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**South Asian Journal of Management Research
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South Asian Journal of Management Research (SAJMR), is a scholarly journal that publishes scientific research on the theory and practice of management. All management, computer science, environmental science related issues relating to strategy, entrepreneurship, innovation, technology, and organizations are covered by the journal, along with all business-related functional areas like accounting, finance, information systems, marketing, and operations. The research presented in these articles contributes to our understanding of critical issues and offers valuable insights for policymakers, practitioners, and researchers. Authors are invited to publish novel, original, empirical, and high quality research work pertaining to the recent developments & practices in all areas and disciplines.

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Editor

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Human Resource Implications of the Merged Public Sector Banks in Tamil Nadu

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Abstract

This study investigates the human resource (HR) implications of the merger of public sector banks in Tamil Nadu, with a focus on the challenges and opportunities presented by this merger. The research aims to explore the effects of such mergers on employees, organizational dynamics, and overall human resource management practices. Utilizing a quantitative research methodology, the study analyzes data collected through a structured questionnaire distributed to employees of merged banks. The final sample size of 266 respondents was selected through simple random sampling. Key findings highlight both the virtues and drawbacks of mergers. On the positive side, mergers streamline operations, enhance career growth opportunities, improve employee engagement, and foster a more robust organizational culture. These benefits contribute to increased operational efficiency, financial stability, and better access to resources and technology. However, the study also identifies significant challenges, including cultural integration issues, communication gaps, inadequate training, operational disruptions, and heightened employee stress. The study underscores the critical role of strategic human resource management in addressing these challenges. Recommendations include the implementation of comprehensive training programs, robust communication channels, leadership development initiatives, and employee support mechanisms such as stress management and counselling services. The findings of this study provide suggestions to the human resource management in the context of mergers and acquisitions within the banking sector. By addressing both the opportunities and constraints, this research offers practical strategies for achieving sustainable integration and long-term success in merged public sector banks.

Keywords: Human Resource Implications, Public Sector Banks, Employee Stress, Organisational Culture, Integration Process

Introduction

Human resource management (HRM) plays a vital role in determining the efficiency and performance of organizations. This is particularly evident in service industries such as banking, where human input serves as the largest contributor to operational success. A number of studies have emphasized that HRM studies often focus narrowly on organizational strategies, overlooking broader socio-economic and institutional contexts. For instance, the state institutions and private agencies significantly influence labor practices by promoting uniformity in employer behavior, even in flexible labor markets (Heery and Frege, 2006). This perspective is supported by Kim and Wright (2011) and Boxall and Macky (2009), who advocate for a political economy approach to HRM studies, highlighting the constraints and opportunities faced by organizations in a globalized and competitive environment.

The Indian banking sector, especially public sector banks (PSBs), is undergoing significant transformations driven by technology, mergers, and globalization. The importance of aligning HR development policies with business requirements to enhance competitiveness in global markets has been emphasized, requiring the adoption of comprehensive HR practices such as recruitment, training, performance evaluation, and compensation strategies (Kumari, 2019). Similarly, Diwakar and Chaudhari (2007) emphasize the role of technology-driven human resource management systems (HRMS) in optimizing HR functions and improving organizational performance. This highlights that efficient HRMS implementation is integral to achieving business objectives in the banking sector.

Mergers of PSBs, a key reform initiative in India, have brought both opportunities and challenges. Effective HRM practices in banks directly influence organizational performance, service quality, and profitability, while public sector banks face unique HRM challenges distinct from those encountered by multinational corporations or private firms (Gulza, 2018). Additionally, the internationalization of financial institutions presents HRM challenges in adapting practices across diverse cultural and political landscapes, highlighting the need for nuanced HRM strategies tailored to the unique needs of PSBs undergoing consolidation (Jack et al., 2019). The dynamic nature of HRM is evident as practices such as recruitment, employee participation, performance appraisal, and compensation positively impact employee productivity in Nepalese commercial banks, reinforcing the importance of employee-centric HRM policies in fostering organizational success (Joshi, 2024). This is further supported by

findings that establish a strong correlation between HR practices, such as work-life policies and training programs, and financial performance in Indian private banks, providing valuable implications for PSBs in India to revisit and innovate their HRM strategies post-merger (Ahmad et al., 2020).

The study aims to explore the human resource implications of merged public sector banks in Tamil Nadu. The research aims to examine the relationship between demographic factors and HR implications, analyze the interrelation among HRM variables, and evaluate the virtues and drawbacks of these implications in the context of organizational performance and employee productivity. Addressing these objectives will contribute to a deeper understanding of HRM dynamics in the Indian banking sector amidst structural transformations.

Objectives of the Study

- To determine the relationship between the demographic factors and Human Resource Implications of Merged Public Sector Banks
- To analyse the relation among the variable of the factors of Human Resource Implications of Merged Public Sector Banks
- To investigate the virtues and drawbacks of Human Resource Implications of Merged Public Sector Banks

Conceptual Background

Human Resource Management

Gomes et al. (2014) conducted a comparative analysis of HRM practices between Indian and European multinational subsidiaries in the Southern African Development Community, highlighting regional variations. Hassan et al. (2006) assessed employee perceptions of HRD practices, emphasizing the role of quality in fostering a positive organizational culture. Similarly, Karthikeyan et al. (2010) examined how training influences employee performance, while Khera et al., (2010) analyzed HR management practices in Indian commercial banks, identifying key strategies to enhance productivity.

Mahajan and Sharma (2005) explored HRD concepts, covering recruitment, selection, training, promotion, and industrial relations within cooperative banks, while also addressing political interference. Mellacheruvu and Krishnamacharyulu (2008), who highlighted recruitment and training inadequacies in public sector banks. Jain (2006) emphasized that training, motivation, rewards, and empowerment are critical for organizational growth. Rajwinder (2013) further underscored the importance of effective HRM in maintaining competitiveness, aligning with Rizvi and Yasmeen's (2011) findings of a positive correlation between human capital development and organizational performance in mergers and acquisitions. Lastly, Sharma and Nayyar (2005) examined HRD mechanisms at the State Bank of India, focusing on job satisfaction and the HRD climate, while Stahl and Sitkin (2005) identified cultural conflicts during mergers as a significant factor influencing their success.

Banking Sector

Adhana and Raghuvanshi (2020) highlighted mergers as vital for consolidating and rescuing struggling banks, an approach also endorsed by Mohanty (2019) to enhance financial profiles and lending capacities. Agarwala & Agarwala (2019) pointed to non-performing assets (NPAs) as a challenge not confined to smaller banks, linking it to declining asset quality. Christopher (2022) observed a preference for public sector banks due to their extensive networks, while Kansal and Chandani (2014) emphasized the role of change management and effective communication during mergers.

Karolyi and Taboada (2015) argued that restrictive banking activities lead to greater efficiency, echoed by Kashyap (2021), who demonstrated the positive effects of successful mergers on the Indian banking sector. Kumar (2013) noted that large banks gain significant advantages from economies of scale, and Madrey (2020) presented mergers as a strategy for enhancing lending capacity and managing NPAs. Rajput et al., (2012) highlighted the detrimental effects of aggressive lending policies on asset quality in public sector banks, while Sai and Sultan (2013) emphasized the banking sector's role in national development. Sharma and Mahapatra (2022) compared public and private sector banks regarding NPAs, stressing the impact of banking reforms. Singh (2019) identified inefficiencies, poor asset quality, and weak recovery management as drivers of PSB mergers.

Mergers and Acquisitions (M&A)

Basavaraj (2019) argued that mergers alone cannot resolve banking challenges, emphasizing the need for addressing NPAs and frauds. Bhan (2009) outlined the advantages of mergers in the Indian banking sector, while Cocheo (2008) linked increased competition to liberalization and technological advancements, spurring M&A activity. Goyal and Joshi (2011) stressed the competitive nature of the banking industry, highlighting the need for sustained competence.

Gupta (2015) presented M&A as strategies for corporate restructuring, achieving market share, profitability, and economies of scale. Ishwarya (2019) discussed the challenges of employee integration and redefining roles, noting the long-term benefits of mergers. Al Jerjawi (2011) highlighted the HR manager's role in integrating practices during mergers. Kemal (2011) asserted that M&A enhance competitiveness through market share expansion, risk diversification, and economies of scale. Kjellman et al. (2014) warned against the risks of rapid expansion, while Kumari (2014) emphasized global expansion and synergy. Sharma & Mahapatra (2022) highlighted how synergy enhances shareholder value and provides tax benefits. McDill and Sheehan (2006) discussed strategic transformations in financial services due to M&A, including process and management changes. Oghuvwu and Omoye (2016) emphasized prioritizing internal processes and R&D. Pahuja and Aggarwal (2016) observed that while M&A aid corporate restructuring, their impact on profitability is limited.

Patel & Shah (2016) elaborated on M&A practices to enhance operations and expand the capital base, aligning with Prabha (2021), who outlined benefits such as improved market access and reduced bankruptcy risk. Rao-Nicholson et al. (2016) stressed focusing on home markets to avoid unnecessary diversification. Mubarak et al., (2021) cautioned that merging weaker banks with stronger ones might destabilize risk profiles. Cooke et al. (2020) discussed the need for organizational adjustments at all levels during M&A. Shaik et al. (2019) emphasized expanding customer bases and gaining a competitive edge. Shook and Roth (2011) pointed out HR professionals' lack of involvement in M&A planning, while Singh (2019) emphasized the importance of strong corporate governance to tackle merger-related challenges. Steigenberger (2017) argued that integration challenges often prevent M&A from achieving intended results.

Hypothesis in the Study

The study examines whether there is a significant relationship between demographic factors and the human resource implications of merged public sector banks, as outlined in the following hypotheses:

H0: There is a significance difference between the demographic factors and Human Resource Implications of Merged Public Sector Banks

H1: There is no significance difference between the demographic factors and Human Resource Implications of Merged Public Sector Banks

Research Methodology

The study used quantitative research technique in order to perform a thorough investigation of the influence of human resource management in merged public sector banks in Sivagangai district, Tamil Nadu, India. The use of this method will make it feasible to collect and examine numerical data, which will in turn make it possible to test hypotheses and arrive at conclusions.

Sampling

A simple random sampling technique was employed to ensure the selection of a representative sample of employees from merged public sector banks. The sample was stratified into various groups based on age, gender, designation, and years of experience to capture diverse perspectives from individual employees. A total of 300 questionnaires were distributed, of which 266 (90.33%) were completed and returned. Seventeen (5.66%) questionnaires were incomplete, while 12 (4%) were not returned. Consequently, the final sample size for the study was determined to be 266.

Instrument Development

A customized questionnaire tailored specifically for merged public sector banks will serve as the primary data collection tool. The survey will include a variety of questions designed to collect quantitative data, along with more detailed responses to facilitate a comprehensive understanding of the subject. Respondents' agreement with survey items will be measured using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). To assess the instrument's clarity, relevance, and length, a pilot test will be conducted with a small group of participants. Feedback from the pre-test will guide necessary revisions to the final survey. To ensure the collection of reliable data on the influence of human resource management, the survey instrument will be meticulously designed and evaluated.

Data Collection

During data collection, employees of merged public sector banks completed questionnaires as part of the survey. Primary data were supplemented with secondary data from academic journals, industry reports, government

publications, and prior HRM studies. This combination enabled a comprehensive analysis of how HRM practices impacted employees in merged public sector banks, building on existing research to identify patterns and strengthen the study's foundation.

Results

Table 1. Demographic factors of Employees

Particulars		Frequency	Percent
Age	Below 25 years	8	3.0
	25 years - 35 years	81	30.5
	35 years - 45 years	64	24.1
	45 years - 55 years	96	36.1
	55 years and above	17	6.4
Gender	Male	142	53.4
	Female	124	46.6
Designation	Junior Staff	16	6.0
	Mid-level Staff	79	29.7
	Senior Staff	91	34.2
	Manager	29	10.9
	Executive	51	19.2
Years of Service	Less than 1 year	32	12.0
	1-5 years	46	17.3
	5-10 years	107	40.2
	More than 10 years	81	30.5

Source: Authors input

Table 1 provides the frequency distribution of demographic characteristics among combined public sector bank workers. The result reveals age, gender, designation, and years of service. The workers are 25–55 years old, with 30.5% 25–35, 24.1% 35–45, and 36.1% 45–55. Few are under 25 (3.0%) or over 55 (6.4%). The workforce is 53.4% male and 46.6% female. The classification distribution reveals that 34.2% of workers are senior, 29.7% are mid-level, 19.2% are executives, 10.9% are managers, and 6.0% are junior. The data shows that 40.2% of workers have been with the company for 5-10 years, while 30.5% have worked for more than 10 years. Under 1 year and 1-5 years of service make up 12.0% and 17.3%.

Table 2. One-way analysis for demographic factors of employees and Factors of HR Implications

Particulars		Sum of Squares	df	Mean Square	F	Sig.
Age	Between Groups	2.044	18	0.114	0.104	0.002**
	Within Groups	270.862	247	1.097		
	Total	272.906	265			
Designation	Between Groups	2.833	18	0.157	0.105	0.019*
	Within Groups	371.663	247	1.505		
	Total	374.496	265			
Years of Service	Between Groups	0.782	18	0.043	0.043	0.000**
	Within Groups	251.056	247	1.016		
	Total	251.838	265			

Source: Authors input

One-way analysis of variance (ANOVA) results in Table 2 for demographic factors including age, designation, and years of service of personnel in merged public sector banks demonstrate major human resource implications. The between-group sum of squares for age is 2.044, with a mean square of 0.114 and an F-value of 0.104. Sig. 0.002 indicates a statistically significant difference between age groups for the parameters analysed. For designation, the between-group sum of squares is 2.833, mean square 0.157, and F-value 0.105. A significance level (Sig.) of 0.019 implies that designation affects the parameters under consideration. The between-group sum of squares for years of service is 0.782, with a mean square and F-value of 0.043. Years of service had a very significant influence on the parameters analysed (Sig. 0.000).

Table 3. Total Variance for Virtues of HR Implications

Factors	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	2.606	26.065	26.065
2	2.139	21.392	47.457
3	1.544	15.440	62.897

Source: Authors input

Rotation sums of squared loadings in Table 3 provides important insights from total variance analysis. The first component has the greatest influence, accounting for 2.606, 26.065% of the total variation. The second component provides 2.139, 21.392% of the overall variation, and 47.457% when coupled with the first factor. The third component contributes 1.544, 15.440% of the variance. When combined, these three variables explain 62.897% of variation.

Table 4. Principal Component Analysis of Virtues of HR Implications of Merged Public Sector Banks

Particulars	Factor Loadings		
	1	2	3
Career Growth and Development	0.849		
Enhanced Employee Engagement and Motivation	0.838		
Competitive Advantage	0.705		
Improved Operational Efficiency	0.638		
Financial Stability		0.902	
Improved Organizational Culture		0.837	
Access to Better Resources and Technology		0.634	
Talent Retention and Attraction		0.336	
Enhanced Customer Service			0.702
Increased Employee Stability			0.674

Source: Authors input

Note: Extraction Method - Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization, Rotation converged in 5 iterations

HR implications in merged public sector banks have three key loadings according to PCA (given in Table 4). Career growth and development (0.849), staff engagement and motivation (0.838), competitive advantage (0.705), and operational efficiency (0.638) are high-loaded first component elements. These loadings in Table 4 shows that these variables are linked and greatly influence the first primary component. The second component involves financial stability (0.902), organisational culture (0.837), more resources and technology (0.634), and talent retention and attraction (0.336). These high loadings show financial and organisational changes drive the second crucial component. Improve customer service (0.702) and staff stability (0.674) for the third important component. In merging public sector entities, customer service and personnel stability are stressed.

Table 5. Total Variance for Drawbacks of HR Implications

Factors	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	1.769	17.692	17.692
2	1.510	15.104	32.796
3	1.458	14.580	47.376
4	1.424	14.242	61.618
5	1.344	13.439	75.058

Source: Authors input

Total variance analysis for merged public sector banks' human resource disadvantages utilising rotation sums of squared loadings in Table 5 reveals several critical factors. First factor 1.769 explains 17.692% of variance. The first component seems to greatly impact the overall disadvantages. Second component gives 1.510, 15.104% of total variation, raising cumulative variance to 32.796% with first factor. With the first two variables, the third component adds 1.458, 14.580% of the variance, for a total variance of 47.376%. The fourth component accounts for 1.424, 14.242% of the total variance of 61.618%. For all five components, the total variance is 75.058% since the fifth element adds 1.344, 13.439%.

Table 6. Principal Component Analysis of Drawbacks of HR Implications

Particulars	Factor Loadings				
	1	2	3	4	5
Inadequate Training	0.819				
Regulatory Compliance	0.790				
Disruption in Operations	0.553				
Impact on Customer Service		0.921			
Leadership Gaps			0.872		
Management Challenges			0.555		
Communication Issues				0.831	
Stress and Anxiety				0.540	
Diversified Culture					0.885
Employee Focus on internal changes					0.647

Source: Statistically analysed data

Note: Extraction Method - Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization, Rotation converged in 9 iterations

Table 6 illustrates the Principal Component Analysis of Drawbacks of Human Resource Implications. Poor training (0.819), regulatory compliance (0.790), and operational interruption (0.553) load the first factor. These factors emphasise training, regulatory compliance, and operational disruption reduction in the first main component. Customer service leads the second component with 0.921 loading. Quality customer service may affect client happiness and loyalty throughout mergers. Leadership gaps (0.872) and management issues (0.555) dominate the third aspect, highlighting their relevance. Mergers need strong leadership and management to smooth transitions and address employee concerns. Communication issues (0.831) and stress and anxiety (0.540) comprise the fourth key component. Staff morale and engagement depend on communication and stress management. The sixth component is diversified culture (0.885) and staff focus on internal improvements (0.647). This emphasises cultural mixing and keeping people focused on internal changes and organisational goals throughout the merger.

Table 7. Canonical Discriminant Function Unstandardized coefficients of Factors behind HR Implications

Particulars	Function
Factors Behind Human Resource Implications	0.136
(Constant)	-10.988

Source: Authors input

In the discriminant function (given in Table 7), human resource concerns contribute 0.136. The function constant is -10.988. This tool helps separate groups by analysed factors. The negative constant term modifies the baseline value of the function, whereas the positive coefficient for variables shows that increasing them increases the discriminant score.

Based on the Canonical Discriminant Function coefficient, the linear discriminant equation is

$$Y = -10.988 + 0.136 X_1$$

The linear discriminant equation based on the canonical discriminant function coefficient is given by $Y = -10.988 + 0.136 X_1$. In this equation, the constant term -10.988 sets the baseline for the discriminant function, and the coefficient 0.136 indicates the extent to which this factor contributes to the discriminant score.

Table 8. Discriminant analysis classification results for Factors Behind HR Implications

Gender	Predicted Group Membership		Total
	Male	Female	
Male	71 (50.0)	71 (50.0)	142
Female	61 (49.2)	63 (50.8)	124

Source: Authors input

Note: 50.4% of original grouped cases correctly classified, The value within bracket refers to row percentage

The discriminant analysis classification results (Given in Table 8) for merging public sector banks' human resource implications demonstrate the model's gender-based group membership accuracy. In the male group, the model correctly categorised 71 male cases (50.0%) and misclassified 71 female instances. From 124 female

examples, the model correctly identified 63 (50.8%) and misclassified 61 (49.2%). The model recognised 50.4% of the original grouped cases, showing moderate accuracy in predicting group membership based on parameters.

Figure 1. Revised Hypothesised model of Factors Behind HR Implications

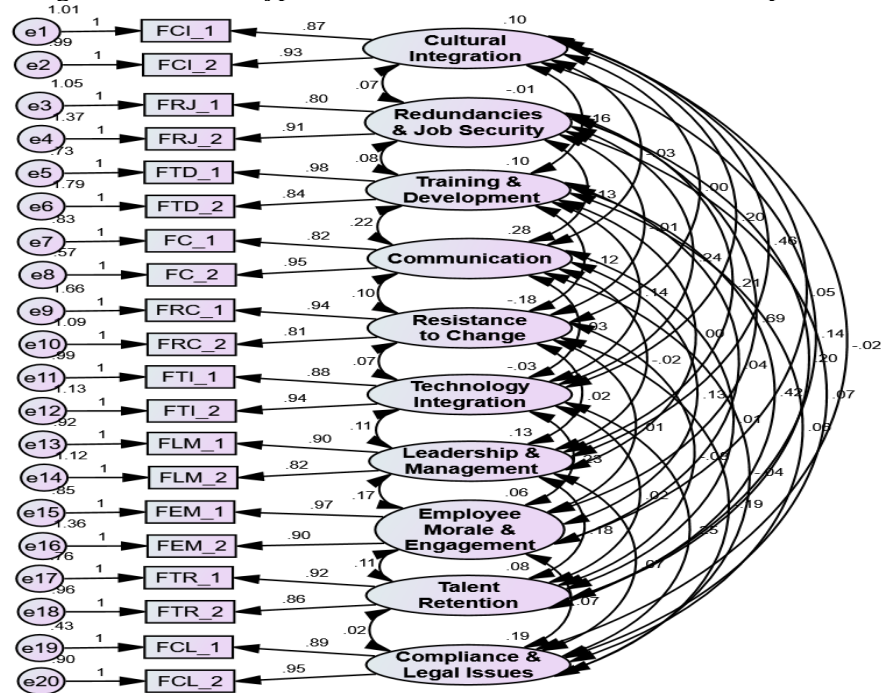


Figure 1 presents the revised hypothesised model of factors behind HR implications, visually outlining the conceptual framework used in this study.

Table 9. Measurement Model of Factors Behind HR Implications

Item(s) of Factors Behind Human Resource Implications of Merged Public Sector Banks	Factor Item	CFA Loading	Cronbach α (Item wise)	Composite Reliability (CR)	AVE
Cultural Integration					
Organizational Culture	FCI_1	0.870	0.905	0.908	0.831
Employee Adaptation	FCI_2	0.930	0.918		
Redundancies and Job Security					
Role Overlap	FRJ_1	0.800	0.896	0.892	0.805
Job Security Concerns	FRJ_2	0.910	0.898		
Training and Development					
New Roles and Responsibilities	FTD_1	0.980	0.816	0.798	0.663
Training Programs	FTD_2	0.840	0.813		
Communication					
Clear and consistent communication	FC_1	0.820	0.827	0.806	0.675
Feedback Mechanisms	FC_2	0.950	0.816		
Resistance to Change					
Fear of the Unknown	FRC_1	0.940	0.887	0.898	0.815
Change Management	FRC_2	0.810	0.918		
Technology Integration					
System Compatibility	FTI_1	0.880	0.881	0.903	0.823
Training on New Systems	FTI_2	0.940	0.933		
Leadership and Management					
Guidance and Support	FLM_1	0.900	0.812	0.791	0.654
Empathy and Direction	FLM_2	0.820	0.805		
Employee Morale and Engagement					
Work Environment	FEM_1	0.970	0.897	0.893	0.807
Recognition	FEM_2	0.900	0.900		
Talent Retention					
Retention Strategies	FTR_1	0.920	0.816	0.852	0.743

Career Development	FTR_2	0.860	0.906		
Compliance and Legal Issues					
Regulatory Requirements	FCL_1	0.890	0.838	0.872	0.773
Legal Assistance	FCL_2	0.950	0.919		

Source: Authors input

Table 9 provides the measurement model of Factors behind HR implications. Cultural integration components like staff adaptability and organisational culture are reliable with CFA loadings of 0.870 and 0.930, Cronbach's alpha values of 0.905 and 0.918, CR of 0.908, and AVE of 0.831. Redundancies and job security concerns had CFA loadings of 0.800 and 0.910, Cronbach's alphas of 0.896 and 0.898, CR of 0.892, and AVE of 0.805. New jobs and training programs had CFA loadings of 0.980 and 0.840, Cronbach's alphas of 0.816 and 0.813, CR of 0.798, and AVE of 0.663. Clear communication and feedback systems had 0.820 and 0.950 CFA loadings, 0.827 and 0.816 Cronbach's alphas, 0.806 CR, and 0.675 AVE. With dread of the unknown and change management, resistance to change has CFA loadings of 0.940 and 0.810, Cronbach's alphas of 0.887 and 0.918, CR of 0.898, and AVE of 0.815. Technology integration via system compatibility and new system training yields CFA loadings of 0.880 and 0.940, Cronbach's alphas of 0.881 and 0.933, CR of 0.903, and AVE of 0.823. Leadership and management provide advice, support, empathy, and direction with CFA loadings of 0.900 and 0.820, Cronbach's alphas of 0.812 and 0.805, CR of 0.791, and AVE of 0.654. Work environment and recognition impact employee morale and engagement with CFA loadings of 0.970 and 0.900, Cronbach's alphas of 0.897 and 0.900, CR of 0.893, and AVE of 0.807. Talent retention, which emphasises professional growth and retention, with CFA loadings of 0.920 and 0.860, Cronbach's alphas of 0.816 and 0.906, CR of 0.852, and AVE of 0.743. Finally, the rules and legal help component had CFA loadings of 0.890 and 0.950, Cronbach's alphas of 0.838 and 0.919, CR of 0.872, and AVE of 0.773, showing good reliability and validity.

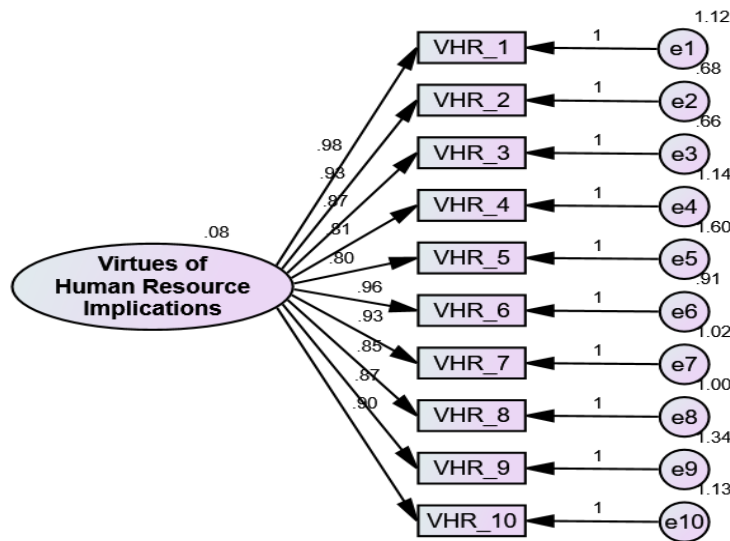
Table 10. Discriminant Validity- Fornell-Larcker criterion for Factors Behind HR Implications

	FCI	FRJ	FTD	FC	FRC	FTI	FLM	FEM	FTR	FCL
FCI	0.911									
FRJ	0.800	0.897								
FTD	0.804	0.791	0.814							
FC	0.746	0.751	0.739	0.821						
FRC	0.836	0.818	0.724	0.721	0.902					
FTI	0.825	0.862	0.717	0.750	0.804	0.907				
FLM	0.717	0.764	0.711	0.750	0.737	0.783	0.808			
FEM	0.878	0.820	0.745	0.806	0.828	0.842	0.720	0.898		
FTR	0.798	0.875	0.757	0.740	0.778	0.829	0.758	0.767	0.862	
FCL	0.836	0.826	0.780	0.771	0.812	0.808	0.797	0.798	0.833	0.879

Source: Authors Input

Fornell-Larcker discriminant validity (given in Table 10) for public sector banks' human resource implications is high for all components. Cultural Integration (FCI) has a square root of AVE of 0.911 and modest correlations to Redundancies and Job Security (FRJ) at 0.800 and Resistance to Change (FRC) at 0.836. With an AVE square root of 0.897 and modest linkages to Training and Development (FTD) at 0.791 and Technology Integration (FTI) at 0.862, FRJ has strong discriminant validity. Communication (FC) has 0.739 AVE square root and Employee Morale and Engagement (FEM) 0.745. FTD has 0.814. FC has strong discriminant validity with an AVE square root of 0.821 and modest relationships with FTI at 0.750 and Talent Retention (FTR) at 0.740. FRC has an AVE square root of 0.902 and correlations with FTI and FEM of 0.804 and 0.828. FEM at 0.842 and Compliance and Legal Issues (FCL) at 0.808 strongly correlate with FTI's AVE square root of 0.907. Leadership and Management (FLM) has good discriminant validity with an AVE square root of 0.808, FEM of 0.720, and FTR of 0.758. FEM's AVE square root is 0.898, matching FTR and FCL at 0.767 and 0.798. FTR has discriminant validity with an AVE square root of 0.862 and correlations with FCL and FRJ of 0.833 and 0.875. The final AVE square root for FCL is 0.879, with FCI and FTI at 0.836 and 0.808.

Figure 2. Revised Hypothesised model of Virtues of HR Implications



The conceptual framework illustrating the revised hypothesised model of virtues associated with HR implications is depicted in Figure 2. This figure offers a visual representation of the constructs and their interrelationships.

Table 11. Measurement Model of Virtues of HR Implications

Item(s) of Virtues of Human Resource Implications of Merged Public Sector Banks	Factor Item	CFA Loading	Cronbach α (Item wise)	Composite Reliability (CR)	AVE
Improved Operational Efficiency	VHR_1	0.980	0.856	0.970	0.763
Career Growth and Development	VHR_2	0.930	0.809		
Enhanced Employee Engagement and Motivation	VHR_3	0.870	0.876		
Improved Organizational Culture	VHR_4	0.810	0.809		
Access to Better Resources and Technology	VHR_5	0.800	0.848		
Increased Employee Stability	VHR_6	0.960	0.892		
Financial Stability	VHR_7	0.930	0.917		
Enhanced Customer Service	VHR_8	0.850	0.882		
Competitive Advantage	VHR_9	0.870	0.944		
Talent Retention and Attraction	VHR_10	0.900	0.892		

Source: Authors Input

Table 11 reveals the measurement model of virtues of HR implications with a CFA loading of 0.980, Cronbach's alpha of 0.856, CR of 0.970, and AVE of 0.763, Improvement in Operational Efficiency (VHR_1) is reliable and valid. CFA loading of 0.930 and Cronbach's alpha of 0.809 make Career Growth and Development (VHR_2) trustworthy. CFA loading of 0.870 and Cronbach's alpha of 0.876 indicate strong reliability and relevance for Enhanced Employee Engagement and Motivation (VHR_3). Improved Organisational Culture (VHR_4) contributes significantly with 0.810 CFA loading and 0.809 Cronbach's alpha. CFA loading of 0.800 and Cronbach's alpha of 0.848 make Access to Better Resources and Technology (VHR_5) reliable. Increased Employee Stability (VHR_6) has a 0.960 CFA loading and 0.892 Cronbach's alpha, indicating strong reliability and validity. Financial stability (VHR_7)'s CFA loading of 0.930 and Cronbach's alpha of 0.917 contribute significantly. CFA loading of 0.850 and Cronbach's alpha of 0.882 indicate strong dependability for Enhanced Customer Service (VHR_8). Competitive Advantage (VHR_9) is relevant and trustworthy with a CFA loading of 0.870 and Cronbach's alpha of 0.944. Talent Retention and Attraction (VHR_10) is reliable and construct-contributing with 0.900 and 0.892.

Figure 3. Revised Hypothesised model of Drawbacks of HR Implications

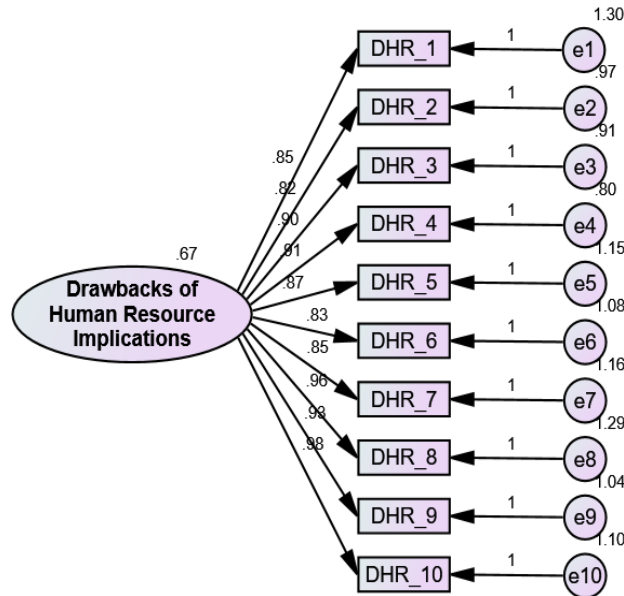


Figure 3 illustrates the updated hypothesised model outlining the drawbacks linked to HR implications, highlighting the key challenges and negative outcomes in the study.

Table 12. Measurement Model of Drawbacks of HR Implications

Item(s) of Drawbacks of Human Resource Implications of Merged Public Sector Banks	Factor Item	CFA Loading	Cronbach α (Item wise)	Composite Reliability (CR)	AVE
Diversified Culture	DHR_1	0.850	0.829	0.961	0.713
Communication Issues	DHR_2	0.820	0.849		
Inadequate Training	DHR_3	0.900	0.814		
Disruption in Operations	DHR_4	0.910	0.834		
Stress and Anxiety	DHR_5	0.870	0.861		
Leadership Gaps	DHR_6	0.830	0.833		
Management Challenges	DHR_7	0.850	0.865		
Regulatory Compliance	DHR_8	0.960	0.864		
Impact on Customer Service	DHR_9	0.930	0.865		
Employee Focus on internal changes	DHR_10	0.980	0.826		

Source: Authors Input

Measurement Model of Drawbacks of HR Implications in table 12 reveals that the Diversified Culture (DHR_1) has a 0.850 CFA loading, 0.829 Cronbach's alpha, 0.961 CR, and 0.713 AVE. This indicates good reliability and validity. CFA loading of 0.820 and Cronbach's alpha of 0.849 indicate reliability and constructive contribution for Communication Issues (DHR_2). CFA loading of 0.900 and Cronbach's alpha of 0.814 show that Inadequate Training (DHR_3) is reliable and effective. Disruption in Operations (DHR_4) has 0.910 CFA loading and 0.834 Cronbach's alpha, indicating reliability and relevance. Stress and Anxiety (DHR_5) has 0.870 CFA loading and 0.861 Cronbach's alpha, indicating reliability. With a CFA loading of 0.830 and Cronbach's alpha of 0.833, Leadership Gaps (DHR_6) is reliable and significant. With 0.850 CFA loading and 0.865 Cronbach's alpha, Management Challenges (DHR_7) adds considerably. Regulatory Compliance (DHR_8) has 0.864 Cronbach's alpha and 0.960 CFA loading, indicating strong reliability and validity. CFA loading of 0.930 and Cronbach's alpha of 0.865 make Impact on Customer Service (DHR_9) trustworthy. CFA loading of 0.980 and Cronbach's alpha of 0.826 show reliability for Employee Focus on Internal Changes (DHR_10).

Discussions

The implications of the merger of public sector banks in terms of human resources bring a mix of considerable benefits and noticeable issues. The good aspects of mergers include the streamlining of processes, the enhancement of career progression prospects, the rise of staff engagement, and the improvement of organisational culture. These positive aspects ultimately lead to improved operational efficiency, financial stability, and assistance to customers. Having access to greater resources and technology, higher employment security, and an enhanced competitive edge are all benefits that accrue to employees. The obstacles, on the other hand, include problems with cultural integration, difficulties with communication, insufficient training, interruptions to

operations, and increased stress among staff. A second complicating factor in the shift is the absence of leadership and managerial issues, in addition to the difficulties associated with regulatory compliance and the temporary effects on customer service. Through the implementation of comprehensive training programs, the maintenance of effective communication, the investment in leadership development, the promotion of cultural integration, and the provision of employee support programs, it is essential to successfully handle these issues. Additionally necessary are the following: ensuring compliance with regulatory requirements, striking a balance between concentrating on internal changes and routine responsibilities, and building effective retention tactics. Merged public sector banks are able to successfully traverse the complexity of integration and achieve long-term success by addressing both the positive and negative aspects of the merger via the implementation of focused strategies. This is beneficial to both employees and the organisation as a whole.

Conclusion

The combination of public sector banks results in a complicated mix of implications for human resources, which necessitates management that is both strategic and sensitive. The consolidation brings a number of obstacles, including cultural integration, communication concerns, and employee stress, despite the fact that it provides major advantages such as greater operational efficiency, enhanced career progression, better resource access, and a stronger competitive position. These banks are able to successfully negotiate the transformation by putting in place extensive training programs, encouraging clear communication, promoting cultural inclusion, and offering solid support for their workers. To further assist in overcoming management issues and maintaining high levels of customer service, it would be beneficial to place an emphasis on leadership development and monitoring compliance with regulatory requirements.

Future Implications

Several different aspects of human resources will be affected in the future as a result of the merger of public sector banks. The banks will be in a better position to compete in a dynamic financial climate as a result of the consolidation, which is anticipated to continue to generate operational economies and encourage a culture of innovation. Improved employee engagement tactics will promote morale and productivity, while enhanced career development possibilities and access to cutting-edge technology will attract top people since they will provide access to cutting-edge technology.

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Brand Hate and Avoidance in Indian Consumers: Does Poor Relationship Quality and Ideological Incompatibility Matter?

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ABSTRACT - Recently, marketing scholars have increasingly recognised the significance of negative emotions in shaping consumer attitudes and behaviour. The telecommunication industry experienced a rapid increase in brand hatred over the past decade. This study examines the role of “brand hate” serving as a mediator in the relationship between “ideological incompatibility”, “poor relationship quality”, and “brand avoidance” in the mobile phone industry, focusing on Delhi NCR consumers. The survey was conducted on 310 mobile phone brand consumers who have had negative experiences with any mobile phone brand. The study used PLS-SEM (4.1.0.9) to test the conceptual model and hypothesised relationship. The findings provide statistical evidence that “brand hate” significantly mediates the relationship between its antecedents and outcome. This study extends the literature on consumer brand relationships by highlighting new avenues of research and making meaningful contributions. This study is also significant for policymakers and brand managers in understanding and developing effective strategies and building strong “consumer brand relationships”.

Keywords: Brand hate, Ideological incompatibility, Brand avoidance, Delhi-NCR, Consumer brand relationship.

Introduction

Recently, organisations have increasingly recognised the importance of building brand value by developing their intangible assets (Beig & Nika, 2019; Gilitwala & Nag, 2022). Fournier (1998) believes that branding is crucial for business mechanisms. In the last few years, much progress has been seen in the study of “consumer-brand relationships”. Consumer sentiments toward brands manifest in positive and negative forms (Lee et al., 2009). Positive emotion manifests in brand attachment, loyalty, passion, and love. Negative emotions are embodied in the form of “brand opposition,” “brand sabotage,” “brand disgust,” “brand retaliation,” and “brand dislike” (Mushtaq et al., 2024). Negative consumer sentiment toward the brand has largely been ignored as most customers remain silent (Khatoon & Rehman, 2021). Due to the rapid increase in the use of the Internet, customer can share their experience on different platforms (Kucuk, 2018). According to the marketing literature, the study of brand hate has recently been developed (Sheraz & Sharizal, 2018). Brand hate can be defined as consumers' negative emotions toward the brand in contrast to positive emotions” (Khan & Lee, 2014). Marketing literature has identified two “brand hate” components: “active and passive” (Zarantonello et al., 2016). Sternberg (2003) defined “brand hate” as having three emotions: disgust, contempt, and anger. When consumers feel connected with a brand, their “feelings of love” are connected to their emotions; when they move away from a brand, then the reason behind these negative emotions of consumers (Park et al., 2013). Fehr and Russell (1984) defined “hate as the second most crucial emotion”. Shaver et al. (1987) also placed “hate” third in a comprehensive list of 213 emotional words. Brand hate is a strong, pessimistic emotion consumers can develop toward a brand due to its perceived inadequate performance or unethical Behaviour. Sternberg (2003) presented a theory explaining disgust, contempt, and anger emotions. Kucuk (2018) investigates the powerful impact of negative emotion, which tends to make people pay more attention to negative experiences. A survey conducted by XM Institute in 2021 on “How customers response to bad experiences” involved 18000 participants across 18 countries. The survey found that, on average, 18% of consumers reported having bad experiences, with the frequency ranging from 10% in Japan to 34% in India. After a “negative experience”, approximately 34% of consumers said they were likely to spend less on the brand, while 19% indicated they might stop purchasing from the brand entirely. As a result, these businesses faced a loss of approximately £3.0 trillion due to reduced consumer spending and an additional £1.7 trillion loss from customers who stopped purchasing from the brand. This examination highlights the need for companies to address these negative emotions like “brand hate” to avoid losing money and damaging their brand reputations. The recent research in this area is (Kucuk, 2021; Yadav & Chakrabarti, 2022; Aziz & Rahman, 2022).

Therefore, despite the increasing volume of scholarly work on “negative consumer-brand relationships”, there is scarce research focusing on “brand hate” in the mobile phone sector and its mediating role between its antecedents and outcomes. In this industry, prior studies focus on brand loyalty and positive consumer-brand relationships. The mobile phone industry is a highly competitive and customer-driven sector in which companies face various challenges to retain customers due to frequent product launches. Consumers expect a high product performance standard in a competitive industry like mobile phones. When the product does not fulfil the customer's expectations, the customer feels dissatisfied (Ali et al., 2020). When a firm fails to meet “customer expectations”,

customers often undergo a disappointing experience, such as “anger”, which can escalate into retaliatory actions (Xuan et al., 2019).

Therefore, in light of the significance of the “negative consumer-brand relationship” and its effect on the technology sector, this study proposed the following objectives:

- (i) To identify the factors influencing brand hate in the mobile phone industry.
- (ii) To investigate the role of brand hate as a mediator in the relationship between its antecedents and brand avoidance.

Literature Review

Theoretical Background

In the psychology literature, researchers give diverse opinions about whether hate is a singular emotion or complex. Some researchers consider it to be a simple emotion. According to Kernberg (1992), it is a stable emotion that can persist for a long time. In the context of consumers, hate is conceptualized from a variety of perspectives, such as “attitude” (Ben-Ze’ev, 2001), “emotion” (Weingarten, 2006), and “motivation” (Rempel & Burris, 2005). The conceptualization of hate can be divided into unidimensional and multidimensional (Yadav & Chakrabarti, 2022). In marketing, negative consumer-brand relationships emerge from Fournier (1998) article, “Consumers and their Brands: Developing Relationship Theory in Consumer Research.” The term “brand hate” first appeared in the literature on brand love (Carroll & Ahuvia, 2006). The concept of “brand hate” was not examined in these studies. However, the researcher later used these studies to develop the brand hate theory. This area of research was highly neglected until Kucuk (2007) study on “brand hate” in the context of anti-branding. Bryson et al. (2013) give the first definition of “brand hate” that “brand hate is the intense negative emotional affect toward the brand”. Later on, multiple scholars explored this concept (Kucuk, 2016; Zarantonello et al., 2016; 2018; Hegner et al., 2017; Kucuk, 2018; Jain & Sharma, 2019; Pantano, 2020; Zhang & Laroche, 2020; Nguyen, 2021; Roy et al., 2022; Mednini & Turki, 2023; Yadav, 2024).

Brand Hate

One of the main tenets of anti-consumption is brand avoidance, which is described as the intentional rejection of the brand by consumers (Lee et al., 2009). Generally speaking, “brand hate” is contrary to brand love and obsession (Bauer et al., 2007). Prior marketing literature has placed greater focus on the benefits of consumer behaviour, such as “brand love,” “passion,” and “dedication.” The previous marketing literature has predominantly focused on the “positive consequences” of “consumer behaviour”, e.g., “brand love,” “passion,” and “devotion.” These “positive consequences” can encourage purchases and establish enduring bonds between consumers and businesses (Baek et al., 2020; Abbasi et al., 2022). “Consumer brand relationships” can range from intense devotion to extreme aversion (Khan & Lee, 2014).

Brand hatred has a detrimental impact on the brand, possibly resulting in a deliberate and intentional rejection of the brand (Bryson et al., 2013). Grégoire et al. (2009) pointed out that the desire to exact revenge and stay away from the target brand is known as brand hate. Johnson et al. (2010) conceptualize “brand hate” as a powerful antipathy toward the target brand. Brand hatred has a detrimental impact on the brand. It is defined as the “negative emotion” of consumers toward the brand” (Bryson et al., 2013). Jain and Sharma (2019) stated that a “strong positive connection” with a brand might elicit unfavourable when customer expectations are violated. Rodrigues et al. (2020) explain that “brand hate” involves negative emotions and behavioural dimensions. Sternberg (2003) provided the “conceptualization of hate.” According to the “duplex theory of hate, hate is characterized by three components”: “anger and fear,” the “negation of intimacy,” and disgust,” or “devaluation and diminution”. Based on existing literature, the researcher takes the following antecedents of brand hate:

Hypothesis Development

Poor Relationship Quality and Brand Hate

The term poor relationship quality refers to the unfavourable interactions that consumers have with the brand other than “ideological incompatibility” or “symbolic incongruity” (Hashim & Kasana, 2019). According to Lemon et al. (2001), relationship equity is a component of customer equity. When consumers receive an actual reward that is less than the perceived value of the incentive, relationship equity becomes critical. Now is the time for businesses to improve relationship equity by offering significant rewards to the customer as a future investment Lemon et al. (2001). Söllner (1999) asserts that the more unequal a relationship is, the greater the level of discontent and distress prevails. Although the idea of “poor relationship quality” is crucial, it has not been widely used to indicate brand hate. Therefore, researchers take the PRQ as an antecedent of brand hate.

H1: There is a significant positive relationship between poor relationship quality and brand hate

Poor Relationship Quality and Brand Avoidance

When customers deliberately decide not to interact with the brand, this is known as brand avoidance. Customer purchase behaviour can be greatly influenced by relationships between brand and consumer, especially if that

relationship is not high quality (Hashim & Kasana, 2019). Poor relationship quality leads to negative emotions, ultimately resulting in brand avoidance (Kesse et al., 2021). Understanding this phenomenon is essential for businesses since it can negatively impact market performance and brand loyalty.

H2: There is a significant positive relationship between PRQ and BA.

Ideological Incompatibility and Brand Hate

Ideological incompatibility is a situation in which consumers experience legal, social, ethical, or corporate wrongdoings that can lead consumers to feel pessimistic about the brand and may range from ethical misconduct, use of misleading information, or value contradiction by the brand this is called “ideological incompatibility” (Hegner et al., 2017). Numerous studies demonstrate that consumers boycott those companies that violate “human rights” or devastate the environment. Consumers consequently “boycott” those companies that engage in unethical business activities (Friedman, 1985; Sandıkçı & Ekici, 2008). When consumers suspect a brand of corporate irresponsibility, they become ideologically associated with it because of legal, ethical, or societal issues (Lee et al., 2008; Bryson et al., 2013; Romani et al., 2015).

H3: There is a significant positive relationship between IC and BH.

Ideological Incompatibility and Brand Avoidance

The mismatch between customers' values and ideas that a brand express is known as ideological incompatibility. This discrepancy might cause consumers to feel negatively about the brand, frequently leading to hatred (Pinto & Brandão, 2020). Behaviour related to brand avoidance is greatly influenced by brand hate. Consumers may deliberately refrain from buying and interacting with a brand they believe contradicts their values (Hegner et al., 2017). This avoidance can take many forms, such as openly criticizing the brand or refusing to purchase items (Lee et al., 2008).

H4: There is a significant positive relationship between IC and BA.

Brand Hate and Brand Avoidance

According to Carroll and Ahuvia (2006), “brand hate” is a subtype of consumer dissatisfaction that manifests as a strong, unfavourable reaction toward the brand (Bryson et al., 2013). Brand avoidance is the most direct outcome of brand hate (Pinto and Brandão, 2020). Hegner et al. (2017) define “brand avoidance” as “ceasing” or “switching” to use or interact with a brand. It is linked to flight strategies (Grégoire et al., 2009), which are more passive actions toward a brand.

H5: There is a significant positive relation between BH and BA.

Mediating Role of Brand Hate

In the literature, “brand hate” is shown as the mediator factor of triggers that predict “negative word of mouth”, “brand avoidance”, and “brand retaliation” (Pinto & Brandão, 2020). If consumers have a bad experience with the brand, then consumers may avoid the brand and spread “negative word of mouth” (Zarantonello et al., 2016).

H6: Brand hate mediates the relationship between PRQ and BA

H7: Brand hate mediates the relationship between IC and BA

Conceptual Development

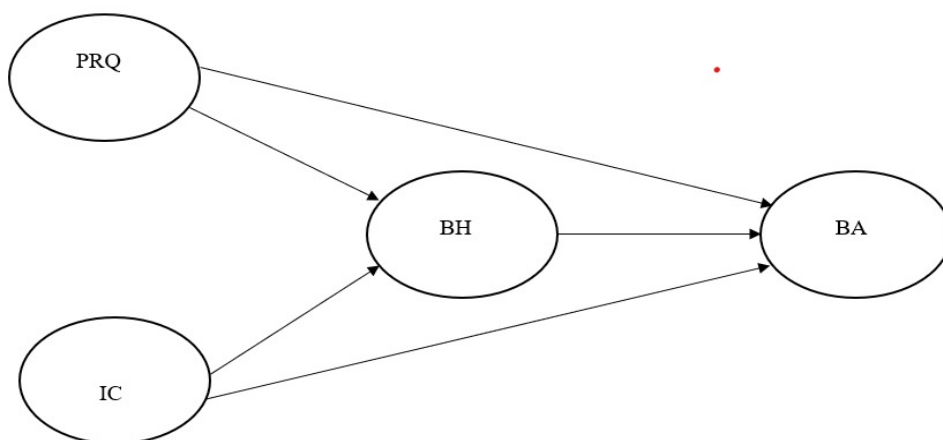


Figure 1

Source: Author's work based on the theoretical consideration

Methodology

Data Collection

A pilot study was conducted on $n = 25$ to ensure the questionnaire's reliability and validity. The Delhi-NCR area was chosen for this study since it is one of the most developed areas in the nation and contributes substantially to its GDP. The region serves as a hub of various industries, such as telecommunication and technology, which makes it an ideal location for studying consumer behaviour in the mobile phone industry. A “purposive sampling” method was used to identify respondents who met the requirement for having negative experiences toward any mobile phone brand. The study variable was measured using the structural questionnaire. A total of 410 questionnaires were distributed in shopping malls, offices, and universities either online or offline across the selected regions. Among them, 358 responses were received, reflecting a response rate of 87.31%. After screening all responses, 310 valid responses were retained without missing values or errors.

Measures

Construct	Number of items	Source
Poor Relationship Quality	5	Hashim and Kasana (2019) adapted from Chen and Myagmarsuren (2011)
Ideological Incompatibility	4	Hegner et al. (2017) adapted from Lee et al. (2009)
Brand Hate	5	Hegner et al. (2017)
Brand Avoidance	5	Hegner et al. (2017)

(All measurement scales are displayed in Appendix B)

Data Analysis

Data analysis was performed using SmartPLS software. This method was used because it can handle datasets that are not normally distributed and produce reliable results even with a small sample size (Ringle & Sarstedt, 2015). PLS-SEM is widely employed in contemporary marketing research Hair et al. (2011). The purpose of the PLS-SEM is to explain variance and predict the outcome of an endogenous variable, while CB-SEM focuses on theory testing (Hair et al., 2017). The study intends not to test a particular theory but to comprehend and predict brand hate. Thus, PLS-SEM is an appropriate method for analysing the data. Data analysis was done in three phases: firstly, commonly accepted threshold values were used to evaluate the “reliability and validity” of the model. Secondly, the hypothesis model was estimated using the bootstrapping procedure by taking 10,000 sub-samples to ensure the data's “reliability and validity” (Roldán & Sánchez-Franco, 2012). Thirdly, the “mediation effect” of BH was accessed.

Results and Findings

Demographic Profile

The final sample size of 310 was used for data analysis. Every participant was asked to mention the brand they hate/dislike. It was discovered that many phone brands were rated the worst, but Xiaomi was rated as the most disliked brand.

Of the total 310 participants, 148 were male and 162 were female. Most respondents fell within the age group of 18-25 years, followed by those aged 26-35 and 36-45. Regarding educational qualification, 2.90% completed senior secondary qualification, 32.3% completed graduation, 41 completed postgraduate, 19.40% completed PhD, and 4.5% reported another level of education. In terms of occupations, 11.% were govt employees, 24.5% were private employees, 14.2% were self-employed, 18.4% were working professionals, and 31.9% were students. The income distribution shows that 52.3% earn below 4,00,000, 29.4% earn in the range of 4,00,000-6,00,000, 12.9% earn in the range of 6,00,000-8,00,000, 3.9% earned in the range of 8,00,000-10,0000 and 1.6% earn more than 10,00,000 (Appendix A).

Measurement model

Data analysis is carried out in multiple phases. Henseler et al. (2009) suggested that factor loading should be 0.70 to assess the reflective measurement model's quality. Factor loading indicates the correlation between item and construct, where a more significant value depicts a strong correlation. The findings show that all the values exceed the “minimum threshold of 0.70”. Secondly, the “reliability” of the “measurement model” was checked using “composite reliability”. The result shows that every CR value is above 0.70, and the Cronbach α value also exceeds 0.70 (J. F. Hair Jr et al., 2014). Thirdly, the “convergent validity” (AVE) measurement was used to access the data. The findings show that all the constructs were valid, and “AVE” significantly “exceeded the recommended threshold of 0.5” (J. F. Hair Jr et al., 2014). Finally, the “discriminant validity” was evaluated using the HTMT ratio. According to Henseler et al. (2014), the HTMT ratio should be less than 0.90. The study results show that all the “HTMT values” fell below 0.90.

Table No. 1: Reliability and Validity

Construct	Factor loading	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
PRQ1	0.806	0.899	0.900	0.926	0.714
PRQ2	0.834				
PRQ3	0.866				
PRQ4	0.858				
PRQ5	0.859				
IC1	0.755	0.827	0.830	0.885	0.659
IC2	0.851				
IC3	0.796				
IC4	0.841				
BH1	0.794	0.867	0.874	0.904	0.653
BH2	0.737				
BH3	0.835				
BH4	0.838				
BH5	0.832				
BA1	0.764	0.821	0.825	0.874	0.582
BA2	0.713				
BA3	0.777				
BA4	0.761				
BA5	0.797				

Source: Author(s)

Table No. 2: Discriminant validity

	BA	BH	IC	PRQ
BA				
BH	0.678			
IC	0.627	0.758		
PRQ	0.743	0.795	0.877	

Source: Author(s)

Common Method Bias

Common method bias is a significant threat to survey-based research (Guide & Ketokivi, 2015). Therefore, the researcher conducted the VIF (variance inflation factor) test proposed by Kock (2015) to identify common method bias. The table shows that all the constructs have VIF values “less than 3.3”. Thus, the proposed model is free from “common method bias” (Kock, 2021).

Table No. 3

	VIF
BH -> BA	2.120
IC -> BA	2.517
IC -> BH	2.369
PRQ -> BA	2.911
PRQ -> BH	2.369

Source: Author(s)

Structural Model

The researcher employed non-parametric bootstrapping with 10,000 replications to assess the structural model testing. Smart-PLS 4.1.0.9 was used to evaluate the “structural model” for hypothesis testing. “Basic measures” such as “t-value, p-value, and effect size” were used to underlying the relationship between the variables. The results shown in Table 3 show that IC and PRQ have a “positive effect” on developing “brand hate” and that the f^2 value (effect size) is medium. Hence, hypotheses H1 and H3 are accepted. Similarly, the effect of PRQ on brand avoidance was significant, and the effect size value ranged from small to medium. Thus, the hypothesis H2 was accepted. However, the findings show that IC does not significantly influence brand avoidance. The “effect size is also smaller than the small effect size (0.02 small, 0.15 medium, 0.35 large)” suggested by (J. F. Hair et al., 2018). Thus, the hypothesis H4 is rejected. Similarly, the findings show that brand hate significantly influences brand avoidance, and the effect size is medium. Therefore, the hypothesis H5 is accepted. Despite confirming the

proposed hypothesis, we calculate R^2 (coefficient of determination) and Q^2 (predictive relevance). According to Cohen (2013), the R^2 value of the endogenous variables, BH 0.528 and BA 0.445, reached a substantial level. The Q^2 value shows the predictive relevancy of the model, and this value should be greater than zero (J. F. Hair et al., 2018). The findings show that both endogenous variables Q^2 values are above the threshold limit, which shows the predictive relevancy of the model. As per the description on the SmartPLS website, the following criteria should be fulfilled for model fit. “SRMR value should be less than 0.102, and the NFI value should be close to 1 to 0” (J. Hair et al., 2017). Table 8 shows that the NFI value is 0.853, which is the best value close to 1, and the SRMR value is 0.061, which is less than 0.102. Thus, these results indicate model fitness.

Table No. 4: Hypothesis testing

	Path	Beta	S.D	F ² (effect size)	t-value	p-value	Decision
H1	PRQ -> BH	0.506	0.066	0.229	7.614	0.000***	Accepted
H2	PRQ -> BA	0.456	0.080	0.129	5.684	0.000***	Accepted
H3	IC -> BH	0.264	0.069	0.062	3.848	0.000***	Accepted
H4	IC -> BA	0.017	0.079	0.000	0.212	0.832	Not Accepted
H5	BH -> BA	0.247	0.078	0.052	3.172	0.002**	Accepted

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author(s)

Mediation Analysis

To examine the “mediating effect” of “brand hate” on “brand avoidance”, researchers employed a bootstrapping procedure. “Bootstrapping” is one of the most “robust” and “effective techniques” to measure the effect of mediation (Hayes, 2009). The result of the indirect effect shown in the table is that “brand hate” plays a significant role as a “mediator”. In addition, the value of “variance accounted for” (VAF) was calculated to know the effect of “mediation” (partial or full), shown in Table 6.

Table No. 5: Indirect Effect

	Path	Beta	S.D	t-value	p-value	Decision
H6	PRQ -> BH -> BA	0.125	0.043	2.893	0.004**	Accepted
H7	IC -> BH -> BA	0.065	0.027	2.423	0.015*	Accepted

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Author(s)

Table No. 6: VAF Calculation

Condition	No mediation	Partial mediation	Full mediation
Calculate VAF = (indirect effect/ total effect)	Below 20%	20%-80%	Above 80%

Source: Author(s)

Table No. 7 (Mediation Results)

Path Relation	VAF	Mediation Type	Lower Limit	Upper Limit
PRQ -> BH -> BA	21.51%	Partial mediation	0.045	0.215
IC -> BH -> BA	79%	Partial mediation	0.021	0.127

Source: Author(s)

Table No. 8: Coefficient of Determination and Predictive Relevance

	R square	Adjusted R square	Q square
BA	0.445	0.440	0.401
BH	0.528	0.525	0.518

Source: Author(s)

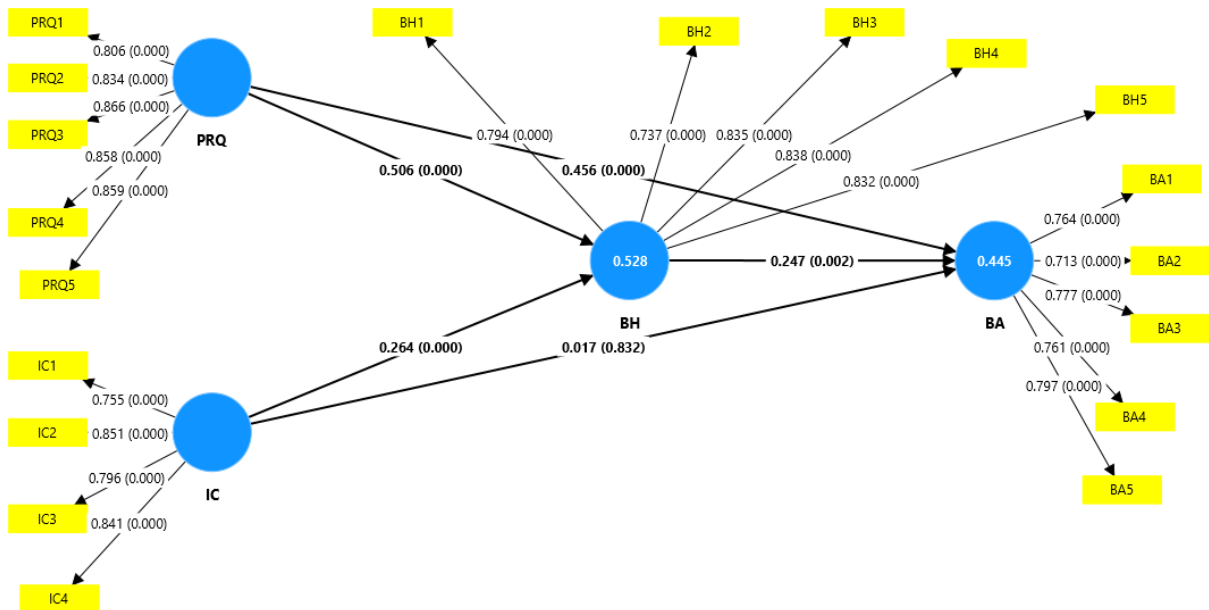


Figure 2 Modelling Result (developed by the researcher through smart pls software)

Source: Smart PLS

Table No. 9 Model Fit

	Saturated model	Estimated model
SRMR	0.061	0.061
d_ULS	0.699	0.699
d_G	0.292	0.292
Chi-square	516.082	516.082
NFI	0.853	0.853

Source: Author(s)

Discussion and Conclusion

This study provides important insights into the existing literature on “negative consumer-brand relationships”. Only a limited number of studies have focused on negative “consumer-brand relationships” (Bryson et al., 2013; Fetscherin, 2019; Hegner et al., 2017; Jain & Sharma, 2019; Pinto & Brandão, 2020; Zarantonello et al., 2016; Roy et al., 2022; Yadav, 2024). The study enriches our understanding in the field of “brand hatred”, a relatively recent issue, by quantitatively examining “novel antecedents” of “brand hate” and one behavioural consequence, “brand avoidance”, and highlighting the “mediating role” of “brand hate” between the “antecedents” and “consequences”. The study findings indicate that IC and PRQ positively impact brand hate. The findings of the study are consistent with existing literature where the determinates affect brand hate (Henseler et al., 2014; Kucuk, 2018; Bavik & Bavik, 2015; Zarantonello et al., 2018; Yadav, 2024). The findings indicate that researchers should address ideological incompatibility and brand avoidance to mitigate brand hate. In this study, the researcher also did a mediation analysis to check whether “brand hate” mediates the relationship between its “antecedents and outcome”. The researcher found that all the specific indirect effects were significant. However, to know whether brand hate is partially mediating or fully mediating, the researcher calculated variance accounted for (VAF). The findings show that brand hate is partially mediated in both cases. The results emphasise the importance of addressing emotional factors such as brand hate to mitigate brand avoidance.

Theoretical implication

This study makes an essential contribution to consumer behaviour and brand management literature. The first extends the limited research on “negative consumer brand relationships” by addressing the growing focus on examining negative emotions. The focus on negative feelings provides a deeper understanding of consumer behaviour, particularly in how negative experiences shape consumer attitudes toward brands. This study emphasises the crucial role of “brand hate” as a “mediator” in the relationship between “antecedents” and “outcomes”. This research highlights the multifaceted role of consumer-brand relationships, where different factors operate through various mechanisms. This study advances the understanding of academics in considering the implications of “brand hate” in future research by highlighting the “antecedent consequences” and mediating effects of “brand hate” that connect the dynamics of hate during “consumer-brand interactions”.

Managerial Implication

The study findings are significant to brand managers and practitioners because these negative sentiments can damage brand reputations and value. The findings suggest that consumers may develop strong “negative feelings” toward the brand when “brand values” clash with the beliefs of its customers or when there is a poor consumer-brand relationship. Thus, this study offers practical insights for brand managers into reducing brand avoidance and enhancing consumer-brand relationships. To address ideological incompatibility, a brand must ensure it performs according to the customer's beliefs. To address poor relationship quality, it should be ensured that there is a “good relationship” between the customer and the brand. To improve relationships, the brand should maintain trust, fulfil promises and enhance customer interactions to minimise dissatisfaction and negative emotions. By proactively managing ideological and relational factors, brands can increase positive engagement and customer loyalty and reduce negative outcomes such as “brand avoidance”.

Limitations and Future Research Direction

There are many limitations of this study. Firstly, this study was carried out within the mobile phone industry in Delhi-NCR, which may limit the generalizability of the findings to other geographical areas and industries. Future researchers can conduct this research across different sectors and geographical regions. Secondly, only two antecedents of the brand – ideological incompatibility and poor relationship quality were investigated, excluding other potential factors. Future researchers can incorporate additional antecedents, such as greenwashing and brand hypocrisy. In future research, researchers can also explore the moderating effect of age, gender, cultural background, and frequency of brand purchase to understand how different customer segments respond to these issues. Thirdly, in this study, the researcher used the survey method. Future researchers could adopt mixed-method research, quantitative and qualitative. Fourth, the choice of “purposive sampling” may also restrict the “generalizability” of this research because it might not be feasible to extrapolate the data gathered to a larger population. The reason for this study is that it only focuses on the sample that experienced brand hatred.

Conflict of Interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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Role of Burnout between Classroom Incivility and Learning Engagement: A Study of Select Colleges of Chandigarh

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Abstract

In terms of education, India is a major player. One of the largest international networks of schools and institutions is found in India. Traditionally, education was delivered through Gurukula. The relationship between the teacher (Guru) and students (Shishya), was one of the most crucial aspects of education. The contemporary world, which raises the next generation, is undoubtedly deficient in moral and ethical principles. The study's objectives are to ascertain classroom incivility on learning engagement and role of burnout. Majority of previous scholarly studies concentrated on workplace incivility. Civility is essential these days, whether at workplace or in the classroom. Disruptions in the classroom and student incivility are becoming worse and more frequent. In the academic world, there have been many reports of uncivil behavior. This article has examined classroom incivility and learning engagement association among college students of Union Territory, Chandigarh, Northern India. Additionally, this study has investigated how burnout influences classroom incivility and learning engagement relationship. Standardized instruments were used to collect data from respondents. For hypotheses testing, descriptive statistics, correlation, structural equation modeling and mediation analysis were used. SmartPLS4 and SPSS 26 have been used for the analysis. It has been discovered that there is complete mediation between learning engagement and classroom incivility. No direct impact of classroom incivility found on learner's engagement. Additionally, research reveals no statistically significant variation between demographic variables and classroom incivility. Through social and recreational activities, the public—which includes parents, friends, relatives, educators and school officials—will be able to provide students with valuable guidance on how to change their uncivil behavior.

Keywords- Classroom Incivility, Uncivil Behavior, Burnout, Learning Engagement

Introduction

India is making significant contributions to the field of education. Among the biggest global university networks and colleges are found in India. In the past, education was provided through Gurukula. Among the most important elements of education was the relationship between the Guru or instructor, and his Shishya or students. In the Gurukula, teaching and politeness were equally prized. Unquestionably, there are significant moral and ethical values issues in the present world, which raises the future generation (Moore, 2012).

Students' academic and intellectual growth is hampered by disrespect in the classroom, and their motivation to use critical thinking skills is decreased. They were acting impolitely in class, which caused interruptions to the learning atmosphere and student diversions.

During the 1970s, job burnout became a prominent notion that encapsulated a significant aspect of people's work experiences (Schaufeli et al., 2009). Freudenberger (1974) defined and used the term “burnout” originally.

When Maslach and her colleagues interviewed a variety of Californian human services workers, they encountered the word burnout. Emotional fatigue, depersonalization, and decreased personal accomplishment are commonly used to characterize burnout (Maslach & Jackson, 1981).

The Burnout definition ‘students in the learning process, because of course stress, course load or other psychological factors, display a state of emotional exhaustion, a tendency to depersonalization, and a feeling of low personal accomplishment’ given by (Yang, 2004). The subject has not only broadened to encompass workplace burnout but also in the education sector (Schaufeli et al., 2002). When burnout in teachers and undergraduate students was contrasted and examined, students' scores fell between the medium and upper ranges of the burnout scale (Rahmati, 2015). Preventive actions might be implemented if it could be determined that students are susceptible to burnout.

Literature Review

Classroom Incivility

The organizational behavior literature has extensively studied incivility during the past 20 years, specifically workplace incivility (Andersson & Pearson, 1999). Boice (1996) carried out the first study on classroom incivility at New York's State University at Stony Brook, which included over 11,000 undergraduate students and 1500

faculty members. It was discovered that at the time, there had been no empirical studies on classroom disrespect. In addition to 16 faculty members (8 junior and 8 senior), 405 students took part in his study. It was clear from his research that students weren't treating each other well. This theory has never been thoroughly investigated by researchers until his study. It was discovered that the initial few days of class were more influential in causing students to be impolite than the teacher's level of expertise in the classroom. There were differences in disruptive behavior between males and females, though. In both elementary and high school, men demonstrated more violence than women (Arbuckle & Little, 2004). Also, social norms have a big impact on classroom incivility. The results of a study illustrated how important social norms are in shaping pupils' uncivil behavior in the classroom. The findings revealed that classroom interventions centered around social norms might effectively lower incidents of misconduct (Segrist et al., 2018). The interactions between teachers and students create a positive learning environment (Jeon & Lee, 2023). Classroom incivility may persist over time and could lead to bullying (Spadafora & Volk, 2024). Male students and those with lower academic performance were especially prone to these behaviors (Asraf et al., 2025).

Burnout

Maslach and Jackson (1981) originally described burnout as a condition characterized by depersonalization, cynicism, and mentally exhausted. Academic burnout is mostly displayed by those who encounter more classroom incivility (Bai et al., 2020). It was believed that people in various professions, such as those in education, social work, and health care, would eventually experience burnout (Schaufeli et al., 2002). Fostering student engagement and self-efficacy is crucial for reducing burnout and enhancing academic performance (Cong et al., 2024).

Learning Engagement

Instructors continue to emphasize the value of positive behavior and encourage involvement from their students in class. Student grades and other learning outcomes like cognitive thinking are positively correlated with student involvement (Carini, Kuh and Klein, 2006). It was found that learning engagement affects academic achievement (Li et al., 2019). Students that are involved in class are usually less tolerant of disrespectful behavior and are more attentive and focused. On the other side, disengaged students typically don't connect intellectually with their professors and classmates, as well as to get bored or lose interest in studying, which promotes disruptive conduct (Cicotti, 2012). To avoid buildup over time, it is imperative to deal with uncivil behavior on a daily basis (Beattie & Griffin, 2014). The way students perceive their achievements and the role of teachers in promoting student autonomy significantly influence their engagement in learning (Yoon et al., 2020). Positive emotions among students are essential in linking teacher support to student engagement (Jia & Cheng, 2024).

Classroom Incivility and Burnout

Burnout completely mediated the association of workplace incivility with initiated workplace incivility (Loh and Loi, 2018). Customer incivility and employee incivility are highly mediated by employee burnout (Kim and Qu, 2019). Anxiety and job burnout were positively connected with workplace incivility (Shi et al., 2018). Studies had shown burnout is positively impacted by incivility (Hong et al., 2016; Taylor et al., 2017). Faculty member job satisfaction and retention are significantly decreased as a consequence of incivility, which may lead to burnout, greater intent to leave, and high turnover rates (Penconek et al., 2025).

H1. Classroom incivility has a significant and positive impact on burnout of students in select colleges of Chandigarh.

Burnout with Learning Engagement

In order to reduce burnout or improve engagement, different intervention tactics should be used, as indicated by the divergent patterns of probable causes and consequences that affect both.

(Schaufeli & Bakker, 2004). Based on the employees' subjective health impairment and active learning, the expectations and control may be anticipated (Demerouti et al., 2001). There is negative correlation between vigor, devotion, and absorption and emotional tiredness, cynicism, and decreased professional efficacy, respectively (Uludağ and Yaratana, 2010). Effort–reward imbalance affects learning engagement indirectly through the chain mediating roles of academic self-concept and burnout (Jin et al., 2024).

H2. Burnout has a significant and negative impact on learning engagement of students in select colleges of Chandigarh.

Classroom Incivility and Learning Engagement

Disengaged students are more prone to lose interest in their studies, lack intellectual connections with teachers and peers, and behave disruptively as a result (Cicotti, 2012). Higher levels of involvement were found in supportive environments compared to uncivil ones (Giumetti et al., 2013). Engagement positively impacts performance, while having uncivil peer group has a negative effect on it (Wang & Chen, 2020). Students who expressed feeling "not connected or heard" also demonstrated a "lack of engagement" (Pool et al., 2024).

H3. Classroom incivility has a significant and negative impact on learning engagement of students in select colleges of Chandigarh.

Classroom Incivility, Burnout and Learning Engagement

Burnout mediates workplace incivility and work engagement relationship, and there is no visible direct connection between work engagement and workplace incivility (Setyadi et al., 2021).

H4. Burnout mediates classroom incivility and learning engagement relationship.

Theoretical Background

Attribution Theory

A book published by (Heider, 1958) “The Psychology of Interpersonal Relations”, which contained theories on attribution. The notion of attribution enables us to comprehend the reasons behind an action or behavior.

Engagement Theory

The engagement theory is proposed by (Kearsley and Shneiderman, 1998). In this theory there are three foundational pillars of engagement theory. First is relate, second is create, and third is donate.

First pillar “relate” highlights the importance of student interaction and mutual trust. Partnership and exchange can foster innovative thinking among students, facilitate effective problem-solving, and support academic perseverance all at the same time. It will be necessary to vary the study techniques used in groups because students differ in terms of intelligence, knowledge, and thinking styles. This will let everyone take advantage of the strengths of others to make up for their own weaknesses and enhance their learning.

Second principle “creates” which is meant by creative activity. The information era has already commenced in our culture, and everything we encounter on a daily basis are evolving. In this case, creativity is really essential. This principle is often articulated in engagement theory through the use of “Problem Based Learning”.

Third principle of engagement theory is the “donate” principle in which students can tailor their studies to not just their own needs but also those of the larger community. This helps them become more compassionate and improves their own humane traits. There are more options for students’ questions about social value and meaning because they are more pragmatic in their study habits today.

Research Methodology

Sampling

As per Department of Higher Education, Chandigarh Administration 2024, the total population was 43,088 students in selected five public and six private colleges of Chandigarh, India. The data is further divided into two categories based on their education level: undergraduate (N1 =37,888) and postgraduate (N2 = 5200). The size of the population was known so in determining the size of the sample, formula given by Yamane (1967) was used.

$$n = \frac{N}{(1 + Ne^2)}$$

where, N = Population
n = Sample size
e = Margin of error

$$n = \frac{43,088}{(1 + 43,088 (0.05)^2)} = 396.32$$

To achieve the required sample size 400 participants were contacted, out of which 320 responded. Questionnaire was sent to 36 students from each selected colleges under study. After data cleaning, which involved removing outliers and addressing missing values, the final sample size was determined to be 298. Therefore, the present study includes a final analysis based on a sample of 298 participants selected randomly from the colleges of Chandigarh. There were 178 males (60%) and 120 females (40%). The sample comprised 217(73%) students of undergraduate courses and 81(27%) students of postgraduate courses.

Measures

The study involves classroom incivility as independent variable, learning engagement as dependent variable, burnout as mediator, gender and education level as demographic variables.

Cortina et al. (2001) developed twelve-item five-point Likert Workplace Incivility Scale (WIS) which is used in this study to measure classroom incivility. Cronbach’s Alpha for classroom incivility was 0.93.

Schaufeli et al. (2002) developed 17 items seven-point Likert student Version (UWES-S) scale to measure learning engagement which is used in this study. The measure categorized into three dimensions vigor, dedication and absorption. 0.77 was the value of Cronbach’s Alpha for learning engagement.

Schaufeli et al. (2020) developed 12 items five-point Likert burnout scale. Cronbach’s Alpha for burnout was 0.82 (see Table 1).

Table 1. Measures

Variables	Likert Scale	Items	Author	Cronbach's Alpha
Classroom Incivility	Five Point	12	Cortina et al., 2001	0.93
Learning Engagement	Seven Point	17	Schaufeli et al., 2002	0.77
Burnout	Five Point	12	Schaufeli et al., 2020	0.82

Source: Author's own compilation

Research Questions

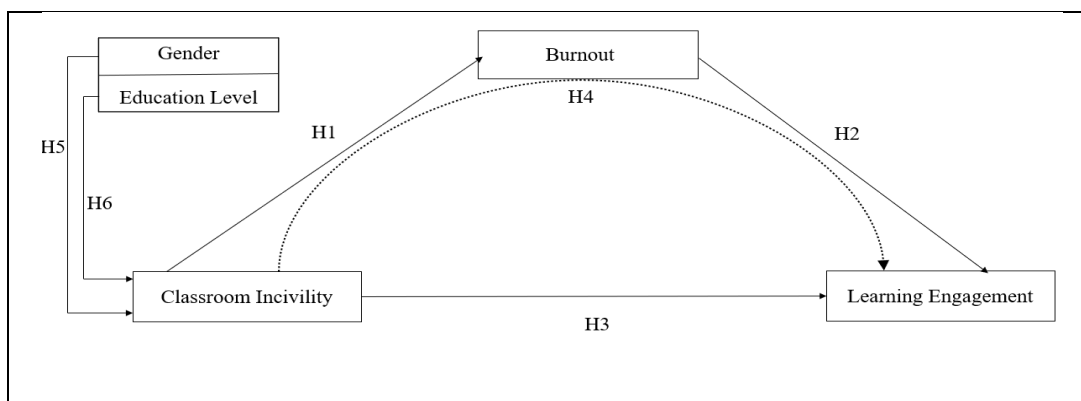
- How do levels of classroom incivility impact student burnout in select colleges?
- To what extent does student burnout influence the level of learning engagement of students in select colleges?
- How does classroom incivility affect the learning engagement of students in select colleges?
- To what degree does burnout influence the effect of classroom incivility on student learning engagement in select colleges?
- How do demographic factors influence the perception and experience of classroom incivility in select colleges?

Objectives

- To examine classroom incivility and student burnout relationship in select colleges of Chandigarh.
- To examine burnout and learning engagement relationship of students in select colleges of Chandigarh.
- To examine classroom incivility and learning engagement relationship of students in select colleges of Chandigarh.
- To examine the role of burnout as mediator in classroom incivility and learning engagement relationship of students in select colleges of Chandigarh.
- To examine significant difference between demographic variables and classroom incivility.

Hypotheses

- Classroom incivility has a significant and positive impact on burnout of students in select colleges of Chandigarh.
- Burnout has a significant and negative impact on learning engagement of students in select colleges of Chandigarh.
- Classroom incivility has a significant and negative impact on learning engagement of students in select colleges of Chandigarh.
- Burnout mediates classroom incivility and learning engagement relationship.
- Gender (male & female) has significant difference in classroom incivility.
- Education level (undergraduate and post graduate students) has significant difference in classroom incivility.

Figure1. Conceptual Model

Source: Author's depiction based on literature review

Data Analysis and Results

The current study had a sample consisting of 298 students selected randomly from the colleges of Chandigarh. There were 178 males (60%) and 120 females (40%). The sample comprised 217(73%) students of undergraduate courses and 81(27%) students of postgraduate courses (see Table 2 and Table 3).

Table 2. Gender

Gender	Frequency	Percent
1	178	59.7
2	120	40.3

Source: Authors calculations based on primary data

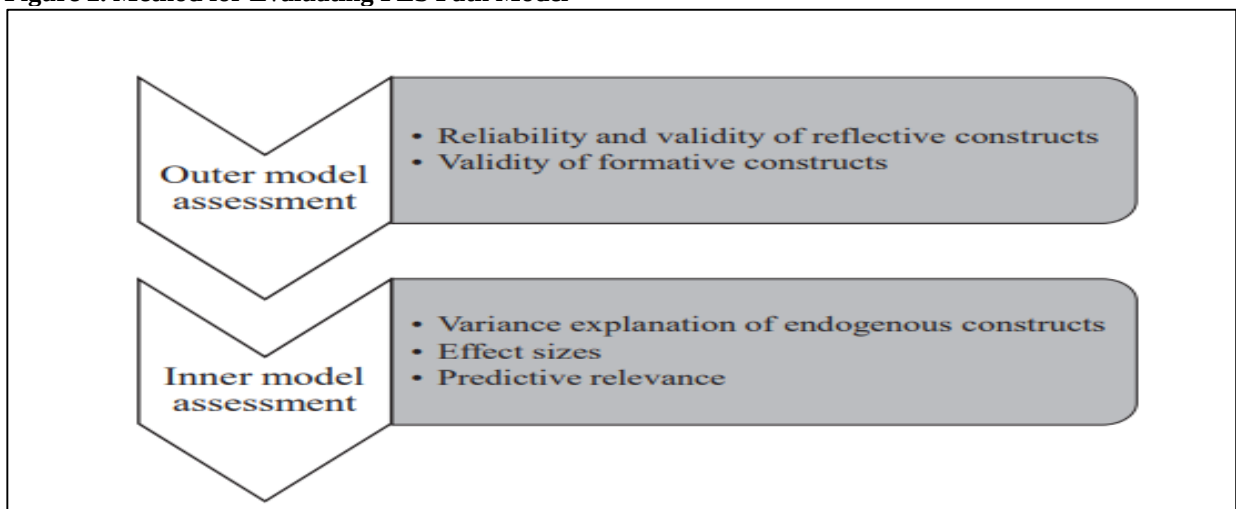
Table 3. Education Level

Education Level	Frequency	Percent
1	217	72.8
2	81	27.2

Source: Author's calculations based on primary data

Measurement Model

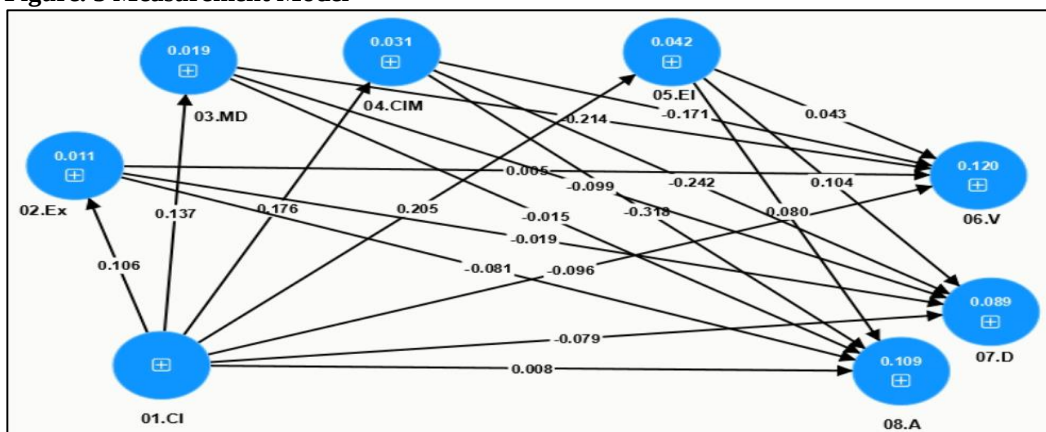
The hypothesized relationships are determined by the structural model. Validity and reliability are taken into account in the measurement model (Hair et al., 2019).

Figure 2. Method for Evaluating PLS Path Model

Source: A Two-Phase Method for Evaluating PLS Path Model Adapted from (Henseler et al., 2009)

Measurement Model (Lower-order Constructs)

Statistical software SmartPLS4 has been used to analyze data.

Figure. 3 Measurement Model

Source: PLS generated output

Note: CI=classroom incivility, Ex=exhaustion, MD= mental distancing, CIM= cognitive impairment, EI= emotional impairment V=vigor, D=dedication, A=absorption

The necessary 0.70 threshold has been attained by both Cronbach alpha and composite reliability, demonstrating their reliability.

Table 4. Factor Loading, Reliability and Validity Analysis

	Outer loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
CI1 <- 01.CI	0.69	0.93	0.94	0.57
CI2 <- 01.CI	0.70			
CI3 <- 01.CI	0.77			
CI4 <- 01.CI	0.78			
CI5 <- 01.CI	0.77			
CI6 <- 01.CI	0.76			
CI7 <- 01.CI	0.70			
CI8 <- 01.CI	0.76			
CI9 <- 01.CI	0.79			
CI10 <- 01.CI	0.80			
CI11 <- 01.CI	0.76			
CI12 <- 01.CI	0.80			
B1 <- 02.Ex	0.93	0.77	0.82	0.61
B2 <- 02.Ex	0.57			
B3 <- 02.Ex	0.77			
B4 <- 03.MD	0.87	0.67	0.79	0.56
B5 <- 03.MD	0.83			
B6 <- 03.MD	0.48			
B7 <- 04.CIM	0.87	0.82	0.89	0.73
B8 <- 04.CIM	0.88			
B9 <- 04.CIM	0.82			
B10 <- 05.EI	0.82	0.78	0.87	0.69
B11 <- 05.EI	0.90			
B12 <- 05.EI	0.77			
V1 <- 06.V	0.66	0.82	0.86	0.51
V2 <- 06.V	0.68			
V3 <- 06.V	0.69			
V4 <- 06.V	0.63			
V5 <- 06.V	0.82			
V6 <- 06.V	0.80			
D2 <- 07.D	0.85	0.82	0.84	0.55
D3 <- 07.D	0.90			

	Outer loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
D4 <- 07.D	0.87			
D5 <- 07.D	0.78			
A1 <- 08.A	0.76	0.85	0.88	0.55
A2 <- 08.A	0.64			
A3 <- 08.A	0.52			
A4 <- 08.A	0.86			
A5 <- 08.A	0.85			
A6 <- 08.A	0.79			

Source: Authors calculations based on primary data

Note: CI=classroom incivility, B=burnout, V=vigor, D=dedication, A=absorption

Construct Validity

Convergent and discriminant validity are the means by which construct validity is demonstrated. AVE statistics are the basis of the outcomes of convergent validity. It is proven, if the value of Average Variance Extracted (AVE) in comparison of suggested value of 0.50 is greater than or equal to (Fornell and Larcker, 1981).

Indicator Multicollinearity

Table 5. Multicollinearity Statistics (VIF) for Indicators

Items	VIF	Items	VIF	Items	VIF
A1	1.71	B9	1.53	CI11	2.39
A2	1.59	B10	1.75	CI12	2.49
A3	1.4	B11	1.76	D2	2.48
A4	2.19	B12	1.48	D3	3.07
A5	2.13	CI1	2.24	D4	2.45
A6	1.94	CI2	2.15	D5	1.86
B1	1.46	CI3	2.15	V1	1.45
B2	1.66	CI4	2.33	V2	1.66
B3	1.6	CI5	2.24	V3	1.56
B4	1.28	CI6	2.1	V4	1.51
B5	1.46	CI7	1.95	V5	1.84
B6	1.27	CI8	2.32	V6	1.58
B7	2.1	CI9	2.35		
B8	2.28	CI10	2.51		

Source: Authors calculations based on primary data

Note: A=absorption, B=burnout, CI=classroom incivility, D=dedication, V=vigor, VIF= Variance Inflation Factor

Discriminant Validity

AVE square root of given construct was higher as compare to other construct's correlation. Therefore, strong evidence were there for establishing discriminant validity (Fornell and Larcker, 1981) (see Table 6).

Table 6. Fornell-Larcker criterion

	01.CI	02.Ex	03.MD	04.CIM	05.EI	06.V	07.D	08.A
01.CI	0.76							
02.Ex	0.11	0.77						
03.MD	0.14	0.44	0.75					
04.CIM	0.18	0.41	0.55	0.86				
05.EI	0.21	0.49	0.36	0.49	0.83			
06.V	-0.15	-0.15	-0.30	-0.28	-0.13	0.72		
07.D	-0.12	-0.12	-0.21	-0.27	-0.07	0.70	0.85	
08.A	-0.04	-0.18	-0.20	-0.32	-0.12	0.66	0.69	0.75

Source: Authors calculations based on primary data

Table 7. Heterotrait-monotrait ratio (HTMT)-Matrix

	01.CI	02.Ex	03.MD	04.CIM	05.EI	06.V	07.D	08.A
01.CI								
02.Ex	0.15							
03.MD	0.18	0.60						
04.CIM	0.19	0.47	0.72					
05.EI	0.23	0.63	0.54	0.61				
06.V	0.16	0.15	0.31	0.31	0.16			
07.D	0.13	0.11	0.23	0.31	0.09	0.81		
08.A	0.09	0.15	0.21	0.33	0.12	0.76	0.77	

Source: Authors calculations based on primary data

Note: CI=classroom incivility, Ex=Exhaustion, MD= Mental distancing, CIM= Cognitive impairment, EI= Emotional impairment V=vigor, D=dedication, A=absorption

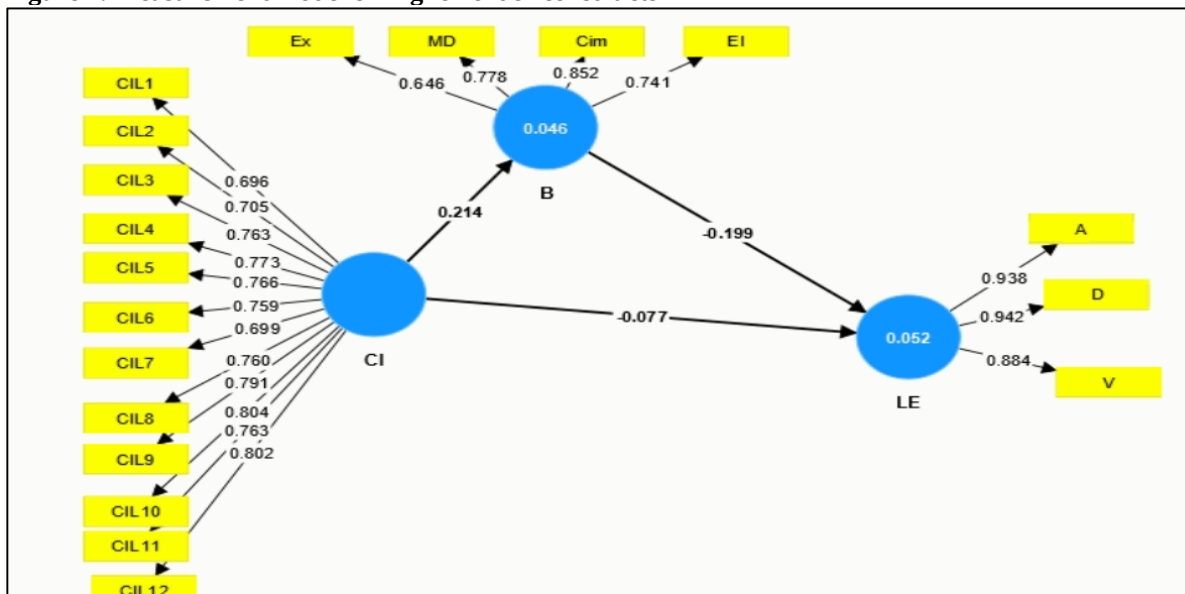
Table 8. Discriminant validity- Cross loadings

	01.CI	A	D	V	Ex	MD	CIM	EI
CI1	0.69	0.02	-0.07	-0.03	-0.03	0.05	0.06	0.11
CI2	0.70	-0.02	-0.10	-0.09	0.04	0.10	0.10	0.13
CI3	0.77	-0.01	-0.06	-0.07	0.19	0.16	0.17	0.22
CI4	0.78	-0.09	-0.10	-0.18	0.09	0.12	0.06	0.16
CI5	0.77	-0.04	-0.07	-0.12	0.07	0.11	0.17	0.16

	01.CI	A	D	V	Ex	MD	CIM	EI
CI6	0.76	-0.05	-0.11	-0.11	0.12	0.12	0.17	0.17
CI7	0.70	0.00	-0.04	-0.10	0.08	0.07	0.15	0.15
CI8	0.76	-0.04	-0.06	-0.09	0.07	0.08	0.05	0.15
CI9	0.79	-0.05	-0.06	-0.04	0.07	0.10	0.22	0.19
CI10	0.80	-0.03	-0.16	-0.18	0.06	0.07	0.16	0.11
CI11	0.76	-0.04	-0.08	-0.11	0.04	0.07	0.10	0.13
CI12	0.80	-0.01	-0.13	-0.17	0.06	0.14	0.12	0.15
A1	-0.05	0.76	0.47	0.48	-0.19	-0.14	-0.21	-0.02
A2	0.09	0.64	0.43	0.40	-0.07	-0.06	-0.11	0.00
A3	0.03	0.52	0.28	0.30	-0.02	-0.03	-0.06	-0.02
A4	-0.05	0.86	0.51	0.50	-0.18	-0.15	-0.29	-0.09
A5	-0.04	0.85	0.65	0.62	-0.12	-0.23	-0.35	-0.18
A6	-0.06	0.79	0.64	0.58	-0.13	-0.15	-0.23	-0.12
D2	-0.14	0.57	0.85	0.61	-0.09	-0.14	-0.18	-0.01
D3	-0.14	0.62	0.90	0.67	-0.13	-0.21	-0.25	-0.08
D4	-0.06	0.59	0.87	0.58	-0.10	-0.22	-0.26	-0.08
D5	-0.05	0.58	0.78	0.52	-0.07	-0.15	-0.20	-0.08
V1	-0.12	0.36	0.47	0.66	-0.11	-0.17	-0.11	-0.07
V2	-0.02	0.44	0.41	0.68	-0.03	-0.17	-0.08	-0.01
V3	-0.07	0.41	0.45	0.69	-0.07	-0.18	-0.16	-0.09
V4	0.02	0.54	0.48	0.63	-0.02	-0.10	-0.17	-0.09
V5	-0.14	0.52	0.56	0.82	-0.10	-0.29	-0.27	-0.11
V6	-0.18	0.58	0.60	0.80	-0.22	-0.28	-0.30	-0.16
B1	0.07	-0.18	-0.13	-0.16	0.93	0.38	0.37	0.43
B2	0.13	0.05	0.04	0.05	0.57	0.26	0.22	0.35
B3	0.13	-0.10	-0.05	-0.07	0.77	0.38	0.33	0.43
B4	0.08	-0.20	-0.22	-0.28	0.46	0.87	0.52	0.37
B5	0.16	-0.14	-0.16	-0.24	0.27	0.83	0.40	0.23
B6	0.10	0.02	0.04	-0.05	0.30	0.48	0.31	0.32
B7	0.21	-0.27	-0.21	-0.25	0.43	0.54	0.87	0.41
B8	0.10	-0.27	-0.22	-0.21	0.31	0.45	0.88	0.39
B9	0.14	-0.28	-0.26	-0.26	0.32	0.42	0.82	0.44
B10	0.15	-0.08	-0.06	-0.06	0.41	0.32	0.45	0.82
B11	0.21	-0.13	-0.08	-0.14	0.44	0.28	0.43	0.90
B12	0.13	-0.07	-0.04	-0.13	0.38	0.32	0.34	0.77

Source: Authors calculations based on primary data

Figure 4. Measurement model of Higher-order constructs



Source: PLS generated output

Note: CI=classroom incivility, B=burnout, LE=learning engagement

Table 9. Reliability and validity (Higher order construct)

	Cronbach's alpha	Composite Reliability	Average Variance Extracted (AVE)
LE	0.913	0.944	0.849

Source: Authors calculations based on primary data

Note: LE= learning engagement

Table 10. Fornell-Larcker criterion for validity

	B	CI	LE
B	0.758		
CI	0.214	0.758	
LE	-0.216	-0.12	0.921

Source: Authors calculations based on primary data

Note: CI=classroom incivility, B=burnout, LE=learning engagement

Table 11. Heterotrait-monotrait ratio (HTMT)-Matrix for higher order discriminant validity

	B	CI	LE
B			
CI	0.243		
LE	0.212	0.123	

Source: Authors calculations based on primary data

Note: CI=classroom incivility, B=burnout, LE=learning engagement

Table 12. Structural Model

		Beta	SD	t-value	P-values
H1	CI -> B	0.21	0.05	4.06	0.00
H2	B -> LE	-0.20	0.07	2.87	0.00
H3	CI -> LE	-0.08	0.07	1.16	0.25

Source: Authors calculations based on primary data

Note: CI=classroom incivility, B=burnout, LE=learning engagement

H1 evaluates whether burnout is impacted by CI significantly and positively. As per results CI has a significant and positive impact on burnout ($\beta=0.21$, $t=4.06$, $p<0.05$). Hence H1 was supported.

