further efforts to enhance awareness, accessibility, and support are needed to maximize its benefits and promote inclusive growth.

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IMPACT OF EMPLOYEES' BRANDING AT PHARMACEUTICAL COMPANIES IN TAMILNADU

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ABSTRACT

A strong employer brand should connect an organisation's values, people strategy and HR policies and be linked to the company brand. Internal Branding is concerned with the current and potential employees' information about the employment experience and what is expected of them. In HR practices, the role of the HR Department plays a vital role nowadays in applying employer brand management to the employee experience, which is a more recent focus and may be considered underexplored. Building organisational commitment and influencing workplace behaviours that drive employee engagement, which will enhance high performance for the learning and development function in a firm. This paper emphasises Employer branding in Pharmaceutical companies. This paper focuses on Tamilnadu as its geographical location. This paper also reveals the importance of HR branding.

KEYWORDS: Employer branding, HR branding, internal branding, external branding.

INTRODUCTION

Employer branding is the process of creating an identity and managing the company's image in its role as an employer. As organisations are complex, open systems, single interventions are not enough. The employer brand has to be aligned and congruent with what the company delivers to the employee, customer, public and shareholder.

Factors that Impact the Employer Brand are:

1. Reputation/ integrity
2. Culture
3. Recruitment/orientation
4. Pay and benefits
5. Work /Life balance
6. Leadership and management
7. Performance management, growth and development

Of these seven factors in the employer branding model, four have proven to be crucial for a large majority of high performing employees. These are:

1. Culture
2. Pay and benefits
3. Leadership and management
4. Performance management, growth and development.

Only two of these four factors form a crucial part of the employer brands of majority companies: A highly developed culture and outstanding leadership; and management qualities.

Employer Brand

An employer brand is a collection of ideas and beliefs that influence the way current and potential employees view an organization and the employment experience that organization is offering. It communicates the company's culture and values and helps to ensure employees are passionate about, and fit in with, the organizational culture to help move the company forward. "Employer branding" is an emerging discipline with its roots in marketing as well as HR principles. Its aim is to develop an image of the organization as an 'employer of choice' in the minds of existing and potential employees, as well as other stakeholders including customers and recruiters. The objective is not only to offer these tangible benefits, but to also develop an emotional link with them. A strong employer brand should connect an organization's values, people strategy and HR policies and be linked to the company brand. The employer branding is focused on building the brand name of the employer on the job market. It is focused on developing the positive relationship with employees and target groups on the job market (potential pools of candidates for the future job vacancies). The employer branding is the essential part of the recruitment and staffing area and consumes a significant proportion of the HR budget.

AIM OF THE STUDY

Globally, many organizations now use employer HR branding as bait for attracting and retaining talent. This is in view of thechallenges inherent in recruiting top talent, which can be a very tall order. Thus organizations splash huge resources and efforts on building the ‚right image‛, its values, culture and character, in the hope of appealing to potential and current employees. For obvious reasons, it is only companies with stronger employer brands that are better placed to win this relentless war for rare talent. The increasing focus on competitive advantage is leading many firms to rethink their employer brand. ‚India, Inc.‛— a common term used in India to refer to India's corporate sector aims to positively build on opportunities as the world economy strengthens, and the employer brand is a prime example of a progressive HR practice in India.

STATEMENT OF THE PROBLEM

Companies are struggling to transform their businesses to meet the urgent call of digitalization. Nearly 67 per cent of leaders believe their businesses must become significantly more digital to be competitive, but often digitalization strategies may be too underdeveloped or siloed to be truly transformative. In today's volatile competitive context, employer branding will be important to organization's future success. Employer branding is widely adopted in dealing with independent developmental process, and how to create a competitive advantage and enhancement. This study shows how the framework of employer branding can support organization retention and development.

OBJECTIVES OF THE STUDY

1. To analyse the level of time management system (Functional Value, Psychological Value, Economic Value, Development Value, and Social Value) as opined by the respondents of selective pharmaceutical companies in Tamil Nadu.
2. To examine the relationship between different attributes of the time management system (Functional Value, Psychological Value, Economic Value, Development Value, and Social Value).

3. To provide suitable suggestions.

REVIEW OF LITERATURE

The employer branding is about the communication of the expectations and benefits provided for meeting the expectations of organizations.

Many organizations focus on the communication a quick career path; many organizations focus on the communication for the friendly and fair internal environment. The organizations build the competitive advantage using their corporate cultures. They build the competitive difference in human capital management and development. The employer branding is not onlyfor the recruitment activity. It is mainly driven by the recruitment function, but it incorporates different HR Processes to build a complex picture of the organization as a preferred employer on the job market.Chhrabra and Mishra (2008,) have defined Employer Branding in the following way: "Employer Branding is the process of creating an identity and managing the company's image in its role as an employer. An organization brand lives in the minds of its customers –its employees. The customers may have positive or negative association with the brand."

Mark Gray (2008) , "Employer branding is an emerging discipline with its roots in classical marketing and brand management principles. It aims to position an image of a company as ‚a great place to work'. The idea is first to develop an emotional link with the best talent, and then offer prospective candidates tangible benefits based on evidence. The promise and fulfilment of an employer brand enables the attraction, motivation and retention of appropriate talent for the business to continue delivering on the corporate brand promise."

Sartain and Schumann (2006) defined employer brand as: "how a business builds and packages its identity, from its origins and values, what it promises to deliver to emotionally connect employees so that they in turn deliver what a businesspromises to customers."

Brett Minchington (2005) defines "employer branding as ‚the image of your organization as a 'great place to work' in the mind of current employees and key stakeholders in the external market (active and passive candidates, clients, customers andother key stakeholders)."

RESEARCH GAP

Global time management is gaining attention from academicians but the main problem persists that there is no consensus around the definition and the mechanism of the concept. Time management has been into debate for more than a decade and practitioners and scholars have long argued about the concept. There is obviously a need for further research, not only to set up a clear and consensual definition of time management and its positioning within the theoretical body of human resource management but also to demonstrate the value of time management through empirical studies in order to build up its scientific validity and its managerial relevance.

RESEARCH METHODOLOGY

The study is descriptive in nature. The primary and the secondary data were adopted for the collected data. The secondary data was collected from previous literature and journals. The primary data consist of structured questionnaire. The questionnaire constitutes the attributes of Time Management. The pilot study with a sample of 50 respondents was conducted to check thereliability statistics. The Cronbach's Alpha value for the attributes of Time Management were found to be more than 0.8, this clearly signifies that the questionnaire is reliable. After reaching the approved alpha value, the researcher has moved forwardfor the major research in the prescribed geographic location and the industry.

The geographic location and the target industry selected for the study pharmaceutical companies in Tamilnadu. The population of the study is the employees, who are working in theses top ten pharmaceuticals companies in Tamil Nadu. Sincethe total numbers of employees working in the respective companies are not exactly available in record, so the researcher has considered the population as infinite population. The researcher has taken only the top ten major pharmaceuticals players in Tamil Nadu. The top ten companies are (*https://www.pharmafaq.in/top-10-pcd-pharma- companies-in-tamilnadu/)

1. Indian Immunologicals Limited
2. Micro Labs Limited
3. Zota Pharmaceuticals PVT LTD
4. Eucare pharmaceutical Pvt Ltd
5. A to Z Pharmaceuticals Pvt. Ltd
6. Aassk Pharmaceuticals Private Ltd.
7. Aastik Pharma Pvt. Ltd (Pcd Franchise Company in Tamilnadu)
8. Abhilash Chemicals Pvt. Ltd
9. Acmey Inc.
10. Actavis Pharma Manufacturing Pvt. Ltd

These companies have been considered as the research area for the current study. The top ten pharmaceuticals companies hasbeen selected based on companies' performance, growth trend, client base, market presence, training interventions, large scale projects of different industry verticals. The random sampling technique was adopted by the researcher to select the samples for the study. According to the Demorgan's table for an infinite population 663 sample sizes is required with a confidence level of 99 percent and with the confidence interval of 5 percent. The researcher has distributed around 700 questionnaires and 674 questionnaires were returned and answered. The remaining 26 questionnaires were returned and found to be biased and unanswered, so, the researcher has confined the sample size as 674. The collected data were fed into Statistical Package for Social Sciences (SPSS) 20 version, popularly used Statistical Software for Social Research Analysis. The statistical tools used for analysis were Bivariate Correlation and Structural Equation Modelling

ANALYSIS AND INTERPRETATION

Bivariate correlation (relationship among the variables of time management), the analysis measures the relationship between the variables of "Employer Branding", The Bivariate Pearson Correlation has been used to measures the relationship between the variables. The correlation analysis is as follows;

Table 1

Correlation among the Variables of "Employer Branding"

H_0: There is no significant correlation between the variables of "Employer Branding".

Variables	Test	FV	PV	EV	DV	SV	EB
FV	PC	1					
PV	PC	.051	1				
EV	PC	.386**	.107**	1			
DV	PC	-.031	.002	-.003	1		
SV	PC	-.038	-.070	-.009	.442**	1	
EB	PC	.247**	.088*	.275**	.178**	.120**	1
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							
Pc – Pearson Correlation Value							

Positive Correlation: The independent variable Functional Value has positive correlation with the dependent variables Economic Value (Pearson Correlation Value = 0.386) and Employer Branding (Pearson Correlation Value = 0.247). The independent variable Psychological Value has positive correlation with the dependent variables Economic Value (Pearson Correlation Value = 0.107) and Employer Branding (Pearson Correlation Value = 0.088). The independent variable Economic Value has positive correlation with the dependent variable Employer Branding (Pearson Correlation Value = 0.275). The independent variable Development Value has positive correlation with the dependent variables Social Value (Pearson Correlation Value = 0.442) and Employer Branding (Pearson Correlation Value = 0.178). The independent variable Social Value has positive correlation with the dependent variables Employer Branding (Pearson Correlation Value = 0.120). No Correlation: the independent variable Functional Value has any correlation with the dependent variables Psychological Value, Development Value, Social Value. The independent variable Psychological Value has no correlation with the dependent variables Development Value, Social Value. The independent variable Economic Value has no correlation with the dependent variables Development Value, Social Value.