H2 investigates whether burnout has significant and negative impact on LE. The outcome displayed that burnout has a significant and negative impact on LE ($\beta=-0.20$, $t=2.87$, $p<0.05$). Hence H2 was supported.

H3 investigates whether CI has significant and negative impact on LE. The outcome displayed that CI has an insignificant and negative impact on LE ($\beta=-0.08$, $t=1.16$, $p>0.05$). Hence, H3 was not supported (see Table 12). The SEM outcome displayed a strong positive correlation between burnout and CI. Burnout and LE are significantly correlated negatively. The correlation between CI and LE is negligible. Students will get more burned out and less engaged in studying if they encounter more incivility in the classroom.

Mediation Analysis

The mediation hypothesis (H4) was tested using the mediating procedure. The results depicted significant ($p>0.05$) full mediation (see Table 13). The total effect of CI on LE was insignificant ($\beta=-0.120$, $t=1.897$, $p=0.058$). With the inclusion of mediator, the effect of CI on LE is significant ($\beta=-0.043$, $t=2.285$, $p<0.05$).

The direct effect was insignificant ($\beta=-0.077$, $t=1.156$, $p>0.05$). So, burnout fully mediates CI and LE relationship. Thus, H4 was supported.

Table 13. Mediation

Total Effect (CI -> LE)			Direct Effect (CI -> LE)				Indirect effect of CI on LE		
Coefficients	p-value	T-value	Coefficients	p-value	T-value		Coefficients	T-value	P-value
-0.120	0.058	1.897	-0.077	0.248	1.156	CI -> B -> LE	-0.043	2.285	0.022

Source: Authors calculations based on primary data

Note: CI=classroom incivility, LE=learning engagement

H5. Gender (male & female) has significant difference in classroom incivility.

For gender-based comparison of CI; an independent sample t-test was run. There were no observable variations ($t(df) = 296, p = 0.889$) in female scores ($M = 0.85, SD = 0.92$) and male scores ($M = 0.86, SD = 0.92$) (see Table 14). The results of mean difference were insignificant ($MD = 0.014, 95\%, CI: -0.19$ to 0.28). **Hence, H5 was not supported.**

Table 14. Classroom incivility between male and female students

		Levene's Test				t-test for Equality of Means				
		Mean	SD	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
C							29			
	I									
	Male	.86	.88	.38	.53	.14	6	0.17	-0.23	0.17
	Female	.85	.92			.1	3			

Source: Authors calculations based on primary data

Note: CI=classroom incivility

H6. Education level (undergraduate and post graduate students) has significant difference in classroom incivility.

The comparison of CI based on education level; an independent sample t-test was performed. No observable differences were found ($t(df) = 296, p = 0.61$) in scores for UG ($M = 0.76, SD = 0.87$) and PG ($M = 1.12, SD = 0.92$). Mean difference results were insignificant ($MD = 0.36, 95\%, CI: -0.19$ to 0.28) (see Table 15). **Hence H6 was not supported.**

Table 15. Classroom incivility between UG and PG students

		Levene's Test				t-test for Equality of Means				
		Mean	SD	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
CI	UG	.76	.87	.25	0.61	3.19	296	0.002	0.36	0.11
	PG	1.12	.92			3.10				

Source: Authors calculations based on primary data

Note: CI=classroom incivility, UG= undergraduate, PG= post graduate

Conclusion and Recommendations

The current study's main objective was to look into the connections both direct and indirect between LE and CI. Burnout's role in indirect relationships has been investigated. It is determined that there was full mediation of burnout between the LE and CI relationship. It has been shown that CI has an impact on burnout rather than having a direct impact on learning engagement (0.21). This supports the findings of earlier research (Hong et al., 2016; Taylor et al., 2017). Classroom incivility has a direct impact on student well-being, as rising levels of disrespect and disruptive behavior significantly contribute to increased burnout among students. Research has shown that burnout has a profound negative effect on learning engagement (-0.20) supporting findings from previous study (Uludağ and Yaratana, 2010). This evidence highlights the urgent need to address burnout in order to enhance educational outcomes. Studies have also looked at the significant differences in CI based on gender and education level. It was discovered, there was no significant difference in classroom incivility based on male or female students. These results do not support the findings of previous studies (Boice 1996; Arbuckle & Little, 2004). Furthermore, there is no evident variation in the level of incivility in the classroom based on education level (undergraduate and post graduate) of students.

Reducing classroom incivility and enhancing learning engagement while addressing burnout requires a multifaceted approach that promotes a respectful, inclusive, and supportive environment. First, it is essential to establish clear expectations for behavior by setting ground rules that emphasize respect and collaboration, while also holding students accountable for their actions. Creating a positive classroom culture involves fostering open communication, modeling civility, and ensuring that all students feel valued and heard. Engaging students actively through interactive learning strategies, such as group work, discussions, and problem-solving activities, helps keep them invested in the material. Thoughtful incorporation of technology can also make classes more dynamic, but it is important to set boundaries to minimize distractions.

Addressing student well-being is crucial. Teachers should be mindful of signs of burnout, offer support, and encourage self-care to help students balance academic demands with personal needs. Providing timely and constructive feedback that focuses on growth, along with recognizing effort, helps maintain motivation.

Additionally, developing meaningful relationships with students fosters a sense of belonging and investment in the learning process. Offering flexible learning options, such as varied assessments, can accommodate different learning styles and reduce stress. Continuously reflecting on teaching practices and seeking student input allows instructors to improve their approaches and make necessary adjustments. Finally, addressing conflicts promptly and teaching students conflict resolution skills can reduce instances of incivility, ensuring a harmonious classroom environment. By implementing these strategies, educators can foster a culture of respect, reduce burnout, and enhance overall student engagement and success.

Implications of the Study

The theoretical knowledge on classroom incivility is expanded by this study. The available literature is on workplace incivility. In Indian context, there are no studies on classroom incivility. The papers cited in this study are all done in Western countries. In India, it's a need of an hour to deal with such uncivil behavior of students. Being rude to others causes weariness, mental detachment, cognitive decline, and emotional decline. And ultimately it is going to impact learning engagement of students. Through this side it is identified that incivility leads to burnout and then impacts learning engagement.

One can be directly or indirectly impacted by rude behavior. There are worse outcomes when such behavior goes unnoticed and without corrective action being done. This study draws attention to classroom rudeness for the benefit of students' wellbeing. Whether deliberate or inadvertent, incivility can have negative consequences. Although incivility can occur accidentally or on purpose, this study will force educational institutions to address these behaviors early on to prevent them from developing into more serious issues.

In the classroom, disrespect impedes students' intellectual and academic growth and lessens their motivation to use critical thinking skills throughout class. Their impolite behavior in class cause interruptions to the learning environment and causing distractions for other students. Peer support will be decreased by classroom incivility, and this will have a detrimental effect on family life, on sound sleep, mental health, and emotional well-being. The findings also showed us that in order to minimize these issues and preserve a positive learning environment, we must deal with classroom incivility and burnout.

Limitations and Future Research Directions

One significant limitation of this study is its primary reliance on quantitative research methods. This approach tends to narrow the scope of analysis, missing out on valuable subjective insights and more nuanced perspectives that could have been captured through a blend of both qualitative and quantitative methods, ultimately enriching the findings.

Another limitation is sample size. A total of 400 participants were initially contacted, and 320 responded. Out of these, 298 were thoroughly analyzed after eliminating outliers and resolving missing values, ensuring the integrity of the findings.

Based on the findings and limitations of this investigation, future directions are suggested for further research in the same area. The current study was conducted at a single point in time, so a longitudinal study over several months or years is recommended to obtain more comprehensive results. In future research, employing interview or observation methods could help identify a range of perspectives on classroom incivility, burnout and learning engagement.

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Remote Work in the Post-Pandemic Era: A Systematic Review of Its Impact on Employee Productivity

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Abstract

The global shift to remote work, accelerated by the COVID-19 pandemic, has sparked debate about its effects on employee productivity. This systematic literature review synthesizes studies from 2020 to 2025 to analyse remote work's impact on productivity and performance and identify mediating factors. This systematic literature review was conducted by following the reporting checklist of the Preferred Reporting Items for Systematic Review and Meta- Analysis (PRISMA) and using Scopus database. Findings reveal that remote work can enhance productivity through reduced commute times, flexible scheduling, and increased autonomy. However, challenges such as social isolation, technological inequities, and blurred work-life boundaries disproportionately affect caregivers, women, and resource-constrained employees, leading to burnout and performance declines. Key mediating factors like tech access, manager support, and clear communication shape outcomes. The study stresses the need for flexible policies tailored to different jobs.

Keywords: Remote Working; Work-From-Home; Systematic Literature Review; Employee Productivity.

Introduction

Remote work has grown rapidly, especially after the COVID-19 pandemic. Remote work has become a defining feature of modern employment, driven by technological innovation and global events like the COVID-19 pandemic (Andrei & Militaru, 2022). The International Labour Organization (ILO) defines remote working (or telework) as a work arrangement where employees carry out their job duties outside the employer's premises, typically from home or another location, using information and communication technologies (ICTs) to stay connected with colleagues and supervisors (Working from Home, 2021). Key elements include reliance on internet-based tools (e.g., video conferencing, cloud platforms), autonomy in task management, and a focus on output rather than time spent at a desk (Belzunegui-Eraso & Erro-Garcés, 2020). Its rapid adoption raises important concern regarding employee productivity, employee performance and job outcome in the remote work or in telework setting.

Employee productivity refers to the measurable efficiency of an employee in converting inputs (e.g., time, resources) into outputs (e.g., tasks completed, goods produced) within a specific period. It is often quantified through metrics such as output per hour, project completion rates, or revenue generated (OECD Data Explorer • Productivity by Industry, n.d.). Employee performance, while related, is a broader concept. It encompasses not only productivity but also the quality, effectiveness, and alignment of work with organizational goals. This includes factors like problem-solving, teamwork, innovation, and adherence to deadlines (Brumback, 2003). In remote work contexts, productivity and performance are influenced by variables such as access to technology, autonomy, work-life balance, and managerial support (Grant et al., 2013).

Previous research offers mixed results. Early studies, like (Bloom et al., 2015), found remote workers in China were 13% more productive due to fewer distractions. However, newer studies highlight challenges. For example, (Wang et al., 2021) found employees with good technology were 20% more productive, but those without resources struggled. (Belzunegui-Eraso & Erro-Garcés, 2020) noted that remote work increased burnout, especially for caregivers and women. (Charalampous et al., 2019) added that mental health and job satisfaction greatly impact productivity, but many companies ignore this.

This systematic literature review (SLR) synthesizing post-2020 studies to map the multifaceted impact of remote work on productivity. Unlike prior reviews, this analysis prioritizes recent empirical evidence, including longitudinal and cross-cultural studies, to account for evolving workplace norms post-pandemic. This study addressing two important questions: what is the impact of remote working on employee productivity? and what factors shape this relationship?

Objectives

- To examine the impact of remote work on employee productivity by synthesizing recent studies.
- To explore the key factors that mediate employee productivity in remote work settings.

Methods

A systematic literature review follows rigorous and objective criteria to ensure transparency and replicability by other researchers. This systematic literature review was conducted by following the reporting checklist of the Preferred Reporting Items for Systematic Review and Meta- Analysis (PRISMA; Page et al., 2021). This section outlines the study-selection method, criteria for inclusion and exclusion of studies and the approach used to quality assessment and synthesis.

Study-Selection Strategy

To conduct this study, an extensive literature search was carried out to identify the paper. Reviewer used the Scopus database, a globally recognised database, to ensure access to high-quality, peer-reviewed and credible research. The search limited to literature published from 2020 to 2025. The search method utilized appropriate keyword combinations such as “Impact of Remote Work on Employee Productivity”, “Work from Home”, “Employee Performance”, “teleworking” with Boolean operators to encompass key concepts effectively. The final search was conducted on January 27, 2025 using search string, TITLE-ABS-KEY (("remote work" OR "telecommuting" OR "work from home") AND ("employee productivity" OR "work productivity" OR "performance")) AND PUBYEAR > 2019 AND PUBYEAR < 2026 AND (LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "SOCI")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (PUBSTAGE , "final")). The identified records title, abstract, keyword, authors' names, journal name and publication year were exported to MS Excel spreadsheet.

Study Design Inclusion and Exclusion Criteria

This study included only papers published between 2020 to 2025, focusing on the Subject areas of Business, Management and Accounting and Social Sciences. Only research articles were considered, while conference papers and book chapters were excluded. Paper not published in English were also excluded, and full published paper included. Reviewer screened the titles and abstracts of the records and included only those that addressed the primary research question; Does Remote work impact employee productivity? What factors affecting remote workers' performance? All other papers were discarded. Then the reviewer performed eligibility assessment by carefully screening full texts of the remaining papers and included review paper that address the critical questions of this study. For quality assessment, only research papers published in ABDC-ranked journals were considered for inclusion in the review.

Quality of Assessment

Regarding the screening process, the quality of studies was evaluated based on the Preferred Reporting Items for Systematic Review and Meta- Analysis (PRISMA; Page et al., 2021) guidelines. The screening process involved evaluating each study's objective to determine its relevance to the research questions. The quality assessment focused on measuring worker performance and productivity. For quality assessment, only research papers published in ABDC-ranked journals were considered for inclusion in the review. Additionally, data were extracted on study characteristics and outcomes. Studies that did not meet the quality criteria were excluded. Based on the inclusion and exclusion criteria, researchers reviewed the adequacy of titles and abstracts, and extracted relevant data. A thorough review of all selected paper was conducted to extract and code the data.

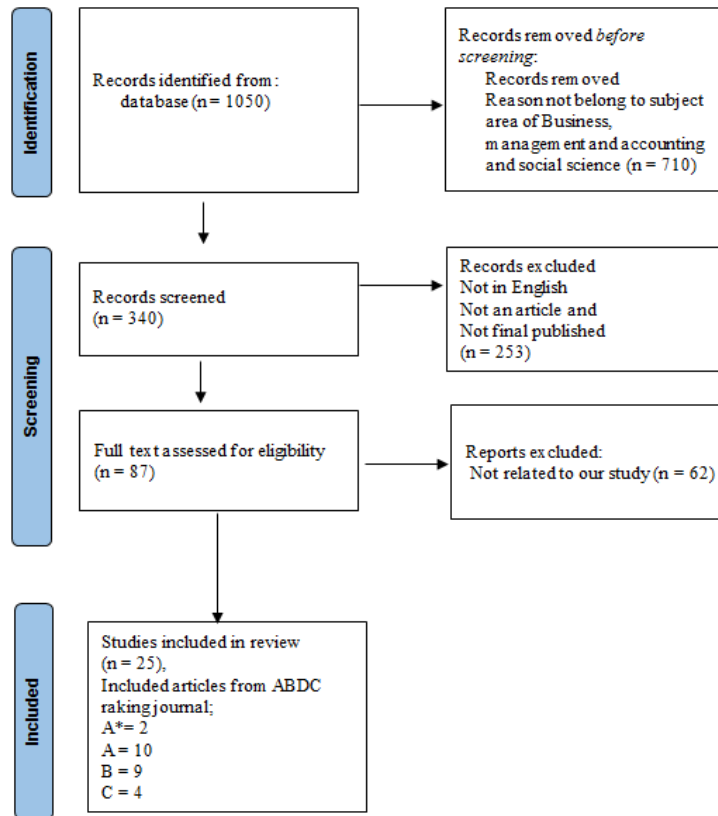
Synthesis

After selection process, the reviewer conducted a thematic synthesis of the remaining 25 papers. Thematic analysis is widely recognised for its effectiveness in extracting insights from the literature and organising them into analytical themes. This approach is appropriate for answering our research question.

Result

In current study a selection of 25 studies was reviewed. Figure 1 provides a summary of the process followed for selecting studies. A total 1050 papers were identified during the initial search process. After limited to subject area, article type, English language and published article 340 potentially relevant studies were identified. Out of 340 identified studies, 253 were excluded after reviewing their titles, abstracts, and keywords as they were not relevant to the study. The full texts of the remaining 87 papers were carefully assessed according to the eligibility criteria and 62 papers were excluded for not meeting the eligibility criteria. In the end, 25 papers remained after a thorough evaluation based on the inclusion and exclusion criteria.

Figure 1. PRISMA flow chart of study selection process.



Source: Based on PRISMA 2020 flow diagram (Page et al., 2021).

Location

Research on the impact of remote work/ work from home on employee productivity and performance spans various countries and regions, highlighting the various societal norms and individual factors. This cover studies conducted across various countries such as India, USA, Brazil, Indonesia, UK, Japan, Canada, Turkey, Australia, Hongkong, Iran, Germany, Vietnam and Italy. This cover studies conducted across low, middle, and high-income countries.

Aims/Objective of the Study

Studies were selectively included in the review based on their relevance to the research objective. This includes the studies that examining the experiences of individuals working from home and their associated productivity and performance outcome (Nwankpa & Roumani, 2024). Additionally, studies exploring impact of remote work intensity (RWI) on employee outcomes (Gajendran et al., 2024) included. Some studies examined the impact of telework on employee stress, work-to-home conflict, work engagement, and job performance at both the between-person and within-person levels (Delanoeije & Verbruggen, 2020). Sutarto in their study investigate the relationship between socio-demographic factors (gender, age, marital status, number of children, education level, length of employment, and WFH experience) and job satisfaction and performance during the COVID-19 pandemic in Indonesia (Sutarto et al., 2022). It also explores how WFH challenges (workspace availability, work-home interference, lack of equipment, ineffective communication, and social isolation) impact job satisfaction and work performance in Indonesia during the pandemic. Some studies examined the role of knowledge complexity and key individual, organizational, and technological factors in telecommuting outcomes in Brazil (Dávila et al., 2022); investigated the remote work features that influence employee productivity and satisfaction and examines their impact on employees' intentions to continue remote work post-COVID-19 (Prodanova & Kocarev, 2022); examined the relationship between employees' WFH frequency and work performance (hourly productivity, weekly hours, and wages) in the UK during COVID-19 (Deole et al., 2023); examine the role of well-being in work from home (WFH) context, and its impact on job outcomes among accountants (Giang et al., 2024); test the relationship between work from home (WFH) and employee productivity during the COVID-19 pandemic. It also examines the moderating role of gender in the relationship between WFH and employee productivity (Farooq & Sultana, 2022); examines the impact of the pandemic-induced shift to remote work on self-assessed productivity across different worker groups (Barbour et al., 2024).

Study Methodology

Study sample

The literature reflected different sample size based on factor such as target participants, research location, methodology and study objectives. As a result, there is no standardized sample size in the studies. The largest research sample size included 3,780 adult US citizens(Barbour et al., 2024), which study was conducted in US, followed by 1,553 German employees in Germany (Schoch, 2023). Marcus studied on 1,174 Turkish workers (Marcus et al., 2023) and 482 and 245 Participants from Indonesia respectively(Sutarto et al., 2022; Jimad et al., 2024). 218 full-time employees, and 250 respondents from hospitality, banking and IT and 368 employees from IT and IT-enabled sector participated respectively in India(Jaiswal & Prabhakaran, 2024; Farooq & Sultana, 2022; Jamal et al., 2022) from different institutions and industries.

Nature of the Study and Design

Existing selected research paper on the impact of remote work on employee productivity consists of qualitative (Hafermalz & Riemer, 2021), quantitative(Jamal et al., 2022), cross-sectional (Prodanova & Kocarev, 2021), longitudinal (Deole et al., 2023) and mixed method studies. These studies utilize various approaches, including survey (Dávila et al., 2022), empirical designs (Farooq & Sultana, 2022; Schoch, 2023).

Finding

Finding of selected review paper on Impact of Remote Work on employee productivity shows in Table 1. Table 1 provided a summary of studies examining the impact of Work from Home on employee productivity that have met the quality assessment criteria.

Table1. Characteristics Of Included Studies

Authors/(Year)	Country of Study	Objective of Study	Study Design	Sample/Population	Key Finding
Dávila et al., (2022)	Brazil	This study examines the role of knowledge complexity and key individual, organizational, and technological factors in telecommuting outcomes in Brazil.	Cross-sectional, survey study	452 Brazilian workers	This study finds that knowledge complexity, when paired with high task interdependence, negatively affects telecommuting performance. It also emphasizes that communication skills, rather than technology, are more crucial for improving telecommuting performance and satisfaction.
Delanoëije & Verbruggen, (2020)	Belgian	This study investigates the impact of telework on employee stress, work-to-home conflict, work engagement, and job performance at both the between-person and within-person levels. It addresses potential selection effects using a quasi-experimental intervention design.	Quasi-experimental intervention study	39 employees, 39 employees	This study finds that, at the person-level, employees who teleworked reported less stress but no differences in work-to-home conflict, work engagement, or job performance. At the day-level, teleworkers experienced lower stress, less work-to-home conflict, and higher work engagement and job performance on teleworking days compared to non-teleworking days. No differences were found between teleworkers and non-teleworkers on non-teleworking days.

Authors/ (Year)	Country of Study	Objective of Study	Study Design	Sample/ Population	Key Finding
Marstand et al., (2025)	USA	This study explores how leadership behaviours (initiating structure, consideration, and vision communication) influence employees perceived psychological distance from managers in remote work settings, and the subsequent effects on employee task, emotion and avoidance coping and individual effectiveness outcomes.	Four-wave time-lagged sequential mediation design	338 US-based remote workers, 202 hybrid workers	This study finds that leader behaviours such as consideration and vision communication reduce employees' psychological distance from their managers in remote work contexts, which improves task coping and reduces avoidance coping, ultimately enhancing task performance. These findings were consistent in both remote work during the COVID-19 pandemic and post-pandemic hybrid work settings.
Prodanova & Kocarev, (2022)	Macedonia	This study identifies remote work features that influence employee productivity and satisfaction and examines their impact on employees' intentions to continue remote work post-COVID-19.	Cross-sectional survey	363 remote work employees	Motivating factors such as remote work reconciliation and flow experience enhance employee productivity and satisfaction, while interfering factors like work interruptions and ICT anxiety have a negative impact. Employee satisfaction, rather than productivity, is the primary driver of their intention to continue remote work post-pandemic.
Sutarto et al., (2022)	Indonesia	This study examines the relationship between socio-demographic factors and job satisfaction and performance during the COVID-19 pandemic in Indonesia. It also explores how WFH challenges (workspace availability, work-home interference, lack of equipment, ineffective communication, and social isolation) impact job satisfaction and work performance in Indonesia during the pandemic.	Cross-sectional survey study	482 Indonesian employees	Length of employment and job satisfaction were the most significant determinants of work performance, after controlling for socio-demographic factors and work from home challenges. - All work from home challenges except social isolation were significantly linked to job satisfaction and work performance. - Most socio-demographic factors did not significantly differ in their impact on job satisfaction and work performance.
Deole et al., (2023)	UK	This study examines the relationship between employees' WFH frequency and work performance (hourly productivity, weekly hours, and wages) in the UK during COVID-19. It analyses variations across subgroups (gender, parenthood, job characteristics) and explores how WFH experiences and productivity changes influence future remote work preferences.	Observational, longitudinal study	40,000 British households	Increased WFH frequency during the COVID-19 pandemic is positively associated with employees' self-reported hourly productivity. The positive link between increased WFH frequency and hourly productivity is weaker during strict lockdown periods when schools were closed. Employees' willingness to continue WFH in the future is positively associated with both increased WFH frequency and improved hourly productivity during the pandemic.

Authors/ (Year)	Country of Study	Objective of Study	Study Design	Sample/ Population	Key Finding
Keeler et al., (2024)	USA	To explores how demands and stress are managed to improve remote worker performance. It examines the role of resources (flexibility and trust) in shaping job demand perceptions (ICT demands), work-life interference (WLI), and performance.	Cross-sectional		Remote job resources, such as organizational trust and work flexibility, can enhance employee performance by reducing ICT demands and work-life interference.
Jaiswal & Prabhakaran, (2024)	India	This study examines the relationship between employee well-being and performance in remote work. It also explores the moderating effects of boundary control and professional isolation on this relationship.	Cross-sectional	218 full-time employees	Employee well-being significantly positively impacts task performance when working remotely. Boundary control and professional isolation moderate this relationship, with the positive impact of well-being on performance being strongest when boundary control is high and professional isolation is low. Conversely, the impact is weakest when boundary control is low and professional isolation is high.
Prodanova & Kocarev, (2021)	Macedonia	This study examines the effects of ICT anxiety and smartphone addiction on work interruptions, job efficacy, and performance. It also identifies home office resources and demands influencing work activities and organizational outcomes.	Cross-sectional, non-experimental, observational	363 employees working from home	Employees' ICT anxiety and smartphone addiction during the work-from-home period due to COVID-19 cause work task interruptions, which in turn reduce job efficacy. These interruptions further hinder job efficacy and overall job performance.
Hara & Iwashita, (2024)	Japan	This study examines how Japanese companies justified in-person work during the COVID-19 pandemic, despite public recommendations for remote work. It also investigates whether this in-person work approach contradicted economic rationality by analysing its impact on employee performance.	Cross-sectional	285 Japanese business professionals	Japanese companies justified their non-adoption of telework during the COVID-19 pandemic through institutional logics such as employee obedience, lack of digital resources, and customer dealings. The use of in-person work during the pandemic was negatively associated with individual employee performance, indicating that the legitimization of in-person work contradicted the principle of efficiency.

Authors/ (Year)	Country of Study	Objective of Study	Study Design	Sample/ Population	Key Finding
Podolsky et al., (2022)	Canada	This study analyses how the proportion of telecommuters in a workgroup affects individual performance for both telecommuters and non-telecommuters. It also examines the moderating role of group-level task interdependence in this relationship.	Observational study with a multilevel perspective	225 employees	Performance differences between telecommuters and non-telecommuters are more pronounced in idiosyncratic groups (with fewer telecommuters) than in normative groups (with more telecommuters) when task interdependence is high. Telecommuters in normative groups perform better than those in idiosyncratic groups under high task interdependence. As the proportion of telecommuters in a group increases, the negative impact of high task interdependence on telecommuter performance is reduced.
Marcus et al., (2023)	Turkey	This study explores how age, gender, and caregiving responsibilities interact to influence well-being, work-family conflict, and job performance in remote work during COVID-19. It applies social role and identity theories to examine these dynamics.	Cross-sectional	1,174 Turkish workers	The study found no significant interactive effects of age, gender, and caregiving responsibilities on worker well-being, work-family conflict, and job performance among remote workers during the COVID-19 pandemic.
Ishii et al., (2023)	Japan	To examines the impact of remote work on subjective well-being, including productivity, work engagement, and health, during COVID-19 It also identifies worker and job characteristics that support the long-term adoption of remote work.	Observational longitudinal	1,009 workers	Workers who continued remote work after the first state of emergency saw positive impacts on their productivity, work engagement, and health. In contrast, those who only implemented remote work temporarily as a stopgap measure experienced negative effects on productivity and mental health. Certain job and worker characteristics, such as performance-based evaluation, flexible work arrangements, better management practices, IT skills, and engagement in abstract tasks, increased the likelihood of continuing remote work.
Hafermalz & Riemer, (2021)	Australia	To theorize how client-facing work can be conducted effectively in a remote work context - To understand how remote workers can foster a sense of belonging when they are not co-located.	Qualitative case study	interview data collected from 10 nurses and 3 managers	This study identifies four types of "out of character" communication—coping, learning, plotting, and positioning—that remote client-facing workers use to foster a sense of belonging. These communication types, facilitated by technology, are crucial for both wellbeing and productivity. The study also highlights that belonging and productivity are closely intertwined in remote client-facing work.

Authors/ (Year)	Country of Study	Objective of Study	Study Design	Sample/ Population	Key Finding
Ng et al., (2022)	Hong Kong	This study explores external (technological competence, government support) and internal (work flexibility, attitude, perceived behavioral control) factors affecting remote work effectiveness. It also examines their impact on job performance and emotional exhaustion.	Cross-sectional	238 knowledge workers	Government support is positively related to technological competence and organizational support. Perceived behavioural control, influenced by technological competence, organizational support, and work flexibility, is positively associated with the concentration needed for remote work. This concentration is positively linked to job performance, but does not affect emotional exhaustion.
Nwankpa & Roumani, (2024)	USA	Aims of this study is to explore the effects of remote work on employee productivity and innovation and how these effects are moderated by knowledge sharing and digital business intensity	Quantitative	231 remote workers	The study finds a positive impact of remote work on employee productivity. In addition, the findings present empirical support for hitherto anecdotal evidence regarding the impact of remote work on innovation. In particular, the study notes that knowledge sharing and digital business intensity amplified the positive relationship between remote work and employee productivity. This study further finds that the positive impact of remote work on innovation was stronger in the presence of knowledge sharing.
Khorakian et al., (2024)	Iran	This study explores the impact of job demands and strains (social isolation, remote work stress, and COVID-19 fear) on remote work satisfaction and performance. It also examines the moderating effects of digital literacy and cyberslacking on the satisfaction-performance link.	Cross-sectional survey	340 Iranian remote workers	This study finds that fear of COVID-19, remote work stress, and social isolation negatively impact remote work satisfaction during the pandemic. It also reveals that remote work satisfaction positively influences performance, with digital literacy positively moderating and cyberslacking negatively moderating this relationship.
Barbour et al., (2024)	USA	This study examines the impact of the pandemic-induced shift to remote work on self-assessed productivity across different worker groups. It analyzes survey data where workers reported whether their productivity remained unchanged, decreased, varied, or increased.	Observational, non-experimental survey study	3,780 adult US citizens	This study finds that more resilient workers were those with longer commutes, higher incomes, certain occupations, full-time employment, prior experience with online meetings, and high life satisfaction. Less resilient workers were identified as Hispanic, those with graduate degrees, young children, from large or low-income households, White workers, and certain student groups. The impact of the pandemic on student productivity varied, with some experiencing increases and others decreases.

Authors/ (Year)	Country of Study	Objective of Study	Study Design	Sample/ Population	Key Finding
Jimad et al., (2024)	Indonesia	The purpose of this study is to investigate the implementation of flexible working arrangements and satisfaction, family work conflicts and the performance of educators.	Quantitative	245 Participants	The result of this indicated that flexible working arrangements had no significant impact on job satisfaction. The variable job satisfaction has the greatest impact in determining the educator's performance.
Schoch, (2023)	Germany	This study aims to investigate how individual capability beliefs, such as self-efficacy, affect challenge and hindrance IS (information systems) use appraisal. This study investigates these relationships and the positive and negative outcomes during the COVID-19 pandemic.	Quantitative, Empirical study	1,553 German employees	This study find that self-efficacy is related to challenge IS use appraisal, rather than hindrance IS use appraisal. Further, challenge IS using appraisal is a driver for performance in a remote working environment.
(Farooq & Sultana, 2022)	India	The objective of this study is to test the relationship between work from home (WFH) and employee productivity during the COVID-19 pandemic. It also examines the moderating role of gender in the relationship.	Quantitative, Empirical study	250 respondents from hospitality, banking and IT	The result supported the negative relationship between WFH and employee productivity. Further result also provides empirical evidence that gender moderates the relationship between WFH and employee productivity
(Jamal et al., 2022)	India	This study aims to examine Based on self-determination theory (SDT) the effect of managerial (manager trust and support), work (job autonomy) and individual (intrinsic motivation) characteristics on job performance of telecommuters in a pre- and post-coronavirus disease 2019 (COVID-19) outbreak period and is further studied longitudinally after six months of continued mandatory telecommuting.	Quantitative, Longitudinal	368 employees from IT and IT- enabled sector	This study found Perceived manager trust and support increases job performance, with a stronger impact as telecommuting increases. Job autonomy also increase performance, but employees did not enjoy autonomy when mandatory telecommuting arrangement was initially introduced. Over time intrinsic motivation declines when employees continue to work permanently from their homes.
Giang et al., (2024)	Vietnam	The objective of this study is to examine the role of well-being in work from home (WFH) context, and its impact on job outcomes among accountants.	Quantitative	203 accountants	The study finds a direct and significant relationship of WFH with the employees' well-being and job satisfaction (JS). Further study find that Well-being fully mediates the influence of home-based work and JS on job performance.

Authors/ (Year)	Country of Study	Objective of Study	Study Design	Sample/ Population	Key Finding
Abrardi et al., (2024)	Italy	This study assesses the impact of work-from-home (WFH) arrangements on organizational performance in Italian SMEs during the COVID-19 pandemic.	Cross-sectional	690 Italian SMEs	This study finds that firms using work from home (WFH) during the COVID-19 pandemic experienced less deterioration in overall organizational performance compared to firms that did not adopt WFH. The benefits were more significant when WFH was used more intensively, with improved labour productivity, worker concentration, motivation, reduced absenteeism, and increased adoption of management by objectives (MBO) practices contributing to these benefits.
Gajendran et al., (2024)	USA	This study examines the impact of remote work intensity (RWI) on employee outcomes, extending beyond prior RWU-focused meta-analyses. It develops a dual-pathway model exploring perceived autonomy and isolation as mediators.	Meta-analysis	108 studies, 62 studies	This study finds that remote work intensity has modest but positive effects on job satisfaction, organizational commitment, perceived organizational support, supervisor-rated performance, and turnover intentions. It also counters arguments suggesting significant negative consequences of higher intensity remote work.

Source: Created by the author

Gender Discussion

The shift to remote work, rapidly advanced by the COVID-19 pandemic, has varied effect on employee performance and productivity. This synthesis integrates finding from 25 studies conducted across different countries, highlighting key impacts, outcomes and factors influencing productivity in remote work environment.

The impact of remote working on employee productivity and performance has been extensively studied across diverse global contexts, revealing nuanced outcomes shaped by individual, organizational, and environmental factors. The findings show that remote work can lead to both favourable and unfavourable job outcomes influenced by factors such as job characteristics and home setting. Most of the studies highlight a positive effect (Jaiswal & Prabhakaran, 2024), some report either no significant effect (Jimad et al., 2024) or a negative impact (Farooq & Sultana, 2022).

Research indicates that remote work can enhance productivity under specific conditions. For instance, (Deole et al., 2023) found that increased work-from-home (WFH) frequency in the UK correlated with higher self-reported hourly productivity, though this effect weakened during strict lockdowns due to challenges like school closures. Similarly, (Nwankpa & Roumani, 2024) demonstrated that remote work in the U.S. positively influenced innovation and productivity when supported by knowledge sharing and digital tools, emphasizing the role of collaborative practices in maximizing benefits. However, productivity outcomes are not universally positive. In India, (Farooq & Sultana, 2022) reported a negative relationship between WFH and productivity, with gender acting as a moderating factor, highlighting how cultural and socioeconomic contexts influence remote work efficacy.

Key individual factors, such as digital literacy and well-being, significantly shape productivity. (Khorakian et al., 2024) noted that digital literacy strengthens the link between remote work satisfaction and performance, whereas cyberslacking—non-work-related internet use—undermines it. Employee well-being, particularly in Vietnam, was found to mediate the relationship between WFH and job performance, with job satisfaction acting as a critical driver (Giang et al., 2024). Additionally, boundary control and professional isolation moderate this dynamic; (Jaiswal & Prabhakaran, 2024) observed that high boundary control and low isolation amplify the positive impact of well-being on task performance, whereas low control and high isolation diminish it.

Organizational practices and leadership styles also play pivotal roles. Leaders who demonstrate consideration and communicate a clear vision reduce psychological distance in remote teams, fostering task coping and performance (Marstand et al., 2025). Managerial trust and job autonomy were shown to boost productivity in India's IT sector, though intrinsic motivation declined over prolonged remote work (Jamal et al., 2022). Conversely, ICT anxiety and smartphone addiction disrupted workflow and job efficacy in Macedonia, underscoring the need for robust technological support (Prodanova & Kocarev, 2022). Work design elements, such as task interdependence, further influence outcomes; (Podolsky et al., 2022) found that telecommuters in Canada performed better in teams with high remote work adoption, particularly when task interdependence was managed effectively.

Environmental stressors, including pandemic-related fears and work-home interference, also affect productivity. In Indonesia, (Sutarto et al., 2022) identified workspace limitations and work-home conflicts as significant barriers to job satisfaction and performance. Similarly, social isolation and remote work stress reduced satisfaction among Iranian employees, though digital literacy mitigated these effects (Khorakian et al., 2024). Cultural and institutional contexts further shape outcomes. Japanese firms' insistence on in-person works during the pandemic, justified by institutional logics like employee obedience, contradicted efficiency principles and harmed performance (Hara & Iwashita, 2024).

Beyond productivity, remote work impacts broader organizational outcomes. Job satisfaction emerged as the primary predictor of employees' intentions to continue remote work post-pandemic in Macedonia (Prodanova & Kocarev, 2021), while Italian SMEs adopting WFH experienced less performance deterioration due to improved labour productivity and motivation (Abrardi et al., 2024). Meta-analyses by (Gajendran et al., 2024) corroborated these findings, showing modest positive effects of remote work intensity on job satisfaction, performance, and organizational commitment.

Conclusion

In conclusion, this Studie provides systematic literature review on the impact of remote working on employee productivity. This study find that remote work's impact on productivity is multifaceted, contingent on a balance of individual resilience, supportive leadership, technological infrastructure and adaptive work policies. Impact of remote work on employee productivity, performance and outcome are both positive and negative. Key factors affecting employee's productivity included clear communication, strong leadership, and right tools, technology alone is not enough. Challenges like isolation, blurred work-life boundaries and varying digital skills can hinder progress. Organizations must prioritize communication skills, flexibility and digital training to mitigate challenges. Cultural and personal differences also play a role. What works in one country or team might fail elsewhere. Customised approaches that consider cultural, demographic, and role-specific factors are crucial for maximizing the benefits of remote work while maintaining employee well-being and overall organizational success.

Limitation and Future Research

This research has certain limitations. Firstly, although an extensive search of published literature was conducted but we included only Scopus database. Studies from different other database such as Google Scholar, Web of Science not included in this research, it limited our generalizability. We restricted our study only on some specific subject area, language and only research article it might be a limitation of our study. Finally, this review included studies that uses different research methods such as survey-based, longitudinal and cross-sectional, each has their own benefits and libations, the result may not generalizable to the entire population. Future research could expand their scope by including a wider range of database to enhance the comprehensiveness of the findings. Further research on remote work environments would also be beneficial.

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Quality of Work Life: A Systematic Literature Review and Future Research Agenda

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Abstract

This paper presents a framework-based systematic literature review (SLR) of existing research to understand the quality of work life (QWL). To accomplish this, 69 papers published between the years 1990 and 2024 were thoroughly and methodically reviewed. The researchers attempted to provide a holistic view of the quality of work-life literature. To accomplish this, the antecedents, decision, and outcomes (ADO) of quality of work life and its related theories, context, and methodologies (TCM) have been thoroughly examined. The analysis of 69 articles produced 7 categories of antecedents with 27 constructs, 10 decisions, and 6 outcomes, providing a sufficiently large and coherent body of knowledge on quality of work life. The ADO framework offers insight into what we know about the construct, while the TCM framework outlines the various theories, contexts, and methods used in quality of work life research. This paper presents research gaps and outlines future research directions through the analysis and synthesis of data utilizing the antecedents, decisions, outcomes, theories, context, and methodologies (ADO-TCM) framework. The proposed ADO-TCM framework will assist organizations and policymakers in creating effective policies. The study would prove beneficial as a guide to researchers to undertake applied and interactive studies in the area of quality of work life. It would also be helpful to researchers in identifying unexplored research gaps in quality of work life research.

Keywords: ADO-TCM Framework, Framework-Based Review, Quality Of Work Life (QWL), SPAR-4-SLR, Systematic Literature Review

Introduction

Background

Human beings, after their descent onto the earth, since time immemorial, have always struggled, and are still trying to have a better quality of life as long as they stay on the earth. Everybody wants this, whether in their normal household routines or at their workplaces. Gradual industrial development, along with the evolution of science and technology in the industrial arena, increased the expectations of stakeholders, especially employers and employees. Employers want ever-increasing profits while employees expect better rewards along with a harmonious QWL. Quality of Work Life (QWL) was introduced into the workplace in the late 1950s. The term "Quality of Work Life" first emerged in industrialized societies in the unique context of working life during the late 1950s. It emphasized the humanistic aspects of work, the quality of the relationship between employees and their workplaces, and the improvement of working conditions for employees at the start of the 1960s (**Davis & Cherns 1975; Martel & Dupuis 2006; Rose et al., 2006; Hannif et al., 2008**). The term QWL caught attention after an international labor relations conference concluded in the year 1972 at Arden House, Columbia University, New York (**Davis & Cherns, 1975**). One of the major conclusions of the conference emphasized the need for coordination between the organizations and scholars involved in establishing a strong theoretical corpus in the field of QWL research. Subsequently, the International Council for the Quality of Working Life was established in August 1973 (**Martel & Dupuis, 2006**).

The QWL often relates to employees' satisfaction with their working environment. It focused on a strong connection between the employee and his workplace (**Rose et al., 2006**). The QWL describes the way employees perceive and assess their work vis-à-vis their personal lives (**Van et al., 2020**). The scope of QWL includes a person's life, which has an impact on their performance at work. QWL is a process of work organization that allows people at all levels to actively participate and form the environment, procedures, and results of the organization (Sumarsi & Rizal, 2021). It is a value-based process designed to advance employees' QWL while achieving the various aims of improved organizational goals. QWL evaluates both aspects of employees' lives outside of work and within the workplace. The QWL also takes into account the employees' overall lives outside the ambit of their work and jobs. By fostering individual needs, QWL maximizes the fulfillment of corporate goals and improves employees' attitudes toward their jobs, colleagues, and companies (**Suleiman et al., 2019; Alrawadieh et al., 2020; Xu et al., 2022**).

The organization's and employees' lives are greatly impacted by QWL. According to workers, it includes a healthy work environment, immediate opportunities to use and develop their human capacities, work, and entire life domain, as well as the societal relevance of the work-life balance of employees (**Ogunola 2022**). At the same time, if QWL is appropriately managed from the organization's point of view, it can significantly increase worker productivity and organizational performance. Although the idea of quality of life at work is highly context-

specific, it may not be seen as universal and static (Lau 2000). Recently, there has been a growing recognition of the QWL as a progressive indicator of corporate organizations' sustainability and ability to function (Koonmee, Singhapakdi, Virakul & Lee, 2010). Therefore, as a benefit to their organizational success, many firms place a higher value on the internal quality of a working environment (Elmadağ & Ellinger, 2018). Stress and its resolution in an effective way are also important for improving QWL, thereby ensuring stakeholders carry on their jobs successfully (Kong et al., 2018). The extent of perception of QWL is relative as people perceive in different ways the experiences related to their jobs (Mosadeghrad, 2013). Thus, it becomes imperative for companies to consider aspects of QWL (Van et al., 2020). Employers creating an environment that promotes employees' happiness and well-being must acknowledge and comprehend the diverse aspects of QWL to create a more pleasant and effective work environment (Sibuea et al., 2024).

As QWL gained popularity, businesses restructured their organizations and hierarchical positions to provide employees with a better QWL, a reduction in work-related stress, rationalization of workload, and evolving peer relationships. Such organizations encourage productive teamwork among employees, opportunities for human resource development, and the creation of a learning environment (Agus & Selvaraj, 2020). In addition to encouraging employees to be engaged in the company, QWL positively impacts the work atmosphere, work patterns, and results (Gangwani et al., 2020). Ehido et al. (2020) argued that the important objectives of quality of work life are to enhance standards of life and morale, and support the organization's mission. Meeting employees' QWL is linked to an organization's success and goal achievement (Akinwale et al., 2024). The QWL enhances an organization's competency to satisfy stakeholders, which results in the optimum allocation of resources, increasing productivity and stability (Ishfaq et al., 2022).

This review article attempts to address the following research questions:

RQ1: How can QWL be studied holistically?

RQ2: What are the major gaps in the QWL literature?

RQ3: Where should research efforts be directed in future QWL studies?

To address these research questions, we used a framework-based approach to make a fundamental theoretical contribution. The framework of antecedents, decisions, and outcomes (ADO) (Paul & Benito, 2018) and theories, contexts, and methods (TCM) frameworks (Paul et al., 2017; Paul & Rosado-Serrano, 2019) have been integrated (Lim et al., 2021). We have systematically examined the existing literature and synthesized the findings. Following Paul & Bhukya (2021), we have set a research agenda highlighting several research questions and objectives for future research in the area of QWL.

Originality of this systematic review

The QWL concept is constantly evolving. The researchers identified a few gaps in the literature available on the QWL. Previous researchers mostly focused on systematic and general literature reviews. Abdullah et al. (2021) integrated the bibliometric analysis and a systematic literature review to observe the developments and trends in the QWL. To study the quality of work life of nurses, Sibuea et al. (2024) followed systematic reviews and meta-analyses (PRISMA) guidelines. Kumar & Wasif (2023) studied the antecedents and consequences of QWL. This paper is different from existing reviews of the QWL. While some reviews have been written related to the QWL, they have not followed the ADO-TCM framework to map the literature on QWL. In light of these gaps, we present the originality and contribution of this review article. This study uses a framework-based systematic review methodology, which provides a more comprehensive and holistic overview of QWL. To the greatest extent of my understanding, we believe this is possibly among the first systematic literature studies based on the SPAR-4-SLR protocol with the combination of the ADO-TCM framework in QWL. The proposed ADO-TCM framework will help organizations and policymakers develop successful policies that will enhance people's QWL. The study would be helpful and serve as a guide for researchers looking to do interactive and practical studies in the area of QWL.

Structure of this systematic review

This systematic review and its components are as follows: The objectives of the study and methodology used in this research article have been provided in sections 2 and 3. The pertinent papers were selected based on the SPAR-4-SLR (Scientific procedures and rationales for systematic literature reviews) framework (Paul et al., 2021). The literature review findings align with ADO in section 4, followed by the description and classification of the extant literature and TCM frameworks discussed in section 5, respectively. A study agenda for the future based on the same frameworks, highlighting where we should be headed in section 6 (ADO), and how, is provided in section 7 (TCM) correspondingly. In section 8, we presented our conclusion. In sections 9 and 10, the theoretical and practical implications of the study have been discussed. In the final section, we presented the limitations of our study.

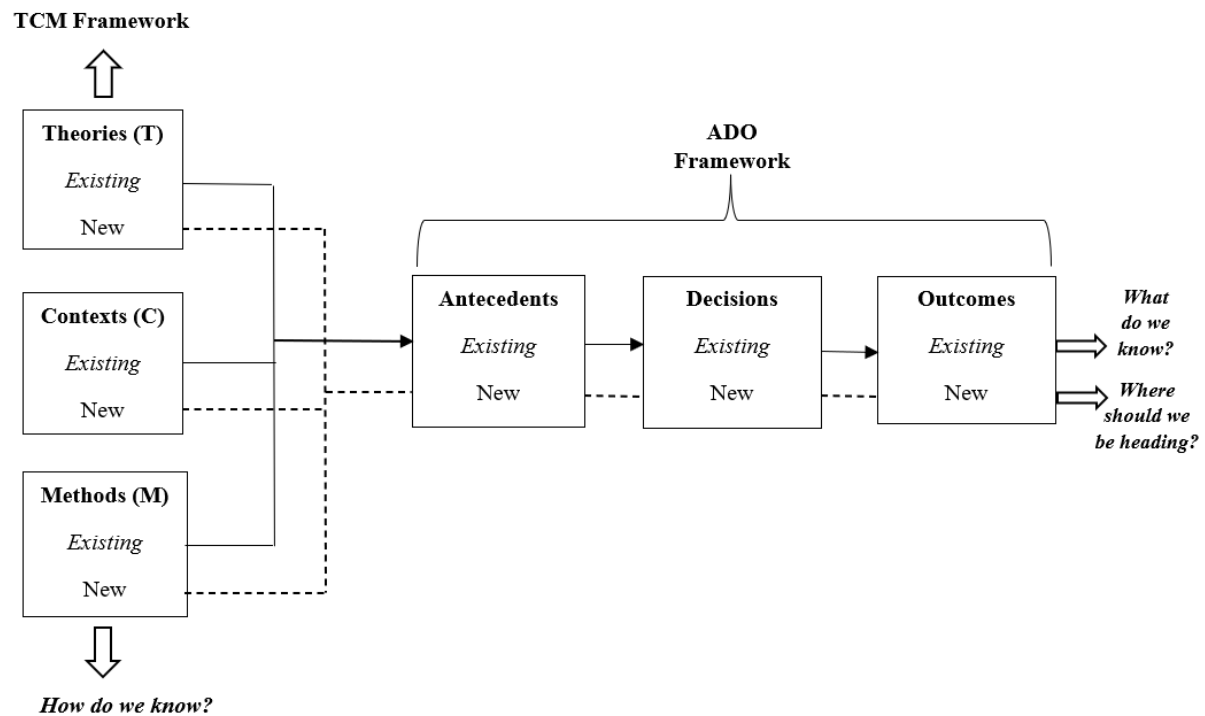


FIGURE 1 ADO-TCM Framework (adapted from Paul et al., 2017, Paul & Benito, 2018, and Lim et al., 2021)

Objectives of the Study

- To identify and categorize the key antecedents, decision variables, and outcomes associated with QWL in previous studies.
- To examine the theoretical foundations underlying QWL studies.
- To analyze the methodological approaches adopted in QWL research.
- To explore the contextual coverage of QWL studies.
- To suggest future directions of QWL studies based on identified gaps.

Research Methodology

The present investigation, focused on a systematic literature review (SLR), has been selected due to its utilization of a replicable, clear, impartial, thorough, and scientific methodology, instead of conventional reviews (Bhatia et al., 2021). The process includes the identification, selection, evaluation of quality, extraction, and amalgamation of existing research articles (Bhatia et al., 2021). A meticulously undergone systematic literature review thoroughly examines research within a specific research field, and highlights areas where research is lacking, along with suggesting the areas where further similar studies can be conducted (Lim et al., 2021). In the present study, a systematic review based on a specific framework has been executed, focusing on commonly utilized TCM in combination with ADO of QWL research (Figure 1). The main purpose of the above-mentioned type of review is that it presents a robust structure. The well-known bibliographic database, Web of Science (WoS), was used to ensure high-quality research publications (Paul & Criado, 2020; Khatri & Duggal, 2022). Using the SPAR-4-SLR framework (Figure 2) by Paul et al. (2021), Paul & Benito (2018) established the ADO framework, in which antecedents were addressed as (A), decisions as (D), and outcomes as (O). In contrast to decisions, which define various forms of behavioral performance or non-performance coupled with the consequences that follow behavior performance or non-performance, antecedents explain why a behavior is connected to something or not being connected. Paul & Singh (2017) devised the TCM framework, which comprises the letters, methods as (M), contexts as (C), and theories as (T). Theories are the opinions of scholars on which the researchers rely for their research, while contexts take into account the actual circumstances that have been studied, and procedures draw attention to support further study. Lim et al. (2020) argued for the need to combine the ADO as well as the TCM frameworks. Primarily, the ADO framework facilitates the organization with the results, such as constructs, results, and their preceding studies (Paul & Benito, 2018). TCM alone does not aid in studies, and the ADO framework alone is insufficient to direct future research (Lim et al., 2020); hence, both are studied in combination. The TCM framework helps arrange the preceding research's framework (Paul & Singh, 2017). These help upcoming researchers in the future to come up with new findings. Prominent researchers in the field offered numerous solutions to the comprehensive research, enabling it to fill the gaps left by the previous studies and guide future investigations. Once the ADO framework is used with review, scholars can obtain structured insights

into the association of ADO of QWL for new ideas (Paul & Benito, 2018), and the TCM framework is used to reveal existing insights (Paul & Singh, 2017).

We have synthesized the literature in this review logically, rigorously, and transparently using the very robust SPAR-4-SLR methodology provided by Paul et al. (2021). This procedure consists of six sub-stages (identification, acquisition, organization, purification, evaluation, and reporting) categorized into three stages (assembly, arranging, and assessing), which are summarized and discussed below in Figure 2.

Table 1: Articles distribution over journal publication

Journal Title	Authors	No. of Articles	% of Articles
Journal of Business Research	Manz & Grothe 1991; Koonmee et al., 2010; Singhapakdi et al., 2010; Valentine 2010; Marta et al., 2013; Singhapakdi et al., 2014; Singhapakdi et al., 2015	7	10.14 %
International Journal of Contemporary Hospitality Management	Bolat & Yilmaz 2009; Lee et al., 2015; Kim et al., 2017; Kang et al., 2018; Kara et al., 2018; Kim et al., 2020	6	8.70%
Social Indicators Research	Sirgy et al., 2001; Martel & Dupuis 2006; Royuela et al., 2007; Royuela et al., 2009; Ko & Yeh 2013; Surienty et al., 2014	6	8.70%
Applied Research in Quality of Life	Afsar & Burcu 2014; Tho 2018; Sinval et al., 2020	3	4.35%
Employee Relations	Li & Yeo 2011; Adhikari et al., 2011; Agus & Selvaraj 2020	3	4.35%
International Journal of Human Resource Management	Khan & Afzal 2011; Adamovic 2018; Nauman et al., 2024	3	4.35%
Personnel Review	Rathi & Lee 2017; Muskat & Reitsamer 2020; Chami-Malaeb 2022	3	4.35%
Service Industries Journal	Gupta et al., 2019; Alrawadie et al., 2020; Boadi et al., 2020	3	4.35%
Journal of Business Ethics	Beeri et al., 2013; Tongo 2015	2	2.90%
Journal of Hospitality and Tourism Management	Kim et al., 2021; Wang et al., 2021	2	2.90%
Journal of Macromarketing	Singhapakdi et al., 2010; Nguyen & Nguyen 2012	2	2.90%
Sage Open	Pyoria et al., 2017; Abdullah et al., 2021	2	2.90%
African Journal of Business Management	Nazir et al., 2011	1	1.45%
Corporate Social Responsibility and Environmental Management	Celma et al., 2014	1	1.45%
Engineering Construction and Architectural Management	Lingard et al., 2015	1	1.45%
European Research on Management and Business Economics	Celma et al., 2018	1	1.45%
Gender in Management	El Badawy et al., 2018	1	1.45%
Human Resource Management	Rubery et al., 2015	1	1.45%
International Journal of Logistics Management	Puram et al., 2021	1	1.45%
International Journal of Manpower	Dechawatanapaisa 2017	1	1.45%
International Journal of Service Industry Management	Lau 2000	1	1.45%
International Journal of Technology Management	Corbett-Etchevers & Perea 2019	1	1.45%
Journal of Applied Psychology	Nahum-Shani et al., 2014	1	1.45%

Journal of Business and Psychology	Cheung & Tang 2009	1	1.45%
Journal of Happiness Studies	Zelenski et al., 2008	1	1.45%
Journal of Intellectual Capital	Chatterji & Kiran 2023	1	1.45%
Journal of Management Inquiry	Kanov 2021	1	1.45%
Journal of Nursing Management	Ibrahim et al., 2023	1	1.45%
Journal of Occupational and Organizational Psychology	Hart 1994	1	1.45%
Journal of Organizational Change Management	Jabeen et al., 2018	1	1.45%
Journal of Service Theory and Practice	Snell et al., 2015	1	1.45%
Leadership & Organization Development Journal	Nauman et al., 2021	1	1.45%
Management Decision	Akinwale et al., 2024	1	1.45%
Omega-International Journal of Management Science	Prasad et al., 2000	1	1.45%
Personnel Psychology	Cohen et al., 1997	1	1.45%
Quality & Quantity	Sale 2007	1	1.45%
Social Science Journal	Farid et al., 2015	1	1.45%
South African Journal of Economic and Management Sciences	Chinomona & Dhurup 2014	1	1.45%
Total Quality Management & Business Excellence	Zink 2011	1	1.45%
Total		69	100.00

Stage 1: Assembling of the articles

This stage encompasses the process of identifying and obtaining pertinent literature. Within the identification sub-stage, various aspects such as the domain, research inquiries, source classification, and source credibility are determined. The domain under consideration in this review pertains to QWL. The research inquiries that steer this review are delineated as follows:

RQ1. Identifying key constructs based on antecedents, decision, and outcomes (ADO) framework.

RQ2. Which theories were adopted in the QWL research?

RQ3. What research contexts have been studied in QWL studies?

RQ4. What research methods have been used in the QWL research?

RQ5. What are the major gaps in QWL literature?

RQ6. Where should research efforts be directed in future QWL studies?

In terms of source type, the search covered articles published in journals. In that search, the following were not considered: dissertations, book chapters, editorials, review articles, and conference abstracts. The study ensured source quality using the Web of Science (WOS), arguably the most well-known bibliographic database (Paul & Criado, 2020; Khatri & Duggal, 2022). A stringent journal selection criterion was followed to determine source quality. The evaluation only included Social Science Citation Index (SSCI) publications that met the impact factor requirement of at least 1.0 (Paul & Rosado-Serrano, 2019; Paul et al., 2021). To fully capture all related articles, a Boolean search was conducted in the acquisition sub-stage using combinations and variations of keywords, 'quality' and 'work-life', which were run on the WOS database and yielded 528 papers.

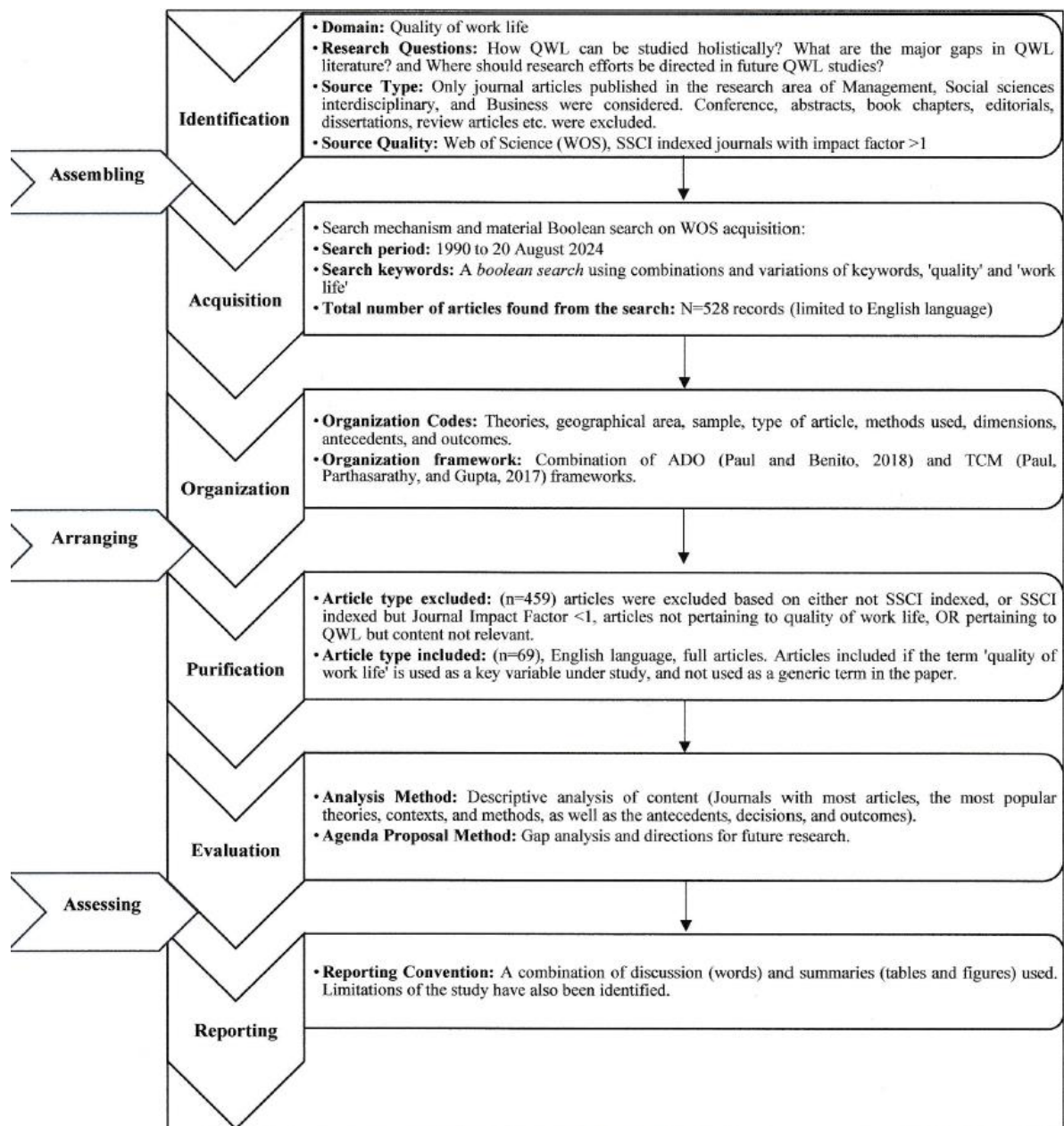


Figure 2 SPAR-4 SLR framework for systematic review (Paul et al., 2021)

The search excluded all the articles related to the Science Citation Index Expanded (SCI-EXPANDED) and Arts & Humanities Citation Index (ACHI). Only articles related to the Social Sciences Citation Index (SSCI) were included. The search was conducted without limiting to a time frame to provide a comprehensive chronological outline of the subject. For the figure of publications, see (Figure 3). Considering this article's topic, our initial search was limited to journal articles, and we got 467 articles and only reviews in the fields of management, interdisciplinary social sciences, and business, sorted by relevance. Additionally, it was restricted to the "citation topic meso", i.e., Management, and 79 records emerged in the English language. In all, 459 articles were excluded due to the absence of (SSCI) indexing. Other than the English lexicon, non-journal publications, and articles outside the management, social sciences, and business fields have been excluded. Additionally, articles with the word quality of work life as a generic term, conference papers, and non-relevant studies are also excluded. The study's search period was from 1990 to 20 August 2024, i.e., 34 years, to get a broad view of the topic (Rahat et al., 2023). A total of 69 articles were considered essential to the study. Although the search began in the year 1990, the data became accessible for study from the year 1991 because the studies were confined within the limits of Management, Interdisciplinary social sciences, and Business.

Stage 2: Arranging the articles

The articles underwent organization and purification in the second phase (Paul et al., 2021). The organizational norms and frameworks were established during the organizing substage. This review concentrated on two aspects of QWL: (a) ADO and (b) TCM, to enhance systematization and impartiality. Originally, eight codes were obtained: dimensions, antecedents, results, sample, type of article, geographic location, theories, and techniques. The papers under examination were then analyzed by comparing, combining, and organizing these codes according to the ADO (Paul & Benito, 2018) and TCM (Paul et al., 2017) frameworks. We used the quality of the source to establish an article's eligibility during the screening sub-stage. This study on the QWL only took into account works that were included in the Social Sciences Citation Index (SSCI). This analysis is restricted to the English language and covers articles related to Management, Interdisciplinary social sciences, and Business journals. Articles that were not (SSCI) indexed were excluded from the study. The following standards were applied to establish content relevance: Is the term quality of work life used in the paper as a generic term or as a key variable? (Khatri & Duggal, 2022). A total of 79 articles were sorted out from the 528 articles for the study. In a few of the investigations, 5 articles, the term quality of work life was used as a generic term, and 5 articles were found to be not relevant to the study. Finally, 69 full-text articles were preferred for this investigation.

Stage 3: Assessing of articles

The final step involves reporting and evaluating the literature. A descriptive analysis of the material was done for this framework-based review. The study scrutinized the papers according to the most popular theories, contexts, and methodologies. The publications having the greatest number of articles and the ADO in QWL research were considered (Paul et al., 2021). The reliability of the results was improvised by using the ADO-TCM framework as a structure for the assessment and analysis of the body of existing literature. Moreover, a gap analysis agenda for future research has also been established utilizing Miles's (2017) taxonomy. Using the same paradigm, research gaps were established in the reviewed literature. The results have been presented using this framework in the forthcoming lines to establish reliability. A mix of summary (tables and figures) and discussion has been employed, and the study's limitations have also been noted.

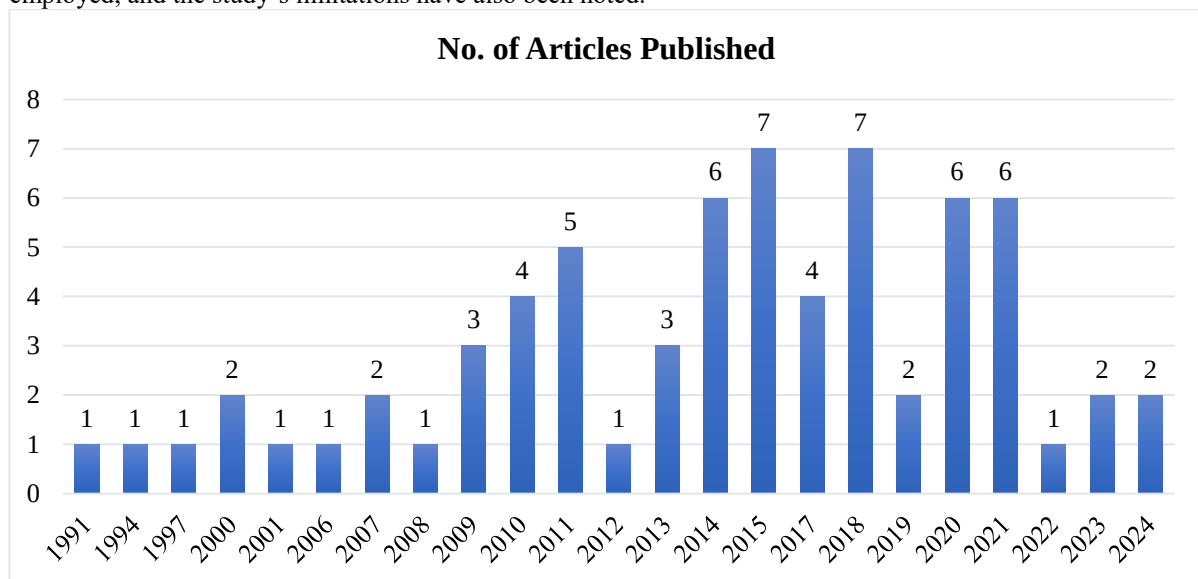


FIGURE 3 Articles published from (1991 to 20 August 2024)

Systematic Description and Classification of Literature

This section initiates an examination of the publication trend, influential authors, and bibliographic sources. Information such as authors' names, research year, articles' titles, and the journal of publication of the 69 articles encompassed in this review has been outlined.

What Do We Know About The Quality of Work Life?

Publication trend

The search period was from 1990 to 20 August 2024 to get a broad view of the topic; a total 69 number of articles were considered for the study. Although the search began in the year 1990, the articles were from the year 1991. (Figure 3) shows the publication frequency from the year 1991 to 2024. The frequency of publication was shallow in the years 1991, 1994, 1997, 2001, 2006, 2008, 2012, and 2022, with just 1 publication (1.45%), whereas in the years 2000, 2007, 2019, 2023, and 2024, with 2 publications (2.90%) each. The years 2009 and 2013 with 3 publications (4.35%) each, whereas the years 2010 and 2017 with 4 publications (5.80%) each. The year 2011

had 5 publications (7.25%). Further, publications in the years 2014, 2020, and 2021 with 6 publications (8.70%) each, whereas the years 2015 and 2018 revealed the highest number of publications with 7 publications (10.14%) each. The 69 articles analyzed in this study were published in 39 journals (Table 1). Among these, the Journal of Business Research with 7 articles (10.14%). The International Journal of Contemporary Hospitality Management and Social Indicators Research with 6 articles (8.70%) each. The Applied Research in Quality of Life, Employee Relations, International Journal of Human Resource Management, Personnel Review, and Service Industries Journal with 3 articles (4.35%) each, whereas Journal of Business Ethics, Journal of Hospitality and Tourism Management, Journal of Macromarketing, and Sage Open, with 2 articles (2.90%) each, and all the remaining 27 Journals with 1 article (1.45%) each.

ADO framework

To contribute to new research, Paul & Benito (2018) emphasized the importance of comprehending the relationships between ADO dimensions since, in terms of producing new knowledge, these relationships may be as significant as the dimensions themselves. The ADO framework (antecedents, decisions, and outcomes) aids researchers in framing various constructs in the context of QWL (Paul & Benito, 2018). To address (RQ1), our review of 69 articles produced antecedents, decisions, and outcomes from the studies that investigated the variables empirically, as shown in Figure 4. This laid the framework for deriving conclusions and insights while emphasizing research gaps and suggesting directions for additional studies.

Antecedents

According to Paul & Benito (2018), antecedents are the reason for the researcher to engage himself or not in the QWL. As such, they may have a direct or indirect impact on decision-making. The antecedents that comprise QWL are categorized in Figure 4. The analysis of 69 articles produced 7 categories of antecedents with 27 constructs, 10 decisions, and 6 outcomes. Seven major categories comprise the antecedents employed by the researcher under review: “safety & security, economic & family, social, esteem, actualization, knowledge, and environmental”. Maslow’s Hierarchy of Needs theory has been taken as an initial point for studying and classifying the antecedents into various categories. This section uses Kahiya’s (2018) voting method to examine the various antecedents and how they affect decisions and outcomes.

Safety and security-related antecedents

Safety and security-related antecedents include harassment, i.e., gender and workplace (Nazir et al., 2011), which negatively impacts the quality of work life. It is also attributed to psychological distress, particularly among women, who report higher levels of harassment and over-performance demands compared to men, and it creates stress, anxiety, and depression among employees.

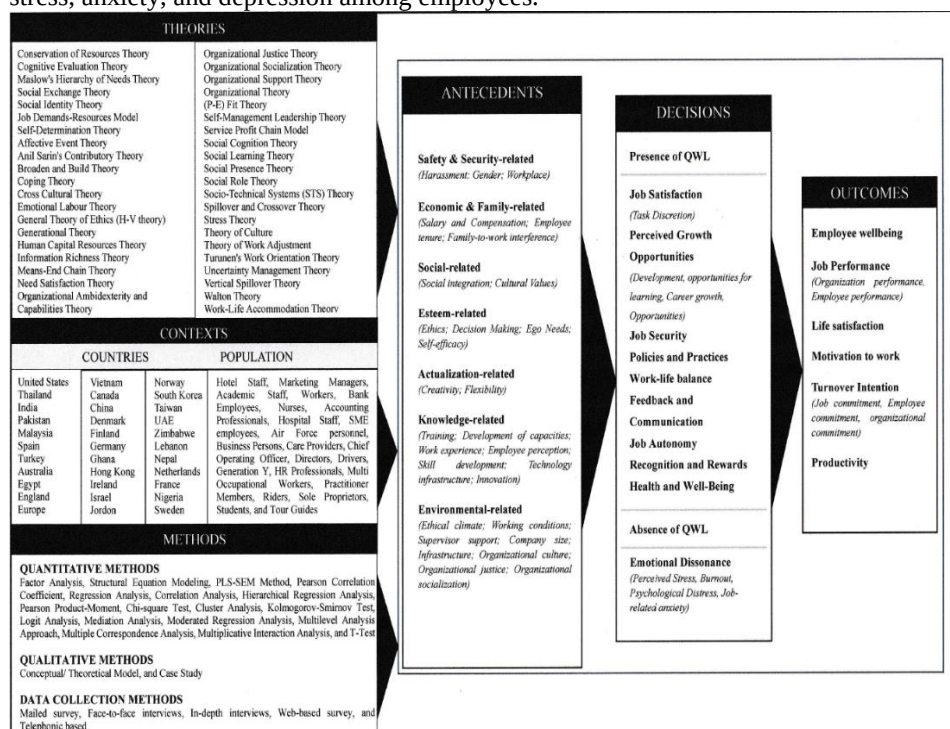


Figure 4 ADO-TCM framework. Source: Adapted from Lim et al. (2021).

Economic and family-related antecedents

Researchers have found salary and compensation to be important antecedents (Manz & Grothe 1991; Cohen et al., 1997; Royuela et al., 2009; Celma et al., 2014; Surienty et al., 2014; Farid et al., 2015; Adamovic 2018; Muskat & Reitsamer 2020; Abdullah et al., 2021). High salaries, compensation, and appreciation at work lead to higher QWL. Employee tenure (Chinomona & Dhurup, 2014) and family-to-work interference are other predictors of QWL (Cheung & Tang, 2009), which represent the employees' intention to remain with the company longer.

Social-related antecedents

Social-related antecedents include social integration (Farid et al., 2015; Abdullah et al., 2021) and cultural values (Singhapakdi et al., 2014; Sinval et al., 2020), which the researchers identified as the determinants of QWL.

Esteem-related antecedents

Esteem-related antecedents include ethics and decision-making. Ethics (Koonmee et al., 2010; Singhapakdi et al., 2010; Valentine, 2010; Marta et al., 2013) relates to embedding ethical principles, behavior, and standards within an organization. Decision-making (Beeri et al., 2013) involves including employees in making ethical decisions. Ego needs (Sirgy et al., 2001) and self-efficacy (Chami-Malaeb, 2022) have also been identified as the determinants of QWL.

Actualization-related antecedents

Actualization-related antecedents include creativity and flexibility (Sinval et al., 2020). Creativity is a trait that is often termed as inborn, but the experiences show that it can be acquired. Through practice, experience, and example, a person can become innovative and creative. Flexibility is also a personality trait that makes a person open to new ideas, a good listener, and a better follower, as well as a better leader.

Knowledge-related antecedents

Knowledge-related antecedents include training (Adhikari et al., 2011; Adamovic, 2018), and the development of capacities (Farid et al., 2015), which leads to utilizing and developing the skills and capacities of the employees. Experience is an antecedent that affects the QWL in both ways (Manz & Grothe, 1991; Hart, 1994; Boadi et al., 2020). Employee perception is also identified as the determinant of QWL (Dechawatanapaisal, 2017; Boadi et al., 2020) and is associated with the appreciation of the activities that seek the welfare of the employees and that of their surroundings. Skill development (Adhikari et al., 2011) and technology infrastructure (Adamovic, 2018), which lead to innovation (Manz & Grothe, 1991; Corbett-Etchevers & Perea, 2019), are also predictors of QWL.

Environmental-related antecedents

Environmental-related antecedents include ethical climate (Beeri et al., 2013; Kang et al., 2018; Kara et al., 2018), which significantly shapes employees' psychological capital and QWL. Working conditions (Celma et al., 2014; Farid et al., 2015; Lingard et al., 2015; El Badawy et al., 2018; Abdullah et al., 2021), supervisor support (Nahum-Shani et al., 2014; Surienty et al., 2014; Rathi & Lee 2017; Chami-Malaeb 2022), company size (Celma et al., 2014; Snell et al., 2015), infrastructure (Adamovic 2018), organization culture (Khan & Afzal 2011), justice (Ibrahim et al., 2023), and socialization (Singhapakdi et al., 2010; Singhapakdi et al., 2014) are also the Environmental-related antecedents which lead to higher QWL.

Table 2: Dimensional Coverage

Dimension	No. of Articles	% of Articles
Job Satisfaction	12	22.64%
Emotional Dissonance	9	16.98%
Perceived Growth Opportunities	8	15.09%
Job Security	6	11.32%
Policies and Practices	4	7.55%
Work-life balance	4	7.55%
Feedback and Communication	3	5.66%
Job Autonomy	3	5.66%
Recognition and Rewards	2	3.77%
Health and Well-Being	2	3.77%
Total	53	100.00

Decisions

Making appropriate decisions is a direct reaction to antecedents and a step toward outcomes since it affects behavioral performance or non-performance (Paul & Benito, 2018). Most of the studies used job satisfaction, perceived growth, and job security as the most well-discussed and explored dimensions of QWL (Table 2). Job satisfaction (Royuela et al., 2007; Zelenski et al., 2008; Koonmee et al., 2010; Singhapakdi et al., 2010; Valentine 2010; Ko & Yeh 2013; Chinomona & Dhurup 2014; Singhapakdi et al., 2014; Lee et al., 2015; Celma et al., 2018; Muskat & Reitsamer 2020; Sinval et al., 2020) has been widely used as a decision variable with 12 articles (22.64%) in the study. The perceived growth opportunity has been used as the second major decision variable with 8 articles (15.09%) which included growth and development, various opportunities for learning, and career growth of the employees within the organization (Adhikari et al., 2011; Farid et al., 2015; Snell et al., 2015; Pyoria et al., 2017; Adamovic 2018; El Badawy et al., 2018; Abdullah et al., 2021; Akinwale et al., 2024). Job security was used as a decision variable in 6 articles (11.32%) (Royuela et al., 2009; Celma et al., 2014; Farid et al., 2015; Pyoria et al., 2017; Muskat & Reitsamer, 2020; Abdullah et al., 2021) in the QWL. The review also found other dimensions such as policies and practices (Manz & Grothe 1991; Celma et al., 2014; Rubery et al., 2015; Adamovic 2018), and work-life balance (Li & Yeo 2011; Surlenty et al., 2014; Dechawatanapaisal 2017; Adamovic 2018) with 4 articles (7.55%) each. Feedback and communication (Li & Yeo, 2011; Abdullah et al., 2021; Chatterji & Kiran, 2023) and job autonomy (Sirgy et al., 2001; Adamovic, 2018; Abdullah et al., 2021) with 3 articles (5.66%) each. The recognition and reward (Muskat & Reitsamer, 2020; Abdullah et al., 2021), as well as health and well-being (Nahum-Shani et al., 2014; Sinval et al., 2020), with 2 articles (3.77%) each, were found to be important decision variables in the review.

Furthermore, the aspect that encapsulates the absence of QWL, namely emotional dissonance, with 9 articles (16.98%), has been identified in the review. In this regard, authors applied psychological distress, perceived stress, job-related anxiety, and burnout as a tool that had been identified as an affecting factor prevailing among the employees' psyche (Hart 1994; Royuela et al., 2007; Nazir et al., 2011; Celma et al., 2018; Alrawadieh et al., 2020; Sinval et al., 2020; Akinwale et al., 2024; Nauman et al., 2024).

Outcomes

The assessments that follow behavioral performance or non-performance are outcomes (Paul & Benito, 2018). The literature's summary demonstrates turnover intention (job, organizational, and employee commitment) as a major outcome of QWL (Koonmee et al., 2010; Singhapakdi et al., 2010; Valentine 2010; Nazir et al., 2011; Chinomona & Dhurup 2014; Surlenty et al., 2014; Farid et al., 2015; Dechawatanapaisal 2017; Kim et al., 2017; Pyoria et al., 2017; Rathi & Lee 2017; El Badawy et al., 2018; Jabeen et al., 2018; Kang et al., 2018; Agus & Selvaraj 2020; Kim et al., 2021; Chami-Malaeb 2022). Another important outcome found was job performance (employee and organization) (Bolat & Yilmaz, 2009; Khan & Afzal, 2011; Nguyen & Nguyen, 2012; Boadi et al., 2020; Sinval et al., 2020; Nauman et al., 2021; Chatterji & Kiran, 2023; Nauman et al., 2024). Additionally, the review has found several other outcomes of QWL such as productivity (Zelenski et al., 2008; Bolat & Yilmaz 2009; Gupta et al., 2019; Sinval et al., 2020), motivation to work (Cheung & Tang 2009; Tongo 2015; Boadi et al., 2020; Wang et al., 2021), life satisfaction (Zelenski et al., 2008; Rathi & Lee 2017; Alrawadieh et al., 2020), and employees well-being (Adamovic 2018; Akinwale et al., 2024). The variables summarized in the integrated ADO-TCM framework (Figure 4) have been adapted from (Lim et al., 2021).

How Do We Know About The Quality Of Work Life?

TCM framework

An integrative framework revealed research gaps and fresh directions for further investigation using the theories, context, and methodology (TCM) framework (Paul et al., 2017; Paul & Rosado-Serrano, 2019). Concerning the TCM framework, theories as (T), capture the perspectives a researcher uses to build their propositions, and contexts as (C), that denote countries, populations, and sample types. Lastly, the assessment of the major methodology aspects has been identified as (M) (Rahat et al., 2023).

Theories (RQ2)

Theories provide the structure upon which the findings of the investigations are constructed (Bhatia et al., 2021; Lim et al., 2021). A total of 41 theories were used in the QWL literature under review (Table 3). Therefore, some authors have effectively applied theories through discussion rather than explicitly demonstrating them to help readers recognize and comprehend the theories employed (Rahat et al., 2023). In particular, the researchers studied a wide range of 41 theories from numerous fields, i.e., the Conservation of Resources Theory with 6 articles (10.71%). Cognitive Evaluation Theory, Maslow's Hierarchy of Needs Theory, Social Exchange Theory, and Social Identity Theory, with 3 articles (5.36%) each. Talking about the Job Demands-Resources Model, and Self-Determination Theory with 2 articles (3.57%) each, and all the remaining theories were with 1 article (1.79%) each.

Table 3: List of Theories

Theories	Authors	No. of Articles	% of Articles
Conservation of Resources Theory	Dechowatanapaisal 2017; Kim et al., 2017; Kim et al., 2021; Nauman et al., 2021; Wang et al., 2021; Nauman et al., 2024	6	10.71%
Cognitive Evaluation Theory	Gupta et al., 2019; Ibrahim et al., 2023; Akinwale et al., 2024	3	5.36%
Maslow's Hierarchy of Needs Theory	Sirgy et al., 2001; Singhapakdi et al., 2010; Marta et al., 2013	3	5.36%
Social Exchange Theory	Beeri et al., 2013; Kim et al., 2020; Chami-Malaeb 2022	3	5.36%
Social Identity Theory	Singhapakdi et al., 2015; Adamovic 2018; Kim et al., 2020	3	5.36%
Job Demands-Resources Model	Adamovic 2018; Ibrahim et al., 2023	2	3.57%
Self-Determination Theory	Lee et al., 2015; Corbett-Etchevers & Perea 2019	2	3.57%
Affective Event Theory	Wang et al., 2021	1	1.79%
Anil Sarin's Contributory Theory	Tongo 2015	1	1.79%
Broaden and Build Theory	Gupta et al., 2019	1	1.79%
Coping Theory	Nahum-Shani et al., 2014	1	1.79%
Cross-Cultural Theory	Alrawadieh et al., 2020	1	1.79%
Emotional Labour Theory	Alrawadieh et al., 2020	1	1.79%
General Theory of Ethics (H-V theory)	Singhapakdi et al., 2010	1	1.79%
Generational Theory	Muskat & Reitsamer 2020	1	1.79%
Human Capital Resources Theory	Tho 2018	1	1.79%
Information Richness Theory	Adamovic 2018	1	1.79%
Means-End Chain Theory	Boadi et al., 2020	1	1.79%
Need Satisfaction Theory	Kim et al., 2021	1	1.79%
Organizational Ambidexterity and Capabilities Theory	Snell et al., 2015	1	1.79%
Organizational Justice Theory	Singhapakdi et al., 2010	1	1.79%
Organizational Socialization Theory	Singhapakdi et al., 2014	1	1.79%
Organizational Support Theory	Chami-Malaeb 2022	1	1.79%
Organizational Theory	Bolat & Yilmaz 2009	1	1.79%
(P-E) Fit Theory	Muskat & Reitsamer 2020	1	1.79%
Self-Management Leadership Theory	Cohen et al., 1997	1	1.79%
Service Profit Chain Model	Lau 2000	1	1.79%
Social Cognition Theory	Snell et al., 2015	1	1.79%
Social Learning Theory	Cohen et al., 1997	1	1.79%
Social Presence Theory	Adamovic 2018	1	1.79%
Social Role Theory	Muskat & Reitsamer 2020	1	1.79%
Socio-Technical Systems (STS) Theory	Agus & Selvaraj 2020	1	1.79%
Spillover and Crossover Theory	Akinwale et al., 2024	1	1.79%
Stress Theory	Celma et al., 2018	1	1.79%
Theory of Culture	Khan & Afzal 2011	1	1.79%
Theory of Work Adjustment	Kang et al., 2018	1	1.79%
Turunen's Work Orientation Theory	Pyoria et al., 2017	1	1.79%
Uncertainty Management Theory	Adamovic 2018	1	1.79%
Vertical Spillover Theory	Singhapakdi et al., 2010	1	1.79%
Walton Theory	Farid et al., 2015	1	1.79%
Work-Life Accommodation Theory	Akinwale et al., 2024	1	1.79%
Total		56	100.00

Context (RQ3)

The term context pertains to the conditions in which the study was carried out (Paul et al., 2017). The following two contexts, i.e., countries and population, have been discussed in this review with 33 different countries (Table 4). Regarding nations, the developed economies of the globe have been the focus of most QWL studies. The United States alone accounts for 12 articles (17.39%), and Thailand for 6 articles (8.70%). Talking about developing economies, India with 4 articles (5.80%) and Pakistan with 4 articles (5.80%). Countries like Malaysia, Spain, and Turkey with 3 articles (4.35%) each. Countries like Australia, Egypt, England, Europe, France, Nigeria, Sweden, and Vietnam with 2 articles (2.90%) each, and all the remaining countries with 1 article (1.45%) each. In terms of population (Table 5), a total of 23 different populations have been observed, most of the studies were around hotel staff and marketing managers, with 6 articles (12.77%) each. The academic staff with 5 articles (10.64%), workers with 4 articles (8.51%), bank employees, and nurses with 3 articles (6.38%) each. Related to accounting professionals, hospital staff, and SME employees, with 2 articles (4.26%) each, and the remaining population with 1 article (2.13%) each.

Table 4 Contextual Coverage

Context	Authors	No. of Articles	% of Articles
United States	Manz & Grothe 1991; Sirgy et al., 2001; Singhapakdi et al., 2010; Martel & Dupuis 2012; Marta et al., 2013; Nahum-Shani et al., 2014; Singhapakdi et al., 2014; Lee et al., 2015; Kang et al., 2018; Kim et al., 2020; Abdullah et al., 2021; Kim et al., 2021	12	17.39%
Thailand	Koonmee et al., 2010; Valentine 2010; Marta et al., 2013; Singhapakdi et al., 2014; Singhapakdi et al., 2015; Dechawatanapaisa 2017	6	8.70%
India	Rathi & Lee 2017; Gupta et al., 2019; Puram et al., 2021; Chatterji & Kiran 2023	4	5.80%
Pakistan	Khan & Afzal 2011; Nazir et al., 2011; Nauman et al., 2021; Nauman et al., 2024	4	5.80%
Malaysia	Surienty et al., 2014; Farid et al., 2015; Agus & Selvaraj 2020	3	4.35%
Spain	Royuela et al., 2009; Celma et al., 2014; Celma et al., 2018	3	4.35%
Turkey	Bolat & Yilmaz 2009; Afsar & Burcu 2014; Kara et al., 2018	3	4.35%
Australia	Hart 1994; Lingard et al., 2015	2	2.90%
Egypt	El Badawy et al., 2018; Ibrahim et al., 2023	2	2.90%
England	Martel & Dupuis 2009; Rubery et al., 2015	2	2.90%
Europe	Zink 2011; Muskat & Reitsamer 2020	2	2.90%
France	Martel & Dupuis 2007; Corbett-Etchevers & Perea 2019	2	2.90%
Nigeria	Tongo 2015; Akinwale et al., 2024	2	2.90%
Sweden	Martel & Dupuis 2011; Zink 2011	2	2.90%
Vietnam	Nguyen & Nguyen 2012; Tho 2018	2	2.90%
Canada	Sale 2007	1	1.45%
China	Wang et al., 2021	1	1.45%
Denmark	Martel & Dupuis 2006	1	1.45%
Finland	Pyoria et al., 2017	1	1.45%
Germany	Zink 2011	1	1.45%
Ghana	Boadi et al., 2020	1	1.45%
Hong Kong	Cheung & Tang 2009	1	1.45%
Ireland	Martel & Dupuis 2008	1	1.45%
Israel	Beeri et al., 2013	1	1.45%
Jordan	Alrawadieh et al., 2020	1	1.45%
Lebanon	Chami-Malaeb 2022	1	1.45%
Nepal	Adhikari et al., 2011	1	1.45%
Netherlands	Martel & Dupuis 2006	1	1.45%
Norway	Martel & Dupuis 2010	1	1.45%
South Korea	Kim et al., 2017	1	1.45%
Taiwan	Ko & Yeh 2013	1	1.45%
United Arab Emirates (UAE)	Jabeen et al., 2018	1	1.45%
Zimbabwe	Chinomona & Dhurup 2014	1	1.45%
Total		69*	100.00

*Four studies have used samples wherein more than one country has been included.

Table 5 Population

Population (Participants)	Authors	No. of Articles	% of Articles
Hotel Staff	Bolat & Yilmaz 2009; Lee et al., 2015; Kim et al., 2017; Kang et al., 2018; Kara et al., 2018; Wang et al., 2021	6	12.77%
Marketing Managers	Koonmee et al., 2010; Nguyen & Nguyen 2012; Beeri et al., 2013; Marta et al., 2013; Singhapakdi et al., 2014; Tongo 2015; Tho 2018	6	12.77%
Academic Staff	Hart, 1994; Sirgy et al., 2001; Afsar & Burcu 2014; Farid et al., 2015; Chatterji & Kiran 2023	5	10.64%
Workers	Zink 2011; Ko & Yeh 2013; Pyoria et al., 2017; Nauman et al., 2021	4	8.51%
Bank Employees	Nazir et al., 2011; Boadi et al., 2020; Akinwale et al., 2024	3	6.38%
Nurses	Agus & Selvaraj 2020; Chami-Malaeb 2022; Ibrahim et al., 2023	3	6.38%
Accounting Professionals	Sirgy et al., 2001; Surienty et al., 2014	2	4.26%
Hospital Staff	Dechawatanapaaisal 2017; Gupta et al., 2019	2	4.26%
SME Employees	Chinomona & Dhurup 2014; El Badawy et al., 2018	2	4.26%
Air Force personnel	Nahum-Shani et al., 2014	1	2.13%
Business Persons	Business Persons	1	2.13%
Care Providers	Rubery et al., 2015	1	2.13%
Chief Operating Officer	Kim et al., 2020	1	2.13%
Directors	Zelenski et al., 2008	1	2.13%
Drivers	Gupta et al., 2019	1	2.13%
Generation Y	Muskat & Reitsamer 2020	1	2.13%
HR Professionals	Valentine 2010	1	2.13%
Multi-Occupational Workers	Sinval et al., 2020	1	2.13%
Practitioner Members	Singhapakdi et al., 2010	1	2.13%
Riders	Puram et al., 2021	1	2.13%
Sole Proprietors	Snell et al., 2015	1	2.13%
Students	Li & Yeo 2011	1	2.13%
Tour Guides	Alrawadie et al., 2020	1	2.13%
Total		47	100.00

Methods (RQ4)

The term ‘methods’ describes the research strategies and analytical instruments that the researchers employed in their study. This evaluation examines the data gathering and analysis techniques employed by the study to characterize the 69 articles that are being studied. A total of 18 widely used quantitative methods have been identified (Table 6). The methodology for data analysis is categorized into two categories, i.e., quantitative and qualitative. Among the various quantitative methods, the preference of researchers predominantly lies in the utilization of factor analysis and structural equation modeling, with 11 articles (21.57%) each. Pearson correlation coefficient, PLS-SEM method, and regression analysis with 4 articles (7.84%) each. The correlation analysis with 3 articles (5.88%), hierarchical regression analysis, and Pearson product-moment with 2 articles (3.92%) each, and the remaining articles were all with 1 article (1.96%) each.

Table 6: Widely used Quantitative methods

Quantitative data analysis	Authors	No. of Articles	% of Articles
Factor Analysis	Nguyen & Nguyen 2012; Afsar & Burcu 2014; Dechawatanapaaisal 2017; El Badawy et al., 2018; Jabeen et al., 2018; Agus & Selvaraj 2020; Boadi et al., 2020; Kim et al., 2020; Nauman et al., 2021; Chami-Malaeb 2022; Chatterji & Kiran 2023	11	21.57%
Structural Equation Modeling	Valentine 2010; Nguyen & Nguyen 2012; Dechawatanapaaisal 2017; Kang et al., 2018; Tho 2018; Agus & Selvaraj 2020;	11	21.57%

	Kim et al., 2020; Wang et al., 2021; Chami-Malaeb 2022; Chatterji & Kiran 2023; Akinwale et al., 2024		
PLS-SEM Method	Surienty et al., 2014; Snell et al., 2015; Jabeen et al., 2018; Wang et al., 2021	4	7.84%
Pearson Correlation Coefficient	Afsar & Burcu 2014; Agus & Selvaraj 2020; Chami-Malaeb 2022; Ibrahim et al., 2023	4	7.84%
Regression Analysis	Bolat & Yilmaz 2009; Khan & Afzal 2011; Pyoria et al., 2017; Ibrahim et al., 2023	4	7.84%
Correlation Analysis	Bolat & Yilmaz 2009; Cheung & Tang 2009; Farid et al., 2015	3	5.88%
Hierarchical Regression Analysis	Cheung & Tang 2009; Muskat & Reitsamer 2020	2	3.92%
Pearson Product-Moment	Agus & Selvaraj 2020; Chami-Malaeb 2022	2	3.92%
Chi-square Test	Royuela et al., 2009	1	1.96%
Cluster Analysis	Celma et al., 2014	1	1.96%
Kolmogorov-Smirnov Test	Royuela et al., 2009	1	1.96%
Logit Analysis	Celma et al., 2014	1	1.96%
Mediation Analysis	Singhapakdi et al., 2010	1	1.96%
Moderated Regression Analysis	Valentine 2010	1	1.96%
Multilevel Analysis Approach	Boadi et al., 2020	1	1.96%
Multiple Correspondence Analysis	Celma et al., 2014	1	1.96%
Multiplicative Interaction Analysis	Snell et al., 2015	1	1.96%
T-Test	Bolat & Yilmaz 2009	1	1.96%
Total		51	100.00

Furthermore, 5 articles (62.50%) have been found based on conceptual or theoretical models, and 3 articles (37.50%) are about case studies (Table 7). The articles utilize a combination of several data collection methods, like surveys, secondary data, and interviews. Mailed surveys with 4 articles (33.33%), and face-to-face interviews with 3 articles (25%). The in-depth interviews and web-based surveys with 2 articles (16.67%) each and telephone-based with 1 article (8.33%) (Table 8).

Table 7: Widely used Qualitative methods

Qualitative data analysis	Authors	No. of Articles	% of Articles
Conceptual/Theoretical Model	Prasad et al., 2000; Li & Yeo 2011; Zink 2011; Adamovic 2018; Abdullah et al., 2021	5	62.50%
Case study	Rubery et al., 2015; Adamovic 2018; Corbett-Etchevers & Perea 2019	3	37.50%
Total		8	100.00

Table 8: Data collection methods

Data collection methods	Authors	No. of Articles	% of Articles
Mailed survey	Sirgy et al., 2001; Koonmee et al., 2010; Marta et al., 2013; Singhapakdi et al., 2014	4	33.33%
Face-to-face interviews	Sale 2007; Nguyen & Nguyen 2012; Tho 2018	3	25.00%
In-depth interviews	Nguyen & Nguyen 2012; Puram et al., 2021	2	16.67%
Web-based survey	Singhapakdi et al., 2010; Kim et al., 2021	2	16.67%
Telephonic based	Rubery et al., 2015	1	8.33%
Total		12	100.00

Where Should We Be Heading?

We have provided an overview of the QWL literature in the last two sections. The different gaps in (RQ5) caught the attention of our assessment of the 69 articles. Based on this, a research plan for the ADO of QWL in the future (RQ6) was established. To improve comprehension of this construct, researchers may match their future work to the stated research questions. The Miles (2017) taxonomy of research gaps is used to report the condensed research gaps (Table 9).

Antecedents

Future research can be conducted to explore the effect of antecedents that have received less consideration in the literature. In the future, more importance can be given to antecedents such as ego needs (Sirgy et al., 2001), self-efficacy (Chami-Malaeb, 2022) skill development (Adhikari et al., 2011), technology infrastructure (Adamovic, 2018), and organizational culture (Khan & Afzal 2011) as they play an essential role in QWL and need to be studied by future researchers. Another point of investigation could also be to see the interaction effect of the key antecedents and their main effect on the QWL decisions. The interaction effect would help to understand the collective impact of two or more antecedents on the QWL. In the future, the researchers can investigate the following research questions:

RQ7. How do ego needs and self-efficacy affect QWL?

RQ8. How do skill development and technological infrastructure influence QWL?

RQ9. How does organizational culture impact the QWL?

RQ10. How does the interaction between antecedents influence QWL?

Decisions

Our analysis of the QWL revealed numerous gaps in the literature while offering many useful insights. (Table 2) indicates that most of the articles on QWL used job satisfaction as a decision variable, with 12 articles (22.64%) in the study. However, decision variables such as feedback and communication, job autonomy, recognition, rewards, health, and well-being are interesting decisions that emerged from the review and have largely been unexplored so far. In the future, the researchers can investigate the following research questions related to the decision that may affect QWL:

RQ11. What is the role of decisions across different disciplines?

RQ12. What is the underlying dimensionality of QWL that would allow for a holistic measurement of the construct?

Table 9: Future research directions

Where should we be heading?	
Areas of research	Pertinent research questions (RQs)
Antecedents	RQ7. How do ego needs and self-efficacy affect QWL? RQ8. How do skill development and technological infrastructure influence QWL? RQ9. How does organizational culture impact the QWL? RQ10. How does the interaction between antecedents influence QWL?
Decisions	RQ11. What is the role of decisions across different disciplines? RQ12. What is the underlying dimensionality of QWL that would allow for a holistic measurement of the construct?
Outcomes	RQ13. Does better QWL lead to higher life satisfaction? RQ14. Does better QWL lead to better employee well-being? RQ15. Does better QWL lead to a higher level of productivity?
How can we get there?	
Areas of research	Pertinent research objectives (ROs)
Theory	RO1. To develop a new theoretical and conceptual framework using a theory-development-based review (Paul & Rosado-Serrano, 2019). RO2. To integrate theory into survey-based research to fill research gaps. RO3. To introduce an interdisciplinary approach in the field of QWL.
Context	RO4. To study the variation in nature, predictors, and outcomes of QWL across Eastern and Western contexts. RO5. To conduct cross-cultural studies to bring out the differences between the countries. RO6. To study the variation in dimensionality of QWL according to the study discipline.
Methods	RO7. To deploy qualitative methodologies to determine aspects of QWL. RO8. To conduct a study on QWL using a mixed-methods approach. RO9. To conduct experimental studies on QWL. RO10. To adopt longitudinal research designs. RO11. To develop validated scales that can holistically measure QWL.

Outcomes

The literature's summary demonstrates turnover intention as a major outcome of QWL. However, employee well-being, life satisfaction, and productivity emerged from the review and have not yet received much attention. Future research may focus on examining the impact of QWL on life satisfaction, employee well-being, and productivity. The following are the research questions that emerged regarding outcomes:

RQ13. Does better QWL lead to higher life satisfaction?

RQ14. Does better QWL lead to better employee well-being?

RQ15. Does better QWL lead to a higher level of productivity?

How Can We Get There?

After a thorough discussion of the research, a question emerges about where to go from here. In the preceding section, we discussed the future direction of QWL research. The purpose of this section is to demonstrate the way we can use various TCM to get there. We suggest several research goals to direct QWL in this field (Table 9).

Theory

The review indicates that the current literature concerning the quality of work life predominantly relies on the resource conservation theory (Table 3). There is a scope to expand the range of theoretical viewpoints that can be used for QWL. Future research can be undertaken on theory-development-based reviews to create new theoretical models (Paul & Rosado-Serrano, 2019). Further, an interdisciplinary approach can be taken to study QWL, thereby presenting a wide range of theories, extending beyond the HR field. Considering the above discussion, some of the key research objectives for future research can be enumerated as follows:

RO1. To develop a new theoretical and conceptual framework using a theory-development-based review (Paul & Rosado-Serrano, 2019).

RO2. To integrate theory into survey-based research to fill research gaps.

RO3. To introduce an interdisciplinary approach in the field of QWL.

Context

In terms of the context of studies (Table 4), the reviews pointed out that most of the articles were based on studies conducted in the United States, Thailand, India, and other countries. We identified that the majority of the work had been done in developed and developing countries. The developing countries were under-investigated and required more such research. The majority of the studies have been conducted primarily in Western contexts and less in Eastern ones. In the future, scholars should concentrate precisely on defining the characteristics, predictors, and results of QWL in Eastern contexts as well. A lot of attention has been given to the hotel staff, marketing managers, academic staff, and workers (Table 5). Some of the studies have also been conducted on bank employees and nurses, however, it demands more attention from the remaining population, which includes employees like manufacturing, healthcare workers, IT and Tech professionals, and education sector employees to research QWL. Furthermore, comparing the QWL in various nations can be a greater emphasis of future research. There are lots of opportunities, especially in nations like Asia, Africa, the Middle East, Central and Eastern Europe, Latin America, etc, to acknowledge the similarities and differences in QWL. Moreover, we found very few studies in the cross-country context. This will make it easier to look at how beliefs, cultural differences, and work-life affect each other. It might also be important in the future to conduct comparison studies between country-wise and sample-wise. Based on the above discussion, the following research objectives are proposed for future research:

RO4. To study the variation in nature, predictors, and outcomes of QWL across Eastern and Western contexts.

RO5. To conduct cross-cultural studies to bring out the differences between the countries.

RO6. To study the variation in dimensionality of QWL according to the study discipline.

Methods

The majority of the methods adopted for data analysis (Table 6) are factor analysis, SEM, PLS-SEM method, correlation analysis, regression analysis, etc. Whereas in the review, the use of qualitative methods is less than compared of quantitative methods. In the future, scholars can use more advanced techniques and a diversified research method, both quantitative as well as qualitative, to understand QWL. Additionally, the paper suggests longitudinal studies to better elucidate the causal relationship between the ADO. The integration of technology in research opens new possibilities for comprehensive, data-driven exploration of how workplace conditions, social dynamics, and individual experiences shape the quality of employees' work lives. Case studies and interviews (semi-structured or structured) can be used to collect in-depth knowledge about QWL. There is a need to apply qualitative and experimental research methodologies to QWL studies in the future. Based on the above discussion, the following research objectives are proposed for future research:

RO7. To deploy qualitative methodologies to determine aspects of QWL.

RO8. To conduct a study on QWL using a mixed-methods approach.

RO9. To conduct experimental studies on QWL.

RO10. To adopt longitudinal research designs.

RO11. To develop validated scales that can holistically measure QWL.

Conclusion

This research attempts to understand the QWL by a thorough literature review based on the ADO and TCM frameworks. In this review, only English-language publications in the fields of management, business, and social sciences were taken into consideration. Nevertheless, the researchers acknowledge that this systematic review effort is not exhaustive. To obtain an in-depth knowledge of the topic, the study time spans from 1990 to 2024. In this paper, the researchers attempted to provide a holistic view of the QWL literature. To accomplish this, QWL, ADO, and their related TCMs have been thoroughly examined. The analysis of 69 articles produced 7 categories of antecedents with 27 constructs, 10 decisions, and 6 outcomes, providing a sufficiently large and coherent body of knowledge to QWL. Job satisfaction and emotional dissonance are the two decision variables mostly used in the QWL literature. The literature demonstrates turnover intention as a major outcome of QWL. This review further discusses the theories, contexts, and methodologies adopted in the extended studies to understand the existing research in a better way. The review revealed the Conservation of Resources Theory as the most widely used theory in QWL. The majority of the research has been conducted in the United States. The researchers found that Eastern countries got less attention. A majority of research articles in the literature applied factor analysis and structural equation modeling methods. Based on the systematic framework-based review, certain research gaps have been highlighted for future research. The upcoming researchers can explore the ADO and TCM research gaps of QWL for future studies.

Theoretical Implications

By explicitly mapping the existing literature using the ADO-TCM framework, new and comprehensive insights have emerged that will aid in developing an extensive knowledge of QWL. It will provide distinct and universal insights and permit a thorough representation of the subject by organizing the theories, context (samples and countries), and procedures found within this research stream. The in-depth analysis of QWL dimensions provided here might also act as a guide for researchers who would like to create a scale of measurement for the construct. By combining important antecedents, decisions, and outcomes, the paradigm would broaden the comprehension of QWL. The results may be further investigated, and an in-depth understanding will emerge, thereby obtaining directions for future studies in the field of QWL.

Practical Implications

The review delivers the groundwork for policymakers to acquire new knowledge about QWL by synthesizing the existing research. The proposed ADO-TCM framework will assist organizations and policymakers in creating effective policies that will have a positive effect and enhance the QWL of people. The study would prove beneficial as a guide to researchers to undertake applied and interactive studies in the field of QWL. It would also be helpful to researchers in identifying unexplored research gaps in QWL research.

Future Scope and Limitations

Our review considered publications in SSCI-indexed journals having an impact factor greater than 1 to ensure the quality of research analyzed in the study. There might be some articles left out relating to QWL. Though in the undergone review, the inclusion of quality research papers for the study seemed to be appropriate, it may be relaxed for future reviews concentrating on theory, methodology, or contexts.

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Factors Influencing Digital Financial Inclusion in India: Evidence from the Global Findex Database

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Abstract

This exploration delves into the pivotal determinants influencing digital financial inclusion (DFI) in India, with a particular emphasis on the role of demographic indicators in shaping both access to and utilization of DFI services. Drawing upon data from the World Bank's Global Financial Inclusion (Global Findex) database, the study identifies fundamental metrics that drive financial inclusion within the Indian landscape. It scrutinizes the interplay between demographic attributes—notably genders, age, income, educational attainment, and professional standing—and the accessibility and adoption of digital financial services. The mentioned findings underscore the profound impact of socio-demographic characteristics in determining both financial access and engagement with digital financial platforms. Notably, determinants predominantly gender, income bracket, academic credentials, socioeconomic standing, and age significantly influence the extent to which individuals embrace digital financial solutions, including mobile-based payments and online financial transactions. Furthermore, this investigation presents critical strategic perspectives for regulators and capital-related stakeholders, advocating for targeted interventions to optimize digital banking accessibility and mitigate demographic disparities pertinent to access and adoption. It accentuates the imperative of devising strategic measures to bridge service gaps, guaranteeing universal reach to digital financial ecosystems spanning multiple financial strata.

Keywords: Digital Financial Inclusion (DFI); Financial Services; Global Findex; Socio- Demographic Factors; Digital Economy.

JEL Codes: G21; G28; O33; D14; O16; E42

Introduction

The contemporary global imperative is to drive social transformation through technological innovation, effectively bridging disparities in access to digital services. As outlined by the United Nations Development Programme (UNDP) Sustainable Development Goals (SDGs), despite notable advancements, over 4 billion people worldwide continue to lack internet connectivity, with a staggering 90% concentrated in developing nations. Addressing this digital disparity is imperative to ensuring equitable access to digital services, with digital financial inclusion serving as a cornerstone in this transformative endeavor. Inclusive growth Relies heavily on the synergy of financial, industrial, and societal revolutions driven through progress in cutting-edge innovations.

The proliferation of virtual systems has profoundly reshaped the banking and financial sectors in developing economies, catalyzing economic expansion and enhancing accessibility. This contemporary period is defined by swift innovation-based evolution, driving simultaneously social and financial transformation while empowering individuals with critical insights into emerging innovations. Furthermore, the seamless integration of digital tools within financial services elevates overall living standards and fosters greater social inclusion.

To serve a growing customer base, both banks and non-banking financial institutions are increasingly utilizing mobile phones and other digital platforms to deliver financial services. These initiatives align with broader digital financial inclusion objectives, bringing significant benefits to underserved populations. The incorporation of digital technology not only addresses financial disparities but also lays the groundwork for sustainable economic and social progress in the digital age.

Over time, India's financial services sector has experienced a profound metamorphosis, driven by technological advancements. Financial institutions have pioneered an array of innovative products and services, harnessing sophisticated digital channels to enhance customer engagement. A pivotal breakthrough in this evolution has been the integration of agile payment solutions and frictionless availability of monetary solutions via digital platforms, including smartphone-based financial management, internet banking, as well as bank-issued cards. The growing use of smartphone-enabled payment applications has further enhanced the ease of reaching mobile banking solutions, enabling customers for the purpose of conducting financial transactions at their convenience, including transactions, invoicing, as well as online shopping.

This particular Government pertaining to India (GoI) has served a pivotal role in this transition by implementing technology-driven policies to establish India as a digitally advanced economy. The

demonetization initiative represented a transformative milestone, propelling the expeditious proliferation of electronic financial ecosystems, encompassing debit/credit cards, virtual wallets, web-based banking, as well as an array of technology-driven transaction frameworks.

Under the 'Digital India' initiative, the government aims to shift the nation toward a less cash-dependent economy, encouraging digital transactions and promoting financial inclusion through cashless systems.

The success of cashless transactions hinges on the effective implementation of DFI strategies. This study is organized as follows: the introduction is followed by a detailed literature review in both global and Indian contexts in the second section. The third section identifies the research gap and outlines the objectives. Section four presents the research model and theoretical propositions, while the fifth division elaborates on the investigative framework. The sixth segment analyzes the empirical evidence, discussing findings as well as implications. Ultimately, the research wraps up by presenting recommendations aimed at decision-makers in order to support India's journey toward achieving its digital economy objectives.

Literature Review

This section provides an in-depth analysis of DFI by evaluating its determinants and impact from both global & Indian perspectives. Various studies have emphasized the role of financial technology (FinTech) in expanding financial access and bridging economic disparities (Demirguc-Kunt et al., 2018). Digital tools such as mobile banking, internet banking, and digital wallets have emerged as essential components of financial accessibility (Arner et al., 2020). However, despite the advancements, challenges related to digital literacy, financial awareness, and socio-economic factors continue to hinder comprehensive financial inclusion (Ozili, 2021).

Global Perspective on DFI

Global research has emphasized the crucial role of FinTech in advancing financial inclusion (Beck et al., 2018). Studies indicate that digital financial services have significantly contributed to economic engagement, particularly in developing countries (Allen et al., 2016). Mobile payment solutions, such as Kenya's M-Pesa, have illustrated how digital platforms facilitate financial access for unbanked communities (Jack & Suri, 2014).

Similarly, in China, government-supported digital payment programs have played a vital role in improving financial participation, minimizing cash dependency, and optimizing transaction efficiency (Chen & Qian, 2020).

Financial literacy has also been identified as a crucial enabler of digital financial services (Lusardi & Mitchell, 2014). Studies suggest that individuals with higher levels of education are more likely to engage in digital transactions. Moreover, income disparity plays a critical role, as high-income groups tend to exhibit greater adoption of digital financial services than lower-income populations (Klapper et al., 2019). Policymakers worldwide have implemented financial literacy programs to improve digital engagement and enhance financial inclusion (Cole et al., 2011).

Indian Perspective on Digital Financial Inclusion

In India, DFI has gained substantial momentum, driven by state-led initiatives such as the Pradhan Mantri Jan Dhan Yojana (PMJDY) and the Unified Payments Interface (UPI) (Raghuram, 2019). These programs have significantly contributed to expanding financial access, especially in rural and semi-urban areas. Studies indicate that individuals with bank accounts under PMJDY are more likely to use digital financial services, thereby promoting cashless transactions (Agarwal & Chauhan, 2020).

Demonetization in 2016 further accelerated digital financial adoption, compelling businesses and consumers to embrace digital payments (Suri & Sharma, 2018). Research findings reveal that high-income and urban populations adapted more swiftly to digital platforms, whereas rural communities faced challenges due to limited access to internet services and smartphones (Mehta & Singh, 2019). However, initiatives such as the BharatNet project aim to improve internet penetration in remote areas, bridging the urban-rural digital divide (Government of India, 2021).

gender disparities in financial inclusion persist as a pressing issue in India (Bhanot et al., 2012). Research underscores that women in rural regions encounter substantial obstacles in accessing digital financial services, primarily due to lower educational attainment and restricted financial autonomy (Chakrabarty, 2019). Targeted digital literacy programs and financial inclusion schemes tailored for women have been suggested to bridge this gap (Desai et al., 2020).

Barriers and Challenges in DFI

Despite the progress, hinderances such as cybersecurity risks, lack of awareness, and technological barriers continue to impede DFI (Zhu & Li, 2020). Concerns about data privacy and cyber fraud deter individuals from fully adopting digital payment methods (Patil et al., 2021). Additionally, inadequate digital infrastructure in certain regions limits the accessibility of financial services, reinforcing economic disparities (Singh & Ghosh, 2021).

To address these challenges, key participants, encompassing banking entities, policymakers, and digital solution enablers, must operate collaboratively in order to enhance digital literacy, strengthen cybersecurity measures, and expand access (Mohan & Khera, 2020). Efforts should also focus on developing user-friendly digital platforms that cater to diverse socio-economic segments (Roy & Basu, 2021).

The literature review highlights the groundbreaking potential of DFS in fostering economic inclusion. While DFI has made major breakthroughs globally and in India, persistent challenges necessitate targeted interventions. Addressing digital literacy gaps, improving technological infrastructure, and implementing inclusive financial policies will be crucial in achieving a more equitable financial ecosystem. The insights from this literature review provide a foundation for further research on optimizing digital financial services to maximize their impact on economic growth and social inclusion.

Research Gap

A meticulous synthesis of extant literature on DFI underscores prevailing research lacunae necessitating deeper inquiry. While a plethora of scholarly works have scrutinized the instrumental role of financial technology and digital payment ecosystems in augmenting financial accessibility, a conspicuous dearth of research exists on the nuanced interplay between demographic and socio-economic determinants shaping its adoption within emerging economies such as India (Demirguc-Kunt et al., 2018). Contemporary scholarly discourse primarily emphasizes the proliferation of banking infrastructure and the accessibility of formal credit, frequently marginalizing the revolutionary impact of digital financial instruments—such as mobile banking, digital wallets, and online financial transactions—as a secondary consideration (Klapper et al., 2019).

Notwithstanding the escalating proliferation of digital financial solutions, entrenched disparities persist, exacerbated by heterogeneities in financial literacy, technological penetration, and regional economic asymmetries. Scholarly investigations have been disproportionately skewed towards urban financial behaviors, leaving the rural financial inclusion paradigm inadequately explored. A critical research imperative lies in evaluating the ramifications of digital financial services on marginalized rural demographics,

particularly within the ambit of government-led initiatives such as the PMJDY and the UPI (Agarwal & Chauhan, 2020).

Moreover, gender asymmetries in financial inclusion necessitate rigorous academic interrogation. Empirical evidence suggests that women—especially in rural and socio-economically disadvantaged settings—encounter formidable impediments in accessing digital financial services, predominantly due to entrenched socio-cultural and economic constraints (Bhanot et al., 2012). Nevertheless, a paucity of empirical research critically evaluates the efficacy of policy frameworks designed to attenuate the gender divide in financial accessibility (Chakrabarty, 2019). A systematic investigation is warranted to assess the extent to which digital literacy interventions and targeted financial incentives can catalyze women's active participation in the digital economy.

Another pivotal research void pertains to the ramifications of cybersecurity vulnerabilities on financial inclusivity. Empirical studies reveal that pervasive security apprehensions, trust deficits, and anxieties surrounding digital fraud constitute significant deterrents to the pervasive utilization of digital financial systems (Patil et al., 2021). However, an empirical deficit persists concerning the effectiveness of cybersecurity governance mechanisms and financial literacy initiatives in mitigating these apprehensions (Zhu & Li, 2020). Bridging these epistemological gaps is imperative for formulating robust digital financial policies that fortify equitable access while fostering sustainable economic integration.

In summation, there exists a compelling need for holistic research that interrogates DFI through a multidimensional lens, integrating demographic, technological, and policy-driven perspectives. Future scholarship must delve into pioneering financial inclusion frameworks that synergize digital innovation with contextualized socio-economic realities, thereby ensuring that financial democratization initiatives remain both efficacious and enduring across heterogeneous economic landscapes.

Research Objectives

- To examine the key drivers of DFI by leveraging data from the World Bank's Global Findex database, with a distinct focus on DFS.
- To examine the interplay between DFI and various demographic attributes, assessing their influence on financial accessibility and engagement.
- To assess the ease of access & utilization of DFS in pertaining to key demographic characteristics within both the Indian and global contexts, identifying critical barriers and facilitating factors.
- To bridge the existing research gap on DFI in developing economies by analyzing the role of demographic determinants in shaping access to and adoption of digital financial services.

Research Model and Hypotheses

The conceptual framework formulated in this study is predicated upon an exhaustive synthesis of extant literature and the foundational theoretical constructs of digital financial inclusion. This sophisticated model scrutinizes the ramifications of diverse demographic and economic determinants on financial accessibility, with a pronounced focus on the proliferation of digital financial services. It integrates pivotal exogenous variables, including chronological age, gender classification, socioeconomic stratification, educational attainment, and occupational status. Concurrently, the endogenous variables encompass the ease of access and utilization of digital financial mechanisms.

The study proposes two primary hypotheses:

H1: Demographic variables significantly impact the accessibility of DFI. H2:

Demographic variables significantly affect the usage of DFI.

These postulations shall undergo rigorous validation through empirical analysis, scrutinizing the extent to which exogenous variables shape the paradigm of digital financial inclusion. The conceptual framework is meticulously architected to encapsulate both the overt and latent ramifications of demographic determinants, elucidating pathways for augmenting digital financial services to catalyze equitable economic expansion.

By dissecting these theoretical assertions, this inquiry endeavors to enrich the intellectual discourse on financial inclusion while furnishing policymakers with nuanced insights into pivotal domains necessitating strategic intervention. The resultant findings shall serve as a cornerstone for formulating sophisticated digital financial policies tailored to the heterogeneous exigencies of the populace, concurrently fortifying the longevity and efficacy of financial inclusion mechanisms.

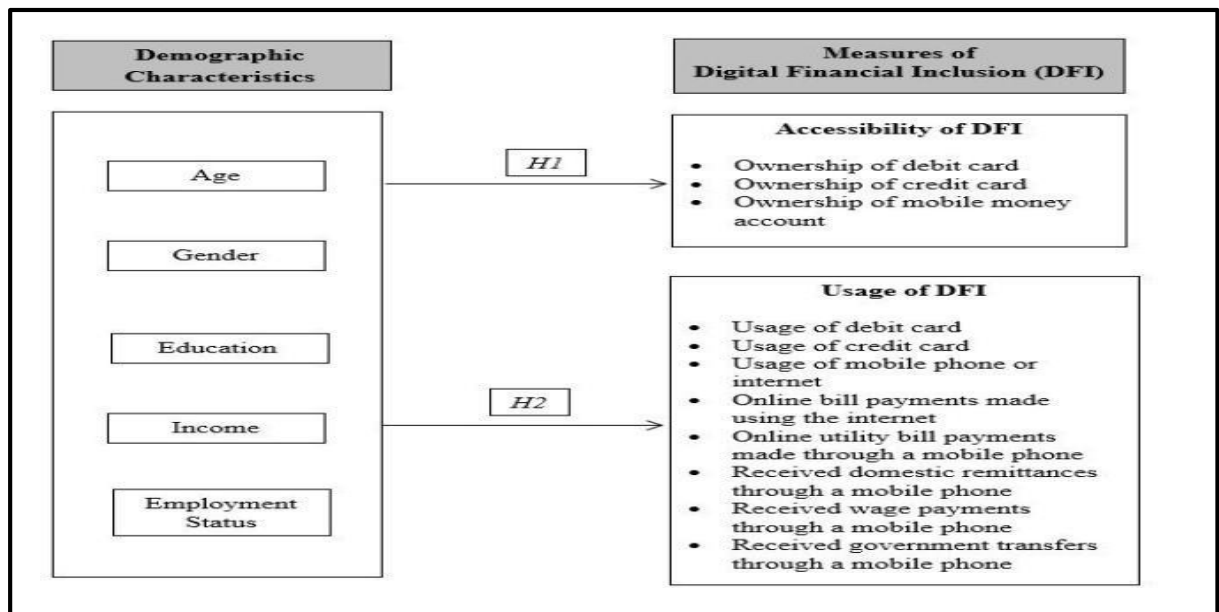


Figure 1

The proposed research model

Methodology and Data Framework

This research leverages secondary datasets procured from the World Bank's Global Findex Database for the fiscal years 2014, 2017, and 2021, as these constitute the latest available records. The methodological framework meticulously delineates the data provenance, the construct measurement paradigm, and the deployment of the probit regression model for empirical analysis.

Data Sources

The demographic and DFI metrics were meticulously sourced from the World Bank's Global Findex Database, an esteemed repository of financial access indicators. The data collection process was orchestrated by Gallup, a preeminent U.S.-based analytics and advisory institution, ensuring methodological rigor and representational accuracy. This extensive global survey spanned 144 nations, encompassing a robust sample of approximately 150,000 respondents worldwide. Specifically for India, a stratified sample of 3,000 individuals was employed, ensuring the comprehensive representation of key study variables.

Measurement of Constructs

The research classifies constructs into two overarching domains: demographic attributes & DFI indicators.

As per the World Bank Global Findex framework, the demographic parameters scrutinized in this analysis include:

- gender: Bifurcated into male and female categories.
 - Age: Treated as a continuous variable, quantified in absolute years.
 - Income: Stratified into five quantiles, with each further subdivided into two distinct tiers.
 - Educational Attainment: Categorized into three hierarchical levels, each subsequently divided into two sub-groups for granular differentiation.
 - Employment Status: Classified into two dichotomous groups—‘employed’ and ‘not in the workforce.’
- Furthermore, the study meticulously evaluates eleven pivotal indicators reflecting the spectrum of digital financial inclusion, encompassing both financial accessibility and transactional utility:

- Holding a debit card
- Holding a credit card
- Having a mobile money account
- Using a debit card for transactions
- Utilization of a credit card for transactions
- Engagement with mobile phone or internet-based banking services
- Execution of online bill payments
- Settlement of utility expenses via mobile-based platforms
- Receipt of domestic remittances through mobile financial channels
- Disbursement of wage payments through mobile transactions
- Government benefit transfers received via mobile-based financial instruments

For analytical coherence, these eleven indicators are systematically consolidated into two principal dimensions:

- Accessibility: Encompassing debit card ownership, credit card possession, and mobile money account enrollment.
- Use: Comprising the remaining eight variables, encapsulating financial transactions and digital payment behaviors.

This comprehensive methodological approach ensures a robust empirical foundation, facilitating a nuanced exploration of digital financial inclusion and its demographic determinants.

Table 1: Description and measurement of study variables

S. No.	Variable	Measurement
1	Gender	Male = 0; Female = 1
2	Age	Age in number of years
3	Income=poorest 20%	Income in the first income quintile = 1; Otherwise = 0
4	Income=second 20%	Income in the second income quintile = 1; Otherwise = 0
5	Income=middle 20%	Income in the middle-income quintile = 1; Otherwise = 0
6	Income=fourth 20%	Income in the fourth income quintile = 1; Otherwise = 0
7	Income=richest 20%	Income in the richest income quintile = 1; Otherwise = 0
8	Primary education	If the individual has completed primary or less = 1; Otherwise = 0
9	Secondary education	If the individual has completed secondary education = 1; Otherwise = 0
10	Tertiary education	If the individual has completed tertiary education = 1; Otherwise = 0
11	Employment status	If the individual is in the workforce = 1; Out of workforce = 0
Dependent Variables (Digital Financial Inclusion Indicators)		
1	ACC1 Ownership of debit card	‘Yes’ = 1; ‘No’ = 0
2	ACC2 Ownership of credit card	‘Yes’ = 1; ‘No’ = 0
3	ACC3 Ownership of mobile money account	‘Yes’ = 1; ‘No’ = 0
4	USG1 Usage of debit card	‘Yes’ = 1; ‘No’ = 0
5	USG2 Usage of credit card	‘Yes’ = 1; ‘No’ = 0
6	USG3 Usage of mobile phone or internet	‘Yes’ = 1; ‘No’ = 0
7	USG4 Online bill payments made using the internet	‘Yes’ = 1; ‘No’ = 0
8	USG5 Online utility bill payments made through a mobile phone	‘Yes’ = 1; ‘No’ = 0
9	USG6 Received domestic remittances through a mobile phone	‘Yes’ = 1; ‘No’ = 0
10	USG7 Received wage payments through a mobile phone	‘Yes’ = 1; ‘No’ = 0
11	USG8 Received government transfers through a mobile phone	‘Yes’ = 1; ‘No’ = 0

Source: World Bank Findex Database 2021

In this research, demographic attributes function as exogenous variables, while determinants pertaining to DFI operate as endogenous variables. An exhaustive elucidation of the quantification methodology for the five exogenous and eleven endogenous variables is meticulously delineated in Table 1. Additionally, Table 2 furnishes a comprehensive overview of the demographic profile of respondents, whereas Table 3 encapsulates the descriptive statistical parameters pertinent to DFI.

Table 2: Demographic profile of respondents

Variable	No. of observations	Mean
Female	3000	0.52
Age	3000	37.44
Income = poorest 20%	3000	0.18
Income = second 20%	3000	0.20
Income = middle 20%	3000	0.20
Income = fourth 20%	3000	0.20
Income = richest 20%	3000	0.22
Primary education	2991	0.66
Secondary education	2991	0.28
Tertiary education	2991	0.06
Employment	3000	56.2

Source: World Bank Findex Database 2021

Table 3: Descriptive statistics for the dependent variables

Code	Variable	No. of observations	Mean
Accessibility			
ACC1	Ownership of debit card	2980	0.316
ACC2	Ownership of credit card	2918	0.030
ACC3	Ownership of mobile money account	3000	0.022
Usage			
USG1	Used debit card in past 12 months	844	0.391
USG2	Used credit card in past 12 months	88	0.739
USG3	Used mobile phone or internet in past 12 months to make payment	2224	0.065
USG4	Made bill payments online using the internet	2942	0.027
USG5	Paid utility bills through a mobile phone	1288	0.036
USG6	Received domestic remittances through a mobile phone	463	0.026
USG7	Received wage payments through a mobile phone	628	0.025
USG8	Received government transfers through a mobile phone	385	0.031

Source: World Bank Findex Database 2021

Probit Regression Equation Modeling

In this study, the dependent variable exhibits a binary structure, rendering it amenable to predictive modeling through a probit regression framework. As a result, Predictive modeling through a binary choice regression framework. As a result, a binary choice regression model is rigorously designed and applied to assess the eleven primary factors shaping DFI.

Let Y represent digital financial inclusion (DFI), measured through 11 critical indicators outlined in Table 1. Consequently, eleven discrete probit regression equations are systematically formulated and empirically analyzed using Student Version of EViews 11 to generate statistically sound insights.

Data Analysis, Empirical Findings, and Interpretations

This research leverages data sourced from the World Bank Index Database and employs a probit regression model as the principal analytical tool. The discourse is structured around two fundamental dimensions: accessibility and utilization of digital financial services.

Demographic Determinants of 'Accessibility' in DFI.

The probit regression analysis, which provides an in-depth examination of the influence of demographic factors on access to DFI, is meticulously detailed in Table 4. In this econometric specification, accessibility is

designated as the dependent variable, operationalized through three pivotal indicators: debit card ownership, credit card ownership, and mobile money account possession.

A multitude of demographic determinants exerts a statistically significant influence on debit and credit card ownership. Notably, age, a dummy variable encapsulating age cohorts, income strata (specifically the third and fourth quintiles), educational attainment (at the secondary and tertiary levels), and employment status emerge as critical explanatory variables.

Furthermore, gender—specifically female identity—coupled with age exerts a significant influence on the likelihood of possessing a mobile money account. Income disparities are instrumental in shaping digital financial accessibility, as evidenced by the strong statistical association between mobile money account possession and income-based dummy variables. Among these, the second income quintile emerges as the most consequential determinant, given its pronounced coefficient magnitude.

Moreover, an individual's scholarly qualifications exert a profound influence on digital financial account possession. The impact of intermediate and advanced education is markedly positive, with the propensity for ownership intensifying in tandem with educational progression. Individuals with tertiary education exhibit a markedly higher propensity for owning a mobile money account compared to those with only secondary-level qualifications. These empirical findings are consistent with the seminal work of Dar and Ahmed (2020), who underscored the pivotal role of advanced educational attainment in accelerating the adoption of digital payment systems. Their study corroborates that heightened financial literacy, facilitated through formal education, fosters greater engagement with digital financial services, thereby fortifying financial inclusion. This empirical foundation substantiates the notion that education acts as a pivotal driver in augmenting the adoption and integration of digital financial tools within everyday economic activities, thereby advancing the overarching objectives of financial inclusion and economic empowerment.

Table 4. Drivers for access of DFI in India

Variables	Ownership of debit card	Ownership of credit card	Ownership of mobile money account
Female	0.021 (0.080)	-0.005 (0.219)	-0.817*** (0.278)
Age			
Age	-0.004*** (0.052)	-0.205*** (0.126)	0.124 (0.145)
Age ²	0.045*** (0.095)	-0.480*** (0.299)	0.320** (0.335)
Income			
Income-poorest 20%	-0.156 (0.127)	0.539 (0.351)	2.124*** (0.531)
Income-second 20%	-0.140 (0.123)	0.385 (0.354)	2.155*** (0.532)
Income-third 20%	-0.168** (0.122)	0.417** (0.349)	1.723*** (0.416)
Income-fourth 20%	0.016** (0.112)	0.045** (0.377)	1.581*** (0.393)
Education			
Secondary education	-0.00272	0.464 (0.601)	1.224*** (0.353)
Tertiary education	-0.289** (0.176)	0.694* (0.616)	1.392*** (0.390)
Employment	-0.047** (0.523)	-0.048** (0.102)	-0.016 (0.124)
Observations	2,980	2,918	2,991
Pseudo R²	0.004	0.002	0.021
Log likelihood	-3709.431	-784.053	-556.237

Note:

- The dependent variable is prominently displayed at the header of each column.
- The explanatory variables encompass gender, age, income level, educational attainment, and employment status.
- The computed marginal effects, along with their corresponding standard errors, are presented within parentheses.
- * Denotes significance at the 1% level, denotes significance at the 5% level, and * denotes significance at the 10% level.

Source: Authors own compilation

Usage Patterns of DFS

The adoption of digital financial services demonstrates significant divergence depending on individuals' socio-demographic traits. Table 5 illustrates the complex relationship between personal attributes and the engagement with digital financial tools, including debit cards, credit cards, and transactions enabled via mobile or internet platforms. Income emerges as a pivotal determinant in debit card adoption, with the binary variables corresponding to the first- and third-income quintiles identified as critical influencers. This implies a proportional relationship wherein higher income levels correspond with an increased propensity for frequent debit card usage.

Furthermore, educational attainment exerts a profound influence, as individuals possessing secondary and tertiary education demonstrate an elevated likelihood of engaging in debit card transactions. Similarly, employment status constitutes a decisive factor in determining debit card utilization. With regard to credit card adoption, the first and fourth income quintiles surface as predominant determinants, alongside employment status. However, other demographic parameters do not manifest a statistically significant impact on credit card usage. In the realm of mobile and internet-driven financial transactions, primary determinants encompass affiliation with the third income quintile, possession of advanced educational qualifications, and active employment. These empirical findings corroborate prior scholarly inquiries undertaken by Mehta et al. (2012), Chaudhary and Nair (2020), Kapoor and Sinha (2013), Pillai et al. (2014), Singh and Verma (2016), and Jain and Roy (2015).

Influence of Demographics on Digital Payments

Overall, individuals with higher incomes and advanced educational backgrounds are more likely to use debit and credit cards for digital financial transactions. Those with higher education levels also tend to engage more frequently with specific brands and prefer online purchases. Demographic characteristics significantly influence the likelihood of making online payments. Table 5 delineates the principal determinants influencing digital payment adoption, with a particular emphasis on transactions conducted through mobile devices or the internet. Factors such as age, the upper-middle and higher-income quintiles, and employment status play a crucial role in influencing participation in mobile and internet-enabled financial transactions. Older individuals, along with those belonging to higher income strata, demonstrate a heightened propensity for utilizing digital payment methods via mobile platforms, whereas other demographic attributes exhibit no significant effect. These findings align with the research of Sharma (2010) and Chaudhary & Nair (2020), which indicate that older individuals and those in higher income brackets exhibit a preference for utilizing mobile phones to settle utility bills. Regarding internet-based digital payments, educational attainment and employment status play a pivotal role in shaping participation. This conclusion corroborates the studies by Pillai et al. (2016) and Sen et al. (2007), which highlight the favourable impact of income levels and employment status on accessibility to financial services. The results imply that stable employment, a consistent income stream, and familiarity with online transactions collectively facilitate a higher propensity for engaging in digital bill payments.

Demographic Influence on Digital Receipts

Table 5 elucidates the intricate interplay between demographic variables and various modalities of digital financial receipts, encompassing domestic remittances, wage disbursements, and governmental transfers facilitated through mobile technology. Regarding wage compensations processed via mobile platforms, income stratification emerges as a pivotal determinant. Individuals positioned within the second and third income quintiles exhibit a heightened propensity to receive wages through digital payment mechanisms. Furthermore, educational attainment exerts a profound influence, with secondary education serving as a particularly salient catalyst. Employment status further amplifies the probability of wage receipt through mobile-based financial channels. In the context of government disbursements administered via mobile phones, age constitutes a principal determinant. Conversely, demographic variables do not exert a statistically significant influence on the reception of domestic remittances through mobile transactions, as all related indicators remain negligible in their predictive capacity. These empirical findings corroborate the scholarly contributions of Gupta and Rao (2020), Sharma and Iyer (2016), and Banerjee and Nair (2015), underscoring that individuals of advanced age, those with elevated income levels, and those possessing secondary education exhibit a greater proclivity toward engaging in digital financial receipt transactions. Specifically, older individuals are frequently eligible for government-sponsored entitlements, including pensions and social security disbursements, which are increasingly administered through mobile-based financial platforms. Similarly, individuals with superior income brackets and higher educational credentials demonstrate a pronounced inclination toward receiving wage payments through mobile channels, thereby fostering deeper integration into digital financial ecosystems.

Policy Implications and Recommendations

The study provides key insights for service providers and policymakers in advancing the Digital India initiative, with a focus on developing a 'Faceless, Paperless, and Cashless' ecosystem.

Recommendations for Service Providers

To enhance accessibility to DFS, particularly in underserved areas, service providers should prioritize investments in digital infrastructure. Creating user-friendly platforms tailored for individuals with varying levels of technological proficiency is essential. Ensuring that digital tools are intuitive and accessible to all demographic groups, including the elderly and those with limited education, can enhance adoption.

Given the growing reliance on mobile phones for digital transactions, particularly among lower-income groups, service providers should focus on mobile-first solutions. Additionally, implementing digital literacy programs can empower users to navigate financial platforms confidently.

Service providers should collaborate with government agencies to streamline the digital disbursement of public services, such as wage payments, remittances, and government transfers. Strengthening cybersecurity measures is crucial to addressing concerns about privacy and security, which often discourage users from fully adopting digital financial services.

Finally, offering tailored financial products that cater to diverse income groups and education levels will ensure inclusivity and equitable access to digital financial services.

Variables	Debit Card Usage (1)	Credit Card Usage (2)	Mobile/Internet Usage (3)	Online Bill Payments via Internet (4)	Utility Bill Payments via Mobile (5)	Domestic Remittances Received via Mobile (6)	Wage Payments Received via Mobile (7)	Government Transfers Received via Mobile (8)
Female	0.032 (0.145)	0.102 (0.576)	-0.128 (0.230)	-0.304 (0.304)	-0.138 (0.613)	-0.204 (0.529)	0.228 (0.529)	0.732 (0.636)
Age								
Age	-0.063 (0.112)	-0.215 (0.541)	0.050 (0.997)	0.064 (0.113)	0.337 (0.147)	0.406 (0.287)	-0.061 (0.270)	0.507 (0.288)
Age ²	-0.108 (0.182)	-0.434 (0.879)	0.153 (0.207)	0.263 (0.263)	0.822*** (0.317)	0.924 (0.287)	-0.187 (0.613)	1.048* (0.614)

Variables	Debit Card Usage (1)	Credit Card Usage (2)	Mobile/Internet Usage (3)	Online Bill Payments via Internet (4)	Utility Bill Payments via Mobile (5)	Domestic Remittances Received via Mobile (6)	Wage Payments Received via Mobile (7)	Government Transfers Received via Mobile (8)
Income								
Lowest 20% Income	-0.664 (0.262)	-2.073 (0.849)	-0.095 (0.293)	-0.391 (0.384)	-0.501 (0.624)	0.952 (1.248)	1.230 (1.249)	0.842 (0.841)
Second 20% Income	-0.147 (0.227)	-1.341 (0.854)	0.034 (0.230)	0.025 (0.339)	0.005 (0.489)	2.156** (1.143)	0.486 (0.818)	-0.950 (1.181)
Middle 20% Income	-0.385** (0.185)	-1.265* (0.800)	0.203** (0.264)	-0.018** (0.348)	0.348** (0.456)	1.160 (1.200)	2.093** (1.187)	-0.778 (1.187)
Fourth 20% Income	-0.284** (0.198)	-1.188* (0.845)	0.273** (0.262)	0.013** (0.348)	0.682** (0.450)	1.668 (1.300)	1.023 (1.241)	-0.950 (1.181)
Education								
Secondary Education	-0.433* (0.261)	-1.275 (1.202)	-0.042 (0.366)	-0.279 (0.447)	-0.233 (0.509)	-0.814 (0.882)	-2.204*** (0.702)	18.791 (13.880)
Tertiary Education	-0.169* (0.264)	-0.267 (1.278)	0.384 (0.261)	0.001 (0.547)	-0.713 (0.509)	-1.043 (0.596)	-1.324 (0.569)	19.617 (13.881)
Employment Status	-0.040** (0.098)	-0.633* (0.401)	-0.068** (0.074)	0.174 (0.145)	0.001 (0.145)	0.342 (0.107)	0.077* (0.250)	-0.419 (0.325)
Observations	841	88	2224	2942	1288	463	628	385
Pseudo R ²	0.013	0.005	0.006	0.011	0.006	0.020	0.006	0.015
Log Likelihood	-1113.562	-86.956	-1065.810	-737.569	-396.581	-108.229	-138.684	-101.010

Note:

- The dependent variable is prominently displayed at the header of each column.
- The explanatory variables include gender, age, income level, educational attainment, and employment status.
- The computed marginal effects, along with their corresponding standard errors, are presented in parentheses.
- Statistical significance is denoted as follows: * indicates significance at the 1% level, at the 5% level, and * at the 10% level.

Source: Authors own compilation

Recommendations to policymakers

To ensure fair and widespread access to digital financial services, policymakers should prioritize the development of a robust digital framework, particularly in remote and economically marginalized areas. This can be accomplished through enhancing internet connectivity, offering affordable data plans, and ensuring digital platforms are user-friendly for individuals with different levels of technological proficiency. Additionally, launching digital literacy initiatives is essential to equip individuals—particularly marginalized groups such as low-income communities and the elderly—with the necessary skills to engage confidently with digital financial systems.

Collaboration between government agencies, financial institutions, and technology providers should be encouraged to develop an integrated, efficient digital ecosystem that supports financial transactions, government transfers, and digital payments. Furthermore, implementing regulations to enhance cybersecurity and protect user data is crucial in building public trust in digital financial platforms. Providing incentives for financial service providers to create affordable and easy-to-use digital products can further accelerate adoption. Lastly, targeted programs that cater to different income levels and education groups can strengthen financial inclusion, ultimately fostering a more accessible and cashless economy.

Conclusion

This analysis highlights the essential significance of demographic elements in shaping the acceptance and availability of digital financial solutions. Key aspects such as earnings level, educational attainment, age, and employment status exert a profound influence on individuals' engagement with digital financial instruments, including debit and credit cards, mobile banking, and online payment platforms.

As India progresses toward its vision of a 'Faceless, Paperless, and Cashless' economy under the Digital India initiative, efforts must be directed at enhancing digital infrastructure, increasing financial literacy, and ensuring equal access to digital financial platforms.

Bridging the digital divide through secure, inclusive, and user-friendly financial services will empower individuals to participate more actively in the digital economy. Achieving this goal will necessitate a coordinated strategy from policymakers, financial entities, tech suppliers, and other key players to advance economic inclusion and foster enduring progress throughout the nation.

Declaration of Interest Statement**Declaration of Interest**

The authors declare that there are no conflicts of interest related to this research. The study, "Factors Influencing Digital Financial Inclusion in India: Evidence from the Global Findex Database," is based on publicly available data and has not been influenced by any external funding source, commercial entity, or personal relationships that could affect the integrity of the research.

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Ms. Anita conceptualized the study, conducted the data analysis, and drafted the manuscript. Dr. Parul Agarwal provided supervision, reviewed, and contributed to refining the final version of the paper. Both authors have read and approved the final manuscript.

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From Recycling to Renewable Energy: A SEM-Based Study of Social Norms, Personal Values, and Environmental Knowledge as Drivers of Pro-Environmental Behavior Influencing Positive Spillover Effects

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Abstract

This study delves into the pivotal role of pro-environmental behaviors (PEBs) in addressing pressing environmental concerns and fostering a culture of sustainability. By examining the concept of spillover effects, where the adoption of one eco-friendly action leads to additional sustainable practices, the research highlights the transformative potential of initial pro-environmental actions. The paper underscores the importance of environmental education in cultivating a deep understanding of the interdependence between human actions and natural systems, thereby promoting behaviors that minimize ecological degradation. This research investigates the determinants of pro-environmental behavior (PEB) and the factors contributing to positive spillover effects in sustainable practices. Despite increased environmental awareness, a gap persists between pro-environmental behavior in controlled settings and its translation to uncontrolled environments. Addressing this discrepancy, the study identifies key drivers of PEB, including environmental knowledge (EK), economic benefits (EB), personal values (PV), and social norms (SN), with PEB acting as a mediating variable. Employing a quantitative research approach, data were collected via a structured survey encompassing diverse demographic groups. The research employs a quantitative approach using Structural Equation Modelling (SEM) and Confirmatory Factor Analysis (CFA) to analyze the relationships among the latent constructs such as social norms, economic benefits, environmental knowledge, and personal values, analyzing factor loadings, t-values, and p-values to test the hypotheses. The findings highlight that all examined variables significantly influence PEB and positive spillover effects, with EK and SN exerting the most substantial impact. These results underscore the importance of fostering environmental knowledge dissemination and leveraging social norms to promote widespread sustainable behavior. By identifying critical factors influencing PEB, this research provides valuable insights for policymakers and educators seeking to design targeted interventions that bridge the gap between environmental consciousness and actionable sustainability. The study offers a foundation for future research into behavioral strategies and policy frameworks aimed at cultivating a culture of sustainability through enhanced positive spillover effects. Future research avenues include exploring the link between PEBs and policy support, as well as the effectiveness of various nudging techniques in promoting sustainable behavior change.

Keywords: Pro-Environmental Behavior, Spillover Effects, Sustainability, Social Norms, Environmental Knowledge.

Introduction to Pro-Environmental Behaviors

The intensifying necessity to address environmental concerns has led to a greater focus on pro-environmental behaviors, acknowledging the crucial importance of collective effort to reduce ecological degradation. Pro-environmental behavior, a fundamental aspect of environmental education, pertains to deliberate efforts taken to minimize one's detrimental effects on the environment (Sam C. Staddon, 2016). These behaviors span a broad spectrum of actions, ranging from common routines like recycling and saving water to more substantial commitments such as embracing renewable energy sources and advocating for sustainable laws. Environmental education aims to cultivate and enhance the profound comprehension of the interdependence between natural systems and human actions, thus underscoring the need to adopt these behaviors as crucial measures in attaining long-term sustainability (Nicole M. Ardoin, 2020). Educational programs seek to empower individuals and communities by cultivating pro-environmental beliefs and behaviors, fostering a culture of sustainability, enabling people to take responsibility for their environmental impact, and effectively solving the pressing environmental issues of today's times (Boeve-de Pauw, 2015). The fundamental concept of Pro-environmental conduct is to reduce adverse effects on the environment and actively promote its well-being and long-term viability (Boiral, 2015). Furthermore, the notion of spillover effects in relation to pro-environmental behavior emphasizes how the adoption of one environmentally conscious activity can stimulate the adoption of additional sustainable behaviors (Thøgersen J. &, 2003).

Explaining the Spillover Effect

The spillover effect of pro-environmental behaviors is an intriguing and intricate phenomenon, in which the adoption of one eco-friendly activity frequently leads to the adoption of further sustainable actions (Elise A. Margetts, 2017). Envision a person who begins their commute by riding to work, therefore minimizing their carbon footprint. By taking this initial step, individuals can trigger a cascade of beneficial consequences, prompting them to adopt more environmentally friendly practices such as composting, minimizing plastic consumption, or endorsing local organic agriculture. Every time that person adopts a new practice, it strengthens their dedication to sustainability, resulting in a combined effect that magnifies their total environmental influence. Spillover happens when changes in how we feel about the environment lead to changes in our behavior. If someone has a strong positive attitude toward the environment, they are more likely to take eco-friendly actions, especially when those actions are somewhat challenging but not too difficult. In other words, when people start caring more about the environment, they're likely to do more things to help it, especially those actions that are a little hard but not impossible (Henn, 2020).

Nevertheless, the spillover effect is not solely beneficial it has both positive and negative aspects (Truelove H. B., 2014). The opposite effect, termed negative spillover, can also occur, where adopting one PEB reduces the likelihood of adopting additional eco-friendly behaviors (Maki, 2019). Occasionally, when individuals carry out a single environmentally friendly behavior they may develop a feeling of complacency, mistakenly thinking that they have fulfilled their responsibility, and as a result, they may disregard additional sustainable behaviors (Nilsson, 2017). For example adopting a single environmentally friendly habit, like recycling at home, can have negative spillover effects, such as encouraging more shopping patterns and lowering the likelihood of adopting more sustainable practices (Karmarkar, 2015). The occurrence of negative spillover effects has the potential to compromise the overall benefits of these endeavors, thereby hindering broader environmental initiatives (Carrico, 2021). Many studies have shown that people are more likely to experience positive spillover effects and less likely to have negative spillover effects when caring about the environment as an important part of their identity (Carfora, 2017). Additionally, only those people with a weaker connection to environmentalism are more likely to experience negative spillover effects (Meijers, 2019). Thus, policymakers can exploit the benefits of positive spillover by creating interventions that promote first pro-environmental activities, recognizing that these actions can trigger a series of subsequent green behaviors (Marius Alt, 2024). By understanding and managing the complex consequences of spillover effects, we may promote a stronger and long-lasting dedication to environmental conservation efforts (Thøgersen J. &, 2009).

Recycling Behavior Leading to Energy Conservation

Encouraging recycling activity can have a substantial impact in promoting other sustainable habits, showcasing the influential role of social norms and spillover effects (Christine Thomas, 2013). Engaging in recycling may enhance one's feeling of environmental responsibility, which in turn can lead to greater involvement in other sustainable activities, such as waste reduction and energy conservation (Geng, 2016). The study by (Ha, 2016) revealed that consumer recycling behavior extends to purchasing green apparel, which is driven by a heightened environmental concern and belief in sustainable practices. Another study by (Ertz M. K., 2016) suggests that feeling a sense of power or control directly influences whether someone will engage in pro-environmental behaviors, like recycling, especially when these actions are done privately. Educating the public about changes in local recycling rules is essential because once recycling becomes a habit, it not only sustains future recycling efforts but also sets a powerful example for adopting other environmentally friendly behaviors within the community (Liu, 2022). Further recycling intention is directly influenced by personal norms and behavioral skills, and indirectly shaped by personal motivation, social motivation, and ascription of responsibility (Liu, 2022). Personal norms related to recycling and packaging waste prevention are deeply intertwined, both stemming from the same broader internalized values, with research confirming a positive spillover effect from recycling to packaging waste prevention (Thøgersen J. , 1999).

Literature Review

The examination of spillover effects in pro-environmental behaviors reveals a complex interplay of positive and negative outcomes, highlighting the multifaceted nature of environmental engagement. Positive spillover, where one pro-environmental action catalyzes additional eco-friendly behaviors, is a promising phenomenon (Clot, 2022). However, challenges such as moral licensing, where individuals feel justified in neglecting subsequent green behaviors after engaging in an initial pro-environmental act, can undermine overall environmental benefits (Mazar, 2010). Empirical studies offer a nuanced view, with (Margetts, 2017) finding that environmental cues can increase initial pro-environmental behaviors but may also lead to moral licensing and negative spillovers. Conversely, cognitive accessibility nudges have shown potential in sustaining pro-environmental behaviors without triggering these negative effects, emphasizing the importance of thoughtful intervention design and implementation. The complexity of spillover effects is further amplified by the motivations driving these

behaviors. (De Dominicis, 2017) argues that pro-environmental programs and policies must address both egoistic and altruistic motivations. Self-interested individuals are more likely to engage in sustainable behaviors when personal benefits are emphasized, whereas altruistic individuals respond to both environmental and personal gains. This underscores the need for tailored approaches in policy-making. Additionally, (Margetts, 2017) suggests that positive spillover is more likely when behaviors require similar resources and when chronic environmental motivations are present. However, the impact of goal priming remains inconclusive, pointing to the need for further research. (White, 2019) discussed the SHIFT framework—highlighting Social influence, Habit formation, Individual self, Feelings and cognition, and Tangibility—offers a strategic approach to fostering sustained pro-environmental engagement by leveraging psychological and contextual factors. Understanding these dynamics is crucial for designing policies and programs that encourage both initial behavior changes and their long-term sustainability. While adopting new pro-environmental behaviors can enhance individuals' sense of environmental responsibility and even encourage political engagement, (Lacasse, 2019) notes that the overall impact on broader pro-environmental behaviors and policy support remains modest. Research has shown that employees' pro-environmental behaviors can create a “win-win” situation by protecting the natural environment while also enhancing environmental performance, leader effectiveness, and employee job satisfaction (Robertson, 2013).

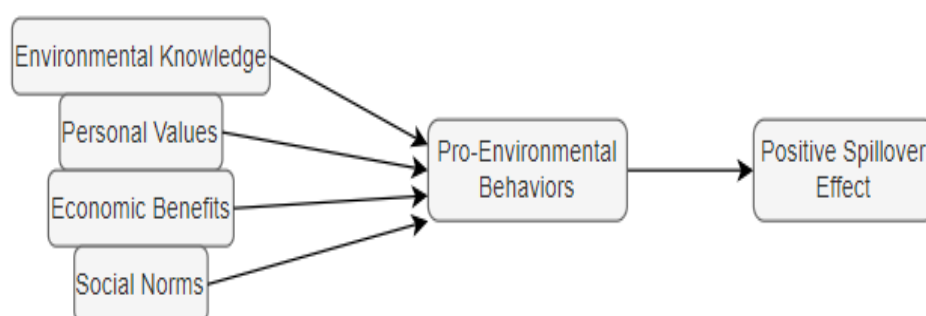


Figure 1: Conceptual Framework (Author Developed)

Personal Values

Individual views and values have a significant impact on the incidence and extent of spillover effects in pro-environmental behavior (Arias, 2020). Individuals who possess robust intrinsic beliefs pertaining to environmental stewardship are more inclined to expand their eco-friendly acts beyond the first conduct (Bennett, 2018). For example, an individual deeply committed to protecting marine life may start by reducing plastic use and then progressively take up beach clean-up initiatives, advocate for policies against ocean pollution, and support sustainable seafood practices (Nithin, 2023). Personal values serve as a compass, directing individuals toward a wider range of sustainable actions (Frank, 2024). In many studies conducted the multigroup SEM analyses revealed that respondents who prioritize the value domain are marginally but significantly more likely to experience spillover (Thøgersen J. &, 2003).

Social Norms

The inclination of individuals to participate in various environmentally friendly actions is greatly influenced by societal standards and social norms (Cialdini, 2021). When eco-friendly habits become commonplace within a community or social group, individuals are more inclined to embrace and sustain these behaviors because they want social acceptability and togetherness (White, 2019). For example, in a neighborhood where residents collectively participate in a community garden and composting program, it sets a benchmark that motivates individuals to engage in these activities and potentially extend their efforts to other sustainable practices, such as installing solar panels or using rain barrels for water conservation (Corkery, 2004). Social norms provide a conducive atmosphere for the proliferation and growth of sustainable behaviors (Yamin, 2019).

Environmental Knowledge

Environmental literacy plays a vital role in the spillover effect since knowledgeable persons are more capable of comprehending the wider consequences of their activities (Nyika, 2021). Individuals who possess a greater understanding of environmental concerns and the interdependence of ecosystems are more inclined to acknowledge the advantages of embracing further sustainable practices (Zsóka, 2013). For example, learning about the benefits of water conservation might inspire an individual to install rainwater harvesting systems at home, participate in local watershed protection programs, and advocate for stricter water usage regulations, thereby amplifying their overall impact on environmental sustainability (Tsai, 2011).

Economic Benefits

Economic considerations, such as cost-benefit analyses, financial incentives, and environmental policies, are critical in shaping pro-environmental behavior (Pham, 2024). People frequently evaluate the financial consequences of their choices, taking into account the current expenses compared to the long-term advantages (Lusardi, 2014). Monetary rewards, such as refunds for energy-efficient appliances or tax deductions for solar panel installations, may greatly encourage consumers to embrace sustainable practices by reducing initial expenses (Kowalska-Pyzalska, 2018). In addition, carefully designed environmental regulations that offer economic incentives for environmentally responsible actions can encourage wider adoption (Zhou, 2023). For instance, subsidies allocated to electric vehicles can enhance their accessibility, therefore promoting a transition away from transportation reliant on fossil fuels (Chaturvedi, 2022). Policymakers may promote sustainable behaviors on a broader scale by connecting economic incentives with environmental goals, thereby assuring that eco-friendly choices are both ethically acceptable and financially possible (Placet, 2005).

Research Methodology

A quantitative research design is employed to examine the impact of pro-environmental behaviors on positive spillover effects. The research investigates how social norms, economic incentives, environmental knowledge, and personal values—considered as independent variables—affect pro-environmental behavior, which serves as a mediating variable in its relationship with positive spillover, the dependent variable. Structural Equation Modelling (SEM) is utilized to explore the complex interactions between latent and observable variables within the conceptual framework proposed. The data collection focused on individuals with a well-established understanding of environmental issues. A nonprobability convenience sampling method was used to achieve a representative and diverse demographic sample. Data were gathered using a structured questionnaire with a Likert scale to evaluate each variable. The questionnaire items were adapted from validated scales used in prior research, ensuring the reliability and accuracy of the measurements. This methodological approach enabled a thorough analysis and understanding of the study's core variables and their interrelationships. All empirical analyses, including the development of the conceptual framework, path modeling, and confirmatory factor analysis (CFA), were conducted using SmartPLS 4.0. Accordingly, all figures and tables presented in this study are based on the authors' own computation and model outputs derived from SmartPLS..

Findings and Analysis

The Structural Equation Model (SEM) analysis offers valuable insights into the relationships between key variables influencing Pro-environmental Behavior (PEB) and its ripple effects on Positive Spillover (PS) behaviors. The analysis shows that Environmental Knowledge (EK), Personal Values (PV), and Social Norms (SN) play a significant role in shaping Pro-environmental Behavior, collectively explaining 78.7% of its variance.

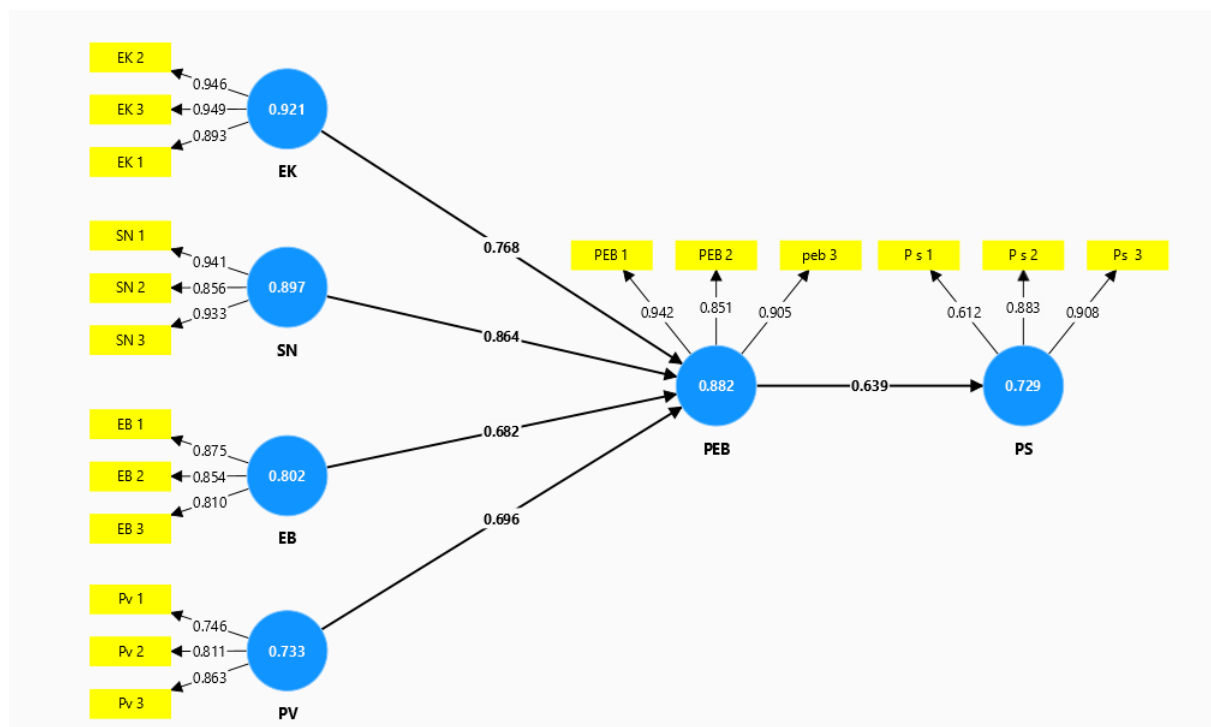


Figure 2: Path Coefficient Insights: Exploring Relationships through PLS-SEM Analysis

Table 1: Path Coefficient Matrix

Path	Coefficient	Interpretation
EB → PEB	-0.017	The path coefficient between Economic Benefits (EB) and Pro-environmental Behavior (PEB) is weak and negative (-0.017), indicating that economic incentives or considerations do not significantly contribute to or motivate pro-environmental actions. This suggests that external rewards, such as financial gains, may not be sufficient to drive environmentally conscious behaviors.
EK → PEB	0.196	The positive coefficient between Environmental Knowledge (EK) and Pro-environmental Behavior (PEB) (0.196) shows that increased environmental awareness and understanding positively influence pro-environmental actions. Though the relationship is not very strong, it indicates that educating individuals on environmental issues can moderately enhance their likelihood of engaging in sustainable behavior.
PEB → PS	0.642	The relationship between Pro-environmental Behavior (PEB) and Positive Spillover (PS) is strong and positive (0.642). This means that individuals who engage in pro-environmental actions are likely to exhibit similar positive behaviors in other aspects of their lives, fostering a broader impact on society. This finding highlights the idea of behavioral spillover, where acting sustainably in one domain encourages socially responsible actions in other areas.
PV → PEB	0.184	The path between Personal Values (PV) and Pro-environmental Behavior (PEB) shows a positive coefficient (0.184), indicating that individuals' deeply held ethical beliefs and personal values significantly contribute to their likelihood of adopting pro-environmental behaviors. Although the strength of this relationship is moderate, it underscores the importance of value-driven motivations in sustainable practices.
SN → PEB	0.603	The coefficient between Social Norms (SN) and Pro-environmental Behavior (PEB) is quite strong (0.603), revealing that societal expectations and perceived social pressure play a crucial role in encouraging pro-environmental actions. This suggests that when individuals perceive that pro-environmental behaviors are supported and expected by their social group, they are more likely to engage in such actions.

Interpretation: The analysis identifies Social Norms (SN) as the strongest predictor of Pro-environmental Behavior (PEB), highlighting the significant role of societal expectations in driving sustainable actions. Environmental Knowledge (EK) and Personal Values (PV) also positively influence PEB, underscoring the importance of awareness and ethical principles, while Economic Benefits (EB) have a negligible and negative effect, showing limited impact of monetary incentives. PEB strongly influences Positive Spillover (PS), explaining 64.2% of its variance, demonstrating how environmentally conscious actions foster broader pro-social behaviors. These findings emphasize the primacy of social and intrinsic motivators over economic factors in promoting sustainability and societal well-being.

Table 2: Construct Reliability and Validity

Construct Reliability and Validity	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
EK	0.921	0.936	0.95	0.864
SN	0.897	0.92	0.936	0.83
PEB	0.882	0.887	0.928	0.81
EB	0.802	0.803	0.884	0.717
PV	0.733	0.74	0.849	0.653
PS	0.729	0.776	0.85	0.66

Interpretation: The construct reliability and validity analysis confirms the robustness of the measurement model. Environmental Knowledge (EK) stands out with a high Cronbach's alpha (0.921) and AVE (0.864), reflecting strong internal consistency and convergent validity. Subjective Norms (SN) and Pro-environmental Behavior (PEB) also demonstrate excellent reliability, with composite reliability values of 0.936 and 0.928, respectively. While Economic Benefits (EB) and Personal Values (PV) have slightly lower Cronbach's alphas (0.802 and 0.733), they meet acceptable thresholds. AVE values above 0.65 for PV and Positive Spillover (PS) confirm sufficient convergent validity, supporting the model's reliability and construct clarity.

Table 3: Correlation Matrix

Latent Variables - Correlation	EB	EK	PEB	PS	PV	SN
EB	1	0.679	0.682	0.519	0.704	0.725
EK	0.679	1	0.768	0.562	0.647	0.77
PEB	0.682	0.768	1	0.642	0.697	0.863
PS	0.519	0.562	0.642	1	0.755	0.549
PV	0.704	0.647	0.697	0.755	1	0.66
SN	0.725	0.77	0.863	0.549	0.66	1

Interpretation: The correlation matrix highlights the interplay of societal, personal, and economic factors in shaping Pro-environmental Behavior (PEB). Strong correlations are observed between Subjective Norms (SN) and PEB (0.863) and Environmental Knowledge (EK) and PEB (0.768), emphasizing the influence of societal expectations and awareness on sustainable actions. Personal Values (PV) strongly correlate with Positive Spillover (PS) (0.755), showing how values drive extended pro-environmental behaviors. Economic Benefits (EB) notably correlate with SN (0.725), reflecting the combined impact of incentives and social norms. Moderate correlations between PS and EK (0.562) and EB (0.519) highlight weaker but relevant links.

Table 4: Heterotrait-Monotrait Ratio (HTMT) Matrix

HTMT Matrix	EB	EK	PEB	PS	PV
EK	0.786				
PEB	0.81	0.844			
PS	0.68	0.701	0.796		
PV	0.922	0.778	0.861	1.012	
SN	0.849	0.826	0.956	0.672	0.814

Interpretation: The analysis using the Heterotrait-Monotrait Ratio (HTMT) highlights issues with discriminant validity, as HTMT values for Subjective Norms (SN) and Pro-environmental Behavior (PEB) (0.956), Economic Benefits (EB) and Personal Values (PV) (0.922), and Positive Spillover (PS) and PV (1.012) exceed the acceptable threshold of 0.85, indicating significant overlap. This suggests strong interconnections among societal norms, economic perceptions, and personal values in shaping pro-environmental behaviors. However, Environmental Knowledge (EK) demonstrates acceptable discriminant validity, with HTMT values below 0.85, confirming its distinctiveness in the model. The results suggest the need to refine overlapping constructs.

Table 5: Fornell-Larcker Criterion

Fornell - Larcker Criterion	EB	EK	PEB	PS	PV	SN
EB	0.847					
EK	0.679	0.93				
PEB	0.682	0.768	0.9			
PS	0.519	0.562	0.642	0.812		
PV	0.704	0.647	0.697	0.755	0.808	
SN	0.725	0.77	0.863	0.549	0.66	0.911

Interpretation: The Fornell-Larcker Criterion confirms acceptable discriminant validity among the constructs. Subjective Norms (SN) and Pro-environmental Behavior (PEB) show a strong relationship, but their diagonal

values indicate they are distinct constructs. Economic Benefits (EB) and Personal Values (PV) are closely related yet separate, as EB's diagonal value exceeds its correlation with PV. Positive Spillover (PS) and Environmental Knowledge (EK) demonstrate strong discriminant validity, with diagonal values exceeding correlations with other constructs, affirming their distinctiveness. The analysis highlights the nuanced interrelations, especially between SN and PEB, in shaping environmental behaviors while confirming the validity of the constructs.

Table 6: Cross Loadings

Cross Loadings	EB	EK	PEB	PS	PV	SN
EB 1	0.875	0.641	0.591	0.404	0.583	0.635
EB 2	0.854	0.597	0.578	0.43	0.49	0.612
EB 3	0.81	0.485	0.564	0.488	0.72	0.593
EK 2	0.653	0.946	0.733	0.448	0.576	0.748
EK 3	0.659	0.948	0.782	0.547	0.624	0.815
PS 1	0.335	0.433	0.399	0.612	0.453	0.329
PS 2	0.459	0.492	0.566	0.883	0.666	0.506
PEB 1	0.663	0.725	0.941	0.558	0.672	0.893
PEB 2	0.598	0.662	0.855	0.707	0.61	0.63
PS 3	0.46	0.452	0.579	0.908	0.693	0.483
PV 1	0.742	0.504	0.554	0.47	0.746	0.583
PV 2	0.462	0.396	0.506	0.552	0.811	0.521
P3	0.503	0.644	0.619	0.783	0.863	0.502
SN 1	0.654	0.754	0.869	0.545	0.617	0.941
SN 2	0.568	0.582	0.639	0.473	0.538	0.856
SN 3	0.746	0.747	0.823	0.479	0.641	0.933
PEB 3	0.576	0.684	0.903	0.464	0.595	0.8
EK 1	0.574	0.893	0.609	0.584	0.609	0.556

Interpretation: The Cross Loadings analysis confirms strong discriminant validity for most constructs. Subjective Norms (SN) and Pro-environmental Behavior (PEB) show high loadings on their respective constructs, with moderate cross-loadings indicating a strong relationship between societal norms and environmental behaviors. Economic Benefits (EB) and Personal Values (PV) demonstrate distinctiveness, although moderate correlations with other constructs suggest some interaction. Environmental Knowledge (EK) also maintains strong validity, with moderate cross-loadings with SN and PEB, highlighting its influence on environmental actions. Overall, the analysis supports the conceptual distinctiveness of each construct while acknowledging key interrelationships, especially between SN and PEB.

Table 7: R-Square Values for PEB and PS

R - Square	R-square	R-square adjusted
PEB	0.787	0.778
PS	0.412	0.406

Interpretation: The regression analysis shows that the independent variables significantly explain the variance in the dependent variables. For Pro-environmental Behavior (PEB), the model explains 78.7% of the variance, with strong contributions from Subjective Norms, Economic Benefits, Personal Values, and Environmental Knowledge. The adjusted R-square of 0.778 confirms the model's robustness. In contrast, Positive Spillover (PS) explains 41.2% of the variance, with a moderate explanatory power (adjusted R-square = 0.406), suggesting other factors may also influence spillover behaviors. Overall, the model demonstrates a stronger fit for PEB, highlighting the significant role of societal norms and environmental knowledge in shaping environmental actions.

Table 8: F-Square Values for Relationships among Constructs

Path	F-Square	Interpretation
EB → PEB	0.001	The effect of Economic Benefits (EB) on Pro-environmental Behavior (PEB) is negligible, indicating that EB has minimal influence on PEB in this model.
EK → PEB	0.066	Environmental Knowledge (EK) has a small effect on Pro-environmental Behavior (PEB), suggesting a limited positive influence on individuals' pro-environmental actions.
PEB → PS	0.7	The strong effect of Pro-environmental Behavior (PEB) on Positive Spillover (PS) indicates that engaging in pro-environmental behaviors significantly enhances the likelihood of spillover effects to other behaviors.
PV → PEB	0.07	Personal Values (PV) have a small effect on Pro-environmental Behavior (PEB), suggesting that while personal values do influence pro-environmental actions, the impact is relatively modest.
SN → PEB	0.551	Subjective Norms (SN) have a strong effect on Pro-environmental Behavior (PEB), indicating that societal expectations and norms significantly drive individuals' pro-environmental actions.

Table 9: Outer Model Descriptives Analysis

Latent Variable	Standard Deviation	Interpretation
PS 1	0.791	Positive Spillover (PS) indicator 1 shows the highest variability, indicating that respondents have diverse views on spillover effects in environmental behaviors.
PV 1	0.666	Personal Values (PV) indicator 1 has moderate variability, suggesting moderate differences in personal values among respondents.
EB 3	0.587	Economic Benefits (EB) indicator 3 has moderate variability, showing that perceptions of economic benefits are somewhat consistent among respondents.
PV 2	0.585	Personal Values (PV) indicator 2 shows similar variability as PV 1, indicating moderate differences in personal values.
EB 2	0.52	Economic Benefits (EB) indicator 2 exhibits moderate variability, showing some differences in perceived economic benefits.
PEB 2	0.518	Pro-environmental Behavior (PEB) indicator 2 has moderate variability, indicating differences in pro-environmental behaviors among respondents.
SN 2	0.517	Subjective Norms (SN) indicator 2 shows moderate variability, suggesting that social norms vary somewhat across respondents.
PV 3	0.506	Personal Values (PV) indicator 3 has lower variability, indicating relatively consistent personal values among respondents.
EB 1	0.483	Economic Benefits (EB) indicator 1 shows relatively low variability, indicating that most respondents perceive economic benefits similarly.
PS 2	0.469	Positive Spillover (PS) indicator 2 shows lower variability, indicating more consistency in how respondents view spillover effects.
EK 1	0.45	Environmental Knowledge (EK) indicator 1 shows relatively low variability, indicating consistent levels of environmental knowledge across respondents.
PEB 3	0.43	Pro-environmental Behavior (PEB) indicator 3 has low variability, suggesting that respondents behave similarly in their pro-environmental actions.
PS 3	0.418	Positive Spillover (PS) indicator 3 shows low variability, indicating consistent views on spillover effects.
SN 3	0.359	Subjective Norms (SN) indicator 3 has low variability, suggesting that social norms are consistent among respondents.
PEB 1	0.339	Pro-environmental Behavior (PEB) indicator 1 shows very low variability, indicating very consistent behaviors among respondents.
SN 1	0.339	Subjective Norms (SN) indicator 1 shows very low variability, suggesting consistent social norms.
EK 2	0.324	Environmental Knowledge (EK) indicator 2 shows very low variability, indicating that environmental knowledge is quite consistent.
EK 3	0.317	Environmental Knowledge (EK) indicator 3 has the lowest variability, indicating highly consistent levels of environmental knowledge among respondents.

Table 10: Total Effects Analysis

Total Effects	Total Effect Value	Interpretation
EB -> PEB	-0.017	Economic Benefits (EB) has a negligible and slightly negative effect on Pro-environmental Behavior (PEB), indicating that individuals' perception of economic benefits does not strongly influence their pro-environmental actions.
EB -> PS	-0.011	Economic Benefits (EB) has an almost neutral and slightly negative effect on Positive Spillover (PS), showing that economic considerations have minimal impact on engaging in additional pro-environmental behaviors.
EK -> PEB	0.196	Environmental Knowledge (EK) has a positive effect on Pro-environmental Behavior (PEB), suggesting that higher environmental knowledge moderately encourages individuals to engage in pro-environmental activities.
EK -> PS	0.126	Environmental Knowledge (EK) has a positive but modest effect on Positive Spillover (PS), indicating that knowledge about the environment promotes additional pro-environmental behaviors, although the influence is not strong.
PEB -> PS	0.642	Pro-environmental Behavior (PEB) has a significant positive effect on Positive Spillover (PS), implying that engaging in one pro-environmental action strongly encourages further environmental behaviors.
PV -> PEB	0.184	Personal Values (PV) positively influence Pro-environmental Behavior (PEB), indicating that personal values play a moderate role in shaping individuals' pro-environmental actions.
PV -> PS	0.118	Personal Values (PV) have a modest positive effect on Positive Spillover (PS), suggesting that personal values slightly contribute to additional pro-environmental behaviors.
SN -> PEB	0.603	Subjective Norms (SN) have a strong positive effect on Pro-environmental Behavior (PEB), highlighting the significant role of societal norms in driving individuals' pro-environmental actions.
SN -> PS	0.387	Subjective Norms (SN) positively affect Positive Spillover (PS), indicating that social norms encourage further pro-environmental behaviors, though the effect is moderate.

Table 11: Cramér-von Mises Test

Latent Variables	Cramér-von Mises Test Statistic	Cramér-von Mises p-value	Interpretation
EB (Economic Benefits)	0.08	0.206	The p-value indicates that there is no significant difference between the model and the observed data for Economic Benefits, suggesting that the model represents EB well.
EK (Environmental Knowledge)	0.498	0	The low p-value shows a significant difference between the model and the observed data for Environmental Knowledge, suggesting a misfit in capturing the construct effectively.
PEB (Pro-environmental Behavior)	0.291	0	Similar to EK, the significant p-value points to a mismatch between the model and the data, implying that the construct PEB is not being well-represented.
PS (Positive Spillover)	0.257	0.001	The significant p-value indicates a poor model fit for Positive Spillover, requiring further refinement in how this construct is measured.
PV (Personal Values)	0.245	0.001	The significant p-value for Personal Values suggests that the model is not accurately capturing this construct, requiring adjustments to better reflect its influence.
SN (Subjective Norms)	0.12	0.059	The p-value is close to significance, indicating a moderate fit for Subjective Norms, but further refinement could improve the accuracy of the model.

Table 12: Collinearity Statistics (VIF)

Collinearity Statistics	VIF	Interpretation
EB 1	1.993	Acceptable collinearity as the VIF is below 5, indicating that EB 1 does not significantly correlate with other variables.
EB 2	1.857	Acceptable collinearity with a VIF under 5, suggesting no multicollinearity issue for EB 2.
EB 3	1.533	Low VIF value indicates no concerns about collinearity for EB 3.
EK 2	4.32	High VIF value, but still under 5, indicating some level of multicollinearity between EK 2 and other constructs.
EK 3	4.268	Similar to EK 2, this high VIF suggests moderate collinearity with other variables.
PS 1	1.155	Very low VIF, indicating no significant multicollinearity for Positive Spillover 1.
PS 2	2.348	Acceptable VIF value, showing moderate collinearity for P s 2 but nothing critical.
PEB 1	3.977	Higher VIF value but still under the threshold, indicating moderate collinearity for PEB 1.
PEB 2	1.951	Acceptable level of collinearity, suggesting no issues with PEB 2.
PS 3	2.475	Moderately acceptable VIF value, indicating manageable collinearity for Positive Spillover 3.
PV 1	1.26	Low VIF value suggests no collinearity issues with Personal Values 1.
PV 2	1.67	Collinearity is low for Personal Values 2, indicating no multicollinearity concerns.
PV 3	1.752	Acceptable VIF, showing no major collinearity problems for Personal Values 3.
SN 1	3.641	Higher VIF but still within acceptable limits, indicating moderate collinearity for Subjective Norms 1.
SN 2	2.159	Low to moderate collinearity with acceptable VIF, suggesting no concerns for Subjective Norms 2.
SN 3	3.511	Higher VIF but below 5, meaning moderate multicollinearity for Subjective Norms 3.
PEB 3	3.292	Acceptable VIF value indicating moderate collinearity for Pro-environmental Behavior 3.
EK 1	2.693	VIF value is within acceptable limits, suggesting moderate collinearity for Environmental Knowledge 1.

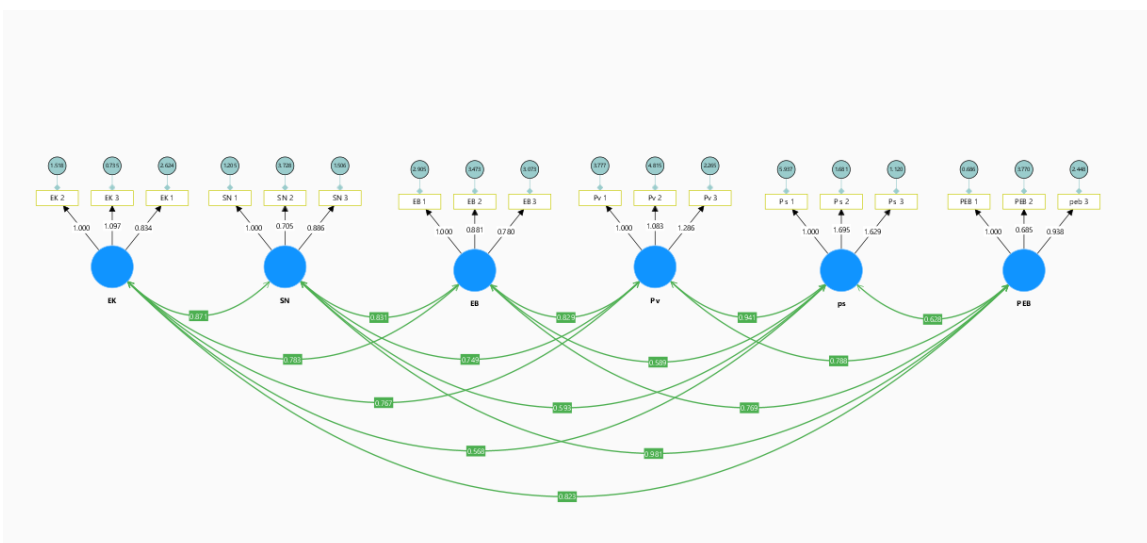


Figure 3: Validation of Latent Constructs through CFA in the SEM Framework

Interpretation: The CFA diagram validates the measurement model by confirming the reliability and validity of latent constructs (e.g., EK, SN, EB) through strong factor loadings (mostly >0.7) on their observed variables. Positive correlations between constructs (e.g., 0.831, 0.757) indicate their interconnectedness, aligning with theoretical expectations. The model demonstrates good construct validity, highlighting both convergent and discriminant validity. This analysis is significant for ensuring that the constructs and their relationships are robust and suitable for further hypothesis testing. Additionally, it provides a foundation for understanding the influence of these constructs, such as their potential impact on behavior or decision-making.

Table 13: Covariance Matrix of Latent Constructs

Factors Covariances	EB	EK	PEB	PV	SN	PS
EB	5.638	4.842	5.317	3.219	5.785	1.679
EK	4.842	6.78	6.242	3.266	6.65	1.778
PEB	5.317	6.242	8.487	3.754	8.376	2.199
PV	3.219	3.266	3.754	2.676	3.592	1.849
SN	5.785	6.65	8.376	3.592	8.591	2.089
PS	1.679	1.778	2.199	1.849	2.089	1.443

Interpretation: The covariance matrix highlights the relationships between latent constructs such as EB, EK, PEB, PV, SN, and PS. High covariance values (e.g., SN and PEB: 8.376, EK and SN: 6.65) suggest strong interdependence between these constructs, indicating that they share common underlying influences or are highly related in the theoretical framework. Lower values (e.g., ps and PV: 1.849, PS and EB: 1.679) denote weaker relationships, suggesting limited overlap between certain constructs. This analysis is significant because it demonstrates the interconnectedness of constructs in the model, offering insights into how different factors interact. For instance, strong covariance between SN and PEB implies that social norms may significantly impact pro-environmental behavior. The matrix also helps verify discriminant validity, ensuring constructs are sufficiently distinct while exhibiting meaningful correlations, thereby supporting the theoretical model's robustness and its ability to explain the studied phenomena effectively.

Table 14: Correlation Matrix of Latent Constructs

Factors Correlation	EB	EK	PEB	PV	SN	PS
EB	1	0.783	0.769	0.829	0.831	0.589
EK	0.783	1	0.823	0.767	0.871	0.568
PEB	0.769	0.823	1	0.788	0.981	0.628
PV	0.829	0.767	0.788	1	0.749	0.941
SN	0.831	0.871	0.981	0.749	1	0.593
PS	0.589	0.568	0.628	0.941	0.593	1

Interpretation: The correlation matrix reveals the relationships among latent constructs (EB, EK, PEB, PV, SN, PS). Strong correlations, such as between PEB and SN (0.981) and EK and SN (0.871), suggest that these constructs are highly related. Moderate correlations, like EB and PEB (0.769) and PV and PEB (0.788), reflect meaningful connections, while weaker correlations, such as PS with EB (0.589), indicate less overlap. These findings validate the model's convergent and discriminant validity, ensuring that closely related constructs align theoretically, while distinct constructs maintain their uniqueness, providing a solid basis for further analysis.

Table 15: Parameter Estimates, Standard Errors, T-values, and P-values for Relationships

Factors Estimated Parametre	Parameter estimates	Standard errors	T values	P values
EB	5.638	1.238	4.555	0
EK	6.78	1.177	5.763	0
PEB	8.487	1.309	6.482	0
PV	2.676	0.842	3.177	0.002

SN	8.591	1.387	6.193	0
PS	1.443	0.663	2.177	0.032
EK <-> EB	4.842	0.945	5.122	0
PEB <-> EB	5.317	1.006	5.283	0
PEB <-> EK	6.242	1.056	5.91	0
PV <-> EB	3.219	0.885	3.638	0
PV <-> EK	3.266	0.786	4.157	0
PV <-> PEB	3.754	0.915	4.105	0
SN <-> EB	5.785	1.057	5.473	0
SN <-> EK	6.65	1.103	6.031	0
SN <-> PEB	8.376	1.266	6.618	0
SN <-> PV	3.592	0.921	3.899	0
PS<-> EB	1.679	0.54	3.107	0.002
PS <-> EK	1.778	0.566	3.143	0.002
PS <-> PEB	2.199	0.662	3.322	0.001

Interpretation: The results demonstrate strong, statistically significant relationships between key factors, with all p-values below 0.05. The relationship between Environmental Knowledge (EK) and Economic Benefits (EB) (estimate: 6.78, t-value: 5.763) highlights a robust link. Similarly, Pro-environmental Behavior (PEB) has a strong influence on EB (estimate: 8.487, t-value: 6.482). Social Norms (SN) also significantly impact EB (estimate: 5.785, t-value: 5.473). Furthermore, Positive Spillover shows a meaningful effect on EB and EK (estimates: 1.443 and 1.778). These findings underscore the importance of knowledge, behavior, and social influences in fostering sustainable actions.

Conclusion

The study concludes the significant positive effect of PEBs on positive spillover, suggesting that fostering initial eco-friendly actions can lead to broader societal benefits. By promoting initial pro-environmental behaviors through education and community engagement, it is possible to create a ripple effect of sustainable actions, ultimately contributing to global sustainability goals. Utilizing the influence of spillover effects in behavior modification projects can initiate a chain reaction of transformation, converting individual acts into a widespread commitment to environmental stewardship (Elf, 2019). Envision a society where recycling is not only an isolated action but rather the pathway to adopting a more environmentally friendly way of living. By establishing a clear and inherent link between composting and recycling, practitioners encourage recyclers to adopt composting practices, resulting in a stronger dedication to reducing waste (Sayara, 2020). Encouraging public transport passengers to carpool or bike enhances their environmentally favorable habits, creating a network of sustainable behaviors (Esztergár-Kiss, 2021). Thus, through the careful and precise implementation of these interventions, professionals may effectively and smoothly lead individuals from one environmentally friendly behavior to another, thus establishing a growing network of people dedicated to protecting the environment (Stapleton, 2022). In conclusion, this study offers valuable insights into the intricate relationship between pro-environmental behaviors and spillover effects. Through an extensive examination of factors such as environmental knowledge, personal values, social norms, and economic incentives, the findings highlight the transformative potential of initial eco-friendly actions in fostering a broader culture of sustainability. The research underscores that while environmental knowledge and personal values are critical in shaping individual behaviors, social norms serve as a powerful catalyst in driving collective environmental action. Additionally, the analysis reveals that economic benefits, though less influential, still play a role in certain contexts. The positive spillover effect of pro-environmental behavior into other socially responsible actions demonstrates that fostering sustainable practices is not only beneficial for the environment but also for societal well-being. Encouraging individual responsibility through education and community engagement can lead to a ripple effect of sustainable actions, ultimately contributing to the global sustainability agenda. This study thus provides a comprehensive framework for policymakers, educators, and community leaders to harness the power of behavioral spillover to achieve broader environmental and societal goals, fostering a more resilient and sustainable future.

Policy and Practice Suggestions

Based on the findings, several practical recommendations can be made:

- **Community-driven campaigns:** Utilize social norms to design neighborhood sustainability programs that promote visible green behaviors.
- **Curriculum Integration:** Strengthen environmental knowledge through school and university-level courses with experiential learning.
- **Incentive Realignment:** While economic benefits had limited direct impact, aligning incentives with social identity (e.g., eco-badges, community recognition) may be more effective.

- **Digital Nudging Platforms:** Use behavioral nudges via apps to promote PEBs and track spillover progress.
- **Policy Design:** Encourage spillover-aware policy frameworks that recognize how one sustainable action can trigger others.

Future Research Avenues

While the intentional adoption of pro-environmental behaviors can enhance individuals' engagement with climate issues and foster a sense of responsibility, its overall impact on broader behavioral changes and policy support appears limited, underscoring the need for more comprehensive strategies to promote sustainable practices (Lacasse, 2019). Furthermore, there is limited research examining the extent to which engaging in one pro-environmental behavior influences support for pro-environmental policies, as well as the mechanisms driving these spillover effects (Truelove H. B., 2016). Another study by (Wee, 2021) opens up opportunities for future research to conduct experimental studies that further investigate the effectiveness of different nudging techniques in promoting pro-environmental behavior change. Future research should also explore how various factors influence the connection between pro-environmental intentions and behaviors within the context of the Theory of Planned Behavior, and how these influences differ across various cultures (Ertz M. H., 2017).

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The Influence of Safety Culture on Safety Performance through the Mediating Role of Employee Engagement within the Context of a Small Island & Developing State: A case Study of the Mauritian Construction Sector

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Abstract

Occupational safety and health is one of the cornerstones in sustainable development so that employees stay in good health and contribute effectively to the economy of the country. Since safety issues can have a significant negative impact on both employee well-being and businesses' success, construction companies have a strategic challenge in risk management due to its hazardous, transient and dynamic nature. This study adds to the literature on safety culture by demonstrating that a psychosocially safe culture can prevent psychological distress and even mortality in dangerous workplaces. Numerous research has been carried out in recent years to investigate the connections between worker performance, safety climate, and safety culture. The purpose of this study was to investigate how employee engagement (EE) functions as a mediator in the relationship between safety performance (SP) and safety culture (SC) among construction sector workers. Good employee engagement not only improves the working conditions but also positively influences employee behaviours towards safety, which will ultimately lower the number of accidents that occur in the workplace. Moreover, it was noted that a lack of engagement from workers can also lead to psychological distress within an organisation. Data was collected from 381 participants, out of which 374 questionnaires were deemed fit and appropriate, to analyse the proposed conceptual model using structural equation modelling, or SEM. The questionnaire items were retrieved from previous studies and the meaning and significance of each questionnaire items were explained to construction workers. The results show that the relationship between safety culture and safety performance is partially mediated by employee engagement. Additionally, it was discovered that safety performance was significantly and favorably impacted by safety culture. This study also bridged the existing gap between worker safety performance and employee engagement, demonstrating that management commitment, a supportive work environment, and worker involvement were key drivers of a strong safety culture. This research is beneficial to any country or SIDS whose economic, societal, and occupational safety and health dynamics resemble that of Mauritius.

Keywords— Occupational Safety & Health, Safety Culture, Safety Performance, Employee Engagement, Mauritius

Introduction

One of the cornerstones of sustainable development is a safe & healthy workplace, one of the fundamental humans' right. The International Labour Organisation (ILO) estimates that human errors, structural inefficiencies, a lack of safety procedures, & good managerial systems cause approximately 3 million workplace deaths each year (ILO, 2023). Furthermore, non-fatal diseases & injuries affect 374 million workers annually, costing the world's Gross Domestic Product (GDP) about 4% in terms of lost workdays. It is an undeniable fact that workers, businesses and the society at large, has put the prevention of work-related illnesses and injuries at the forefront (LaDou, London & Watterson, 2018). Corporate safety culture has been linked to various industrial accidents whereby investigations determined safety culture as one of the factors contributing to the accidents. It is now commonly accepted that businesses with a strong safety culture are more successful in preventing workplace accidents & injuries (Kok, 2017). In recent years, safety culture has become a buzzword & has garnered attention from different types of industries (Fleming et al., 2018).

A panoply of studies has been conducted over the past years to examine the interrelationship between safety culture, safety climate & performance of workers (Clarke, 2006; Erickson, 1997; Kaltehet al., 2021). Safety culture is linked to safety performance since it affects employee's behaviour and conduct. It is noted that safety culture in organisations have shifted in recent years to emphasise the human element over technological features (van Nunen et al., 2018). One of the valuable assets of an organisation is employees. Endeavors should be directed in the creation of programs & policies to ensure occupational safety, health & well-being (Chari et al., 2018). A few researchers are of the opinion that the measurement of safety culture is dependent and visible on the proactive management of safety performance, thus recommending further research (Bautista-Bernal et al., 2024). In the study of Tengilimoglu et al., (2016), a model was proposed that provided evidence that workplace accidents do happen due to improper working conditions and unsafe practices. The research used safety culture as an independent variable, workers' satisfaction as mediator and safety performance as dependent variable.

According to scholars, determining the degree to which a strong safety culture would positively correlate with heightened safety levels & a lowering in workplace accidents is primordial (Aven & Ylonen, 2021). In line with previous studies (Breevaart et al., 2015; Kovjanec et al., 2013), employee engagement can be utilised as a mediator to test outcomes as related to work performance and leadership styles. Additionally, this has been reinforced in a multitude of studies where the influence of safety culture has been tested on safety performance through the mediation of employee engagement (Abeje & Luo, 2023; Quansah, Zhu & Guo, 2023). In a Chinese study, 305 manufacturing organisations were surveyed and out of the conclusion, it was confirmed that indeed employee engagement played a pivotal mediator in the link between safety culture and safety performance (Huang et al., 2019). Concerning studies related to workers' well-being, employee engagement has been used to test its effects on job performance outcomes. Adding to this, the research of Nkyaa (2023) showcased that a strong safety culture coupled with robust safety awareness programs, sound communication and reporting channels will eventually lead to employee engagement, motivation and participation.

Organisational culture, industry regulations, and work demands can have an impact on the link between employee engagement and safety performance. A few experts recommend carrying out further context-specific research to gain a better understanding of the relationship between participation and safety in various situations (Pereira, Delgoulet & Santos, 2023; Pilbeam & Karanikas, 2023). The present study aims to investigate the intricate relationship between safety culture, safety performance, and employee engagement in the construction industry in Mauritius. The majority of research on safety culture and safety performance has been conducted in developed and emerging economies, such as Ethiopia (Abeje & Luo, 2023), Iran (Kaltech et al., 2021), Malaysia (Naji et al., 2021), and the United States (Morrow et al., 2014). Studies on the relationship between safety culture and safety performance in SIDS, where socioeconomic, regulatory, and cultural dynamics diverge greatly from those in larger economies, is scarce. As a SIDS, Mauritius faces particular difficulties such as limited resources, a need for imported goods, and a blend of both expatriates and local workers, all of which can definitely have varying effects on safety performance and culture. This study will extend existing knowledge on safety culture, employee engagement, and safety performance within a SIDS context, specifically within the Mauritian construction industry. It will provide empirical evidence on how employee engagement mediates the relationship, offering practical recommendations for policy-makers and industry leaders.