Structural Equation Modelling

In this part the impact of the independent variable over the dependent variable is measured using the path analysis. The influence is found out using Regression Weights and the degree of change in the independent variables is found out using squared multiple correlation. The analysis as follows;

Table 2

Model Fit - Impact of "Functional Value", "Psychological Value", "Economic Value", "Development Value" and "Social Value" Over"Employer Branding"

Test for model fit	Values
GFI (Goodness of Fit)	0.901
AGFI(Adjusted Goodness of Fit)	0.863

The GFI (Goodness of Fit) and AGFI (Adjusted Goodness of Fit Index) should be nearing to one or one indicates that the model is a good fit. In this model it's nearing one so it indicates that the model is a good fit. In this model the GFI value is 0.921 and AGFI value is 0.938. This clearly implies that the model is a good fit.

Figure - 1

Impact of "Functional Value", "Psychological Value", "Economic Value", "Development Value" and "Social Value"Over "Employer Branding"

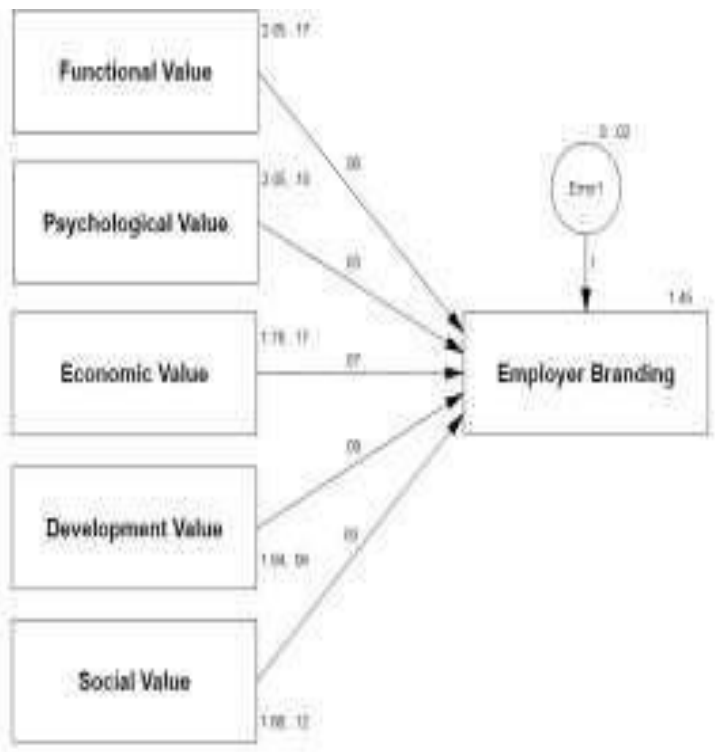

Table 3
Regression Weights - Impact of "Functional Value", "Psychological Value", "Economic Value", "Development Value" and "SocialValue" Over "Employer Branding"

Variable	Inf.	Variable	UE	SE	S.E.	C.R.	P
Employer Branding	→	Psychological Value	0.028	0.063	0.016	1.74	0.082
Employer Branding	→	Development Value	0.091	0.158	0.021	4.334	***
Employer Branding	→	Functional Value	0.061	0.176	0.013	4.825	***
Employer Branding	→	Economic Value	0.07	0.206	0.012	5.659	***
Employer Branding	→	Social Value	0.026	0.066	0.015	1.804	0.071
*** Significant at 0.001percentage Level			S.E – Standard Error				
** Significant at 0.05percentage Level			C.R – Critical Ration				
UE – Unstandardized Estimate			P – Probability Value				
SE – Standardized Estimate			Inf. – Influence				

Positive Influence

1. If independent variable "Development Value" rises to one degree up in the positive direction, then it can be seen, 0.091 increase in the dependent variable "Employer Branding".
2. If independent variable "Functional Value" rises to one degree up in the positive direction, then it can be seen, 0.061increase in the dependent variable "Employer Branding".
3. If independent variable "Economic Value" rises to one degree up in the positive direction, then it can be seen, 0.07increase in the dependent variable "Employer Branding".

No Influence

1. The independent variable "Psychological Value" and "Social Value" does not influence the dependent variable "Employer Branding".

Table 4
Squared Multiple Correlations - Impact of "Functional Value", "Psychological Value", "Economic Value", "Development Value" and"Social Value" Over "Employer Branding"

Variable	Estimate
Employer Branding	0.107

The dependent variable "Employer Branding" shows 10.7 percentage of its variance in when influence by the independent variables "Functional Value", "Economic Value" and "Development Value".

SUGGESTION

Thorough image audits of what value propositions make an organization an attractive employer (Highhouse et al., 1999; Arnold et al., 2003; Lievens et al., 2005) is a good starting point for employer branding, but it is often complicated to decide which characteristics an organization should promote to enhance its attractiveness as an employer (Lievens et al., 2005). In this respect, this study has key practical implication for Indian pharmaceutical companies as the study attempted to identify these primary dimensions.

CONCLUSION

Employment branding and the actions required to build and manage an employment brand are powerful tools that can be used to add value to your organization through HR. All too often, HR looks to impact the bottom line of the firm by enactingcost-containment initiatives. Such initiatives do nothing to increase quality or productivity. Employment branding, on the other hand, can increase the quality of employees, help inspire them to become more productive, and open opportunities to the company in the marketplace that might not have been open before. In short, employment branding can address many of the issues facing corporation today.

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PERCEPTION OF ORGANIZATIONAL CLIMATE- A STUDY OF PRIVATE SCHOOL TEACHERS IN TIRUPATTUR TOWN

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ABSTRACT

The present study examines the perception of organizational climate among private school teachers in Tirupattur Town and its influence on organizational effectiveness. Organizational climate plays a significant role in shaping teachers' attitudes, motivation, job satisfaction, and overall performance. A positive organizational climate contributes to effective teaching, improved teacher morale, and enhanced educational outcomes. The study adopted a descriptive survey design and collected data from 120 private school teachers selected through simple random sampling from various private schools in Tirupattur Town. Primary data were gathered using a structured questionnaire, while secondary data were obtained from books, journals, articles, and other published sources. The collected data were analyzed using the Statistical Package for Social Sciences (SPSS). The findings reveal that most teachers perceive their organizational climate positively in terms of work allocation, management support, teacher participation, career growth opportunities, workplace relationships, morale, and loyalty toward school values. However, some respondents expressed concerns regarding freedom and independence in performing their duties, workplace safety, and communication with senior staff. The study also found that a supportive organizational climate enhances teacher motivation, commitment, and organizational effectiveness. Based on the findings, the study recommends improving salary structures, providing professional development programs, strengthening teamwork, ensuring transparent performance appraisal systems, and recognizing teachers' contributions through rewards and incentives. The study concludes that maintaining a positive organizational climate is essential for improving teacher effectiveness, job satisfaction, and the overall performance of private schools in Tirupattur Town.

KEYWORDS: Organizational Climate, Teacher Effectiveness, Organizational Effectiveness, Private School Teachers, Job Satisfaction, Tirupattur Town.

INTRODUCTION AND DESIGN OF THE STUDY

Workers perceive organizational climate as a fleeting aspect of the internal environment that influences behaviour, it may also be described in terms of the values of a certain organizational trait. The set of characteristics that make up an organization's climate traits, which identify and distinguish one administration from another. Climate perceptions may be used as concepts to help people cope with information overload and make better decisions. Frameworks are used by people to identify activities that will help them adapt to their surroundings. Organizational climate has been a popular topic of research in the West. It increased as well. It is significant in India, but only in terms of administration. It has been observed that schools' formal qualities have changed.

A teacher's teaching proficiency is a collection of skills, knowledge, and beliefs that he or she possesses and employs to facilitate effective teaching and learning. To put it another way, proficiency is having the necessary abilities and commitment to complete a certain type of task properly.

Teachers make up the majority of the labor in schools, and they are responsible for providing high-quality education. They are in charge of the students. Teaching is a dynamic and challenging profession. It is necessary to adapt to the changing demands of the educational system on a constant basis. It necessitates continuous upgrading of knowledge and abilities, as well as a healthy corporate atmosphere. Furthermore, the organizational atmosphere will undoubtedly reveal the level of dedication of employees to the administration.

STATEMENT OF THE PROBLEM

Teachers' job performance plays a vital role in students' academic success and overall school effectiveness. Effective teaching is influenced by various factors within the organizational climate of a school. Elements such as the principal's leadership style, work environment, reward and recognition, career advancement opportunities, school facilities, disciplinary policies, and interpersonal relationships significantly affect teachers' performance.

Poor job performance among teachers may result from inadequate salary, limited promotional opportunities, ineffective leadership, insufficient facilities, and negative workplace attitudes. Therefore, creating a positive organizational climate that promotes job satisfaction, healthy working conditions, fair compensation, and professional growth is essential. A supportive organizational climate can enhance teachers' performance, increase organizational effectiveness, and reduce issues such as absenteeism and turnover.

RESEARCH METHODOLOGY

This descriptive study, which is based on a survey approach, aims to ascertain how teachers in Tirupattur's private schools perceive several characteristics of the organizational environment. Both primary and secondary sources provided the data used in this investigation. A questionnaire was distributed to a sample size of 120 individuals in Tirupattur Town in order to gather fundamental information about the organizational environment of the schools.

A range of published and unpublished records, articles, books, journals, and magazines provided secondary data for the study's theoretical framework.