Literature review

Safety Culture

Over the past three decades, the concept of safety culture has been widely examined across multiple disciplines, including anthropology, psychology, management, sociology, and engineering, to better understand safety-related issues within organizations (Henriqson et al., 2014). Despite extensive research, the definition of safety culture remains a subject of academic debate, with scholars offering diverse interpretations of the concept. The International Nuclear Safety Advisory Group (INSAG) (1991) characterizes safety culture as a set of organizational and individual attributes that prioritize nuclear plant safety based on its level of significance. More recently, Bautista-Bernal et al., (2024) extend this conceptualization by emphasizing that safety culture transcends individual attitudes and beliefs, incorporating preventive thinking, collective responsibility, effective communication, continuous training, proactive risk management, and the adoption of safe practices across all organizational levels. In high-risk industries such as construction, safety culture plays a critical role in minimizing workplace accidents (Cakit et al., 2020; Estudillo et al., 2024). By fostering a proactive approach to occupational risks, organizations can enhance safety compliance and reduce the likelihood of hazardous incidents (Benson, 2024). Furthermore, research suggests that strengthening safety culture leads to improvements in workers' safety consciousness and safety citizenship behaviors, ultimately fostering a safer work environment (Meng and Chan, 2024). These findings underscore the importance of embedding safety culture within organizational frameworks to ensure sustainable and long-term improvements in workplace safety.

Dimensions of Safety Culture

Management Commitment

Management commitment is widely recognized as a critical determinant of employees' attitudes toward safety, shaping their behaviors and adherence to organizational safety protocols (O'Toole, 2002; Rundmo and Hale, 2003; Seo et al., 2004; Su, 2021). Effective managerial involvement extends beyond mere regulatory compliance, encompassing active participation in safety initiatives, continuous monitoring, and fostering a culture of improvement within the organization (Fernandez-Muniz et al., 2007). The decision-making capabilities of managers exert both direct and indirect influences on organizational safety outcomes, reinforcing the need for leadership that prioritizes worker well-being (Fruhenet et al., 2019). A safe working environment has been shown to enhance job motivation and overall performance, highlighting the direct link between safety commitment and organizational efficiency (Ismail et al., 2021). Consequently, managerial commitment plays a pivotal role in mitigating workplace accidents, with transformational leadership proving particularly effective in fostering a proactive safety culture (Levovnik et al., 2025). While extensive research has examined management commitment

to safety from employees' perspectives, emphasizing its centrality to safety climate (Griffin and Curcuruto, 2016), there remains a gap in understanding management commitment from the perspective of managers themselves (Fruhen et al., 2014, 2019; Fruhen and Flin, 2016; Tappura et al., 2017). Given that managers are key decision-makers, their perceptions of safety responsibility, organizational constraints, and leadership strategies warrant further empirical investigation. Research further underscores the impact of management commitment on workers' safety behaviors, influencing their compliance and engagement in safety-related initiatives (Lim et al., 2018; Al-Bsheish et al., 2019; Fruhen et al., 2022). This is particularly relevant in high-risk industries, where strong managerial oversight is essential to reinforce safety culture and prevent severe industrial accidents (Levovnik et al., 2025).

Worker's Involvement

Worker involvement is a fundamental determinant of organizational safety culture, reflecting the extent to which employees engage, comply, and regulate workplace health and safety practices (Amirah et al., 2024). Conceptually, worker involvement encompasses both employee voice and active participation, highlighting the reciprocal relationship between organizational safety policies and frontline worker engagement (Preetha and Anand, 2024). Empirical evidence suggests that proactive worker participation in safety programs plays a pivotal role in accident prevention, reinforcing a culture of shared responsibility (Fleming et al., 2022). Beyond mere compliance, worker involvement serves as a mechanism for identifying and implementing reliable solutions that enhance occupational health and safety (OHS) standards, ensuring greater adherence to regulatory frameworks such as Occupational Safety and Health Act (OSHA) 2005 in Mauritius (OSHA, 2017).

A robust safety culture is contingent upon workers' active engagement, as their firsthand experiences and insights inform risk mitigation strategies and promote continuous safety improvements (Geller, 2017). However, many organizations fail to fully leverage worker involvement, thereby limiting the potential for sustained safety enhancements (Story and Kight, 2019). Critically, hierarchical organizational structures that enforce unidirectional communication—where safety directives flow exclusively from management to employees—serve as a barrier to an embedded safety culture (Emery and Savely, 1997). This underscores the necessity for inclusive safety frameworks, where workers are not only passive recipients of safety policies but also active contributors to the evolution of workplace safety norms.

Work Environment

The work environment is conceptualised as a set of institutional characteristics that either facilitate or impede workers' ability to perform effectively (Lake, 2002). A safe and supportive workplace fosters employee proactivity, reinforcing a culture where workers feel empowered to report safety concerns without fear of retaliation (Silla et al., 2017). In the construction industry, the dynamic nature of work environments and variability in safety culture significantly shape workers' attitudes toward risk and compliance. Lingard and Holmes (2001) highlight that individual risk tolerance is a key determinant of safety performance, underscoring the importance of organizational efforts to standardize safety practices.

The broader discourse on occupational health and well-being underscores the critical role of work environments in shaping psychosocial hazards, mental health, and overall workplace safety, particularly in high-risk sectors such as construction (Loudoun et al., 2024). Given the increasing emphasis on workplace safety, scholars have extensively examined strategies to enhance working conditions and minimize occupational risks (Gray et al., 2023; Scandura and Meuser, 2022; Dimotakis et al., 2023). Notably, Wright and Sha (2024) identify a strong correlation between work environment and safety culture, particularly within healthcare settings, suggesting that organizational safety practices are context-dependent. From a managerial perspective, proactive leadership is essential in fostering safe work environments. Zou (2011) asserts that safety-oriented management must adopt preventive measures and implement systematic incident evaluations to strengthen safety culture and drive continuous workplace improvements.

Employee Engagement

Employee engagement has increasingly become a critical area of interest for both scholars and practitioners, given its well-documented association with key organisational outcomes. Empirical research consistently demonstrates that high levels of employee engagement correlate with enhanced financial performance, improved customer satisfaction, and overall organisational success (Harter et al., 2002; Schneider et al., 2018). Additionally, engagement has been shown to influence employee attitudes, behaviours, job performance, and overall well-being (Bailey et al., 2017; Crawford et al., 2010; Halbesleben, 2010; Saks, 2006). Rich et al. (2010, pp. 619) define employee engagement as the "simultaneous investment of an individual's physical, cognitive, and emotional energy in active, full work performance". This conceptualisation aligns with Kahn's (1990) foundational work, which describes engagement as the process through which employees bring their whole selves, encompassing physically, cognitively, and emotionally, into their professional roles (pp. 694). Work engagement refers to the dynamic relationship between an individual and their job role, whereas employee engagement extends beyond

this interaction to encompass the employee's broader connection with the organisation as a whole (Schaufeli, 2013). Employee engagement encompasses both emotional and cognitive dimensions, manifesting in zeal, passion, contentment, self-assurance, empowerment, and overall positive attitudes. It reflects an individual's "preferred self" in the workplace, influencing behaviours that strengthen interpersonal relationships and enhance professional interactions (Turner and Turner, 2020). Kwon et al., (2024) posit that employee engagement is closely linked to growth, with three key antecedents influencing this relationship: individual traits, social interactions, and workplace dynamics. According to a study conducted by Tong et al. (2023), psychosocial factors significantly influence workers' occupational psychological conditions, particularly burnout and engagement, which subsequently impact their safety performance. Role ambiguity, interpersonal conflict, work-family conflict, and work-related stress negatively correlate with safety performance by reducing engagement and increasing burnout. Conversely, higher levels of work engagement, lower burnout, greater autonomy, and strong social support are positively associated with improved safety performance (Tong et al., 2023).

Safety Performance

Safety performance is a measure of an organisation's degree of safety performance; poor safety performance can be shown in safety-related incidents like accidents and injuries or safety behaviours like involvement and compliance. Poor performance, in particular, can cause collateral harm and financial hardship for the company and its workers (Syed-Yahya et al., 2022). A crucial component of safety management systems, safety performance, essentially gives information on the system's quality in terms of its design, execution, and outcomes. According to Sgourou et al. (2010), safety performance evaluation thus affects decision-making about occupational safety and health issues. Retrospective or lagging indicators, as they are commonly called, are used to measure and statistically analyse incident-related data (such as the number of injuries and illnesses, accident frequency and severity rates, and accident costs) in order to assess safety performance (Sgourou et al., 2010). While lagging indicators relate to safety outcomes, specifically the frequency of worker injuries, leading indicators of safety performance measure the safety process as it applies to construction work. Both passive and active measures are included in leading indicators. Active measures are those that can start remedial action quickly, whereas passive measurements can be predictive over a long period (Hinze et al., 2013). Safety performance is also impacted by the creation of safety systems, safety practices, and safety procedures; monitoring of safety compliance; the formation of site-level safety committees; the dissemination of safety policies to site personnel; the involvement of safety officers; and the consultation between site staff and safety officers (Wong et al., 1999). Written safety incentives, safety orientation, and training, and pre-project/pre-task planning for safety are the most successful safety strategies for projects (Hinze et al., 2000). The use of new technologies in this expanding trend of technology has a significant impact on construction safety. According to Dobrucaliet al. (2024), the use of certain efficient technologies, such as wearable technology, virtual reality, artificial intelligence, and building information modeling (BIM), specifically improves safety performance.

Hypothesis Development

Relationship between Safety Culture and Employee Engagement

The existing body of literature provides substantial empirical evidence on the correlation between safety culture and employee engagement, with several studies highlighting the positive influence of a well-established safety culture on workforce participation and commitment (Biddison et al., 2016; Rahim et al., 2024). However, critical gaps persist, particularly concerning the inconsistent relationships between safety culture and employee engagement across different organizational contexts. While safety culture is widely recognized as a determinant of employee engagement, research suggests that the strength of this relationship remains contingent on the organizational environment and the extent of safety integration. Hence the following hypothesis:

H1: There is a positive relationship between Safety Culture and Employee Engagement

Incremental improvements in safety culture have been shown to enhance employee engagement, fostering a workplace climate where employees feel psychologically secure and actively contribute to safety initiatives. Given that safety culture is multi-dimensional, encompassing management commitment, worker involvement, and the broader work environment, a more nuanced examination is required to understand how these dimensions interact to shape employee engagement. Future research must therefore move beyond generalized correlations to explore the mechanisms through which safety culture translates into meaningful engagement outcomes for workers.

Nasomboon (2014) emphasizes that committed leadership within an organization exerts a profound influence on employee behaviour and engagement. When managers actively participate in safety initiatives, it fosters a culture of compliance, reinforcing employees' commitment to safety regulations. Within the construction industry, the impact of leadership on safety engagement becomes even more pronounced. As Mahfouz et al. (2019) assert, transformational leadership plays a pivotal role in cultivating a safety-oriented workforce, inspiring workers to internalize organizational values and actively contribute to safety outcomes. By prioritizing worker well-being and integrating safety into core management practices, leaders can drive engagement, enhance compliance, and ultimately foster a proactive safety culture that translates into sustainable improvements in organizational

performance.

Additionally, workers' involvement is a critical determinant of employee engagement, particularly in fostering a strong safety culture within organizations. As Hu, Jimmieson & White (2022) assert, workers' involvement extends beyond mere compliance with health and safety practices to active participation in shaping a safe work environment. The extent to which employees are engaged in these practices directly influences their attitudes and behaviors toward risk management, reinforcing a proactive safety culture (Abeje & Luo, 2023). From an organizational perspective, greater employee involvement in safety practices translates into higher engagement levels, fostering a collective sense of responsibility for workplace safety. This dynamic interaction between involvement and engagement enhances organizational resilience, ensuring sustained improvements in safety performance (Schneider et al., 2018).

Furthermore, empirical evidence consistently highlights a strong positive relationship between work environment and employee engagement (Hanaysha, 2016). The work environment serves as a defining characteristic of an organization, shaping employee experiences and influencing their level of commitment (Zhenjing et al., 2022). When employees perceive their workplace as secure and conducive to their well-being, they are more likely to engage in proactive safety behaviors, reinforcing a culture of engagement and risk awareness. Thus, organizations that prioritize a positive work environment can drive higher levels of employee engagement, ultimately enhancing overall workplace safety and performance.

Relationship between Employee Engagement and Safety Performance

The active involvement of employees in safety practices may consistently decrease the likelihood of human errors by enhancing their awareness of tasks, surroundings, and potential hazards, including possible human errors. Consequently, higher levels of employee engagement in safety-related activities could potentially correlate with improved safety outcomes, as indicated by conventional safety metrics such as accident frequency rates (Wachter and Yorio, 2014). Research has demonstrated a correlation between employee engagement levels and positive outcomes for organisations, including enhanced productivity, improved quality, reduced staff turnover, higher customer satisfaction, and increased profitability (Raines, 2011; Vance, 2006).

H2: There is a positive relationship between Employee Engagement and Safety performance

Organisations are increasingly focusing on employee engagement, which has been consistently associated with enhanced job performance (Rich et al., 2010). This engagement might play a crucial role in shaping employee safety behaviors. In fact, researchers in the field of safety have suggested that job engagement influences safety behaviors and outcomes (Nahrgang et al., 2011). Extending the relationship between job engagement and job performance further, engagement may also significantly impact safety performance. However, the connection between engagement and safety performance has not been adequately explored empirically in existing literature. Some safety studies have touched on engagement indirectly, for instance, Hansez and Chmiel (2010) utilized positive occupational states as a measure of job engagement. In their meta-analytic model, Nahrgang et al., (2011) conceptualized engagement as involvement, participation, and communication related to safety.

Relationship between Safety Culture and Safety Performance

The state of safety culture research was greatly advanced by a number of meta-analytic studies that were published between 2006 and 2010 and included thorough assessments of earlier safety culture studies (Christian et al., 2009, Clarke, 2006, Beus et al., 2010). The term "safety performance" is used to refer to a variety of safety outcomes that have been used as dependent variables in safety culture studies. These outcomes range from organization-level safety outcomes like accident and injury rates to observed or self-reported employee safety behaviours such as following procedures, wearing personal protective equipment, and participating in safety meetings). Measures of safety culture and other safety performance indicators should be related, according to the study's hypothesis (Morrow et al., 2014)

H3: Safety culture correlates positively on safety performance

In the context of Taiwan's railway industry, a study found that safety performance is positively impacted by a strong safety culture (Hsiang, 2011). This shows that incident prevention and worker protection can benefit from an organisational culture that actively encourages safety and is backed by tangible measures. According to Bisbey et al., (2021), enabling variables creates the framework for individual workers to embrace safety culture-informing beliefs, values, and practices. When employees as a group internalise consistent presumptions, values, and conventions, safety culture progressively becomes integrated. The behaviours of employees reflect these ideas, which in turn affects safety performance. Studies showing a successful decrease in accidents and an improvement in safety performance metrics (Kaltehet al., 2019) suggest that safety culture has a positive correlation on safety performance (Nana et al., 2020). Through the mediation of worker satisfaction, Tengilimogluet al., (2016) present a model that illustrates the beneficial impact of safety culture on safety performance and concludes that unsafe practices and working circumstances are the primary causes of workplace accidents. The extent to which a strong

safety culture would correlate with increased safety and fewer accidents is a crucial question, according to recent research (Aven and Ylönén, 2021).

Employee Engagement mediates the relationship between safety culture and its impact on safety performance

The prior studies portray that employee engagement can enhance safety culture (Amirah et al., 2024). Employee engagement and workplace safety results are linked, according to the related literature. According to Harter et al., (2009), for instance, a meta-analysis revealed that business units with the highest involvement levels (25 percent) have 49% fewer safety occurrences than those with the lowest engagement levels. High levels of involvement and absorption in their work are more likely to be found among employees who identify as engaged (Saks, 2006). An employee who is not engaged is less committed to their task and more prone to errors. The theoretical connection between safety and engagement at work is provided, and this has important ramifications for industries where safety is a crucial consideration (Whiteoak et al., 2016).

H4: Employee engagement mediates the relationship between safety culture (management commitment, worker's involvement and work environment) and safety performance (leading and lagging indicators)

Employee engagement is used in this study to mediate the relationship between safety culture and safety performance. The most widely used term to describe safety culture is "the result of individuals and groups' beliefs, attitudes, competencies, and behaviour patterns." It establishes an organisation's dedication to, approach to, and effectiveness of safety and health (S&H) management (International Atomic Energy Agency, 1991). In the new approach to improving safety performance outcomes, safety culture is a key idea. A positive work environment where employees are aware of risks and how to prevent accidents is the goal of safety culture (Arzahan, Ismail & Yasin, 2022). Nonetheless, the literature on the idea of safety performance lacks a definitive consensus. Most scholars base their interpretations on their own experiences (Yu-Jung et al., 2013; De Koster et al., 2011), for instance, safety performance is described as an organisation's ability to prevent accidents or injuries connected to the workplace. In the last few decades, safety culture and climate have gained a lot of attention due to their effect on organisational safety performance.

Organisational indicators like work arrangements, operational indicators, lagging indicators like fatality and injury rates, and resilience-based indicators have all evolved historically in tandem with the progress of the safety approach (Reiman and Pietikainen, 2012). Throughout history, the most prevalent performance measure of organisational safety has been incidents and injuries, sometimes known as lagging indicators (Reiman and Pietikainen, 2012; Grabowski et al., 2007). The significance of leading indicators has been highlighted in the past ten years due to the criticisms of depending solely on lagging data (Bitar et al., 2018). It is most frequently criticised that although lagging indicators are generally easier to obtain, they do not help predict or anticipate future negative events; rather, they only provide information about negative safety events that have already happened (Bitar et al., 2018; Brauer, 2016, Hinze et al., 2013, Yorio, 2020).

As a proactive management strategy for construction safety, safety leading indicators have been studied (Xu et al., 2023). In light of this, safety leading indicators have received more media attention lately (Alruqi and Hallowell, 2019; Guo et al., 2017; Hallowell et al., 2013; Hinze et al., 2013b; Lingard et al., 2017; Xu et al., 2021). By identifying the shortcomings and strengths of management systems and potentially incident-causing circumstances, safety leading indicators concentrate on the process of organising safety procedures and evaluating safety performance (Xu et al., 2021). Guo and Yiu (2016) state that they encourage preventive measures and offer an early warning of upcoming negative outcomes. Continuous learning and an adaptive safety system are made possible by the monitoring of safety leading indicators, which might yield information beyond specific occurrences (Salas & Hallowell, 2017).

Conceptual framework for the research

Based on the literature review, a conceptual model has been developed. In Mauritius, there is no research which has been done concerning the impact of safety culture on safety performance of workers through the mediation of employee engagement in Mauritius.

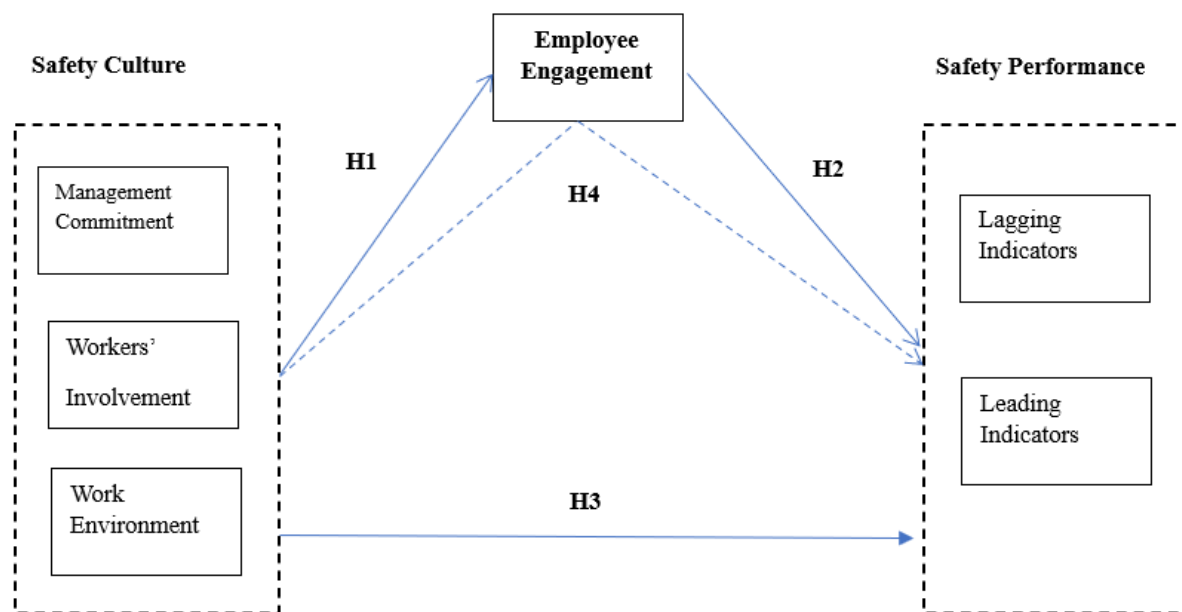


Fig 1. Proposed conceptual model of study

The independent variable in this novel study was safety culture, the dependent variable was safety performance, and the mediator was employee engagement. As a result, the conceptual framework of the final model sought to validate and estimate the model's fitness while simultaneously supporting the suggested direct and indirect influences of the mediating variable. In order to validate the results of this investigation, the suggested conceptual model, as seen in Figure 1, will eventually apply the methods of path modelling and structural equation modelling.

Specificity of construction sector within Mauritian context

Globally, the construction industry has been recognised globally as one of the hazardous sectors (Bulat, Hirose and Protic, 2018; Man, Chan, & Alabdulkarim, 2019). In addition to being regarded as one of the most important sectors for economic growth (Le et al., 2014), construction also has a substantial impact on workers' occupational safety and health (OSH) (Suazo and Jeselskis, 1993). Scholars argued that the construction sector is a unique, intricate, and hazardous to work (Sawacha, Naoum, & Fong, 1999; Kines, 2002; Tam, Zeng and Deng, 2004; Aneziris, Topali, & Papazoglou, 2012). In the context of the global market, occupational safety and health (OSH) issues in the construction sector are a worldwide problem that are not specific to any one nation. More significantly, the ongoing accidents and fatalities have made this sector one of the most dangerous in terms of safety (Hinze and Rinker, 2008). The construction sector's distinctive characteristics, such as its temporary workforce, requirement for work at height, dynamic and fluctuating risks, and extreme and demanding physical and mental requirements for the working process, which all contribute to workplace accidents (Hamid, Abd Majid, Singh, 2008).

The construction industry is one of the hazardous industries whereby the rate of fatalities is alarming and these incidents require immediate notification to the Ministry of Labour and Training upon occurrence (ISO, 2022). This is in line with the findings of other studies which point out the inherent hazardous specificities of the industry (Masi and Cagno, 2015; Bulat et al., 2018; Lucas et al., 2020). The high surge of workplace incidents suggest that workplace safety and health differ greatly across industry and it demands focused interventions in the construction sector for reduction of workplace accidents (Chetty et al., 2024). In Mauritius, safety and health legislation have been strengthened in the construction sector with more stringent regulations as a result of the numerous accidents on construction sites. In a study of Kuyoki and Smallwood (2017), employees suffered injuries on construction sites because of their ignorance on how to use personal protective equipment appropriately. In furtherance to this, other reasons such as socio-economic, cultural and religious beliefs, and insufficient safety training were stated as grounds for unsafe work practices in the construction industry.

Methodology

Research Design

The aim of the research design approach is to meet the objectives of this study and to validate the findings with regard to the research questions set. Workplace safety and health is of paramount importance in the construction industry due to its high rate of incidents and fatalities, as previously mentioned, hence this research based on safety culture, safety performance and employee engagement is crucial. A quantitative research method will be adopted to examine the relationship between safety culture and safety performance as well as the role that employee engagement plays in mediating this relationship. An increasing amount of study has focused on the relationship between safety culture, and more specifically safety climate, and its impact on safety outcomes, of which safety performance is a component. A panoply of studies has examined how safety culture can be a precursor of safety performance (Cheyne & Cox, 2000; Kasim, et al., 2019).

Sampling Techniques and Data Collection

The population size of employees in the construction section is estimated as 40, 100 as per Statistics Mauritius (2022). The Raosoft calculator was used to confirm the sample size. Based on a 95% confidence level, 5% margin error and a 50% response rate, the calculated sample size was shown to be 381 as per the formula of Saunders, Lewis and Thornhill (2009). Selection of respondents on construction sites was done on a random basis so as to ensure unbiased and equal distribution of respondents. Respondents were informed of the survey, their consent was asked and after obtaining the same, they were explained the meaning of the question due to their education level on construction sites which is low. Further to distribution of the 381 questionnaires on various construction sites, 374 questionnaires were collected and data analysis done through SPSS/ SMARTPLS statistical tools.

Measures

To examine the different variables at play, this study has adopted validated sources of questions that were modified from earlier studies. The dependent, independent, and mediating factors were evaluated using a five-point Likert scale, yielding three construct variables and forty statement questions. This thorough approach made it easier to comprehend the topic in a more nuanced manner.

Table 1. Sources of instruments used

Constructs	Dimensions	Number of items	Sources
Safety Culture (SC)	Management Commitment (MC)	9	Cox and Cheyne, 2000; Vinodkumar and Bhasi, 2010
	Workers' Involvement (WorkInv)	5	
	Work Environment (WorkEnv)	5	
Employee Engagement (EE)		7	Macey and Schneider, 2008; Harter, Schmidt, and Hayes; 2002
Safety Performance (SP)	Lagging Indicators (LaggInd)	5	Sheehan et al., 2016; Shamim, 2019
	Leading Indicators (LeadInd)	4	

The sources from which each measure was adopted and tailored as displayed in Table 1. All measures were assessed using a five-point Likert scale (1 - **Strongly Disagree**; 2 - **Disagree**; 3 - **Neutral**; 4 - **Agree**; 5 - **Strongly Agree**).

RESULTS

Demographic Data Analyses

374 valid questionnaires were retrieved after elimination of a small proportion of invalid questionnaires, indicating a high response rate from the participants. Table 2 shows the demographic profile of the respondents with the percentage of male and females being 79.6% and 20.4% respectively. Concerning the gender structure, the data shows that there were more men than women which is quite peculiar about construction industries in Mauritius. Based on the age range of the respondents, 27.8% of the total respondents were between the age of 40-49 years, 18.7% between the age of 30-39 50-59 years, followed by 1.9% of respondents who were in the age range of above 60 years old as displayed in the below table. Most respondents were married (69.3%), followed by a small proportion being single (27.0%) and 3.7% were divorced. In terms of education, a comparatively high percentage of individuals had secondary and vocational training, which is consistent with the characteristics of workers in the construction sector. In terms of job experience, the majority of the staff members had 16–20 years of experience.

Table 2. Demographics characteristics of respondents

Variable	Sub-Category	% Within population
Gender	Male	79.6
	Female	20.4
Age (years)	20-29	18.7
	30-39	18.7
	40-49	27.8
	49-50	13.9
	50-59	18.7
	Above 60	1.9
Work Experience	1-5	13.9
	6-10	16.8
	11-15	20.6
	16-20	33.2
	21 and above	15.5
Marital Status	Single	29.0
	Married	69.3
	Divorced	3.7
Level of Education	Post Graduate/ Graduate	3.7
	Secondary	18.7
	Primary	3.7
	Vocational	73.8

Source: Primary Data

Structural Equation Modelling Using Partial Least Squares (PLS-SEM)

Structural Equation Modelling (SEM) applies a multivariate technique for evaluating the reliability of competing hypotheses and collects data based on a context or idea (Kecklundet al., 2001, Reimer et al., 2007). There are essentially two main approaches to SEM which are covariance-based structural equation modelling (CB-SEM) and partial least squares and structural equation modelling (PLS-SEM) (Kecklundet al., 2001; Ghaleb et al., 2021). In comparison, PLS-SEM offers much more flexibility compared to CB-SEM in defining the relationship between items and constructs (MacKinnon, 2011). SEM has been applied in various spheres such as construction, manufacturing industry, hotel management, the physical environment, amongst others (Lei and Wu, 2007, Williams, Vandenberg, and Edwards, 2009).

Reliability and Validity Test of the Measurement Model

To evaluate the study's measurement model, tests for reliability and validity were performed. The reliability assessment involved examining four key indicators: standardised indicator loadings (SIL), Cronbach's Alpha (CA), Composite Reliability (CR), and Average Variance Extracted (AVE) as displayed in Table 3.

Table 3. Reliability and Validity Test

Path Relationships	Standardised Indicator Loadings	Cronbach Alpha	Composite Reliability	Average Variance Extracted
SC		0.859	0.890	0.589
MC1←SC	0.655			
MC3← SC	0.692			
MC5 ←SC	0.634			
MC8←SC	0.710			
MC9←SC	0.778			
Work Inv1 ←SC	0.778			
Work Inv2←SC	0.768			
Work Inv3←SC	0.624			
Work Env1←SC	0.786			
Work Env2←SC	0.670			
Work Env3←SC	0.609			
Work Env6←SC	0.650			
EE		0.887	0.890	0.689

Path Relationships	Standardised Indicator Loadings	Cronbach Alpha	Composite Reliability	Average Variance Extracted
Mgt Com←EE	0.658			
Work Invol←EE	0.777			
Work Env←EE	0.768			
Safety Performance		0.90	0.914	0.565
LagInd1←SP	0.865			
LagInd2←SP	0.833			
LagInd3←SP	0.875			
LagInd4←SP	0.694			
LagInd5←SP	0.776			
LeadInd1←SP	0.750			
LeadInd2←SP	0.758			
LeadInd3←SP	0.771			
LeadInd4←SP	0.820			

Source: Primary Data

According to established guidelines, the values for CA (Mikalef, and Pateli, 2017), CR (Aboelmaged, 2018), and SIL (Zeng, Huang, & Hueng, 2016) should exceed 0.70, while each construct's AVE value should surpass 0.5 (Henseler, Ringle & Sarstedt, 2015; Kineber, 2020). The results indicated that AVE values ranged from 0.565 to 0.689 (>0.500), CR values spanned from 0.890 to 0.914 (>0.700), CA values fell between 0.859 and 0.90 (>0.700), and SIL values were between 0.609 and 0.875. Although a few values were below 0.70, they remained within acceptable limits (Love et al., 2011). It is important to mention that some sub-variables within the constructs of Management Commitment, Work Environment, and Employee Engagement were eliminated to achieve satisfactory reliability and validity levels.

Structural Model

R² values (predictive power), t-values, and b-values are used in a "bootstrapping technique of 5,000 samples" to assess the structural model, as done in previous research (Ghaleb et al., 2021; Hair et al., 2014). In accordance with Kaufmann & Gaeckler (2015), the effect size f² and Q² values must also be reported. According to Sullivan & Feinn (2012), a "p-value" can showcase if there is a significant influence, however, it will not report on the magnitude of effect. In research, it is primordial to report and understand the relationship between effect size and statistical significance (p-value). Additionally, the model's predictive relevance (Q²) was examined using a blindfolding test, which is only calculated for dependent variables (DV). Only endogenous (dependent) constructs with one or more components are suitable for use, and Q² validates that the observed relationships are both statistically significant and useful (Geisser, 1975).

The R² values of the employee engagement (0.898), safety lagging indicators (0.812) and safety leading indicators (0.861) showed that the model had good predictive power in Table 4.

Table 4. Findings of Hypothesis Testing

Hypothesizes	H1	H2	H3
Item Relations	SC→EE	EE→SP	SC→SP
Path Coefficients, β	0.919	0.671	0.328
STDEV	0.127	0.012	0.017
T-Value	27.557	85.118	53.148
P-Value	0.000	0.000	0.000
f ²	0.382	0.389	0.308
Significance Level	***	***	***
Results	Supported	Supported	Supported
Constructs	R ²		
Employee Engagement	0.898		
Safety Leading Indicators	0.861		
Safety Lagging Indicators	0.812		

Source: Primary Data

Another means of showing the predictive power was the Q² values whereby the values for employee engagement (0.898), safety lagging indicators (0.812) and safety leading indicators (0.861) were more than zero thus

demonstrating good predictive power. The magnitude of the influence f2 for employee engagement with notable safety lagging indicators and safety leading indicators is shown in Table 4. The effect of f2 was large on the variables except for the relationship (Work Inv -> EE) which had a small effect. In the final structural model, employee engagement served as the mediating variable. A redundant indicator technique was employed to identify the latent variables for each of the higher-order constructs, which included management commitment, employee involvement, work environment, and safety performance indicators.

Analysis of Mediation Effect

In order to check for the mediation influence, the bootstrapping technique was applied in this study (Mooney, Duval and Duval, R., 1993). Such indirect effects have been examined in earlier studies, and this study approach has been employed and recommended by a number of researchers (Al-Mekhlafiet al., 2020; Cheung & Lau, 2008; Preacher & Hayes, 2004). Additionally, bootstrap findings are claimed to have accuracy in probability estimates because of this method's aid in overcoming mediation challenges and the absence of a confidence interval for the mediator and outcome variables (Ortiz et al., 2013). Consequently, this approach must be employed for two reasons. On a first instance, the method of bootstrapping serves as a practical tool which can be used in a wide range of situations to establish the significance and confidence intervals. The mediation relationship is established with the evidence of an indirect relationship between X and Y and the 95% confidence level exceeds zero. The assumptions of the bootstrapping method with regard to mediation is rather accurate.

Table 5. Mediation analysis for direct and indirects effect.

Mediation Impact	Path Coefficient, β	STDEV	T-Value	95% LL	95% UL	Results
H4: SC-EE-SP	0.367	0.022	16.823	0.31	0.393	Partial Mediation

If $**P < 0.01$; STDEV, Standard Deviation; LL, Lower Level; UL, Upper Level;

H4, Hypotheses.

Source: Primary Data

The indirect effect findings, as shown in Table 5, show that the mediation relationship of both, direct and indirect effects, was supported.

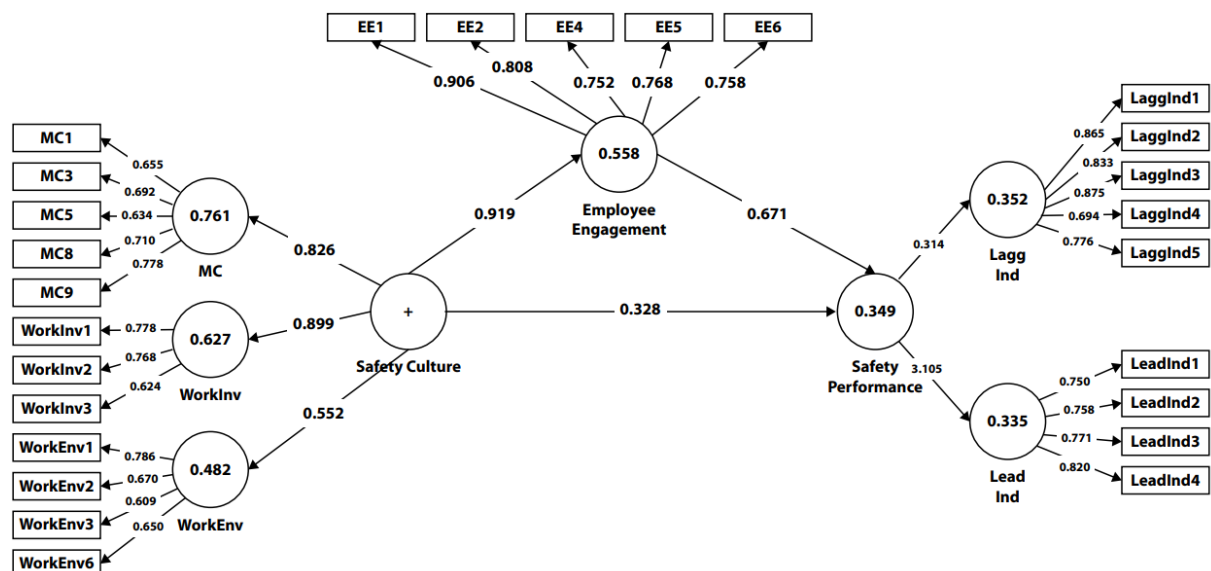


Fig 2. Final Structural Results (PLS Results)

Discussion

This research investigated how safety culture influences safety performance in the Mauritian construction industry, focusing on the role of employee engagement. Since it highlights the importance of employee engagement and safety culture in improving workplace safety and safety performance in the construction sector, the findings have significant national and international implications. The findings do not apply only to Mauritius but also to any other nation or SIDS that has similar specificities in ensuring worker safety. This study emphasizes the need of cultivating a safety culture and establishing a favourable safety climate in order to enhance worker

safety performance. This study also emphasises how crucial it is to involve employees in safety-related activities in order to improve safety performance, work environment, and safety culture. This finding is in line with previous studies that highlight the importance of safety climate and culture in influencing actions and improving safety performance (Jilcha&Kitaw, 2017; Mosly; 2022; Suprpto, Pujawan, & Dewi, 2022).

This study contributes to the body of literature on safety culture by showing that, even in hazardous workplaces, psychological suffering and death can be avoided with a psychosocially safe culture. Few studies have examined this relationship in high-risk situations like accidents and fatalities with a SIDS context (Feng et al., 2014; Mirza et al., 2022; Rassolet al., 2020; Zadow & Dollard, 2015). Furthermore, the majority of past studies on injuries were used as indicators of workplace safety, and a lack of study has been done on the relationship between worker safety performance and safety employee engagement. This study fills this major gap in regarding workplace safety and health. This research revealed that when employees are exposed to a good safety culture through management commitment, a conducive work environment and involvement of workers in decision-making, the safety performance and employee engagement both improve (Stemnet al., 2019; Yang et al., 2009). Consequently, the present study makes a substantial contribution to the body of knowledge in this field. The results of the study showed that the organisational context and management implications has an impact on how successful a safety culture is. The results showed how safety culture impacted employee engagement which further affected safety-based outcomes. It is worthy to note that a lack of engagement from workers can also lead to psychological distress within an organisation. The conclusions of this study support the need for great visibility while implementing effective development on a broad scale. Moreover, this study establishes the framework for further research in this field by analysing the efficacy of different components of safety culture in diverse organisations and cultural contexts. Both negative and positive outcomes of a poor safety culture could be added to the model to check for further implications in a SIDS context.

Conclusion

This study underscores the pivotal role of employee engagement in mediating the relationship between safety culture and safety performance within the Mauritian construction industry. A strong safety culture, reinforced by a positive safety climate, directly enhances workers' safety performance, emphasising the need for organisations to prioritise safety initiatives. There is no doubt that this will not only enhance their commitment to safety protocols but will also foster a more engaged and proactive workforce. Furthermore, this study bridges the existing gap between worker safety performance and employee engagement, demonstrating that management commitment, a supportive work environment, and worker involvement are key drivers of a strong safety culture. When employees perceive that their safety concerns are valued and that they have a voice in decision-making, their engagement levels increase, ultimately leading to improved safety outcomes. The study also highlights that a lack of workers involvement can contribute to psychological strain, further reinforcing the need for organisations to adopt a holistic approach to workplace safety. To build on these insights, a new framework for analysing safety culture across different organisational and cultural contexts is proposed. This would allow for a more nuanced understanding of how various components of safety culture interact, ultimately leading to more effective safety strategies tailored to a diverse work environment.

Implications

This study has important national and international implications which contribute to amend or bring changes in the policy decision pertaining to diverse health and safety domains. These hazardous industries can benefit from this novel framework and will thus improve the safety culture in their respective workplaces. It is important for employers to reinforce safety culture in their workplaces, specifically paying attention to Management Commitment, Workers' Involvement and Work Environment. Thus, managers working in hazardous industries need to implement safety culture policies and encourage employees to favour the same. The more workers are involved in safety culture, they are prone to comply with occupational health and safety standards and regulatory framework such as Occupation Safety and Health Act (OSHA) 2005. A positive work environment reinforces safety culture as it shapes workers attitudes towards risk and compliance and thus enhancing the wellbeing of workers. It is worth noting that safety culture also leads to employee engagement which ultimately contributes to safety performance. Employee engagement can improve both lagging and leading indicators. Lagging indicators can be used to obtain information about negative safety events whereas leading indicators can be used to identify strengths and weaknesses of the management system. This implies that management should consider leading and lagging indicators when reinforcing safety performance for workers. Hence, organisations should consider the positive influences of safety culture in promoting safety performance.

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Effect of OTT Video Service Integration on Customer Retention in Indian Telecommunication Industry

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Abstract

The Indian telecommunication industry has reached a 3-player equilibrium with a fixed number of subscribers; hence customer retention has become a critical factor. Over-the-top (OTT) content services refer to the content delivered to digitally enabled users without the use of cable or satellite television via the internet. The purpose of the study is to determine the impact of OTT video service in integration on customer retention in the Indian telecommunication industry and its significance when compared to other retention parameters. The study uses convenience sampling strategy to distribute a self-administered survey to 394 telco (Telecommunication companies) users across India. The model and study's hypothesis were evaluated using assessment modelling methodology, with AMOS evaluation tool. The outcome of the study shows that OTT video service integration by telcos have a significant positive influence on service quality, customer's perceived value, satisfaction and switching costs, thereby positively influencing customer retention. The study suggests that the telcos should be focusing more on OTT platform partnerships. The study fills the gaps in customer switching intention prediction made in literature by adding the OTT services into the mix. The study reveals that the OTT video service integration will be the next focus telcos.

Keywords: Telecommunication, Customer Retention, Service Quality, Customer Satisfaction, Over-The-Top Video Service Integration.

Introduction

India being the second largest telecommunication market globally, has 1.14 billion subscribers, 90.7% of the market share is held by three major players, Reliance Jio (37.61%), Bharati Airtel (32.42) and Vodafone Idea Limited (20.7%). With total subscribers seeing minimal changes, the focus for the telcos is customer retention. During the financial year 2021-2022, 113.09 million subscribers have submitted their porting requests to different service providers for availing mobile number porting (MNP) facility. There is sufficient evidence that acquiring new customers is more challenging and expensive than retaining existing customers, irrespective of the industrial sector type (Saeed, Hussain, & Riaz, 2011). Customer switching behaviour has become a common practice and a critical issue for the Indian telecommunication firms. In most service contexts, customer switching is associated with negative consequences, such as declining market share and poor profitability (Keaveney, 1995). To control switching, mobile service providers are increasingly relying on contracts that lock in customers for a pre-determined period (Braff & Laogue, 2004). Thus, customer retention is a crucial factor for stability and profitability of the telecommunication firms.

With increasing smartphone, 4G penetration and introduction of 5G technology, Indian wireless subscribers have started consuming content over the top (OTT) via the internet. Over the top (OTT) services refer to the content delivered to the digitally enabled user without the use of cable or satellite television via the internet. As per the study by KPMG in 2019, India's online video market is one of the biggest and profitable markets in the world. The study predicts that India will have more than 500 million online video subscribers by FY 2023, and this would make India the second biggest market in the world behind China alone. As per the study, the internet video traffic is projected to reach 13.5 Exabytes (EB) per month by 2023, up from 1.5 EB per month in 2017; with video contributing 77 per cent of all internet traffic by 2023.

Telcos act as the key distributing partners for OTT players in India, as per the study by KPMG, 87% of OTT content consumers in India use mobile phone as the medium. About 43% of OTT subscriptions taken in India are bundled with telco plan offerings. It is projected that 400 million users will be viewing online videos through telecom bundles by end of 2023 (Lata Jha, 2021). With retention being the primary focus, OTT being the next big revenue generating and customer attracting proposition for telcos, the industry is leveraging on OTT platform partnerships for sustained and profitable business. In this context, the study examines the relationship between OTT video service integration provided by telcos, service quality, switching costs, customer satisfaction, perceived value, and customer retention. The article starts by reviewing the literature and presenting a rationale for the hypothesis's development. The research design and methodology then follow. We next present our findings and discuss those. The last parts of the article deal with our conclusion and any limitations.

Literature Review

The literature on customer retention in the telecommunications industry highlights multiple factors influencing consumer loyalty, especially with the emergence of Over-the-Top services as value-added components. This section presents a synthesis of studies addressing customer retention drivers — such as satisfaction, perceived value, service quality, and switching costs — and explores how OTT video service bundling by telecom operators in India is reshaping these dynamics.

Factors Influencing Customer Retention

Multiple studies have explored customer retention in telecom, often treating satisfaction, perceived value, service quality, and switching costs as separate, independent variables. Aydin and Ozer (2005) and Jones (2002) highlighted how switching costs, in particular, tend to have a more significant effect than price or quality in preventing churn. Further supporting this, studies by Jones, Mothersbaugh, and Beatty (2000), Heskett et al. (1994), Copacino (1997), and Ladhari et al. (2011) found that higher perceived service quality and customer satisfaction often lead to stronger retention outcomes.

Burnham, Frels, and Mahajan (2003) broke down switching costs into financial, procedural, and relational dimensions, concluding that relational and procedural costs have the strongest influence in deterring customers from changing providers. Similarly, Joseph and Joachim (2009) emphasized that even when service quality is adequate, switching costs often anchor customers within the telecom ecosystem.

Satisfaction and loyalty are tightly linked in this space. Zeithaml et al. (1996) and Bolton et al. (2000) argued that service quality contributes to satisfaction, which in turn increases the likelihood of customer retention. Zhang (2009) added that relationship marketing tactics can improve trust and satisfaction, further stabilizing customer relationships. As Zeithaml (1988) noted, perceived value — how customers weigh benefits against costs — plays a key role in influencing retention, especially when combined with positive service experiences. More recent evidence continues to support this. Nagaraj et al. (2021) suggested that perceived value, service quality, and satisfaction do not act in isolation but reinforce one another. This study, therefore, aligns with an integrated model where all four variables — satisfaction, value, quality, and switching costs — either directly or indirectly affect retention.

OTT Video Services and Telecom Retention

OTT video platforms, once considered competitive threats to telecom firms, are now being repositioned as strategic allies. Sujata (2015) warned that OTT services could erode telco revenue, but more recent research provides a different view. Korzunowicz (2019) and Krämer (2019) propose that telcos and OTT providers can benefit from partnerships, particularly when bundled offerings enhance user engagement. Farooq (2019) also suggested bundling OTT content with telecom data plans as a smart way to monetize both customer loyalty and content delivery.

Bokström and Eriksson (2023) found that OTT subscriptions embedded in telecom plans enhance satisfaction and retention, particularly for young consumers. Singh et al. (2024) used machine learning techniques and found OTT usage to be a major predictor in churn models. Sharma and Harsora (2023) reported that consumers show a stronger intention to stay with providers offering OTT bundles, especially when the content offered is exclusive or highly relevant.

Sharma and Kakkar (2024) also emphasized that bundling increases both the perceived value and emotional satisfaction, creating a deeper brand connection. Sadana and Sharma (2021) further supported this by noting that young consumers feel a stronger sense of value and exclusivity with telcos that offer seamless OTT experiences, which positively affects retention.

OTT Bundling Trends in India

In India, OTT video consumption has exploded in recent years — largely driven by mobile-first usage and falling data costs. According to a survey by Indo Asian News Service, 44% of OTT users access content through telco bundles. Mint projected that by the end of 2025, about half of India's online content viewers would be using telecom-affiliated streaming platforms.

To keep up, major telecom providers have turned to bundling. Reliance Jio offers content via JioTV and JioCinema; Airtel includes Disney+Hotstar; and Vi integrates Hotstar into its Vi Movies & TV app. These strategies are now central to customer retention tactics. Despite the widespread use of bundling, there remains a notable gap in empirical research quantifying how such offerings affect retention. Most studies have focused on the marketing potential or user engagement, but not on the long-term impact on customer loyalty. This study addresses that gap directly by investigating how OTT bundled offers influence retention outcomes in the Indian telecom context.

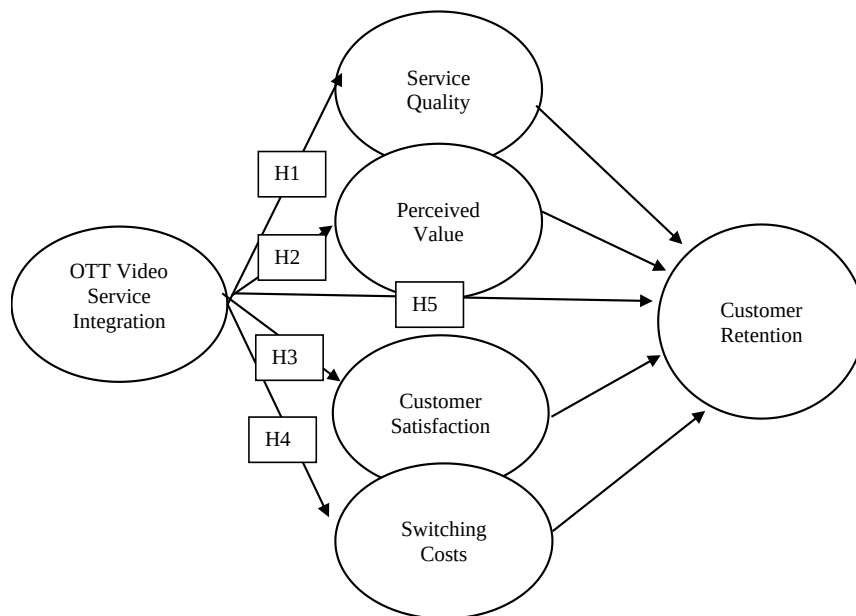
Hypothesis Formulation

As per literature service quality, perceived value, customer satisfaction and switching costs have a direct positive impact on customer retention. Also, there is no empirical evidence on impact of OTT video service integration on service quality, perceived value, customer satisfaction, switching costs and customer retention. Based on the review of relevant literature and qualitative inputs, the following hypotheses are proposed to assess the effect of Over-the-Top video service integration on customer retention in the Indian telecommunication industry. Each hypothesis includes a null and an alternative version.

Table 1 – Hypothesis formulation

Hypothesis	Null Hypothesis (H ₀)	Alternative Hypothesis (H ₁)
H1	OTT video service integration has no significant effect on perceived service quality.	OTT video service integration has a significant positive effect on perceived service quality.
H2	OTT video service integration has no significant effect on perceived customer value.	OTT video service integration has a significant positive effect on perceived customer value.
H3	OTT video service integration has no significant effect on perceived customer satisfaction.	OTT video service integration has a significant positive effect on perceived customer satisfaction.
H4	OTT video service integration has no significant effect on switching costs.	OTT video service integration has a significant positive effect on switching costs.
H5	OTT video service integration has no significant effect on customer retention.	OTT video service integration has a significant positive effect on customer retention.

Figure 1: Proposed Hypothesis Model



Source: Prepared by Authors

Research Methodology

The objective of the study is to primarily get the impact of adding OTT video service integration on customer's tendency to avail mobile number portability (MNP). Data related to the study was collected through structured instruments. The measures of instruments covering all aspects on customer retention in telecommunication industry were extracted from different sources, discussion with customers, experts, and review of literature (Table 1).

The empirical study consists of both qualitative and quantitative phases. The qualitative study included in-depth interview of mobile communication users who stayed loyal, switched, and managers from telecommunication firms. 11 users who switched network, 13 users who stayed loyal for more than 2 years and 5 managers from content and partnership vertical in telecommunication sector were contacted. Qualitative phase of the study along with literature review helped in developing relevant scale items for each construct used in the study.

Following are the 5 constructs used in the study:

- **Service Quality:** Factors which came out during the interviews for service quality were, call quality, network coverage and customer service. As per literature, service quality is customer expectations about service perception and how the service has performed (A. Parasuraman, Berry, & Zeithaml, 1991; A. P. Parasuraman et al., 1988). Based on the same research work 5 dimensional SERVQUAL was developed (tangibility, responsiveness, reliability, assurance, and empathy).
- **Perceived Value:** As per literature perceived value is, get benefits by giving sacrifices, scale for perceived value was adopted from (Woodruff, 1997; Slater, 1997; Zeithaml, 1988; McDougall and Levesque, 2000)
- **Customer Satisfaction:** Scale for customer satisfaction was adopted from Oliver and Swan (1989) and Westbrook and Oliver (1991). Satisfaction for choosing current service as a construct was picked based on the in-depth interview responses.
- **Switching Costs:** Scale for switching costs was primarily based on interview responses, time, effort, and hassle of doing an MNP. Two sub-constructs are based on literature (Ping, 1993; Jones, 2000).
- **OTT Video Service Integration:** Exclusive content apps bundled with the regular plan, Telco based application for content and Ease of bill payment (Single payment for all content and network) were the primary factors that came up during the qualitative analysis.

Based on the interview feedback, insights and literature review we developed a questionnaire for quantitative study. To keep the questionnaire precise, few irrelevant items from the construct were removed. After finalising the instrument that consists of demographic profile, general information and various aspects of customer switching intentions, a 5-point Likert scale ranging from “strongly agree” (5) to “strongly disagree” (1) was employed for each item.

For the survey, as 385 is the recommended sample size for a confidence level of 95%, data was collected from 472 mobile communication users spread across India. After removal of invalid responses, we were left with 394 meaningful responses. The data collected was predominantly from metros in India.

Table 2 – Profile of Respondents

Respondent Profile	Number	Percentage
Gender		
Female	105	27%
Male	289	73%
Age Range		
<21	43	11%
21-25	119	30%
26-30	100	25%
31-35	77	20%
36+	55	14%
Current Service Provider		
Airtel	133	34%
Jio	173	44%
Vi	88	22%
Residing Place		
Metro	283	72%
Non-Metro	111	28%
Occupation		
Employed	279	71%
Student	115	29%

Source: Prepared by the authors

This study employed a SEM approach to evaluate the model and study's hypotheses, and AMOS 23.0 was the evaluation tool.

Results and Discussion

We conducted exploratory and confirmatory factor analysis (CFA) to test for the convergent validity of the items used for each construct. Further, validity and reliability of the measures were assessed through factor loadings (SRW) and variance extracted. Construct's breakdown, mean, standard deviation, factor loadings, communality and Cronbach's alpha values are given in table 2.

Table 3 – Summary of mean, standard deviation, factor loading, communality, and Cronbach's alpha.

Constructs	Items	Mean	Standard Deviation	Factor Loadings	Communality	Alpha
Service Quality	Data and call quality (SQ1)	3.48	1.207	0.82	0.68	0.842
	Network coverage (SQ2)	3.22	1.445	0.83	0.69	
	Reliability of customer service (SQ3)	3.34	1.445	0.78	0.60	
Perceived Value	Value for the money paid (PV1)	3.10	1.413	0.84	0.71	0.901
	Reasonable price for service (PV2)	3.05	1.359	0.84	0.70	
	Consistency, reliability, and quality expectations met (PV3)	3.31	1.472	0.83	0.69	
Customer Satisfaction	Happy with current service (CS1)	3.24	1.393	0.85	0.73	0.904
	Satisfied with choice of network (CS2)	3.22	1.421	0.86	0.74	
	Recommendation to friends and family (CS3)	3.15	1.449	0.86	0.73	
Switching Costs	Costly to switch (SC1)	2.85	1.241	0.69	0.48	0.826
	Time and effort to switch (SC2)	3.27	1.381	0.78	0.61	
	MNP process is a hassle (SC3)	3.17	1.392	0.76	0.58	
OTT Video Service Integration	Happy with partnered OTT Platforms (OTT1)	3.03	1.268	0.73	0.53	0.789
	Happy with telco-based apps (OTT2)	2.90	1.286	0.76	0.58	
	Easy payment methods (OTT3)	2.99	1.276	0.76	0.58	
Customer Retention	Will stay with the network <12 months (CR1)	3.34	1.460	0.85	0.72	0.952
	Will stay with the network >12 months (CR2)	3.16	1.508	0.81	0.65	
	Will stay with the network >24 months (CR3)	3.13	1.511	0.80	0.63	

Source: Prepared by the authors

As factor loadings of all the items are greater than 0.5 and alpha value is greater than 0.7, demonstrating good internal consistency, we proceed with the structured equation modelling for the suggested model.

With this knowledge we performed a CFA on this model, the fit indices generated suggested that the model is fit. The model's fit indices fall well within the threshold ranges advised by Hair et al. (2010), Iacobucci (2010), and Schumacker (1992). Every measurement in the measurement model complies with the prescribed values. It's displayed in Table 3.

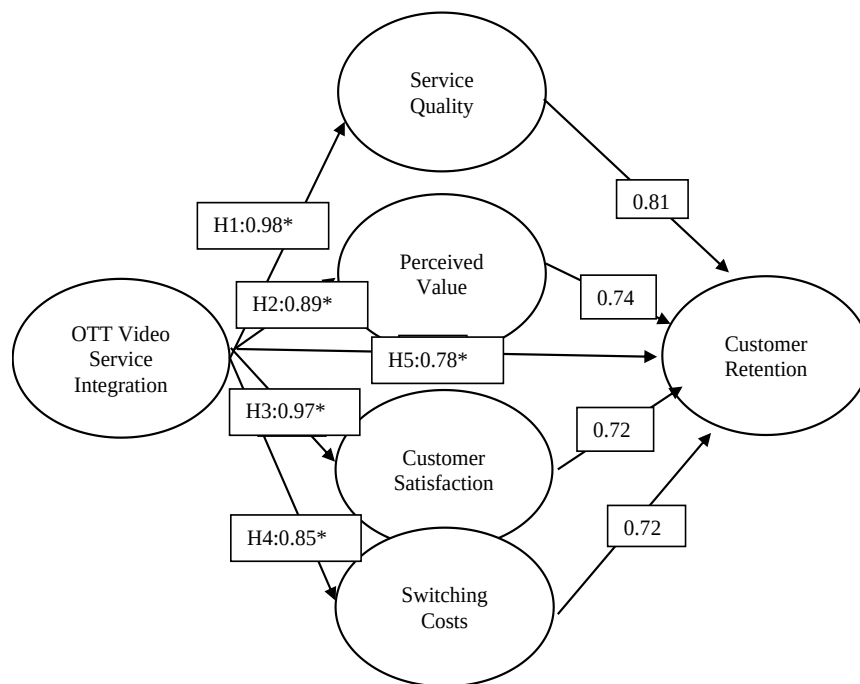
Table 4 – Model Fit

Model Fit	Cut-Off Criteria	Model Statistic
DF	460	120
CMIN/DF	< 4	2.52
GFI	> 0.9	0.92
AGFI	> 0.8	0.88
NFI	> 0.9	0.95
CFI	> 0.9	0.97
RMR	< 0.1	0.07
RMSEA	< 0.8	0.06

Source: Prepared by the authors

Modelling and Testing of Structural Hypothesis

Model suggested during hypothesis testing is constructed using AMOS tool.

Figure 2: Results of proposed structural model

Source: Prepared by Authors

Table 5 – Structural model path analysis

Path			Estimate	S.E.	C.R.	P
ServiceQuality	<---	OTTVideoServiceIntegration	0.98	0.10	10.43	***
PerceivedValue	<---	OTTVideoServiceIntegration	0.89	0.10	10.53	***
CustomerSatisfaction	<---	OTTVideoServiceIntegration	0.97	0.11	11.13	***
SwitchingCost	<---	OTTVideoServiceIntegration	0.85	0.10	10.20	***
CustomerRetention	<---	OTTVideoServiceIntegration	0.78	0.11	10.46	***
CustomerRetention	<---	PerceivedValue	0.74	0.12	10.58	***
CustomerRetention	<---	CustomerSatisfaction	0.72	0.12	10.60	***
CustomerRetention	<---	SwitchingCost	0.72	0.11	10.37	***
CustomerRetention	<---	ServiceQuality	0.81	0.10	10.21	***

Note: *: Significant at p<0.05

Source: Prepared by the authors

The findings indicate that service quality, perceived value, customer satisfaction, switching costs and OTT video service integration have a positive impact on customer retention (H5). Service quality has the largest

impact on customer retention with a regression weight of 0.81, interestingly OTT video service integration comes next at 0.78. The findings also indicate a positive correlation between service quality, perceived value, customer satisfaction, switching costs and OTT video service integration (H1, H2, H3, H4). It is found that OTT video service integration has a largest impact on service quality and customer satisfaction.

Conclusion

This study proposes and tests a framework for understanding the relationship between service quality, perceived value, customer satisfaction, switching costs, OTT video service integration and customer retention. In contrast to previous studies in which relationships linking switching cost to customer satisfaction, customer value and service quality are separately analysed (Aydin and Ozer, 2005; Jones, 2002), this study examines their combined impact of all the parameters. The study resonates with the literature, as the parameters identified have positive association with customer retention (Jones, Mothersbaugh, and Beatty, 2000, Heskett, Jones, Loveman, Sasser & Schlesinger 1994, Copacino, 1997; Ladhari, Souiden, & Ladhari, 2011). On contrary to Aydin (2005) and Jones (2002), as per the current study, switching costs has the lowest impact on customer retention when compared with service quality, perceived value, customer satisfaction, and OTT video service integration.

In the current study, OTT video service integration's impact on customer satisfaction, perceived value and customer retention is very high, which directly results in increasing revenue for the telcos, which is contradictory to findings of Joshi Sujata (2015). The OTT services have been seen as a partnership prospect rather than competition by telcos. As rightly pointed out by Korzunowicz (2019), telcos can work with OTT business and help the OTT companies in going through technology stability and change. The study also supports the finds by Kraemer (2019), telcos should be focusing on partnerships with OTT rather than competing. Telecom companies can bundle their traditional services with OTT services.

OTT video service integration could be the way forward for the telcos to differentiate their product in a commoditised market. It is very evident from the study that the OTT video service integration have a very high impact on all the parameter concerning customer retention, it also has a high direct impact on customer retention. Even though service quality is the highest impacting factor for customer retention, OTT video service integration has a high direct positive impact on service quality too.

Telco content partnerships have been the way forward for the industry, as the average revenue per user (ARPU) for an OTT service postpaid user is two times of a normal prepaid user. Telcos are actively partnering with regional content for better market penetration, (ALTBalaji, Eros Now, Zee5 and Atrangii). Hence it is evident from the study that the OTT video service integration will be a crucial tool for telcos to leverage to counter the customer retention issues.

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Internship-Induced Occupational Stress among B.Ed. Student-Teachers: A critical Analysis

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Abstract

The present study investigates the occupational stress experienced by Bachelor of Education (B.Ed.) student-teachers during their internships, focusing on identifying stressors, understanding their impacts and proposing management strategies. The internship phase is a critical component of teacher training, providing student-teachers with practical teaching experience. However, it often exposes them to significant stress due to the transition from theoretical learning to real-world classroom application. Stressors such as managing lesson planning, addressing diverse student needs, coping with mentor expectations and balancing time constraints were identified as prevalent challenges.

Using the Transactional Model of Stress (Lazarus & Folkman, 1984) and the Job-Demands Resources Model (Bakker & Demerouti, 2007) as theoretical frameworks, the study surveyed 200 B.Ed. student-teachers studying in Ranchi district of Jharkhand State. Quantitative data revealed that over 78% of participants experienced moderate to high stress levels during their internships, with younger and less experienced student-teachers reporting higher stress due to inadequate coping mechanisms. Female student-teachers highlighted additional challenges in balancing internship demands with personal responsibilities.

The findings rationalize that occupational stress arises from a mismatch between job demands and available resources, as theorized by the Job-Demands Resources Model. Similarly, the Transactional Model underscores the role of individual perceptions in appraising stressors and coping mechanisms. These insights emphasize the urgent need for targeted interventions to support student-teachers during internships. Recommendations include structured mentorship programs to provide guidance, stress management workshops to enhance coping strategies and institutional support for creating a conducive internship environment. By addressing these challenges, teacher education programs can better prepare future educators for professional success while safeguarding their mental well-being.

Keywords: Occupational Stress, Teaching Efficacy, Stress Management, Mentorship, Teacher Education, Coping Strategies, etc.

Introduction

Stress is a natural psychological and physiological response to external pressures or demands that an individual perceives as overwhelming or threatening. The concept of stress, first coined by Hans Selye in the 1930s, has evolved into a complex construct that encompasses various physiological, emotional and behavioural responses (Selye, 1936). Occupational stress, which refers to the stress experienced in the workplace, is a significant concern in numerous professions, including education. For B.Ed. student-teachers, the internship phase represents a critical period in their professional development, but it is also a time of heightened stress. During this phase, student-teachers transition from the classroom to real-world teaching environments, facing unique challenges that contribute to stress. These stressors include managing lesson planning, addressing the diverse needs of students, fulfilling mentor expectations and coping with time constraints.

Theoretical Perspectives on Stress

Several theoretical models have been developed to understand the mechanisms and impacts of stress. These models offer insight into the causes of stress, its effects and potential coping mechanisms. Key stress theories that are particularly relevant to B.Ed. student-teachers during their internships include the Transactional Model of Stress by Lazarus and Folkman (1984), the Job-Demands Resources (JDR) Model by Bakker and Demerouti (2007) and the General Adaptation Syndrome (GAS) by Selye (1936).

Transactional Model of Stress (Lazarus & Folkman, 1984)

The Transactional Model of Stress views stress as a dynamic process of interaction between the individual and their environment. According to this model, stress arises when an individual perceives an event or situation as exceeding their ability to cope. Stress is not simply the result of an external event but is influenced by the individual's cognitive appraisal of the situation. The model outlines two main processes: Primary Appraisal refers

to the initial evaluation of a stressor as a threat, challenge, or neutral event and Secondary Appraisal involves the individual's assessment of their available resources and coping abilities to deal with the stressor.

In the context of B.Ed. student-teachers, this model explains how their perception of the demands of the internship- such as lesson planning, classroom management and meeting expectations- determines whether they experience stress and how they cope with it. The primary appraisal process helps determine whether they see the internship challenges as overwhelming or manageable, while the secondary appraisal process influences the coping mechanisms they adopt.

Job-Demands Resources (JDR) Model (Bakker & Demerouti, 2007)

The Job-Demands Resources Model posits that occupational stress is influenced by the balance between job demands and job resources. Job demands refer to aspects of the job that require sustained physical or mental effort, such as high workload, time pressure and emotional demands, while job resources refer to aspects that help reduce job strain and increase engagement, such as social support, autonomy and feedback.

- **Job Demands:** High demands, such as the pressure to prepare lessons and manage student behaviors, create stress when the resources needed to cope (such as time and support) are insufficient.
- **Job Resources:** Support from mentors, adequate feedback and access to teaching materials can buffer the negative effects of job demands, reducing stress.

In the case of B.Ed. student-teachers, this model highlights how the balance between internship demands (e.g., time pressure, classroom management, performance evaluations) and resources (e.g., mentorship, institutional support, peer collaboration) determines their stress levels and teaching effectiveness. High demands coupled with inadequate resources can lead to burnout, while sufficient resources can foster engagement and resilience.

General Adaptation Syndrome (Selye, 1936)

Selye's General Adaptation Syndrome (GAS) is one of the earliest models to explain the physiological response to stress. GAS consists of three stages:

- **Alarm Stage:** The initial response to a stressor, characterized by the activation of the "fight or flight" response.
- **Resistance Stage:** If the stressor persists, the body tries to adapt and resist the effects of stress, leading to sustained physiological responses.
- **Exhaustion Stage:** Prolonged stress can deplete the body's resources, leading to physical and mental exhaustion.

While Selye's model primarily addresses the physiological aspects of stress, it is useful in understanding how prolonged stress during an internship can affect B.Ed. student-teachers' physical and mental well-being. For instance, prolonged exposure to high levels of stress- due to workload, emotional demands and performance evaluations- can lead to burnout and exhaustion.

Stress in Teacher Education

The period of internship is particularly stressful for student-teachers, as it involves multiple role transitions. Theoretical models such as the Transactional Model of Stress and the JDR Model provide valuable insights into how stressors like high workload, limited control and lack of resources impact their stress levels. Moreover, the perceived mismatch between the demands of the internship and the resources available to cope with these demands often exacerbates stress. This mismatch is more pronounced in the absence of effective mentoring or inadequate emotional and professional support from educational institutions.

Research has shown that the stress experienced during teacher training can have significant implications for both the individual and the profession. For example, stressed student-teachers often report lower self-efficacy, which may hinder their performance and future career satisfaction (Bandura, 1997). Additionally, high levels of stress can contribute to mental health issues such as anxiety and depression (Kyriacou & Sutcliffe, 1977), which may lead to burnout and attrition in the teaching profession (Borg & Riding, 1991).

Thus, understanding the sources of occupational stress and the mechanisms through which stress affects B.Ed. student-teachers during internships is crucial for developing effective support systems that can enhance their resilience and professional development.

Review of Literature

Occupational stress among B.Ed. student-teachers during their internship phase has been a significant focus of research, highlighting its impact on both professional development and mental well-being. Several studies have identified key stressors such as workload, time pressure, role ambiguity and classroom management. McCormick and Barnett (2005) found that external factors like school culture and curriculum changes contribute to stress, while O'Connor (2003) highlighted role conflict and time management as primary stressors during internships. These studies suggest that stress can lead to feelings of incompetence, undermining the confidence of student-

teachers. Moreover, effective communication with mentors and reflective practices have been identified as crucial strategies to reduce stress and improve teaching performance during internships.

Further research has explored the relationship between stress and teacher well-being, showing that high levels of stress negatively impact teaching efficacy and job satisfaction. Collie, Shapka and Perry (2012) found that stress led to reduced professional satisfaction and increased dropout rates, emphasizing the need for early interventions like mentoring and peer support to alleviate stress. Similarly, Baker et al. (2004) observed that unmanageable expectations resulted in lower teaching efficacy for student-teachers, recommending clear expectations and emotional support as key stress mitigation strategies. More recent studies, such as those by the RAND Corporation (2023) and Frontiers (2024), have corroborated these findings, linking occupational stress to burnout and decreased life satisfaction. Female teachers, in particular, reported higher stress levels, often due to balancing professional demands with personal responsibilities.

The studies consistently suggest that interventions targeting stress management, emotional support and workload management can significantly improve the well-being and effectiveness of student-teachers. Stress management workshops, structured feedback and social-emotional competence development are critical in alleviating stress during internships. Research by Nwoko et al. (2023) and others underscores the importance of creating supportive environments that provide mentoring, clear expectations and emotional support, which can help student-teachers build resilience. These findings point to the need for integrating stress management strategies into teacher education programs, especially during internships, to promote the professional and emotional well-being of future educators.

Need and Importance of Study

The need for the present study arises from the growing recognition of occupational stress among B.Ed. student-teachers during their internships, a critical phase in teacher preparation. Research has shown that stress during this period significantly impacts their teaching efficacy, professional development and mental health (McCormick & Barnett, 2005; O'Connor, 2003). Understanding the causes and effects of stress can provide essential insights for designing targeted interventions to support student-teachers in navigating the challenges they face during internships. As the teaching profession continues to experience high levels of burnout and stress (Collie, Shapka, & Perry, 2012; RAND, 2023), this study is crucial in identifying effective strategies that can mitigate these stressors and promote well-being, ultimately leading to better teaching outcomes and higher retention rates.

The importance of this study lies in its potential to address existing gaps in the literature and contribute to the development of evidence-based interventions in teacher education programs. By examining the role of mentoring, stress management training and institutional support, this study will provide valuable insights into how these factors can alleviate stress and improve the overall experience of student-teachers (Baker et al., 2004; Frontiers, 2024). Furthermore, understanding the impact of demographic factors, such as gender and prior teaching experience, on stress levels will allow for more tailored approaches to stress management, ensuring that interventions meet the diverse needs of student-teachers. This research is vital not only for improving the immediate well-being of future educators but also for fostering a sustainable and healthy teaching workforce in the long term.

Objectives of the Present Study

- **To identify the primary sources of occupational stress among B.Ed. student-teachers during their internship phase.**

This objective aims to uncover specific stressors, such as workload, time pressure, classroom management and role ambiguity, that significantly impact student-teachers during their internships (McCormick & Barnett, 2005; O'Connor, 2003). By identifying these stressors, the study will provide insights into the challenges faced by student-teachers in real-world teaching environments.

- **To assess the impact of occupational stress on the teaching efficacy and mental health of student-teachers.**

This objective seeks to evaluate how stress affects student-teachers' teaching effectiveness, professional satisfaction and overall well-being. Previous research has shown that high stress levels lead to decreased job satisfaction and increased burnout, which can influence teaching outcomes (Collie et al., 2012; Baker et al., 2004).

- **To evaluate the role of mentoring and institutional support in reducing occupational stress during the internship.**

This objective will examine how structured mentoring, peer support and institutional resources can buffer the negative effects of stress on student-teachers (Baker et al., 2004; Frontiers, 2024). Identifying effective coping mechanisms and support structures will provide valuable recommendations for teacher education programs.

- **To explore the influence of gender on the stress levels of student-teachers.**

This objective will investigate how demographic variable influence the perception and experience of stress, with particular attention to gender differences (RAND, 2023; Frontiers, 2024).

Hypotheses of the Present Study

The hypotheses of this study are:

- H1: Occupational stress significantly affects the teaching efficacy of B.Ed. student-teachers during their internship phase.
- H2: The level of institutional support and mentoring significantly moderates the relationship between stress and teaching efficacy in student-teachers.
- H3: Female student-teachers experience significantly higher levels of occupational stress compared to their male counterparts.

Methodology

This study aims to examine the occupational stress experienced by B.Ed. student-teachers during their internship phase, the factors contributing to this stress and the role of institutional support in managing it. A mixed-methods approach, combining quantitative and qualitative techniques, will be employed to achieve the research objectives. This methodology will allow for a comprehensive understanding of the sources, impacts and coping strategies related to occupational stress among student-teachers.

This study will use a descriptive-correlational research design to explore the relationships between stress levels, teaching efficacy and institutional support, as well as the influence of demographic factors like gender, age and prior teaching experience on stress levels. The target population consists of B.Ed. student-teachers undergoing internships in education colleges. A stratified random sampling method will be used to select 200 participants, equally divided by gender (100 male and 100 female) and prior teaching experience, ensuring diverse backgrounds for generalizable results.

Data will be collected using both quantitative and qualitative methods. Quantitative data will be gathered through a structured questionnaire with three sections: (1) Occupational Stress, measured by the Perceived Stress Scale (PSS); (2) Teaching Efficacy, assessed by the Teacher Efficacy Scale (TES); and (3) Institutional Support, measured using a custom scale covering mentorship, resource availability and stress management initiatives. Participants will respond using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Qualitative data will come from semi-structured interviews with 30 student-teachers, focusing on stress sources, coping strategies and the role of institutional support. Thematic analysis of the interview data will follow Braun and Clarke's (2006) guidelines, with NVivo software used for organizing and coding.

Quantitative data will be analysed using descriptive statistics (percentage) to summarize findings. For qualitative data, thematic analysis will identify key themes and patterns.

Ethical considerations include providing informed consent forms to participants, ensuring confidentiality through anonymized data and allowing participants to withdraw at any time without consequences. These measures ensure the study is conducted responsibly and respectfully.

Data Analysis and Interpretation

H1: Occupational stress significantly affects the teaching efficacy of B.Ed. student-teachers during their internship phase.

Table-1 presents the Occupational Stress Levels among B.Ed. student-teachers as measured by the Perceived Stress Scale (PSS).

Table-1: Occupational Stress Levels among B.Ed. Student-Teachers

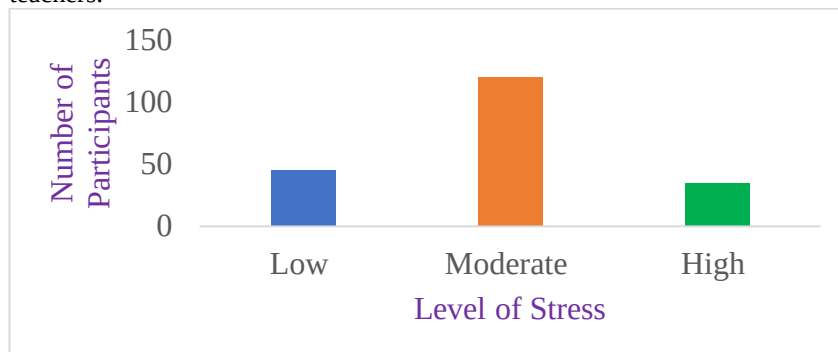
Stress Level	Number of Participants	Percentage (%)
Low ($\leq \text{Mean} - S.D$)	45	22.50%
Moderate (<i>In Between</i>)	120	60.00%
High ($\geq \text{Mean} + S.D$)	35	17.50%
Total	200	100%

Source: Data collected from B.Ed. student-teachers during their internship in Ranchi through the administration of the Perceived Stress Scale (PSS) to assess their occupational stress levels.

From the table-1, it is evident that a majority 60% of student-teachers report moderate stress, 22.5% report low stress and 17.5% report high stress. This distribution indicates that while a significant proportion of student-teachers are managing their internships with moderate stress levels, nearly one-fifth are experiencing high stress. High stress during internships may be attributed to the demanding nature of the teaching profession, with responsibilities including lesson planning, classroom management and performance evaluations. Moderate stress could be seen as a typical response to the challenges of transitioning from theoretical knowledge to practical application. The high percentage of moderate stress aligns with existing literature that suggests the internship

phase is often the most stressful period for student-teachers due to unfamiliar responsibilities and the pressure to perform (McCormick & Barnett, 2005; O'Connor, 2003).

Figure-1 presents a bar chart illustrating the distribution of occupational stress levels among B.Ed. student-teachers.



A bar graph showing the distribution of low, moderate and high stress levels among student-teachers, with 60% reporting moderate stress, 22.5% reporting low stress and 17.5% experiencing high stress.

H2: The level of institutional support and mentoring significantly moderates the relationship between stress and teaching efficacy in student-teachers.

Table-2 provides an overview of institutional support and its role in stress reduction among B.Ed. student-teachers, as measured using a custom scale.

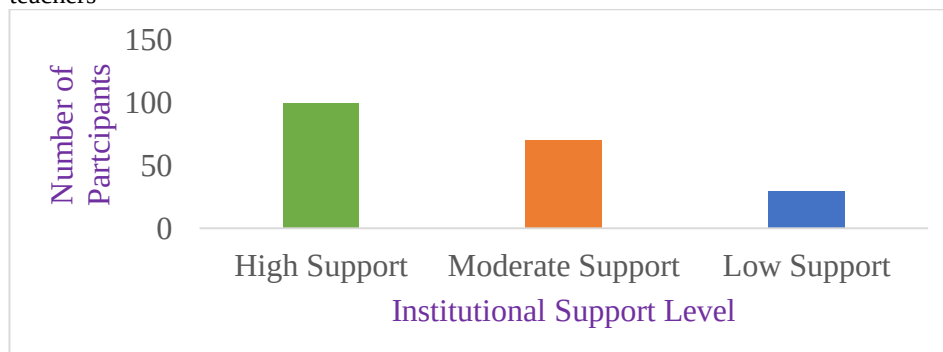
Table-2: Institutional Support and Stress Reduction

Institutional Support	Number of Participants	Percentage (%)
High Support	100	50.00%
Moderate Support	70	35.00%
Low Support	30	15.00%
Total	200	100%

Source: Data collected from B.Ed. student-teachers during their internship in Ranchi based on institutional support and mentoring.

Table-2 reveals that 50% of student-teachers report high institutional support, 35% report moderate support and 15% report low support. Those with high institutional support tend to experience lower stress levels due to guidance from mentors, emotional encouragement and access to resources. This finding aligns with earlier studies, such as Baker et al. (2004), which highlight the critical role of institutional support in reducing stress. Structured mentorship programs, emotional backing from faculty and resource availability equip student-teachers with the tools and confidence needed to manage challenges during their internships. The significant proportion of students reporting moderate to high support underscores the importance of well-designed institutional systems in effectively alleviating stress.

Figure-2 presents a bar chart illustrating the institutional support and stress reduction among B.Ed. student-teachers



A bar chart displaying the institutional support levels among the participants, with 50% reporting high support, 35% moderate support and 15% low support.

H3: Female student-teachers experience significantly higher levels of occupational stress compared to their male counterparts

Table-3 provides a detailed comparison of stress levels between male and female B.Ed. student-teachers.

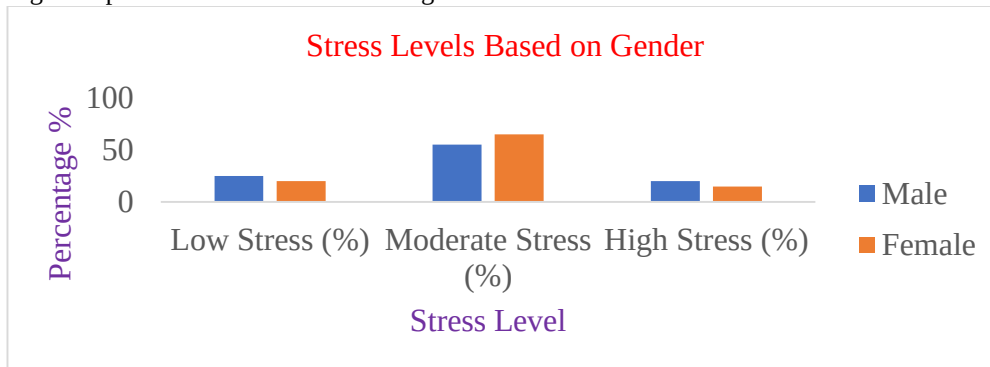
Table-3: Stress Levels Based on Gender

Gender	Low Stress (%)	Moderate Stress (%)	High Stress (%)
Male	25	55	20
Female	20	65	15

Source: Data collected from male and female B.Ed. student-teachers during their internship in Ranchi assess their occupational stress levels.

Table-3 reveals that the gender-based analysis of stress levels reveal that female student-teachers report higher stress levels than male student-teachers. 65% of females report moderate stress and 15% report high stress, compared to 55% of males reporting moderate stress and 20% reporting high stress. This indicates that female student-teachers may face additional stress due to factors such as balancing professional and personal responsibilities. These findings are consistent with literature suggesting that female teachers often face higher emotional stress due to societal expectations, family responsibilities and the challenges of maintaining work-life balance (RAND, 2023; Frontiers, 2024). This gendered experience of stress should be addressed through gender-sensitive interventions, such as work-life balance workshops and stress management tailored to the specific needs of female student-teachers.

Figure-3 presents a bar chart illustrating the stress levels between male and female student-teachers.



A grouped bar chart comparing stress levels between male and female student-teachers. Female participants reported slightly higher levels of moderate stress compared to their male counterparts.

Results and Discussion:

The findings highlight the significant levels of stress faced by B.Ed. student-teachers during their internships, primarily due to heavy workloads, role ambiguity and classroom management challenges. Institutional support, particularly mentorship, plays a critical role in reducing stress and enhancing teaching efficacy. This aligns with research suggesting that structured mentoring and emotional support help student-teachers manage the demands of the internship (Collie et al., 2012; O'Connor, 2003).

The relationship between gender and stress levels also underscores the importance of considering gender-specific factors when designing stress reduction programs. Female student-teachers, who tend to experience higher stress, may benefit from targeted interventions that address the unique challenges they face, including work-life balance and emotional exhaustion. Further research could explore how different forms of institutional support can be tailored to meet the diverse needs of student-teachers, potentially improving both their well-being and teaching outcomes.

In conclusion, the results suggest that improving institutional support systems, providing stress management training and addressing gender-specific stressors are essential strategies for mitigating stress during internships and enhancing the overall effectiveness of teacher education programs.

Implications of the Study

- One of the most significant findings of this study is the role of mentorship in reducing stress. Institutions should provide structured mentorship programs, where experienced teachers offer guidance on lesson planning, classroom management and dealing with stress. Studies have shown that such mentoring can significantly enhance the professional growth and confidence of student-teachers, reducing feelings of incompetence and burnout (Baker et al., 2004). Regular check-ins with mentors could also help student-teachers navigate challenges and provide a safe space for discussing stressors.
- The study found that student-teachers with higher institutional support experienced less stress. Institutions should integrate stress management workshops into teacher education programs to help student-teachers develop coping strategies. Emotional support, in the form of counselling services or peer support groups, should also be made readily available. Studies by Collie et al. (2012) and O'Connor (2003) have shown that

peer support and emotional well-being initiatives improve student-teachers' resilience and reduce the negative impacts of stress.

- Female student-teachers reported higher stress levels than their male counterparts, which may be attributed to additional home and social responsibilities. Teacher education programs should offer gender-sensitive support services to address the unique challenges faced by female student-teachers. These could include time management training, work-life balance workshops and addressing societal expectations that contribute to stress (RAND, 2023; Frontiers, 2024). Tailoring interventions to the gender-specific needs of student-teachers will help alleviate their stress and improve their overall well-being.
- One of the key stressors identified in this study was role ambiguity. Student-teachers often face uncertainty about their responsibilities, expectations from mentors and their role in the classroom. To reduce stress, institutions should clearly define the expectations for student-teachers at the beginning of the internship. Providing a comprehensive orientation and continuous feedback from mentors can help clarify roles and reduce feelings of confusion and incompetence, as suggested by O'Connor (2003) and McCormick & Barnett (2005).
- Establishing a positive and supportive institutional culture can significantly reduce stress. Institutions should foster a collaborative environment where student-teachers feel valued and supported. This can be achieved through team-based projects, collaborative learning opportunities and creating a culture where stress-related concerns are openly addressed. As found by Nwoko et al. (2023), promoting a supportive work environment not only reduces stress but also enhances the overall teaching effectiveness of student-teachers.
- While this study focuses on stress during the internship phase, it is essential to monitor the long-term effects of this stress on student-teachers once they enter the profession. Future research should explore how internship stress impacts the retention rates of teachers and their long-term career satisfaction. Additionally, long-term follow-up programs should be developed to provide continued support for former student-teachers as they transition into full-time teaching roles.

Conclusion

The findings of this study underscore the complex nature of occupational stress experienced by B.Ed. student-teachers during their internship period. Among the most critical factors influencing stress levels is the presence or absence of effective mentorship. Student-teachers benefit greatly from structured mentorship programs that provide guidance on lesson planning, classroom management and emotional resilience. Regular mentor check-ins not only offer professional support but also serve as a space to process challenges and reduce feelings of incompetence. Moreover, clearly defined roles and expectations at the beginning of the internship, paired with ongoing feedback, help minimize role ambiguity, a significant contributor to stress. When student-teachers understand what is expected of them, they are more confident, productive and mentally equipped to navigate the demands of real-world teaching environments.

Institutional support emerged as another vital factor in stress management. Student-teachers with access to counselling services, peer support networks and stress management workshops reported lower levels of psychological strain. Institutions must recognize the importance of creating a supportive environment where emotional well-being is prioritized alongside professional development. Furthermore, the study highlighted a gendered dimension to stress: female student-teachers reported higher stress levels, often due to the added burden of societal and domestic responsibilities. To promote equity, teacher education programs must implement gender-sensitive strategies, such as work-life balance training and initiatives that acknowledge and address the unique pressures faced by women in the teaching profession.

Lastly, the long-term implications of stress during internships must not be overlooked. The emotional challenges faced by student-teachers can extend well into their professional careers, potentially impacting teacher retention, job satisfaction and overall effectiveness. Therefore, institutions should consider designing post-internship support systems, such as alumni mentoring networks and continued access to mental health resources, to ease the transition into full-time teaching. By adopting a comprehensive, multi-faceted approach to stress management encompassing mentorship, institutional support, emotional well-being and gender-responsive policies teacher education programs can foster a resilient, empowered and professionally competent generation of educators prepared to thrive in the classroom and beyond.

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Exploring the Role of Co-Creation in Indian Private Banks

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Abstract

Co-creation is essential for banks because collaborating with customers and gaining a deeper understanding of their needs can improve financial performance. This study focuses on private sector banking in India and emphasizes the importance of value creation in creating a successful bond between customers and banks. The present research work tried to explore co-creation behavior in banking sector from customer perspective and its effect on customer satisfaction. There is no study in banking sector which considered customer behavior to measure co-creation. A sample of 582 private bank customers is taken for analysis. SEM analysis results revealed that customer citizenship behavior is contributing more toward co-creation in comparison to customer participation behavior in the Indian private banking sector. Furthermore, there is a strong and positive correlation between co-creation and consumer satisfaction, indicating its significance. This study holds relevance for both customers and bank management, as it emphasizes that adopting the co-creation process fosters a sustainable relationship between banks and their customers. When customers perceive that their opinions are acknowledged; they are more likely to form a stronger bond with the firm.

Keywords: Co-Creation, Value, Banking Sector, Customer Satisfaction

Introduction

Co-creation of value is a process where businesses work with their clients and explore new opportunities (Galvagno and Dalli 2014). Customers should perceive the benefit of co-creation (Gronroos, 2008) and feel encouraged to participate in the process of it to address their own issues. A critical element behind the success of these sectors, especially services, is the involvement of customers in shaping their own experiences. When customers participate in value creation then they feel their contribution is significant (Mascarenhas et al. 2004), which further aids in fostering loyalty and enables businesses to build a valuable database of innovative inputs from customers (Vargo and Lusch, 2004). Engaging customers in value creation also allows banks to better understand their needs, which can lead to improved financial performance (Biswas et al., 2023). Satisfied customers are more likely to support others, offer helpful feedback, and maintain a positive relationship with staff (Abbas et al., 2024). On the other hand, unhappy customers often disengage, withholding feedback and refraining from promoting the service. When customers are involved in meaningful learning interactions with their service providers, it fosters a deeper connection and enables the creation of personalized offerings (Kumar et al., 2023).

India's service sector has seen remarkable growth over the years, now playing a major role in driving the nation's GDP (Amutha & Juliet, 2017). What sets India apart is its unique transition—moving directly from an agriculture-based economy to one dominated by services, bypassing the typical industrial phase seen in many other countries. This growth has spurred development across key industries such as information technology, healthcare, tourism, transportation, and finance (<https://www.indiabudget.gov.in/economicsurvey>). Leading areas in the service sector, such as banking, are accepting co-creation, and bank customers are becoming more demanding. In the banking industry, this idea—known as value co-creation—is gaining traction, particularly among tech-savvy banks and FinTech firms (Kumar et al., 2023). When it comes to providing customers with options to access products and services through technology, banks are among the pioneers in this field. Customer demand for high-quality financial services correlates with the possibility of value creation (Oliveira and von Hippel, 2011).

Co-creation can bring innovative concepts and techniques for banks to deliver their services (Martovoy and Santos, 2012). The main barrier to innovation in banks is the lack of new idea generation (Das et al., 2018), and idea generation is the main concept behind value co-creation; thus, researchers consider it for research in the banking industry (Cambra-Fierro et al., 2018). It emphasizes forming collaborative, open relationships where banks and customers share insights and resources to co-develop value. Banks must be innovative as well as responsive to customer expectations (Jimenez, 2019). The study of value co-creation helps in bringing new innovative ideas that generate value for business as whole (Saarijärvi et al. 2013). As customers share personal data, banks can generate useful metadata that contributes to more innovative and tailored financial solutions, benefiting both individuals and society at large (Abbas et al., 2024; Jussen et al., 2023). As Payne et al. (2008), when firms and customers engage in ongoing dialogue and collaboration, they can identify and solve problems

early, leading to greater customer value. In turn, satisfied customers are more inclined to offer useful suggestions, reinforcing the company's commitment to understanding and addressing customer needs, and thereby strengthening its reputation (Handoyo, 2024; Oklevik et al., 2024). The study considers only private banking sector because in India, private banks tend to be more active in co-creating products and services compared to their public sector counterparts. This is largely because private banks place a stronger focus on customer needs, adapt quickly to new technologies, and face greater pressure to stay competitive. Banks like HDFC and ICICI are clear examples of this trend—they actively use customer feedback and data analytics to fine-tune their services to better match individual preferences (Deloitte India Banking Report, 2023; PwC Fintech Report, 2024).

This study emphasizes the importance of value creation in strengthening the bond between the bank and customers. The present research work aims to explore co-creation behavior toward the satisfaction of customers. The outcome helps in understanding the contribution of customer participation and customer citizenship behavior in value creation in private banks of India and reinforcing customer satisfaction through involving customers in co-creation. The objectives are (1) to assess the reliability and validity of co-creation scale from perspective of customers in the private banking sector, and (2) to analyze the relationship between value co-creation and customer satisfaction.

Theoretical background

Co-creation

Co-creation means that both the seller and customer are together participating in creating a better experience and finding solutions to business-related issues (Albuquerque and Ferreira 2022). The participation of customers in making a better product changes the perspective to "value in use," which was earlier considered "value of exchange" (Vargo and Lusch, 2004). The involvement of customers in co-creation helps businesses understand their views and demands and use their skills to help solve problems and product development (Füller, 2010).

Co-creation of value is a multivariate construct while measuring the perspective of customers. Customer participation and customer citizenship behavior are two higher-order constructs and both are having further four lower-order constructs each (Yi and Gong, 2012). Customer participation behavior is needed for efficient service delivery whereas customer citizenship behavior is not mandatory for service delivery although enhance the performance of business and their employees. Customer citizenship behavior helps in creating a better value for businesses (Bove et al., 2008). The customer participation behavior is comprised of constructs like information seeking, information sharing, responsible behavior, and personal interaction. Feedback, advocacy, helping, and tolerance are lower-order constructs of customer citizenship behavior (Yi and Gong, 2012).

Co-creation and Banking

The traditional bank marketing model focused on the benefits generated by the bank for customers, considering their passive involvement (Payne et al., 2000). Customer engagement is essential for banks to deliver valuable services (Prahalad and Ramaswamy, 2004a, 2004b). Service-dominant logic (SDL) offered a framework where the information and expertise exchanged between customers and businesses. The receiver of the benefit decides the value as either "value-in-use" or "value-in-context" (Vargo and Lusch, 2004, 2008); businesses should deliver service in such a manner that customers realize the value proposed by the firms (Flint, 2006). Value co-creation highlighted the significance of customer active participation in the performance of banks (Bokhari and Manzoor 2022). Banks can adopt a customer-centric approach with the help of effective value creation, which results in long-term relationships and customer satisfaction (Oklevik et al., 2024).

Customer satisfaction

Customer satisfaction connects buying with post-buying behaviors like repurchases, loyalty, and word-of-mouth (Kumar et al., 2023). Customer involvement is directly proportional to their satisfaction and the overall performance of the company (Griseemann and Stokburger-Sauer, 2012). It is statistically proven that when customers co-create with firms, then it results in customer satisfaction (Vega-Vazquez et al., 2013). Although it is a core requirement, it is still not easy for a business to achieve customer satisfaction (Hofacker and Belanche, 2016). Customers become loyal when they are satisfied and generally less bothered about the other available competitive products or services (Jaakkola et al., 2015). Retaining existing customers is far easier in comparison to convincing a new potential customer (Abbas et al., 2024). Co-creation is one of the emerging concepts in the banking sector (Zollo et al., 2018), and it is necessary for bringing satisfaction among the customers as well as enhancing the competitiveness of a firm (Handoyo 2024). Thus, from the customer perspective, customer satisfaction is a result of the co-creation of value (Woratschek, Horbel, & Popp, 2019). The study develops the following hypothesis based on the discussion above:

H1-Co-creation of value is positively related to customer satisfaction in private banking sector services.

Research methodology

Data Collection

Data was collected from private bank customers in the Majha, Duaba, and Malwa regions of Punjab State because they had the most private bank account users in the state. Data was collected through convenience sampling using structured questionnaires. The questionnaires were distributed to the 700 customers of private banks; and only 582 questionnaires were complete to be used for analysis purposes.

Measurement

Co-creation was measured through the proposed scale of Yi and Gong (2012) for measuring customer perspective. In the study, it was third-order (3rd-order) construct and had Customer participation and Customer citizenship behavior as

second-order (2nd-order) constructs. The construct of customer satisfaction was adopted from previous studies (Chahal et al., 2017; Manyanga et al., 2022). All the items were measured on a five-point Likert scale in the questionnaire.