OBJECTIVES OF THE STUDY

1. To provide a solid theoretical foundation for the idea of organizational climate research
2. To identify the various organizational climate dimensions for evaluating the school teacher’s perception
3. To find out the extent of variation among teachers working in schools on their perception towards the various dimension of organizational climate in tirupattur town
4. To offer suggestion to improve the organizational climate of schools at tirupattur town.

LIMITATIONS OF THE STUDY

1. The study suffers from the well-known survey technique restriction of not being able to question respondents beyond the supplied response.

2. The information provided by the respondents is not entirely devoid of prejudice.
3. The study's shortcomings as they relate to the statistical methods used.
4. Because the current study only looked at private school teachers in Tirupattur, the results cannot be extended to other areas.

REVIEW OF LITERATURE

Cecilia Helen D'Souza and A.V. Karabasanagouda (2020) a studied of Influence of Organizational Climate on Teacher Morale the teachers play a vital role in quality of organization to a student and developing a positive climate to a organization tool has to use in this article any concept or construct in the point of view are communication flow, warmth ,decision making ,performing to a organization ,motivation level, conflict resolution an they have to talk about lack of empirical studies and theoretical of school climate and also talk about a teachers salary and curriculum issues they have taken 100 samples of teachers.

Harvinder Kaur (2018) The studied has talked about teachers effectiveness and organization climate , he has taken 50 samples of teachers from 10 different schools. He applied a descriptive statistical for this study and the objectives are effectiveness of teachers in a gender relation of secondary school ,organizational climate of gender of teachers , hypotheses of no difference between climate and effectiveness and difference between effectiveness of male teachers and also difference between teachers of govt and private school teachers . the study is in Kapurthala district. most of the objectives are having difference between climate and teacher, difference of male staff and female staff.

Kayastha D P (2016) investigated work remuneration, coworkers, and supervision in her study of secondary school teachers' job satisfaction in Nepal. The study consists of private and public school from kathamandu and latitpur in Nepal. she has taken 130 samples, she as to use on each private and government school teachers work experience and psychological indicators in the region, Concerning job in general, the study's findings on job satisfaction are displayed in the table of findings for professionals and demographics, and supervision and advancement are looked at in higher secondary schools.

Vedavathi.B (2017) studied on secondary school organizational climate and work value of secondary school teachers. He has taken nearly 220 samples of secondary schools heads in south canara district at Karnataka in India and also he has use satisfied random sampling technique of government, private - aided , private schools. The data is acquired using a survey strategy that includes descriptive and comparative study in the South Canara district of Karnataka, India. this study is observed that the work values of the read have significant contribution towards his/her instructional leaders. So that the quality of school climate could be reformed to achieve the Exim' and objectives of education.

Sadia Malik's (2010) research looks at how teachers' life satisfaction is affected by work-related stress in both public and private schools. 200 instructors from Bhakkar's public and private schools provided samples to him. The demographic sheet, organizational role stress scale, and contentment with life scale were used to collect data. He concluded that life satisfaction was negatively impacted by work-related stress. It has also been demonstrated that female teachers have higher levels of occupational stress than male teachers.

Yahya Don, Mohd Faiz Mohd Yaakob, Wan Rozimi WanHanafi, Rahimi Yusof, Muhamad Dzahir Kasa, and Mohd Sofian Omar-Fauzee (2021) investigated the challenges of evaluating teacher job satisfaction using an organizational environment metric. Their study aims to investigate how primary school teachers perceive their workplace and level of satisfaction. They used both qualitative and quantitative methods to collect the data for their study. As a representative sample, he employed 220 primary school teachers. He concluded that teachers are more driven to accomplish the school's objectives when they are in agreement with the management. Additionally, more research is required to determine how the school environment affects teachers' unique traits in a dynamic internal framework.

RESEARCH METHODOLOGY

INTRODUCTION

This chapter presents the methodology adopted for the study on organizational climate and its influence on organizational effectiveness. It explains the theoretical framework, research design, sampling technique, data collection tools, data analysis methods, and challenges faced during the study.The research employed a descriptive survey design using convenience sampling. The study was conducted among employees of the selected organization, and the findings were compared to organizational effectiveness measures.

The chapter also provides a brief profile of the organization and discusses the concept of organizational climate. Organizational climate refers to employees' perceptions of the work environment, including relationships, policies, and working conditions. It influences employee behavior, performance, and overall organizational effectiveness. Since organizational climate varies across organizations and individuals, understanding employees' perceptions is essential for improving organizational outcomes.

ORGANIZATIONAL CLIMATE

Since the 1930s, numerous studies on organizational climate have been conducted, yet there is no precise definition or structure for measuring organizational climate. In truth, there is a vast range of approaches to defining and measuring the organizational climate. The average course or state of the weather at a location over a period of years as demonstrated by temperature, wind velocity and precipitation is referred to as climate in the natural sense. The "weather of the workplace" is the organizational climate. Organizational climate effects employee motivation, performance, behavior at work and satisfaction in the same way that weather conditions influence daily activities.

Organizations are studied in a variety of management, and organizational communication. An organizational behavior system establishes a healthy organizational atmosphere. The foundations of term organizational philosophy are fact and value principles. Furthermore, the organizational environment is influenced by the types of individuals who work there, as well as technology, education, and expectations.

Economic, social, and fulfilling men are three categories of people. Each class of man has a unique set of beliefs and motivations, necessitating a unique organizational environment. In order to create a solid organizational climate, organizations must first understand their employees. The management must be in sync with the actual human environment. All of the models are based on the hierarchy of needs. Education, maturity, age, social background, personality, and work environment all influence people's needs. The management should construct an appropriate model based on these functions. As a result, organizational climate is defined as organizational members' behaviour patterns based on their behaviour experiences. Organizational climate provides the foundation for acceptable individual behaviour.

Organizational climate researchers have used data on human perceptions of organizational elements to determine organizational climate. Determine the organizational climate characteristics in this situation. Several dimensions of organizational climate are common to all organizations, according to the literature review and previous studies on the subject. Organizational Climate was associated by Owens (2004) with concepts such as atmosphere, personality, tone, and ethos. From a functional standpoint, the focus is on how entities such as corporate or state authority are used. Many people consider Halpin and Croft's (1963) concept of climate—which effectively linked it to morale—to be the foundational work on school climate. However, they acknowledged that time constraints confined their examination of that construct to the social interaction between the administrator and the teachers. The adjective "competency" is synonymous with "quality," "efficiency," "appropriate," and "adequate." Its dictionary definitions include the capacity, strength, aptitude, or competence to carry out a task. According to Hyland (1995), "competence entails the accomplishment of basic minimal norms." A teacher's teaching competency is a collection of abilities, information, and convictions that they have and use to support successful teaching and learning. In other words, competency is the existence of the skills and readiness to carry out a certain kind of work in a satisfactory manner.

Organization structure, organizational studies, organizational behaviour, and organizational analysis are all terms used to describe a larger analysis of an organization. There are a variety of viewpoints, some of which are compatible**:**

1. An organization is considered as a purposeful structure within a social setting from an institutional standpoint.
2. An organization is considered as an entity that is being reorganized as a set of tasks or actions from a process perspective.

Organizational climate-influencing factors

- Organizational structure
- Individual duties
- Physical surroundings
- standards, and values
- Mutual trust
- Sense of performance useful work
- Employee participation
- Process
- Achievement
- Closeness of supervision
- Rules orientation
- Result orientation performance
- Co-worker relationship

Educational institute

Education is delivered through a variety of programs, with the teacher serving as the primary agent for putting these programs into action at educational institutions. It is the responsibility of the teachers to use the programs to lead, inspire, and motivate pupils to live a disciplined life and to instil values in them that are consistent with India's cultural history and societal goals. There is a widespread perception that instructors are dissatisfied with their work. Teachers appear to be growing dissatisfied with their jobs, and as a result, the quality of teaching is deteriorating. Despite the various initiatives and programs that have been implemented to improve their job happiness, they are dissatisfied. It is possible to isolate the sources of unhappiness, and then seek to improve or lower the severity of the dissatisfaction in order to increase the profession's holding power. There's no denying that a teacher can't offer excellent instruction unless he or she enjoys their job. In Tamil Nadu, there are two types of management in charge of schools: government and private. Private schools can either be aided or self-supporting. Self-financing schools are wholly governed and supported by private managements, whereas aided schools are controlled by private managements but funded by the government.

It is believed that teachers in assisted schools are happier in their positions than those in self-financing establishments. Therefore, the goal of this study is to examine higher secondary school teachers' job happiness. It is impossible to overestimate the significance of education for human progress. Higher education, in particular, is a barometer of a country's advancement and prosperity. The quality of a nation's citizens is a reflection of its growth. In turn, the quality of the citizens is determined by the country's educational system. Teachers are essential to the health and prosperity of every educational system, regardless of the organizations in which they work. As a result, teachers have always held a prominent place in society and have been held in high regard. In their chosen professions, people require job satisfaction. Without job satisfaction, the job ceases to be a source of pleasure for them, and unhappiness gradually sets in. Teachers who are dissatisfied with their jobs have a difficult time adjusting to their students and become ineffective. As a result, it is critical that teachers are happy in their jobs.

Higher education institutions' academic and social environments can help or hinder students' academic advancement. The current beliefs, attitudes, and expectations that define the school and its participants have been defined as the campus environment in higher education research (Peterson and Spencer 1990). In order to help students preserve their cultural identities and overcome the uncomfortable experiences of isolation, segregation, and marginalization, institutions that are concerned with enhancing the social climate and attempting to make it more in line with students' lives have created special programs, services, and dedicated physical facilities (such as multicultural centers and tutoring and mentoring centers). Once students have a realistic sense of "belonging," they are more likely to complete their college education.

Teachers effectiveness

Teachers play a vital role in shaping society by transferring knowledge, skills, values, and experiences to future generations. They contribute significantly to the development of students and the progress of the nation. As emphasized by Sarvepalli Radhakrishnan, teachers help preserve and pass on intellectual and cultural heritage.

Teacher effectiveness refers to a teacher's ability to perform educational and institutional responsibilities successfully. It is influenced by factors such as teaching methods, classroom management, student relationships, assessment practices, and professional skills. Effective teachers create a positive learning environment that supports students' academic, social, and emotional development. Therefore, teacher effectiveness is an essential factor in achieving school goals and improving educational outcomes.

Research design

Convenience sampling design was used for the research. This design gave out the descriptive of the study and more understandable and statistical for the output

Pilot study

Pilot study was done by the research by visiting the areas in view of previewing and feasibilities of the study. Having chosen private school teachers in tirupattur town for degerming organizational climate. A short visit was made to the private school teachers for the study.

Selecting of samples

The researcher used probability sampling in specific simple random sampling for selecting 120 samples for data collection from the total population of nearly 600 private school teachers in tirupattur town

Source of data

In general, data can be categorized as

- Primary Data
- Secondary Data

Primary Data

The primary data are those that are obtained from filed data for the first time. A questionnaire was used to collect the primary data.

Secondary Data

Data that has already undergone statistical processing is referred to as secondary data. The secondary data was gathered from books, Internet, Journals or periodicals and Research thesis.

Analysis

The statistical package for social science (SPSS) software was used to edit, process, and analyze the acquired data. Tables, charts, and diagrams were used to display the results of the analysis.

Area of the study

The present study was conducted among private school teachers in Tirupattur Town to examine organizational effectiveness. Various private schools in Tirupattur were selected for the study.Tirupattur, often referred to as the "Town of Ten Villages," is an important taluk in Tamil Nadu. It includes several villages such as Aathiyur and Kodiyur and is known for its ancient Vishnu and Shiva temples, as well as water reservoirs dating back to the Hoysala period. The town has excellent road and rail connectivity with major cities such as Bengaluru, Vellore, Chennai, Salem, Coimbatore, and Tiruvannamalai. It is also known for the presence of several Islamic saints' shrines.

According to the 2011 Census, Tirupattur had a population of 64,125. During British rule, Tirupattur served as a revenue division and was part of both the Vellore and Salem districts at different periods. The Tirupattur subdivision includes the taluks of Tirupattur, Natrampalli, Vaniyambadi, and Ambur. Notable personalities such as Dr. T.V. Somanathan, K.P.S. Menon Jr., and Anna Rajam Malhotra served as Sub-Collectors of Tirupattur during their early careers.

The Tirupattur Municipality was established as a Third-Grade Municipality in 1886. It was upgraded to a Second-Grade Municipality through Government Order No. 194 dated 10.02.1970 and later classified as a First-Grade Municipality through Government Order No. 654 dated 01.04.1977.

Tirupattur has adequate population and geographical area for political representation in both the state and national legislatures. The town falls under the Tiruvannamalai Lok Sabha Constituency for parliamentary elections and has representation in the Tamil Nadu Legislative Assembly. The Tirupattur District was formed on 15 August 2019 following the trifurcation of the Vellore District, with Tirupattur town serving as the district headquarters. This made Tirupattur an important administrative and educational center, making it a suitable location for the present study.

Item Statistics

Particulars	Mean	Std. Deviation	N
Work activities of school teachers	2.73	1.221	120
Freedom and Independence to perform my job	2.94	1.023	120
Ideas and suggestions of teachers	3.21	1.166	120
Compatible atmosphere in school	3.33	1.205	120
Quality principles of teachers	3.27	1.172	120
Opportunities to take decisions in school	3.22	1.132	120
Feedback of job performance	3.29	1.279	120
Goal and objectives of school	3.38	1.108	120
Work place safety importance	3.34	1.119	120
Policies and organizational structure	3.25	1.176	120
Assistance of co workers	3.25	1.125	120
Relationship of management and teachers	3.36	1.075	120
Need of time to consult teachers	2.65	1.135	120
Friendly atmosphere among teachers	3.24	1.069	120
Resource shared throughout the school	3.36	1.083	120
Treating humanly without differences	3.22	1.161	120

Trustworthy of senior teachers	3.33	1.203	120
Freely communicate with senior teachers	3.28	1.23	120
Teachers suggestions	3.38	1.077	120
School enhances career growth	3.32	1.159	120
Job stimulating	3.56	1.215	120
Effective of new technologies	3.64	1.165	120
Morale is at its best	3.67	1.155	120
Loyal to the values of school	3.73	1.067	120
Work beyond the experience of school	3.78	1.055	120
Like to work at school	3.6	1.08	120
Need of the teachers in school	3.6	1.148	120

Table 1

Demographic Profile of Respondents (N = 120)

Sl.No.	Variable	Category with Highest Response	Frequency	Percentage (%)
1	Gender	Male/Female (Equal)	60	50.0
2	Marital Status	Married	86	71.7
3	Age	26–35 Years	32	26.7
4	Educational Qualification	UG/PG with B.Ed.	45	37.5
5	Monthly Income	₹25,000–₹40,000	35	29.2
6	Teaching Experience	5–10 Years	38	31.7
7	Type of School	Higher Secondary	37	30.8
8	Working Hours	8 Hours	88	73.3

Table 2

Summary of Organisational Climate Variables (N = 120)

S. No	Organisational Climate Variable	Highest Response Category	Percentage (%)
1	Work activities are fairly allocated	Agree	28.3
2	Freedom and independence in performing a job	Disagree	33.3
3	Teachers' ideas and suggestions are valued	Agree	30.0
4	A compatible atmosphere exists in school	Agree	36.7
5	School follows quality principles	Agree	37.5
6	Opportunities for decision-making are provided	Agree	31.7
7	Feedback on job performance is provided regularly	Agree	31.7
8	Importance is given to workplace safety	Neutral	31.7
9	Policies and organizational structure are clearly explained	Neutral	31.7
10	Assistance is available from co-workers and senior staff	Agree	33.3
11	Contributions towards school goals are recognized	Agree	34.2
12	Warm relationship exists between	Agree	40.0

	management and teachers		
13	Teachers are permitted sufficient time for consultation	Neutral	32.5
14	Friendly atmosphere prevails among staff members	Neutral	30.8
15	Resources are shared throughout the school	Neutral/Agree	33.3
16	Teachers are treated humanely without discrimination	Neutral	31.7
17	Information provided by senior teachers is trustworthy	Agree	30.8
18	Teachers can freely communicate with senior teachers	Neutral	30.0
19	Management considers teachers' suggestions seriously	Agree	33.3
20	School enhances career growth	Agree	35.8
21	Job provides stimulation and motivation	Agree	35.0
22	New technologies improve job effectiveness	Agree	31.7
23	Teacher morale is high	Agree	42.5
24	Teachers are loyal to school values	Agree	44.2
25	Teachers are willing to work beyond expectations	Agree	46.7
26	Teachers like working in their school	Agree	45.0
27	School understands teachers' needs	Agree	43.3

FINDINGS

1. Most of the respondents (26.7%) are in the age group of 26–35 years and are working as private school teachers.
2. Equal numbers of male and female respondents (50% each) are working as teachers in Tirupattur.
3. The majority of the respondents (71.7%) are married and belong to families residing in Tirupattur town.
4. Most respondents possess UG/PG qualifications along with a B.Ed. degree (37.5%) and are working in private schools in Tirupattur town.
5. The majority of the respondents (29.2%) earn a monthly income between ₹25,000 and ₹40,000 and are satisfied with their jobs.
6. A major portion of the respondents (31.7%) have 5–10 years of teaching experience in Tirupattur town.
7. The study sample was collected from all types of schools in Tirupattur, and 29.2% of the respondents are from primary schools.
8. The majority of the respondents (73.3%) work for 8 hours daily as school teachers.
9. Most respondents (28.3%) agreed that work activities are properly allocated among teachers in their schools.
10. Most respondents (33.3%) disagreed that they have freedom and independence to perform their jobs in their schools.
11. Most respondents (30%) agreed that importance is given to teachers' ideas and suggestions in their schools.
12. Most school teachers (36.7%) agreed that a compatible atmosphere is maintained in their schools.
13. Most school teachers (37.5%) agreed that the principles of quality are followed in their

schools.

14. Most respondents (31.7%) agreed that teachers are given ample opportunities to participate in decision-making in their schools.
15. Most respondents (31.7%) agreed that they receive regular feedback on their job performance.
16. Most respondents (31.7%) were neutral regarding whether their contribution toward the goals and objectives of the school is duly recognized by the management.
17. Most school teachers (31.7%) were neutral regarding the importance given to workplace safety in schools.
18. Most school teachers (33.3%) agreed that they receive assistance from senior staff members and co-workers when handling difficult assignments.
19. Most respondents (34.2%) agreed that the management recognizes teachers' contributions toward achieving the goals and objectives of the school.
20. Most respondents (40%) agreed that there is warmth in the relationship between the management and teachers in the school.
21. Most respondents (32.5%) were neutral regarding whether teachers are permitted to consult one another in times of need.
22. Most respondents (30.8%) were neutral regarding whether a friendly atmosphere prevails among staff members in the school.
23. Most respondents (33.3%) agreed that resources are shared throughout the school.
24. Most respondents (31.7%) were neutral regarding whether top management values teachers and treats them humanely without discrimination.
25. Most respondents (30.8%) agreed that the information provided by senior teachers is trustworthy.
26. Most respondents (30%) were neutral regarding whether teachers can freely communicate with senior teachers about work-related matters.
27. Most respondents (33.3%) agreed that the management seriously considers teachers' suggestions in the school.
28. Most respondents (35.8%) agreed that the school enhances career growth opportunities.
29. Most respondents (35%) agreed that their jobs are stimulating in their schools.
30. Most respondents (31.7%) agreed that they are updated with new technology in order to be effective in their jobs.
31. Most respondents (42.5%) agreed that morale is at its best in their schools.
32. Most respondents (44.2%) agreed that they are loyal to the values of the school.
33. Most respondents (46.7%) agreed that their work goes beyond their previous experience in the school.
34. Most respondents (45%) agreed that they like working in their school.
35. Most respondents (43.3%) agreed that the school understands the needs of teachers.