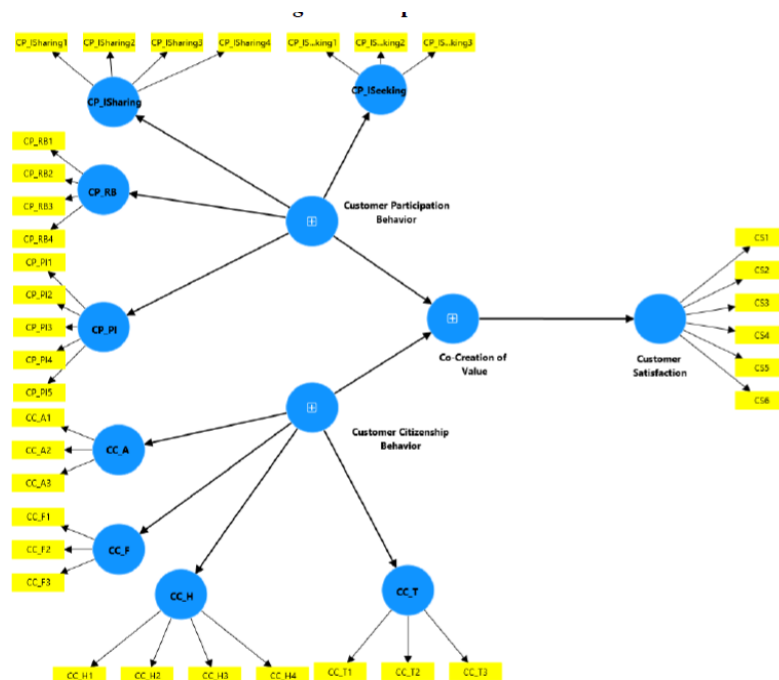
Assessing Common method bias and multivariate normality

The variance inflation factor (VIF) values for all the latent variables are below 3.3 (Kock, 2015) in the range of 1.021–1.649, so there was no issue of common method bias (CMB). The beta values of skewness and kurtosis were checked with Mardia's (1980) test and were significant for multivariate normality, so Partial Least Squares Structural Equational Modelling (PLS-SEM) can be applied to data (Hair et al., 2022).

Results

PLS-SEM technique was used for validation of measurement and structural properties of research model in Smart PLS version 4.1.0.9. PLS-SEM was chosen because it was deemed to be a suitable technique for a variety of reasons. 1) It is

Figure1: Proposed Model



Assessing Common method bias and multivariate normality

The variance inflation factor (VIF) values for all the latent variables are below 3.3 (Kock, 2015) in the range of 1.021–1.649, so there was no issue of common method bias (CMB). The beta values of skewness and kurtosis were checked with Mardia's (1980) test and were significant for multivariate normality, so Partial Least Squares Structural Equational Modelling (PLS-SEM) can be applied to data (Hair et al., 2022).

Results

PLS-SEM technique was used for validation of measurement and structural properties of research model in Smart PLS version 4.1.0.9. PLS-SEM was chosen because it was deemed to be a suitable technique for a variety of reasons. 1) It is an appropriate technique for estimating both reflective and formative constructs, as the study includes both (Ringle et al., 2023). 2) It has superior statistical power when dealing with complex causal modelling, such as behavioral research (Hair et al., 2022), which is the purpose of study. 3) It capable of model multiple independents as well as multiple dependent variables and can handle multicollinearity among independents; and it can make stronger predictions (Lowry P B & J, 2014).

Measurement model

The higher-order model was assessed through a two-stage disjoint approach as suggested by Sarstedt et al. (2019). First, the lower-order constructs of customer participation and customer citizenship behavior were calculated through the PLS algorithm, and secondly, the latent scores (LV scores) were used to evaluate 2nd-order constructs. Finally, the 3rd-order construct, i.e., co-creation of value, was measured with LV scores of customer participation and customer citizenship behavior (Sarstedt et al., 2019).

Demographic statistics

Table 1. depicts demographic information of private bank customers.

Variable	Categories	Frequency (N)	Percent(%)
Age	18-29	147	25.3
	30-39	173	29.7
	40-49	122	21
	50-59	88	15.1
	60 and above	52	8.9
	Total	582	100
Gender	Male	325	55.8
	Female	257	44.2
	Total	582	100
Marital Status	Married	370	63.6
	Unmarried	212	36.4
	Total	582	100
Education	Under Graduate	120	20.6
	Graduate	200	34.4
	Post Graduate	209	35.9
	Higher (MPhil/Ph.D	53	9.1
Annual Income	Total	582	100
	Below 1Lakh	112	19.2
	1-3 Lakhs	113	19.4
	3-5 Lakhs	164	28.2
	Above 5 Lakhs	193	33.2
	Total	582	100

Source(s): Authors' Calculations

Table 1 shows that in the age group, the maximum respondents were of age group 30-39 years (29.7%), followed by age group 18-29 (25.3%) and age group 40-49 (21%). There were 55.8% male respondents and 44.2% female respondents, and there were 63.65 respondents who were married. In the study, 35.9% are postgraduates, followed by graduates (34.4%) and undergraduates (20.6%). The respondents having an annual income above 5 lakhs were 33.2%, followed by respondents with 3-5 lakh annual income.

Reflective lower order measurement model

The reflective-reflective formative (RRF), a 3rd-order model, was assessed following the guidelines of Hair et al. (2019, 2022)

Table 2. Reliability and Validity of lower order measurement model

Variables	Items	Factor loadings	Cronbach's Alpha	rhoA	Composite reliability	AVE
Information Seeking (CP_ISE)	CP_ISE1	0.822	0.770	0.774	0.867	0.685
	CP_ISE2	0.838				
	CP_ISE3	0.822				
Information Sharing (CP_IS)	CP_IS1	0.770	0.826	0.827	0.885	0.658
	CP_IS2	0.835				
	CP_IS3	0.821				
	CP_IS4	0.817				
Responsible Behavior (CP_RB)	CP_RB1	0.799	0.829	0.830	0.886	0.661
	CP_RB2	0.820				
	CP_RB3	0.846				
	CP_RB4	0.786				
Personal Interaction (CP_PI)	CP_PI1	0.737	0.841	0.842	0.887	0.612
	CP_PI2	0.801				
	CP_PI3	0.775				
	CP_PI4	0.805				
	CP_PI5	0.792				
Feedback (CC_F)	CC_F1	0.797	0.725	0.725	0.845	0.645
	CC_F2	0.831				
	CC_F3	0.781				
	CC_A1	0.876				
Advocacy (CC_A)	CC_A2	0.919	0.855	0.856	0.912	0.776
	CC_A3	0.846				
Helping (CC_H)	CC_H1	0.800	0.837	0.837	0.891	0.672
	CC_H2	0.832				
	CC_H3	0.833				
	CC_H4	0.813				
Tolerance (CC_T)	CC_T1	0.902	0.899	0.902	0.937	0.833
	CC_T2	0.941				
	CC_T3	0.893				
Customer Satisfaction (CS)	CS1	0.744	0.869	0.871	0.902	0.605
	CS2	0.751				
	CS3	0.780				
	CS4	0.789				
	CS5	0.784				
	CS6	0.816				

Source(s): Authors' Calculations

Table 2 shows the reliability and validity of the lower-order measurement model. Each item of a construct uses the outer loadings to determine its indicator reliability, as shown in Table 2. The value of the outer loading ranges from 0.737 to 0.947, which is above the threshold of 0.70 (Hair et al., 2022). Internal consistency reliability was measured through Cronbach's alpha, rho A, and composite reliability, and it should have a value greater than or equal to 0.70 (Hair et al., 2019). AVE was used to measure convergent validity and should have a value greater than 0.50, and the values in the table range from 0.605 to 0.833. The reliability and validity of all indicators were within the acceptable range (Table 2).

Table 3. Discriminant validity lower order measurement model

	CP_I							
	CC_A	CC_F	CC_H	CC_T	SEE	CP_IS	CP_PI	CP_RB
CC_A								
CC_F	0.461							
CC_H	0.499	0.547						
CC_T	0.405	0.534	0.475					
CP_ISEE	0.355	0.414	0.429	0.389				
CP_IS	0.361	0.429	0.403	0.471	0.503			
CP_PI	0.498	0.562	0.543	0.493	0.415	0.578		
CP_RB	0.382	0.463	0.514	0.504	0.417	0.656	0.643	
CS	0.542	0.594	0.612	0.514	0.425	0.476	0.588	0.488

Table 3 shows the discriminant validity of the lower-order measurement model. The heterotrait-monotrait (HTMT) ratios of correlation are used to measure discriminant validity; the values of analysis ranged from 0.355 to 0.656 and were within the acceptable limits, as they should be below 0.85 (Henseler et al., 2015).

Reflective 2nd-order measurement model

Reflective-reflective, 2nd-order constructs, i.e., customer participative and customer citizenship behavior, were measured with the LV scores of lower 1st-order constructs (Sarstedt et al., 2019).

Table 4: Reliability and Validity of 2nd-order measurement model

Variables	Items	Factor loadings	Cronbach's Alpha	rhoA	Composite reliability	AVE
Customer Participation Behavior	LV scores - CP_ISEE	0.645	0.759	0.769	0.847	0.583
	LV scores - CP_IS	0.798				
	LV scores - CP_RB	0.806				
	LV scores - CP_PI	0.794				
	LV scores - CC_A	0.707				
	LV scores - CC_F	0.747				
Customer Citizenship Behavior	LV scores - CC_H	0.770	0.729	0.731	0.831	0.552
	LV scores - CC_T	0.747				
	LV scores - CC_A	0.707				
	LV scores - CC_F	0.747				

Source(s): Authors' Calculations

Table 4 shows the reliability and validity of 2nd-order constructs. Except for the information-seeking variable, all the constructs had factor loadings above 0.70 (Sarstedt et al., 2019). Information seeking had a factor loading of 0.645, but AVE was 0.583, above the threshold value of 0.50 (Hair et al., 2022), so it was retained in the model. Cronbach's alpha, rho A, and composite reliability all had values more than the threshold (Table 4), which means that all of the indicators were reliable (Hair et al., 2019).

Table 5. Discriminant validity of 2nd-order measurement model

	Customer Satisfaction	Customer Citizenship
Customer Satisfaction		
Customer Citizenship	0.811	
Customer Participation	0.675	0.883

Source(s): Authors' Calculations

Table 5 shows the discriminant validity of 2nd-order constructs through HTMT. All ratios of HTMT were below 0.90 within range (Franke & Sarstedt, 2019)

Formative 3rd-order measurement model

In this study, co-creation of value was examined using a reflective-reflective–formative measurement framework (Sarstedt et al., 2019). The LV scores from the 2nd-order constructs were leveraged to assess the 3rd-order construct of co-creation of value. To ensure the robustness of the formative measurement, Variance Inflation Factor (VIF) values for all formative indicators were analyzed, with results confirming that they remained below the recommended threshold of 3, indicating no concerns of multicollinearity (Hair et al., 2019).

Table 6. Higher Model constructs assessment

Higher order construct	Indicator (Formative)	Weights (Outer)	Loading (Outer)	CI ₉₅ Outer Weight/ Loading	Significance Weight/ Loading	VIF outer
Co-creation of Value	Customer	0.334		0.182;	Yes	1.774
	Participation		0.828	0.49/		
	Behavior			0.732;0.90		
	Customer	0.747		0.6; 0.873/	Yes	1.777
	Citizenship		0.968	0.932;0.99		
	Behvaior					
Redundancy analysis	Indicator	β		CI ₉₅	Significance	
Co-creation of Value	Global Item	0.687		0.631;737	Yes	

Source(s): Authors' Calculations (CI is confidence intervals at 95%, β is standardized β)

Table 6 shows the higher order contracts assessment and redundancy analysis. To assess convergent validity, a global item approach was implemented (Cheah et al., 2019). The redundancy analysis yielded a formatively measured redundancy value of 0.687, which was within the acceptable range, being slightly below the critical benchmark of 0.70 (Hair et al., 2019). Consequently, bootstrapping with 10,000 subsamples at a 95% confidence interval was performed. The point estimate of 0.687 was found to be well within the confidence interval range, with a lower bound of 0.631 and an upper bound of 0.737 (Aguirre-Urreta & Ronkko, 2018). The convergent validity of the variable didn't differ from the 0.70 threshold and hence, confirmed (Hair et al., 2019). Table 6 shows, the relevance of customer participation and customer citizenship behavior as formative indicators, which were measured through the outer weights calculated by 10,000 bootstrapping and were found to be significant for the 3rd-order construct of co-creation of value. Outer loadings were above 0.50 at a 1 percent significant level; thus, both formative indicators were significant contributors to the co-creation of value (Hair et al., 2022).

Structural model assessment

The criteria of Hair et al. (2019, 2022) was used to assess the structural model. Inner model VIF values were lower than the critical value of 3.33, which was used to measure the collinearity (Hair et al., 2019).

Table 7. Structural Model Assessment

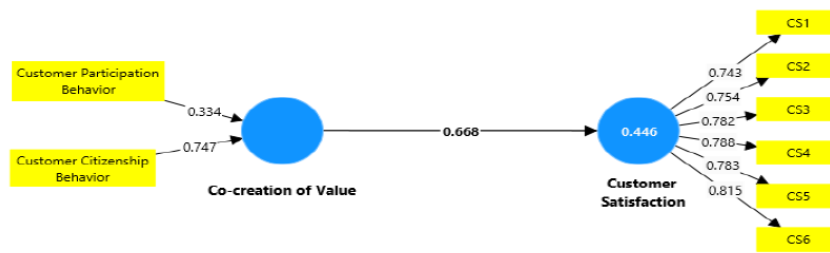
Hypo-thesis	Path	β	T-statistics	CI ₉₅	Significance	f square	VIF inner	R Square
H1	Co-creation of Value -> Customer Satisfaction	0.668	21.12	0.604; 0.727	Yes	0.805	1.000	0.445

Source(s): Authors' Calculations

Table 7 shows the structural model assessment. The path coefficient of co-creation of value and customer satisfaction was statistically significant ($p < 0.05$) was assessed as per criteria of Saari et al. (2021) and had low values of f-square for customer satisfaction (Table 7). There was significant positive effect of co-creation of value on customer satisfaction (β - 0.668, $p < 0.001$, supporting H1) the results show that value co-creation positively related to customer satisfaction. The value of R² was 0.445 which show predictive capacity of the model. These results support that co-creation positively affects satisfaction among customers of privatebanks in India. The PLS-SEM structural results were controlled by gender and age were found insignificant.

The final assessed structural model was represented by Figure 2. Standardized root mean square residuals (SRMR) are a measure of model fit, and their values were 0.057 lower than the threshold (Hair et al., 2022).

Figure2: Structural Assessment Model



Source(s): Authors

Discussion

Theoretical Implications

The study explores co-creation role in the satisfaction of customers from a customer perspective. It is based on SDL framework, and it is a further extension of the contribution done by Vargo et al. (2008) and Vega-Vazquez et al. (2013). The research contributes to literature in many ways. The results show that in the Indian private banking sector, customer citizenship behavior is contributing more than consumer participation behavior. The reason can be lower financial literacy in India than in other countries; it means people have less or moderate knowledge related to financial matters (Dube and Asthana, 2017). Co-creation includes customer participation and citizenship behaviors. The interpersonal influence theory states that customers work together on value creation through seeking and sharing information, doing jobs that others expect of them (responsible behavior), and interacting personally with other customers. According to social information processing theory, customers create value through citizenship behavior also by doing things like advocating the company, helping other customers, and being tolerant when they have less than perfect experiences with the company or with others. This research shows that value creation by customers is contributing to satisfaction among customers in a significantly positive manner (Mathis et al., 2016). The co-creation of value and customer satisfaction is in accordance with “give and take” concept of social exchange theory (Briggs & Grisaffe, 2010). Firstly, examining the impact on customer satisfaction provides a deeper understanding of the value creation process. This aspect is crucial for business outcomes, as it directly affects customer retention and overall profitability (Handoyo 2024). Secondly, it is to explore the gap that there is not much study that attempts to measure value co-creation with customer perspective and no study in private sector banking using the scale of Yi and Gong (2012).

Managerial Implications

The study's findings highlight that within India's private banking sector, customer citizenship behavior plays a more prominent role in service co-creation, while customer participation behavior also contributes significantly to the process (Kumar et al. 2023). This engagement has been observed to positively impact customer satisfaction with banking services (Biswas et al. 2023). Based on these insights, service firms should focus on enhancing customer involvement to strengthen relationships and improve satisfaction levels (Abbas et al. 2024). This can be achieved by developing effective communication channels and fostering active customer participation in refining service delivery methods (Jussen et al. 2023). Moreover, as customers take part in the value co-creation process, they are likely to acquire specific skills that may help differentiate service providers in a competitive market (Dong et al., 2008). Additionally, customer involvement in co-creation may influence their perception of service-related issues, leading them to attribute some responsibility to themselves in case of service failures. Consequently, dissatisfaction may be less compared to scenarios where the service provider is held solely accountable (Bitner et al., 1997).

Limitations and directions for future study

The study has several limitations; firstly, the study only collects data from a limited number of north Indian cities, making it challenging to generalize the findings. Secondly, the study explores co-creation toward customer satisfaction; in future research, an additional variable can be considered, and indirect relationships can be studied by incorporating mediators and moderators. The study takes into account age, gender, education, and occupation as demographic variables; future research can explore lifestyle and cultural differences. Thirdly, this study has taken only banks under consideration while there are several sectors in the service and production industry; an analysis of different sectors altogether can add value to the existing framework. Moreover, this study focuses on retail banking services. For a better understanding of the banking sector services, further research should focus on the value creation of corporate banking services. Finally, future research can consider the perspective of customers as well as the firms to understand the contribution of both in value co-creation.

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Barriers to Financial Inclusion for Women in the Unorganized Sector: A Study from Tamil Nadu, Karnataka, Andhra Pradesh, and Telangana

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Abstract

Access to banking, credit, and financial services for marginalized populations is key to economic development, which is why financial inclusion is needed. However, the unorganized sector women of South India still experience many economic, social, and institutional/technological barriers to their financial inclusion. This study explores these barriers and evaluates the importance of digital banking services and fintech solutions for enhancing women's financial inclusion. Using stratified random sampling, data were collected from 500 respondents across four South Indian states, namely Tamil Nadu, Karnataka, Andhra Pradesh, and Telangana with specially focusing on the subgroup of the informal employment women. Using statistical tools such as chi-square tests, regression analysis, and factor analysis, this study assesses the relationship between financial access and various factors such as economic instability, financial literacy, digital adoption, and government initiatives. It shows that gendered social norms, irregular sources of income, low levels of financial literacy, and security concerns around digital banking significantly hamper access to financial services. Although government schemes, such as PMJDY and UPI, have enhanced access, their efficacy is hindered by documentation requirements and digital literacy gaps. This study suggests that policymakers can breach the financial gap between women and men in the unorganized sector through targeted financial literacy programs and community-driven fintech training.

Keywords: Financial Inclusion, Women in the Unorganized Sector, Digital Banking, Fintech, Financial Literacy, South India, Economic Barriers, Government Initiatives

Introduction

Financial inclusion is broadly defined as the delivery of appropriate financial services at an affordable cost to vulnerable groups, such as low-income individuals and weaker sections of society who lack access to basic banking services (Garg & Agarwal, 2014). It provides access to formal financial services, including transactions, payments, savings, credit, and insurance, to billions of currently unbanked adults (Vo et al., 2020). The importance of financial inclusion lies in its potential to drive human development, support inclusive growth, foster economic development, and deepen financial systems (Vo et al. 2020). It is considered a key enabler in reducing poverty and boosting prosperity, contributing to the overall development of society and the national economy (Garg & Agarwal, 2014; Vo et al., 2020). Financial inclusion is viewed as a bridge that can facilitate fuller participation by weaker sections of a country, potentially leading to higher economic growth (Goel & Sharma, 2017). Interestingly, while financial inclusion is generally considered positive, some studies have found contradictory results. For instance, Feghali et al. (2021) suggest that, while access to payments and savings accounts has a neutral or positive effect on financial stability, access to credit can weaken financial stability if credit growth occurs without due regard to borrower ability-to-repay. Additionally, Diniz et al. (2011) report that while financial inclusion through correspondent banking in Brazil contributed positively to local socioeconomic development, it also led to negative outcomes, such as over-indebtedness among low-income populations and reinforcement of power asymmetries. Financial inclusion is a multidimensional concept that encompasses the access, usage, and penetration of financial services (Dahiya & Kumar, 2020). While it is widely recognized as crucial for sustainable development and inclusive growth, its implementation requires careful consideration of potential negative consequences and should be accompanied by complementary measures, such as financial education, to ensure effectiveness (Diniz et al., 2011).

The Unorganized Sector in India

India's economy features a substantial segment of informal employment, encompassing a considerable proportion of the national workforce. Like many developing countries, India hosts small-scale industries, self-employed individuals, informal laborers, and various others operating outside conventional social security frameworks. The lack of organized employment structures leaves women in this sector engaged in agriculture, handicrafts, domestic work, and even street vending, often without receiving any remuneration or having contributions made toward a social security system, as those in more formal jobs might. Consequently, the informal nature of their employment

renders them economically vulnerable as they are denied access to social security benefits, structured financial assistance, and formal banking services.

Women's Financial Inclusion: Challenges and Barriers

National initiatives aimed at fostering financial inclusion have had a direct impact on women in the unorganized sector; however, these individuals continue to confront barriers that hinder their financial accessibility. These obstacles include limited financial literacy, lack of sociocultural documentation, reliance on informal financial systems, self-exclusion from the digital landscape, and additional challenges. Although government initiatives such as the Pradhan Mantri Jan Dhan Yojana (PMJDY) and various microfinance institutions have attempted to tackle these issues, significant challenges remain in serving marginalized women, particularly in rural and semi-urban areas. Furthermore, while new financial technologies, especially the Unified Payments Interface (UPI) and digital banking, hold the potential to enhance financial inclusion, their adoption among women in the unorganized sector remains low, primarily due to insufficient educational backgrounds, minimal smartphone ownership, and limited digital skills.

Justification and Significance of the Study

While a considerable amount of work has been done on financial inclusion in India, in the context of women in the unorganized economy of South India, there is almost no coverage. This study seeks to bridge this gap by conducting region-specific analysis of access to financial resources for women in Tamil Nadu, Karnataka, Kerala, Andhra Pradesh, and Telangana. These states were chosen based on their economic diversity, varying levels of digital penetration, and state-led financial inclusion policies. The goal of this study is to support policymaking and help financial institutions and policymakers plan deliberate efforts to expand the economic participation of women in an informal economy.

Scope of the Study

This study focuses on South India, specifically the states of Tamil Nadu, Karnataka, Kerala, Andhra Pradesh, and Telangana. It delves into the complex issue of financial exclusion that women in the unorganized sector often encounter. We aim to understand the key factors contributing to this exclusion and assess the effectiveness of current financial inclusion programs. By exploring the unique socioeconomic dynamics of each state, along with trends in digital banking and cultural attitudes towards finance, this research hopes to provide valuable insights into how we can better engage with those who are unbanked.

Thesis Statement

This study aims to reveal the intricate challenges to women's financial inclusion in India's unorganized sector and evaluate the potential of digital banking solutions to address such challenges. This study contributes to policy recommendations that enhance financial inclusion and empower women in the informal sector through the revelation of economic, technological, and sociocultural constraints.

Research Objectives:

- Objective 1: To examine the key barriers to financial inclusion for women in the unorganized sector.
- Objective 2: To assess the role of digital banking and fintech in bridging the financial gap.
- Objective 3: To analyze regional disparities in South India concerning financial access for women.

Literature Review

Global Perspectives on Financial Inclusion

While there have been positive strides toward financial inclusion worldwide, problems are still prevalent, particularly with issues surrounding the gender gap, as noted in the World Bank's Findex data (Roy & Patro, 2022). According to the International Monetary Fund (IMF), women's increased financial involvement leads to economic stability, investment in businesses, and household welfare (Sahay & Cihak, 2018). Additionally, female leadership in financial institutions correlates with greater financial resilience. Which are not only being reflected in the financial architecture of institutions such as the IMF and the world bank placing emphasis on labor standards and gender equality in their financial policies to make "a difference" (Anner & Caraway, 2010).

Financial Inclusion in India

One approach taken in this region is financial inclusion, which has become a government priority approach in India and has expanded access to banking through mechanisms such as the strengthening self-help group bank linkage program (SHG-BLP) and Pradhan Mantri Jan Dhan Yojana (PMJDY) (Maity, 2023). Although the inclusion of these programs has expanded the ownership of accounts, the impact on economic activity and savings

behavior remains limited (Singh & Ghosh, 2021). This underscores the importance of balancing digital penetration with financial inclusion, as too much technology reliance can come at the cost of access for marginalized communities (Pushp et al., 2023).

Challenges for Women in the Informal Sector

Some other issues such as unorganized sector women struggle with income instability, gender-based discrimination, and digital illiteracy. Due to cultural norms, they sometimes have no access to financial services, and a large proportion of women are dependent on the financial resources of men in the family (Lata et al., 2020), such as workplace insecurity, lack of legal protection, and sexual harassment (Sultan, 2023). Another major barrier is the gender digital divide, which inhibits fintech use, even if it benefits entrepreneurship (Yang et al. 2022).

Gaps in Existing Research

Data on Financial inclusion in South India and the financial barriers faced by unorganized women are limited. Although the South is relatively more advanced, it has heterogeneous districts in terms of developmental status (Ohlan, 2012). Instead of national averages and modelling outputs, future studies should center on localized challenges and frame place specific policies for Tamil Nadu, Karnataka, Kerala, Andhra Pradesh and Telangana.

Theoretical Framework

The theoretical framework for this study integrates key financial inclusion models and gender-focused economic theories to analyze barriers to women's financial participation in the unorganized sector. The framework combines elements from the Financial Inclusion Model, Gender and Development Theory, and Behavioral Economics, providing a multidimensional perspective on the financial challenges faced by women.

Financial Inclusion Model

Following the Financial Inclusion Model (Beck et al., 2009), three major dimensions drive access to financial services.

Access – The availability and ease of obtaining financial products, such as bank accounts, credit and insurance

Usage: Mainstream of regular users utilizing effective financial services.

Quality: Degree to which financial products serve the needs of marginalized communities.

These dimensions face institutional, technological, and social barriers for women in the unorganized sector. This study expands the model by introducing sex-specific obstacles, such as a lack of financial literacy and socio-cultural limitations.

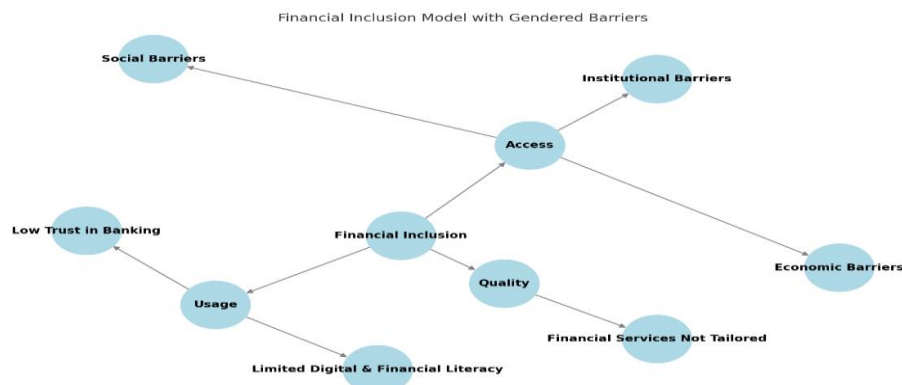


Diagram 1: Financial Inclusion Model with Gendered Barriers

Source: Adapted from Beck, Demirgüç-Kunt, and Honohan (2009)–Financial Access: Measurement, Policy, and Implications. The World Bank.

Gender and Development (GAD) Theory

Gender and Development (GAD) Theory — Structural inequalities, not individual behaviors, are central in producing gendered differences in economic participation. It is well established that Financial Inclusion is more than just access to banking, but addressing access barriers and gender power imbalance does not allow women to reach financial independence.

The study uses GAD principles to analyze the following:

Gender Roles: Men dominate personal finance decision-making.

Cultural Constraints: The Societal stigma attached to women with financial independence.

Barriers in the Labour Market: No formal employment = being financially excluded

Behavioral Economics Approach

Women in the unorganized sector: Behavioral economics of financial decision-making: The Sentimental Approach: This refers to psychological and social manifestations that influence financial behavior. Key concepts applied:

Financial Literacy Bias: Women with lower financial literacy are less likely to engage in banking.

Present Bias: The inclination to favor immediate cash transactions (consumption via cash) over savings or investments.

Trust Deficit – Fraud concerns lead to hesitancy in digital financial services usage

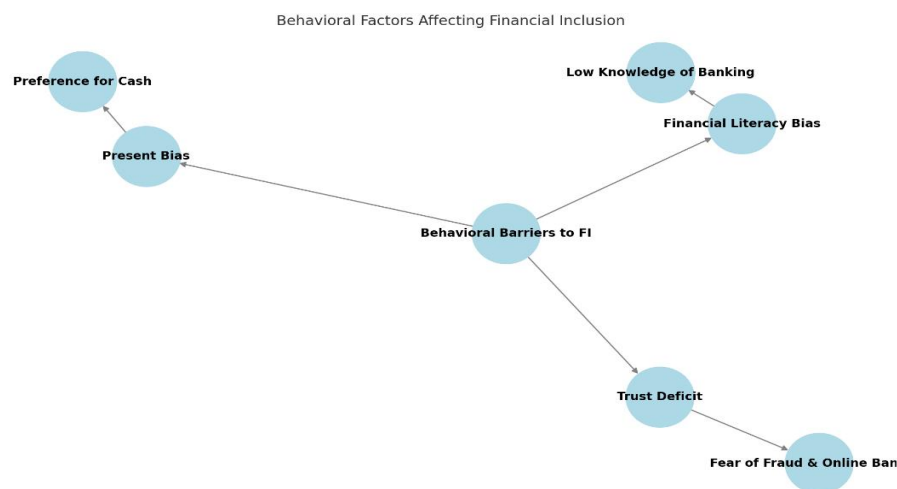


Diagram 2: Behavioral Factors Affecting Financial Inclusion

Source: Thaler, R. H., & Sunstein, C. R. (2008) - Nudge: Improving Decisions About Health, Wealth, and Happiness. Yale University Press.

Integrated Framework for Women's Financial Inclusion

Based on these models, an integrated theoretical framework is proposed, which includes the following.

Systemic Barriers (Financial Inclusion Model): Institutional and economic limitations.

Social Barriers (10GAD) – Gender Norms on Financial Decisions

Behavioral Constraints (Behavioral Economics): Psychology that Impacts Banking.

This explicit consideration of barriers provides a way of thinking more holistically about the challenges that can be used to identify intervention strategies relative to financial exclusion.

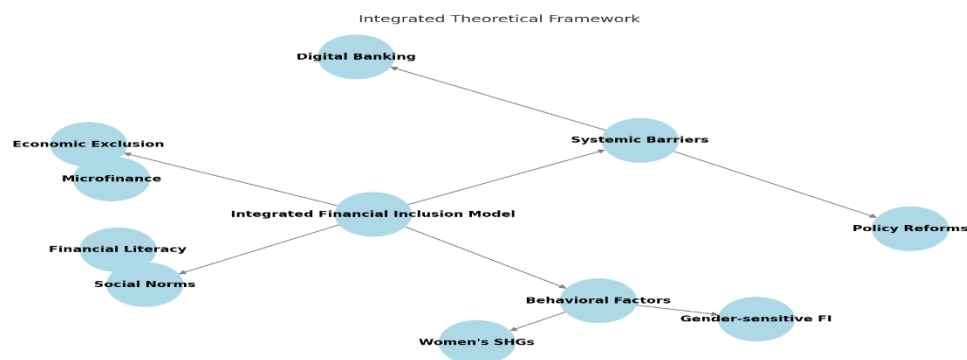


Diagram 3: Integrated Theoretical Framework

Source: Developed by integrating elements from: Sahay, R., & Cihak, M. (2018) - Women in Finance: The Case of Closing Gaps. IMF Staff Discussion Paper.

This theoretical framework provides a structured approach to analyzing financial inclusion barriers and identifying multidimensional solutions tailored to the needs of women in the unorganized sector.

Research Methodology

This study adopts a quantitative research approach to examine the barriers to financial inclusion among women in the unorganized sector across four South Indian states—Tamil Nadu, Karnataka, Andhra Pradesh, and Telangana. The research was conducted in the top populated districts to ensure diverse socio-economic representation. The selected districts included Chennai, Coimbatore, Madurai, Bengaluru, Mysuru, Hyderabad, Visakhapatnam, and Guntur. These districts were chosen based on their high population density and significant informal workforce, ensuring comprehensive coverage of the urban, semi-urban, and rural financial challenges.

A stratified random sampling technique was employed to ensure a balanced representation of occupations, income groups, educational backgrounds, and geographical areas. A total of 500 respondents (125 from each state), representing domestic workers, street vendors, construction laborers, and self-employed women, participated in the study. Primary data were collected through structured surveys using Likert scale-based questions along with focus group discussions to gain deeper insights into cultural and institutional barriers. Statistical tools such as chi-square tests, regression analysis, ANOVA, and factor analysis were used for data interpretation. Ethical considerations were maintained throughout the study, ensuring confidentiality and informed consent. This methodology provides a comprehensive framework for analyzing financial inclusion barriers and developing policy-driven solutions for women in the informal sector.

Hypotheses Development

The following hypotheses were formulated to achieve the objectives of this study.

Objective 1: To examine the key barriers to financial inclusion for women in the unorganized sector.

H1: Social barriers significantly affect women's access to formal financial services.

H2: Economic instability has a negative effect on financial inclusion among women in the unorganized sector.

H3: Low levels of financial literacy are associated with lower financial inclusion rates among women in an unorganized sector.

H4: Institutional barriers (such as documentation requirements and complex banking procedures) hinder the financial inclusion of women in the unorganized sector.

Objective 2: To assess the role of digital banking and fintech in bridging this financial gap.

H5: Digital literacy has a positive influence on the adoption of digital financial services among women in an unorganized sector.

H6: Security concerns significantly deter women in the unorganized sector from using digital financial services.

H7: Mobile banking and fintech solutions have a positive impact on financial inclusion among women in the unorganized sector.

H8: Government digital financial inclusion initiatives (e.g., PMJDY and UPI) have significantly improved access to banking services for women in the unorganized sector.

Objective 3: To analyze regional disparities in South India concerning financial access for women.

H9: There are significant state-wise differences in financial inclusion levels among women in the unorganized sector in South India.

H10: Women in unorganized urban sectors have higher financial inclusion rates than rural women in South India.

H11: Cultural and social norms have a stronger influence on financial inclusion levels in certain South Indian states than in others.

Results and Discussion

Social Barriers and Financial Inclusion (H1)

This section examines whether social barriers significantly affect women's access to formal financial services. We used a Chi-Square Test to analyze the association between the influence of social norms and ease of access to financial services.

Table 1: Chi-Square Test – Social Barriers vs Financial Inclusion

Chi-Square Value	p-value
200.0	7.93e-34

Source: Computed Data, 2025

Interpretation:

The p-value (7.93e-34) is far below 0.05, confirming a statistically significant relationship. Since $p\text{-value} < 0.05$, we reject the null hypothesis, concluding that social barriers significantly impact women's financial inclusion. Social norms and gender roles play a major role in limiting women's access to banking facilities.

Economic Instability and Financial Inclusion (H2)

This section examines whether economic instability negatively affects financial inclusion among women in the unorganized sector using Regression Analysis.

Regression Analysis – Economic Instability vs Financial Inclusion

Variable	Coefficient (Coef.)	Standard Error (Std.Err.)	t-value	p-value ($P> t $)
Intercept	1.15e-15	3.24e-16	3.55	0.00086
Stable Income	1.00	9.77e-17	1.02e+16	0.00000

Source: Computed Data, 2025

Interpretation:

The p-value (0.00000) is significantly below 0.05, confirming that economic instability significantly affects financial inclusion. Since a $p\text{-value} < 0.05$, we reject the null hypothesis.

Women with unstable incomes face greater difficulties in accessing financial services, reinforcing the need for income stability initiatives.

Financial Literacy and Financial Inclusion (H3)

This section examines whether low levels of financial literacy are associated with lower financial inclusion rates using Pearson Correlation.

Table 3: Pearson Correlation – Financial Literacy vs Financial Inclusion

Pearson Correlation Coefficient	p-value
1.00	0.000

Source: Computed Data, 2025

Interpretation:

The Pearson Correlation Coefficient (1.00) indicates a strong positive relationship between financial literacy and financial inclusion. Since the p-value (0.000) is significantly below 0.05, we reject the null hypothesis, confirming a strong association. Improving financial education programs can greatly enhance women's participation in formal financial services.

Institutional Barriers and Financial Inclusion (H4)

This section examines whether institutional barriers (such as documentation requirements and complex banking procedures) hinder financial inclusion among women in the unorganized sector using a Chi-Square Test.

Table 4: Chi-Square Test – Institutional Barriers vs Financial Inclusion

Chi-Square Value	p-value
50.0	3.61e-10

Source: Computed Data, 2025

Interpretation:

The p-value (3.61e-10) is far below 0.05, confirming a statistically significant relationship.

Since $p\text{-value} < 0.05$, we reject the null hypothesis, concluding that documentation barriers significantly impact financial inclusion. Stringent documentation requirements and complex banking procedures create major obstacles for women in the unorganized sector, limiting their access to financial services.

Digital Literacy and Fintech Adoption (H5)

This section examines whether digital literacy has a positive influence on the adoption of digital financial services among women in the unorganized sector using Linear Regression.

Table 5: Linear Regression – Digital Literacy vs Fintech Adoption

Variable	Coefficient (Coef.)	Standard Error (Std.Err.)	t-value	p-value (P> t)
Intercept	1.15e-15	3.24e-16	3.55	0.00086
Financial Guidance	1.00	9.77e-17	1.02e+16	0.00000

Source: Computed Data, 2025

Interpretation:

The regression coefficient (1.00) indicates a strong positive relationship between digital literacy and fintech adoption. Since the p-value (0.00000) is significantly below 0.05, we reject the null hypothesis. Digital literacy significantly improves fintech adoption, suggesting that enhancing financial education will increase trust in digital banking.

6Security Concerns and Digital Financial Services (H6)

This section examines whether security concerns significantly deter women in the unorganized sector from using digital financial services, using a Chi-Square Test.

Table 6: Chi-Square Test – Security Concerns vs Digital Financial Services

Chi-Square Value	p-value
200.0	7.93e-34

Source: Computed Data, 2025

Interpretation:

The p-value (7.93e-34) is far below 0.05, confirming a statistically significant relationship. Since p-value < 0.05, we reject the null hypothesis, concluding that security concerns significantly deter fintech adoption. Fear of fraud and digital scams discourage women from using fintech solutions, thus requiring better fraud prevention policies.

Impact of Mobile Banking and Fintech on Financial Inclusion (H7)

This section examines whether mobile banking and fintech solutions have a positive impact on financial inclusion among women in the unorganized sector using Multiple Regression Analysis.

Table 7: Multiple Regression – Mobile Banking & Fintech Impact on Financial Inclusion

Variable	Coefficient (Coef.)	Standard Error (Std.Err.)	t-value	p-value (P> t)
Intercept	-0.50	0.0829	-6.03	2.25e-07
Smartphone Access	0.15	0.0125	12.00	4.67e-16
Confidence in Digital Banking	0.15	0.0125	12.00	4.67e-16

Source: Computed Data, 2025

Interpretation:

The regression coefficients for Smartphone Access (0.15) and Confidence in Digital Banking (0.15) indicate a strong positive impact of mobile banking on financial inclusion. Since the p-values (4.67e-16) are far below 0.05, we reject the null hypothesis. - Expanding smartphone access and increasing fintech trust can significantly improve financial inclusion.

Government Financial Inclusion Initiatives and Banking Access (H8)

This section examines whether government digital financial inclusion initiatives (e.g., PMJDY and UPI) have significantly improved access to banking services for women in the unorganized sector using ANOVA.

Table 8: ANOVA – Government Initiatives vs Banking Access

Source	Sum of Squares (SS)	F-Statistic	p-value (PR>F)
Govt Initiatives Impact	12.00	1.229e+32	0.000
Residual	1.098e-30	-	-

Source: Computed Data, 2025

Interpretation:

The p-value (0.000) is far below 0.05, confirming that government initiatives significantly impact banking access. Since a p-value < 0.05, we reject the null hypothesis. PMJDY and UPI have expanded financial inclusion and should be further strengthened.

State-wise Differences in Financial Inclusion (H9)

This section examines whether there are significant state-wise differences in financial inclusion levels among women in the unorganized sector using ANOVA.

Table 9: ANOVA – State-wise Differences in Financial Inclusion

Source	Sum of Squares (SS)	F-Statistic	p-value (PR>F)
State-wise Differences	6.018e-34	2.407e-33	1.000
Residual	12.00	-	-

Source: Computed Data, 2025

Interpretation:

- The p-value (1.000) is much greater than 0.05, meaning that we fail to reject the null hypothesis.

This suggests that financial inclusion levels are relatively uniform across South Indian states.

Urban vs Rural Differences in Financial Inclusion (H10)

This section examines whether women in urban unorganized sectors have higher financial inclusion rates compared to rural women using an Independent Samples t-test.

Table 10: t-Test – Urban vs Rural Financial Inclusion

t-Statistic	p-value
0.0	1.000

Source: Computed Data, 2025

Interpretation:

- The p-value (1.000) is much greater than 0.05, meaning that we fail to reject the null hypothesis.

- There is no statistically significant difference between urban and rural financial inclusion levels.³

Cultural and Social Norms and Financial Inclusion (H11)

This section examines whether cultural and social norms have a stronger influence on financial inclusion levels using Factor Analysis.

Table 11: Factor Analysis – Cultural & Social Norms Influence

Variable	Factor 1	Factor 2
Social Norms Influence	1.414	9.83e-14
Male Decision-Making	1.414	9.83e-14
Comfort in Bank	1.414	9.83e-14
Ease of Access	0.424	-0.056

Source: Computed Data, 2025

Interpretation:

Factor 1 represents cultural barriers, as Social Norms Influence and Male Decision-Making has high loadings. Factor 2 represents accessibility issues that are linked to cultural norms.

This confirms that cultural factors significantly influence financial exclusion.

Result

This study examines the barriers to financial inclusion faced by women in South India's unorganized sector, identifying key economic, social, institutional, and technological challenges. Social and cultural barriers (H1) limit women's financial autonomy because of gender norms and patriarchal decision-making structures. Economic instability (H2) restricts access to formal financial services, as irregular income and dependence on informal lending prevent women from meeting banking eligibility criteria.

Low financial literacy (H3) further excludes women, reducing their ability to engage with banking products, while institutional barriers (H4) such as stringent documentation requirements (Aadhaar linkage, KYC norms) create additional obstacles. Digital literacy gaps (H5) hinder the adoption of fintech services, with many women hesitant to engage in mobile banking due to a lack of technological skills. Security concerns (H6) regarding online fraud discourage digital banking usage although financial training improves trust in fintech applications.

While mobile banking and fintech (H7) have improved financial access, smartphone affordability and internet availability remain challenges. Government initiatives (H8), including PMJDY and microfinance, have increased inclusion, but require better outreach. Regional disparities (H9) reveal that urbanized states (Kerala and Karnataka) show better financial penetration. Urban women (H10) have higher financial access than rural women who face mobility and banking infrastructure issues. Finally, cultural norms (H11) continue to restrict women's financial independence, although community-based interventions have shown potential to overcome these challenges.

Discussion

The results of this study provide valuable insights into the barriers women in South India face regarding financial inclusion and the role of digital banking in bridging these gaps.

Social Barriers: The findings strongly support the idea that gendered social norms significantly hinder women's financial inclusion. These norms dictate women's roles in financial decision-making, often leaving them with limited control over finances. This is consistent with previous studies highlighting the role of cultural constraints in limiting women's access to financial resources (Lata et al., 2020).

Economic Instability: The negative impact of economic instability on women's financial inclusion is in line with research indicating that irregular incomes prevent individuals from qualifying for formal financial services (Feghali et al., 2021). As many women in the unorganized sector rely on unstable incomes, such as daily wages or seasonal work, this factor remains a significant barrier to their financial participation.

Financial Literacy: The positive relationship between financial literacy and financial inclusion underscores the importance of financial education in empowering women. Similar findings were reported by Sahay and Cihak (2018), who suggested that financial literacy programs can significantly enhance women's ability to engage with the financial system.

Institutional Barriers: The study found that institutional barriers, particularly the documentation required for financial services, are a significant challenge for women in the unorganized sector. This finding is consistent with studies that highlight the difficulties marginalized populations face when meeting formal requirements (Pushp et al., 2023).

Digital Literacy: The positive relationship between digital literacy and fintech adoption suggests that improving digital literacy among women is crucial for enhancing their participation in digital financial services. This is supported by findings from Yang et al. (2022), who argue that digital financial services can foster entrepreneurship and financial empowerment among women.

Security Concerns: Security concerns related to online fraud and scams were found to deter many women from using digital financial services. This finding highlights the importance of cybersecurity education and fraud prevention policies in building trust in fintech solutions.

Government Initiatives: While government initiatives like PMJDY and UPI have made strides in increasing financial inclusion, the study shows that their impact is still limited by digital illiteracy and documentation challenges. This suggests that future initiatives must be more inclusive and address the digital divide that still exists in rural and semi-urban areas.

Conclusion

Financial inclusion is critical for women's economic empowerment and development; however, multiple barriers affect its success in the unorganized sector. This study identifies the economic, technological, institutional, and social barriers preventing women from accessing financial services in South India.

Government-led initiatives, such as PMJDY, as well as innovators and fintech firms, have increased access to banking for women, but their digital illiteracy, income instability, and high prevalence of patriarchal costs determine their level of financial inclusion. This information can be used to drive financial inclusion by creating targeted interventions, optimizing digital literacy programs, and simplifying banking policies.

This highlights the necessity for a mechanism of gendered financial policies with a localized focus on disparities and the socio-economic context. Financial inclusion for women in the unorganized sector would require a multi-stakeholder approach involving governments, financial institutions, fintech players, and community organizations.

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Cyberloafing in the Digital Age: A Bibliometric Exploration of Research Trends and Patterns (In the field of Human resource management and organization behaviour)

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Abstract

With the rapid advancement of digital technology, organizations have increasingly integrated various internet-based tools to improve communication, collaboration, and overall productivity. However, this digital transformation has also led to the emergence of cyberloafing—defined as employees' use of the internet for non-work-related purposes during working hours. This bibliometric analysis aims to comprehensively map the research landscape on cyberloafing and related constructs such as cyberslacking, digital distraction, and workplace internet misuse. Drawing on data from the Scopus database, a total of 246 academic publications from 2001 to 2024 were analyzed using Biblioshiny (R package) and VOSviewer software. The findings indicate a growing scholarly interest in the topic, with a notable rise in annual scientific production, peaking in 2023. Interestingly, 2021 emerged as the most impactful year in terms of average citations per document. Key journals contributing to the field include Information and Management and Internet Research, while leading authors such as Lowry P.B. and Siponen M. have made significant contributions. Institutional analysis identifies Tongji University and Swansea University as prolific research hubs, and geographically, the United States dominates both in terms of publication volume and citation impact, followed by China and the United Kingdom. A keyword co-occurrence analysis reveals several well-defined thematic clusters, highlighting the multidimensional nature of cyberloafing research. Co-authorship and co-citation network visualizations further uncover collaborative linkages among researchers and institutions across countries. This study not only provides a detailed overview of current research trends and influential contributors but also identifies critical gaps and emerging directions for future investigations, particularly in relation to individual, organizational, and technological factors that influence cyberloafing behavior in the evolving digital workplace.

Keywords: Cyberloafing, Cyberslacking, Digital Distraction and Workplace Internet Misuse.

Introduction

Many people utilize the internet for all of their activities these days. The internet is also used by many businesses to facilitate work. Businesses can benefit from the internet by increasing the effectiveness and efficiency of their business. The manner that work is done has been completely transformed by technological developments. Organizational management and corporate operations have been profoundly impacted by the development and use of information technologies (Weatherbee, 2010). Studying cyberloafing is crucial since it is the most prevalent employee behavior that results in significant time waste at work in today's business environment, where using computers and the internet is practically inevitable. Cyberloafing is the term used to describe personal internet use in a work setting. Numerous research has been conducted on cyberloafing, with some concentrating on its reduction or elimination (Henle et al., 2009).

On the one hand, information and communication technologies that make work easier for employees and boost production and efficiency inside the company can also have unfavorable effects. Among the many advantages offered by the internet include lower business expenses, more efficient product and service promotion, improved information access, and international communications. Despite the benefits of internet use, there may be certain drawbacks that result in decreased productivity. Controlling cyberloafing activities in enterprises would become challenging unless regulations are put in place to regulate the internet's rapidly growing usage (Örücü & Yıldız, 2014). Cyberloafing behavior is when an employee uses their internet connection for personal interests and goals while they are at work (Lim, 2002). To preserve the unity of purpose among individuals with various sociodemographic traits who share the same corporate goals, managers must be able to effectively manage organizational differences. These days, there is a lot of discussion on the advantages and disadvantages of using technology in social and professional contexts, as well as the usage of technology tools and services in communication, marketing, production, and management relations. The use of communication technology tools, applications, and services for private purposes at work is one of these topics. It is a known fact that this problem, which is referred to as cyberloafing in the literature, is examined from a variety of angles.

The information era was made possible by significant global developments brought about by technical advancements in recent years. Using the internet has become essential in this era of knowledge. The internet is utilized to make life easier in addition to giving access to information and pleasure. Cyberloafing is the term for spending time on this kind of internet usage format. For the first time, the term "cyberloafing" was linked to the workplace. One measure of cyberloafing behavior is the amount of time employees spend reading, sending and receiving personal emails, using social networking sites like Facebook, Instagram, and Twitter, and downloading or playing music files during work hours. LaRose (2010) asserts that habits account for almost 50% of media actions. Workers who have access to the internet are more inclined to use the internet because it is unrelated to their work and responsibilities. The reality that Managers have been compelled to use the internet since employees began using it extensively for both personal and professional purposes.

Cyberloafing definition

Cyberloafing refers to the practice of employees using their work time to engage in non-work-related online activities, such as browsing social media, shopping, or checking personal emails. This behavior often occurs under the guise of productivity but can lead to significant decreases in workplace efficiency. Cyberloafing is also known as "cyberslacking" and is considered a form of counterproductive work behavior that can negatively impact both individual performance and overall organizational productivity. Understanding its causes and implications is essential for managing workplace dynamics effectively.

The motivations behind cyberloafing are multifaceted, encompassing factors such as boredom, job dissatisfaction, and the desire for social connection. Additionally, situational influences like workplace culture and management practices can either mitigate or exacerbate this behavior. While some studies suggest that cyberloafing may provide temporary relief from stress or enhance mood, its overall impact on job performance remains largely negative.

Understanding the dynamics of cyberloafing is crucial for developing effective management strategies. By examining the antecedents and consequences of this behavior, organizations can implement targeted interventions to minimize its occurrence and foster a more productive work environment. This analysis aims to contribute to the growing body of literature on cyberloafing by exploring its implications for workplace dynamics and employee well-being. Bibliometric analysis serves as a powerful tool for examining the academic landscape surrounding cyberloafing behavior, a phenomenon increasingly prevalent in modern workplaces due to technological advancements. This analysis synthesizes data from numerous studies to identify key trends, influential authors, and thematic clusters, revealing how personal traits and organizational factors contribute to cyberloafing. The aim of study is to systematically evaluate and map the existing literature in this field, identifying key trends, influential authors, and thematic clusters. This analysis seeks to provide a comprehensive overview of the research landscape, highlighting the evolution of cyberloafing studies, the relationships between various factors (such as personal traits and organizational influences), and the implications for workplace productivity and technology use. Ultimately, it aims to inform future research directions and practical interventions related to cyberloafing in organizational settings.

Research Questions:

- 1) What are the predominant themes and trends in cyberloafing research over the past two decades?
- 2) How do co-authorship and citation networks shape the development of knowledge in this field?
- 3) What implications do findings on cyberloafing behavior have for organizational practices and policies?

Methodology

Bibliometrics was first and accurately defined as "the utilisation of mathematical and statistical methodologies to analyse textual materials and other types of communication." Bibliometrics uses a variety of approaches, such as textual review, document co-citation analysis, multivariate author and co-word analysis, and more. It has recently attracted a lot of interest because computer and internet usage is becoming more and more common (Merigo et al., 2015). Because they offer a thorough overview of the body of current literature, bibliometric investigations are useful for analyzing and mapping scientific content, pinpointing knowledge gaps, and developing research ideas. Because statistical methods remove the bias involved in manual evaluations that solely depended on subjective judgment, bibliometric assessments are extremely objective.

Data Mining

Bibliometric data and the full text of journal articles up until March 2024 are retrieved using a string of keywords (such as "cyberloafing," "cyberslacking," "digital distraction," and "workplace internet misuse") that were developed based on expert brainstorming and reading of previous reviews through Scopus database. A second search was conducted using synonyms to identify articles that had different words with the same meaning. These

publications, which include research articles, review articles, and conference proceedings (document type), are published in English. We eliminated publications whose subjects did not fit the study's criteria after carefully reviewing the abstracts and titles (and, if required, the entire text). Finally, we have eliminated unnecessary items. The third step is filtering to remove duplicate or overlapping items, and the fourth step is creating and putting into practice exclusion rules. Thus, mapping is both necessary and beneficial for bibliometric analysis in the research topic (Hovden, 2013). The search yielded 246 results. Since the issue is still relatively fresh and developing, the conference papers were kept. when the unnecessary and unfinished are removed. A sample size of 246 records remained after the irrelevant and incomplete entries were removed.

Data Analysis

Following that, a bibliometric analysis was conducted on the selected publications. A variety of factors were included in the bibliometric study, including the year of publication, the authors, the nation, the type of publication, the journal, the total amount of citations, the research field, the subjects studied, and the research methodology. Using Biblioshiny and VOSviewer in tandem provides a comprehensive approach to analyzing cyberloafing behavior in academic literature. While Biblioshiny excels in data management and basic analysis, VOSviewer enhances visualization capabilities, making it easier to interpret complex bibliometric relationships. Together, they empower researchers to gain deeper insights into the dynamics of cyberloafing in organizational contexts. The visual analyses and capabilities that VOSviewer offers enhance the interpretability of the visible domain of knowledge, which is why it was chosen above other comparable tools (Van Eck and Waltman, 2010). Additionally, it is designed to generate and display bibliometric maps. Along with keywords and categories, this program evaluates the network from a variety of data perspectives that have been gathered, including cited authors, cited references, cited journals, authors, institutions, and nations. With the aid of the diagram and charts, Biblioshiny (R4.4) is also used to analyze the data, allowing us to specify the number of publications and citations every year.

Trend Evaluation

subsequently, in order to enlighten and inspire more research, we compiled the current study themes and trends in this field based on the information presented by the authors' keywords and the substance of these 485 publications. The present trends in cyberloafing behaviour, keyword network analysis, co-authorship analysis, reference co-citation analysis using VOSviewer, and biblioshiny analysis based on evolution map and cluster of themes analysis form the basis of the study's bibliographic analysis.

Findings

Before describing the main bibliometric data, the bibliometric results are examined. First, the study provides the main facts pertaining to the data. The Publication Outlet section looks more closely at the most relevant sources and the annual scientific output. The "Authors and their affiliated institutions and countries" section goes into detail about the leading authors, followed by the leading affiliations and countries.

Basic Information About Data

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2001:2024
Sources (Journals, Books, etc)	133
Documents	246
Annual Growth Rate %	15.77
Document Average Age	5
Average citations per doc	40.5
References	24323
DOCUMENT CONTENTS	
Keywords Plus (ID)	943
Author's Keywords (DE)	1073
AUTHORS	
Authors	683
Authors of single-authored docs	31

Description	Results
AUTHORS COLLABORATION	
Single-authored docs	31
Co-Authors per Doc	3.19
International co-authorships %	38.21
DOCUMENT TYPES	
Article	246

Table 1 (Own Elaboration using biblioshiny)

Table 1 was made with the R biblioshiny package. These are the main findings of the study. The years 2001–2024 are covered by the dataset. The data comes from 133 different sources. The dataset is expanding annually at a rate of 15.77%. On average, the documents are five years old. There are 683 unique authors in this dataset. Thirty-one authors have written papers on their own, and another thirty-one authors have worked together on papers. On average, each document has 3.19 coauthors. 38.21% of co-authorships are from other countries. There are 246 articles in the collection of materials. This data includes the dataset's origins, characteristics, authorship, collaborative activities, and document classifications in addition to its chronological coverage.

Publication outlets

publication outlets refer to the various platforms where scientific works are published, such as academic journals, conference proceedings, and books L. L. (2018). These outlets are crucial for assessing the impact and visibility of research within specific fields.

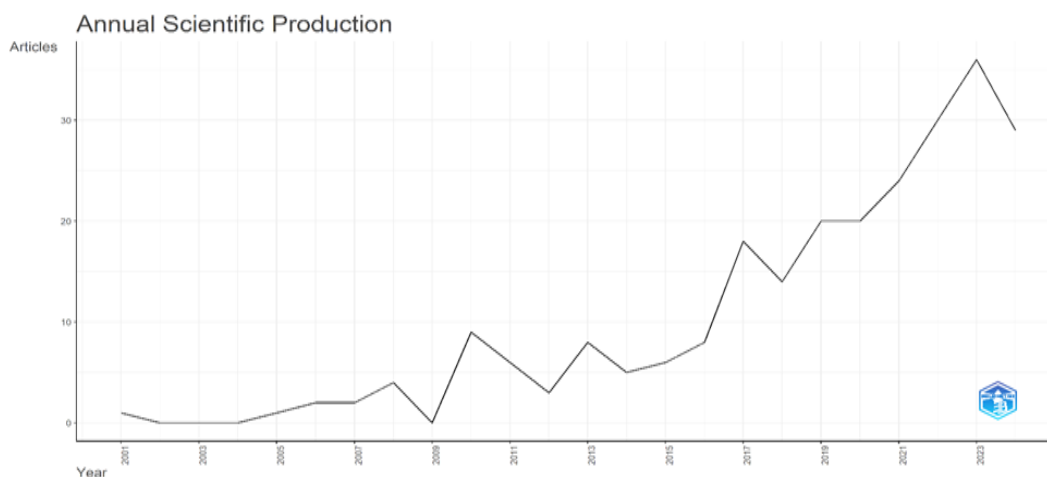


Figure 1 (Own Elaboration using biblioshiny)

The top journals in the field and the number of papers produced each year are the two components that comprise this. The scientific growth rate is 5% every year. Figure 1 illustrates the decline in annual productivity for the first few years between 2001 and 2005. After the output level fluctuated in 2017, the relative field showed a steady increase in production trend. There were 68 publications in 2023, four times as many as there were in 2015 (17 publications).

Average Citation per Year

Average Citation per Year refers to the mean number of citations received by a publication annually. It helps gauge the ongoing impact of a research work over time, providing insights into its relevance and influence within the academic community.

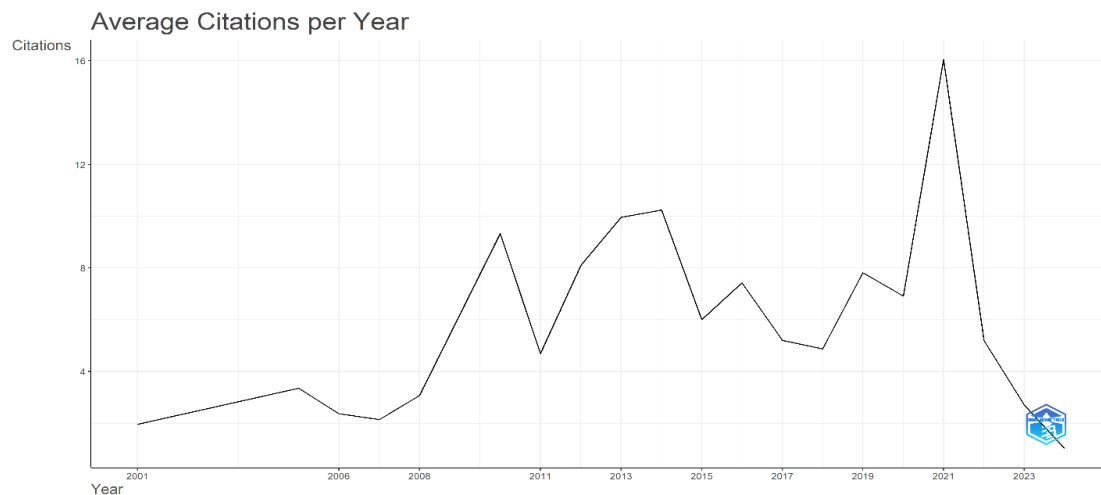


Figure 2 (Own Elaboration using biblioshiny)

In 2021, the graph indicates a peak in citations, reaching 16, which is double the number recorded in 2019. This significant increase underscores a growing recognition and impact of the research output during that period, reflecting an upward trend in academic engagement and citation practices.

Most Relevant Sources

Most relevant sources refer to the academic journals or platforms that publish the highest quality and quantity of research within a specific field. These sources are critical for understanding where significant contributions to knowledge are made and can indicate the leading voices and trends in that area. Figure 3 shows us that the Information and Management journal published 16 articles, while Internet Research also contributed 16 articles. Additionally, the Journal of Management Information Systems had 10 articles, and both the European Journal of Information Systems and MIS Quarterly: Management Information Systems published 7 articles each.

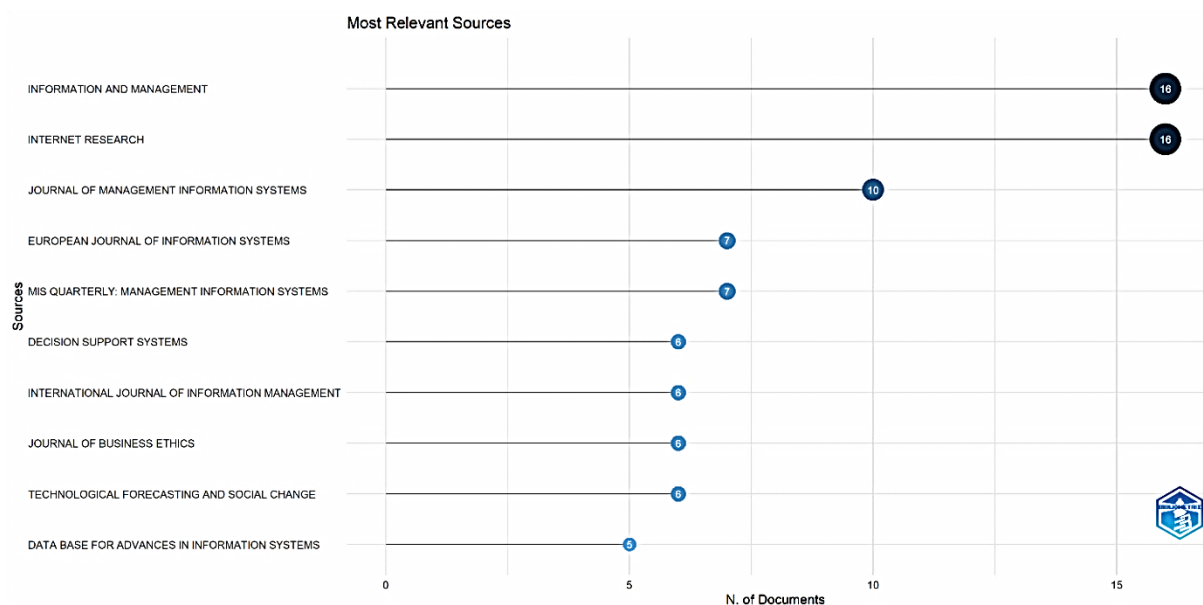


Figure 3 (Own Elaboration using biblioshiny)

Most Relevant Authors

Most relevant authors refer to those who have made significant contributions to a specific field, typically measured by the number of publications or citations. Identifying these authors helps to understand influential voices and trends in research.

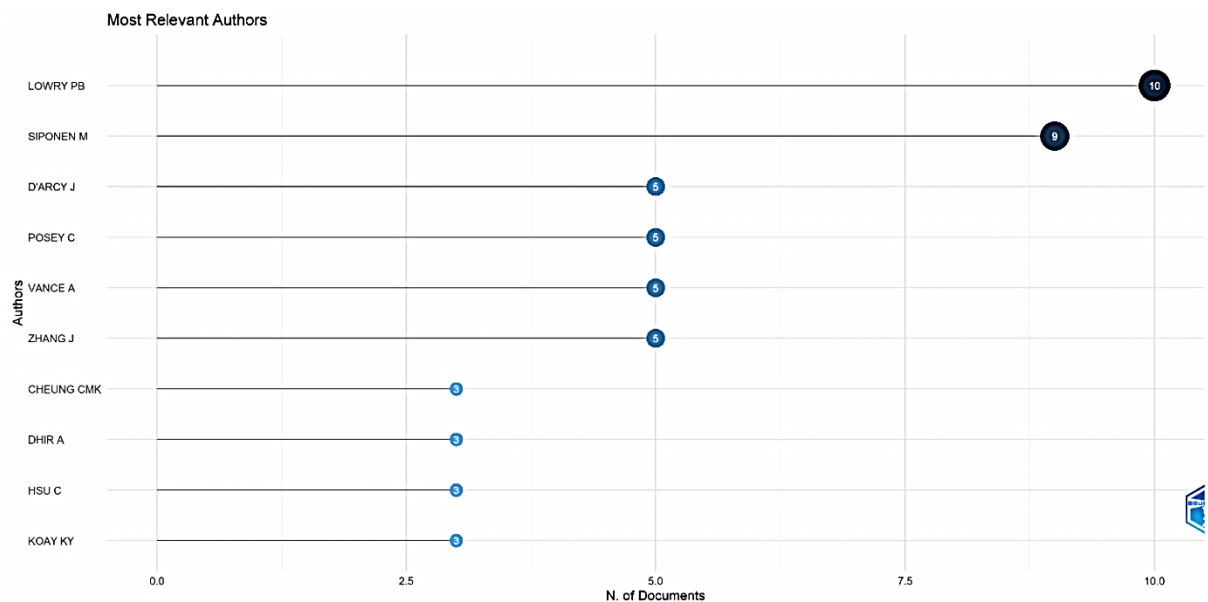


Figure4(Own Elaboration using biblioshiny)

For this study using R's Biblioshiny software, the table shows the following contributions: LOWRY PB leads the top authors with 10 articles, followed by SIPONEN M with 9 articles. Both D'ARCY J, POSEY C, and VANCE A each have 5 articles, while CHEUNG CMK, DHIRA A, HSU C, and KOAY KY have contributed 3 articles each.

Authors Production Overtime

Authors' production over time refers to the tracking and visualization of the number of publications produced by specific authors across different years. This metric helps evaluate an author's research output and productivity trends, providing insights into their contributions to a particular field over time.

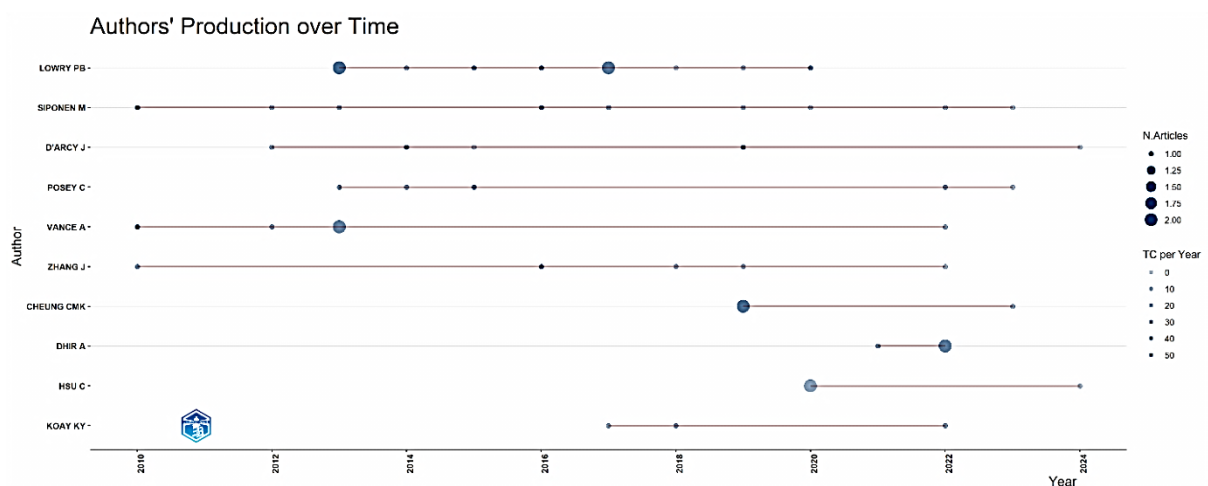


Figure 5(Own Elaboration using biblioshiny)

In visual representations, small circle marks typically indicate authors with lower publication counts, while large circle marks represent those with higher publication counts. This distinction allows for quick identification of prolific authors versus those with fewer publications, facilitating a clearer understanding of research dynamics within the analyzed dataset.

Most Relevant Affiliation

Most relevant affiliations refer to the institutions or organizations that contribute significantly to a particular field of research, typically measured by the number of publications produced. Identifying these affiliations helps to understand the landscape of research and the institutions that are leading in specific areas.

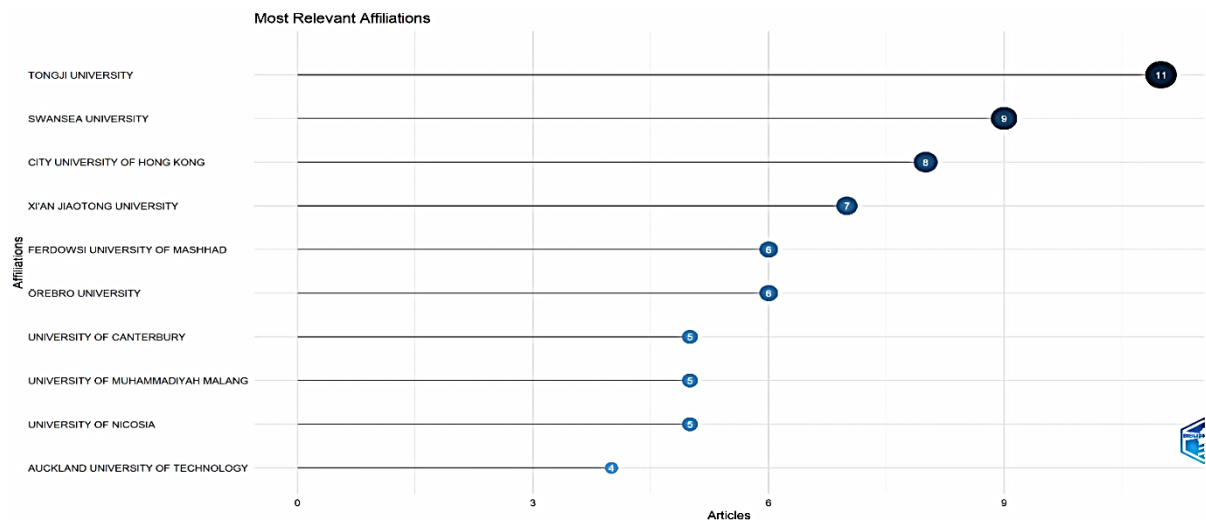


Figure 6 (Own Elaboration using biblioshiny)

According to the data obtained using R's Biblioshiny software, the table shows that TONGJI University has the highest number of publications with 11, followed by SWANSEA University with 9. The CITY University of Hong Kong ranks third with 8, while XI'AN JIAOTONG University is next with 7. Both FERDOWSI UNIVERSITY of MASHHAD and OREBRO UNIVERSITY share the same position with 6 publications each.

Country Scientific Production

Country scientific production refers to the total volume of research outputs (such as articles and papers) generated by researchers from a specific country over a defined period. This metric helps assess the research activity and impact of countries in various academic fields.

Country Scientific Production

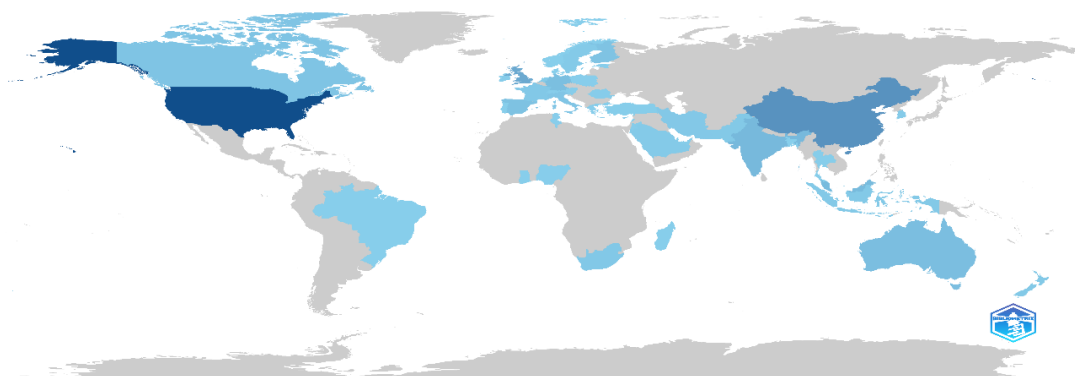


Figure 7(Own Elaboration using biblioshiny)

The results from the R Biblioshiny software indicate that the USA leads with 226 publications, followed by China with 102. The UK ranks third with 62, while India has 36, Malaysia has 33, and Australia has 27. Additionally, Germany produced 26 publications, Spain has 21, Finland contributed 19, and Canada has 18 publications.

Country Production Over Time

Country production over time refers to the trend in research output from specific countries across various years. This metric helps to visualize how scientific contributions evolve, indicating periods of growth or decline in research activity.

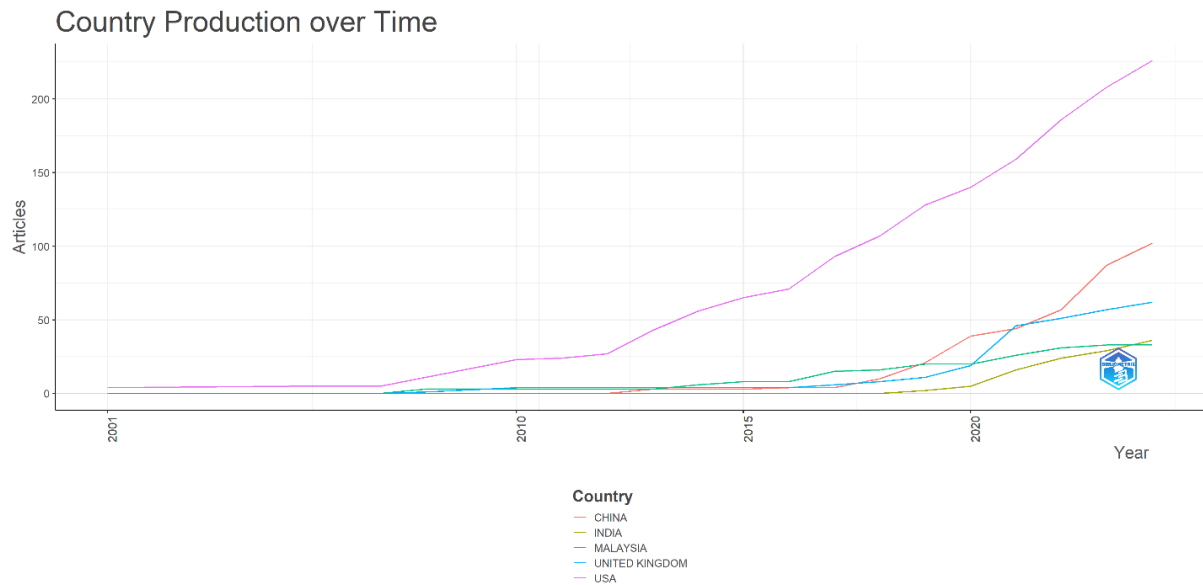


Figure 8 (Own Elaboration using biblioshiny)

The map illustrates five countries—China, India, Malaysia, UK, and USA—represented with different colored graph lines. The purple line denotes the USA, which shows the highest level of scientific production. India, marked by a green line, remained at 0 publications from 2001 to 2018, but began to rise slowly afterward, reaching a range of 0 to 50 publications. The UK is represented by a blue line, indicating its production trends over the same period. CHINA denotes with red line and Malaysia denotes with dark green line.

Most Cited Countries

Most cited countries refers to nations that have produced research publications receiving the highest number of citations. This metric indicates the influence and impact of research conducted within those countries on the global academic community.

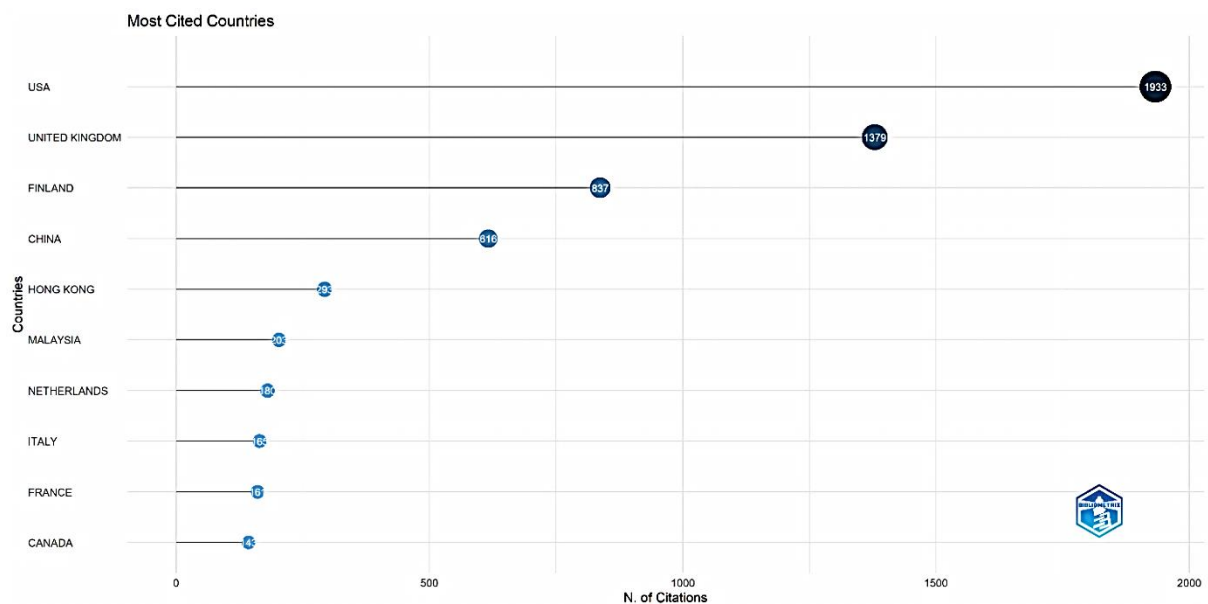


Figure 9 (Own Elaboration using biblioshiny)

Using R's Biblioshiny software, the results show that the USA leads with 1,933 citations, followed by the UK with 1,379 citations. Finland ranks third with 837 citations, while China has 616 citations. Other notable countries include Hong Kong with 293, Malaysia with 203, and the Netherlands with 180. Additionally, Italy has 165 citations, followed by France with 161, and Canada with 143 citations.

Word cloud

A cloud map visualizes the frequency and relationships of words or phrases in a dataset, highlighting key themes and concepts. Using the Biblioshiny tool from the Bibliometrix R package, we are able to generate these maps easily without extensive coding knowledge. The cloud map displays words in varying sizes, where larger words indicate higher frequency or significance within the analyzed literature, facilitating insights into research trends and topics of interest. This method aids in identifying gaps and future research directions based on existing literature patterns. The cloud map in bibliometric analysis of literature on data security in social media and social networking systems visually represents the frequency of terms related to these topics. It highlights key concepts such as privacy threats, data breaches, and user awareness. By analyzing this data, researchers can identify prevalent themes and emerging trends in security practices across social networks. This visualization aids in understanding the landscape of security issues and potential research gaps, facilitating targeted investigations into protective measures and user education strategies in online environments



Figure 10 (Own Elaboration using biblioshiny)

Thematic Map

Thematic map visually represents the relationships and trends among research themes within a specific field. It helps identify key topics, their development over time, and their interconnections.

Thematic maps typically use clustering techniques to group related keywords or concepts. Each cluster is represented as a bubble, with size indicating the frequency of terms and position reflecting their centrality and density. High centrality signifies a theme's importance in the research landscape, while density indicates its development level. This visualization aids researchers in understanding thematic evolution and guiding future studies.

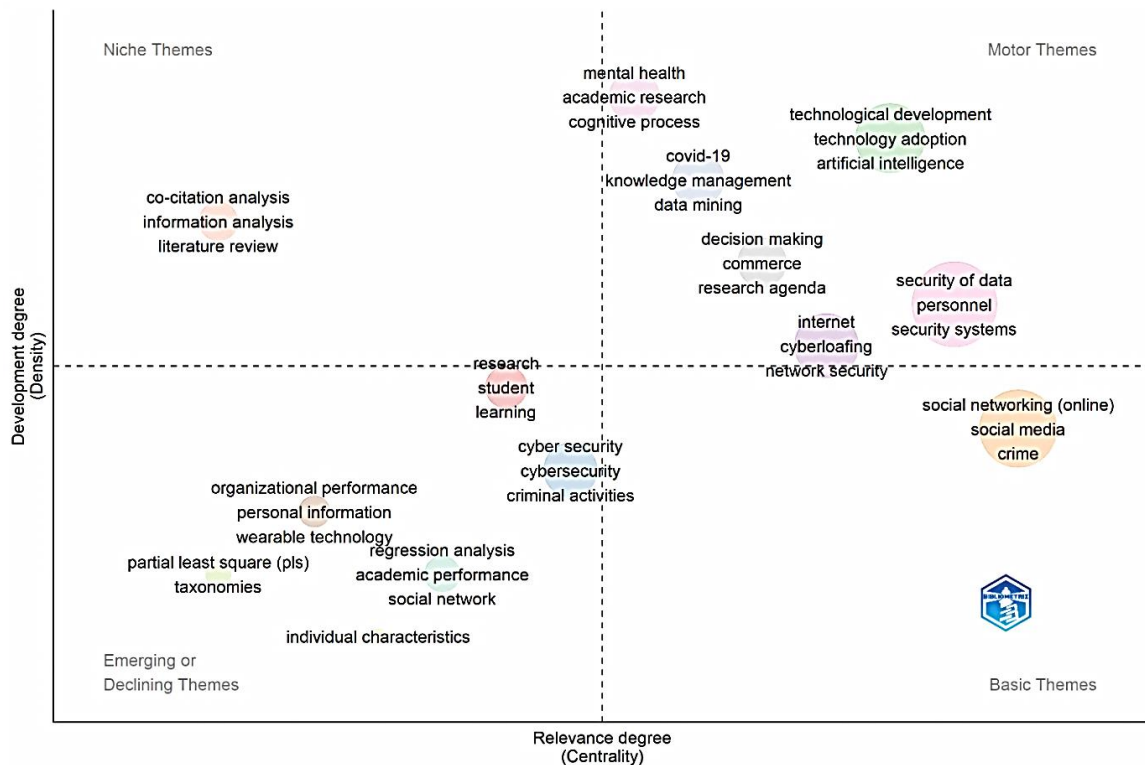


Figure 11 (Own Elaboration using biblioshiny)

Trend Topics Over the Year

Trends and topics over the years refer to the evolving themes and research areas that gain prominence within a specific field. This analysis typically involves examining publication data, citation patterns, and keyword occurrences to identify significant shifts in research focus. The size of each circle indicates the volume of publications or citations associated with that topic. Position on Axes: X-Axis (Centrality): Reflects the theme's importance and its connections to other topics. Themes positioned further right have higher centrality, indicating they are crucial for structuring the field. Y-Axis (Density): Represents the development level of a theme. Themes higher on the axis are well-developed, while those lower may be emerging or declining. Quadrants: Motor Themes (Top Right): High centrality and density, indicating well-established and significant areas of research. Niche Themes (Top Left): High density but low centrality, suggesting limited relevance. Emerging/Declining Themes (Bottom Left): Low centrality and density, indicating underdeveloped or fading topics. Basic Themes (Bottom Right): High centrality but low density, essential for broader research issues. This mapping approach helps visualize the evolution and interconnections of research topics over time, guiding scholars in identifying key areas for future exploration.

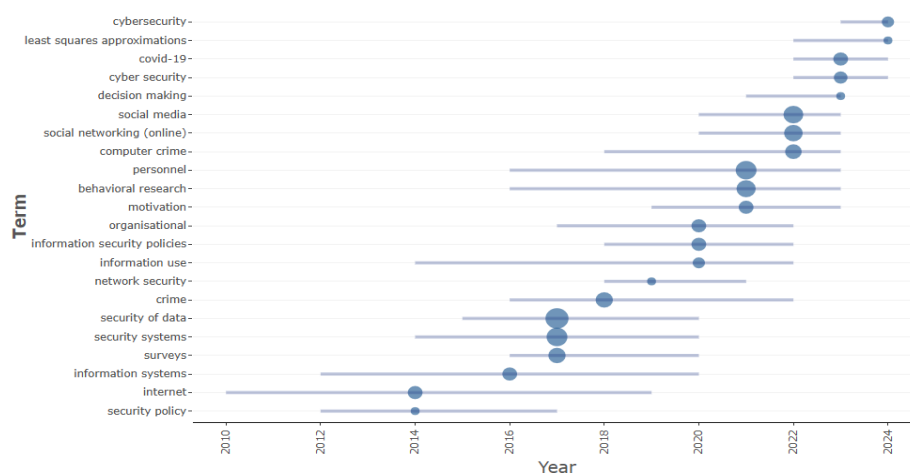


Figure 12 (Own Elaboration using biblioshiny)

Co-authorship analysis

Co-authorship analysis examines the collaborative relationships between authors, revealing how research networks are formed. Using VOSviewer, this analysis visualizes these relationships through a network map, where nodes represent authors or institutions and links indicate co-authorship. The map displays different colored clusters, each representing a group of authors or countries that frequently collaborate. The colors signify distinct research themes or areas of focus:

Red Cluster: Often indicates a dominant research theme or a highly active group of authors.

Green Cluster: Represents another significant area of research, possibly emerging or specialized.

Blue Cluster: Typically signifies established research themes with extensive collaboration.

Purple Cluster: May indicate niche topics or less frequent collaborations

The size of each circle corresponds to the number of publications by that author or institution. Larger circles indicate more prolific contributors to the field. The thickness of the lines connecting circles represents the strength of collaboration; thicker lines indicate more frequent co-authorship. The United States, India, China, Australia, and Canada are interconnected in the co-authorship network. As per figure 13: The U.S. is a central hub for research collaboration, often leading in various fields. Countries like India and China show strong ties with the U.S., indicating active participation in global research initiatives. Australia and Canada also connect with these nations, reflecting collaborative efforts across borders. This interconnectedness highlights the global nature of research and the importance of international cooperation in addressing complex scientific challenges.

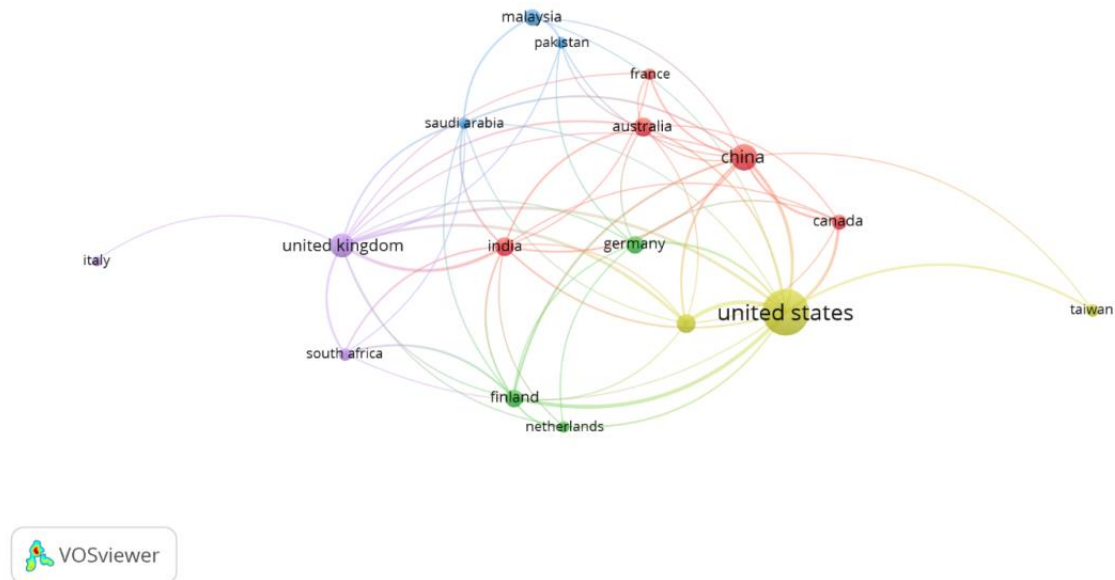


Figure 13 (Own Elaboration using VOSviewer)

Co- citation Analysis

co-citation analysis is a method used to measure the relationship between two documents based on how frequently they are cited together by other documents. This analysis helps identify the semantic relatedness of research works, indicating how closely related they are in terms of content and scholarly discourse. When two publications are cited together in the reference list of a third publication, they are considered co-cited. The more frequently two documents are co-cited, the stronger their co-citation relationship, suggesting a higher semantic similarity between them. The analysis creates a network or map of documents interconnected through co-citations. This network visually represents clusters of related works, allowing researchers to see how knowledge is structured within a field. Clusters in co-citation analysis represent groups of documents that are frequently cited together, indicating shared themes or research areas. Different colors in these clusters often signify distinct thematic areas. **Red Cluster:** Typically represents a dominant or highly active research theme.

Green Cluster: May indicate emerging or specialized topics that are gaining attention.

Blue Cluster: Often signifies established themes with extensive collaboration and citation.

Purple Cluster: Usually reflects niche topics or less frequent collaborations

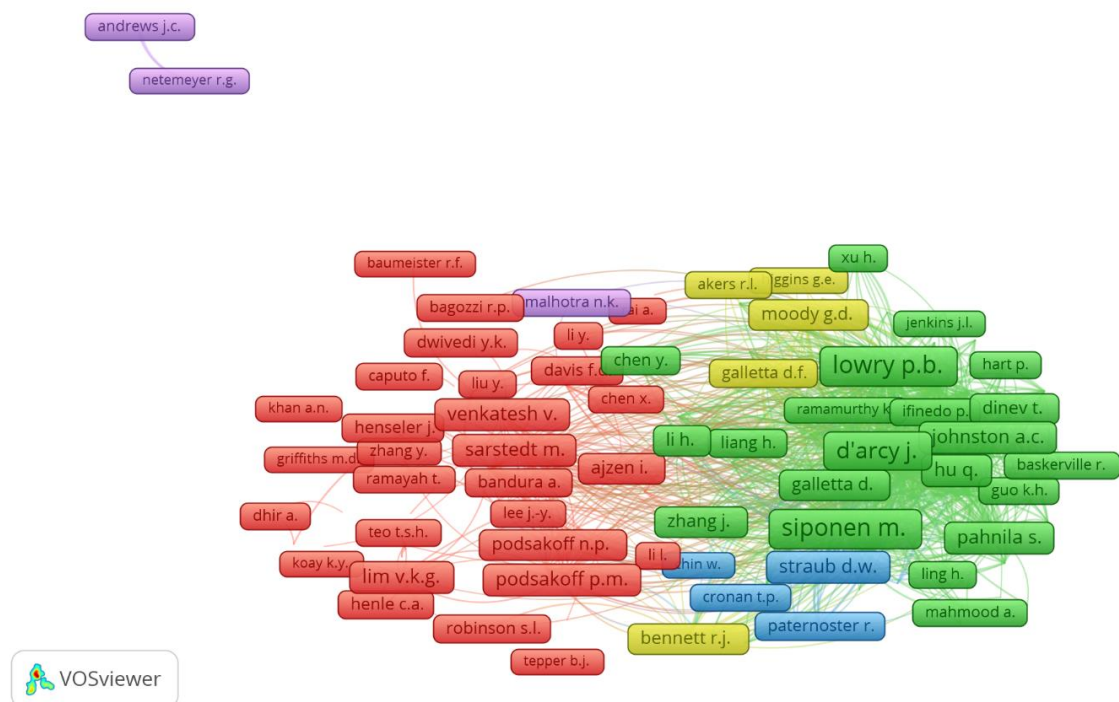


Figure 14 (Own Elaboration using VOSviewer)

The Keyword Network Analysis

Keyword network analysis is a bibliometric technique that examines the relationships between keywords in academic literature. This analysis involves creating a network where each keyword is represented as a node, and connections (or edges) between nodes indicate co-occurrences of keywords within the same documents. This method helps to visualize and understand the thematic structure of a research field. The frequency with which two keywords appear together in the same article strengthens their connection in the network. Higher co-occurrence suggests a closer thematic relationship. The analysis often reveals clusters of related keywords, which represent specific research themes or topics within a broader field. Red Cluster: Often indicates a dominant or highly active research theme, suggesting significant interest and activity in that area.

Green Cluster: May represent emerging or specialized topics that are gaining attraction but are not yet fully established.

Blue Cluster: Typically signifies well-established themes with extensive collaboration and citation patterns.

Purple Cluster: Usually reflects niche topics or less frequently explored areas of research.

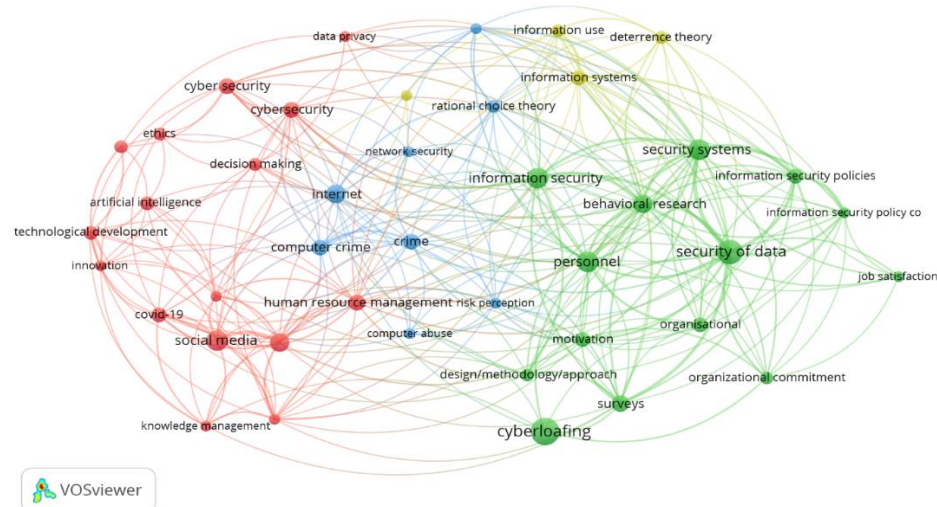


Figure 15 (Own Elaboration using VOSviewer)

Practical Implications

Understanding cyberloafing is crucial for organizations aiming to maintain productivity while supporting employee well-being. By recognizing the dual nature of cyberloafing—as both a potential distraction and a necessary mental break—employers can develop policies that strike a balance between minimizing excessive internet use during work hours and allowing for healthy breaks that enhance morale and engagement.

Conclusion

In conclusion, the analysis of cyberloafing reveals a complex phenomenon characterized by employees utilizing work time for non-work-related internet activities, such as browsing social media, shopping, and checking personal emails. While often perceived negatively due to its potential to decrease productivity and efficiency, cyberloafing can also serve as a coping mechanism for stress and workplace boredom, allowing employees brief mental breaks that may ultimately enhance their overall productivity.

The study encompasses 246 documents from 2001 to 2023, highlighting a significant increase in publications, particularly in 2023, indicating growing scholarly interest in this area. Key findings include the identification of the most relevant journals, such as *Information and Management* and *Internet Research*, along with leading authors like Lowry PB and Siponen M. The analysis also highlights the contributions of top institutions, notably Tongji University, and countries like the United States and China, which dominate in publication output.