SUGGESTIONS

1. Since the majority of the staff are working for the development of the school, they should be provided with training programs to help them cope with academic and family-related pressures.
2. Many teachers working in private schools receive low salaries. Therefore, their salaries may be increased based on their performance and contributions to the school.
3. School and student discipline, teacher performance, student attendance and achievement, community participation, and parental involvement in school activities should be recognized and rewarded through appropriate awards.
4. Teachers have a high level of trust in the school. This trust should be maintained and strengthened to enhance their involvement and commitment.

5. Teamwork among teachers should be encouraged and recognized to promote a positive and collaborative work environment.
6. The performance appraisal system should be administered in a transparent and reliable manner by the school administration. This will motivate teachers to work more efficiently and effectively.

CONCLUSION

This study examined the motivation of private school teachers in Tirupattur. A total of 120 teachers from four different types of private schools participated in the study. The majority of the respondents had more than 10 years of teaching experience and possessed varying educational qualifications. The findings suggest that schools should provide greater job security and appropriate salary increments to improve the quality of life of teachers and enhance their motivation. In addition, schools should organize health camps at least once every six months and conduct regular awareness programs on recent educational trends and developments.

Furthermore, the management should have a clear vision and adopt modern technologies to create a motivating work environment for teachers. Such initiatives can improve teacher motivation, enhance organizational effectiveness, and contribute to better educational outcomes.

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A COMPARATIVE ANALYSIS OF THE FINANCIAL SOUNDNESS OF SELECTED PUBLIC AND PRIVATE SECTOR BANKS IN INDIA (2021-2025): A SECONDARY DATA STUDY

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ABSTRACT

This study empirically assesses the structural transformation and institutional resilience of the Indian banking sector between FY20 and FY25. It focuses on a comparative assessment of top-tier public sector banks (PSBs) – State Bank of India (SBI) and Punjab National Bank (PNB), along with major private sector banks (PvSBs) – HDFC Bank and ICICI Bank. Using the international CAMEL framework and longitudinal panel analysis, the study identifies a historic structural shift. The findings reveal that PSBs achieved a record net profit of ₹3.71 lakh crore in FY25 (As per RBI Data, 2025), driven by the lowest system-wide gross NPA of 2.1% in a decade. Most notably, for the first time in 14 years, PSBs outperformed private banks in domestic credit growth (13.1% vs. 9.0%). Ratio analysis indicates a significant performance convergence in asset quality and return profile. The study concludes that the government's 4Rs strategy and aggressive digital adoption have successfully bridged the historical efficiency gap.

KEYWORDS: Indian Banking Sector, Public Sector Banks, Private Sector Banks, CAMEL framework, performance convergence, Non-Performing Assets (NPA), 4Rs Strategy.

INTRODUCTION

The banking sector represents the fundamental backbone of India's economic structure, serving as the primary mechanism for capital formation. Between 2021 and 2025, the industry made an unprecedented journey from chronic asset quality stress to a decade of financial stability. When the global economy faced severe shocks due to pandemic-induced volatility and geopolitical uncertainty, the Indian banking system demonstrated unique resilience, anchored by strong regulatory oversight and successful insolvency reforms. By 2025, the traditional dichotomy between state-owned and private institutions had fundamentally changed. Public sector banks (PSBs) were no longer simply *fragile* entities burdened with inherited assets but were now aggressively competing commercially. This study aims to measure this *renaissance* through standardized financial metrics and advanced multi-factor statistical validation.

BACKGROUND OF THE STUDY

Historically, the Indian banking landscape was defined by the '*twin balance sheet*' crisis, where banks were plagued by over-leveraged corporates and bad loans (NPAs). Non-performing assets tripled between 2015 and 2018 to reach Rs 8.45 lakh crore. However, the 2021 - 2025 period is set to witness a radical change with the mega-merger of 2020, which will see the public sector merged into 12 entities and government capital inflows of over Rs 3.15 lakh crore.

RESEARCH PROBLEM

Despite the apparent resurgence of state-owned banks, contemporary academic literature often relies on historical data that consistently outperform private sector banks on all performance measures. There is a clear research gap in documenting the *performance shift* to 2025, where state-owned banks caught up with private banks in net NPA ratios and surpassed them in loan growth. The issue focuses on determining whether the traditional performance differences are valid after system-wide GNPAs fell to a 13-year low of 2.1% by the end of 2025.

RESEARCH QUESTIONS

Aligned with CAMEL framework, this study addresses the following questions:

1. **(C)** How have Capital Adequacy Ratios (CAR) evolved differently across sectors from 2021 to 2025?
2. **(A)** What is the trajectory of Asset Quality (Net NPA) across public and private banks post-pandemic?
3. **(M)** How much impact has digital maturity (YONO, India Stack) had on the Management Efficiency ("profit per employee") score?
4. **(E)** How has the Earnings Quality (ROA) trajectory shifted between public and private sector banks over the five-year period?
5. **(L)** How do social mandates like Pradhan Mantri Jan Dhan Yojana (PMJDY) affect the Liquidity profile of public sector banks?

RESEARCH OBJECTIVES

1. (**C**) To map the Capital Adequacy resilience (CAR) of top-tier banks through post-pandemic recovery.
2. **(A)** To analyze the trajectory of Asset Quality (NPAs) and assess the effectiveness of solution frameworks such as IBC.
3. (**M**) To examine the impact of digital banking adoption on management efficiency indicators such as profit per employee.
4. (**E**) To provide a detailed comparison of Earnings Quality metrics (Net Profit, ROA) over a five-year long-term (2021-2025) period.
5. (**L**) To examine how public sector banks, maintain stronger liquidity through financial inclusion driven deposit growth.

LITERATURE REVIEW

Contemporary research identifies digital adoption as a performance differentiator. Kiruthika and Muthumari (2025) find that while private banks have maintained higher absolute profits, state-owned banks have shown the most significant recovery in asset quality in Indian history. Shukla (2025) highlights the historical anomaly of FY2025 where state-owned banks led loan growth at 13.1%, indicating a desire for state-backed lending. Mehta et al. (2025) argue that bank consolidation has significantly reduced the efficiency gap across sectors. An important gap remains in the analysis of the full audited FY25 cycle, which is addressed in this study.

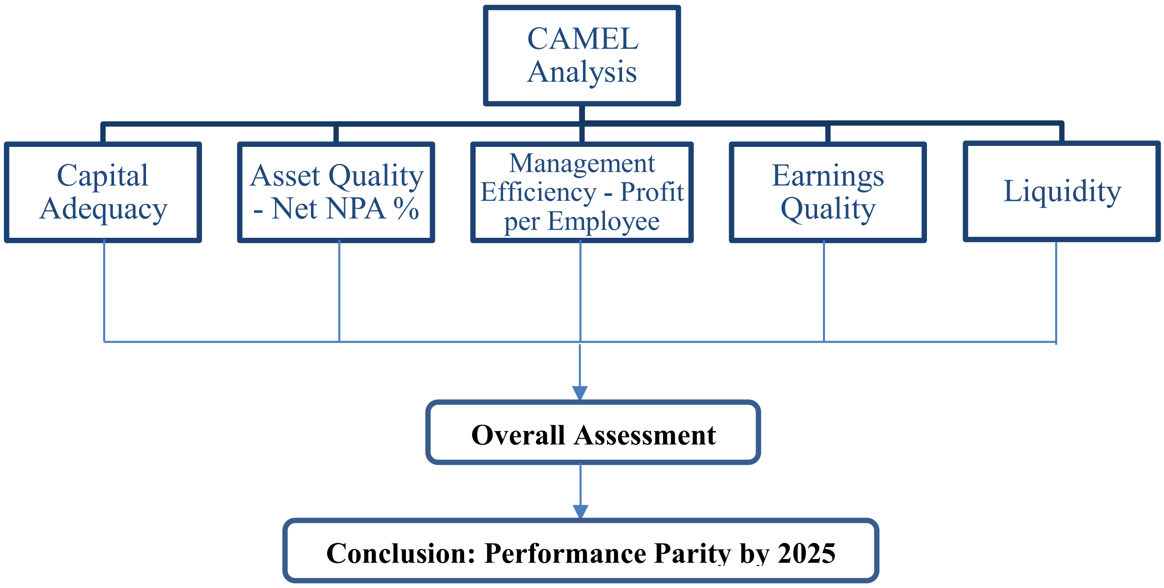
THEORETICAL FRAMEWORK

This study is based on the theory of financial-led growth, which suggests that a strong financial intermediation system is essential for industrial productivity and economic output. In addition, it uses the CAMEL rating model, an international standard adopted by the Reserve Bank of India in 1996. The framework assesses:

1. Capital adequacy (C): Buffer to absorb unexpected losses.
2. Asset quality (A): Assessment of credit risk exposure.
3. Management efficiency (M): Soundness of managerial oversight.

4. Earnings quality (E): Quality of sustainability and profitability.
5. Liquidity (L): Short-term liabilities and cash management.