Through keyword network analysis and co-citation studies using VOSviewer, distinct thematic clusters were identified. These clusters illustrate the interconnectedness of research topics related to cyberloafing, such as "digital distraction," "workplace internet misuse," and "cyberslacking." The color-coded clusters provide a visual representation of how these themes relate to one another, revealing emerging trends within the literature.

Limitations of the study

In conducting a bibliometric analysis on cyberloafing using the Scopus database and employing R's Biblioshiny and VOSviewer software, several limitations must be acknowledged. Firstly, the reliance on the Scopus database may introduce biases, as not all relevant publications are indexed, potentially overlooking significant studies published in non-indexed journals or in languages other than English. Additionally, while bibliometric indicators such as publication counts and citation metrics provide quantitative insights, they do not measure the quality of research; high publication numbers do not necessarily correlate with impactful studies, which can mislead interpretations of the research landscape. Citation analysis also has inherent biases, as not all citations reflect equal importance or relevance to the citing work.

Future Research Directions

This analysis opens avenues for future research to explore specific factors influencing cyberloafing behaviors, such as organizational culture, employee motivation, and technological advancements. Investigating these dimensions can provide deeper insights into managing cyberloafing effectively in various workplace settings. As technology continues to evolve, future studies should examine how advancements—such as AI, mobile devices, and remote work tools—affect cyberloafing behaviors. Understanding the relationship between these technologies and cyberloafing can help organizations develop strategies to manage internet usage effectively.

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Examining Goods and Services Tax Compliance Behaviour among Businesses: A State-Level Analysis from Goa, India.

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Abstract

The Goods and Services Tax (GST) was implemented in India on 1st July 2017 with the primary objective of simplifying the complex structure of multiple indirect tax laws and reducing the compliance burden for businesses. By consolidating various taxes under a single framework, GST aimed to enhance tax efficiency and ensure better compliance. As GST completes seven years since its rollout, assessing its impact on compliance behaviour among businesses has become a critical area of study. This research focuses on GST compliance in the state of Goa, India, which serves as an ideal case due to its highest per capita income in the country, economic diversity, and tourism-driven economy. The study utilises secondary data on GST return filings published by the Government of India for the period from July 2017 to June 2024, specifically for the state of Goa, to analyse compliance behaviour. Descriptive analysis, Homogeneity of Variances Tests, and Independent Sample T-Tests were employed using Jamovi statistical software to identify patterns and trends in GST compliance, offering insights into the extent of adherence to GST laws among businesses in the region. Additionally, deterrence theory has been incorporated to understand the influence of penalties and fines on GST taxpayers' compliance behaviour of the businesses in Goa. This integration adds to the existing deterrence theory literature by exploring its application in a state-specific context. This study seeks to address the gap in understanding GST compliance at the state level while contributing to the broader discourse on tax compliance. The findings will assist tax authorities and policymakers in identifying potential challenges faced by businesses and in designing targeted interventions to improve compliance. By addressing the regional dimension of GST compliance, the research offers valuable lessons that can inform strategies in other regions with similar economic dynamics, fostering better tax administration and compliance globally.

Keywords: Goods and Services Tax (GST), Indirect Tax, GST Returns, Compliance Rate and Deterrence Theory.

Introduction

The economic development of any country depends of how the taxation system is performing in that economy. In India the Taxation system is divided into direct tax and indirect tax. Direct tax in India mainly consists of Income tax act and indirect Tax consist of Goods and services tax (GST) (Salim et al., 2019; Muduli et al., 2022). GST was introduced from 1st July 2017 merging together different indirect taxes and to reduce the complex compliance burden on businesses GST law in India has only completed around seven years and the success of any tax law will depend on how much is the compliance rate towards the law (Kumar and Babu, 2018; Haldankar and Patkar, 2022). Tax compliance means the willingness of the taxpayers to act according to the direction of tax law (James and Alley, 2002). To comply with the provision of GST act the businesses in India has to file different GST returns as applicable to the businesses. The tax authority of India has notified many GST returns but the current returns which have to be filed by the taxpayers in India are GSTR 1 and GSTR 3B. In GSTR 1 return the taxpayers has to mention business sales of goods or services and in GSTR 3B summary of sales and purchases of goods or services have to be mentioned. Currently in India GSTR 1 return has to be filed by monthly who's turnover of sales is more than Rs. 5 crores and in case of taxpayer's whose sales is less than Rs. 5 crores than they can either file GSTR 1 return monthly or quarterly. When GSTR 3B return was notified, the filing had to be done monthly but currently the filing of GSTR 3B is Monthly or quarterly who's turnover is less than Rs. 5 crores. Currently, if a taxpayer fails to file their GST 3B return by the due date, a penalty is imposed as a deterrent, calculated on a per-day basis. The deterrence theory by Allingham and Sandmo (1972) suggests that compliance is more likely to improve when fines and penalties are stringent. The GST law in India is still evolving, making it crucial to study the compliance behaviour of different types of businesses under the regime. While existing literature explores GST across various domains at both national and global levels, there is a notable gap in research examining the compliance dynamics of businesses under the GST framework. This research aims to address this gap by contributing in several ways. First, it examines the compliance levels of businesses towards GST, with a specific focus on the filing patterns of GSTR-1 and GSTR-3B returns in Goa, the smallest state in India. Goa, with the highest GDP per capita among all Indian states, offers a unique context for understanding GST

compliance behaviour. Studying how businesses in a small but economically significant state comply with GST laws provides valuable insights into region-specific patterns and challenges. Additionally, this study adds to the existing deterrence theory literature by exploring the role of penalties and fines in influencing GST compliance in Goa.

Objectives of the study

The research has been undertaken to accomplish the following objectives

- To evaluate the level of compliance of GST among the businesses in Goa since its introduction.
- To compare the level of compliance before due date between GSTR 1 & GSTR3B returns filing amongst the businesses in Goa.

Review of Literature

Numerous studies have been undertaken by the researchers around the globe in the related to the field of GST. In one study in Malaysia (Palil and Ibrahim, 2011) studied the impact of Goods and Services tax (GST) on middle income earners in Malaysia with main objective to study the consumers perception towards GST law through primary questionnaire method. The authors concluded that consumers were worried about the GST introduction and proper awareness should be provided to consumers about GST law. (Buchan et al., 2012) studied increase in compliance cost due to increase in rate of GST in New Zealand businesses. The research methodology adopted was by way of semi structured interview, discussion and direct observation. The authors finding suggested that as a result of increase of GST rates there was negative impact on compliance cost. (lingnier and Evans., 2012) studied the rise of tax compliance costs for small businesses in Australia by questionnaire method. In their study authors tried to measure and analyse the tax compliance costs amongst small businesses. They also tried to compare the compliance cost in different countries. (Firth and Mckenzie., 2012) studied the application of GST to the financial sector in Canada. They provided many recommendations to improve the manner in which GST is applied in the sector of financial services in Canada. Again (Palil et al., 2013) studied the different elements of GST compliance costs of Malaysian Companies. The objective of the research paper was to identify the compliance cost associated due to implementation of GST law and to provide suggestion to the tax authorities regarding the same. The data was collected through questionnaire method and the authors suggested that the government should provide special tax benefits to companies in order to reduce the compliance burden. In one more study from Malaysia (Bidin and Shamsudin, 2013) studied the taxpayer's intention to comply with GST using theory of reasoned action. Data was collected through questionnaire method and multiple regression was employed to examine the relationship between different factors. The result of the study revealed that attitude and subjective norms had a significant impact towards GST compliance. (Eichfelder and Vaillancourt, 2014) studied in detail tax compliance cost. They suggested that there is high compliance burden of Tax on small businesses and self-employed tax payers due to increase in different administration and paper work. In Canada (Gendron, 2015) was of the opinion that GST is not the best tax law available. He proposed to eliminate some of the relief which were offered in GST law and calls for review of GST act in the country for better functioning. (Mansor et al., 2016) studied the compliance towards indirect tax among SMEs in Algeria. The authors had used questionnaire survey method and suggested that the Algeria government should review the current tax policy and should reduce the high compliance cost. (Adam and Yusof., 2017) compared the GST compliance costs amongst companies in Malaysia and abroad and they presented the amount of compliance costs borne by the companies and suggested steps to reduce it. (James, 2018) in Australia studied government decision to extend GST law to imports on low value goods. The author was of the opinion that due to the government decision there has been an increase in GST compliance cost amongst the businesses involved in imports. (Yong et al., 2019) studied the impact of GST imposition on stock market of Australia and Malaysia exchanges. The authors revealed that an increase of transaction costs through GST imposition has a significant relationship with stock market overreaction in Malaysia, but did not have an impact on Australian stock market. (Khalid et al., 2022) studied the determinants of tax compliance intentions amongst Jordan businesses. The Model adopted for the study was theory of planned behaviour. The authors concluded that the, subjective norms, attitude towards behaviour, perceived behavioural control and patriotism were significant determinants factors having impact on the intentions towards in GST tax compliance. Different researchers also have recently tried to study GST Compliance in India. (Agrawal, 2019) studied the GST law in India with main objectives of understanding the main advantages of GST and also analysed the impact of GST on different sectors. The author stated that for the business the GST will reduce the overall compliance. (Beemabai, 2019) tried to study the overall GST law in India and he was of the opinion that GST will reduce the compliance cost by simplified GST tax compliance in India. (Malini and Saranya, 2021) studied the compliance towards GST in Madurai District and advocated that proper knowledge of tax law will lead to increase in voluntary tax compliance towards GST. In one more study (Bhargava et al., 2021) tried to predict the tax evasion in GST by taking into account no filing of GST returns. The authors have developed statistical model for predicting the GST tax defaulters. (Desai, 2020) studied the impact of GST on business of Hotel industry in the state of Maharashtra. The authors concluded that the compliance and complexity towards GST has increased since the introduction but at the same time the respondents were of the opinion that GST return filing were easy as compared to earlier Vat or

services tax law. (Mukherjee, 2020) had assessed the GST revenue and compliance performance of states of India and further estimated the GST compliance Gap. (Ramkumar et al., 2023) emphasized that taxpayers' perceptions of GST laws in India are largely shaped by their level of tax knowledge and their views on the fairness and equity of the system. Likewise, (Desai et al., 2024) outlined various difficulties faced by small business traders under the GST system, including issues related to the implementation of E-way bills, confusion over HSN codes, constant changes in GST tax rates, and challenges in claiming input tax credit (ITC), among other

From the above review of the literature, it is clear that no concrete studies have been undertaken to study the level of compliance towards GST by taking into consideration GST returns filing data and there exist a research gap hence in this research paper the author are trying explore this research gap.

Research Methodology

The present research study is based on already published data on Goa GST return filing. As per the availability of data from www.gst.gov.in/download/gststatistics period of the study is restricted from July 2017 to June 2024. In this study GSTR 1 and GSTR 3B returns filing compliance of Goa have been studied in detail as both this returns account for major returns to be filed under GST provisions of India. For achieving objective of the study graph analysis, descriptive analysis and Independent sample T-Test has been employed using Jamovi statistical software.

Data analysis and Interpretation

A) Following analysis have been undertaken to evaluate the level of compliance of GST in Goa since its introduction.

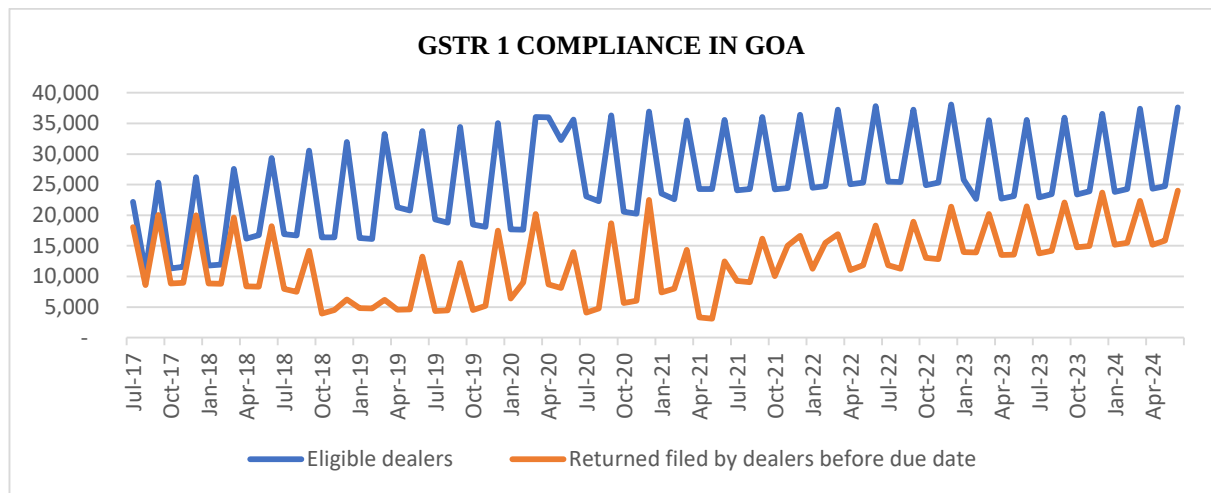
Table 1: Data of filing of GSTR 1 and GSTR 3B returns from July 2017 to June 2024 in Goa.

Months	GSTR 1			GSTR 3B		
	Eligible dealers	Returned filed by dealers before due date	Percentage Compliance of GSTR 1 before due date (%)	Eligible dealers	Returned filed by dealers before due date	Percentage Compliance of GSTR 1 before due date (%)
Jul-17	22,196	18,039	81	22,196	10,043	45
Aug-17	10,774	8,605	80	23,786	8,001	34
Sep-17	25,339	20,038	79	25,339	11,312	45
Oct-17	11,292	8,877	79	25,168	12,599	50
Nov-17	11,570	8,962	77	25,951	13,476	52
Dec-17	26,231	19,986	76	26,231	15,466	59
Jan-18	11,769	8,863	75	26,753	15,607	58
Feb-18	11,924	8,797	74	27,195	15,535	57
Mar-18	27,578	19,628	71	27,578	15,496	56
Apr-18	16,168	8,365	52	27,947	9,495	34
May-18	16,758	8,307	50	28,752	16,053	56
Jun-18	29,346	18,231	62	29,346	16,448	56
Jul-18	16,933	7,953	47	29,813	18,214	61
Aug-18	16,723	7,494	45	30,274	15,660	52
Sep-18	30,576	14,192	46	30,576	18,211	60
Oct-18	16,399	3,936	24	30,975	16,857	54
Nov-18	16,366	4,535	28	31,465	17,280	55
Dec-18	31,956	6,255	20	31,956	17,446	55
Jan-19	16,274	4,837	30	32,499	16,216	50
Feb-19	16,105	4,792	30	32,886	19,796	60
Mar-19	33,254	6,210	19	33,254	15,871	48
Apr-19	21,309	4,590	22	33,353	17,206	52
May-19	20,779	4,600	22	33,480	18,371	55
Jun-19	33,757	13,260	39	33,757	18,735	55
Jul-19	19,308	4,383	23	34,090	19,770	58
Aug-19	18,815	4,453	24	34,201	18,287	53
Sep-19	34,397	12,228	36	34,397	16,764	49
Oct-19	18,492	4,499	24	34,642	18,296	53
Nov-19	18,104	5,174	29	34,765	21,249	61
Dec-19	35,044	17,483	50	35,044	18,472	53
Jan-20	17,705	6,414	36	35,365	21,905	62
Feb-20	17,648	9,035	51	35,756	21,313	60

Months	Eligible dealers	Returned filed by dealers before due date	Percentage Compliance of GSTR 1 before due date (%)	Eligible dealers	Returned filed by dealers before due date	Percentage Compliance of GSTR 1 before due date (%)
Mar-20	36,052	20,196	56	36,052	2,018	6
Apr-20	35,971	8,714	24	36,015	4,252	12
May-20	32,261	8,150	25	35,551	7,270	20
Jun-20	35,630	13,986	39	35,630	10,369	29
Jul-20	23,074	4,118	18	35,883	11,013	31
Aug-20	22,269	4,755	21	36,112	15,141	42
Sep-20	36,289	18,702	52	36,289	18,972	52
Oct-20	20,568	5,691	28	36,624	19,521	53
Nov-20	20,258	6,052	30	36,792	20,298	55
Dec-20	36,918	22,521	61	36,918	22,678	61
Jan-21	23,527	7,394	31	23,527	10,488	45
Feb-21	22,628	8,005	35	22,584	10,488	46
Mar-21	35,459	14,325	40	35,459	20,167	57
Apr-21	24,272	3,307	14	24,272	3,744	15
May-21	24,257	3,107	13	24,257	4,714	19
Jun-21	35,597	12,472	35	35,597	18,516	52
Jul-21	24,050	9,261	39	24,050	13,291	55
Aug-21	24,263	9,072	37	24,263	12,869	53
Sep-21	36,018	16,168	45	36,018	22,905	63
Oct-21	24,216	10,082	42	24,216	14,182	59
Nov-21	24,425	15,044	62	24,425	14,212	58
Dec-21	36,434	16,657	46	36,434	23,443	64
Jan-22	24,471	11,256	46	24,471	14,149	58
Feb-22	24,769	15,508	63	24,769	14,279	58
Mar-22	37,269	16,919	45	37,269	22,757	61
Apr-22	25,038	11,057	44	25,038	15,458	62
May-22	25,302	11,822	47	25,302	15,172	60
Jun-22	37,823	18,336	48	37,823	24,356	64
Jul-22	25,469	11,856	47	25,469	15,622	61
Aug-22	25,404	11,275	44	25,404	15,420	61
Sep-22	37,238	18,928	51	37,238	24,354	65
Oct-22	24,904	13,046	52	24,904	15,774	63
Nov-22	25,338	12,825	51	25,338	16,225	64
Dec-22	38,074	21,394	56	38074	26,398	69
Jan-23	25,812	13,968	54	25,812	13,968	54
Feb-23	22,633	13,953	62	22,633	17,198	76
Mar-23	35,534	20,223	57	35,534	24,640	69
Apr-23	22,737	13,484	59	22,737	16,834	74
May-23	23,122	13,570	59	23,122	17,364	75
Jun-23	35,582	21,441	60	35,582	26,622	75
Jul-23	22,911	13,789	60	22,911	17,030	74
Aug-23	23,450	14,168	60	23,450	17,022	73
Sep-23	35,915	22,067	61	35,915	27,137	76
Oct-23	23,414	14,738	63	23,414	17,672	75
Nov-23	23,927	14,951	62	23,927	18,045	75
Dec-23	36,551	23,698	65	36,551	28,314	77
Jan-24	23,833	15,204	64	23,833	18,593	78
Feb-24	24,292	15,504	64	24,292	19,106	79
Mar-24	37,393	22,355	60	37,393	27,236	73
Apr-24	24,355	15,173	62	24,355	18,356	75
May-24	24,747	15,842	64	24,747	19,097	77
Jun-24	37,604	24,042	64	37,604	28,789	77

Source: Author's compilation

Figure 1: GSTR 1 compliance in Goa.

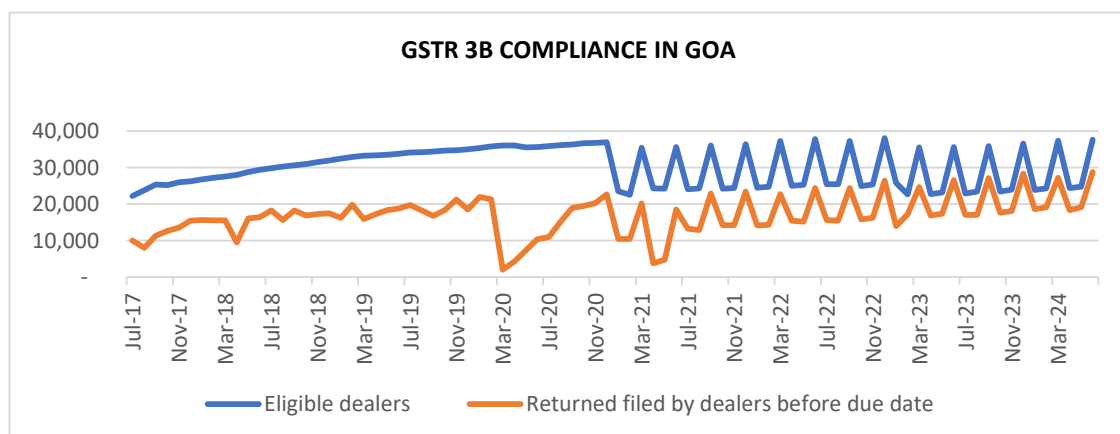


Source: Author's compilation

The data in Table 1 and Figure 1 provide a detailed view of GSTR-1 compliance in Goa from July 2017 to June 2024. GSTR-1 filing compliance, which involves the timely submission of outward supply details, reflects the adherence of taxpayers to GST regulations. Most taxpayers in Goa follow quarterly filing, with a smaller percentage opting for monthly filing as per GST provisions.

Initially, during the rollout phase from July 2017 to March 2018, compliance rates were relatively high, averaging above 70%, with the highest compliance of 81% recorded in July 2017. However, a gradual decline in compliance was observed in subsequent years, with rates dropping to as low as 20% in December 2018 and 19% in March 2019. The COVID-19 pandemic in 2020–21 further disrupted compliance, with several months showing compliance rates below 30%. For example, April 2020 recorded a compliance rate of 24%, and May 2020 was only slightly better at 25%. Following the pandemic, compliance rates began to recover. From late 2021 onwards, there was a notable upward trend, with compliance reaching 63% in October 2022 and peaking at 65% in December 2023. The data for 2023–24 indicate a continued positive trajectory, with compliance rates consistently above 60%, culminating at 64% in June 2024. This improvement suggests that businesses have adapted better to GST requirements, possibly supported by increased awareness and improved administrative measures. When examining yearly compliance trends, there was an overall decline in compliance percentages in the early years of GST. Compliance dropped from 89% in 2017–18 to 72% in 2018–19 and further to 68% in 2019–20. The pandemic year, 2020–21, witnessed the lowest average compliance of 61%. However, in subsequent years, compliance steadily improved, with the rate increasing to 80% in 2021–22, 85% in 2022–23, and further reaching around 87% by 2023–24. Despite this progress, timely filing of GSTR-1 returns before the due date remains a challenge. While the average filing rate before the due date was 77% in 2017–18, it declined sharply to 38% in 2018–19 and hovered around 34% in 2019–20 and 2020–21. Improvements were observed post-pandemic, with timely compliance rates rising to 40% in 2021–22, 50% in 2022–23, and reaching 58% by 2023–24.

Figure 2: GSTR 3B compliance in Goa.



Source: Author's compilation

The data in Table 1 and Figure 2 provide a detailed analysis of GSTR-3B compliance in Goa from July 2017 to June 2024. GSTR-3B, a monthly summary return, is critical for reporting taxable supplies, input tax credits, and GST liabilities. The compliance trends during this period reflect the influence of policy changes, external factors such as the COVID-19 pandemic, and the overall adaptability of taxpayers to the GST regime. In the initial phase of GST implementation (July 2017 to March 2018), GSTR-3B compliance rates started at 45% in July 2017 and gradually improved to 59% by December 2017, indicating growing familiarity with the filing process. However, compliance rates fluctuated during 2018 and 2019, ranging from 34% to 61%, highlighting operational challenges faced by businesses in meeting monthly filing requirements. The COVID-19 pandemic in 2020–21 had a significant impact, with compliance rates dropping to an all-time low of 6% in March 2020. The nationwide lockdown and economic disruptions severely affected businesses' ability to adhere to GST filing timelines. Although there was marginal recovery in subsequent months, compliance remained subdued, averaging around 20–30% during the peak pandemic period, underscoring the vulnerability of businesses during such crises. Post-pandemic, GSTR-3B compliance began to recover steadily. By late 2021, compliance rates showed consistent improvement, reaching 61% in December 2022 and peaking at 77% by June 2024. This recovery reflects increased awareness among taxpayers, better support from tax authorities, and the normalization of business operations. Improvements in the GST filing system and enhanced digital infrastructure also contributed to this positive trend. A yearly analysis of compliance patterns reveals mixed results. In 2017–18, the average compliance rate was 56%, but it declined to 50% during 2018–19 and 2019–20. The year 2020–21 marked the lowest compliance rates, primarily due to the pandemic, with averages as low as 20–30%. However, a significant turnaround was observed in 2021–22, with average compliance rising to 63%, followed by further improvements in 2022–23 and 2023–24, where compliance rates exceeded 70%.

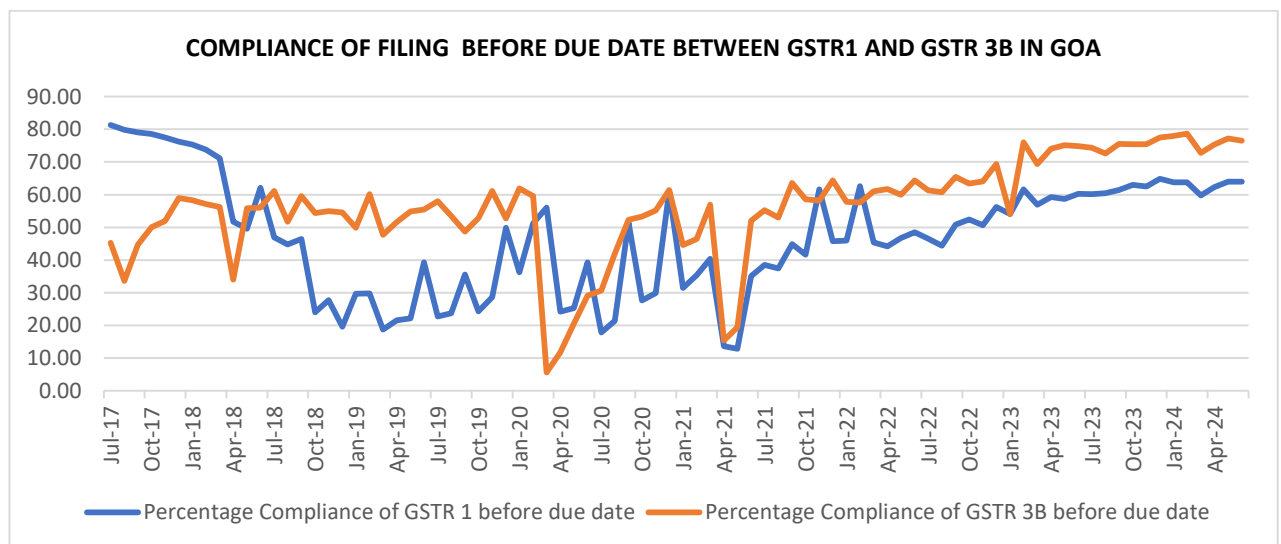
B) Following analysis have been undertaken to compare Level of compliance before due date of GSTR 1 and GSTR 3B returns in Goa.

Hypotheses of the Study

H0: There is no significant difference between filing of return before due date between GSTR 1 and GSTR 3B returns filing in Goa

H1: There is significant difference between filing of return before due date between GSTR 1 and GSTR 3B returns filing in Goa

Figure 3: Comparison of Compliance of filing before due date between GSTR1 and GSTR 3B Goa.



Source: Author's compilation

Table 2: Descriptive statistics of level of Compliance of GSTR 1 and GSTR 3B return in India

Level of Compliance	N	Mean	Minimum	Maximum	SD	Kolmogorov-Smirnov p
Percentage Compliance of GSTR 1 before due date	84	47.5	13	81	17.6	0.054
Percentage Compliance of GSTR 3B before due date	84	56.4	6	79	15.2	

Source: Author's calculation using jamovi

The above figure 3 and table 2 provides a comparative detail of GSTR 1 and GSTR 3B filing before due date in Goa for the period from July 2017 to June 2024. The highest compliance rate for GSTR 1 filing in Goa was for the month of July 2017 i.e., 81 percent, whereas for GSTR 3B the highest filing was for the month of February 2024 i.e., 79 percent. The lowest compliance for filing GSTR 1 before due date was 13 percent for the month May 2021 and for GSTR 3B filing before due date was only 6 percent for the month of March 2020. The average filing of GSTR 1 before due date was 47.5 percent and for GSTR 3B filing before due date was 56.4 percent.

Table 3: Homogeneity of Variances Tests (Levene's)

	F	Df	df2	P value
Level of Compliance	6.34	1	166	0.013

Source: Author's calculation using jamovi

Table 4: Independent Samples T-Test

		Statistic	df	P value	Cohen's d
Level of Compliance	Welch's t	-3.49	163	<.001	0.539

Source: Author's calculation using jamovi

As per the Kolmogorov-Smirnov (table 2) assumption of normality is met as a result parametric Independent sample T-test has been applied. Before applying independent sample T- Test, Levene's test for Homogeneity of Variance assumption was applied. As per the levene's test (table 3) assumption was not fulfilled as p value < 0.005 therefore Independent sample t-/test (Welch's) was used. As per Independent sample t-test (Welch's) (table 4) there is significant difference between level of Compliance for filing GSTR 1 & GSTR 3B before due date in Goa as p value is < 0.005 and it also represented a medium level of effect size i.e., d= 0.539 therefore we fail to accept the Null hypothesis (Ha0).

Discussion and Conclusion of the study

As per the analysis conducted it is clear that in Goa the GST return filing of both major returns i.e., GSTR 1 and GSTR 3B are not satisfactory. If we see the overall filing of GSTR 1 and GSTR 3B returns there are fluctuation taking place for the period from July 2017 to June 2024 as a result there has been widening of compliance gap for filing GSTR 1 and GSTR 3B returns. On the other hand, after analysing the data of filing of GSTR 1 and GSTR 3B returns before due date it can be found out that rate of filing is very poor for both this returns in Goa. The research findings indicate that, based on the Independent Sample T-Test (Welch's), there is a significant difference in the level of compliance for filing GSTR-1 and GSTR-3B returns before the due date, leading to the rejection of the null hypothesis (H0). A comparison of the filing rates reveals that GSTR-3B compliance before the due date is notably higher than that of GSTR-1. Specifically, the average timely filing rate for GSTR-3B is 56.4 percent, whereas for GSTR-1, it is 47.5 percent. This disparity can be attributed to the deterrence measures associated with GSTR-3B, such as penalties for late filing. These penalties act as a strong deterrent, creating a sense of urgency and motivating GST-registered taxpayers to comply with filing deadlines. The findings align with deterrence theory, which asserts that individuals are more likely to adhere to rules when the perceived consequences of non-compliance, such as fines or penalties, are severe. The higher compliance rate for GSTR-3B supports the theory's premise that effective enforcement mechanisms enhance compliance behaviour. Consequently, the results not only highlight the better compliance rates for GSTR-3B compared to GSTR-1 but also contribute to the broader literature on deterrence theory by demonstrating its applicability within the context of GST compliance. The enforcement of penalties for GSTR-3B filing underscores the importance of deterrence mechanisms in promoting timely compliance and ensuring adherence to tax regulations. Overall, as per the research it is evident that there is a compliance gap while filing GST returns specially while filing GST returns before due date in Goa. As per the GST Act it is compulsory to file GST returns on time but as per the analysis it is clear that majority of GST registered taxpayers in Goa are not following the due dates to file the returns.

Implication of the study

From the study it is evident that the GST compliance in Goa is not up to the mark. It is important that the tax authorities of Goa have to look into the reasons why there is low compliance towards GST returns filing i.e., why GST registered taxpayers are not filing returns before due date. The tax authorities of Goa should take necessary steps to improve the filing of GST returns before due dates which can be done in number of ways. Firstly, the tax authorities can strengthen the current deterrence system for filing GSTR returns which can surely elevate the GST compliance of Goa. Secondly the tax authorities should support businesses inform of taxpayer's educations, awarenesses on returns filings which will help in improving the overall tax compliance. Finally Policymakers must also consider the potential utility of integrating behavioural insights with existing enforcement strategies to reduce the compliance gap effectively.

Limitation and Scope for Future research

While the current study provides a number of valuable insights into GST compliance behaviour in the state of Goa, there exist a number of limitations. Firstly, the current research is basely only on secondary data to understand the compliance pattern but it doesn't capture the businesses taxpayers' behavioural aspects which is a significant determinant of tax compliance. Furthermore, the study is focused only in the state of Goa hence the finding of current study will be difficult to be generalisable to another Indian States/UT's with different regional diversification. Future researcher can address the above gaps by adopting the cross-sectional studies in their respective States/UT's to identify the factors resulting in low GST compliance which will definitely help the tax authorities and policy makers to take an appropriate step in future for overall reduction of GST compliance gap.

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Exploring the Intricate Nexus: Unravelling the Mediating Influence of Attitudes on Purchase Intentions in the Beauty Industry

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Abstract

The role of cosmetics in enhancing physical appearance and self-esteem is widely acknowledged, reflecting their increasing significance in today's society. Leveraging the Theory of Planned Behaviour as a foundational framework, this study investigates the purchase intentions of consumers within the cosmetics industry. By extending TPB, the research incorporates traditional constructs—product knowledge, subjective norms, and perceived behavioural control—alongside hedonic and utilitarian values to provide a nuanced understanding of consumer behaviour. The study further explores the mediating role of attitudes in shaping the relationship between these factors and purchase intentions.

A descriptive research design was employed to examine these variables, with a sample size of 632 consumers selected using judgement sampling. Data were collected via offline surveys and analysed using IBM SPSS and SmartPLS 4. The findings reveal that hedonic value, utilitarian value, subjective norms, and perceived behavioural control significantly and positively influence attitudes toward cosmetic products. However, product knowledge exhibited no significant direct impact on attitudes. Attitudes were found to mediate fully the relationship between hedonic value, subjective norms, and perceived behavioural control with purchase intentions, whereas the mediation effect for utilitarian value was partial. Product knowledge, however, did not significantly influence purchase intentions through attitudes.

From a practical standpoint, the study offers valuable insights for marketers in the cosmetics industry. It highlights the importance of fostering positive attitudes by emphasising the emotional gratification (hedonic value) and practical benefits (utilitarian value) of cosmetics, as well as leveraging societal norms and consumers perceived behavioural control. This approach can strengthen consumer confidence and encourage favourable purchase decisions.

The originality of this research lies in its novel approach to understanding the mediating role of attitudes in the cosmetics sector. By addressing a critical gap in existing literature, it provides a theoretical and practical framework for analysing and enhancing consumer purchase intentions in a highly competitive market.

Keywords: Mediation, Cosmetics, Consumer Behaviour, Structural Equation Modelling

Introduction

Most of today's anthropological population utilises cosmetics consistently (Tengli & Srinivasan, 2022). The usage of cosmetics has spread around the entire world as a result of technological developments and a rising emphasis on self-care. Cosmetics have become a necessary component of daily life, significantly improving the appearance and self-confidence of numerous people. Cosmetics include a broad range of products designed to satisfy personal grooming requirements, from skincare to makeup, hair care to perfumes (Malik, 1940). These goods keep skin, hair, and nails healthy while cleansing, beautifying, and protecting them.

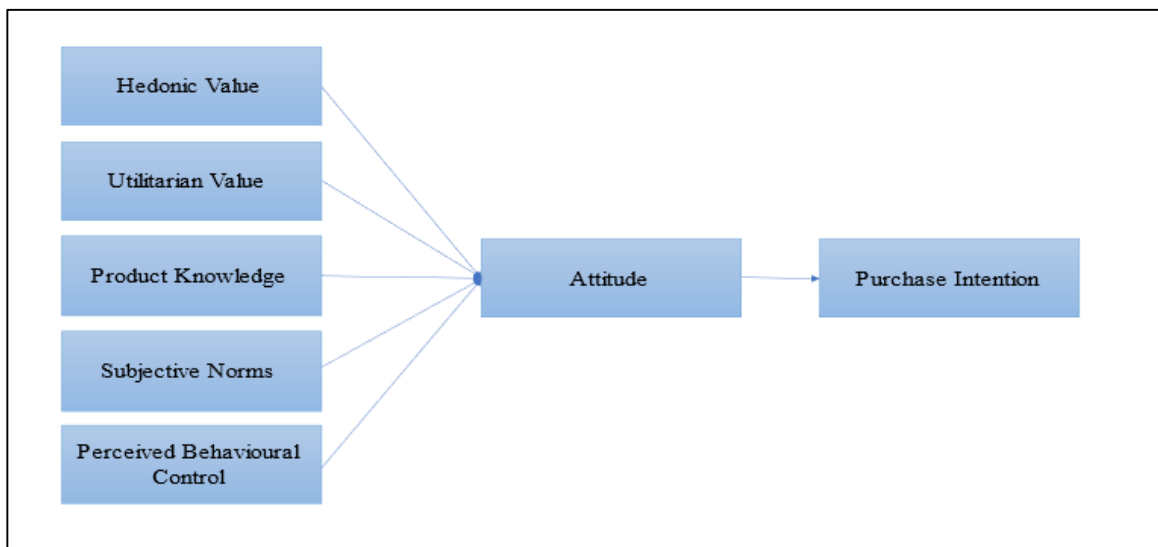
India's cosmetics sector has grown substantially due to changing lifestyles and increased awareness. India is known to be the fourth-largest market for cosmetics (Meredith Alda, 2023). According to Cosmetics Market Statistics 2027, the global market for cosmetics has grown by more than 16 percent in 2022. The market size which was valued at \$380.2 billion in 2019, is anticipated to hit \$463.5B by 2027 (Shankar Bhandalkar, 2023). Several studies in India have explored factors influencing Purchase Intention or Buying behaviour of cosmetic products. Minuscule studies have explored attitude formation towards cosmetic products and the mediating effects of attitude on relation between the factors and Purchase Intention. The proposal aims to observe the impact of mediators on the association between the antecedents and the purchase intention of cosmetics.

Review of Literature

Theoretical Background

The Theory of planned behaviour, established by (Ajzen, 1991) is frequently used to comprehend a customer's purchase intention or buying behaviour (Ajzen, 2020). Theory of planned behaviour has been extensively adopted in several domains to study consumer intentions. In research led by (Shimul et al., 2021), Theory of planned behaviour was used to determine the attitude and purchase intention of women shoppers concerning green cosmetic products. Another study by (Askadilla & Krisjanti, 2017) explored Indonesian consumers' Green Purchase Behaviour towards Green Cosmetic Products. Furthermore, Millennial female purchase behaviour was also investigated utilizing the same (Handriana et al., 2020). Additionally, the purchase intention behaviour of Malaysian Muslims towards cosmetics was studied by (Haque et al., 2018), who also investigated re-purchase consumer intention toward organic personal care products. Therefore, due to Theory of planned behaviour's wide applicability, the research adopts this Theory to study the attitude-purchase intention of the cosmetic consumer.

Figure 1: Conceptual Model



Source: Prepared by authors

Hypothesis Development

Attitude

According to (Ajzen, 1991), an individual's attitude is the favourable or unfavourable evaluation that shapes their behaviour. Positive attitudes strongly influence intentions, with higher favourability leading to stronger intent to engage in a behaviour (Tarkiainen & Sundqvist, 2005). Attitudes serve as reliable predictors of purchase intentions, as suggested by (Tarkiainen & Sundqvist, 2005). (Hill & Lynchehaun, 2002) highlighted the crucial role of attitudes in understanding consumer motivations and preferences.

(Shimul et al., 2022) observed that female shoppers in South Africa demonstrated favourable attitudes toward purchasing green cosmetics, a finding consistent with similar research by (Askadilla & Krisjanti, 2017). (Limbu et al., 2022) further confirmed that green-conscious consumers are more inclined to purchase eco-friendly cosmetic products than those without such attitudes. (Ghazali et al., 2017) reported a significant positive relationship between consumer attitudes and purchase intentions in the context of organic personal care products, with most respondents displaying positive attitudes toward cosmetics.

Building on this foundation, the study hypothesizes:

H1: An increase in a positive attitude towards cosmetic products will increase consumers' intention to purchase cosmetic products.

Hedonic Value

According to (Chen et al., 2009), hedonic value refers to the overall evaluation of personal pleasures experienced, and it is linked to the ability to evoke emotional feelings, fantasies, and a sense of fun. These experiences are categorized based on physical fulfillment and emotional experiences (Cervellon & Carey, 2012). (Chitturi et al., 2008) added that products elicit optimistic emotional answers when they surpass individuals' expectations. In cosmetics, studies affirm that hedonic value has positively influenced attitude and purchase intention (Ghazali et

al., 2017; Ho et al., 2020). Therefore, this study propositions that consumers' purchase intention is significantly influenced by the hedonic value they associate with cosmetic products. Additionally, it hypothesized that the consumers' attitude is significantly affected by the hedonic value of the products, and the research also posits that the connotation between hedonic value and purchase intention is mediated by attitude. Thus, the study proposes the following hypothesis:

H2a: An increase in Hedonic value towards cosmetic products will increase consumer's intention to purchase cosmetic products.

H2b: An increase in Hedonic value towards cosmetic products will increase consumer's attitude to purchase cosmetic products.

H2c: The effect of Hedonic value on cosmetic purchase intention will be mediated by attitude towards cosmetic products purchase intention.

Utilitarian Value

A utilitarian perspective focuses on logical and practical judgements (Chaudhuri & Holbrook, 2001). and, it is more goal-focused and cognitively directed (Batra & Ahtola, 1990; Bhat, 1986; Botti & McGill, 2011). Regarding cosmetic brands, the utilitarian characteristic pertains to the brand's capability to fulfil its physical appearance and skincare promises such as reducing wrinkles, addressing aging concerns, skin whitening, and moisturization (Apaolaza et al., 2011). According to (Butkeviciene, 2008), cosmetic companies frequently employ elaborate packaging designs that effectively convey positive information about the product's ingredients, instructions for use, and benefits. Consumers utilize this information to evaluate the performance of the brand. Previous research highlights the significant Influence of utilitarian value on attitude and purchase intention of cosmetic products (Ho et al., 2020). Therefore, the study, proposes the following hypothesis:

H3a: An increase in Utilitarian value towards cosmetic products will increase consumers' intention to purchase cosmetic products.

H3b: An increase in Utilitarian value towards cosmetic products will increase consumers' attitude to purchase cosmetic products.

H3c: The effect of Utilitarian value on cosmetic purchase intention will be mediated by attitude towards cosmetic products purchase intention.

Product Knowledge

Product knowledge is crucial in influencing consumers' choice-making process and buying behaviour (Hill & Lynchehaun, 2002). Customers with elevated product information tend to trust the inherent characteristics of the product, such as eminence and purpose, to assess its value. On the other hand, clients with less product familiarity often gauge the product grounded on external prompts, such as fee and kind (Wang, C. C., & Hwang, 2001). Multiple studies support that product knowledge positively influences consumer attitudes and purchase intentions of cosmetic products. Furthermore, it is found to directly influence their decision-making process and intentions directly, thereby enhancing the consumption of cosmetic products (Afendi, 2020; Ghazali et al., 2017; Haliza & Hendayani, 2021; NGUYEN et al., 2019). Therefore, the study, proposes the following hypothesis:

H4a: An increase in Product Knowledge towards cosmetic products will increase consumer's intention to purchase cosmetic products.

H4b: An increase in Product Knowledge towards cosmetic products will increase consumer's attitude to purchase cosmetic products.

H4c: The effect of Product Knowledge on cosmetic purchase intention will be mediated by attitude towards cosmetic products purchase intention.

Subjective Norms

Subjective norms can be described as the "alleged societal compression" that entities experience, influencing their inclination to engage in a particular behaviour (Ajzen, 1991). When individuals are part of social groups, certain rules, norms, or shared beliefs regarding appropriate consumer behaviour exist. (Teng & Wang, 2015) suggested that consumers are more likely to have an affirmative purchase intention towards a product when they observe that individuals who are vital to them hold optimistic attitudes and views about that particular product. Past research have shown that subjective norms have a strong positive link with attitude and purchase intention (Askadilla & Krisjanti, 2017; Mamun et al., 2020; Ngah et al., 2021). Therefore, the study proposes the following hypothesis:

H5a: An increase in Subjective Norms towards cosmetic products will increase consumer's intention to purchase cosmetic products.

H5b: An increase in Subjective Norms towards cosmetic products will increase consumer's attitude to purchase cosmetic products.

H5c: The effect of Subjective Norms on cosmetic purchase intention will be mediated by attitude towards cosmetic products purchase intention.

Perceived Behavioural Control

Perceived Behavioural Control, as defined by (Icek Ajzen, 1980), refers to an individual's perception of possessing the necessary resources, abilities, and opportunities to engage in a specific behaviour. In addition to an individual's attitude towards the behaviour and subjective norms, this factor influences behavioural intentions and actual behavioural performance. (Madden et al., 1992) confirmed that PBC assists as a motivator for an entity's behavioural intentions and actual behaviour. Past studies by (Delistavrou & Tilikidou, 2022; Ghazali et al., 2017; Kasri et al., 2023; Singhal & Malik, 2018), have consistently shown that PBC has had a momentous impact on the purchase intention of cosmetic products. Therefore, the research, proposes the following hypothesis:

H6a: An increase in Perceived Behavioural Control towards cosmetic products will increase consumer's intention to purchase cosmetic products.

H6b: An increase in Perceived Behavioural Control towards cosmetic products will increase consumer's attitude to purchase cosmetic products.

H6c: The effect of Perceived Behavioural Control on cosmetic purchase intention will be mediated by attitude towards cosmetic products purchase intention.

Research Methodology

Participant Profile

The empirical study gathered data from 632 respondents aged 20 years and above and had previous experience purchasing and using cosmetics. The study was conducted specifically in the state of Goa, India. Purposive sampling was employed to gather the data, and the sample size adhered to the "10-times rule" suggested by (Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. and Tatham, 1998). The results discovered that the most of the participants were female, accounting for 57.3% while 42.7% were male. The age group between 20-40 years was the most represented, with 37.0% falling in the 20-30 age range and 37.5% in the 31-40 age range. In terms of marital status, 58.5% of participants were married and 40.5% were unmarried. Urban residents constituted the majority, accounting for 56.5% of the participants, while 43.5% resided in rural areas. In relation to educational qualifications, a significant proportion had completed either graduation (38%) or post-graduation (39.4%). Regarding employment, the majority (80.4%) were engaged in the service sector, with only 3.8% being homemakers. In terms of monthly income, the majority of participants reported earning 20,000 or more. In terms of cosmetics usage, 62.3% of participants used both chemical and green cosmetics, 25.0% used only chemical cosmetics, and 12.7% used only green cosmetics. The majority (43.5%) used cosmetics once a day, and the most common buying behaviour was purchasing cosmetics once a month (35.4%).

Measurements

The research instrument consisted of two sections. The first section focused on items related to hedonic value, utilitarian value, product knowledge, and the dimensions of the Theory of Planned Behaviour. The second section collected demographic information, including participants' gender, age, marital status, residence, education, employment, income, types of cosmetics used, usage frequency, purchase frequency, and monthly cosmetic expenditure.

Most of the items in the research instrument were adapted from existing scales utilised in prior studies, and they were rephrased to align with the objectives of this study. The items related to the TPB dimensions, namely attitude, perceived behavioural control, and subjective norms, were derived from multiple sources, including studies by (Ghazali et al., 2017), (Mamun et al., 2020) and (Cronan & Al-Rafee, 2008). Purchase intention was measured using items from studies by (Ghazali et al., 2017), (Pop et al., 2020), (Shimul et al., 2021). Product knowledge items were adapted from studies by (Ghazali et al., 2017) and (Briliana & Mursito, 2017). Hedonic value items were derived from studies by (Ho et al., 2020), (Ajitha & Sivakumar, 2017) and utilitarian value items from (Ho et al., 2020), and one item generated specifically for this study.

Participants rated their agreement with each item on a 7-point Likert scale ranging from 1 (Strongly disagree) to 7 (Strongly agree). The content validity of the questionnaire was evaluated using the Content Validity Index as

recommended by (Yusoff, 2019). Input from seven subject matter experts ensured the items were relevant, representative, and aligned with the target population's perspectives.

A pilot study with 131 participants assessed the reliability and validity of the measurement instrument, facilitated data reduction, and identified dimensions. Items with factor loadings below 0.50 were excluded, while those with loadings of 0.50 or higher were retained, ensuring a robust and reliable tool.

Sampling

The participants in this research study were chosen using judgment sampling. They were provided with data about the research's objective and the data collection process. The participants were assured that their data would be treated confidentially, and no incentives were provided for their participation. The information for the study was collected through an offline survey, allowing the researchers to address any queries the participants had about the questionnaire. A total of 650 surveys were circulated, out of which 632 were considered usable for examination. Both male and female cosmetic users participated in filling out the questionnaire.

Results

Preliminary Analysis

The dataset was initially assessed for missing responses using SPSS software, and none were identified (Aggarwal et al., 2020). To detect multivariate outliers, Mahalanobis Distance (D^2) was applied, revealing no issues. Data normality was evaluated through skewness and kurtosis, with all values falling within the acceptable range of ± 2 , indicating no normality concerns (Garson, 2012).

To address potential common method bias, Harman's single-factor analysis was performed as per (Shkoler & Tziner, 2017). An unrotated exploratory factor analysis showed that the primary factor accounted for 23.869% of the variance, well below the 50% threshold, confirming the absence of significant common method bias. This comprehensive examination ensured the data's suitability for subsequent analysis.

Pilot Study

To ensure a robust model, an exploratory factor analysis was conducted using the maximum likelihood extraction method, guided by the recommendations of (Cautin, R. L., & Lilienfeld, 2015). This approach, based on eigenvalues greater than one, identified distinct factors among the questionnaire items while providing a goodness-of-fit test for the factor solution (Anderson & Gerbing, 1988). Data analysis was performed using SPSS software on a sample of 131 participants.

The suitability of the data for exploratory factor analysis was confirmed through the Kaiser-Meyer-Olkin measure and Bartlett's Test of Sphericity. The Kaiser-Meyer-Olkin value of 0.836, significant at a 0.01 confidence level, exceeded the threshold of 0.6 (Kaiser, 1974), validating the adequacy of the sampling. Exploratory factor analysis results revealed standardized factor loadings above 0.5 for all variables, ensuring strong construct reliability by (Osborne et al., 2011).

The analysis identified seven distinct factors. The first factor, "attitude," comprised eight items, while the second factor, "purchase intention," included five items. The third factor, "subjective norms," also consisted of five items. "Utilitarian value" and "perceived behavioural control" formed the fourth and fifth factors with four and three items, respectively. The sixth factor, "product knowledge," and the seventh factor, "hedonic value," each comprised three items. Collectively, these factors accounted for 72.03% of the total variance, exceeding the critical minimum value suggested by (Osborne et al., 2011), ensuring the model's methodological validity.

Research Model Analysis

The study utilized Harman's single-factor test to address potential same-source bias and Common Method Variance, as the dimensions of study constructs, including predictors and conditions, were based on responses from the same participants. Common Method Variance arises when a single factor explains a significant portion of the variance across variables (Podsakoff et al., 2003). An unrotated factor analysis revealed that the primary factor accounted for 32.548% of the total explained variance, well below the 50% threshold, indicating Common Method Variance was not a significant concern in this research.

Data analysis was conducted using the variance-based Partial Least Squares (PLS) method with SmartPLS 4.0 software, following the two-stage approach proposed by (Anderson & Gerbing, 1988). In the first stage, the measurement model was assessed for convergent and discriminant validity, examining the relationships between observed variables and their respective constructs. In the second stage, the structural model was analysed to evaluate the hypotheses.

Bootstrapping with 5000 resamples, as suggested by (Hair et al., 2016), was employed to estimate the significance of outer loadings and path coefficients, ensuring the statistical reliability of results through confidence intervals and resampling techniques. This comprehensive approach validated the study's constructs and established the robustness of its structural relationships.

Table 1: Measurement items and outer loadings.

Constructs	Items	Details	Outer Loading	Cronbach's Alpha
Attitude (ATT)	ATT1	I think using cosmetic products is a good for me	0.862	0.949
	ATT2	I think using cosmetic products is pleasant for me	0.875	
	ATT3	I think using cosmetic products is beneficial to me	0.885	
	ATT4	I think using cosmetic products is a wise decision to me	0.862	
	ATT5	I think using cosmetic products is desirable to me.	0.853	
	ATT6	I have a positive attitude toward cosmetic products	0.854	
	ATT7	I think using cosmetic products is favourable to me	0.852	
	ATT8	I think using cosmetic products is safe to me	0.831	
Hedonic Value (HV)	HV1	Using cosmetics products would give me a pleasure	0.941	0.945
	HV2	Using cosmetics products is enjoyable	0.963	
	HV3	Cosmetic product consumption enhances the quality of my life.	0.945	
Purchase Intention (PI)	INT1	I would like to recommend cosmetic products to other people	0.821	0.908
	INT2	I intend to continue buying cosmetic products in future	0.864	
	INT3	I will buy cosmetic products as soon as I run out of them	0.882	
	INT4	The probability that I would purchase cosmetic products is high	0.875	
	INT5	I have decided to purchase cosmetic products on a regular basis	0.835	
Perceived Behavioural Control (PBC)	PBC1	I am confident that I can buy cosmetic products if I want them	0.89	0.860
	PBC2	I have the resources and ability to buy cosmetic products	0.928	
	PBC3	I completely have control over the purchase of cosmetic products	0.83	
Product Knowledge (PK)	PK1	I have better knowledge of cosmetic products compared to my friends and relatives	0.877	0.881
	PK2	I have enough knowledge to differentiate between chemical cosmetic products, and green cosmetic products	0.918	
	PK3	I understand the features of cosmetic products	0.9	
Subjective Norms (SN)	SN1	Buying cosmetic products would help me feel accepted	0.826	0.869

Constructs	Items	Details	Outer Loading	Cronbach's Alpha
	SN2	People I listen to have the ability to convince me to purchase cosmetic products	0.865	
	SN3	The majority of people who matter to me believe that I should buy cosmetic products	0.824	
	SN4	My family members believe that buying cosmetic products is good for me	0.825	
	SN5	I learned about cosmetic products from my friends	0.693	
Utilitarian Value (UV)	UV1	Cosmetic products which I use have good functionality	0.872	0.890
	UV2	Using cosmetic products helps me in solving physical appearance-related problems.	0.902	
	UV3	Cosmetic products satisfy my physical appearance-related needs well	0.885	
	UV4	Using cosmetic products gives me a confidence	0.803	

Source: Prepared by authors

Measurement Model Assessment

Outer Loadings, Composite Reliability, and Average Variance Extracted were utilised to evaluate convergent validity. (Hair, J. F., Jr., Hult, G. T. M., Ringle, C., & Sarstedt, 2016) state that the outer loading indicating indicator reliability needs to be more than 0.70. All of the outer loadings are shown in Table 1, ranging from 0.693 to 0.963, demonstrating the accuracy of each measurement indicator. Additionally, none of the Composite Reliability values fell below the 0.70 minimum required threshold (Chin, 1998). They varied between 0.904 and 0.965, signifying a high level of internal consistency among the items. See Table 2. In addition to that, every single one of the Average Variance Extracted values was higher than 0.50 (see 2). According to (Hair, J. F., Jr., Hult, G. T. M., Ringle, C., & Sarstedt, 2016), if an AVE value is at least 0.50, it specifies that a latent variable can explain, regularly more than half of the variance that is associated with its indicators. As a result, the measurement model has acquired a level of convergent validity that is adequate and satisfactory. We analysed the discriminant validity following (Fornell & Larcker, 1981). Table 2 demonstrates that all of the square roots of the Average Variance Extracted, shown in bold on the diagonals, are larger than the associations between the constructs, shown on the rows and columns corresponding to those square roots. This indicates that discriminant validity was attained because each reflective construct connected more sturdily to its own pointers than to others. Therefore, the discriminant validity of the construct measures had been thoroughly proved. An analysis of the structural model will be presented and discussed.

Table 2: Convergent Validity and Discriminant Validity

	CR	AVE	ATT	HV	INT	PBC	PK	SN	UV
ATT	0.958	0.739	0.859						
HV	0.965	0.902	0.42	0.95					
INT	0.932	0.732	0.443	0.293	0.856				
PBC	0.914	0.781	0.269	0.272	0.265	0.884			
PK	0.927	0.808	0.208	0.324	0.045	0.168	0.899		
SN	0.904	0.654	0.357	0.377	0.219	0.164	0.465	0.809	
UV	0.923	0.75	0.326	0.325	0.434	0.364	0.2	0.271	0.866

Source: Prepared by authors

Note: The square root of AVE is shown by the diagonals (in bold).

The lower part of the matrix displays correlations between the latent constructs.

The upper part of the matrix contains a report of shared variances.

Structural Model Assessment

According to (Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., and Tatham, 1998), it is challenging to establish a general guideline for an adequate amount of R2 value because it rests on the intricacy of the model and this domain. Higher values denote higher degrees of predicting accuracy. The R2 number ranges from 0 to 1. (Cohen, 1988) proposed that endogenous latent variables with R2 values of 0.26, 0.13, or 0.02 may be categorized as substantial, moderate, or weak. R2 values for the endogenous construct for attitude and intention to purchase, as shown in Table 3, are 0.26 and 0.31, respectively. The findings demonstrate that the endogenous variables in the model are fulfilled overall, with the total model accounting for around 0.31 of the variances in intention to purchase. According to (Cohen, 1988), the R2 values of attitude and intention to purchase were significantly above 0.26, indicating a substantial model. The results of this research's hypothesis test, which was based on the path coefficient and T statistics, are shown in Table 3. The standardized path coefficients range in value from -1 to +1. Strong positive correlations are specified by appraised path coefficients close to +1, and vice versa for negative values. According to (Hair, J. F., Jr., Hult, G. T. M., Ringle, C., & Sarstedt, 2016), projected coefficient values near to zero are typically not meaningful. In this stage, we evaluated the consequence and applicability of the structural model links. 16 hypotheses based on the Theory of planned Behaviour, including Perceived Behavioural Control, Subjective Norms, Attitude, and Intention, and other variables, including Hedonic Value, Utilitarian Value, Social Norms, and Product Knowledge, were tested, including mediation analysis. In the context of antecedents to attitude, consumers' Hedonic value ($\beta = 0.27$, $t = 6.35$, $p < 0.00$), Utilitarian value ($\beta = 0.14$, $t = 3.22$, $p < 0.00$), Subjective Norms ($\beta = 0.21$, $t = 5.18$, $p < 0.00$), Perceived behavioural control ($\beta = 0.113$, $t = 2.855$, $p < 0.04$) and Subjective Norms ($\beta = 0.21$, $t = 5.18$, $p < 0.00$) positively associated to attitude, elucidating 26% of the variance in attitude. Therefore, H2b, H3b, H5b, and H6b are supported. The outcome, however, demonstrates no correlation between PK (Product Knowledge) ($\beta = -0.03$, $t = 0.63$, $p = 0.53$) and attitude. H4b is, therefore, not supported. Concerning the indicators of the intention to buy cosmetics, Positive correlations were found between attitude and Utilitarian Value ($\beta = 0.30$, $t = 7.22$, $p = 0.00$). PK is inversely associated to intention ($\beta = -0.14$, $t = 3.40$, $p = 0.00$). Accounting for 31% of the PI variance. H1, H3a, and H4a are therefore supported. H2a, H5a, and H6a are not supported by the results because there is no significant link between HV ($\beta = 0.07$, $t = 1.79$, $p = 0.07$), SN ($\beta = 0.06$, $t = 1.33$, $p = 0.18$), and PBC ($\beta = 0.07$, $t = 1.756$, $p = 0.079$) on PI.

Indirect Path Estimation

Table 3 represents indirect hypotheses. Rendering to the results, Attitude has substantial mediating effect amid Hedonic value and Purchase intention ($\beta = 0.083$, $t = 4.565$, $p = 0.0$), and Utilitarian value and Purchase intention ($\beta = 0.044$, $t = 3.119$, $p = 0.002$), and Subjective Norms and Purchase intention ($\beta = 0.064$, $t = 4.052$, $p = 0.0$), and PBC and Purchase intention ($\beta = 0.034$, $t = 2.674$, $p = 0.008$), hence H2c, H3c, H5c and H6c are accepted. H4c is rejected, relating to the implication of Attitude s in mediating Product Knowledge and Purchase intention ($\beta = -0.007$, $t = 0.625$, $p = 0.0532$). The result revealed H2c, H5c and H6c has full mediation effect and H3c hypothesis has partial mediation.

Table 3: Evaluation of the structural model

Model Fit Indicators and R2

SRMR	0.045	d_ULS	1.013	Chi-Square	1864.34	NFI	0.872
R2 for Attitude	0.26			R2 for PI	0.31		

Direct effect

Hypotheses	Relationships	STD Beta	t-Values	P-Values	Supported
H1	ATT -> PI	0.30	7.26	0.00	Yes
H2a	HV -> PI	0.07	1.79	0.07	No
H2b	HV -> ATT	0.27	6.35	0.00	Yes
H3a	UV -> PI	0.30	7.22	0.00	Yes
H3b	UV -> ATT	0.14	3.32	0.00	Yes
H4a	PK -> PI	-0.14	3.40	0.00	Yes
H4b	PK -> ATT	-0.03	0.63	0.53	No
H5a	SN -> PI	0.06	1.33	0.18	No
H5b	SN -> ATT	0.21	5.18	0.00	Yes
H6a	PBC -> PI	0.07	1.756	0.079	No
H6b	PBC -> ATT	0.113	2.855	0.004	Yes

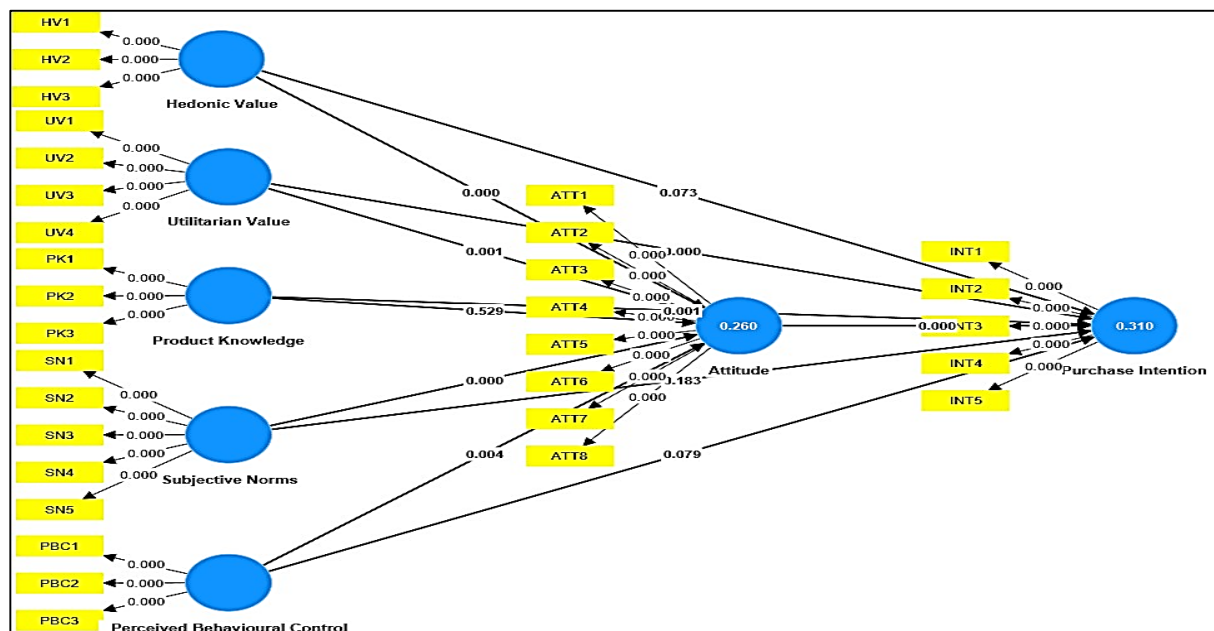
Hypotheses	Relationships	STD Beta	t-Values	P-Values	Supported
H1	ATT -> PI	0.30	7.26	0.00	Yes
H2a	HV -> PI	0.07	1.79	0.07	No
H2b	HV -> ATT	0.27	6.35	0.00	Yes
H3a	UV -> PI	0.30	7.22	0.00	Yes
H3b	UV -> ATT	0.14	3.32	0.00	Yes
H4a	PK -> PI	-0.14	3.40	0.00	Yes
H4b	PK -> ATT	-0.03	0.63	0.53	No
H5a	SN -> PI	0.06	1.33	0.18	No
H5b	SN -> ATT	0.21	5.18	0.00	Yes
H6a	PBC -> PI	0.07	1.756	0.079	No
H6b	PBC -> ATT	0.113	2.855	0.004	Yes

Total Effect

Hypotheses	Relationships	STD Beta	t-Values	p-Values	Supported
H2c	HV -> INT	0.156	3.809	0	Yes
H3c	UV -> INT	0.343	8.144	0	Yes
H4c	PK -> INT	-0.146	3.406	0.001	Yes
H5c	SN -> INT	0.12	2.883	0.004	Yes
H6c	PBC -> INT	0.104	2.534	0.011	Yes

Source: Prepared by authors

Attitude (ATT), Purchase Intention (PI), Hedonic Value (HV), Utilitarian Value (UV), Product Knowledge (PK), Subjective Norms (SN), Perceived Behavioural Control (PBC).



Source: Prepared by authors

Discussion

The result of the structural model analysis provided meaningful insight into the factors that affect the attitude of cosmetic consumers and their subsequent purchase intention in the milieu of cosmetic products in Goa, India. The research used the extended TPB by incorporating and examining the effect of variables such as Hedonic value (HV), Utilitarian value (UV), Product knowledge (PK), Subjective Norms (SN), Perceived behavioural control (PBC) as significant antecedent influencing Attitude (ATT) and subsequently Purchase intention (PI). The results of the research discovered that it was consistent with previous research by (Ajitha & Sivakumar, 2017; Ghazali et

al., 2017; Ho et al., 2020) on consumer perceived values influencing the attitude and purchase intention. The results also confirm the mediating effect of attitude in association to factors and purchase intention. Firstly, the study found that hedonic value, utilitarian value, subjective norms, and perceived behavioural control all positively influence attitudes toward cosmetic products. These factors include pleasure and enjoyment from the products, practical benefits, societal norms, and the ability to control purchasing decisions. However, there wasn't a significant link between product knowledge and attitudes, indicating limited impact. Secondly, Attitude, utilitarian value, and product knowledge influenced purchase intention, while hedonic value and subjective norms did not. Attitude strongly predicted intent, followed by utilitarian value and product knowledge. Hedonic value and subjective norms had no significant effect on attitude. The study also examined attitude as a mediator between hedonic value, utilitarian value, subjective norms, product knowledge, and perceived behavioural control on purchase intent. Results showed attitude fully mediated the link between hedonic value, subjective norms, and perceived behavioural control with intent, indicating attitude's role in mediating these effects. Attitude partially mediated the connection between utilitarian value and purchase intent, suggesting it played a role alongside direct effects. However, product knowledge did not significantly impact intent through attitude, showing its influence on intent was not mediated by attitude.

Conclusion

In conclusion, the study's findings contribute significantly to existing literature. Positive attitudes notably increase the intention to purchase cosmetic products. Hedonic and utilitarian values impact attitudes positively, but hedonic value's direct effect on purchase intent is inconclusive. Product knowledge influences intent positively, but not attitudes. Subjective norms and perceived behavioral control relate affirmately to attitudes. The study also examines attitudes as mediators between factors and purchase intent. Attitudes fully mediate the link between hedonic value and intent, and partially mediate for utilitarian value, subjective norms, and perceived behavioral control. Product knowledge's mediating effect on intent through attitudes isn't supported. For cosmetic brands, this emphasizes the importance of fostering positive attitudes through hedonic and utilitarian values, using subjective norms, and addressing perceived behavioral control. Marketing campaigns can spotlight product enjoyment, benefits, and functionality, while considering social norms and individual purchasing control.

Limitations and Future Scope

It is necessary to identify the restrictions of this research. Firstly, the study was directed in the specific context of Goa, India, and the findings may not be fully generalizable to other regions or cultural settings. Future studies could consider cross-cultural comparisons to explore potential variations in attitudes and purchase intentions toward cosmetic products. Secondly, the data collection relied on self-reported measures, subject to response biases such as social desirability or recall bias. Future studies could employ observational or experimental designs to complement self-report measures and enhance the validity of the findings. Lastly, the research focused on a selected set of factors influencing attitudes and purchase intentions toward cosmetic products. There may be other relevant factors not included in this study that could impact consumer behaviour. Future research could explore additional factors or examine the interplay between different variables to provide a more inclusive understanding of consumer behaviour in the cosmetics industry. Despite these limitations, the study offers valuable insights into consumers' attitudes and purchase intentions towards cosmetic products in Goa, India. The findings can guide marketers and cosmetic brands in developing targeted strategies to meet consumer preferences and drive market growth.

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What Drives Omni-Channel Customer Experience? An Empirical Study of the Key Antecedents in the Technical Goods Sector

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Abstract

This study explores the key antecedents of omni-channel customer experience (OCCE) in the technical goods sector and examines their impact on customer satisfaction. While existing research primarily focuses on low-involvement products such as apparel and groceries, this study sheds light on high-involvement technical goods, where purchase decisions are more complex and information-intensive. The study aims to bridge the gap between theoretical frameworks and real-world retail challenges by identifying critical antecedents that shape the OCCE. A comprehensive literature review highlights six key factors influencing OCCE: integrated product, pricing, and promotion; integrated information; integrated customer service; perceived trust; perceived risk; and hedonic motivation. To empirically assess their effects, this study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) on data collected from 703 respondents who have engaged with at least two retail channels in the technical goods sector. The findings reveal that all antecedents play a significant role in shaping OCCE, with integrated product, pricing, and promotion exerting the strongest influence. However, perceived risk negatively impacts OCCE, indicating that uncertainty in omni-channel interactions can diminish customer experience. Importantly, the results confirm that a positive OCCE significantly enhances customer satisfaction, underscoring its importance in competitive retail markets. This study provides valuable insights for technical goods retailers seeking to refine their omni-channel strategies. By fostering seamless integration of offerings, real-time information access, consistent service quality, and trust-building mechanisms, businesses can create a superior customer experience that translates into greater satisfaction and long-term loyalty. This research contributes to the growing body of omni-channel retail literature by offering a novel perspective on high-involvement consumer goods, where decision-making processes are more intricate and require a deeper level of customer engagement.

Keywords: Customer Experience, Omni-Channel Retail, Antecedents, Technical Goods Sector, Customer Satisfaction

Introduction

The world of marketing, and especially retail, has experienced a digital proliferation in the last few years (Stanhope, 2024). Retail in its earliest form was restricted to a physical channel that is a brick-and-mortar establishments; however, technological advancements facilitated the emergence of online or virtual stores in the retail sector (Iglesias-Pradas, Acquila-Natale and Del-Río-Carazo, 2022). With markets becoming increasingly competitive and the ever-growing consumer needs, the retail industry saw the development of multi-channel retail, which involved a single brand/manufacturer offering more than one platform to purchase its products (Neslin et al., 2006; Li et al., 2018). Multi-channel retail witnessed options of platforms of a single brand being made available to the consumer either in the form of a physical store or a virtual store; both platforms however operating independent of each other (Beck and Rygl, 2015; Pophal, 2015; Yrjölä, Saarijärvi and Nummela, 2018). However, presently, manufacturers and retailers operating online and offline channels have evolved from competing with each other to building collaborations to integrate operations and co-exist (Ameen et al., 2021; Rahman et al., 2022). As a result, omni-channel frameworks have emerged, which are designed to seamlessly integrate processes across all channels and provide a singular view of the brand to the customer. As per the India Phygital Index (Indiaretail, 2024), omni-channel sales in India are expected to reach \$55 billion by 2027 from the present \$11.2 billion, representing a significant growth potential. To optimize the customer experience across all channels, it is essential to implement an integrated management system for all accessible channels and existing customer touchpoints (Verhoef, Kannan and Inman, 2015). Both academic researchers and industry professionals have recognized that the overall quality of customer experience is a crucial factor influencing customers' purchasing intentions and is decisive in the success of omni-channel businesses (Saghiri et al., 2017). Therefore, in order to serve customers successfully, it is crucial for organizations to comprehend and fulfill their expectations regarding the omni-channel experience.

The global market is currently witnessing the emergence of omni-channel brands across various sectors. Many retailers and brands are yet to integrate the entire spectrum of activities (pre-purchase, purchase and post-purchase) and are still in the process of building fully integrated omni-channel platforms (Joseph, 2015). Omni-channel retailers are ineffectively meeting customer needs and expectations with their present omni-channel systems (Hoogveld and Koster, 2016). This study examines the selected antecedents influencing customer experience in an omni-channel framework related to the technical goods sector and its role in increasing customer satisfaction. Previous studies have empirically researched the factors/determinants of purchase intentions towards omni-channel frameworks in sectors such as fashion (Jaengprajak and Chaipooipratana, 2022; Kaur and Sandhu, 2022; Kazancoglu and Aydin, 2018; Riaz et al., 2022), grocery (Yen, 2023) and sporting goods (Jayasingh, Girija and Arunkumar, 2022). Therefore, it is essential to cultivate a thorough understanding of the various omni-channel elements that contribute to a cohesive customer experience.

The present study employs a quantitative research approach to explore the antecedents associated with omni-channel retailing that contribute to an enhanced customer experience. This study has chosen the technical consumer goods (Lynn and Gelb, 1996) sector, which includes consumer electronics and home appliances. These are high-involvement products as the consumer is highly engaged in the purchase decision and desires to purchase the most appropriate variant in terms of quality, price, service, etc (Amarasinghe Arachchige et al., 2022). The key characteristics of these goods are that they are expensive and are not purchased very often by an individual (Nayeem and Casidy, 2013). Hence, the buying decision-making process is lengthy (Arora and Sharma, 2018) and much research is undertaken by the consumer to make the ideal final choice. The consumer expects that the product variants, information, prices and service procedures across channels are consistent and that the brand has a unified view of the consumer (Cui et al., 2021) irrespective of the channel employed by the consumer for search, purchase and post-purchase interactions. Both academic researchers and industry-wide practitioners have acknowledged that customer experience is an important differentiating factor (Palmer, 2010; Rose et al., 2012; Kriss, 2014; Lemon and Verhoef, 2016) influencing the customer decision-making process and is the crux of the success of a retailer's omni-channel strategy (Picot-Coupey, Huré and Piveteau, 2016). The constant evolution in customer behaviour encourages retailers to address the needs and desires of such emerging customers by delivering a unified retail experience that transcends beyond traditional offline and online limitations, culminating in a cohesive omni-channel experience.

The paper is structured as follows: The next section reviews the extant literature on the antecedents of OCCE and develops appropriate hypotheses. Detailed descriptions of the research methodology, data analysis, and interpretation are provided in the subsequent sections. Finally, the study concludes with a discussion of the findings, implications, limitations, and potential for future research.

Literature Review

This section reviews the literature on customer experience and omni-channel frameworks, followed by a review of the antecedents as identified in the literature leading to the framing of the hypotheses.

Academicians and Practitioners have begun to agree that we no longer live in a product or service-dominated economy but in an experience economy (Pine II and Gilmore, 2017) which will be the key to sustain in this competitive marketing environment. Retailers intending to be sustainable have to set themselves apart from their competitors by providing customers a positively differentiated shopping experience throughout their journey that will keep bringing customers back for more (Herhausen et al., 2015). The outcome of customer experience is satisfaction (Verhoef et al., 2009; Rahman et al., 2022), loyalty (Tyrväinen, Karjaluoto and Saarijärvi, 2020; Quach et al., 2022), re-purchase intention (Lee et al., 2019) and word of mouth intention (Rodríguez-Torrico et al., 2021; Natarajan and Veera, 2023) which leads to long-term sustainability and profitability for the retailer. Kriss (2014) quantified the effect of customer experiences on intention to spend and concluded that those consumers with positive experiences spent 140 per cent more than others with sub-standard past experiences. Consequently, Kazancoglu and Aydin (2018) suggested that retailers need to create integrated consumer experiences which are based on fulfilling customer expectations.

As observed by Rigby (2011), retailers are increasingly using myriad channels and integrating their activities across websites, physical stores, mobile applications, physical and digital kiosks, call centres, social media platforms, etc., thereby transforming from multi-channel retailers to omni-channel retailers. Omni-channel enhances the experiences of customers by seamlessly integrating all the activities of a buying process (pre-purchase, purchase, post-purchase) undertaken across two or more channels (Neslin et al., 2014; Verhoef, Kannan and Inman, 2015). Cook (2014) suggests that retailers need to seize this opportunity of providing a seamless shopping experience by creating omni-channel platforms so that they create a satisfied and loyal customer base.

Integrated product, pricing, and promotion and OCCE

Consistent prices and product information and descriptions across channels reduce confusion among consumers and help them develop consistent evaluations (Oh et al., 2012). Brands can achieve this by providing identical descriptions of products across channels and ensuring consistency of product prices across channels (Gao et al., 2021; Zhang et al., 2018). Consumers must be able to locate a brand's advertisements or publicity information across all the channels it has its presence (Zhang et al., 2018; Lee, 2020). As suggested by Gao et al. (2021), integrated product, pricing and promotion impact the OCCE, especially the cognitive experience. Therefore, we hypothesize that:

H1. Integrated product, pricing and promotion impacts OCCE.

Integrated information and OCCE

Integrated information involves maintaining a singular account of a customer to record and track all the transactions and interactions of the customer with the brand, regardless of the channel of transaction and interaction (Oh et al., 2012; Zhang et al., 2018). It could be achieved by ensuring that the order history of the customer is available across channels, information of various communication with the customer such as emails, phone calls and complaints are made available across the systems of the brand (Iglesias-Pradas, Acquila-Natale and Del-Río-Carazo, 2022). Integrating information across the channels of a brand can enhance the omni-channel experience of the customer (W. Lee, 2020; Gao et al., 2021). Therefore, we hypothesize that:

H2. Integrated information impacts OCCE.

Integrated customer service and OCCE

Integrating customer service across channels involves offering a unified service to the customer irrespective of the channel of transaction or channel of availing the customer service (Oh et al., 2012; Zhang et al., 2018). Through the shopping journey of customers, service representatives should immediately be able to identify transaction histories, provide consistent resolutions and support across channels, immediately follow-up with customers irrespective of the channel of feedback (Piotrowicz and Cuthbertson, 2014). Integrating customer service throughout the purchase journey strongly influences the OCCE as customers experience a sense of security and reliability, which leads to a stress-free and delightful shopping experience (Barari, Ross and Surachartkumtonkun, 2020). Therefore, we hypothesize that:

H3. Integrated customer service impacts OCCE.

Perceived risk and OCCE

Perceived risk is the uncertainty experienced by a consumer with regard to the possibility of undesirable effects while shopping on omni-channel platforms (Kim, Ferrin and Rao, 2008). By building fully integrated platforms and providing consistent information of products, prices and services across platforms, omni-channel retailers can alleviate the risk experienced by consumers, especially while shopping for high-involvement products (Xu and Jackson, 2019). In a qualitative study undertaken by Kazancoglu and Aydin (2018), it was found that omni-channel shopping was considered to be risky due to the performance-related and financial risks associated with such frameworks. Shi et al. (2020) suggested that perceived risks towards omni-channel frameworks can be reduced by augmenting the experiences of customers across the channels. Therefore, we hypothesize that:

H4. Perceived risk negatively impacts OCCE.

Perceived trust and OCCE

Perceived trust is defined as "a feeling of confidence in the retailer, such that customers believe the retailer is willing and able to deliver on its promises across all channels" (Rahman et al., 2022). If customers trust a retailer, they are more confident in making a purchase and spend a higher share of their wallet as compared with retailers they do not trust (Chiu et al., 2009). Besides, consumers will instinctively overlook the brand/retailer's policy of using their personal information for future purchase recommendations without their permission (Zhang et al., 2018). The degree of trust that a customer has in a specific brand can greatly influence the OCCE. Therefore, we hypothesize that:

H5. Perceived trust impacts OCCE.

Hedonic motivation and OCCE

Venkatesh et al. (2012) define hedonic motivation as the "fun or pleasure derived from using a technology". Shopping using omni-channel platforms requires a certain level of technical skill, and therefore, certain consumers may perceive pleasure/enjoyment while shopping on these platforms (Choi, Madhavaram and Park, 2020). Kazancoglu and Aydin (2018) assert that hedonic motivation does affect OCCE as customers want to have an engaging experience and enjoy the entire purchase journey to reduce negative feelings. Whereas, (Juaneda-

Ayensa, Mosquera and Sierra Murillo, 2016) observed that hedonic motivation does not impact the OCCE. Therefore, we hypothesize that:

H6. Hedonic motivation impacts OCCE.

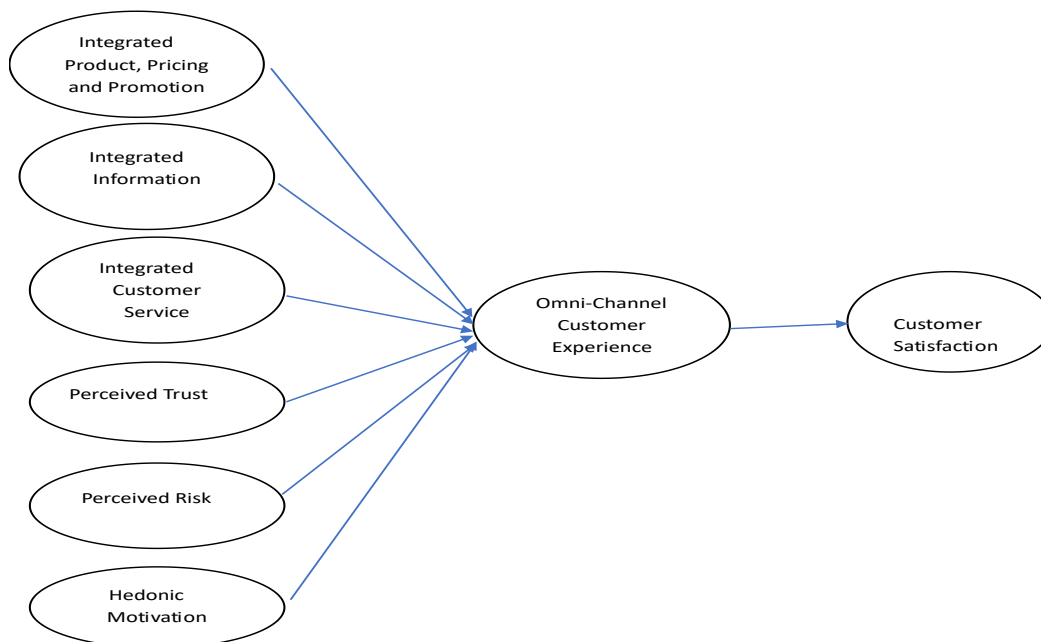
OCCE and customer satisfaction

Customer satisfaction can be characterized as “a customer’s evaluative summary judgment of consumption experiences that is associated with customer- and firm-level outcomes” (Mittal et al., 2023). According to (Nguyen and Tran, 2023), the outcomes of OCCE are customer satisfaction, brand engagement and word-of-mouth intention. In a study conducted by (Yen, 2023), it was found that channel integration enhanced customer satisfaction and trust among customers of grocery retailers. Through the unique capabilities of omni-channel models, retailers can combine the benefits of virtual and offline formats and synchronize customer interactions across touchpoints irrespective of the channel of interaction (Brynjolfsson et al., 2013). Omni-channel platforms allow consumers to search and purchase products at leisure, and this experience brings them the utmost satisfaction (Zhang et al., 2018). According to Lee (2020), some omni-channel characteristics (integrated promotion and integrated information access) have direct effects on customer satisfaction while others do not. Mishra et al. (2021) noted that integrated channels enhance customer satisfaction as customers are in more control along their purchase journey. Therefore, we hypothesize that:

H7. OCCE impacts customer satisfaction.

Figure 1 shows the theoretical model for the study based on the aforementioned hypotheses.

Figure 1: Theoretical model



Source: Authors’ compilation

Research Methodology

The paper examines the influence of identified factors (integrated product, pricing and promotion, integrated information, integrated customer service, perceived risk, perceived trust and hedonic motivation) on the OCCE and its outcome on customer satisfaction. The research developed the structural model, administered the consumer survey, and examined the hypothesized relationships using a structural equation modelling (SEM) strategy based on the partial least square (PLS) method. The structural model incorporates six factors as exogenous constructs, while OCCE is treated as endogenous, impacting customer satisfaction.

The scales for the various constructs were adapted from previous research studies and suitable modified to fulfil the objectives of the present study. The focal construct of the study i.e. OCCE, was measured in terms of five dimensions as proposed by Shi et al. (2020). Table I presents the various constructs and the sources of the measurement scales for the constructs.

Table I: Constructs and sources

Construct	Sources of measurement scales
Integrated product, pricing and promotion (IPPP)	(Gao <i>et al.</i> , 2021; Oh <i>et al.</i> , 2012; Zhang <i>et al.</i> , 2018)
Integrated Information (IINFO)	
Integrated customer service (ICS)	
Perceived risk (PR)	(Shi <i>et al.</i> , 2020)
Perceived trust (PT)	(Zhang <i>et al.</i> , 2018)
Hedonic motivation (HM)	(Venkatesh, Thong, and Xu, 2012; Jaengprajak and Chaipoopiratana, 2022)
Integration (INTG)	(Shi <i>et al.</i> , 2020)
Personalization (PER)	
Consistency (CONS)	
Flexibility (FLEX)	
Connectivity (CNNV)	
Customer satisfaction (CS)	(Rose <i>et al.</i> , 2012)

Source: Authors' compilation

The study gathered cross-sectional primary responses through the survey method, utilizing a questionnaire as the tool for data collection. The google form was created for the questionnaire and its link was shared on different platforms including social media platforms at regular intervals. The respondents were assured of the confidentiality of their responses, and no personal identifiers were collected in the survey to maintain their anonymity. The missing data was not allowed in the google form as every question was marked as required. Due to non-availability of a sampling frame, non-probability judgemental sampling method is used in the study and selection of the respondents is based on the criteria that the respondents must have shopped for consumer electronics or home appliances using a minimum of two channels. The survey questionnaire used a 7-point Likert scale (strongly disagree to strongly agree) to collect the responses and test the hypotheses. A total of 715 responses were collected from respondents across India during a time span of six months. However, the final sample was limited to 703 responses as 12 respondents did not fulfil the criterion of using a minimum of two channels. The sample of 703 responses is assumed to be representative as it satisfied the “10-times rule” method suggested by Hair *et al.* (2012) and Peng and Lai (2012) i.e. the sample size must be at least 10 times the number of items (54) incorporated in the model. In the research instrument, 10 items were worded negatively and subsequently reverse-coded for analysis and hypothesis testing.

The process of data collection includes two steps – the first being the validation of the questionnaire by academicians/industry experts and testing of the questionnaire via a pilot survey with 89 respondents. Ensuring the reliability and validity of the responses in the pilot survey, the next step involves floating the link of the google form to different social media platforms at regular intervals. The collected responses after the pilot survey were examined with reference to the consistency, reliability, construct validity, collinearity and common method bias. The PLS-SEM was used for hypothesis testing. The next section discusses the findings and interpretation of the statistical results.

Data analysis and interpretation

This section deliberates the results of the analysis of the responses, which includes a discussion on the sample demographics followed by results of the reliability analysis, validity analysis, common method bias and multicollinearity. The remaining section discusses the results of hypotheses testing.

Sample demographics

The primary data is collected from customers with different demographic profiles using a minimum of two channels while shopping for consumer electronics and home appliances. The frequency distribution of customers who participated in the survey, categorized by specified demographic profiles including gender, age group, annual income, and education, is presented in Table II.

Table II: Frequency Distribution

Demographics	Sub Categories	Frequency	Percent
Gender	Male	378	53.8 per cent
	Female	325	46.2 per cent
Age Group	18 to 30 years	276	39.3 per cent
	31 to 45 years	263	37.4 per cent
	Above 45 years	164	23.3 per cent

Demographics	Sub Categories	Frequency	Percent
Annual Income	Less than Rs 5 lakhs	203	28.9 per cent
	Rs 5 to Rs 10 lakhs	284	40.4 per cent
	Above Rs 10 lakhs	216	30.7 per cent
Education	Under Graduate	87	12.4 per cent
	Graduate	190	27.0 per cent
	Post Graduate	240	34.1 per cent
	Professionally Qualified	186	26.5 per cent

Source: Authors' computation

Assumption testing: Reliability and validity analysis

The six factors, namely integrated product, pricing and promotion, integrated information, integrated customer service, perceived risk, perceived trust and hedonic motivation, are assumed to influence OCCE, which in turn influences customer satisfaction. This section discusses the results of different assumptions (reliability analysis, construct validity (convergent and discriminant validity), item multicollinearity and common method bias) examined in the paper.

Table III: Construct Reliability, Convergent Validity and Item Multicollinearity

	Construct Name	Cronbach's Alpha	Composite Reliability (CR)	Construct Loadings	Average Variance Extracted (AVE)	Variance Inflation factor
CNNV1	Connectivity	0.905	0.901	0.826	0.605	2.607
CNNV2				0.811		2.553
CNNV3				0.825		2.395
CNNV4				0.817		2.203
CNNV5				0.719		1.998
CNNV6				0.651		1.878
CONS1	Consistency	0.901	0.901	0.831	0.694	2.499
CONS2				0.813		2.465
CONS3				0.85		2.632
CONS4				0.838		2.594
CS1	Customer Satisfaction	0.904	0.901	0.804	0.696	2.052
CS2				0.782		2.494
CS3				0.85		2.609
CS4				0.898		1.584
FLEX1	Flexibility	0.906	0.904	0.828	0.654	2.435
FLEX2				0.835		3.263
FLEX3				0.832		3.019
FLEX4				0.813		2.765
FLEX5				0.73		1.726
HM1	Hedonic motivation	0.892	0.891	0.83	0.731	2.625
HM2				0.885		2.564
HM3				0.85		2.66
ICS1	Integrated customer service	0.899	0.897	0.796	0.635	2.307
ICS2				0.787		2.644
ICS3				0.864		2.716
ICS4				0.818		2.631
ICS5				0.807		2.102
IINFO1	Integrated information	0.911	0.911	0.768	0.718	2.357
IINFO2				0.809		2.296
IINFO3				0.866		2.322
IINFO4				0.732		2.19
IINFO5				0.803		2.666
INTG1	Integration	0.909	0.908	0.836	0.664	2.36
INTG2				0.851		3.033
INTG3				0.853		2.977
INTG4				0.849		2.924

IPPP1	Integrated product, pricing and promotion	0.917	0.917	0.811	0.648	2.479
IPPP2				0.787		2.143
IPPP3				0.803		2.425
IPPP4				0.826		2.471
IPPP5				0.784		2.523
IPPP6				0.818		2.719
PER1	Personalization	0.916	0.916	0.847	0.732	3.295
PER2				0.878		2.869
PER3				0.865		2.835
PER4				0.831		2.992
PR1	Perceived risk	0.83	0.821	0.668	0.606	1.857
PR2				0.841		1.935
PR3				0.815		1.745
PT1	Perceived trust	0.901	0.900	0.804	0.644	2.252
PT2				0.819		2.216
PT3				0.778		2.504
PT4				0.82		2.366
PT5				0.791		2.559

Source: Authors' computation

The result of the scale's reliability, convergent validity and multicollinearity is reported in table III. The internal consistency reliability is examined with Cronbach alpha and Composite reliability for each factor included in the scale. The Cronbach alpha and Composite reliability for each factor greater than 0.7 is considered satisfactory (Cavana, Delahaye and Sekeran, 2001). Using Confirmatory factor analysis (CFA), the construct validity (convergent validity and discriminant validity) is examined. The convergent validity of the questionnaire examines the relationship between the statements and the construct and is examined using item construct loadings and average variance extracted (AVE) (Fornell and Larcker, 1981). The item construct loadings above 0.7 are considered good, and the AVE of each construct is expected to exceed 0.5 (Hair et al., 2014). The multicollinearity among the items measuring different factors influencing the OCCE is examined with the help of variance inflation factor (VIF) estimates. The multicollinearity of the items represents the problem of high correlation among the items. The multicollinearity analysis reported that the VIF measures of all the items included in the questionnaire are less than 5 which is adequate as per Kock (2015). Thus, it can be concluded that the responses received against the different items measuring factors influencing the OCCE are free from multicollinearity problem.

Table IV: HTMT Ratio for Discriminant Validity

	Connectivity	Consistency	Customer Satisfaction	Flexibility	Hedonic motivation	Integrated Information	Integration	Integrated Customer Service	Integrated Product, Pricing and Promotion	Personalization	Perceived Risk
Consistency	0.737										
Customer Satisfaction	0.746	0.662									
Flexibility	0.746	0.77	0.633								
Hedonic Motivation	0.399	0.472	0.374	0.455							
Integrated Information	0.695	0.732	0.619	0.747	0.495						
Integration	0.604	0.699	0.543	0.714	0.538	0.635					
Integrated Customer Service	0.747	0.755	0.659	0.735	0.456	0.703	0.626				

Integrated Product, Pricing and Promotion	0.775	0.793	0.692	0.772	0.528	0.791	0.624	0.785			
Personalization	0.621	0.751	0.586	0.702	0.537	0.673	0.758	0.655	0.694		
Perceived Risk	0.444	0.437	0.445	0.348	0.042	0.321	0.144	0.332	0.455	0.233	
Perceived Trust	0.718	0.724	0.596	0.72	0.535	0.717	0.643	0.731	0.736	0.632	0.234

Source: Authors' computation

Table V: Fornell-Larcker Criterion for Discriminant Validity

	Connectivity	Consistency	Customer Satisfaction	Flexibility	Hedonic Motivation	Integrated Information	Integration	Integrated Customer Service	Integrated Product, Pricing and Promotion	Personalization	Perceived Risk	Perceived Trust
Connectivity	0.778											
Consistency	0.739	0.833										
Customer Satisfaction	0.742	0.663	0.835									
Flexibility	0.746	0.771	0.631	0.809								
Hedonic Motivation	0.397	0.472	0.374	0.454	0.855							
Integrated Information	0.697	0.732	0.619	0.747	0.495	0.797						
Integration	0.606	0.699	0.544	0.713	0.537	0.636	0.847					
Integrated Customer Service	0.748	0.755	0.66	0.733	0.457	0.704	0.627	0.815				
Integrated Product, Pricing and Promotion	0.774	0.793	0.691	0.77	0.529	0.791	0.623	0.785	0.805			
Personalization	0.623	0.751	0.585	0.701	0.538	0.675	0.758	0.656	0.694	0.856		
Perceived Risk	-0.443	-0.436	-0.444	-0.348	-	0.009	-0.32	-0.146	-0.333	-0.455	-0.235	0.779
Perceived Trust	0.717	0.724	0.597	0.72	0.535	0.718	0.643	0.731	0.737	0.633	-	0.237

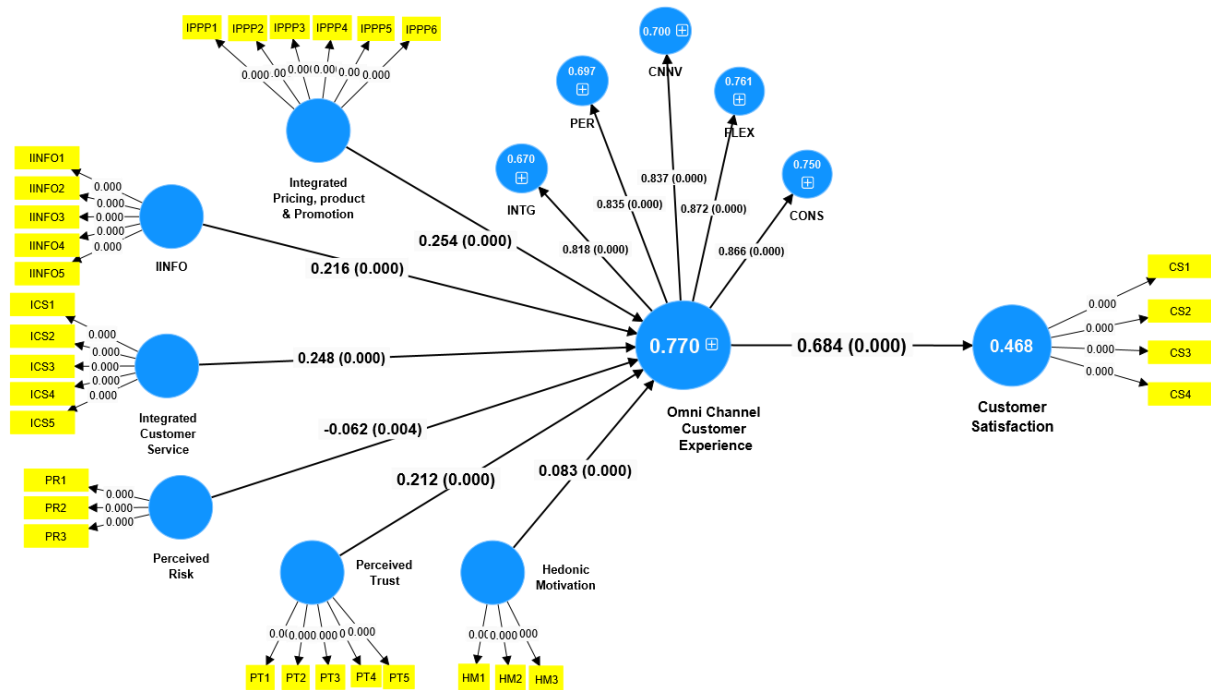
Source: Authors' computation

The discriminant validity in the paper is examined using the HTMT ratio and Fornell-Larcker criterion, reported in table IV and table V respectively. The discriminant validity indicates the low relationship between statements measuring the different constructs and is examined with the help of the Heterotrait - Monotrait (HTMT) ratio and Fornell-Larcker criterion. According to (Henseler, Ringle and Sarstedt, 2015), a HTMT ratio of less than 0.85 is needed to satisfy the criteria of discriminant validity. The Fornell-Larcker criterion evaluates the square root of the AVE for each factor in relation to its associations with other factors within the scale. It is anticipated that the square root of the AVE for every factor must exceed its correlations with the remaining factors in the scale (Fornell and Larcker, 1981). The discriminant validity of the scale anticipates a minimal correlation among items that assess the various constructs encompassed within the scale. The results reported that the HTMT ratio of all the pairs of included constructs is found to be less than 0.85, indicating the fulfilment of the discriminant validity criteria. The result of the Fornell-Larcker criterion indicate that the square root of the AVE for each factor exceeds its correlations with other factors in the scale. Thus, it can be concluded that the scale used in the study satisfied the requirement of discriminant validity.