Dig. 1
CAMEL Research Model Framework



SIGNIFICANCE AND JUSTIFICATION OF THE STUDY

This research provides an important roadmap for policymakers to assess the long-term impact of the "4Rs strategy" (recognition, resolution, recapitalization and reform). For investors, it illustrates the significant revaluation of PSB stocks, with price-to-book (P/B) ratios increasing from an average of 0.35 in March 2020 to 1.14 in July 2025. It also provides a framework for understanding how the "mass banking" mandate can be transformed into a "profitable banking" model.

With system-wide gross NPAs falling to a multi-decade low of 2.1% as of September 2025, the Indian banking system is in its healthiest state in 13 years. To assess the sustainability of this recovery and to guide the future regulatory framework for sustainable economic expansion a comparative study analyzing the full audited cycle from FY 2021 to FY 2025 is mandatory.

RESEARCH METHODOLOGY

This study follows an empirical, descriptive and longitudinal trend analysis approach.

Data Source: Audited Annual Report (2021-2025), RBI Report on Trends and Developments in Banking in India and Database of Indian Economy (DBIE).

Sample Selection: Purposive sampling of top two public sector banks (SBI, PNB) and top two private sector banks (HDFC, ICICI) based on market capitalization and total assets.

Analytical Tools: Ratio analysis was used for CAMEL scoring and assessing longitudinal trends across the five-year period.

Mathematical Formulas:

All ratios were calculated using standard formulas defined by regulatory authorities:

1. Capital Adequacy Ratio (CAR) = $\frac{Tier\ I\ Capital + Tier\ II\ Capital}{Risk\ Weighted\ Assets}\ X\ 100$
2. Net NPA Ratio = $\frac{Net\ Non\ Performing\ Assets}{Net\ Advances}\ X\ 100$
3. Profit Per Employee (M) = $\frac{Net\ Profit}{Total\ No.of\ Employee}$
4. Return on Assets (ROA) = $\frac{Net\ Profit}{Total\ Assets}\ X\ 100$

LIMITATIONS

The study is primarily limited to secondary financial ratios and does not account for internal qualitative governance factors. The merger of HDFC Ltd into HDFC Bank in FY 2024 may create temporary volatility in longitudinal comparisons.

DATA ANALYSIS & FINDINGS

Capital Adequacy

Table 1

Capital Adequacy Ratio (CAR %) Trajectory (2021-2025)

Bank	March 2021	March 2022	March 2023	March 2024	March 2025
SBI (Public)	13.74%	13.83%	14.68%	14.28%	14.25%
PNB (Public)	14.32%	14.50%	15.50%	15.97%	17.00%
HDFC (Private)	18.80%	18.90%	19.30%	19.90%	19.80%
ICICI (Private)	19.12%	19.16%	18.34%	16.30%	16.60%

Sources: Compiled from Audited Annual Reports (2021-2025).

Analysis: Private sector banks consistently maintained a higher capital buffer throughout the recovery phase. However, by 2025, public sector banks like PNB successfully raised their CAR to 17.00%, securing highly comfortable capital positions well above regulatory requirements.

1.12.2 Asset Quality

Table 2

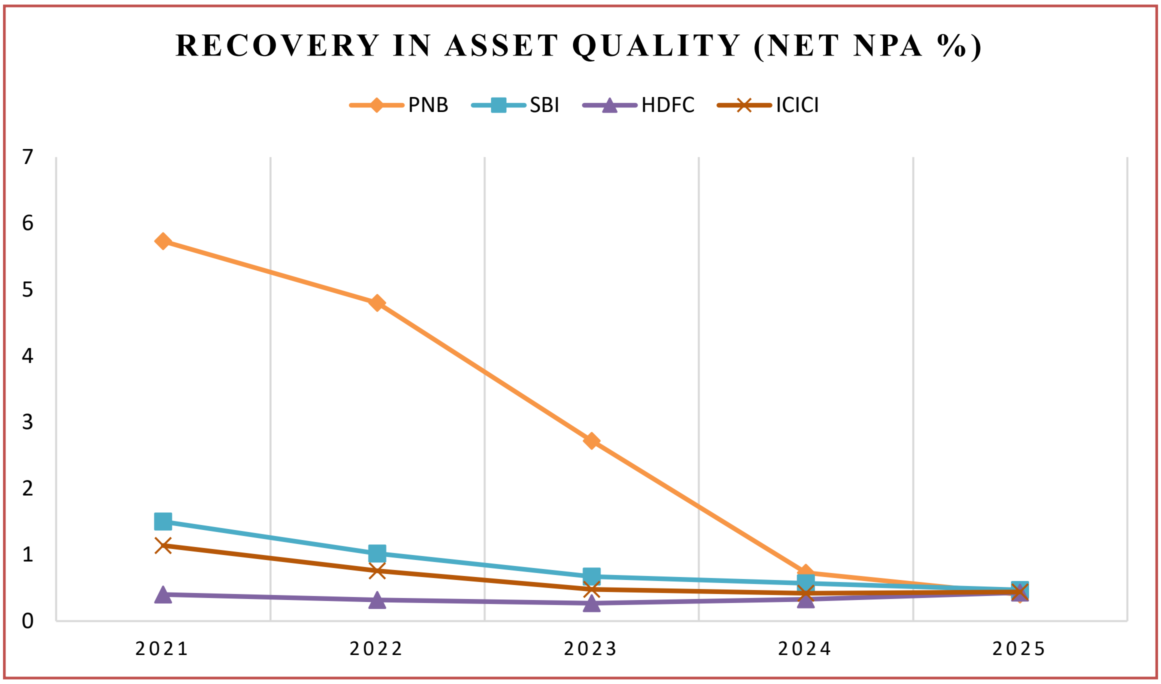
Comparative Asset Quality (Net NPA %) Evolution (2021-2025)

Bank	March, 2021	March, 2022	March, 2023	March, 2024	March, 2025	Trend
SBI (Public)	1.50	1.02	0.67	0.57	0.47	Decadal Low
PNB (Public)	5.73	4.80	2.72	0.73	0.40	Recovery Leader
HDFC (Private)	0.40	0.32	0.27	0.33	0.43	Stable
ICICI (Private)	1.14	0.76	0.48	0.42	0.44	Consistent

Source: Compiled from Audited Annual Reports (2021-2025).

Analysis: The historic turnaround in Punjab National Bank, which reduced its Net NPA from 5.73% to 0.40%, exemplifies the success of resolution frameworks. By 2025, PSBs have effectively matched private sector benchmarks in credit quality. The reduction of system-wide gross NPAs to 2.1% by 2025 was heavily catalyzed by the IBC (Insolvency and Bankruptcy Code, 2016) framework. Public sector banks actively leveraged the NCLT (National Company Law Tribunal) to resolve legacy corporate accounts, fundamentally cleaning PSB balance sheets and elevating Provision Coverage Ratios (PCR) to robust levels.

Dig. 2
Decadal Recovery in Asset Quality (Net NPA %)



Source: Compiled from Audited Annual Reports (2021-2025).
Management Efficiency

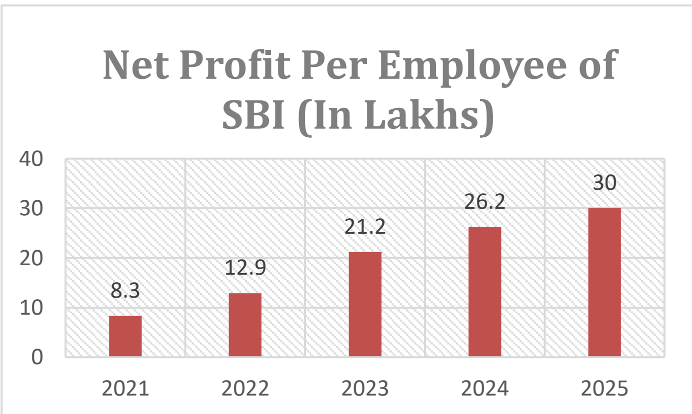
Table 3
Management Efficiency and Productivity Benchmarks (March, 2025)

Metric	SBI	PNB	HDFC	ICICI
Net Profit (In Cr.)	70,901	16,630	67,347	47,227
Profit Per Employee	30,01,389	19,25,000	47,48,000	68,56,000
Daily Digital App Logins	>1.28 Cr	314 L (UPI via ONE)	High	88% Share

Source: Audited Financial Statements and Analyst Presentations.

Analysis: SBI's productivity per employee grew nearly fourfold since 2021 (₹8.3 lakh), proving that digital scaling via platforms like YONO has eliminated historical operational blockages.

Dig. 3
Impact of SBI YONO & Digital Scaling on Productivity



Earnings Quality

Table 4
Comparative Return on Assets (ROA %) Evolution (2021-2025)

Bank	March 2021	March 2022	March 2023	March 2024	March 2025
SBI (Public)	0.48%	0.67%	0.96%	1.04%	1.10%
PNB (Public)	0.12%	0.31%	0.18%	0.54%	1.00%
HDFC (Private)	2.00%	2.03%	2.07%	1.80%	1.90%
ICICI (Private)	1.42%	1.77%	2.13%	1.90%	2.20%

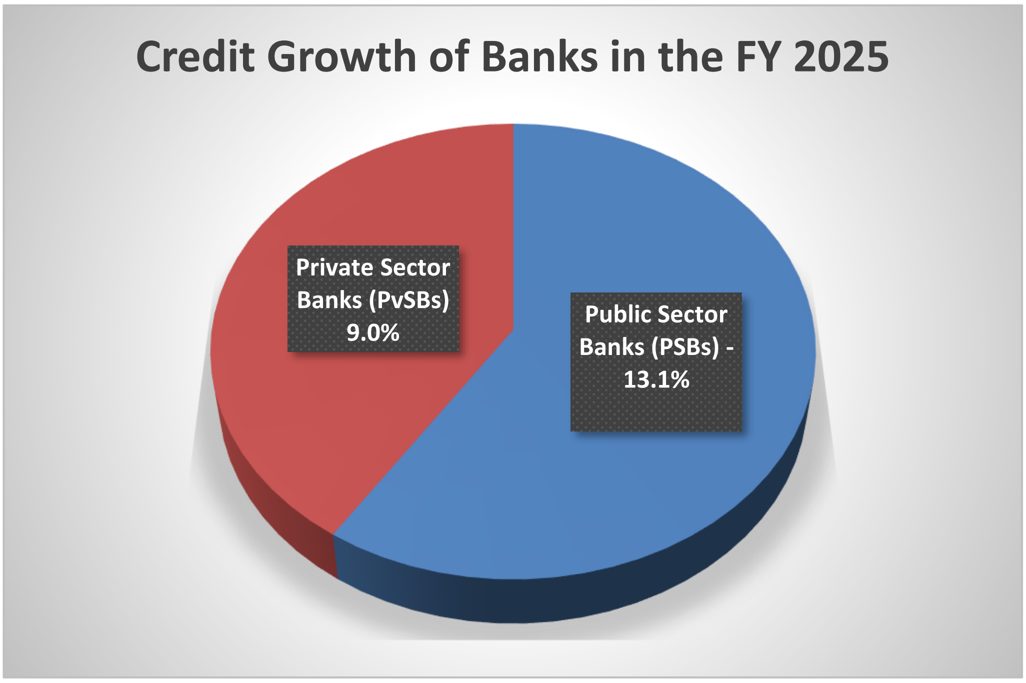
Source: Compiled from Audited Annual Reports (2021-2025).

Analysis: The earning capability of the sampled PSBs has shown sequential strengthening. SBI and PNB successfully pushed their ROA to or above the critical 1.00% threshold by 2025, confirming the shift from recovery to sustainable profitability.

1.12.5 Liquidity

Analysis of Social Mandates on Liquidity: Addressing the final dimension of the CAMEL framework, social mandates like the Pradhan Mantri Jan Dhan Yojana (PMJDY) have profoundly impacted the liquidity profile of public sector banks. By bringing millions of unbanked citizens into the formal financial system, PSBs accumulated a massive and highly stable base of low-cost CASA (Current Account – Savings Account) deposits. This structural advantage insulates their liquidity positions against sudden market shocks, providing a reliable funding base to support the **aggressive 13.1% domestic credit growth** witnessed in FY25.

Dig.4
Sectoral Credit Growth "Flip"



Source: RBI Publication 2024-25.

Note: For the first time in 14 years, PSBs outpaced private peers in portfolio expansion during 2025.

CONCLUSION AND RECOMMENDATIONS

The longitudinal analysis for 2021-2025 indicates a major shift in Indian banking. Public sector banks have successfully transitioned from a phase of asset stress to sustainable profitability, effectively narrowing the historical efficiency gap with private banks. The "performance shift" in 2025, where public sector banks outperformed private banks in lending, indicates a resurgence in lending appetite in state institutions, supported by digital platforms like SBI's YONO. However, regulatory vigilance is needed to be alert to risks arising from high-value fraud (₹34,771 crore in 2024-25) and technological disruptions.

Table 5

Terminal Year Performance Indicators (March 2025) *(This table highlights the Earnings and Management Efficiency metrics for the final year of the study.)*

Bank Name	Sector	Net Profit (₹ in Cr.)	Profit Per Employee (₹)
SBI	Public	70,901	30,01,389
PNB	Public	16,630	19,25,000
HDFC	Private	67,347	47,48,000
ICICI	Private	47,227	68,56,000

Source: Audited Financial Statements of Banks and Analyst Presentations.

Table 6

Mean Performance of Bank Groups (March 2025) *(Sectoral averages used for comparative convergence analysis.)*

Ratio	PSB Group Mean	PvSB Group Mean	System Average
Net NPA (%)	0.435%	0.435%	0.435%
ROE (%)	17.62%	16.44%	17.03%
CAR (%)	15.63%	18.05%	16.84%

Source: Compiled from Audited Annual Reports 2025.

Annexure II: Note on Structural Adjustments (HDFC Bank merger)

Methodological Treatment of the HDFC Ltd. and HDFC Bank Merger (FY24)

Context: The reverse merger of parent company Housing Development Finance Corporation (HDFC Ltd.) into HDFC Bank became effective on July 1, 2023 (Q2 FY24). This created a structural break in the longitudinal data for HDFC Bank, significantly inflating its total asset base, loan book, and altering its net interest margin (NIM) and CASA ratios artificially when compared on a purely historical basis.

Adjustment Protocol Applied in this Study:

1. **Ratio Reliance over Absolute Values:** To mitigate the volume distortion caused by the sudden influx of HDFC Ltd.'s assets, this study relies primarily on normalized percentages (such as Net NPA %, CAR %) rather than absolute volume figures for the longitudinal trend analysis spanning FY21 to FY25.
2. **Per-Employee Normalization:** When assessing management efficiency (Profit Per Employee), the total expanded headcount of the merged entity as of March 31, 2025, was utilized against the consolidated net profit to ensure a true reflection of the current operational efficiency.

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A STUDY ON CONSUMER BEHAVIOUR TOWARDS BODY WASH PRODUCTS: FACTORS INFLUENCING PURCHASE INTENTION AND CUSTOMER SATISFACTION

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ABSTRACT

The personal care industry has witnessed substantial growth in recent years, with body wash products gaining popularity among consumers due to their convenience, hygiene benefits, fragrance, and skin-care properties. Consumers are increasingly shifting from traditional bathing soaps to body wash products because of changing lifestyles, rising awareness of personal hygiene, and the availability of specialized formulations for different skin types. This study aims to examine consumer behaviour towards body wash products by identifying the factors influencing purchase decisions, brand preference, and customer satisfaction. The research employs a descriptive research design and gathers primary data through a structured questionnaire from body wash users. The study evaluates the impact of factors such as product quality, fragrance, price, brand image, packaging, and promotional activities on consumer purchasing behaviour. The findings are expected to provide valuable insights for manufacturers and marketers in developing effective marketing strategies and enhancing customer satisfaction.

Keywords: Consumer Behaviour, Body Wash, Personal Care Products, Purchase Intention, Brand Preference, Customer Satisfaction.

INTRODUCTION

Consumer behaviour refers to the actions and decision-making processes of individuals when purchasing and using products and services. In the personal care industry, understanding consumer preferences is crucial for developing products that meet customer expectations. Body wash has emerged as a popular alternative to traditional bathing soap due to its moisturizing properties, ease of use, attractive fragrances, and skin-friendly ingredients. Consumers today seek products that not only cleanse the skin but also provide additional benefits such as hydration, nourishment, and protection against skin problems.

Various factors influence consumers' purchasing decisions regarding body wash products, including brand reputation, product ingredients, fragrance, price, packaging, advertising, and recommendations from family and friends. Considerate these factors can help marketers design improved products and promotional strategies.

This study focuses on analyzing consumer behaviour towards body wash products and identifying the factors that influence purchase decisions and customer satisfaction.

OBJECTIVES OF THE STUDY

1. To identify the factors influencing the purchase of body wash products.
2. To examine consumer preferences regarding body wash brands.
3. To analyze the influence of fragrance, price, and product quality on purchasing decisions.
4. To assess customer satisfaction towards body wash products.
5. To study the relationship between brand image and purchase intention.
6. To provide suggestions for improving customer satisfaction and marketing effectiveness.

LITERATURE REVIEW

Sharma, Goel, and Sindwani (2024), in their study, found that health consciousness, environmental awareness, and perceived behavioral control significantly and positively influence consumers' intentions to purchase organic personal care products.

Wang, Wang, Han, and Cho (2024) conducted a study , The study revealed that appealing packaging, product aesthetics, and innovative design elements positively affect consumers' emotions, thereby enhancing their purchase intentions.

Setiawan, Widjojo, and Alamsyah (2024), in their research, they concluded that health consciousness and environmental concerns play a crucial role in shaping positive consumer attitudes toward natural personal care products, which in turn significantly influence purchase intentions.

RESEARCH METHODOLOGY

The present study adopted a descriptive research design to examine the relationship between purchase intention, product features, and customer satisfaction towards body wash products. Data were collected from both primary and secondary method. Primary data were gathered through a structured questionnaire administered to body wash users, while secondary data were obtained from journals, books, websites, company reports, and research articles. The study employed convenience sampling, and a total of 157 respondents from Chennai City, Tamil Nadu, participated in the survey. The collected data were analyzed using statistical tools, including the Chi-Square Test, to identify the association between purchase intention, product features, and customer satisfaction.

DATA ANALYSIS AND INTERPRETATION

Hypothesis

H_{01}: There is no significant relationship between age and purchase intention towards body wash products.

H_{11}: There is a significant relationship between age and purchase intention towards body wash products.

H_{02}: There is no significant relationship between product quality and customer satisfaction.

H_{12}: There is a significant relationship between product quality and customer satisfaction.

Chi-Square Test

Table 1.1
Chi-Square Test: Age vs Purchase Intention

Age Group	Low Purchase Intention	Medium Purchase Intention	High Purchase Intention	Total
Below 20 Years	7	10	13	30
21–30 Years	9	12	29	50

31–40 Years	10	12	18	40
41–50 Years	8	7	10	25
Above 50 Years	4	4	4	12
Total	38	45	74	157

Table 1.2
Chi-Square Result

Particulars	Value
Sample Size	157
Calculated χ^2 Value	13.862
Degrees of Freedom	8
Table Value (5% Level)	15.507
p-value	0.086

Interpretation

Since the calculated χ^2 value (13.862) is less than the table value (15.507), the null hypothesis is accepted.

Result: There is no significant relationship between age and purchase intention towards body wash products.