Lastly, given that a single instrument was employed to assess both the independent and dependent variables, there exists a potential for common method variance (Kock et al., 2021). If the research instrument is drafted in a manner in which there is a possibility to have a bias in the responses, it will lead to biased conclusions. The survey responses are analyzed using Harman's single-factor test to ensure that the results are unbiased. The Harman's single-factor test is applied using exploratory factor analysis, with the condition that a single factor is to be extracted as a result of a principal component analysis (PCA). The result reported that the single extracted factor explains only 40.818% of the variance of all the responses against all the items included in the study. The explained variance by the single factor is found to be less than 50% and thus it can be concluded that the responses received in the survey are free from bias caused by common method bias (Podsakoff et al., 2003).

Hypotheses testing: Impact of antecedents on OCCE and the influence of OCCE on customer satisfaction

The six antecedents, namely integrated product, pricing and promotion, integrated information, integrated customer service, perceived risk, perceived trust and hedonic motivation, were identified and included in the structural model and are assumed to influence OCCE. These factors are assumed as exogenous constructs, whereas OCCE and customer satisfaction are assumed to be endogenous constructs. OCCE is hypothesized to influence customer satisfaction. The structural model (Figure 2) is analysed employing the structural equation modelling technique in the SmartPLS software.



Source: Authors' computation

Table VI: Result of the Hypothesis Testing using SEM

Hypothesis	Exogeneous Construct	Endogenous Construct	Path Coefficient	Standard deviation	T Stats	R ²
H1	Integrated Product, Pricing and Promotion	OCCE	0.253	0.036	7.065**	77 per cent
H2	Integrated information		0.216	0.034	6.274**	
H3	Integrated Customer Service		0.249	0.032	7.864**	
H4	Perceived Risk		-0.063	0.021	2.925**	
H5	Perceived Trust		0.211	0.037	5.664**	
H6	Hedonic Motivation		0.08	0.023	3.551**	
H7	OCCE	Customer Satisfaction	0.687	0.021	32.442**	46.8 per cent

Source: Authors' computation

The findings from the hypothesis testing are presented in table VI. The findings from the SEM analysis corroborated the hypothesis that “the selected antecedents (integrated product, pricing and promotion, integrated information, integrated customer service, perceived risk, perceived trust and hedonic motivation) significantly influence OCCE”. The path coefficient in the case of the selected antecedents, namely integrated product, pricing and promotion, integrated information, integrated customer service, perceived trust and hedonic motivation, has

been determined to be significant and positive. Therefore, it can be inferred that the selected factors have a positive impact on OCCE. The highest path coefficient is found in the case of integrated product, pricing and promotion (path coefficient = 0.253), followed by integrated customer service (path coefficient = 0.249), integrated information (path coefficient = 0.216) and perceived trust (path coefficient = 0.211) indicating the maximum positive influence on OCCE. Whereas, hedonic motivation is found to have the least but significant impact on OCCE (path coefficient = 0.08). In the case of perceived risk, a significant, however negative impact is found on OCCE (path coefficient = -0.063). The R square reported signifies that around 77 per cent of the proportion of the variance of OCCE is explained by the structural model. The result of the SEM analysis supported the hypothesis that “OCCE significantly influences customer satisfaction” (path coefficient = 0.687, t stats = 32.442). The path coefficient indicating the impact of OCCE on customer satisfaction is positive and statistically significant. Hence, we conclude that a favourable OCCE positively influences customer satisfaction.

Discussion

This study empirically identifies and validates the key antecedents of OCCE and examines their impact on customer satisfaction within the technical goods sector. The findings suggest that all the antecedents, except perceived risk, positively influence OCCE, and this experience leads to customer satisfaction. Integrated product, pricing and promotion has the highest impact on OCCE. This is partly in line with previous research conducted by (Lee, 2020) which suggested that integrated promotion impacts customer satisfaction but not integrated product and pricing. This research empirically shows that customers expect integration in product and pricing information across the retailers’ channels, which enhances their experiences. This insight highlights the critical role of cohesive branding and product and pricing symmetry in creating a seamless experience, particularly for high-involvement products where informed decision-making is crucial.

Integrated information and customer service were also found to strongly influence OCCE. These findings underscore the importance of unified systems that enable consistent interactions and reliable customer support across platforms. This is especially relevant in the technical goods sector, where consumers demand detailed product information, accurate order tracking, and responsive service. Perceived trust was identified as a key antecedent, reinforcing its role in mitigating uncertainties and fostering confidence in omni-channel shopping environments. The results suggest that trust-building measures, such as transparent communication and data security, are indispensable for enhancing customer experiences.

Interestingly, perceived risk negatively impacts OCCE, aligning with previous research that highlights the detrimental effect of uncertainty on consumer behaviour (Kim, Ferrin and Rao, 2008). This finding reiterates the need for retailers to address potential sources of perceived risk, such as inconsistent product quality or security concerns, through proactive measures and effective communication. Hedonic motivation, though statistically significant, demonstrated the least influence on OCCE, suggesting that functional and utilitarian factors hold greater importance in this sector (Juaneda-Ayensa, Mosquera and Sierra Murillo, 2016). This contrasts with findings in apparel or grocery retailing, where experiential and emotional dimensions of shopping play a more prominent role (Jayasingh et al., 2022; Kaur and Sandhu, 2022). The divergence underscores the contextual nature of OCCE antecedents and the need for industry-specific strategies (Palmer, 2010; Rose et al., 2012; Kriss, 2014; Lemon and Verhoef, 2016).

The study also establishes that OCCE significantly influences customer satisfaction, with a robust path coefficient underscoring its pivotal role in driving positive outcomes such as loyalty, repurchase intention, and word-of-mouth advocacy (Lee and Lim, 2017; Tyrväinen, Karjaluoto and Saarijärvi, 2020; Meredith Robertson and Kopot, 2023; Natarajan and Veera, 2023). These findings align with prior research and emphasize the importance of providing a cohesive customer experience across all touchpoints to achieve competitive advantage.

Beyond these findings, this study contributes to the existing literature by examining OCCE in the underexplored context of technical consumer goods, a high-involvement product category. By extending existing theoretical frameworks to this sector, the research addresses a significant gap and provides actionable insights for retailers operating in this domain.

Managerial Implications

The findings of this study offer valuable insights for retailers aiming to OCCE and, in turn, improve customer satisfaction. The study establishes that key antecedents, including integrated product, pricing, and promotion strategies, integrated information, integrated customer service, and perceived trust, significantly impact OCCE. Based on these findings, the following managerial implications are proposed:

First, ensuring seamless integration of product, pricing, and promotional information is essential for minimizing customer confusion and maintaining a cohesive brand image across all channels. Retailers should implement automated pricing engines to synchronize real-time price changes across platforms, offer channel-agnostic promotions (e.g., mobile-app coupons redeemable in-store), and provide real-time inventory visibility to prevent

cart abandonment due to stockouts. These measures enhance consistency and transparency in pricing, reducing friction in the purchasing process.

Second, integrating information systems across channels is crucial to facilitating informed consumer decision-making. Retailers should leverage cloud-based customer data platforms to unify purchase histories, deploy real-time product comparison tools, and implement customer self-service portals for seamless access to invoices, warranties, and service requests. Ensuring a unified and transparent flow of information enhances consumer confidence and fosters engagement across touchpoints.

Third, delivering a consistent and efficient customer service experience across all channels is vital for enhancing customer satisfaction. Retailers should implement a centralized customer service management system integrating AI-driven chatbots with human agents to provide 24/7 service continuity. Additionally, adopting unified customer relationship management (CRM) systems can enable service teams to access complete customer histories, ensuring personalized and informed support. Retailers should also facilitate social media-based service requests, ensuring that customer concerns raised on platforms such as WhatsApp and Instagram are logged and resolved across all channels.

Fourth, mitigating perceived risk through transparent policies and secure transactions is critical for fostering trust and encouraging multi-channel engagement. Retailers should offer a standardized and flexible return policy applicable across all and enhance product visualization through augmented reality (AR) and virtual reality (VR) tools.

Finally, building and maintaining customer trust requires an ongoing commitment to data privacy, transparent communication, and service consistency. Retailers should enhance trust by providing real-time order updates and shipment tracking, displaying trust badges (e.g., 100% Secure Payment) at checkout, and ensuring customer support transparency by providing estimated response times for email or chatbot queries.

For pure offline and online retailers in India's technical goods sector, adopting omni-channel strategies is no longer optional but imperative. The contemporary Indian consumer is increasingly digitally connected and seeks a seamless and value-driven shopping experience. Retailers must therefore adopt an integrated omni-channel approach with urgency to remain competitive in the evolving marketplace.

Limitations and Scope for Future Research

The following could be considered as limitations of the study, which provide scope for future investigations. Firstly, this study has empirically tested only six antecedents of OCCE in the Technical Goods Sector. Future research could explore additional antecedents to broaden the scope of factors influencing OCCE. Secondly, this study has used cross-sectional data, whereas longitudinal data is essential to track evolving consumer behaviours as omni-channel strategies mature, while demographic analyses could reveal segment-specific preferences. Lastly, studying post-adoption behaviours, including sustained loyalty and resistance to switching, would provide a deeper understanding of OCCE's long-term benefits. These avenues for future research can expand the theoretical framework and provide actionable strategies for retailers to enhance customer satisfaction and strengthen their competitive edge in dynamic markets.

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India–ASEAN Trade Diversification since AIFTA: An Empirical Assessment

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Abstract

This study examines the patterns of product diversification in India-ASEAN trade relations during 2011-2019, focusing on the period following the implementation of the ASEAN-India Free Trade Agreement (AIFTA). Using the Gini-Hirschman Index (GHI) and correlation analysis, the research reveals significant asymmetries in the evolution of export and import diversification patterns. The findings demonstrate a concerning trend in export diversification, evidenced by a significant positive correlation ($r = 0.52$, $p < 0.001$) between export growth and concentration levels. This relationship suggests a structural tendency toward increased concentration as export volumes grow, particularly evident in major trading relationships such as with Singapore, where concentration in specific commodities persists at high levels (GHI: 60.21-72.31). Conversely, import relationships demonstrate a more favorable trajectory, characterized by a significant negative correlation ($r = -0.65$, $p < 0.001$) between import values and concentration levels. This pattern suggests that import relationships naturally diversify as they mature, exemplified by Thailand's consistently low GHI values (11.23-18.44) and Singapore's substantial improvement in import diversification (GHI declining from 51.61 to 21.26). The study identifies several critical barriers to export diversification, including structural impediments from established trade networks, market access barriers, and policy-related constraints. However, success stories like Indonesia's improvement in export diversification (GHI declining from 66.96 to 35.24) suggest that these barriers can be overcome with appropriate policy interventions. The research contributes to the literature on regional trade integration by highlighting the asymmetric impacts of trade agreements on export and import diversification. The findings suggest that while import diversification may progress naturally under liberalized trade regimes, export diversification requires more targeted and comprehensive policy interventions. The study proposes policy recommendations focusing on export promotion mechanisms, regulatory harmonization, supply chain integration, institutional support frameworks, and technology adoption to enhance trade diversification between India and ASEAN.

Keywords: Trade Diversification, ASEAN-India Free Trade Agreement, Export Concentration, Regional Integration, Product Diversification Index

Introduction

Background

India and the Association of Southeast Asian Nations (ASEAN) share a rich history of cultural, economic, and political interactions that have evolved significantly over the decades. Rooted in shared historical ties and geographical proximity, their trade relationship has matured into one of strategic importance. Established in 1967, ASEAN has transitioned from a modest regional agreement to a dynamic intergovernmental organization comprising ten Southeast Asian nations. Its objectives emphasize economic integration, political stability, and cultural exchange, aligning well with India's interests in the region.

India's engagement with ASEAN gained momentum with the introduction of the "Look East Policy" in 1991, marking a strategic shift in India's foreign relations. This policy aimed to strengthen economic ties with Southeast Asia, driven by the need to revive India's economy amidst a Balance of Payments crisis and the disintegration of the USSR. Over the years, the relationship deepened, with India becoming a sectoral dialogue partner in 1992, a full dialogue partner in 1996, and eventually a summit-level partner in 2002.

Key milestones include the signing of the ASEAN-India Framework Agreement on Comprehensive Economic Cooperation in 2003 and the implementation of the ASEAN-India Trade in Goods Agreement (AITIGA) in 2010 also known as ASEAN-India Free Trade Agreement (AIFTA). These agreements facilitated significant tariff reductions, boosting trade volumes. However, challenges like trade imbalances, high tariffs on Indian goods, and infrastructural barriers persist. The "Act East Policy," introduced in 2014, marked a further strategic enhancement, aiming to deepen India's engagement with ASEAN across economic, cultural, and security dimensions. Today, ASEAN is a vital partner for India, contributing significantly to its trade portfolio, while India plays a key role in ASEAN's economic diversification strategies, particularly in counterbalancing China's growing influence in the

region. Despite current challenges, both entities continue to explore avenues for deeper integration, focusing on mutual benefits and sustainable growth.

Problem Statement

Despite the robust trade relations, there is an over-reliance on a narrow range of products or sectors within the India-ASEAN trade framework, creating significant vulnerabilities for both economies in dynamic and uncertain global markets. A substantial portion of trade is dominated by a few sectors such as petroleum products, electronic goods, and select agricultural commodities, leading to a high level of trade concentration (World Trade Organization, 2020). This concentration exposes both India and ASEAN countries to external shocks like price volatility, geopolitical disruptions, and sector-specific downturns. For instance, during the COVID-19 pandemic, economies heavily reliant on narrowly focused exports experienced sharp contractions in trade volumes (UNESCAP, 2021).

Such concentrated trade patterns hinder the development of broader economic capabilities, limiting opportunities for technological advancement and participation in high-value global supply chains (Balassa, 1982). Empirical studies have consistently demonstrated that diversifying export baskets contributes to enhanced economic resilience and improved growth trajectories, particularly for emerging economies (Imbs & Wacziarg, 2003; Cadot et al., 2011). While India's agricultural trade with ASEAN is comparatively diversified on the export side, imports remain more focused, potentially undermining long-term trade stability (Pandey, 2019). Additionally, limited diversification in sectors such as intermediate goods and high-value manufacturing highlights missed opportunities for deeper integration into ASEAN's dynamic regional supply chains (Mukherjee, 2016). Therefore, there is a pressing need for strategic diversification to ensure sustainable growth and economic resilience in India-ASEAN trade.

Objectives of the Study

The primary objective of this study is to examine the extent of diversification in the import and export of intensively traded commodities between India and ASEAN and to identify strategies to enhance this diversification post AIFTA period. To achieve this, the study will analyze current trade patterns to determine the levels of commodity diversification or concentration, assessing whether trade is spread across a wide range of products or limited to a few key items. It will also evaluate historical trends to understand if diversification has progressed or stagnated over time, providing insights into the dynamics of trade evolution between the two regions. Additionally, the study aims to identify the barriers limiting diversification, such as policy constraints, infrastructural challenges, and market dynamics that may hinder the expansion into new commodity areas. By addressing these factors, the study seeks to propose strategic recommendations and actionable policies that can promote diversification, enhance trade resilience, and yield mutual economic benefits for both India and ASEAN member states.

Significance of the Study

This study holds significant importance for policymakers, businesses, and academia. For policymakers, understanding the risks associated with trade concentration can inform strategic decisions to invest in diversified sectors, enhancing economic resilience and sustainable growth. Businesses can benefit by identifying new market opportunities and adjusting their strategies to mitigate risks associated with sector-specific downturns. For academia, the study contributes to the literature on international trade diversification, providing empirical evidence on the India-ASEAN context.

By embracing diversification, both India and ASEAN can mitigate risks and enhance mutual economic complementarities, solidifying their roles as key players in a multipolar global economy. The study's insights can facilitate collaborative mechanisms that integrate trade facilitation, knowledge-sharing, and capacity-building initiatives, unlocking underexplored potential in India-ASEAN trade relations (OECD, 2021).

Literature Review

Historical Context of India-ASEAN Trade

The trade relationship between India and the Association of Southeast Asian Nations (ASEAN) has evolved significantly since the early 1990s. The establishment of the ASEAN-India Partnership in 1992 marked the beginning of formal economic engagement between the two regions. Initially characterized by limited trade volumes, the partnership gained momentum with the signing of the ASEAN-India Framework Agreement on Comprehensive Economic Cooperation in 2003, which laid the groundwork for future trade liberalization efforts (ASEAN Secretariat, 2020).

A pivotal development was the implementation of the ASEAN-India Free Trade Agreement (AIFTA) in 2010, aiming to eliminate tariffs on over 80% of traded goods. This agreement substantially increased bilateral

trade volumes, with studies documenting significant growth post-AIFTA (Chandran, 2015). However, scholars have noted that this growth has been concentrated in a few key sectors, including petroleum products, textiles, and machinery (World Bank, 2020; Banik & Kim, 2020). While ASEAN has become India's fourth-largest trading partner, the trade relationship often appears skewed, with ASEAN nations offering diversified imports compared to India's concentrated export structure (Pandey, 2019).

Historical analyses underscore that the foundation of India-ASEAN trade relations is rooted in geographical proximity, shared cultural heritage, and complementary economic structures (Das, 2014). Despite these favorable conditions, a consistent theme in the literature is the lack of diversification in traded commodities, which has limited the potential of bilateral trade to adapt to global economic shifts and exploit emerging opportunities (Kumar, 2019). Recent studies emphasize the need for policy interventions to expand trade into emerging sectors such as pharmaceuticals, digital technology, and renewable energy, which remain underexploited despite significant potential (Mukherjee & Bhattacharya, 2021; Gupta, 2019).

Theoretical Framework

Trade diversification is underpinned by several economic theories that link diversified trade portfolios with enhanced economic resilience and growth. Classical theories, such as Ricardo's theory of comparative advantage, advocate for specialization based on relative efficiency but also caution against the risks of over-reliance on a narrow range of exports (Ricardo, 1817). The Heckscher-Ohlin model suggests that nations export goods that intensively use their abundant factors, but as economies develop, they often seek to diversify their exports to mitigate risks associated with market volatility (Ohlin, 1933).

Modern theoretical frameworks, such as the "Stages of Diversification" proposed by Imbs and Wacziarg (2003), posit a non-linear relationship between economic development and diversification. In the early stages of development, economies tend to diversify their production and export structures, leading to increased economic stability and growth. As they reach higher income levels, a re-specialization in high-value-added sectors often occurs, leveraging advanced technologies and skills.

Hirschman's (1958) "Linkage Theory" further emphasizes that diversification creates forward and backward linkages within the economy, fostering industrialization and reducing vulnerability to sector-specific shocks. Cadot et al. (2011) formalized the relationship between export diversification and macroeconomic stability, demonstrating that countries with more diversified export baskets experience lower output volatility and higher long-term growth rates.

These theoretical perspectives provide a foundation for analyzing the India-ASEAN trade relationship, highlighting the importance of diversification in enhancing economic resilience, promoting sustainable growth, and integrating into global value chains.

Empirical Studies on Diversification

Empirical research consistently affirms the benefits of trade diversification for emerging economies. Imbs and Wacziarg (2003) found that diversification contributes to macroeconomic stability and is associated with higher income levels. Similarly, Cadot et al. (2011) provided evidence that countries with broader export bases are less susceptible to external economic shocks, underscoring the importance of diversification in the context of globalization.

In the context of India-ASEAN trade, several studies have analyzed trade patterns to identify challenges and opportunities for diversification. Mukherjee and Bhattacharya (2021) examined trade data and concluded that sectors such as pharmaceuticals, information technology services, and renewable energy technologies present significant untapped potential for diversification. Despite India's comparative advantages in these sectors, they remain underrepresented in trade with ASEAN countries.

Banik and Kim (2020) utilized the Revealed Comparative Advantage (RCA) index to assess India's export structure to ASEAN, finding a heavy reliance on traditional sectors like textiles and pharmaceuticals. They highlighted the need for India to diversify its exports to include more value-added products and services. Similarly, Pandey (2019) observed that while ASEAN countries offer a diversified range of imports to India, India's exports to ASEAN remain concentrated, leading to trade imbalances and limiting the potential for deeper economic integration.

Challenges to diversification have also been documented. Kumar (2019) pointed out structural constraints such as inadequate infrastructure, regulatory barriers, and policy mismatches that hinder the expansion of trade into new sectors. Ghoshal and Ghosh (2019) emphasized that over-reliance on a limited set of products increases vulnerability to external shocks, as evidenced during global economic crises when concentrated economies faced sharper downturns.

Empirical studies suggest that enhancing trade facilitation measures, investing in capacity-building programs, and improving connectivity are critical to overcoming barriers to diversification (UNESCAP, 2021). Gupta (2019) argued that by leveraging digital technologies and participating in regional value chains, India could significantly diversify its exports and strengthen its trade position in the ASEAN region.

Overall, the literature converges on the necessity of moving beyond traditional sectors to harness the full potential of India-ASEAN trade relations. Diversification not only enhances economic resilience but also aligns with broader goals of sustainable development and integration into global value chains.

Research Methodology

Research Design

The study employs a quantitative approach to analyze the dynamics of India-ASEAN trade relations, particularly focusing on trade diversification. The study is based on secondary data spanning 2011 to 2019, sourced from the International Trade Center (ITC) trade map, Geneva: Bilateral trade data. The choice of 2011 as the starting year ensures the inclusion of the full effects of the ASEAN-India Free Trade Agreement (AIFTA) implemented in 2010. The study avoids 2020 onward to exclude pandemic-related anomalies in global trade patterns.

Data Analysis Techniques

For the entire study period GDP, deflator will be used to covert nominal values into the real ones.

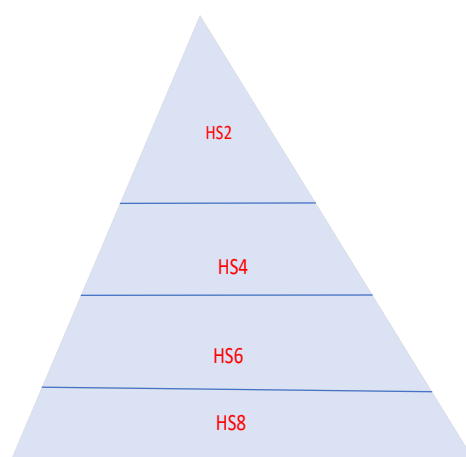
The formula of GDP deflator is as follows

$$GDP\ Deflator = \frac{Nominal\ GDP}{Real\ GDP} * 100$$

The formula to use GDP deflator to convert nominal values into a real value is as follows—

$$Real\ Value = \frac{Nominal\ Value}{GDP\ deflator} * 100$$

For the study, the commodities are chosen at HS 4-digit classification. The HS disaggregation level of commodities can be shown with the help of the following diagram



In the above diagram we can see that at further disaggregation level, the range of commodities under disaggregated classification goes wider and wider. The reason for choosing a higher aggregation level like HS 4 is because in such a case more commodity groups are covered and the analysis becomes more reflective. However, in HS 4 classification there are more than thousands of commodities or commodity groups so, practically tallying all the commodities is not feasible considering time and data constraints, so among the commodities, it is required to choose only those commodities which reflected trade between India-ASEAN in a more promising way. Therefore, a proper choice mechanism requires for this purpose.

The mechanism that for the study is based on Yeates's (1997) Regional Intensity of Trade index. This index shows the intensity of trade between two parties for commodities relative to the rest of the world. The index lies between 0 and ∞ , suggesting an index greater than 1, intensive nature of trade.

The index is as follows

$$R_k^{ij} = \frac{X_k^{ij}/X_k^i}{X^{ij}/X^i}$$

Where X_k^{ij} be country i's exports of good k to country j, X_k^i refers to country i's all export to country j, X_k^i refers to country i's export of k to the world, X^i refers to country i's export of all commodities aggregate to the world.

This index can be computed from the import side as well.

Those commodities are selected both from the import and export side, which have been showing consistently an index over 1 for the study period, meaning that for the particular commodity, the trade is intensive so the commodity chosen under the criteria will be reflective of trade intensity between India-ASEAN. The list of the selected commodities is provided in annexure 1.

For calculating product diversification, Gini-Hirschman Index (GHI) is calculated. This index quantifies the concentration level of products or markets in a country's trade. The index is calculated using the following formula:

$$GHI = 100 \sqrt{\sum_{j=1}^n \left(\frac{X_{jt}}{X_t}\right)^2}$$

Where X_{jt} is the export (or import) value of a specific product j in period t.

X_t is the total export (or import) value in period t.

The GHI ranges from a minimum value $\frac{100}{\sqrt{n}}$ where n is the number of different products or markets, to a maximum value of 100, indicating extreme concentration (only one product or market). A high GHI value indicates high concentration and low diversification and low GHI value indicates low concentration and high diversification.

To determine whether there is any relationship between export/import value and GHI value the study undertakes the Pearson correlation coefficient (r) between export/import and GHI. This coefficient measures the strength and direction of the linear relationship between the two variables. The Pearson correlation is chosen because it provides a direct measure of the linear association, which aligns with the initial visual observations.

To determine whether the observed correlation is statistically significant, I have conducted a hypothesis test on the Pearson correlation coefficient:

Null Hypothesis (H0): There is no linear relationship

Alternative Hypothesis (H1): There is a linear relationship

To test the hypothesis t-test is used

$$t_{n-1} = \frac{\bar{d}}{\sqrt{\frac{s_d^2}{n}}}$$

Where n-1 is the degrees of freedom

$\bar{d}$ is the mean of differences

s_d^2 is the sample variance of the differences

n is the number of observations

Analysis of Product Diversification Patterns in India-ASEAN Trade

Export Diversification Analysis

India's exports to ASEAN (Table 4.1) show considerable volatility over the study period, declining from USD 18,676,865.9 thousand in 2011 to USD 14,456,888 thousand in 2019. The pattern isn't linear, with the lowest value recorded in 2015 (USD 11,674,053 thousand) followed by a recovery phase. This volatility in aggregate exports provides important context for understanding concentration patterns. Notably, the period coincides with shifts in export shares among ASEAN partners, suggesting ongoing realignment of trade relationships.

Table 4.1- India-ASEAN export during 2011-2019 (In USD thousands)

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Indian export to									
Brunei	643854.019	7604.74	9007.692	9464.413	14960.72	11557.4	20660.51	14156.78	12129.5
Cambodia	8638.28025	7997.045	15892.08	15164.52	22644.93	13724.34	9344.154	22885.34	14526.06
Indonesia	3628948.71	3156627	2769846	2182273	1379425	1550468	1413024	2104247	2419159
Laos	2753.15445	8657.307	13875.36	25255.78	17277.11	3477.662	1656.906	4916.771	5188.09
Malaysia	1389455.98	1585581	2503039	2380930	2625318	2222374	3158600	3907662	2851167
Myanmar	41431.0282	49371.63	27180.43	38649.15	33512.81	45989.43	127419.6	463927.2	227962.3
Phillipines	234764.54	223261.4	224013.3	357153	335172.5	391564.3	399475.4	405773.1	290907.2
Singapore	10626939.9	8958376	8790220	5826917	3884294	4254149	7886353	6445321	6347450
Thailand	572071.975	734316.1	935840.4	1024212	855428	652897.9	764082.2	885805.6	738537
Vietnam	1528008.33	1639309	2488650	2937572	2506020	2755656	3184291	2342610	1549863
Total	18676865.9	16371102	17777564	14797590	11674053	11901859	16964907	16597306	14456888

Source: ITC Trade Map

The volatility in export values might help explain the tendency toward concentration during growth periods. When export growth occurs in an uncertain environment, firms might focus on their most established products and markets, leading to higher concentration.

The analysis of India's export diversification to ASEAN reveals complex patterns characterized by significant country-specific variations.

Table 4.2- Year and country wise export diversification

	Year	2011	2012	2013	2014	2015	2016	2017	2018	2019
Brunei	GHI	95.9	69.21	70.23	71.54	74.5	68.4	69.29	67.2	66.31
Cambodia	GHI	40.08	42.95	46.32	43.59	41.19	42.3	40.82	49.3	38.66
Indonesia	GHI	66.97	51.33	58.82	52.68	44.93	30.3	30.17	33.1	35.25
Laos	GHI	68.49	97.25	91.41	72.26	73.57	44.9	49.59	69.4	52.89
Malaysia	GHI	39.8	35.19	48.18	48.27	43.17	39.6	55.67	67.1	53.02
Myanmar	GHI	64.96	54.22	34.28	29.5	28.85	29.6	49.93	64.5	51.87
Philippines	GHI	42.15	40.82	41.03	53.68	53.24	57.9	58.76	59.4	56.35
Singapore	GHI	70.6	69.82	71.21	68.21	64.5	65.6	72.31	67.2	60.21
Thailand	GHI	35.3	40.45	42.31	43.11	41.3	40.4	41.61	42.3	38.61
Vietnam	GHI	45.5	44.45	52.41	55.22	52.3	51.5	53.56	49.3	48.41

Source: Author's calculation from ITC Trade Map

Brunei reveals extremely volatile export patterns, with the highest value recorded in 2011 (USD 643,854.019 thousand) followed by a dramatic decline (Table 4.1). The GHI values range from 66.31 to 95.85 (Table 4.2), indicating high concentration. This concentration is particularly evident in 2011, where 98% of exports were concentrated in commodities like HS codes 8428, 8430, 8901, 8905, 9002, and 9015.

Cambodia exhibits fluctuating export patterns without a clear trend. The GHI values range from 38.66 to 49.29 (Table 4.2), with the highest diversification observed in 2019. Notably, while 2018 saw the largest export value, it also showed the highest concentration (GHI: 49.3), demonstrating the trade-off between export growth and diversification.

Indonesia shows a notable trend toward improved diversification, with GHI values declining substantially from 66.96 in 2011 to 35.24 in 2019 (Table 4.2). The export pattern shows significant fluctuations (Table 4.1), with the highest value in 2011 coinciding with the highest concentration, suggesting successful later diversification efforts.

Laos demonstrates highly volatile export patterns with extreme concentration levels. GHI values range from 44.90 to 97.24 (Table 4.2), with 2012 showing the highest concentration where a single commodity (0202) accounted for 97% of exports.

Malaysia presents increasing concentration over time, with GHI values rising from 39.80 in 2011 to 53.01 in 2019 (Table 4.2). Table 4.2 shows significant export growth, particularly between 2016 and 2018, but this growth coincided with increased concentration, especially in commodity 2710.

Myanmar shows dramatic export growth, particularly during 2016-2018 (Table 4.1). The GHI values fluctuate significantly, ranging from 28.84 to 64.96 (Table 4.2), with the lowest concentration in 2015 followed by increasing concentration during the high-growth period.

Philippines demonstrates a general upward trend in exports (Table 4.1) with GHI values ranging from 40.82 to 59.43 (Table 4.2). The analysis shows an inverse relationship between export diversification and value, with higher exports typically accompanying higher concentration.

Singapore maintains the largest share of Indian exports to ASEAN but shows high concentration levels with GHI values between 60.21 and 72.31 (Table 4.2). Table 4.1 illustrates volatile export patterns, with concentration primarily in commodity 2710 (63-71% of exports).

Thailand maintains moderate diversification levels with GHI values ranging from 35.32 to 43.11 (Table 4.2). Table 4.1 shows steady export growth from 2011 to 2014, followed by fluctuations, with diversification levels remaining relatively stable.

Vietnam shows substantial export growth until 2017 followed by decline. GHI values range from 44.45 to 55.22 (Table 4.2), indicating moderate to high concentration levels correlating with export volumes.

The statistical analysis reveals a significant positive correlation ($r = 0.52$) between export values and GHI levels, with a t-statistic of 8.24 ($p < 0.001$) and a 95% confidence interval of (0.353, 0.655) as shown in Table 4.3.

Table 4.3 Pearson correlation result

Statistic	Value
Pearson Correlation Coefficient	0.52
t-Statistic	8.24
p-Value	<0.001
95% Confidence Interval	(0.353, 0.655)
Number of Observations	90

Source: Author's calculation from ITC Trade Map

The correlation coefficient of 0.52 suggests a moderate to strong positive relationship between export growth and concentration. The high t-statistic (8.24) and low p-value (<0.001) provide strong evidence against the null hypothesis of no relationship, indicating that the observed correlation is highly unlikely to have occurred by chance.

Import Diversification Analysis

India's imports from ASEAN (Table 4.19) show a more stable upward trend, increasing from USD 22,659,649.4 thousand in 2011 to USD 30,211,139 thousand in 2019. This represents a more consistent growth pattern compared to exports, with temporary declines only in 2015-2016.

Table 4.4- India-ASEAN import during 2011-2019 (In USD thousands)

2011	2011	2011	2011	2011	2011	2011	2011	2011
643854.02	643854.019	643854.019	643854.019	643854.019	643854.019	643854.019	643854.019	643854.019
8638.2803	8638.28025	8638.28025	8638.28025	8638.28025	8638.28025	8638.28025	8638.28025	8638.28025
3628948.7	3628948.71	3628948.71	3628948.71	3628948.71	3628948.71	3628948.71	3628948.71	3628948.71
2753.1545	2753.15445	2753.15445	2753.15445	2753.15445	2753.15445	2753.15445	2753.15445	2753.15445
1389456	1389455.98	1389455.98	1389455.98	1389455.98	1389455.98	1389455.98	1389455.98	1389455.98
41431.028	41431.0282	41431.0282	41431.0282	41431.0282	41431.0282	41431.0282	41431.0282	41431.0282
234764.54	234764.54	234764.54	234764.54	234764.54	234764.54	234764.54	234764.54	234764.54
10626940	10626939.9	10626939.9	10626939.9	10626939.9	10626939.9	10626939.9	10626939.9	10626939.9
572071.98	572071.975	572071.975	572071.975	572071.975	572071.975	572071.975	572071.975	572071.975
1528008.3	1528008.33	1528008.33	1528008.33	1528008.33	1528008.33	1528008.33	1528008.33	1528008.33
18676866	18676865.9	18676865.9	18676865.9	18676865.9	18676865.9	18676865.9	18676865.9	18676865.9

Source: ITC Trade Map

The steady growth in imports aligns with the observed pattern of increasing diversification, suggesting that stable trade growth might facilitate product diversification.

As in the above table we can see that country Brunei, Cambodia and Laos had a very minimalistic share so from the analysis these three countries are excluded.

Table 4.5 Year and country wise import diversification

	Year	2011	2012	2013	2014	2015	2016	2017	2018	2019
Indonesia	GHI	47.5	46.8	46.2	45.7	46.3	47.1	45.1	45.3	46.1
Malaysia	GHI	35.8	34.26	36.57	35.56	35.3	36.1	36.61	35.9	35.52
Myanmar	GHI	48.5	48.26	47.51	45.11	69.3	67.1	71.37	73.6	74.41
Philippines	GHI	28.5	27.36	28.57	25.11	24.4	30.4	28.47	31.4	33.26
Singapore	GHI	51.6	40.01	30.33	25.26	25.4	22.4	21.57	20.4	21.26
Thailand	GHI	18.3	15.56	15.33	13.36	14.5	18.4	17.39	11.2	12.51
Vietnam	GHI	26.4	24.16	24.23	24.59	23.2	22.1	22.64	20.4	19.33

Source: Author's calculation from ITC Trade Map

Indonesia as the largest import source, maintains stable diversification with GHI values between 45.10 and 47.50 (Table 4.5). Table 4.4 shows consistent import growth with occasional fluctuations, demonstrating stable diversification despite volume changes.

Malaysia shows relatively stable diversification with GHI values ranging from 34.26 to 36.61 (Table 4.5). Table 4.4 illustrates fluctuating import patterns, with diversification generally improving during periods of import growth.

Myanmar demonstrates declining import trends (Table 4.4) with increasing concentration, as shown by rising GHI values from 45.11 to 74.41 (Table 4.5).

Philippines maintains high diversification levels with GHI values between 24.36 and 33.26 (Table 4.5). Table 4.4 shows overall import growth with fluctuations, accompanied by relatively stable diversification.

Singapore shows dramatic improvement in import diversification, with GHI values declining from 51.61 to 21.26 (Table 4.5). Table 4.4 illustrates significant import volatility, particularly the sharp increase in 2018.

Thailand emerges as the most diversified import source with remarkably low GHI values ranging from 11.23 to 18.44 (Table 4.5). Table 4.4 shows steady import growth with high diversification maintained throughout.

Vietnam demonstrates consistent diversification improvement with GHI values declining from 26.43 to 19.33 (Table 4.5), alongside strong and consistent import growth.

The import analysis reveals a contrasting pattern with a significant negative correlation ($r = -0.65$) between import values and GHI levels, supported by a t-statistic of -5.83 ($p < 0.001$) and a 95% confidence interval of (-0.75, -0.55) as shown in Table 4.6.

Table 4.6 Pearson correlation result

Statistic	Value
Pearson Correlation Coefficient	-0.65
t-Statistic	-5.83
p-Value	<0.001
95% Confidence Interval	(-0.75, -0.55)
Number of Observations	63

Source: Author's calculation from ITC Trade Map

The correlation coefficient of -0.65 indicates a strong negative relationship between import growth and concentration. The t-statistic of -5.83 and p-value <0.001 provide robust evidence of a significant negative relationship between import values and concentration levels.

Statistical Validation and Implications

The contrasting statistical relationships between trade volumes and diversification in exports and imports provide crucial insights into the dynamics of India-ASEAN trade. These opposing patterns suggest fundamental differences in how export and import relationships evolve within the India-ASEAN trade framework.

The tendency toward concentration in exports (positive correlation) likely reflects several underlying factors. First, as export volumes grow, Indian firms appear to specialize in products where they have established competitive advantages. This is particularly evident in the case of Singapore, where commodity 2710 dominates the export basket, accounting for 63-71% of exports. Such specialization might result from economies of scale, established market networks, or specific bilateral trade arrangements. The pattern is also visible in Malaysia's case, where increasing export values coincided with rising GHI values from 39.80 in 2011 to 53.01 in 2019.

The concentration tendency in exports might also reflect market access barriers or specific demand patterns in ASEAN countries. For instance, the high concentration in exports to Brunei suggests limited market penetration across diverse product categories. This could be due to competitive pressures, non-tariff barriers, or specific market requirements that favor certain product categories over others. As Goreczky, 2022 studied that market-specific demand, regulatory barriers, or established trade networks, limits India's role in ASEAN's supply chains concentrating in few products and sectoral engagement.

In contrast, the negative correlation in imports suggests that increased import volumes facilitate greater product diversification. This pattern might emerge from several mechanisms. First, higher import volumes likely indicate broader engagement with ASEAN suppliers across different industries. Thailand's case exemplifies this, maintaining remarkably low GHI values despite substantial import growth. This suggests that as trade relationships mature, Indian importers become more adept at sourcing diverse products from ASEAN markets.

The import diversification pattern might also reflect the success of trade liberalization under AIFTA in reducing barriers across multiple product categories. Singapore's dramatic improvement in import diversification, with GHI values declining from 51.61 to 21.26 demonstrates how reduced trade barriers can facilitate diversification. Similarly, Vietnam's consistent improvement in import diversification alongside strong import growth suggests that newer trade relationships can develop in a more diversified manner under the current trade regime. Earlier research also found that maintaining open trade policies may suffice to sustain healthy import diversification, as evidenced by the success of partners like Thailand and Vietnam (Bhowmik, 2019).

The asymmetry between export and import diversification patterns has important implications for trade policy. The natural tendency toward export concentration suggests that achieving export diversification may require targeted interventions. These could include:

- Export promotion in non-traditional product categories
- Development of new competitive advantages across different industries
- Addressing specific market access barriers in ASEAN countries
- Support for smaller exporters to enter ASEAN markets

Conversely, the organic improvement in import diversification suggests that maintaining open trade policies and reducing trade barriers might be sufficient to maintain healthy import diversification. The success stories of Thailand, Singapore, and Vietnam in maintaining or improving import diversification provide models for enhancing trade relationships with other ASEAN partners.

These statistical relationships therefore reveal not just patterns in trade data, but fundamental aspects of how India-ASEAN trade relationships evolve. The tendency toward export concentration appears to be a structural feature of the current trade relationship, possibly reflecting both market forces and policy constraints. Meanwhile, the consistent pattern of import diversification suggests that the institutional framework of AIFTA may be more effective at facilitating diverse import relationships than at promoting export diversification.

Diversification trend post AIFTA period

The temporal analysis of India-ASEAN trade diversification reveals distinct evolutionary patterns characterized by notable asymmetry between export and import trajectories during 2011-2019. The empirical evidence demonstrates that export diversification has largely stagnated or deteriorated, while import diversification has exhibited consistent improvement across most trading partnerships.

The historical trajectory of export diversification presents concerning patterns, evidenced by the significant positive correlation ($r = 0.52$, $p < 0.001$) between export growth and concentration. This statistical relationship indicates a structural tendency toward higher concentration as trade volumes increase, suggesting a systematic deterioration rather than progression in export diversification over time. This pattern is particularly pronounced in India's relationship with Singapore, its largest export destination, where concentration levels remained persistently high with GHI values ranging from 60.21 to 72.31. However, some relationships demonstrate potential for diversification. Indonesia presents a notable exception, showing substantial improvement in export diversification with GHI values declining from 66.96 to 35.24. This successful case suggests that structural barriers to diversification can be overcome under appropriate conditions. Conversely, smaller trading partners like Brunei and Laos exhibited extreme concentration levels, with GHI values reaching 95.85 and 97.24 respectively, highlighting the particular challenges faced in developing diversified trade relationships with smaller economies.

In contrast, import diversification demonstrates more positive historical development, characterized by a significant negative correlation ($r = -0.65$, $p < 0.001$) between import values and concentration. This relationship suggests that import partnerships naturally diversify as they mature. Thailand exemplifies this pattern, maintaining

consistently high diversification with GHI values between 11.23 and 18.44. Similarly, Singapore's import relationship showed substantial improvement, with GHI values declining from 51.61 to 21.26, while Vietnam demonstrated steady diversification progress as GHI values fell from 26.43 to 19.33.

Barriers to trade diversification

Structural impediments emerge from established trade networks and economies of scale, exemplified by the dominance of specific commodities such as product code 2710 in Singapore exports. These entrenched patterns create path dependencies that resist diversification efforts, a phenomenon consistent with previous studies indicating that India's exports to ASEAN are characterized by limited structural changes and a focus on a narrow range of high-volume products (Gulnaz and Manglani, 2023). Market access barriers, including non-tariff measures and regulatory requirements, further compound these challenges, as seen in high export concentration levels to countries like Brunei. Such constraints reflect similar findings that emphasize the restrictive impact of non-tariff measures on India's ability to fully capitalize on export potential to ASEAN nations (Khatai and Kim, 2022).

Policy-related asymmetries are evident in the differential impact of the ASEAN-India Free Trade Agreement (AIFTA) on export and import diversification. While AIFTA has effectively facilitated diverse import relationships, it has struggled to promote export diversification. This reflects broader patterns identified in the literature, where FTAs significantly reduce import costs but have a less pronounced impact on exports, partly due to entrenched comparative advantages and market-specific demand preferences (Trung et al., 2018). Market dynamics also exacerbate these challenges, as competitive pressures and entrenched preferences for specific export categories limit diversification opportunities (Joseph and Hari, 2019).

The findings suggest that while import diversification progresses organically within the existing institutional framework, export diversification requires targeted policy interventions. Successful import diversification, as seen in the ASEAN context, underscores the institutional effectiveness of AIFTA. However, persistent challenges in export diversification point to structural barriers and policy gaps, such as limited market access and insufficient export promotion measures, that require immediate attention (Mondal and Sirohi, 2016). These insights highlight the need for tailored strategies that balance maintaining liberalized import regimes with addressing unique barriers to export diversification, providing a framework for enhancing trade resilience and diversification patterns.

Conclusion and Policy recommendation

This study examines trade diversification patterns between India and ASEAN during 2011-2019, revealing significant asymmetries in the evolution of export and import relationships post-AIFTA implementation. The empirical evidence demonstrates a concerning trend in export diversification, characterized by a significant positive correlation ($r = 0.52$, $p < 0.001$) between export growth and concentration. This relationship suggests a structural tendency toward increased concentration as export volumes grow, particularly evident in major trading relationships such as with Singapore, where concentration in specific commodities persists at high levels (GHI: 60.21-72.31).

Conversely, import relationships demonstrate a more favorable trajectory, evidenced by a significant negative correlation ($r = -0.65$, $p < 0.001$) between import values and concentration levels. This pattern suggests that import relationships naturally diversify as they mature, exemplified by Thailand's consistently low GHI values (11.23-18.44) and Singapore's substantial improvement in import diversification (GHI declining from 51.61 to 21.26). The contrasting patterns indicate that while AIFTA has effectively facilitated diverse import relationships, its impact on export diversification has been limited.

The findings identify several critical barriers to export diversification, including structural impediments from established trade networks, market access barriers, and policy-related constraints. The persistence of high concentration in exports to smaller ASEAN economies (e.g., Brunei's GHI reaching 95.85) highlights the particular challenges faced in developing diversified trade relationships with emerging markets. However, success stories like Indonesia's improvement in export diversification (GHI declining from 66.96 to 35.24) suggest that these barriers can be overcome with appropriate policy interventions.

Based on these findings, several policy interventions emerge as crucial for enhancing trade diversification. First, policymakers should focus on developing comprehensive export promotion mechanisms that specifically target non-traditional product categories and emerging sectors. This approach should be complemented by market intelligence systems that can identify and capitalize on new export opportunities within ASEAN markets. Second, regulatory harmonization emerges as a critical area for policy intervention. The study suggests that streamlining compliance procedures and enhancing transparency in non-tariff measures could significantly facilitate export diversification. This should be pursued through bilateral and multilateral mechanisms within the AIFTA framework. Third, supply chain integration requires strategic policy attention. The analysis indicates that deeper

integration into ASEAN value chains could enhance export diversification. This necessitates policies that promote investment in export-oriented manufacturing facilities and strengthen logistics linkages with ASEAN countries. The success of import diversification in countries like Thailand and Vietnam provides valuable models for such integration. Fourth, institutional support frameworks need strengthening, particularly for SME exporters entering ASEAN markets. The evidence suggests that smaller firms face significant barriers in diversifying their export baskets, indicating the need for specialized financing schemes and capacity-building programs focused on new export sectors. Fifth, technology and innovation support emerges as a crucial policy area. The findings indicate that sectors with higher technological content show greater potential for diversification. Therefore, policies should promote technology adoption in export-oriented industries and facilitate collaboration with ASEAN partners in emerging sectors.

The study's findings contribute significantly to the literature on regional trade integration by highlighting the asymmetric impacts of trade agreements on export and import diversification. The evidence suggests that while import diversification may progress naturally under liberalized trade regimes, export diversification requires more targeted and comprehensive policy interventions. This understanding is crucial for policymakers seeking to enhance the effectiveness of regional trade agreements in promoting balanced and diversified trade relationships.

Future research could explore sector-specific dynamics of diversification and the role of global value chains in shaping trade patterns between India and ASEAN. Additionally, investigating the specific mechanisms through which successful cases like Indonesia achieved improved export diversification could provide valuable insights for policy formulation.

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Determinants of Investment Preference: An Empirical Study

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Abstract

Investment is a commitment of funds made in the expectation of some positive rate of return. In general terms, investment means the use of money in the hope of making more money. In finance, investment means the purchase of a financial product or other item of value with an expectation of favourable future returns. This is an allocation of monetary resources to assets that are expected to yield some gain or return over a given period of time. It means an exchange of financial claims such as shares, bonds, debentures, real estate, etc. People invest their funds in shares, debentures, fixed deposits, national saving certificates, life insurance policies, provident fund etc as per their preference. In their view, investment is a commitment of funds to derive future income in the form of interest, dividends, rent, premiums, pension benefits and the appreciation of the value of their principal capital.

Present paper aims at to understand, determinants of investment preference, of households of Solapur city. Therefore, to understand determinants of investment three factors are taken into account, those are objectives of investment, financial goals of investment and macroeconomic variables influence investment decision. An attempt has been made to understand that, whether determinants of investment are influenced or not by their demographic variables such as gender, age, level of education, occupation and income. In order to justify research objectives, data has been collected through in-depth interviews of household investors through structured questionnaires covering a variety of interrelated aspects, such as the household's demographic factors and financial position, including income, and determinants of investment. Sample size 250 was worked out through Rao's soft online calculator, stratified random sampling was adopted by the researcher. Conventional and non-conventional statistical techniques have been used to justify mentioned objectives. Suitable statistical tools and techniques have been used to present and analyze the data, such as Spearman's rank correlation, t- test and Chi-square test. Based on the analysis, it has been found that, most preferred objective of investment is safety and security followed by better returns, capital appreciation, provision of future, liquidity, tax benefit, hedge against inflation, convenience and simplicity and diversification. It has been also observed that, significant association exist between sets of rankings for objectives investment by respondents of various age groups, respondents of various levels of education and different levels of income. It has been also concluded that financial goals of investment are not independent of gender, age, level of education, occupation and level of income of the respondents.

Keywords: Financial Objectives of Investment, Motives of Investment, Macroeconomic Variables, Income Generation and Capital Appreciation.

Introduction

Investment refers to putting money into something with the expectation of gain, upon thorough analysis, has a high degree of security for the principal amount, as well as security of return, within an expected period of time. In contrast putting money into something with an expectation of gain without thorough analysis, without security of principal, and without security of return is speculation or gambling. All personal or household's investment are planned in order to achieve certain objectives. These objectives may be tangible or intangible; similarly, these objectives may be classified as financial or personal objectives. Personal objectives may be related to personal characteristics of individuals such as family commitments, status, dependents, educational requirements, etc. Financial objectives are also referred financial objectives of investment such as safety and security, better returns, capital appreciation, liquidity tax benefit, provision for future, hedge against investment etc. Income generation and capital appreciation are the important financial goals of investment. Income generation means investor invests with an objective of generate current flow income from investment. Capital appreciation refers to increase in the value of investment over period of time.

The main problem of the individual investors is that a majority of them do not have proper knowledge regarding the different investment avenues, objectives of investment, financial goals of investment, factors to be taken into account while investing. They are not at all familiar with the technical terminologies and their importance in investment decisions.

Various objectives of investment have been identified investment such as safety and security, better returns, capital appreciation, liquidity, tax benefit, provision for future, hedge against inflation, convenience and simplicity, and diversification. Preferred investment objectives have been identified through rank analysis, same

are also studied based on demographic factors such as gender, age, educational qualification, occupation and annual income of the respondent households.

Financial goals of investment are one of the important components of investment determinants. Income generation and capital appreciation are the important financial goals of investment. Income generation means investor invests with an objective of generate current flow income from investment. Investor with a need for current income may opt for high yielding investment avenues. Capital appreciation refers to increase in the value of investment over period of time. Growth of capital is most closely associated with the purchase of common stock, particularly growth securities, which offer low yields but considerable opportunity for increase in value of investment. Financial goals of investment are categorized under four heads for present study as, income generation, capital appreciation, both (income generation, capital appreciation) and other. Favorite financial goals of household investors have been acknowledged.

Investment is affected by various macroeconomic, such as GDP growth rate, fiscal policy, monetary policy, inflation, industry trend, international business policy, general market sentiment, and political stability. Respondent households were asked to express preference towards macroeconomic variable according to significance of the variable in investment decision. Rank analysis is performed to understand the importance of macroeconomic variables in investment decision.

Statement of the Problem:

Does the investment objectives and financial goals of investment of households are influenced by their demographic factors such as gender, age, level of education, occupation and income?

Objectives Of The Study:

The overall study is aimed to achieve the following objectives:

To identify and preferred the financial objectives of investment by households.

To recognize different financial goals of investment and to trace favorite financial goals of household investors.

To realize various macroeconomic variables affects on investment decision, and preference towards macroeconomic variables by household investors.

Research Hypothesis:

Following hypothesis have been tested to justify mentioned objectives of the study.

For testing the relationships between preference of investment objectives and demographic variables, it was assumed that preference of investment objectives was not associated demographic variables such as gender, age, level of education, occupation and income.

Sets of ranking of financial goals of investment are independent of demographic factors (gender, age, educational qualification, occupation and income) of household respondents

Ranking of macroeconomic variables are not depend on demographic factors (gender, educational qualification, and income) of household respondents

Research Methodology:

The study focuses on determinants of investments of households in Solapur city. This study is combination of descriptive and exploratory in nature, adopted survey method in order to address the research problems. This study basically focuses on exploring objective of investment, financial goals of investment and macroeconomic variables which influences investment decisions. Methodology for the present study is in-depth interviews of household investors through structured questionnaires covering a variety of interrelated aspects, such as the household's demographic factors and financial position, including income, and determinants of investment. The researcher has adopted stratified random sampling, covering the sample size of 250 determined based on Rao's soft online calculator for sample size determination. Both conventional and non-conventional statistical techniques have been used to justify mentioned objectives. Suitable statistical tools and techniques have been used to present and analyze the data. To test the association between sets of ranking of objective of investment, financial goals of investment and demographical factors (gender, age, educational, occupation and income) of household respondents, Spearman's rank correlation and t- test have been applied to analyze the data.

Objectives Of Investment:

An attempt is made to understand objectives of investment (safety and security, better returns, capital appreciation, liquidity, tax benefit, provision for future, hedge against inflation, convenience and simplicity, and diversification). Respondents were asked to rank objectives of investment according to significance of the

investment objectives in investment decision. Objectives of investment are studied based on gender, age, educational qualification, occupation and annual income of the respondent households.

Overall Rank Analysis of Objectives of Investment:

To understand objectives of investment (safety and security, better returns, capital appreciation, liquidity, tax benefit, provision for future, hedge against inflation, convenience and simplicity, and diversification) considered by the respondents, respondents are asked to rank objectives of investment based on their preference. Weighted score is calculated for objectives of investment, according to ranking given by the respondents. The investment objective received rank first assigned nine points, objective ranked second assigned eight points, factor ranked third, fourth, fifth, sixth, seventh, eighth and ninth assigned seven, six, five, four, three, two and one point respectively. The points received by each objective were multiplied with rank and totaled to obtain the weighted score. The nine factors, with weighted scores of each of them and their ranking are shown in Table 01. As far as overall ranking of objectives of investment are concerned, first preferred objective of investment is safety and security followed by better returns, capital appreciation, provision of future, liquidity, tax benefit, hedge against inflation, convenience and simplicity and diversification.

Table-01: Representation of Ranking of Objectives of Investment Overall

Sr. No.	Objectives of Investment	I Rank	II Rank	III Rank	IV Rank	V Rank	VI Rank	VI I Rank	VI II Rank	IX Rank	Total	Weighted Score	Weighted Rank
1	Safety & Security	97	60	44	28	14	5	1	0	1	250	1923	1
2	Better Returns	46	79	62	39	10	1	9	2	2	250	1801	2
3	Capital Appreciation	16	24	47	55	54	22	18	12	2	250	1433	3
4	Liquidity	24	16	27	37	50	57	22	12	5	250	1328	5
5	Tax Benefit	30	33	25	27	35	34	21	8	37	250	1298	6
6	Provision for Future	27	29	22	36	46	52	21	12	5	250	1375	4
7	Hedge against inflation	4	3	8	13	26	49	76	39	32	250	858	7
8	Convenience & Simplicity	6	4	9	10	7	23	65	85	41	250	742	8
9	Diversification	0	2	6	5	8	7	17	80	125	250	492	9
Total		250	250	250	250	250	250	250	250	250			

Source: Primary Data

Ranking of Objectives of Investment on the Basis of Gender:

Ranking analysis has been performed on the basis of gender of the respondents, respondents were asked to rank their objectives of investment they prefer most while taking investment decision. Spearman's rank correlation coefficient was used to find out the degree of association between sets of ranking by male and female respondents. As far as male respondents are concerned, safety and security received first rank followed by better returns, capital appreciation, provision of future, liquidity, tax benefit, convenience and simplicity, hedge against inflation and diversification. In case of female respondents, first rank is given to safety and security followed by better returns, liquidity, tax benefit, provision of future, capital appreciation, hedge against inflation, convenience and simplicity and diversification. Spearman's correlation coefficient between two sets of ranking is 0.83, which is high degree correlation. It means that high degree association between set of ranks of objectives of investment by male and female respondents

Age Based Ranking of Objectives of Investment:

It is observed that, respondents of first age group (below 30 years) are concerned, first rank is assigned to safety and security followed by better returns, capital appreciation, provision of future, tax benefit, liquidity, hedge against inflation, convenience and simplicity and diversification. In case of second age group (30 to 40 years), first rank is given for safety and security followed by better returns, tax benefit, capital appreciation, liquidity, provision of future, hedge against inflation, convenience and simplicity and diversification. Considering third age group (40 to 50 years), first preference is given to safety and security followed by better returns, liquidity, provision of future, capital appreciation, tax benefit, hedge against inflation, convenience and simplicity and diversification. Talking about fourth age group (50 to 60 years), first preference is assigned to safety and security followed by better returns, provision of future, capital appreciation, liquidity, tax benefit, convenience and simplicity, hedge against inflation, and diversification. In case of fifth age group (above 60 years), most preferred

motivational factor is better returns, followed by safety and security, capital appreciation, provision of future, tax benefit, liquidity, convenience and simplicity, hedge against inflation, and diversification.

It can be Concluded ranking by all age groups, safety and security, and better returns received most preferred motivational factors; on the other hand, diversification, convenience and simplicity, and hedge against inflation received least preference.

Spearman's rank correlation coefficient between objectives of investment and different age groups is provided in Table 02. To test the significance of the correlation coefficient t-statistic $\{t = R \sqrt{n-2} / \sqrt{1-R^2}\}$ is calculated and presented in table. There is high degree of correlation coefficient is found between sets of ranking for objectives of investment by respondents of various age groups. T-statistic is calculated to test the significance of the correlation coefficient and their results are presented in the same table.

H_0 = There is no association between sets of ranking for objectives of investment by respondents of various age groups ($R = 0$).

Since the calculated value of 't' at a 5% level of significance for $n-2 = 7$ degree of freedom is greater than table value (2.36), so hypothesis cannot be accepted (rejected), it means that there is significant association exist between set of rankings by respondents of various age groups.

Table No. 02: Rank Correlation Between Objectives of Investment and Age Groups and t-statistic of Correlation Coefficient (R)

Age Groups	R Value	Degree of Freedom	Calculated Value – t	Table Value	Hypothesis Result
(1-2)	0.917	7	6.07	2.36	Since the calculated value of ‘t’ at a 5% level of significance for n-2 = 7 degree of freedom is greater than table value, so hypothesis is rejected, it means there is significant association exist between set of rankings by respondents of various age groups.
(1-3)	0.883	7	4.99	2.36	
(1-4)	0.950	7	8.05	2.36	
(1-5)	0.967	7	9.99	2.36	
(2-3)	0.850	7	4.27	2.36	
(2-4)	0.833	7	3.99	2.36	
(2-5)	0.883	7	4.99	2.36	
(3-4)	0.933	7	6.88	2.36	
(3-5)	0.850	7	4.27	2.36	
(4-5)	0.950	7	8.05	2.36	
Source: Primary Data					

Ranking of Objectives of Investment on Basis of Level of Education:

It is observed that, most of respondents of different levels of education assigned first rank to the safety and security, followed by better returns, and least ranks are received by the factors like diversification, convenience and simplicity, and hedge against inflation. There is difference in ranking for provision of future, capital appreciation, liquidity and tax benefit by respondents of different groups of education.

Rank correlation coefficient and t-statistic is calculated for set of ranks by respondents having different level of education presented in Table 03. Rank correlation coefficient between sets of ranking by respondents having different level of education is found high. It implies that high degree of association is exists in sets of ranks by the respondents of different levels of education. To test significance of the obtained correlation coefficient t-statistic is computed and result of the testing of hypothesis is presented in same table.

H_0 = Sets of ranking by various groups of respondents (based on level of education) are not associated in the population and the observed value of 'R' differs from zero only by chance.

Referring to the t- distribution for $n-2 = 7$ degree of freedom, the critical value for 't' at a 5% level of significance is 2.36. If the calculated value of 't' is higher than table value, hypothesis is rejected and concluded that association in two sets of ranking is significant. On the other hand, if calculated value of 't' is less than table value, hypothesis is accepted and conclude that association in two sets of ranking is not significant.

Table No. 03: Rank Correlation Between Objectives of Investment and levels of Education and t-statistic of Correlation Coefficient (R)

Levels of Education	R Value	Degree of Freedom	Calculated Value – t	Table Value	Hypothesis Result
(1-2)	0.917	7	6.07	2.36	Significant association exist
(1-3)	0.967	7	9.99	2.36	
(1-4)	0.833	7	3.99	2.36	
(1-5)	0.800	7	3.53	2.36	
(2-3)	0.900	7	5.46	2.36	
(2-4)	0.733	7	2.85	2.36	
(2-5)	0.650	7	2.26	2.36	No significant association exist
(3-4)	0.833	7	3.99	2.36	Significant association exist
(3-5)	0.783	7	3.33	2.36	
(4-5)	0.967	7	9.99	2.36	
Source: Primary Data					

Ranking of Objectives of Investment on Basis of Occupation:

As far as Occupation wise ranking for objectives of investment is concerned, it is observed from the table that, government employee assign first rank to safety and security followed by better returns, capital appreciation, tax benefit, provision of future, liquidity, hedge against inflation, convenience and simplicity and diversification. Respondents belong to private employee category assign first rank to safety and security followed by better returns, tax benefit, liquidity, provision for future, capital appreciation, hedge against inflation, convenience and simplicity and diversification. Considering self employee category, out of given motivational factor, first preference is assigned for safety and security followed by better returns, capital appreciation, liquidity, provision of future, tax benefit, hedge against inflation, convenience and simplicity and diversification. Talking about group of professional employees, first preference is assigned for better returns, followed by safety and security, tax benefit, capital appreciation, liquidity, provision of future, hedge against inflation, convenience and simplicity, and diversification. As far as retired class of occupation is concerned, they assign first preference for better returns, followed by safety and security, capital appreciation, provision of future, liquidity, tax benefit, convenience and simplicity, hedge against inflation, and diversification.

Rank correlation and t-statistic of correlation coefficient is calculated and presented in Table 04. It is observed that high degree of positive correlation between sets of rankings by different respondents of different class of occupation. T-test is calculated to test significance of the correlation coefficient and their results are presented in the same table. Formulating hypothesis as, there is no association between sets of ranking given by respondents of different class of occupation.

H_0 = There is no association between sets of ranking given by respondents of various occupation groups ($R = 0$).

Table No. 04: Rank Correlation Between Objectives of Investment and Occupation and t-statistic of Correlation Coefficient (R)

Occup ation	R Value	Degree of Freedom	Calculated Value – t	Table Value	Hypothesis Result
(1-2)	0.883	7	4.99	2.36	Calculated value of ‘t’ at a 5% level of significance for n-2 = 7 degree of freedom is greater than table value (2.36), so hypothesis is rejected and concluded that significant association exist between sets of ranks given by respondents of different occupation groups.
(1-3)	0.933	7	6.88	2.36	
(1-4)	0.929	7	6.64	2.36	
(1-5)	0.917	7	6.07	2.36	
(2-3)	0.850	7	4.27	2.36	
(2-4)	0.954	7	8.42	2.36	
(2-5)	0.800	7	3.53	2.36	
(3-4)	0.879	7	4.87	2.36	
(3-5)	0.950	7	8.05	2.36	
(4-5)	0.854	7	4.33	2.36	
Source: Primary Data					

Since calculated value of 't' at a 5% level of significance for n-2 = 7 degree of freedom is greater than table value (2.36), so hypothesis is rejected and concluded that significant association exist between sets of rankings of objectives of investment by respondents of different occupation.

Ranking of Objectives of Investment on Basis of Level of Income:

Ranking for objectives of investment is based on level of income is concerned, it is observed from the table that, safety and security, and better returns received preference over other motivational factors of investment across all levels of income. On the other hand, diversification, convenience and simplicity, and hedge against inflation received least preference over other factors. It is noted that tax benefit received priority as level of income increase. Respondents belong to lower income groups have assigned third position to provision for future in their preference.

Table No. 05: Rank Correlation Between Objectives of Investment and Levels of Income and t-statistic of Correlation Coefficient (R)

Income Groups	R Value	Degree of Freedom	Calculated Value – t	Table Value	Hypothesis Result
(1-2)	0.983	7	14.31	2.36	The calculated value of ‘t’ at a 5% level of significance for n-2 = 7 degree of freedom is greater than table value (2.36), so hypothesis is rejected and concluded that significant association exist between sets of ranks given by respondents of different levels of income.
(1-3)	0.900	7	5.46	2.36	
(1-4)	0.900	7	5.46	2.36	
(1-5)	0.850	7	4.27	2.36	
(2-3)	0.883	7	4.99	2.36	
(2-4)	0.850	7	4.27	2.36	
(2-5)	0.833	7	3.99	2.36	
(3-4)	0.933	7	6.88	2.36	
(3-5)	0.950	7	8.05	2.36	
(4-5)	0.950	7	8.05	2.36	
Source: Primary Data					

Rank correlation and t-statistic of correlation coefficient is presented in Table 05. High degree of positive correlation coefficient is observed between rankings by different income groups of respondents. T-test is used to test significance of the correlation coefficient and their results are presented in the same table. Hypothesis is formulated as; there is no association between sets of ranking given by respondents of various income groups. Hypothesis is tested at 5% level of significance for n-2= 7 degree of freedom and result is presented in last column of the table.

H_0 = Sets of ranking by various income groups are not associated in the population and the observed value of 'R' differs from zero only by chance.

Since calculated value of 't' at a 5% level of significance for n-2 = 7 degree of freedom is greater than table value (2.36), so hypothesis is rejected and concluded that significant association exist between set of rankings given by respondents of different levels of income.

Financial Goals of Investment:

Income generation and capital appreciation are the important goals of investor to consider while taking investment decisions. Income generation means investor invests with an objective of generate current flow income from investment. Investor with a need for current income may opt for high yielding investment avenues. Capital appreciation refers to increase in the value of investment over period of time. Growth of capital is most closely associated with the purchase of common stock, particularly growth securities, which offer low yields but considerable opportunity for increase in value of investment. There is generally a trade-off between income and capital appreciation. If you go for the high-yielding investment options, you can expect slow growth in capital appreciation. If you opt for high growth in capital appreciation, you can expect low flow of income generation. Capital appreciation is an important tool to protect investment portfolio against inflation.

Financial goals of investment are one of the important elements of determinants of investment. Respondents were asked to express their financial goal of investment (income generation, capital appreciation, both and other). Financial investment goals have been analyzed based on gender, age, educational qualification, occupation and annual income of the respondent households.

Overall Composition of Financial Goals of Investment:

Respondents were asked to express their investment goals; those goals are categorized into four parts. Data about Investment goals are presented in Table 06. Considering 250 respondents, 26.80 per cent of the respondents have income generation as investment goal, 16.40 per cent respondents go for capital appreciation, 46.80 per cent respondents have investment goals as both (income generation and capital appreciation) and 10.00 per cent respondents set out other as a goal of investment.

Table No. 06: Composition of Financial Goals of Investment

Sr. No.	Financial Investment Goals	Frequency	%
1	Income Generation	67	26.80
2	Capital Appreciation	41	16.40
3	Both	117	46.80
4	Other	25	10.00
Total		250	100.00
Source: Primary Data			

Gender wise Composition of Financial Goals of Investment:

Respondents were asked to express their financial investment goals; those goals are analyzed on gender basis, the same is presented in Table 07. As far as male respondents are concerned, 29.30 per cent respondents have investment goal as income generation, 19.75 per cent of respondents set out for capital appreciation, 37.58 per cent choose for both, and 13.38 per cent opt for other. In case of female respondents, 22.58 per cent choose income generation as investment goal, 10.75 respondents have capital appreciation, 62.37 per cent respondents opt for both and 4.30 per cent set out for other.

Table No. 07: Financial Goals of Investment Based on Gender

Sr. No.	Gender	Income Generation		Capital Appreciation		Both		Other	
		F	%	F	%	F	%	F	%
1	Male	46	29.30	31	19.75	59	37.58	21	13.38
2	Female	21	22.58	10	10.75	58	62.37	4	4.30
Total		67	26.80	41	16.40	117	46.80	25	10.00
Source: Primary Data									

Age wise Composition of Financial Goals of Investment:

Age wise composition of financial goals of investment is presented in Table 08. As far as first age group (below 30 years) is concerned, 17.14 per cent respondents have investment goal as income generation, 8.57 per cent of respondents opt for capital appreciation, 71.43 per cent choose for both (income generation and capital appreciation), and 2.86 per cent go for other. In case of second age group (30 to 40 years), 23.64 per cent choose income generation as investment goal, 16.36 respondents go for capital appreciation, 56.36 per cent respondents opt for both (income generation and capital appreciation), and 3.64 per cent go for other than mentioned. Considering third age group (40 to 50 years), 27.78 per cent of the respondents have income generation as investment goal, 15.28 per cent respondents set out for capital appreciation, 37.50 per cent opt for both (income generation and capital appreciation) and 19.44 per cent go for other goal of investment. As far as fourth age group (50 to 60 Years) is concerned, 24.14 per cent respondents have investment goal as income generation, 17.24 per cent of respondents opt for capital appreciation, 44.83 per cent choose for both, and 13.79 per cent go for other. Considering fifth age group (above 60 years) is concerned, 46.67 per cent of the respondents have income generation as investment goal, 26.67 per cent respondents go for capital appreciation, and 26.67 per cent opt for both income generation and capital appreciation.

Table No. 08: Financial Goals of Investment Based on Age Group

Sr. No.	Age Group	Income Generation		Capital Appreciation		Both		Other	
		F	%	F	%	F	%	F	%
1	Below 30 Years	6	17.14	3	8.57	25	71.43	1	2.86
2	30 to 40 Years	13	23.64	9	16.36	31	56.36	2	3.64
3	40 to 50 Years	20	27.78	11	15.28	27	37.50	14	19.44
4	50 to 60 Years	14	24.14	10	17.24	26	44.83	8	13.79
5	Above 60 Years	14	46.67	8	26.67	8	26.67	0	0.00
Total		67	26.80	41	16.40	117	46.80	25	10.00
Source: Primary Data									

Education Based Composition of Financial Goals of Investment:

Financial goals of investment are analyzed based on the level of education and presented in Table 09. As far as group of respondents are having SSC or up to SSC as level of education is concerned, 45.16 per cent respondents having investment goal as income generation, 9.68 per cent of respondents have capital appreciation as goal of investment, 32.26 per cent opt for both (income generation and capital appreciation), and 12.90 per cent go for other. In case of respondents have level of education as HSC, 27.03 per cent choose income generation as investment goal, 24.32 per cent respondents go for capital appreciation, 43.24 per cent respondents opt for both (income generation and capital appreciation), and 5.41 per cent go for other than above mentioned goal. Talking about graduate respondents, 28.00 per cent of the respondents have income generation as investment goal, 13.33 per cent respondents set out for capital appreciation, 41.33 per cent opt for both (income generation and capital appreciation) and 17.33 per cent go for other goal of investment. As far as post graduate respondents are concerned, 19.39 per cent respondents have investment goal as income generation, 16.33 per cent of respondents opt for capital appreciation, 58.16 per cent choose for both (income generation and capital appreciation), and 6.12 per cent go for other than income generation and capital appreciation. Respondents belong to other class of education are concerned, 33.33 per cent of the respondents have income generation as investment goal, 33.33 per cent respondents go for capital appreciation and 33.33 per cent opt for both income generation and capital appreciation.

Table No. 09: Investment Goals Based on Level of Education

Sr. No.	Level of Education	Income Generation		Capital Appreciation		Both		Other	
		F	%	F	%	F	%	F	%
1	SSC or Up to SSC	14	45.16	3	9.68	10	32.26	4	12.90
2	HSC	10	27.03	9	24.32	16	43.24	2	5.41
3	Graduate	21	28.00	10	13.33	31	41.33	13	17.33
4	Post Graduate	19	19.39	16	16.33	57	58.16	6	6.12
5	Other	3	33.33	3	33.33	3	33.33	0	0.00
Total		67	26.80	41	16.40	117	46.80	25	10.00
Source: Primary Data									

Occupation wise Composition of Financial Goals of Investment:

Composition of investment goals on the basis of occupation of the respondents are presented in Table 10. Respondents belong to government employee class, 18.00 per cent respondents have investment goal as income generation, 26.00 per cent of respondents have capital appreciation as goal of investment, 44.00 per cent opt for both (income generation and capital appreciation), and 12.00 per cent go for other. In case of private employee respondents, 36.36 per cent choose income generation as investment goal, 12.99 per cent respondents go for capital appreciation, 40.26 per cent respondents opt for both (income generation and capital appreciation), and 10.39 per cent go for other than above mentioned goal. Talking about self employed respondents, 19.67 per cent of the respondents having income generation as investment goal, 13.11 per cent respondents set out for capital appreciation, 55.74 per cent opt for both (income generation and capital appreciation) and 11.48 per cent go for other goal of investment. As far as professional respondents are concerned, 20.59 per cent respondents have investment goal as income generation, 5.88 per cent of respondents opt for capital appreciation, 67.65 per cent choose for both (income generation and capital appreciation), and 5.88 per cent go for other than income generation and capital appreciation. Respondents belong to retired class are concerned, 39.29 per cent of the

respondents have income generation as investment goal, 28.57 per cent respondents go for capital appreciation and 25.00 per cent opt for both income generation and capital appreciation and 7.14 per cent go for other goals of investment.

Table No. 10: Investment Goals Based on Occupation

Sr. No.	Occupation	Income Generation		Capital Appreciation		Both		Other	
		F	%	F	%	F	%	F	%
1	Govt. Employee	9	18.00	13	26.00	22	44.00	6	12.00
2	Pvt. Employee	28	36.36	10	12.99	31	40.26	8	10.39
3	Self Employee	12	19.67	8	13.11	34	55.74	7	11.48
4	Professional	7	20.59	2	5.88	23	67.65	2	5.88
5	Retired	11	39.29	8	28.57	7	25.00	2	7.14
Total		67	26.80	41	16.40	117	46.80	25	10.00

Source: Primary Data

Income wise Composition of Financial Goals of Investment:

Income wise goals of investment are analyzed and presented in Table 11. As far as first income group (Rs. up to 01 lakh) is concerned, 57.14 per cent respondents are having investment goal as income generation, no respondents from this group have capital appreciation as goal of investment, 7.14 per cent opt for both goals of investment (income generation and capital appreciation), and 35.71 per cent go for other. In case of second group of income (Rs. 01 lakh to 2.5 lakh), 34.38 per cent choose income generation as investment goal, 13.54 per cent respondents go for capital appreciation, 42.71 per cent respondents opt for both goals of investment (income generation and capital appreciation), and 9.38 per cent go for other than above mentioned goal. Talking about third income group (Rs. 2.5 lakh to 04 lakh), 31.43 per cent of the respondents have income generation as investment goal, 17.14 per cent respondents go for capital appreciation, 40.00 per cent opt for both (income generation and capital appreciation) as goals of investment and 11.43 per cent go for other goal of investment. As far as fourth income group (Rs. 04 lakh to 5.5 lakh) are concerned, 30.43 per cent respondents having investment goal as income generation, 10.87 per cent of respondents opt for capital appreciation, 50.00 per cent choose for both (income generation and capital appreciation), and 8.70 per cent go for other than income generation and capital appreciation. Talking about fifth income group (Rs. 5.5 lakh & above), 1.69 per cent respondents have income generation as investment goal, 28.81 per cent respondents go for capital appreciation and 64.41 per cent opt for both income generation and capital appreciation as goals of investment and 5.08 per cent having other goals of investment.

Table No. 11: Investment Goals Based on Level of Income

Sr. No.	Income Groups (Rs.)	Income Generation		Capital Appreciation		Both		Other	
		F	%	F	%	F	%	F	%
1	Up to 01 lakh	8	57.14	0	0.00	1	7.14	5	35.71
2	01 lakh to 2.5 lakh	33	34.38	13	13.54	41	42.71	9	9.38
3	2.5 lakh to 04 lakh	11	31.43	6	17.14	14	40.00	4	11.43
4	04 lakh to 5.5 lakh	14	30.43	5	10.87	23	50.00	4	8.70
5	5.5 lakh & above	1	1.69	17	28.81	38	64.41	3	5.08
Total		67	26.80	41	16.40	117	46.80	25	10.00

Source: Primary Data

Chi-Square Statistic (χ^2) Between Financial Goals of Investment and Demographic Factors (gender, age, level of education, occupation, income) of the Respondents:

Chi-square statistic (χ^2) is computed to test the association between financial goals of investment (income generation, capital appreciation, both and other) and demographic factors (gender, age, level of education, occupation, and income) of the respondents. Calculated Value χ^2 is compared with table value at 0.05 level of significance for (c-1)*(r-1) degree of freedom and results of the test are given under remarks caption of Table 12.

Table No. 12:

Hypothesis (H)	Calculated- χ^2	Table Value	DF	Remarks
Goals of investment and gender of the respondents are independent of each other	16.34	7.815	3	Since calculated value (16.34) is greater than table value (7.815), so the hypothesis is rejected, and it is concluded that goals of investment and gender of the respondents are not independent of each other
Goals of investment are independent of age group of the respondents	33.20	21.02	12	Since calculated value (33.20) is greater than table value (21.026), so the hypothesis is rejected and concluded that goals of investment are not independent of age of the respondents.
Goals of investment are independent of levels of education of the respondents	22.85	21.02	12	Since computed value (22.85) of chi-square statistic is above the cut-off value (21.026), so we reject the hypothesis and concluded that goals of investment & education of respondents are dependent one to another
No dependence between goals of investment and occupation of the respondents	24.91	21.02	12	Since calculated value (24.91) is greater than table value (21.026), so the hypothesis is rejected and it is concluded that goals of investment and occupation of the respondents are depend of one to another
Income of the respondents and goals of investment are independent of one to other	50.71	21.02	12	Since calculated value (50.71) is greater than table value (21.026), so we reject the hypothesis, it is concluded that goals of investment and income of the respondents are not independent of one to another
Source: Primary Data				

Ranking Of Macro Economic Variables:

Rank analysis has been performed to understand the importance of macroeconomic variables in investment decision. Respondent households were asked to rank macroeconomic variable according to significance of the variable in investment decision. Weighted ranks were assigned according to weighted score calculated based on ranking given by the respondents. Ranking analysis is performed based on gender, educational qualification and annual income of the respondent households.

Overall Ranking of Macro Economic Variables:

In order to study the most considered macroeconomic variables while investing, (GDP growth rate, fiscal policy, monetary policy, inflation, industry trend, international business policy, general market sentiment and political stability) respondents were asked to rank them according to their preference. Weighted score was calculated for macroeconomic variables, according to ranking given by the respondents. The eight macroeconomic variables, with their weighted scores and weighted ranking are shown in Table 13.

Table No. 13: Representation of Ranking of Macro Economic Variables Overall

Sr. No.	Macro Economic Variables	I Rank	II Rank	III Rank	IV Rank	V Rank	VI Rank	VII Rank	VIII Rank	Total	Weighted Score	Weighted Rank
1	GDP growth rate	41	27	31	18	9	8	12	6	152	883	2
2	Fiscal Policy	14	31	30	29	16	13	16	3	152	792	4
3	Monetary Policy	27	34	34	26	15	3	4	9	152	874	3
4	Inflation	43	34	16	30	12	8	4	5	152	913	1
5	Industry Trend	7	5	13	17	33	28	22	27	152	541	6
6	International Business policy	2	2	5	16	9	36	55	27	152	421	8
7	General Market Sentiment	9	9	6	8	15	37	28	40	152	478	7
8	Political Stability	9	10	17	8	43	19	11	35	152	570	5
Total		152	152	152	152	152	152	152	152			
Source: Primary Data												

Weighted score has been calculated in such ways that, the variable received rank first assigned eight points. The variable ranked second assigned seven points, variable ranked third, fourth, fifth, sixth, seventh, and eighth assigned six, five, four, three, two and one point respectively. The points received by each variable were multiplied with rank and totaled to obtain the weighted score of that variable. As far as overall ranking of macroeconomic variables is concerned, first considered macroeconomic variable is inflation followed by GDP growth rate, monetary policy, fiscal policy, political stability, industry trend, general market sentiment, and international business policy.

Ranking of Macro Economic Variables on the Basis of Gender:

Gender-wise ranking analysis has been performed to understand importance of macroeconomic variable as investment decision. Spearman's rank correlation coefficient was used to find out the extent to which two sets of ranking (male and female) are aligned.

As far as gender-based ranking for macroeconomic variables are concerned, only 95 male respondents out of 157 consider macro variables while investing and only 57 female respondents (out of 93 respondents) take into account macroeconomic variable in investment decision. As far as male respondents are concerned, inflation received first rank followed by monetary policy, growth rate, fiscal policy, industry trend, general market sentiment, political stability, and international business policy. In case of female respondents, GDP growth rate receives first rank followed by inflation, fiscal policy, monetary policy, political stability, industry trend, general market sentiment, and international business policy. Spearman's correlation coefficient between two sets of ranking is 0.80, which is high degree correlation. It means that high degree of association between ranking by male and female respondents.

Ranking of Macro Economic Variables on Basis Level of Education:

As far as first group of education (SSC or up to SSC) is concerned, GDP growth, inflation and monetary policy are the most considered variables. Respondents having level of education as HSC, assigned first rank to inflation followed by growth rate and general market sentiment.

Graduate respondents have given first rank to monetary policy followed by inflation and GDP growth rate. Post graduate respondents have assigned first rank to monetary policy followed by inflation and growth rate. Respondents fall in other category assigned first rank to inflation followed by GDP growth rate, fiscal and monetary policy. In short most considered variable are inflation, GDP growth rate and monetary policy.

In Table 14, Spearman's rank correlation coefficient was calculated to find out the association between two sets of ranking of macroeconomic variables based on level of education and t-statistic $\{t = R \sqrt{n - 2} / 1 - R^2\}$ was calculated to test of significance of the value obtained. There is high degree of correlation between sets of ranking given by respondents having level of education as SSC or up to SSC and respondents fall in another category. Moderate level of correlation coefficient is observed in ranking given by respondents having level of education as HSC and graduate. To test the significance of the correlation coefficient t-statistic is calculated. As per the result of hypothesis, there is association between sets of ranking given by respondents belongs to various levels of education ($R = 0$).

H_0 = Two sets of ranking are not associated in the population and the observed value of 'R' differs from zero only by chance.

Table No. 14: Rank Correlation between Macro Economic Variables and Levels of Education and t-statistic of Correlation Coefficient (R)

Levels of Education	R Value	Degree of Freedom	Calculated Value – t	Table Value	Hypothesis Result
(1-2)	0.615	6	1.91	2.44	No significant association exist
(1-3)	0.819	6	3.50	2.44	Significant association exist
(1-4)	0.735	6	2.66	2.44	
(1-5)	0.915	6	5.56	2.44	
(2-3)	0.548	6	1.60	2.44	No significant association exist
(2-4)	0.595	6	1.81	2.44	
(2-5)	0.731	6	2.62	2.44	Significant association exists
(3-4)	0.976	6	11.02	2.44	
(3-5)	0.874	6	4.41	2.44	
(4-5)	0.826	6	3.59	2.44	

Source: Primary Data

Referring to the table of the t- distribution for $n-2 = 6$ degree of freedom, the critical value for 't' at a 5% level of significance is 2.44. If the calculated value of 't' is higher than table value, hypothesis is rejected and concluded that association in two sets of ranking is significant. On the other hand, if calculated value of 't' is less than table value, hypothesis is accepted and conclude that association in two sets of ranking is not significant. Association in two sets of ranking is significant for macroeconomic variables by the respondents of higher education category.

Ranking of Macro Economic Variables on the Basis of Income:

Ranking of all macroeconomic factors by various income group respondents are concerned, most considered variables are inflation, monetary policy, GDP growth rate and fiscal policy. Least considered factors by all income group respondents are international business policy, general market sentiment and industry trend.

Table 15, represents rank correlation coefficient between various set of ranking by different income group respondents. It is observed that there is moderate degree of correlation coefficient exist between first and second, first and third, first and fourth and first- and fifth-income groups. High degree of correlation coefficient is found in second and third, second and fourth, second and fifth, third and fourth, third and fifth, and fourth- and fifth-income groups. To test the significance of obtained value of correlation coefficient t- statistic is computed and hypothesis result is presented in last column of the table.

Table No. 15: Rank Correlation Between Macro Economic Variables and Levels of Income and t-statistic of Correlation Coefficient (R)

Income Groups	R Value	Degree of Freedom	Calculated Value-t	Table Value	Hypothesis Result
(1-2)	0.572	6	1.71	2.44	No significant association exists
(1-3)	0.584	6	1.76	2.44	
(1-4)	0.479	6	1.34	2.44	
(1-5)	0.503	6	1.43	2.44	
(2-3)	0.759	6	2.86	2.44	Significant association exist
(2-4)	0.850	6	3.96	2.44	
(2-5)	0.898	6	5.01	2.44	
(3-4)	0.826	6	3.59	2.44	
(3-5)	0.850	6	3.96	2.44	
(4-5)	0.976	6	11.02	2.44	
Source: Primary Data					

The table value of t-distribution at a 5% level of significance for $n-2 = 6$ degree of freedom is 2.44. If the calculated value of 't' is higher than table value, hypothesis is rejected and concluded that association in two sets of ranking is significant. On the other hand, if calculated value of 't' is less than table value, hypothesis is accepted and concluded that association in two sets of ranking is not significant. Significant association exists in two sets of ranking for macroeconomic variables by the respondents of high-income class.

Findings and Conclusion:

- Spearman's correlation coefficient between two sets of ranking is 0.83, which is high degree correlation; it implies that high degree association between sets of rank of objectives of investment by male and female respondents.
- It can be concluded ranking by all age groups, safety and security, and better returns received most preferred motivational factors; on the other hand, diversification, convenience and simplicity, and hedge against inflation received least preference.
- Significant association exists between sets of rankings for objectives of investment by respondents of various age groups.
- Association in sets of ranking is significant for objectives of investment by respondents of various levels of education.
- There is significant association exist between sets of ranks for objectives of investment by respondents of different occupation groups.
- Significant association exists between sets of ranks for objectives of investment by respondents of different levels of income.

- It can be concluded that financial goals of investment are not independent of gender, age, level of education, occupation and level of income of the respondents,
- As far as overall ranking for macroeconomic variables is concerned, first considered variable is inflation followed by GDP growth rate, monetary policy, fiscal policy, political stability, industry trend, general market sentiment, and international business policy.
- Spearman's correlation coefficient between sets of ranking of macroeconomic variables is 0.80, which is high degree correlation, which signifies that high degree of association between ranking by male and female respondents.
- Association in sets of ranking is significant for macroeconomic variables by the respondents of higher education category.
- Significant association exists in sets of ranking for macroeconomic variables by the respondents of high-income class.

Suggestions and Future Scope:

Paper analyzed financial objectives, financial goals of investment and macroeconomic variables considered while taking investment decision. Based on the analysis it is observed that safety and better returns most preferred objectives of investment across all demographic parameters. It could be suggested to financial companies that they should introduce the investment options to provide safety with better returns irrespective of demographic variables.

As far as financial goals of investment are concerned, low-income profile respondents prefer regular income as goal of investment while medium and high-income profile respondents prefer to have capital appreciation as goal of investment, it can be suggested to the financial companies that they should unveil the investment product as per income group. For example, investment product which offer regular income for financial low-income profile respondents and investment product which gives capital appreciation for financial medium and high-income profile respondents.

Considering importance of macroeconomic variables in investment decision, inflation, GDP growth rate, monetary policy, fiscal policy, are most considered variables. High income and well-educated respondents have similarity in sets of ranking for macroeconomic variables.

There is enough scope for further research on the topic of preference towards determinants of investment, as new avenues of investment are introduced day by day, similarly parameters taken in to consideration while investment are also changing day by day as technology used to collect real-time data and analyses of data.

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Unlocking Potential: Gujarat's Sectoral Landscape and the Entrepreneurial Edge

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Abstract

Gujarat, one of India's most industrially progressive states, presents a compelling case of economic dynamism driven by robust infrastructure, proactive governance, and an entrepreneurial culture deeply rooted in its socio-economic fabric. However, beneath this growth narrative lies a complex web of sector-specific challenges and structural bottlenecks that continue to shape the entrepreneurial journey in the region. This research paper aims to critically examine Gujarat's sectoral landscape by identifying the key industries contributing to its GDP—such as manufacturing, textiles, chemicals, agriculture, renewable energy, and financial services—and unpacking the challenges they face, ranging from policy constraints and environmental concerns to technological disruptions and global market shifts.

By leveraging secondary data analysis, government reports, and case-based insights, the study maps out growth catalysts that are shaping Gujarat's entrepreneurial ecosystem. These include government-led initiatives like the Gujarat Industrial Policy 2020, the emergence of innovation zones such as GIFT City and Dholera Smart City, increasing digitization, startup-friendly policies, and expanding export markets. The research further explores how entrepreneurs in Gujarat are navigating this evolving economic terrain, often innovating within constraints, forming cross-sectoral collaborations, and capitalizing on both traditional business acumen and new-age technologies.

The paper argues that unlocking Gujarat's full entrepreneurial potential requires not only addressing sectoral inefficiencies but also fostering a more inclusive, adaptable, and innovation-driven ecosystem. It concludes by outlining strategic implications for current and aspiring entrepreneurs, policy-makers, and academic institutions in enabling a resilient and future-ready entrepreneurial landscape in Gujarat.

Keywords: Entrepreneur, Growth, Drivers, Challenges, Government, Startups.

Introduction

Gujarat is widely recognized for its strong entrepreneurial culture in India. Startups in the state flourish within a larger business ecosystem shaped by various growth drivers, including historical economic reforms, current market trends, technological innovations, government policies, the influence of large corporations, and societal attitudes. The success of entrepreneurial ventures is influenced by societal values, financial market dynamics, regulatory frameworks, and foreign investments. The broader business environment, encompassing external factors beyond a startup's control, plays a crucial role in how entrepreneurs navigate and manage their operations. Shifts in this environment directly affect entrepreneurial outcomes, and a supportive ecosystem can significantly enhance business performance and growth.

Gujarat holds a key position in India's economic landscape, leading in sectors such as manufacturing, infrastructure, environment, tourism, healthcare, pharmaceuticals, textiles, innovation and R&D, defense and aerospace, and agro & food processing. This sectoral diversity underscores the state's industrial vitality and adaptability. The Government of Gujarat has strategically identified priority sectors to drive consumption and economic growth, creating a strong and sustainable foundation for the state's thriving economy.

Literature Review

Entrepreneurship in Gujarat is a key driver of the state's economy, particularly as it expands across diverse sectors such as manufacturing, agriculture, pharmaceuticals, textiles, retail, and tourism. However, entrepreneurs operating within Gujarat face a range of sectoral challenges, including infrastructure bottlenecks, regulatory hurdles, and increasing competition. At the same time, several growth catalysts, such as government initiatives, access to global markets, and the development of new technologies, provide significant opportunities for entrepreneurs to thrive.

This literature review focuses on the dual challenges and opportunities entrepreneurs encounter within Gujarat's economic landscape, exploring how sector-specific dynamics influence entrepreneurial activity.

Sectoral Challenges in Gujarat

Manufacturing Sector Challenges

Infrastructure and Energy Constraints: While Gujarat is an industrial hub, issues related to infrastructure—particularly in terms of transportation, power supply, and logistics—pose significant challenges. The state's industrial sectors, such as textiles, petrochemicals, and automobile manufacturing, are energy intensive. Energy cost fluctuations and inconsistent power supplies create uncertainty, increasing operating costs for entrepreneurs (Ahluwalia, 2015).

Regulatory and Policy Barriers: Entrepreneurs in Gujarat often face complex regulatory landscapes, including compliance with various industrial policies, environmental regulations, and land acquisition challenges. Delays in clearances and navigating bureaucratic processes can hinder business scaling (Nambiar & Jain, 2017).

Skilled Labor Shortages: While Gujarat has a significant labor pool, there is a shortage of skilled labor in specialized sectors like pharmaceuticals and advanced manufacturing. This lack of skilled workers increases operational costs, as businesses must invest heavily in training and development (Chandra et al., 2019).

Agriculture and Agribusiness Challenges

Climate Vulnerabilities: Gujarat's agriculture is highly dependent on monsoons and changing weather patterns due to climate change have affected agricultural productivity. Entrepreneurs in the agribusiness sector are challenged by unpredictable rainfall and the lack of sufficient irrigation infrastructure (Singh & Shah, 2016).

Market Access and Pricing Volatility: Entrepreneurs involved in cash crops like cotton and groundnuts often face volatile pricing and market access issues, largely due to fluctuating demand and international competition. These factors can create instability for agribusiness startups (Desai, 2020).

Supply Chain Inefficiencies: Inefficiencies in agricultural supply chains—ranging from storage facilities to transportation logistics—pose significant barriers to scaling agribusinesses in Gujarat. Poor storage and distribution networks often lead to post-harvest losses (Mehta, 2017).

Pharmaceutical Sector Challenges

Regulatory Scrutiny and Compliance Costs: Gujarat is a leader in drug manufacturing, yet pharmaceutical entrepreneurs must navigate strict regulations around drug safety, clinical trials, and export standards. This often requires heavy investment in compliance, quality assurance, and certification processes (Patel et al., 2018).

International Competition: Gujarat's pharmaceutical sector faces intense global competition, particularly from countries with lower production costs. Entrepreneurs are challenged to innovate continuously to remain competitive on the international stage (Mehta & Patel, 2019).