Table 2.1
Product quality/Features v/s Customer Satisfaction

Product Quality Rating	Low Satisfaction	Moderate Satisfaction	High Satisfaction	Total
Poor	9	4	2	15
Average	11	13	6	30
Good	8	20	17	45
Very Good	4	14	27	45
Excellent	2	5	15	22
Total	34	56	67	157

Table 2.2
Chi-Square Test Result

Particulars	Value
Sample Size	157
Calculated χ^2 Value	35.284
Degrees of Freedom	8
Table Value (5% Significance Level)	15.507
p-value	0.000

Interpretation

The calculated Chi-square value (35.284) is greater than the table value (15.507). The p-value (0.000) is less than 0.05.Hence, the null hypothesis is rejected.

Result

There is a significant relationship between product quality/features and customer satisfaction towards body wash products.

FINDINGS

1. Most respondents belong to the 21–30 age group.
2. Fragrance and product quality are the primary factors influencing purchase decisions.
3. Dove, Nivea, and Loreal are among the most preferred brands.

4. There is no significant relationship between age and purchase intention.
5. Product quality has a strong positive relationship with customer satisfaction ($r = 0.782$).
6. Most consumers prefer body wash due to hygiene and skin-care benefits.
7. A majority of respondents are willing to repurchase their preferred body wash brand.

SUGGESTIONS

The study suggests that body wash brands should focus on enhancing product quality by using safe and skin-friendly ingredients to improve customer satisfaction. Introducing a wider range of fragrance options can help meet diverse consumer preferences. Attractive discounts, promotional offers, and combo packs can encourage purchase intention and increase sales. Strengthening online marketing efforts through digital platforms can improve brand awareness and customer engagement. Additionally, adopting eco-friendly packaging solutions can appeal to environmentally conscious consumers and support sustainable business practices.

CONCLUSION

The study concludes that consumer behaviour towards body wash products is influenced by factors such as fragrance, product quality, brand image, and price. Product quality plays a crucial role in enhancing customer satisfaction and repeat purchases. Manufacturers should focus on innovation, quality improvement, and customer-centric marketing strategies to maintain a competitive advantage in the personal care market.

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ABSTRACT

Smartwatches have become an important part of daily life due to rapid technological advancements and their ease of use. These wearable devices offer features such as fitness tracking, health monitoring, heart-rate monitoring, communication, and instant notifications, making them increasingly popular among consumers. The smartwatch industry has experienced significant growth due to rising health awareness, changing lifestyles, and continuous technological innovation. This study aims to examine consumer behaviour and customer satisfaction towards smartwatches by identifying the factors influencing purchase decisions, usage patterns, and overall user experience. The research adopts a descriptive research design and is based on primary data collected from smartwatch users of different age groups through a structured questionnaire. Factors such as product features, brand image, price, design, battery life, ease of use, purchasing decisions, and social influence were analysed to understand their impact on consumer behaviour and satisfaction. The findings reveal that most consumers are satisfied with their smartwatches because of the convenience, functionality, and health-related benefits they provide. Features such as fitness tracking, heart-rate monitoring, and instant notifications were identified as major contributors to customer satisfaction. However, concerns regarding battery performance, durability, and pricing were also reported by some users. The study concludes that customer satisfaction and consumer preferences play a crucial role in the success of smartwatch brands. Understanding these factors can help manufacturers improve product quality, introduce innovative features, and develop effective marketing strategies to meet consumer needs and enhance market competitiveness.

KEYWORDS: Consumer Behaviour, Smartwatch, Purchase Intention, Customer Satisfaction, Wearable Technology, Brand Preference.

INTRODUCTION

Consumer behaviour refers to the study of individuals, groups, or organizations and the processes they use to select, purchase, use, and dispose of products and services. In today's digital era, wearable technology has become an integral part of consumers' daily lives. Among various wearable devices, smartwatches have gained considerable popularity due to their advanced technological features and convenience.

Smartwatches offer numerous functions such as fitness tracking, heart rate monitoring, sleep analysis, GPS navigation, mobile notifications, and online payment facilities. The growing awareness of personal health and fitness, coupled with technological innovation, has contributed significantly to the expansion of the smartwatch market.

Understanding consumer behaviour towards smartwatch products is essential for marketers and manufacturers to identify customer needs, preferences, and expectations. Various factors such as product quality, price, brand reputation, technological features, social influence, and perceived value affect consumers' purchasing decisions. This study seeks to analyze these factors and evaluate consumer satisfaction levels regarding smartwatch products

OBJECTIVES OF THE STUDY

1. To identify the factors influencing consumers' purchase decisions regarding smartwatches.
2. To analyze consumer preferences for smartwatch features and functionalities.
3. To assess the relationship between price perception and purchase intention.
4. To evaluate customer satisfaction levels towards smartwatch products.
5. To provide suggestions for improving marketing strategies and customer satisfaction.

LITERATURE REVIEW

Sinchana M.P. (2025) studied consumer perception towards smartwatches using secondary data. The study found that features such as fitness tracking, heart-rate monitoring, GPS, and notifications increase smartwatch popularity. Key factors influencing purchase decisions include brand, price, design, features, and usefulness. The study concluded that understanding consumer preferences helps manufacturers improve products and marketing strategies.

Kumaran, M. P., & Sandhiya, G. (2023) examined customer preferences for smartwatches in Coimbatore City. The study revealed that product features were the most important factor influencing purchase decisions, followed by design. Samsung was the most preferred brand, followed by Apple and Noise. The findings showed a significant relationship between age and smartwatch awareness, while occupation had no impact on satisfaction.

Magdalene, S., & Jenifer, P. J. (2023) analyzed customer perception and purchase intention towards smartwatches among consumers in Coimbatore. Using data from 100 respondents, the study found that consumers have a positive perception of smartwatches due to their convenience, usefulness, and innovative features. Factors such as ease of use, fitness tracking, connectivity, design, comfort, and affordability significantly influenced purchase intention. The study concluded that the smartwatch market has strong growth potential.

RESEARCH METHODOLOGY

Research Design

The study adopts a descriptive research design to understand consumer behaviour towards smartwatch products.

Nature of Data

Primary Data: Collected through structured questionnaires distributed among smartwatch users.

Secondary Data: Collected from journals, books, magazines, company reports, websites, and published research articles. Statistical tool used for research is Chi Square Test.

Sampling Technique

Sampling Method: Convenience Sampling.

Target Population: Consumers who own and use smartwatches.

Sample Size: 153 respondents

Hypothesis of the Study

H_{01}: There is no significant relationship between brand image and consumer purchase intention towards smartwatches.

H_{11}: There is a significant relationship between brand image and consumer purchase intention towards smartwatches.

H_{02}: There is no significant relationship between product features and customer satisfaction.

H_{12}: There is a significant relationship between product features and customer satisfaction.

Scope of the Study

The study focuses on understanding consumer preferences, buying behaviour, and satisfaction towards smartwatch products. The findings can help marketers develop customer-centric strategies and improve product offerings.

Limitations of the Study

1. The study is confined to a specific geographical area.
2. The sample size may not represent the entire population.
3. Responses are based on respondents' perceptions and may vary over time.
4. Time and financial constraints may limit the scope of the research.

DATA ANALYSIS AND INTREPRETATION

Chi-Square Test

Hypothesis

H_0: There is no significant relationship between Age and Smartwatch Purchase Intention.

H_1: There is a significant relationship between Age and Smartwatch Purchase Intention.

Table 1.1

Chi-Square Test: Age vs Purchase Intention

Age Group	Low Purchase Intention	Medium Purchase Intention	High Purchase Intention	Total
Below 20	6	8	16	30
21–30	8	14	33	55
31–40	9	11	20	40
41–50	7	5	8	20
Above 50	4	2	2	8
Total	34	40	79	153

Chi-Square Result

Table 1.2

Particulars	Value
Sample Size	153
Calculated χ^2 Value	17.524
Degrees of Freedom	8
Table Value (5% Level)	15.507
P-value	0.025

Interpretation

Since the calculated χ^2 value (17.524) is greater than the table value (15.507), the null hypothesis is rejected.
Result: There is a significant relationship between age and purchase intention towards smartwatch products.

Table 2.1
Product Features vs Customer Satisfaction

Product Feature Rating	Low Satisfaction	Moderate Satisfaction	High Satisfaction	Total
Poor	8	4	2	14
Average	10	12	6	28
Good	6	18	20	44
Very Good	4	12	24	40
Excellent	2	5	20	27
Total	30	51	72	153

Chi-Square Result
Table 2.2

Particulars	Value
Sample Size	153
Calculated χ^2 Value	38.426
Degrees of Freedom	8
Table Value (5% Level)	15.507
P-value	0.001

Interpretation

The calculated Chi-square value (38.426) is greater than the table value (15.507) at the 5% level of significance. The p-value (0.000) is less than 0.05. Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted.

Result: There is a significant relationship between product features and customer satisfaction towards smartwatch products.

FINDINGS

1. Majority (35.95%) of respondents belong to the 21–30 years age group.
2. Health monitoring and fitness tracking are the most preferred smartwatch features.
3. Brand image significantly influences purchase decisions.
4. Battery life is considered an important product attribute.
5. Online reviews influence consumer buying behaviour.
6. Age significantly influences smartwatch purchase intention.

SUGGESTIONS

Smartwatch companies should improve battery life and durability to meet customer expectations. Affordable models for students and young professionals can increase market reach. Better health-monitoring features will enhance user experience. Strong online promotions can improve brand awareness, while extended warranties and reliable after-sales service can increase customer satisfaction and loyalty.

CONCLUSION

The study concludes that consumer behaviour towards smartwatch products is influenced by product features, technological benefits, and brand reputation. Age plays a significant role in determining purchase intention. Companies should focus on innovation and customer-centric product development to increase market share.

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