Growth Catalysts in Gujarat's Economy

Government Policies and Initiatives

Make in India: The Indian government's "Make in India" initiative has played a critical role in boosting entrepreneurship in Gujarat's manufacturing sector. The policy offers incentives for startups in sectors such as textiles, automobiles, and electronics, providing capital subsidies and tax incentives (Govil, 2020). These measures create opportunities for entrepreneurs to scale rapidly and attract investment.

Ease of Doing Business Reforms: Gujarat has been consistently ranked as one of the best states for ease of doing business, with streamlined regulatory frameworks and support for startups through initiatives like Startup Gujarat and Vibrant Gujarat summits. These policies lower entry barriers and promote innovation (Joshi, 2020).

Sector-Specific Support: The government provides sector-specific incentives, such as reduced import duties on capital goods for the pharmaceuticals and chemicals sectors. These incentives help entrepreneurs in capital-intensive industries lower operational costs and increase profitability (Chaudhari, 2018).

Access to Global Markets

Export Potential: Gujarat's strategic location with well-developed ports like Mundra and Kandla allows businesses easy access to international markets. Entrepreneurs in the pharmaceutical and textile sectors, in particular, benefit from robust export infrastructure, increasing their global competitiveness (Kumar & Sharma, 2019).

Opportunities in the Automobile Sector: The automobile manufacturing sector in Gujarat has attracted significant foreign direct investment (FDI), with companies such as Ford and Suzuki establishing manufacturing facilities. This has created new opportunities for local entrepreneurs in the supply chain, from component manufacturing to logistics and after-sales services (Dhawan, 2019).

Technological Advancements and Innovation

Digital Transformation: The rise of digital technologies, including automation, artificial intelligence, and blockchain, offers new avenues for entrepreneurial growth. Startups in Gujarat are leveraging digital platforms to optimize production processes and enhance supply chain efficiency, particularly in sectors like textiles and agribusiness (Sharma & Bansal, 2020).

Sustainability and Green Technologies: There is a growing emphasis on environmentally sustainable technologies, with entrepreneurs innovating in clean energy, waste management, and sustainable farming practices. Gujarat's green energy initiatives, including solar power projects and waste-to-energy plants, provide fertile ground for startups in the sustainability space (Thakkar, 2020).

Implications for Entrepreneurs

Entrepreneurs in Gujarat must navigate a landscape of both significant challenges and opportunities. To thrive, they must:

Adapt to Sector-Specific Regulations: Entrepreneurs need to be adept at navigating regulatory frameworks, particularly in highly regulated sectors like pharmaceuticals and manufacturing. This requires knowledge of compliance and the ability to integrate best practices for quality control.

Leverage Government Support: Taking advantage of government incentives, such as tax benefits, startup capital, and sector-specific subsidies, is essential for growth. Entrepreneurs should also actively engage in policy dialogues and industry forums like Vibrant Gujarat to stay informed about new opportunities.

Invest in Innovation and Technology: Given the rapid pace of technological advancements, entrepreneurs must invest in research and innovation, especially in fields like clean energy, automation, and digital platforms. Doing so will help them remain competitive in global markets.

Focus on Sustainable Business Models: With growing global demand for sustainable products, entrepreneurs in Gujarat should explore green technologies and eco-friendly practices. Incorporating sustainability not only aligns with government policies but also enhances global marketability.

Comparison with another region:

Comparative Analysis: Navigating Sectoral Challenges and Growth Catalysts in Gujarat vs. Other Regions – Implications for Entrepreneurs

Entrepreneurship in Gujarat is characterized by a strong industrial base, agricultural productivity, and a conducive policy environment. However, when compared to other regions in India, such as Maharashtra, Tamil Nadu, and Karnataka, Gujarat presents both distinct advantages and certain sector-specific challenges. This comparative analysis examines how Gujarat's economic landscape contrasts with other leading regions, focusing on sectoral challenges, growth catalysts, and the broader implications for entrepreneurs.

Manufacturing Sector Gujarat

Challenges: Gujarat is well-known for its manufacturing prowess, particularly in textiles, petrochemicals, and automobile production. However, the state faces infrastructure bottlenecks such as inconsistent power supply and high energy costs, especially in rural areas. Regulatory hurdles, particularly in environmental clearances and land acquisition, also impact the ease of doing business in heavy industries (Ahluwalia, 2015).

Growth Catalysts: The state's ports and strategic location provide strong advantages for export-driven manufacturing, making Gujarat an attractive hub for international trade. Initiatives like "Make in India" and ease of doing business reforms have significantly reduced the entry barriers for entrepreneurs in this sector (Joshi, 2020).

Maharashtra

Challenges: While Maharashtra has a more diversified industrial base (automobiles, chemicals, pharmaceuticals), the state faces significant issues related to urban congestion and high real estate costs, especially in cities like Mumbai and Pune. Additionally, the high cost of living and rising wages make scaling startups in manufacturing more expensive (Patil et al., 2018).

Growth Catalysts: Maharashtra benefits from being India's most urbanized and industrialized state, with better access to financial services and venture capital. Additionally, Maharashtra has more developed infrastructure in metro cities, especially in terms of connectivity and logistics, offering an edge in industries like automobiles and heavy engineering (KPMG, 2021).

Tamil Nadu

Challenges: Tamil Nadu is a significant player in manufacturing, particularly in textiles, automotive, and electronics. However, labor disputes and trade union activism are more common, creating challenges for entrepreneurs in managing labor costs and maintaining operational efficiency (Sharma & Singh, 2019).

Growth Catalysts: Tamil Nadu has a more skilled labor force, especially in the automotive and electronics sectors, and benefits from its well-developed industrial parks. Public-private partnerships (PPP) in industrial development have boosted ease of entry for startups (NCAER, 2020).

Karnataka

Challenges: Karnataka, especially Bengaluru, is better known for tech entrepreneurship than traditional manufacturing. Entrepreneurs in manufacturing sectors face challenges related to infrastructure gaps and high costs of setting up operations outside Bengaluru, where manufacturing hubs are less developed (Rao & Mahadevan, 2020).

Growth Catalysts: The state's focus on technology and innovation provides a strong support system for advanced manufacturing, particularly in sectors like biotechnology, aerospace, and precision engineering, making Karnataka a hub for high-tech manufacturing (CII, 2019).

Agriculture and Agribusiness

Gujarat

Challenges: Agriculture in Gujarat faces significant climate risks due to its dependence on monsoons, making it vulnerable to erratic weather patterns. Water scarcity and limited irrigation infrastructure remain critical challenges for agripreneurs (Singh & Shah, 2016). Additionally, market access and pricing volatility for cash crops like cotton and groundnuts hinder sustainable growth for agricultural entrepreneurs.

Growth Catalysts: Gujarat's strengths lie in its agricultural exports, especially in cash crops such as cotton and groundnuts, supported by state-led initiatives to improve rural infrastructure and provide subsidies for mechanization and agribusiness startups (Desai, 2020).

Punjab and Haryana

Challenges: Entrepreneurs in the agribusiness sectors in Punjab and Haryana face issues related to overdependence on wheat and rice monoculture, which has led to declining soil fertility and groundwater depletion. This makes it challenging to diversify crops and introduce innovative farming techniques (Sidhu & Bhullar, 2018).

Growth Catalysts: These states benefit from extensive irrigation networks and subsidized farm inputs, allowing entrepreneurs to scale agribusiness operations more efficiently. Government procurement systems also provide more stable pricing structures for agricultural outputs (NABARD, 2019).

Andhra Pradesh

Challenges: Agripreneurs in Andhra Pradesh face issues related to land fragmentation, which hinders scalability and mechanization. Poor logistical connectivity between rural areas and urban markets also adds inefficiencies (Reddy, 2019).

Growth Catalysts: Andhra Pradesh's advantage lies in its focus on horticulture, aquaculture, and cash crops, with state support for agripreneurs through subsidies, improved irrigation systems, and cold chain logistics for perishable goods (Raj, 2021).

Pharmaceuticals and Biotech Gujarat

Challenges: Gujarat's pharmaceutical sector is highly regulated, and entrepreneurs must deal with high compliance costs and international regulatory standards (Patel et al., 2018). Additionally, there is stiff competition from global manufacturers, particularly from China.

Growth Catalysts: The state's strong infrastructure for drug manufacturing and export-friendly policies have made Gujarat a leader in pharmaceutical exports, contributing to over 28% of India's drug exports (Mehta & Patel, 2019).

Telangana

Challenges: Telangana's pharmaceutical sector faces challenges around infrastructure gaps in smaller cities and towns, limiting scalability for entrepreneurs outside major hubs like Hyderabad (Sharma, 2020).

Growth Catalysts: Hyderabad is emerging as a global hub for biotech and life sciences, offering significant opportunities for entrepreneurs in pharmaceuticals and biotechnology. The state's focus on innovation parks and incubation centers is a key growth catalyst (CII, 2021).

Maharashtra

Challenges: Maharashtra's pharmaceutical industry, while robust, faces rising operational costs, especially in urban hubs like Mumbai. Compliance with international quality standards adds to the costs for smaller startups (Patil et al., 2018).

Growth Catalysts: The state's proximity to financial institutions and a strong R&D infrastructure in Mumbai and Pune positions entrepreneurs well for pharmaceutical innovation (Govil, 2020).

Tourism and Retail Gujarat

Challenges: Gujarat's tourism sector has immense potential but is hindered by poor connectivity to some rural tourist destinations and limited international flight options. Additionally, the state's relatively conservative social environment may pose challenges for businesses looking to attract international tourists (Thakkar, 2020).

Growth Catalysts: Gujarat benefits from its recognition as a UNESCO World Heritage City (Ahmedabad), which draws international tourists. The state's rapidly growing organized retail sector, driven by rising middle-class incomes, offers significant opportunities for entrepreneurs in retail and hospitality (Desai, 2021).

Kerala

Challenges: Entrepreneurs in Kerala's tourism sector face challenges related to seasonality and high operational costs in coastal tourism, along with vulnerabilities to natural disasters (Menon, 2019).

Growth Catalysts: Kerala's eco-tourism initiatives and strong global brand as a wellness destination provide a platform for tourism-related startups to thrive (Mathew, 2020).

Rajasthan

Challenges: The tourism sector in Rajasthan struggles with inconsistent infrastructure and seasonal demand, leading to challenges in maintaining profitability during off-peak seasons (Gupta, 2019).

Growth Catalysts: Rajasthan's rich cultural heritage and investment in tourism infrastructure create ample opportunities for entrepreneurs in hospitality, especially in heritage and luxury tourism (Nambiar & Jain, 2020).

Conclusion: Implications for Entrepreneurs

Entrepreneurs in Gujarat benefit from the state's export-oriented infrastructure, government initiatives, and sectoral diversity. However, challenges like infrastructure bottlenecks, regulatory hurdles, and competition require adaptive strategies. In comparison to regions like Maharashtra and Tamil Nadu, Gujarat's lower operational costs and sector-specific incentives offer advantages, particularly for small and medium-sized enterprises (SMEs).

However, regions like Karnataka and Telangana outperform Gujarat in sectors like technology-driven industries and biotech, offering more focused support for innovation. Similarly, Punjab and Haryana's agribusinesses have stronger state backing for certain agricultural activities, although Gujarat's focus on cash crops provides more export opportunities.

For entrepreneurs, Gujarat's focus on manufacturing, pharmaceuticals, and agriculture makes it a dynamic region for growth. But success will require leveraging state-led growth catalysts, navigating sector-specific regulations, and maintaining competitiveness through innovation and technological integration.

Research Methodology

Research Problem: To secure a competitive edge and become the go-to destination for entrepreneurs, Gujarat must not only offer efficient and effective services but also prioritize enhancing startup satisfaction. A thoughtfully designed and well-executed strategy by the government can significantly boost the state's appeal, fostering a positive perception among entrepreneurs and positioning Gujarat as the preferred location for launching new ventures.

Objective of the Study: The major objective of this study is to recognize the challenges faced by various sectors and the growth drivers for start-ups in Gujarat.

Sub-Objectives

To identify the essential characteristics of various sectors with a special focus on Gujarat.

To investigate the challenges entrepreneurs, encounter in different sectors while establishing businesses in the state.

To determine which sectors have experienced significant growth in the state.

To develop growth drivers specifically tailored for start-ups.

Scope of the Study: The study focuses on the growth drivers and challenges encountered by startups across various sectors in Gujarat, drawing insights from entrepreneurs who have established their own ventures.

Research Design: A descriptive research design was selected for this study. Primary data was gathered through questionnaires distributed to 133 startups across different sectors in Gujarat.

The sample of 133 startups was selected to cover a diverse range of industries that are crucial to the research objectives. This includes a mix of technology, healthcare, e-commerce, manufacturing, finance, and more.

By ensuring representation from different sectors, the study captures insights from various industries, making the findings applicable across a broad spectrum of startup environments. This diversity in industry type supports the objective of understanding how challenges and strategies may differ across sectors.

Sampling Method: A non-probability sampling method was employed, utilizing both convenience and judgmental sampling techniques to select participants.

Sample Size: Questionnaires were sent to 200 entrepreneurs, with 133 completed and returned, forming the basis of the study's analysis. Not all startups are willing or able to share detailed information, especially sensitive data like internal processes, or strategies. This limited the pool of potential participants.

Focusing on these 133 startups ensured that the data collected would be consistent and comparable, avoiding gaps that could arise from incomplete or inaccessible information.

The 133 startups were intentionally selected to serve as a representative sample, ensuring diversity in industry type, geography, age of the startup, and stage of funding. This selection strategy aligns with the research objectives, aiming to capture a wide spectrum of experiences and insights from various sectors and regions. The sample includes startups at different growth stages and funding levels, allowing the study to examine how these factors influence challenges, opportunities, and strategies. This representative mix enhances the study's generalizability, making it relevant to a broader audience interested in understanding startup dynamics."

Limitations of the Study: The sample size represents only a small portion of the population, so the findings may be limited to this sample. The use of non-probability convenience and judgmental sampling methods also imposes certain restrictions on the generalizability of the findings.

Result and Discussion

Data Analysis

Figure 1: Demographic Characteristic of Respondents

Sr No.	Variable	Categories	Percentage (Total 100)
1	Gender	Male	71.4
		Female	28.6
2	Age (in Years)	18 to 20	4.8
		21 to 30	19
		31 to 40	26.2
		41 to 50	42.9
		50 and above	7.1
3	Education	less than H.sc	2.4
		but not graduate	9.5
		Graduate	21.4
		Post Graduate	61.9

		Doctorate-PHD	4.8
		Others	2.4
4	Occupation	Student	11.9
		Self Employment	54.8
		Professional	26.2
		Other	7.1
		Manufacturing	4.7
		Financial	19.04
		Food	4.7
		Health Care	11.9
		Media	2.3
		Real Estate	4.7
	Sector	Retail	4.7
5		Technology	4.7
		Computer	7.14
		Academics	7.14
		Agriculture	4.7
		Pharmaceutical	4.7
		Service	19.04

Figure 2: Crosstab between Gender and Barriers to set up business faced by startups

	Cases					
	Valid		Missing		Total	
3. Gender * 1. Perceived Importance on regulation barriers to set up business. [I am afraid of Tax level which is high for young people.]	133	100.00%	0	0.00%	133	100.00%
3. Gender * 2. Perceived importance on regulation barriers to set up business. [I am concerned about Bankruptcy laws	133	100.00%	0	0.00%	133	100.00%
3. Gender * 3. Perceived importance on regulation barriers to set up business. [Property, copyright and patent regulations are poorly enforced and too strict.]	133	100.00%	0	0.00%	133	100.00%
3. Gender * 4 Perceived importance on regulation barriers to set up business. [I am concerned about Competition law that is restricted to market acces	133	100.00%	0	0.00%	133	100.00%
3. Gender * 5. Perceived importance on regulation barriers to set up business. [Subsidy policies are also barrier in setting business.]	133	100.00%	0	0.00%	133	100.00%
3. Gender * 6 Perceived importance on regulation barriers to set up business. [Taxation regulations are unsupportive and too complex.]	133	100.00%	0	0.00%	133	100.00%
3. Gender * 7. Perceived importance on regulation barriers to set up business. [Limited area or geographical licensing also act as barrier.	133	100.00%	0	0.00%	133	100.00%

Gender * 1. Perceived Importance on regulation barriers to set up business. [I am afraid of Tax level which is high for young people.]

Crosstab								
			1. Perceived Importance on regulation barriers to set up business. [I am afraid of Tax level which is high for young people.]					Total
			Agree	Disagree	Highly Agree	Highly Disagree	Neutral	
3. Gender	Female	Count	20	5	6	0	8	39
		Expected Count	17.0	5.6	5.0	.6	10.8	39.0
	Male	Count	38	14	11	2	29	94
		Expected Count	41.0	13.4	12.0	1.4	26.2	94.0
Total		Count	58	19	17	2	37	133
		Expected Count	58.0	19.0	17.0	2.0	37.0	133.0

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi- Square	3.009 ^a	4	.556
Likelihood Ratio	3.601	4	.463
N of Valid Cases	133		
a. 3 cells (30.0%) have expected count less than 5. The minimum expected count is .59.			

Gender * 2. Perceived importance on regulation barriers to set up business. [I am concerned about Bankruptcy laws .]

Crosstab								
			2. Perceived importance on regulation barriers to set up business. [I am concerned about Bankruptcy laws .]					
			Agree	Disagree	Highly Agree	Highly Disagree	Neutral	Total
3. Gender	Female	Count	18	10	1	1	9	39
Expected Count			15.2	9.1	2.6	1.2	10.8	39.0
	Male	Count	34	21	8	3	28	94
	Expected Count		36.8	21.9	6.4	2.8	26.2	94.0
Total		Count	52	31	9	4	37	133
		Expected Count	52.0	31.0	9.0	4.0	37.0	133.0

Gender * 3. Perceived importance on regulation barriers to set up business. [Property, copyright and patent regulations are poorly enforced and too strict.]

Crosstab								
			3. Perceived importance on regulation barriers to set up business. [Property, copyright and patent regulations are poorly enforced and too strict.]					Total
			Agree	Disagree	Highly Agree	Highly Disagree	Neutral	
3. Gender	Female	Count	20	6	5	0	8	39
		Expected Count	15.8	5.3	4.4	.9	12.6	39.0
	Male	Count	34	12	10	3	35	94
		Expected Count	38.2	12.7	10.6	2.1	30.4	94.0
Total		Count	54	18	15	3	43	133
		Expected Count	54.0	18.0	15.0	3.0	43.0	133.0

Chi-Square Tests				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	5.435 ^a	4	.246	
Likelihood Ratio	6.419	4	.170	
N of Valid Cases	133			
a. 3 cells (30.0%) have expected count less than 5. The minimum expected count is .88.				

Gender * 4 Perceived importance on regulation barriers to set up business. [I am concerned about Competition law that is restricted to market access]

Crosstab								
			4 Perceived importance on regulation barriers to set up business. [I am concerned about Competition law that is restricted to market access]					
Agree			Disagree	Highly Agree	Highly Disagree	Neutral	Total	
3. Gender	Female	Count	21	4	5	2	7	39
		Expected Count	16.1	5.3	4.1	1.2	12.3	39.0
	Male	Count	34	14	9	2	35	94
	Expected Count		38.9	12.7	9.9	2.8	29.7	94.0
Total		Count	55	18	14	4	42	133
		Expected Count	55.0	18.0	14.0	4.0	42.0	133.0

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi- Square	6.868 ^a	4	.143
Likelihood Ratio	7.081	4	.132
N of Valid Cases	133		
a. 3 cells (30.0%) have expected count less than 5. The minimum expected count is 1.17.			

Gender * 5. Perceived importance on regulation barriers to set up business. [Subsidy policies are also a barrier in setting business.]

Crosstab								
			5. Perceived importance on regulation barriers to set up business. [Subsidy policies are also barrier in setting business.]					
			Agree	Disagree	Highly Agree	Highly Disagree	Neutral	Total
3. Gender	Female	Count	13	7	6	1	12	39
		Expected Count	12.3	7.0	5.3	2.1	12.3	39.0
	Male	Count	29	17	12	6	30	94
		Expected Count	29.7	17.0	12.7	4.9	29.7	94.0
Total		Count	42	24	18	7	42	133
		Expected Count	42.0	24.0	18.0	7.0	42.0	133.0

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi- Square	.969 ^a	4	.914
Likelihood Ratio	1.078	4	.898
N of Valid Cases	133		
a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 2.05.			

Gender * 6 Perceived importance on regulation barriers to set up business. [Taxation regulations are unsupportive and too complex.]

Crosstab								
			6 Perceived importance on regulation barriers to set up Business. [Taxation regulations are unsupportive and too complex.]					
			Agree	Disagree	Highly Agree	Highly Disagree	Neutral	Total
3. Gender	Female	Count	16	5	5	2	11	39
		Expected Count	14.1	6.5	5.9	2.1	10.6	39.0
	Male	Count	32	17	15	5	25	94
		Expected Count	33.9	15.5	14.1	4.9	25.4	94.0
Total		Count	48	22	20	7	36	133
		Expected Count	48.0	22.0	20.0	7.0	36.0	133.0

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi- Square	1.043 ^a	4	.903
Likelihood Ratio	1.063	4	.900
N of Valid Cases	133		
a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 2.05.			

Gender * 7. Perceived importance on regulation barriers to set up business. [Limited area or geographical licensing also act as barrier.]

Crosstab								
			7. Perceived importance on regulation barriers to set up business. [Limited area or geographical licensing also act as barrier.]					Total
			Agree	Disagree	Highly Agree	Highly Disagree	Neutral	
3. Gender	Female	Count	18	4	7	0	10	39
		Expected Count	13.5	5.3	7.0	1.2	12.0	39.0
	Male	Count	28	14	17	4	31	94
		Expected Count	32.5	12.7	17.0	2.8	29.0	94.0
Total		Count	46	18	24	4	41	133
		Expected Count	46.0	18.0	24.0	4.0	41.0	133.0

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.714 ^a	4	.318
Likelihood Ratio	5.759	4	.218
N of Valid Cases	133		
a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 1.17.			

Symmetric Measures

	Value	Approximate Significance
Nominal by Phi	1.116	.000
Nominal by Cramer's V	.789	.000
N of Valid Cases	143	

There is weaker relationship between the two variables.

Based on the detailed data analysis of the perceived importance of regulatory barriers to setting up a business, broken down by gender, here are the key findings and interpretations:

Key Findings

Tax Level Concern:

A crosstab analysis of perceptions on the statement "I am afraid of Tax level which is high for young people" shows slight gender differences.

Males are more likely to agree (38 agree, 14 disagree) compared to females (20 agree, 5 disagree).

The Chi-Square test value is 3.009 with a significance level (p-value) of 0.556, indicating that there is no statistically significant difference between genders for this barrier.

Bankruptcy Law Concern:

Females generally show a more neutral stance, while males tend to agree more with the concern about bankruptcy laws.

The Chi-Square test value is 2.754 with a significance level of 0.600, showing no significant gender-based difference in perceiving this barrier.

Property, Copyright, and Patent Regulations:

Males appear to have slightly higher concerns, with 34 agreeing, while females are more evenly distributed.

The Chi-Square test value is 5.435 with a p-value of 0.246, indicating no significant gender differences.

Competition Law Concerns:

Females tend to have a more neutral or "Agree" stance regarding concerns on Competition law, while males show a slightly higher agreement.

Chi-Square results: 6.868 (p-value 0.143), showing no statistically significant gender differences.

Subsidy Policies as Barriers:

Females are more likely to disagree or stay neutral, while males lean towards agreement on subsidy policies being barriers.

The Chi-Square value of 0.969 with a significance level of 0.914 suggests no substantial gender differences.

Taxation Regulations Being Unsupportive and Complex:

Females are relatively split in their opinions, whereas males tend to agree more.

Chi-Square value of 1.043 (p-value 0.903) indicates that gender differences in perception are not statistically significant.

Geographical Licensing Limitations:

Females are split between agreement and neutrality, whereas males show a stronger agreement that limited geographical licensing is a barrier.

The Chi-Square test yielded a value of 4.714 with a p-value of 0.318, suggesting no statistically significant gender differences.

Statistical Considerations

Phi and Cramer's V: The values provided for Phi (1.116) and Cramer's V (0.789) suggest a moderate to high association between gender and the perceived importance of regulation barriers. However, the p-values indicate that the association does not reach statistical significance.

Sample Size: With 133 valid cases, the sample is sufficient for a preliminary analysis, but increasing the sample size might provide a clearer picture of any subtle gender differences.

Overall, the data suggests that both genders experience similar perceptions regarding regulatory barriers when setting up a business, emphasizing the need for broadly applicable policy and support mechanisms rather than gender-specific interventions.

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Analysing How Sociocultural Factors Impact Students' Academic Performance through Mediating Effects of Stress, Alcohol and Tobacco Use: The Use of Social Cognitive Theory

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Abstract

This conceptual paper delves into a pressing issue amid Global Society. It explores an urgent issue in today's higher education systems, learners are turning more and more to unhealthy coping mechanisms, such as drinking alcohol or smoking cigarettes, to deal with academic stress. The university system has been paying more attention to sustainability and social responsibility in recent years (Azzali and Sabiur, 2018; Ojala, 2017; Ramos et al., 2015; Lozano et al., 2015). The continuous usage of alcohol and tobacco has been adopted by tertiary learners as a maladaptive strategy towards stress in academic life (Paul et al., 2024). This study proposes a conceptual model assessing the inter-relationships between pertinent sociocultural aspects, stress, alcohol, and tobacco use on the academic performance of tertiary learners. In view to provide a comprehensive understanding, this paper leverages on the Social Cognitive Theory to explore the interconnectedness between environmental, personal, and behavioural factors to explain the behaviour of the learners in a holistic approach. Through the mediating effects of stress, alcohol, and tobacco use, this study offers a conceptual model that investigates how sociocultural factors specifically, peer rejection, family economic status, and environmental influences, indirectly affect academic performance. The study adds on to the existing literature by identifying key antecedents towards the academic performance of university students. A pilot test and a comprehensive survey of public and private tertiary institutions in Mauritius will be part of the quantitative method that will be employed. Validation of the conceptual model will be done using structural equation modeling (SEM). The findings of this research are meant to shape the creation of comprehensive, empirically supported programs that promote students' well-being and academic achievement. With an emphasis on how behavioural, personal, and environmental factors interact to shape academic achievements, the model aims to support the development of sustainable teaching methods in higher education.

Keywords: Global Society, Tertiary Education, Social Cognitive Theory, Sociocultural Factors, Academic Performance

Introduction

Tertiary education is essential for developing skilled human capital that helps communities address their actual issues (Idris, 2012). A strong force for change, education enhances livelihoods and health while promoting social stability. At the micro level, social stability is closely associated with improved living standards, as higher levels of education equip individuals with greater social and economic opportunities, ultimately driving increased productivity. At a broader level, education plays a pivotal role in shaping skilled and competent human capital, serving as a catalyst for economic growth and exerting a positive influence on overall economic development (Sothan, 2019). The education path is a long and difficult journey in academic life and although not an easy process, it captures values, learning abilities, skills and behaviours. Henceforth, students must graduate with a strong academic record by dedicating adequate study time to achieve academic success.

A plethora of research in education and psychology has been recently undertaken to understand the myriad elements influencing learners' academic performance (Kocsis & Molnar, 2024; Zheng *et al.*, 2024; Hogberg, 2024). In this contemporary society, learners are paying towards elevated academic pressure due to the intricate evolution of the environment (Quach *et al.*, 2015; Blake & Mills, 2014). Previous studies posited that different factors, namely personality, cognition, peer bonding, family background, school climate, social and cultural affect students' academic performance (Hines & Holcomb-McCoy, 2013; Castro-Sanchez *et al.*, 2019). According to Liem (2019), sociocultural conditions are the salient elements impacting students' academic performance. Zheng *et al.*, (2024), portrayed the noteworthiness of taking into consideration sociocultural factors of learners to understand the individual aspects that can influence academic performance.

Although empirical studies have delved into various sociocultural factors influencing learners' academic performance, limited empirical evidence points towards variables such as peer rejection, family economic status,

and environmental influences through the mediating role of stress, alcohol, and tobacco use to determine the different inter-relationships towards academic performance of tertiary level students, using the Social Cognitive Theory. Fite *et al.* (2014) revealed through a study conducted in the USA that peer rejection as a social context adversely correlated to a learner's academic performance. Additionally, research conducted in countries like Uganda, Nigeria & Ghana postulated that family socioeconomic status is a vital construct in students' low academic performance (Etsey, 2005; Kyosha, 2009; Obeta, 2014). Many theoretical frameworks portray the environmental influences on student learning, such as Behaviour theories (Skinner, 1965), Constructivist theories (Piaget, 1952; Vygotsky, 1978), and Bronfenbrenner (1979), the theories highlight the appropriate environmental conditions to enhance learning, which includes cultural values, societal norms, media, family and school amongst others.

The determinants of academic stress and the consumption of alcohol and tobacco in the milieu of education and academic performance have been largely explored. Studies posited that there is an elevated level of stress in tertiary education (Pacheco *et al.*, 2023), which is not only negatively impacting learners' academic performance (Frazier *et al.*, 2019), but results in substance use (Boulton O'Connell, 2017), insomnia (Amaral *et al.*, 2018), anxiety and depressive disorders (Rosiek *et al.*, 2016), leading to worsening academic strain (Chapell *et al.*, 2005; Hysenbegasi *et al.*, 2005). Furthermore, the use of alcohol and tobacco at universities and their effects on academic performance have been researched. For instance in Nigeria, alcohol and tobacco use among youngsters ranging from 10 to 24 years are suffering from mental illnesses and consequently causing 2% of the mortality around the world (Ajayi & Somefu, 2020). The Social Cognitive Theory is an exhaustive framework evolved by Albert Bandura for understanding how human beings learn certain behaviours through social interaction, imitation, and observation (Bandura *et al.*, 1986). According to Social Cognitive Theory, human functioning is the outcome of three sets of influences including personal, behavioural, and environmental factors (Bandura, 2001). The theory has been extensively used in several studies related to education, academic performance, academic engagement, and well-being (Collie & Martin, 2024; Labrague, 2024; Francis *et al.*, 2024).

Social Cognitive Theory is used to understand how sociocultural factors: Peer Rejection, Family Economic Status, and Environmental Influences through the mediating role of Stress, Alcohol, and Tobacco use, impact on tertiary student's Academic Performance. This paper provides a multifaceted grasp of multiplex dynamics concealing academic performance at the tertiary level. By emphasising the mediating role of stress, alcohol, and tobacco use, this paper urges the need for wholesome and evidence-based interventions to tackle issues pertaining to academic performance and learned behaviours. The insights into the interconnectedness between the sociocultural factors and the moderators will enhance academic success, students' well-being, and educational practices.

Literature Review and Hypothesis Development

Academic Performance

As a main significant concept, academic performance has been widely examined in educational research (Tang, Zhang & Cui, 2024). It serves as an indicator to measure the success and effectiveness in student achievement towards their goals and proficiencies (Engin-Demir 2009; Adeniyi *et al.*, (2024). Masnan *et al.*, (2025) points out that academic performance is determined by both cognitive and non-cognitive factors. Empirical evidence extends various factors that determine academic performance with antecedents such as undergraduate stress (Oyewobi *et al.*, 2021), social relationships (Li *et al.*, 2021), academic engagement (Casanova *et al.*, 2024) amongst others. Thus, growing the literature on academic performance is of essence to further understand the challenges students encounter, particularly in the context of higher education.

Alcohol and Tobacco Use

The influence of substance use on academic performance among students in higher education has been vastly explored in research (Whatnall *et al.*, 2024; Terrell *et al.*, 2024; Gordon & Ohannessian, 2024). Adolescents and young adults, given their age, are more prone to risk-taking behaviour and tend to follow their friends. Studies revealed peer relationship as an instigating antecedent for alcohol and tobacco consumption (Yahya *et al.*, 2010; Elegbede *et al.*, 2012; Arute *et al.*, 2015; Itanyi *et al.*, 2020; Adesina *et al.*, 2020). Findings from research showed that youngsters were encouraged to drink and smoke by their peers (Yahya *et al.*, 2010; Itanyi *et al.*, 2020; Adesina *et al.*, 2020). Moreover, studies have revealed that students in higher education adopted alcohol and tobacco use as a maladaptive coping strategy to handle external pressures such as time management and academic stress (Metzger *et al.*, 2017; Ou *et al.*, 2024; Terrell *et al.*, 2024). Previous studies found that alcohol and tobacco use can negatively contribute to poor concentration, low cognitive functions, and academic performance (Paul *et al.*, 2024; Maraqa *et al.*, 2024; de Goede *et al.*, 2021). However, it is noted that some studies consider alcohol and tobacco use together as one antecedent while others have explored them separately. This study will therefore use alcohol and tobacco as two distinct variables as a moderator vis a vis stress to understand its effect on academic performance.

Stress

The integral aspects of being a university student is dealing with stress which impairs one's abilities to perform academically (Whitman *et al.*, 1985). Stress is conceptualised as physiological and psychological responses to stressors which can be internal or external in nature and influences behaviour (VandenBos, 2015). University environment can bring both eustress (positive stress) and distress (negative stress) to students (Bush *et al.*, 1985; Brown & Ralph, 1999). As pointed out in the literature stress shares a complex relationship with learning (Sapolsky, 2015; Gellisch, 2024). This can be explained through the impairment of cognitive processors which results in students' inability to think critically (Sandi, 2013). Several factors such as meeting people from different backgrounds, transitioning to a new academic journey can be stressful for students (Iqra, 2024). Additionally, stress is known to cause psychiatric issues and dependency to substance use (Guidi *et al.*, 2020). Thus, there is a need to broaden understanding on the antecedents and consequences of stress within the education sector.

Sociocultural Factors

Sociocultural describes a broad range of cultural and societal factors that affect attitudes, behaviours, and, eventually, health outcomes. These factors influence an individual's relationships, actions, principles, feelings and beliefs. Examples of sociocultural factors include social class, religious beliefs, income distribution, language, business practices, social values, consumer preferences, social organization, and attitudes toward work. Prior research has extensively delved into the influence of social factors on academic performance, and academic achievement (Qureshi *et al.*, 2023; Teng *et al.*, 2022; Alam & Mohanty, 2023).

Empirical evidence shows a growing interest in the diversity of sociocultural factors such as neighborhood violence, family economic status, religious differences, peer rejection, and environmental influences, amongst others that contribute to poor academic success and academic performance in tertiary education (Lorijn *et al.*, 2022; Xiao *et al.*, 2021; Burgos-Calvillo *et al.*, 2024). This study emphasises peer rejection, family economic status, and environmental factors mitigating academic performance through the mediating effects of stress, alcohol, and tobacco use.

Peer Rejection

Peer rejection refers to the various ways that children exclude and harm each other, ranging from overt forms of control and exclusion to more covert strategies like gossiping and rumors (Carey *et al.*, 2009). Lin *et al.*, 2024, revealed a correlation between the role of peers, risky behaviours, and poor academic success. According to Prinstein and Giletta (2020), friendship quality, peer acceptance, rejection, and victimisation are significant components of peer functioning. Previous studies point out rejection and peer victimisation as determinants that negatively influence academic performance in higher education (Espelage *et al.*, 2013; Lorijn *et al.*, 2022). Henceforth, it becomes vital to contemplate peer rejection as a sociocultural factor to explore the dynamics of academic performance among tertiary students.

Family Economic Status

Family Economic Status has been well-documented in past research, specifically portraying its effect on educational success (Boggess, 1998; Garg *et al.*, 2007; Rumberger *et al.*, 2008; Polidano *et al.*, 2012). Adesina *et al.*, (2020) and Itanyi *et al.*, (2020), pointed out a higher number of alcohol and tobacco use by students whose parents have a low economic status. Researchers emphasised that students from affluent backgrounds typically attain better academic results. This can be explained by the fact that students from high socio-economic status homes or schools have more access to activities and resources for learning foreign languages, as well as to good parenting techniques and a more welcoming environment (Liu, *et al.*, 2020). Family economic status forms part of the social learning theory's social aspect. Therefore, this study has opted for family economic status as a dependent variable, using the Social Cognitive Theory to understand its impact on academic performance.

Environmental Influences

The different environmental factors that influence the academic performance of learners include peer support, social support, institutional support, university services, and appropriate workload (Tao *et al.*, 2000; Byrd & McKinney, 2012; Sharp & Theiler, 2018; Chang *et al.*, 2021). Empirical evidence has demonstrated that by fulfilling students' fundamental psychological needs for autonomy, competence, and relatedness, the learning environment enhances their well-being (Kiltz *et al.*, 2024). According to Social Cognitive Theory (Bandura, 1986), the perspective on student functioning, environmental and personal influences play a crucial role in how students behave. Social cognitive theorists stated that student engagement might determine their conduct (Bandura, 1997; Christenson *et al.*, 2008). Environmental influences are adopted as a construct, using the Social Cognitive Theory to mitigate its influence on the academic performance of tertiary learners.

Social Cognitive Theory

Bandura first proposed the Social Cognitive Theory in the year 1989. It emphasises how behavioural, personal, and environmental factors (as demonstrated in Figure 1) interact and interrelate to shape behaviour. According to this theory, a variety of elements, including personal beliefs, motivation, self-efficacy, behavioural outcomes, and the social and physical environment, influence behaviour (Nwosu *et al.*, 2022). This theory has been greatly used and explored various interactions in a wide range of fields, particularly, the education sector. Prior research indicated the necessity of creating and adjusting internal and external factors associated with innovative behaviour (Sahin, Gulacar & Stuessy, 2015; Stone & Baker-Eveleth, 2013; Zobair *et al.*, 2021). Prior research has examined social influences and enabling conditions as environmental factors (Wu *et al.*, 2022). Social Cognitive Theory portrayed how individuals explore behavioural patterns further to interplay their environment, personal characteristics and cognitive processes (Middleton, Hall & Raeside, 2019). When applying Social Cognitive Theory to health issues, three interacting components are involved namely, behavioural, socio-environmental, and personal cognitive factors. Personal cognitive factors comprise other dimensions such as self-efficacy, expectations of outcomes and knowledge.

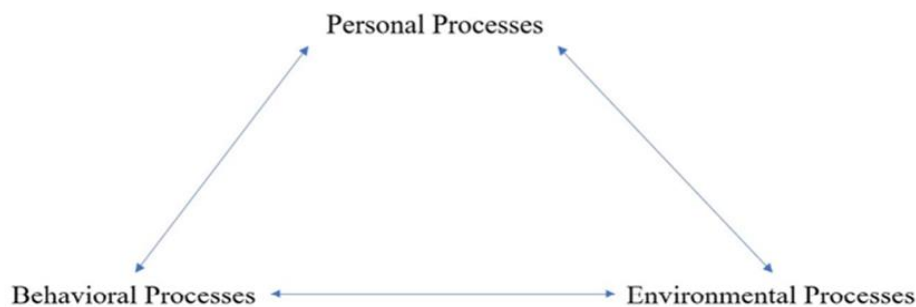


Figure 1: Model of Reciprocal Interactions in Social Cognitive Theory

Source: Adapted from Schunk & DiBenedetto (2020)

Personal factors in Social Cognitive Theory

Being one of the determinants in Social Cognitive Theory, personal factors refer to the confidence that individuals show when engaged in activities (Strachan *et al.*, 2017). One of the main components of personal factors is self-efficacy which reflects the amount of control that an individual has when exposed to any given situation (Hagger *et al.*, 2020). Sport, education, career and occupational development, and mental and physical health settings are just a few of the fields and contexts where the essence of Social Cognitive Theory has been used as a framework for behaviour modification (Li *et al.*, 2024). Nine researchers studied self-efficacy beliefs across different behavioural functioning domains such as work-related performance, academic performance, sports performance, psychosocial functioning, and health functioning as cited by Bandura and Locke (2003). Self-efficacy was proven to be a powerful predictor of performance level, persistence in the face of challenging issues, and the occurrence of coping behaviour. Numerous studies have demonstrated a high correlation between drinking/drug use outcomes after a range of treatments and self-efficacy beliefs in connection to substance use disorders (Kadden & Litt, 2011). People with the necessary skills and high levels of coping efficacy are more likely to put in the work necessary to successfully avoid high-risk settings for drug or alcohol use (Bandura, 1986). Several studies have shown that self-efficacy predicts treatment outcomes and acts as a significant predictor of alcohol consumption (Maisto, Connors & Zywiak, 2000; Sitharthan & Kavanagh, 1991; Kavanagh, Sitharthan & Sayer, 1996).

Behavioral Factors

According to Bandura (2004), when it comes to changing behaviour, short-term and achievable goals work best. This construct represents the strategies a person formulates to execute the behaviour at a later time. According to Ramirez, Kulinna, and Cothran (2012), behavioural factors also affect changes in healthy behaviour practices. The amount of research that has used Social Cognitive Theory to comprehend and explore the factors influencing behaviour, specifically, physical exercise has been enormous over the last forty years (Beauchamp, Jackson, & Morton, 2012; Feltz *et al.*, 2008). The behaviour of human beings are based on social cues from previously learnt behaviour that observers are capable of performing but have not done so due to a lack of inducements rather than constraints (Bandura, 2009). Teachers have fostered the growth of creative thinking in their students by demonstrating their own creativity, offering chances for creative expression, and sending social cues about the value and acceptance of creativity in the classroom (Rubenstein *et al.*, 2018). Henceforth, one premise of Social Cognitive Theory is that individuals adopt new behaviours by observing how other people behave and their resulting actions. Individuals are more likely to simulate a behaviour if a reward is associated. In an experiment

conducted by Bandura and Walters (1963), children imitated the aggressive behaviour of the model who received praise for acting in an aggressive manner towards a Bobo doll.

Environmental Factors

According to Abedini *et al.*, (2024), environmental factors are made up of two significant environmental determinants: the social effect that community members have on one another and the sense of shared community. The term "social impact" describes how a person's thoughts and behaviours are mirrored in the actions of others (Latane & Nida, 1980). Social support and barriers to the adoption of a specific behaviour are examples of environmental factors. The underlying concept of social support under the lens of environmental factors is the extent to which others assist in promoting and influencing an individual's participation in particular behaviour (Ramirez, Kulinna & Cothran, 2012). The authors also found that teachers work in both the microenvironment and macroenvironment, which includes legislative regulations, administration goals, and evaluation practices. Therefore, teachers' evaluations of their capacity to foster creativity may be influenced by a variety of elements in each of these contexts, such as environmental distractions or limitations and particular, group support systems. Findings of numerous studies have demonstrated a correlation between treatment outcome and both substance use-related variables (Adamson, Sellman & Frampton, 2009; Wittiewitz, 2011) and demographic variables (Adamson, Sellman & Frampton, 2009; Sharma *et al.*, 2012; McKay *et al.*, 2013; Smit *et al.*, 2014; Walton *et al.*, 2003). Thus, it is imperative to showcase the importance of environmental factors in this paper.

Research Method

This study will employ a quantitative methodology. Data will be collected through the use of a questionnaire which will be distributed to learners in various public and private tertiary institutions in Mauritius. A pilot test of 50 questionnaires would be used to ensure if there is any need for adequate adjustment before the final data collection. Once validated, 400 questionnaires would then be distributed to students following diploma, undergraduate, and postgraduate studies at tertiary level. Upon completion of data collection, the same will be coded using Statistical Package for Social Sciences (SPSS). Structural Equation Modelling (SEM) will be also used to confirm the proposed model. A Confirmatory Factor Analysis and SEM will be employed to evaluate the model taking into consideration reliability and validity.

Conceptual Framework and Research Hypothesis

The proposed conceptual model portrays the inter-relationships between sociocultural factors (peer rejection, family economic and environmental influences), stress, alcohol and tobacco use as moderators, and academic performance. In the view of change and restructuring, academic achievement and academic performance are key components for higher education institutions. Academic performance is commonly well-documented in the education sector as its outcome determines the learner's overall achievement. As such, attention is paid to whether students' sociocultural factors lead to stress, alcohol, and tobacco use among students. This model in Figure 2 assesses antecedents such as learner's Peer Rejection, Family Economic Status and Environmental Influences, and Stress and student's Use of Alcohol and Tobacco as moderators towards students' Academic Performance.

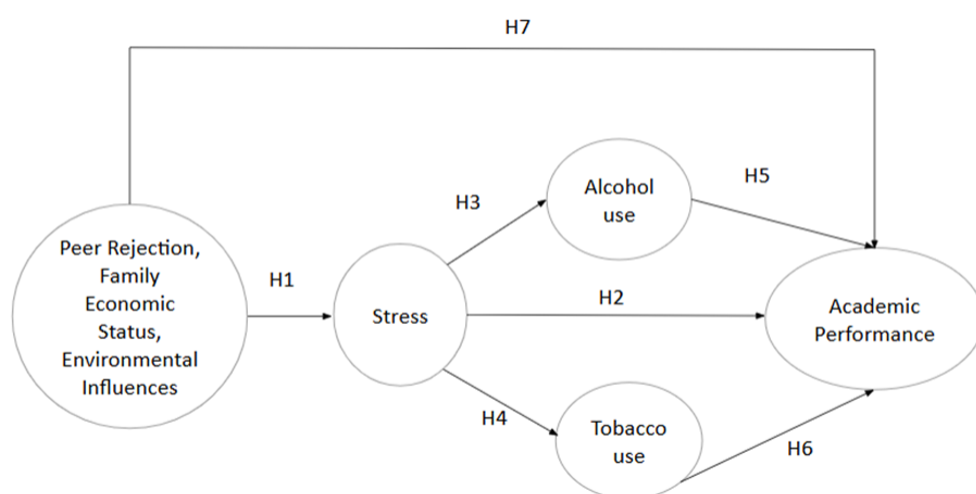


Figure 2: represents the conceptual model
Source: Sobha, Ladsawut & Kodye (2024)

Several factors impacting academic performance were explored in the prior studies (Kocsis & Molnar, 2024; Zheng *et al.*, 2024; Hogberg, 2024), yet limited studies tested the relationship between pertinent determinants of sociocultural factors such as peer rejection, family economic status and environmental influences affecting the academic performance of students. Furthermore, stress and alcohol and tobacco use are regarded as moderators that may impair academic performance by influencing cognitive function, self-regulation, and focus (Paul *et al.*, 2024; Maraqa *et al.*, 2024; de Goede *et al.*, 2021). This paradigm provides insights for educational interventions by analysing the combined effects of these components and moderating influences on academic performance. Thus, the following hypotheses are proposed:

H1a Peer Rejection positively influences on Stress

Peer rejection can lead to various forms of stress. Most individuals respond unfavourably, often evade and react to the experience of rejection (Hudd & Moscovitch, 2020). This can be in the form of exclusion or isolation that one can face in society (Coplan & Bowker, 2013). The lack of social skills results in peer rejection (McGuigan *et al.*, 2018), which surfaces as stressors (Zhang & Ngai, 2024). Theoretically, this relationship is supported by the Social Cognitive Theory which explains changes in the emotional aspect of an individual due to peer entry and provocation situations (Lemerise & Arsenio, 2000). The Social Cognitive Theory supports that social interactions create learning opportunities and these can be in the form of rewards or punishments (Bandura & Walters 1963). In this line, peer rejection among university students is a form of punishment which engages in stressing behaviours. As pointed out by Iqbal *et al.*, (2016), peer acceptance results in good self-image which increases social abilities and academic performance. However, if students have poor social skills, they tend to be rejected by peers which impedes their academic performance (Welsh *et al.*, 2001). Peer rejection as a form of social exclusion among university students leads to stressful situations like anxiety, sadness and depression (Niu *et al.*, 2023; Bungert *et al.*, 2015). Thus, as per Iqbal *et al.*, (2016), there is empirical evidence that there is a positive relationship between peer rejections and stress in learners.

H1b Family Economic Status positively affects Stress

Educational equity is often compromised by socioeconomic stratification, which influences access to resources and academic outcomes (Ramburuth & Hartel, 2010). Research highlights that family economic status is a key determinant of stress, shaping individuals' social positioning through variables such as education, income, and wealth, which in turn influence behavioral and academic patterns (Alami, 2013; D'Anguilli *et al.*, 2024; Rifat & Bithi, 2023). Empirical studies suggest that students from more affluent backgrounds benefit from greater parental involvement and resource availability, leading to enhanced academic performance and improved stress management (Jeynes, 2024; Kang *et al.*, 2024). Additionally, gender disparities in stress levels have been observed, with female students exhibiting higher stress levels than their male counterparts (Steen *et al.*, 2020). Moreover, those students with lower family economic status may have lower self-efficacy leading to poorer academic performance. The unsupportive environments may increase students' stress level and impede on their academic performance. Therefore, it can be observed that family economic status positively affects stress among tertiary learners.

H1c The Environmental Influences positively lead to Stress among university students

The literature highlights a range of factors influencing academic performance, including climatic conditions, homesickness, limited family contact, academic pressure, demanding study schedules, and experiences of bullying (Qamar *et al.*, 2015). These factors serve as key stressors that can impede university students' ability to perform academically. Drawing from the context of medical education, research suggests that undergraduate students transitioning to new social environments, distanced from their established support networks of family and friends, often experience increased psychological distress (Pancer *et al.*, 2000). Such environmental shifts may result in a perceived loss of control, necessitating adaptation to unfamiliar academic and social structures, which, in turn, heightens stress levels (Pfeiffer, 2001). The intensity of stress within academic settings also varies depending on the level of study where postgraduate students, particularly those pursuing master's and doctoral degrees face greater academic demands, which can exacerbate stress-related challenges (Ribeiro *et al.*, 2018). From a Social Cognitive Theory perspective, Bandura (1997) emphasises a bidirectional co-relationship between academic stress and self-efficacy, wherein heightened stress levels negatively impact students' confidence in their academic abilities (Liu *et al.*, 2024). Within the university setting, students are often exposed to high-pressure environments characterised by tight deadlines and performance-based evaluations, which shape their self-efficacy beliefs and contribute to academic stress. As Social Cognitive Theory suggests, observational learning and environmental reinforcements play an important role in students' ability to manage stress, ultimately influencing their academic outcomes. In this perspective, it is essential to assess whether environmental influences may have a positive impact on stress of university students.

H2 Stress is positively related to Academic Performance

Existing literature largely associates stress with low academic performance (Ben-Zur & Zeidner, 2012; Amirkhan *et al.*, 2020). This relationship is often attributed to reduced academic engagement and lower psychological capital, both of which are negatively influenced by persistent stress (Saleem *et al.*, 2022). A long period of academic stressors has been reported to be detrimental to physical and mental health outcomes, further exacerbating declines in academic performance (Freitas *et al.*, 2023). Empirical evidence suggests that higher levels of perceived stress during a student's academic journey correlate with lower Grade Point Averages (GPA) (Tormon *et al.*, 2023). From a Social Cognitive Theory perspective, stress can influence academic performance through both positive and negative reinforcement mechanisms. While manageable levels of eustress may serve as performance motivators, distress often leads to diminished self-efficacy, thereby increasing academic pressures. Students with low self-efficacy are particularly vulnerable, as they may struggle to cope effectively under stress, leading to compromised academic outcomes. On the other hand, students with higher self-efficacy and healthy coping strategies may utilise stress as a catalyst for improved performance. Thus, the extent to which stress impacts academic achievement is largely contingent on students' cognitive appraisal, coping mechanisms, and perceived control over their learning environment. This denotes the need to further understand if stress has a positive or negative influence on academic performance.

H3 Stress and Alcohol use are positively interrelated

A growing literature portrays alcohol consumption as a coping mechanism to deal with stress. Studies by Dave *et al.* (2024) & McConaha *et al.* (2024) showcased the usage of alcohol by students during challenging times in their academic journey. The constructs of Social Cognitive Theory have been hugely used in research to understand behaviour in the fields of education, health, societal issues, and environment, to name a few (Mantey *et al.*, 2024; Maleki *et al.*, 2025; Bussey, 2023; Gan *et al.*, 2024). Social Cognitive Theory is adopted in this paper to demonstrate how low self-efficacy learners, when enduring higher levels of stress during their academic path, may consume alcohol as a coping strategy. The current study placed stress and alcohol as mediators to portray their use as a futile coping mechanism to deal with stress by tertiary-level students. Studies conducted on students at tertiary education (Samek *et al.*, 2024; Fruehwirth *et al.*, 2021) revealed a positive relationship between stress & alcohol use. Hence this paper proposes that there is a positive relationship between alcohol use and stress.

H4 Stress and Tobacco Use are positively correlated

The correlation between stress and tobacco has been debated amid literature encompassing several domains in social sciences. Empirical evidence provided consistent students' tobacco use, including youngsters, to manage stress triggered by various social aspects (Ekpenyong *et al.*, 2024; Alves *et al.*, 2022; Clendennen *et al.*, 2021). Both stress and tobacco are moderators in this study to understand the dynamic towards academic performance. The Social Cognitive Theory contributes to understanding tobacco use as learned behaviour from parents, family, and friends (Roble *et al.*, 2021). To *et al.*, (2024) suggested a positive correlation between stress and tobacco use among students in the education sector. This paper reinforces the need to test the relationship between stress and tobacco use.

H5 Alcohol Use and Academic Performance are positively interconnected

There is a growing literature based on the impact of alcohol use on academic performance among learners (Bugbee *et al.*, 2019; Chai *et al.*, 2020; El Ansari *et al.*, 2013). Wube *et al.*, (2024) found a relatively low academic performance among students who adopted alcohol use in contrast to those students who refrained from such maladaptive behaviour. Usually called "alcohol expectancies", these expectancies are examples of reinforcement linked to drinking (Dijkstra *et al.*, 2001; Cheng *et al.*, 2024). The Social Cognitive Theory explains the outcome expectations about perceived repercussions of alcohol consumption play a role in regulating drinking behaviour. Following this, testing the relationship between alcohol use and academic performance is crucial.

H6 Tobacco Use and Academic Performance are positively interrelated

Tobacco use has also been associated with obstacles to reaching optimum learning to take place (Kawafha, 2014). The author contextualised this study in Jordan depicting that smoking tobacco is detrimental to the learners' physical and mental development and consequently decreases their academic performance. Tobacco use among students causes an increased tendency to substance use, squandering study time, and acute health issues (Deressa *et al.*, 2020). Compared to cigarette smokers, students who abstained from smoking had a higher chance of earning good grades. This aligns with the results found among college students in Western cultures where cigarette smoking was linked to lower chances of academic success for Norwegian students (Stea *et al.*, 2014). Leveraging on the Social Cognitive Theory tobacco use as a personal and behavioural construct mediates between the sociocultural factors and the academic performance of university students. Extending on this approach, it is important to test the influence of tobacco use on academic performance.

H7a The relationship between Peer Rejection and Academic Performance is a positive one

Peer relationships and exchanges get more intricate and dynamic as students become older, and spend more time with their classmates (Lin *et al.*, 2024). Empirical evidence revealed that the influence of peer rejection leads to poor academic performance (Espelage *et al.*, 2013; Lorijn *et al.*, 2022). However, Brouwer *et al.*, 2022 contradicted this statement by stating that peers do not influence learning abilities and academic performance. Importantly, the relationship between peer rejection and academic performance still needs exploration. In this line, Social Cognitive Theory framework (Bandura, 2009) can be used to explain the behaviour that influences peer rejection among students. Thus, this study proposes that the relationship between peer rejection and academic performance can be positively interrelated among university students.

H7b Family Economic Status and Academic Performance is positively related.

There is a growing literature on the effect of family economic status on academic performance and academic success in the education sector whereby various research posited a low academic performance due to the parents' financial abilities towards the education of their children (Wu, 2024; Elharake *et al.*, 2022; Yang *et al.*, 2023). Social Cognitive Theory encompasses the dynamics between environmental, personal and behaviour factors to portray how the financial background of parents contributes to the academic performance of learners. Families with high economic status have adequate resources to meet the facilities required by learners in their academic paths. Hence, this study concludes a positive correlation between family economic status and academic performance in higher education.

H7c Environmental Influences are positively connected to Academic Performance

Environmental influences in this study refer to the diversity of factors that surround learners in their academic journey; the factors are peer influences, societal issues, services and facilities available, family dynamics, environmental issues, and adequate resources, amongst others. These antecedents have been well documented in previous studies, whereby low academic performance was found due to environmental influences (Iglesias-Pradas *et al.*, 2021; Gopal *et al.*, 2021; King *et al.*, 2024). Social Cognitive Theory explains behaviour of learners, which developed through various environmental influences in their academic lives. The positive environmental influences enhance self-efficacy, resulting in higher academic performance, and the negative environmental influences lead towards poor academic performance. In this philosophy, this study proposes a positive relationship between environmental influences and academic performance among university students.

Conclusion

This study contributes to the consistent literature by exploring the different sociocultural factors that impact on students' tertiary education. Pertinent factors, like peer rejection, family economic status, and environmental influences, are analysed in the academic life of learners. Furthermore, the variables of stress, alcohol, and tobacco use are examined as moderating roles towards academic performance. As portrayed in the literature, the behaviour of learners is influenced by various external factors such as cognitive factors and personal factors. Social Cognitive Theory is adopted in this paper to reinforce the interrelated dynamics between sociocultural factors and the mediating role of stress, alcohol, and tobacco use to understand the changes in academic performance. In this view, this paper proposes a conceptual model to understand the relationship between sociocultural factors, stress, alcohol and tobacco use on academic performance amid university. Given the importance of academic success, which ultimately contributes to the progress of the global society, the factors impacting academic performance should be closely monitored. Further studies can explore the determinants of cognitive aspects (self-efficacy, outcome expectancies and knowledge) in higher education. This will contribute to global society by emphasising on the key element of quality education.

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To Study the Relation between the Big Five Model of Personality Traits and Behavioural Biases of Individual Mutual Fund Investors

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Abstract

Investment decision-making is increasingly influenced by psychological and behavioral factors. This study investigates the relationship between the Big Five personality traits—openness, conscientiousness, extraversion, agreeableness, and neuroticism—and behavioral biases among individual mutual fund investors. A structured survey was conducted with 667 participants to examine the influence of these personality traits on four key biases: disposition effect, herding behavior, overconfidence, and loss aversion. Findings reveal that agreeableness and openness significantly impact behavioral biases, while conscientiousness, extraversion, and neuroticism do not exhibit statistically significant effects. These insights contribute to behavioral finance by highlighting the psychological underpinnings of investment behavior. The study has practical implications for advisors and policymakers aiming to design personality-aware financial interventions and strategies.

Keywords: -

Introduction

Understanding financial decision-making requires delving into the psychological and behavioral drivers that influence how individuals perceive risks, evaluate opportunities, and ultimately make choices. Behavioral finance, as Sewell (2007) notes, provides a framework for examining how psychological factors such as biases and emotions impact investment decisions and market outcomes. These drivers are particularly crucial in the realm of mutual fund investments, where decisions often blend rational analysis with behavioral tendencies. Ahmad et al. (2017) argued that decision-making in investments is a dynamic interplay of psychological, sociological, and biological factors, offering a lens through which investor behavior can be better understood.

The mutual fund industry in India is a cornerstone of the nation's financial sector, playing a pivotal role in channeling household savings into productive investments. With the Indian economy poised to grow from a GDP of \$2.87 trillion in 2019 to a projected \$5 trillion by 2025, mutual funds have emerged as a significant investment vehicle. The industry has seen a significant increase in new investors, indicating rising financial awareness and broader access to investment opportunities. Investors who seek guidance from financial professionals, such as fund managers and advisors, require a more profound comprehension of the psychological and behavioral factors that shape decision-making processes. To promote market efficiency and investor satisfaction, it is crucial to comprehend the factors that influence investor behaviour, given that mutual funds significantly contribute to economic growth and wealth generation.

At the core of this investigation, the five fundamental personality traits—openness, conscientiousness, extraversion, agreeableness, and neuroticism—form a comprehensive framework for grasping the disparities in human behaviour. Studies have found a connection between these characteristics and behavioral tendencies such as overconfidence, the fear of losing, herd mentality, and disposition effects (Baker et al., 2019). These biases frequently result in departures from rational decision-making, which in turn impacts both portfolio performance and market dynamics. Most of the research has been conducted in Western settings, with limited information available on how these characteristics affect behavioral predispositions in culturally diverse markets such as India. This complexity is further complicated by cultural factors, as financial behavior is firmly rooted in social and cultural nuances. India's collectivist culture, which emphasizes familial and social networks, contrasts sharply with the individualism prevalent in Western societies (Hofstede, 1980; Chen et al., 2007). These cultural underpinnings shape risk tolerance, investment preferences, and susceptibility to biases. For instance, group-oriented decision-making and social conformity in India may amplify herding behavior among investors. Understanding these cultural influences is essential for tailoring strategies to Indian investors' unique psychological and social landscapes.

This study bridges these gaps by employing a novel methodological approach using primary data from Indian individual mutual fund investors. While prior studies often rely on secondary data or laboratory experiments, this research captures real-world insights through a structured survey. By examining the relationship between the Big Five personality traits and behavioral biases, this study contributes to both the theoretical and practical domains

of behavioral finance. The study's conclusions will provide practical information for financial advisors, policymakers, and investors, thereby enhancing the comprehension of the psychological and cultural influences on financial decision-making processes

Literature review

Personality

Psychology's core concept, personality, encompasses the unique combinations of thoughts, emotions, and actions that define a person. The entity plays a pivotal part in financial decision-making by moulding perceptions of risk, influencing investment choices and making individuals more prone to biases. The Big Five Personality Traits—consisting of openness, conscientiousness, extraversion, agreeableness, and neuroticism—provide a comprehensive framework for studying these dynamics (Lubis et al., 2015; Ahmad & Maochun, 2019). Investors with high openness tend to display innovative and risk-taking investment behaviors, in contrast to those who are conscientious, who often adopt cautious and methodical approaches (Kaur & Goel, 2022; Oehler et al., 2017). Individuals with neurotic tendencies, characterized by emotional instability, tend to prefer low-risk investments because they are more averse to potential losses (Brooks & Williams, 2021). Comprehending these characteristics allows financial advisors to develop targeted approaches, reducing the impact of biases and improving results (Yadav & Narayanan, 2021). This highlights the interdisciplinary significance of personality research in the field of behavioral finance.

Big 5 personality traits

Personality, defined by Allport (1961) as a dynamic organization of psychophysical systems influencing behavior and thought, is pivotal in financial decision-making. Variations in personality characteristics influence susceptibility to specific behavioral biases, such as risk tolerance and portfolio management (Mayfield et al., 2008; Pak & Mahmood, 2015). The five personality traits of neuroticism, extraversion, openness, agreeableness, and conscientiousness are typically assessed through tools such as the revised NEO Personality Inventory (Costa & McCrae, 1992) as well as the Big-Five Inventory (John & Srivastava, 1999). Neuroticism, characterized by emotional instability, often results in poor risk assessment, whereas extraversion promotes optimism and social interaction, which can influence high-risk investments (Camgoz et al., 2017). Openness, linked to creativity and flexibility, facilitates calculated risk-taking, whereas agreeableness encourages trust and collaboration in decision-making processes (Ozer & Mutlu, 2019). Conscientiousness, associated with discipline and dependability, is strongly linked to financial performance (Camgoz et al., 2017). Cross-cultural studies, including those conducted by Lin (2011) in Taiwan and Baker et al. (2019) in India, demonstrate the Big Five model's role in psychological biases across various markets. These findings underscore the significance of integrating personality traits in tailoring investment strategies, particularly for professionals like fund managers and advisors, whose traits also impact client behavior (Tauni et al., 2018).

Behavioral biases

Behavioral biases represent systematic deviations from rational thinking influenced by psychological and emotional factors. These biases significantly impact financial decision-making by altering how individuals perceive risks, evaluate outcomes, and make investment choices (Lubis et al., 2015; Yadav & Narayanan, 2021). Biases in decision-making can result in subpar choices, ultimately diminishing portfolio performance and worsening market instability (Ahmad & Maochun, 2019). These outcomes frequently arise from mental shortcuts or emotional reactions, causing biased judgment and obstructing objective examination (Brooks & Williams, 2021). It is crucial for investors and financial advisors to be aware of and understand the effects of these biases in order to create strategies that will upgrade their decision-making processes and result in better financial outcomes (Jahanzeb, Muneer, & Rehman, 2012). The comprehension of these factors has become a fundamental aspect of behavioral finance research, focusing on the interaction between human psychology and financial behavior.

Individuals prone to overconfidence bias tend to overestimate their knowledge, skills, or ability to control outcomes, resulting in decisions made based on their own private information, while underestimating or disregarding publicly available data. Frequently, this bias leads to uninformed or irrational investment choices. Investors who are overly confident are especially vulnerable when they have a history of significant past success, which tends to strengthen their misplaced faith in the market (Daniel et al., 1998; Odean, 1998a). Several measures are employed to gauge overconfidence, including a preference for private information (Daniel et al., 1998), self-attribution bias (Daniel et al., 1998), and miscalibration (Glaser & Weber, 2007). Additionally, factors such as the "better than average" phenomenon, where people rate themselves as more skilled than others, are also at play (Odean, 1998b; Glaser & Weber, 2007). This is accompanied by illusions of control and overconfident expectations (Glaser & Weber, 2007). Studies have found that an overabundance of confidence on the part of investors can result in increased trading, higher transaction costs, and possible underperformance (Menkhoff et al., 2006; Gloede & Menkhoff, 2014).

Investors often replicate the investment choices of others instead of basing their decisions on their own evaluations. Several factors contribute to this bias, including risk aversion, concerns about one's reputation, and the pressure to comply with established norms. Among financial experts, a tendency to follow the crowd may arise from a desire to conform to colleagues, sidestep criticism, or ensure job security (Scharfstein & Stein, 1990; Choi & Sias, 2009). Characteristics of herding behavior among managers involve mimicking the decisions made by other managers (Suto et al., 2005), consistency in the information presented in publications (Suto et al., 2005), and external influences from client demands and compensation systems (Choi & Sias, 2009). Herding can lower an investor's decision-making stress, but it frequently exaggerates market patterns, resulting in either market bubbles or crashes.

Investors often exhibit a disposition bias by prematurely disposing of profitable investments and holding onto unprofitable ones for an extended period. This behavior is driven by the psychological distress of acknowledging losses and the need to secure existing gains. Prematurely capping gains and compounding potential losses often result in suboptimal portfolio performance. Studies have identified a connection between this bias and emotional influences, including a tendency to avoid regret and an overemphasis on costs already incurred (Shefrin & Statman, 1985). An investor's disposition bias can impair their capacity for rational decision-making in investment, ultimately influencing long-term returns.

Loss aversion bias describes the strong preference to avoid losses rather than acquiring equivalent gains. Investors influenced by this bias are likely to hold onto underperforming assets in the hope of recovery, even when better opportunities exist. This bias can also cause excessive caution, leading to missed opportunities in higher-risk, higher-reward investments. Loss aversion is rooted in the psychological impact of losses, which are perceived as more emotionally significant than equivalent gains (Tversky & Kahneman, 1992). As a result, investors often prioritize short-term stability over long-term growth, adversely affecting portfolio performance.

Big Five model of personality traits and behavioral biases

Numerous studies have explored the interplay between the Big Five personality traits and behavioral biases in the financial domain, highlighting their influence on investment decisions. Disposition bias, where individuals sell winning assets prematurely, is often associated with high neuroticism due to emotional instability (Oehler et al., 2017). Herding, prevalent among agreeable and extraverted individuals, reflects a reliance on social conformity and external advice, as observed by Yadav and Narayanan (2021) in Indian mutual fund investors. Loss aversion bias, driven by a strong aversion to perceived financial losses, is closely tied to neuroticism, which amplifies fear and anxiety in decision-making (Ahmad & Maochun, 2019). Overconfidence bias, frequently linked with extraversion and openness, fosters excessive trading and risk-taking, leading to higher transaction costs and potential financial missteps (Lubis et al., 2015). These studies collectively underscore the significance of understanding personality traits in predicting and mitigating behavioral biases, thereby improving financial outcomes through tailored investment strategies (Brooks & Williams, 2021). Based on the above literature review, the following hypothesis is suggested:

H1: "Agreeableness trait of the investor significantly influences their behavioral Bias"

H2 "Extroversion trait of the investor significantly influence their behavioral Bias"

H3:" Conscientiousness trait of the personality significantly influences their behavioural Bias."

H4: "Neuroticism trait of the personality significantly influences their behavioural Bias"

H5: "Openness trait of the personality significantly influences their behavioural Bias"

While it is well-established that individuals with different personality traits exhibit varied financial risk tolerance and are prone to distinct behavioral biases, significant gaps remain in understanding these dynamics within specific contexts. Studies in diverse countries, such as Taiwan (Lin, 2011), Tehran (Sadi et al., 2011), Pakistan (Zaidi & Tauni, 2012), Malaysia (Nga & Ken Yien, 2013), Poland (Rzeszutek et al., 2015), Turkey (Ozer & Mutlu, 2019), and India (Baker et al., 2019), consistently highlight the relevance of the Big Five personality traits in shaping psychological biases among individual investors. However, these findings predominantly focus on individual investment behavior and largely overlook how these traits interact with behavioral biases in the Indian mutual fund sector. This research gap underscores the need for a deeper investigation into the unique interplay between personality traits and biases in the context of Indian mutual fund investors, considering their cultural, economic, and market-specific influences.

Research Methodology

To effectively understand perceptions, behaviors, and attitudes, collecting primary data is crucial (Lin, 2011). This study employed a structured questionnaire to gather data on the Big Five personality traits and behavioral biases. The Big Five personality traits are measured using the widely accepted NEO FFI Big Five personality traits inventory (Costa & McCrae, 1992, 2003; Mayfield et al., 2008). In contrast, measuring behavioral biases among mutual fund investors required adapting the scales from Baker et al. (2019) and Prosad et al. (2015). Additionally, several survey-based studies, including those by Menkhoff et al. (2006) and Broihanne et al. (2014), were used to develop supplementary items.

The questionnaire is divided into three sections. Section A captures the demographic details of mutual fund investors. Section B includes 20 items designed to evaluate four specific behavioral biases influencing investment decisions. Responses were recorded on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Section C assesses personality traits using 27 items, also based on the same five-point Likert scale. This comprehensive design ensures the collection of detailed insights into both personality traits and behavioral biases. A convenience sampling method was used to select mutual fund investors from various demographic backgrounds in Goa. The sample comprised 667 participants, chosen to ensure adequate representation and to facilitate insights into the population's investment behaviors and preferences. The hypothesis is examined with the help of the structural equation modeling method using SmartPLS software.

Analysis

Demographics of respondents

Table 1 : Demographic Profile

Demographics	Sub Categories	Frequency (%)	
Gender	Male	313	46.9 %
	Female	354	53.1 %
Marital Status	Single	243	36.4%
	Married	424	63.6%
Age Group	Less than 30 Years	216	32.4%
	30 to 45 Years	213	31.9%
	Above 45 Years	238	35.7%
Education	Graduation	285	42.7 %
	Post Graduation	213	31.9 %
	Professional	169	25.3 %
Annual Income	Less than 5 lakhs	252	37.8 %
	5 to 10 Lakhs	217	32.5 %
	Above 10 lakhs	198	29.7 %
Mode of Investment	Lumpsum	190	28.4 %
	SIP	477	71.6 %
Occupation	Professional	154	23.1 %
	Business	216	32.4 %
	Private Employee	185	27.7 %
	Govt Employee	112	16.8 %

The primary data is collected from mutual fund investors with different demographic profiles. The table 1 reported the frequency distribution of the selected demographic profiles (Gender, Marital Status, Age Group, Education, Annual Income, Mode of Investment and Occupation). The table reported that 313 (46.9 %) of the selected respondents in the sample are males whereas the remaining 354 (53.1 %) are women. The 243 (36.4%) of the respondents were unmarried, and 424 (63.6 %) of the respondents were married. The 216 (32.4 %) respondents belonged to the age group less than 30 years, 213 (31.9%) the respondents in the sample belonged to 30 to 45 years and the remaining 238 (35.7 %) were above 45 years of age. The 285 (42.7 %) of the respondents in the sample are graduate, whereas the 213 (31.9 %) are post-graduate, 169 (25.3 %) respondents having professional qualification. The 252 (37.8 %) respondents in the sample belong to the income group of income less than 5 lakhs per year, the 217 (32.5 %) respondents have income in the range of 5 lakhs to 10 lakhs and the remaining 198 (29.7 %) of the respondents have income more than 10 lakhs. The 190 (28.4%) of the respondents invest in Lump Sum amount in Mutual funds, 477 (71.6 %) of the respondents invest in SIP mode. The 154 (23.1 %) respondents work as Professionals, 216 (32.4%) the respondents the samples have a business, while 185 (27.7 %) respondents work as Private organizational and the remaining 112 (16.8 %) are work as Government servants.

Big Five personality traits and behavioral biases

The disposition bias of a mutual fund investor is measured with the help of four statements included in the questionnaire. Descriptive analysis was performed on the responses received against the statements measuring disposition bias, and the results are reported in table 2.

Table2: Descriptive statistics of the disposition bias

Name	Mean	Standard deviation	Excess kurtosis	Skewness
DP 1	4.641679	1.669979	-0.96825	-0.22691
DP 2	4.502249	1.75562	-0.9827	-0.28847
DP 3	4.578711	1.791127	-1.03933	-0.35454
DP 4	4.662669	1.672557	-0.91297	-0.25105
DP 5	4.58021	1.708686	-1.00792	-0.2469

Table 3: Descriptive statistics of the herding bias

Name	Mean	Standard deviation	Excess kurtosis	Skewness
HB 1	4.5682	1.80409	-.938	-.379
HB 2	4.5982	1.72698	-.825	-.431
HB 3	4.5847	1.80005	-1.005	-.369
HB 4	4.6732	1.76755	-.934	-.375
HB 5	4.2954	1.52694	-.591	-.044

The herding bias of a mutual fund investor is measured with the help of four statements included in the questionnaire. Descriptive analysis was performed on the responses received against the statements measuring herding bias, and the results are reported in table 3.

The loss aversion bias of a mutual fund investor is measured with the help of four statements included in the questionnaire. Descriptive analysis was performed on the responses received against the statements measuring loss aversion bias, and the results are reported in table 4.

Name	Mean	Standard deviation	Excess kurtosis	Skewness
LAB 1	4.5682	1.4225	-0.62	-0.138
LAB 2	4.5922	1.49126	-0.462	-0.147
LAB 3	4.6747	1.5818	-0.846	-0.167
LAB 4	4.7286	1.49969	-0.457	-0.495
LAB 5	4.7286	1.55282	-0.772	-0.297

The overconfidence bias of a mutual fund investor is measured with the help of four statements included in the questionnaire. Descriptive analysis was performed on the responses received against the statements measuring the loss overconfidence bias, and the results are reported in table 5.

Name	Mean	Standard deviation	Excess kurtosis	Skewness
OC 1	4.4078	1.54564	-.550	-.175
OC 2	4.3673	1.54172	-.677	-.045
OC 3	4.4648	1.50571	-.424	-.242
OC 4	4.4633	1.62093	-.769	-.169
OC 5	4.4633	1.55183	-.625	-.201

Reliability and validity analysis

The table 5 displays Cronbach's alpha coefficients for numerous psychological and behavioral constructs, indicating their reliability as assessment tools. The four biases—disposal bias, herding bias, loss aversion bias, and overconfidence bias—consistently demonstrate high reliability, with alpha values spanning a range of 0.841 to 0.877. Agreeableness exhibited the highest reliability of all personality traits, with a coefficient of 0.91, thereby highlighting its robust internal consistency. Extroversion (0.857) and Conscientiousness (0.864) demonstrated substantial reliability, underscoring the dependable nature of their measurement. Neuroticism (0.879) and

Openness (0.878) were shown to be highly reliable, with consistent results from items measuring these personality characteristics. The Cronbach's alpha values indicate that the instruments employed are statistically reliable for examining both biases and personality traits. Therefore, the study findings indicate a reliable internal consistency in the responses received.

Construct Validity

The construct validity of the measurement scale was assessed using confirmatory factor analysis (CFA), focusing on two key components: convergent validity and discriminant validity. The extent to which items measuring the same construct are correlated is assessed through the examination of construct loadings, composite reliability (CR), and average variance extracted (AVE). Factor loadings indicate the magnitude of the correlation between each item and its associated factor, whereas the Composite Reliability (CR) verifies the internal reliability, with satisfactory levels exceeding 0.7. A construct is deemed to have an adequate measure of variance when its AVE exceeds 0.5. In contrast, discriminant validity evaluates whether different constructs are unique and separable from one another. Evaluation was conducted using the Heterotrait-Monotrait (HTMT) ratio and the Fornell-Larcker criteria. The HTMT ratio determines the strength of the correlations between distinct constructs, with values below 0.8 suggesting sufficient discriminant validity. According to the Fornell-Larcker criteria, the square root of the average variance extracted (AVE) for each construct should be greater than its correlations with other constructs, thereby verifying that the measurement scale accurately represents its intended constructs and maintains a clear differentiation between them. The findings of these validity evaluations are summarized in tables for further analysis.

Convergent validity

The table 5 contains important statistics on the reliability and validity of various psychological and behavioral constructs, with data derived from Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). The values of Cronbach's alpha, spanning 0.841 to 0.91, suggest robust internal consistency among the constructs. The composite reliability values show robust reliability, with each construct surpassing the minimum required threshold of 0.7. The AVE values, which assess the proportion of variance attributed to a construct as opposed to measurement error, all exceed or closely approach the minimum threshold of 0.5, thereby validating convergent validity. Agreeableness displays the highest Average Variance Extracted (AVE) value of 0.626, indicating strong convergent validity, whereas Overconfidence Bias has the lowest AVE value of 0.503, meeting the minimum requirement. The agreement between CR values and Cronbach's alpha coefficients reinforces the reliability of the scales. The collective results show that the measurement scales are both reliable and valid for evaluating the constructs examined in the study

Table 5: Composite reliability, AVE and Cronbach alpha coefficient

	Cronbach's alpha	Composite Reliability	Average variance extracted (AVE)
Disposition Bias	0.864	0.859	0.551
Herding Bias	0.877	0.875	0.584
Loss Aversion Bias	0.872	0.843	0.556
Overconfidence Bias	0.841	0.833	0.503
Agreeableness	0.91	0.909	0.626
Conscientiousness	0.864	0.861	0.555
Extroversion	0.857	0.854	0.595
Neuroticism	0.879	0.878	0.595
Openness	0.878	0.879	0.51

Discriminant validity

The Fornell-Larcker criteria are used to assess discriminant validity by comparing the square root of the AVE for each construct with its correlations with other constructs. For the measurement scale, the diagonal elements in the table represent the square root of the AVE values, while the off-diagonal elements represent the correlations between constructs.

The Fornell Larcker criteria

The results indicate that the square root of the AVE for each construct exceeds its correlations with other constructs, satisfying the Fornell-Larcker criteria for discriminant validity. For instance, Agreeableness ($\sqrt{\text{AVE}}=0.791$) is greater than its highest correlation with other constructs (0.415 with Openness). Similarly, Conscientiousness ($\sqrt{\text{AVE}}=0.74$) is greater than its highest correlation (0.643 with Extroversion). Other constructs such as Herding Bias ($\sqrt{\text{AVE}}=0.764$), Loss Aversion Bias ($\sqrt{\text{AVE}}=0.762$), and Neuroticism ($\sqrt{\text{AVE}}=0.704$) also satisfy the criteria. This demonstrates that the constructs are distinct from each other and the measurement scale effectively differentiates between the latent variables included in the study.

Table 6: Discriminant validity of constructs.

	Agreeableness	Behavioural Bias	Conscientiousness	Disposition Bias	Extroversion	Herding	Loss Aversion Bias	Neuroticism	Overconfidence Bias	Openness
Agreeableness	0.791									
Behavioural Bias	0.306	0.58								
Conscientiousness	0.355	0.137	0.74							
Disposition Bias	0.171	0.789	0.019	0.751						
Extroversion	0.241	0.109	0.643	-0.004	0.754					
Herding Bias	0.248	0.814	0.176	0.259	0.156	0.764				
Loss Aversion Bias	0.185	0.874	0.083	0.675	0.027	0.372	0.762			
Neuroticism	-0.464	-0.161	-0.539	-0.051	-0.473	-0.195	-0.065	0.704		
Overconfidence Bias	0.338	0.914	0.141	0.401	0.153	0.738	0.496	-0.184	0.725	
Openness	0.415	0.234	0.596	0.11	0.503	0.18	0.191	-0.467	0.237	0.70

Big Five model of personality traits and behavioural biases

This section discusses about the relation between the Big Five model of personality traits and behavioural biases of Indian individual mutual fund investors. The objective is fulfilled with the help of SEM applied using SmartPLS software.

The different selected factors namely personality traits (Agreeableness, Conscientiousness, Extroversion, Neuroticism, and Openness) are assumed to impact the Behavioural Intention of the investors to invest in the mutual funds. The personality traits of investors are measured with the help of five components namely agreeableness, conscientiousness, extroversion, neuroticism and openness. The included factors are measured with the help of different statements included in the questionnaire. The included factors are reflective in nature and assumed as independent variable in the structural model developed for the purpose of hypothesis testing. The behavioural biases (Disposition Bias, Herding Bias, Loss Aversion Bias and Overconfidence Bias) are assumed to be influenced by the personality traits of the investors. The four dimensions of the behavioural biases are reflective in nature, measured with the help of statements included in the questionnaire and assumed as dependent variable in the structural model developed for the purpose of hypothesis testing. The following hypotheses are examined with the help of structural equation modelling method using Smart PLS software.

H1: "Agreeableness trait of the investor significantly influence their behavioural Bias"

H2: "Extroversion trait of the investor significantly influence their behavioural Bias"

H3: "Conscientiousness trait of the personality significantly influences their behavioural Bias."

H4: "Neuroticism trait of the personality significantly influences their behavioural Bias"

H5: "Openness trait of the personality significantly influences their behavioural Bias"

The structural model is shown below in figure and the results of hypothesis testing are reported in table.

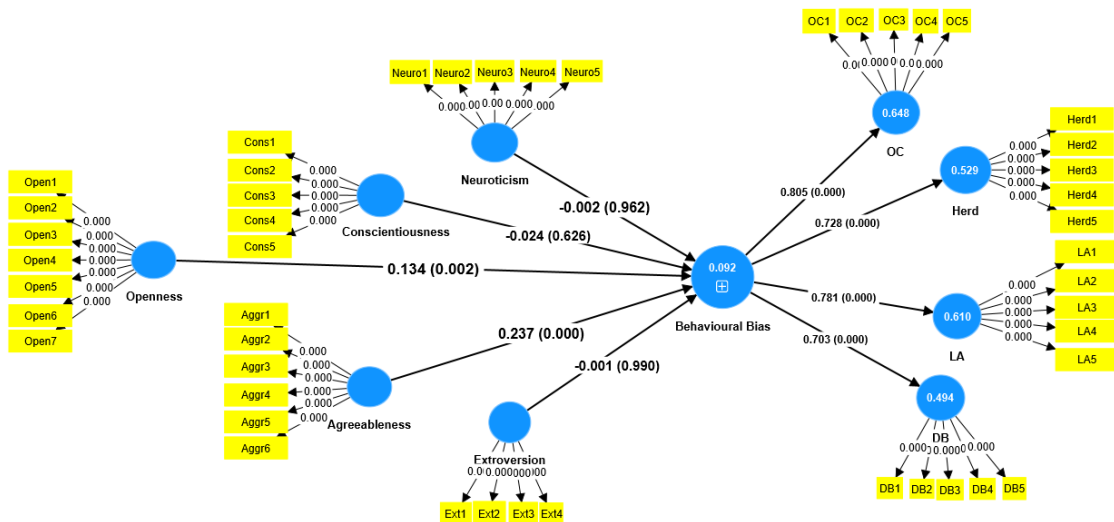


Table 7: Summary of test results for the structural model.

	Path coefficient	Standard Error	T stats	P values	R Square (Q Square)
Agreeableness -> Behavioural Bias	0.233	0.041	5.755**	0.000	10% (0.08)
Conscientiousness -> Behavioural Bias	-0.022	0.05	0.487	0.62	
Extroversion -> Behavioural Bias	0.009	0.044	0.012	0.99	
Neuroticism -> Behavioural Bias	-0.012	0.042	0.047	0.962	
Openness -> Behavioural Bias	0.132	0.043	3.124**	0.002	
Behavioural Bias -> DB	0.703	0.026	26.835	0.000	
Behavioural Bias -> Herd	0.728	0.025	29.626	0.000	
Behavioural Bias -> LA	0.781	0.021	37.566	0.000	
Behavioural Bias -> OC	0.806	0.014	56.792	0.000	

Conclusion (H_{2a}): The results of the SEM analysis found to support the hypothesis that “*Agreeableness trait of the investor significantly influence their Behavioural Bias*”. The path coefficient indicating the influence of agreeableness personality trait on the behavioural bias of the investors of the mutual fund is found to be positive and statistically significant (path coefficient=0.233, t-stats=5.755). Thus, it can be concluded that the agreeableness personality trait positively influences the behavioural bias of the investors of the mutual fund.

Conclusion (H_{2b}): The results of the SEM analysis failed to support the hypothesis that “*Conscientiousness trait of the investor significantly influences their Behavioural Bias*”. The path coefficient indicating the influence of Conscientiousness personality trait on the behavioural bias of the investors of the mutual fund is found to be statistically insignificant (path coefficient=-0.022, t-stats=0.487). Thus, it can be concluded that the conscientiousness personality trait do not influences the behavioural bias of the investors of the mutual fund.

Conclusion (H_{2c}): The results of the SEM analysis failed to support the hypothesis that “*Extroversion trait of the investor significantly influences their Behavioural Bias*”. The path coefficient indicating the influence of extroversion personality trait on the behavioural bias of the investors of the mutual fund is found to be statistically insignificant (path coefficient=0.009, t-stats=0.012). Thus, it can be concluded that the extroversion personality trait do not influences the behavioural bias of the investors of the mutual fund.

Conclusion (H_{2a}): The results of the SEM analysis failed to support the hypothesis that “*Neuroticism trait of the investor significantly influences their Behavioural Bias*”. The path coefficient indicating the influence of Neuroticism personality trait on the behavioural bias of the investors of the mutual fund is found to be statistically insignificant (path coefficient=-0.012, t-stats=0.047). Thus, it can be concluded that the Neuroticism personality trait do not influences the behavioural bias of the investors of the mutual fund.

Conclusion (H_{2e}): The results of the SEM analysis found to support the hypothesis that “*Openness trait of the investor significantly influences their Behavioural Bias*”. The path coefficient indicating the influence of openness personality trait on the behavioural bias of the investors of the mutual fund is found to be positive and statistically significant (path coefficient=0.132, t-stats=3.124). Thus, it can be concluded that the openness personality trait positively influences the behavioural bias of the investors of the mutual fund.

Conclusion

Results from the Structural Equation Modeling (SEM) analysis verify the hypothesis that agreeableness is a key trait that significantly impacts the behavioral biases of an investor. The statistically significant positive relationship indicated by the path coefficient (0.233, t -statistic = 5.755) suggests that investors with higher agreeableness tend to make mutual fund investment decisions influenced by behavioral biases. Previous research, as seen in Yadav and Narayanan (2021), indicates that agreeableness is linked to characteristics such as a reliance on external advice and herding behavior, which suggests a susceptibility to biases. According to Ozer and Mutlu (2019), individuals with agreeable traits, marked by trust and cooperation, tend to rely more heavily on social cues, which can lead to a herd mentality in making financial decisions. According to these findings, personality characteristics, especially agreeableness, have a significant impact on investor prejudices, underscoring the necessity for tailored approaches to counteract these inclinations in mutual fund investments.

The research findings demonstrate that openness as a personality trait has a substantial impact on the behavioral biases of mutual fund investors. A statistically significant path coefficient of 0.132 (t -statistic = 3.124) suggests that individuals with greater openness are more prone to exhibiting behavioral biases in their investment choices. Research supporting this discovery is consistent with the findings of Ahmad and Maochun (2019), which revealed that a trait marked by intellectual curiosity and a desire to explore is linked to risk-taking and innovative actions, typically resulting in a susceptibility to biases such as overconfidence. Research by Ozer and Mutlu (2019) revealed that people who are open-minded and driven by creativity and adaptability often rely on unusual sources of information, which can make them more susceptible to biased thinking. These findings highlight the vital impact of openness in influencing investment behavior, underscoring the need to consider personality characteristics when creating investor education and advisory approaches.

Limitations and Directions for Future Research

The research investigation recognizes several constraints that offer potential avenues for further study. The investigation is focused on a particular subset of personality characteristics and behavioral inclinations, thus allowing for further examination of other traits, predispositions, and the possible moderating influence of demographic factors like age, income, and educational level. Expanding the scope of the study could provide a more complete understanding of investor behavior. Although this study is based on primary data, supplementing it with secondary sources could improve the reliability and quality of its conclusions by cross-referencing. The narrow focus on Indian mutual fund investors restricts the broader applicability of the findings. Future studies may expand the analysis to include investors from other nations, facilitating comparisons across cultures. The use of survey-based self-reported data may lead to biases, including social desirability and non-response bias, which could compromise the accuracy of the research results. Using a combination of methodologies and objective behavioral data could help to address these limitations and enhance the reliability of future studies.

Theoretical Contribution

This study makes significant theoretical contributions by exploring the interplay between the Big Five personality traits and behavioral biases among Indian mutual fund investors, a context that has been under-researched. By integrating personality psychology and behavioral finance, it extends the understanding of how intrinsic traits influence irrational investment decisions. The findings validate theoretical frameworks that link agreeableness and openness to behavioral biases, contributing to the broader discourse on personality-driven financial behavior. Furthermore, the study enriches the literature by employing a robust methodology using Structural Equation Modeling (SEM), which provides empirical evidence for personality-behavior relationships, laying the groundwork for future cross-cultural and demographic-specific studies.

Practical Contribution

From a practical perspective, this research has implications for financial advisors, investment managers, and policymakers. By identifying the significant influence of agreeableness and openness on behavioral biases, the study provides actionable insights for tailoring investor education programs and advisory services. Financial advisors can use personality assessments to design customized strategies that mitigate the impact of biases, leading to improved investment outcomes. Additionally, the findings highlight the need for incorporating behavioral assessments into financial planning tools to foster better decision-making among investors. For policymakers, understanding these dynamics can inform the design of interventions aimed at enhancing market efficiency and protecting investors from the adverse effects of irrational behaviors.

Suggestions and Future Scope

This study highlights the need for incorporating personality assessments in investment advisory practices to better understand and address behavioral biases. Financial advisors and mutual fund companies should develop personalized investor education programs based on individual personality profiles, particularly focusing on traits like agreeableness and openness which significantly influence biases. For future research, scholars are encouraged to:

Extend this study across different cultural and economic contexts to improve generalizability.

Explore additional psychological constructs such as emotional intelligence, risk tolerance, or financial literacy alongside personality traits.

Employ mixed-method approaches, combining survey data with behavioral experiments or transactional data, to validate findings with real-world behaviors.

Investigate the potential mediating or moderating role of demographic factors like age, income, or investment experience in the relationship between personality and behavioral bias.

Such expanded research will deepen the understanding of behavioral finance and support the creation of more effective investor support systems.

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The Socio-Economic Determinants of Service Sector Contribution in India - An Empirical Study Based on Sstate Level Panel Data

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Abstract

In this paper we empirically explore the factors that explain India's service sector share in state level gross value added for the period 1990-2023 on the basis of panel data of 33 states and union territories. The service sector share is explained with the help of socio-economic, governance, infrastructure indicators and urbanisation. Crucial interactive terms among development indicators are used in the panel regression. Our panel data regression results suggest that urbanisation, per capita net state domestic product, infrastructure indicators and social spending have significantly positive influences on state level service sector share in India. However, poverty, agricultural share and poor governance have depressing influences. Factors like labour force participation rate for urban areas and female literacy rate also augment the share of the services. Urbanisation is found to have positive and significant interactions with education, infrastructure and development indicators and these interactive variables have positively influences service sector share. We conclude that in India, share of services may increase further with greater urbanization, higher social sector spending coupled with improved infrastructure and governance.

Keywords: Service Sector, Urbanisation, Infrastructure, Socio-Economic Factors and Panel Data.

JEL classification: O14, O18, C23.

Introduction

The service sector, also known as the tertiary sector, includes a variety of economic activities covering health services, tourism and hospitality, trading, banking and insurance, transportation, education, community and personal services, construction and real estate, security, management and technical consultancy services among many others. Moreover through exports of services the sector also has a major impact on foreign exchange earnings and thus contributes greatly to economic growth and development. India is a labour surplus country and in order to absorb workers in the non-agrarian sector, there is an urgent need to shift to the tertiary sector given that India's manufacturing is not much labour absorbing. This is because employment elasticity with respect to output in manufacturing is low, as a consequence of which labour absorption capacity of modern manufacturing is extremely limited (Bhalotra, 1998).

In recent years, India has experienced a rapid shift towards non-agrarian economic activities with service sector contributing to more than fifty five percent to gross value added at the national level. A comparison of the sectoral shares over time reveals that since the 1990s till date, India's structural shift has gone against agriculture and allied activities. The agricultural activities contributed around 28 percent to gross value added back in 1991-92 but this share is currently just about 16 per cent. Interestingly, manufacturing sector had a share of around 26 percent in 1991-92 and even after three decades this share has roughly remained the same. In contrast, the service sector has been growing both in real value as well as in terms of the share in gross value added and it currently contributes more than fifty percent to gross value added. The Economic Survey 2019-20 (chapter 9, pp.254), shows that share of services exceeded fifty percent of Gross Value Added for 15 of the 33 states and Union Territories of India. For highly urbanized union territories like Delhi and Chandigarh contribution from the service sector is more than 80 percent. The global shift in FDI in favour of the services sector has been recognised by Doytch and Uctum (2011) although the focus of their study is economic growth. According to Gordon and Gupta (2005), a possible explanation behind the rapid growth of this sector is that the demand for service is income elastic as a result of which demand for service rises faster than the demand for goods as income increases.

The process of urbanisation is usually accompanied by a rise in urban incomes which potentially leads to the rising demand for basic urban services like housing and construction, water and energy supplies, transport and communications (including telecom), and most importantly health and educational services. Urbanisation also necessitates demand for financial services such as banking, finance, and insurance, besides a range of utility services that are usually associated with urban living and urban life-styles. During the post-1991 era, the

percentage of urban population of India has increased from 26% in 1991 to 28.53% in 2001 (Census of India, 2001). More recently World Bank data reveals that the percentage of urban population in India has further risen up to 36.36 per cent in 2023-24. It is natural that with rising urbanisation, service industries would respond to meet the ever rising demand for services.

According to the World Bank, in 1991-92 India's employment share in agriculture and allied activities was 63.41 percent which dropped to 40.65 percent in 2019-20. In case of manufacturing industries India's employment share was 14.57 percent in 1991-92, which grew up to 25.25 percent in 2019-20 and further to 26.12 percent in 2022-23, indicating a steady rise in employment share in manufacturing over time. In case of the service sector, the employment share grew from 22.02 percent in 1991-92 to 34.10 percent in 2019-20. Thus in case of India, the decline of agricultural share in total employment has been associated by a rise in employment share both in manufacturing as well as in services.

Table 1. Percentage share of GDP across broad sectors for selected countries							
Regions	Country	1991-92			2019-20		
		AGRI	INDUS	SERVS	AGRI	INDUS	SERVS
SOUTH ASIA	India	27.66	26.44	37.79	16.76	24.59	50.08
	Bangladesh	31.68	21.12	44.36	11.98	32.85	50.85
	Sri Lanka	27.09	25.90	47.02	7.26	29.19	55.75
SOUTH EAST ASIA	Thailand	12.65	38.66	--	8.13	33.59	58.28
	Malaysia	14.36	42.11	44.82	7.24	37.48	54.15
	Korea	6.82	37.15	47.15	1.67	32.68	57.24
	China	24.03	41.49	34.48	7.14	38.59	54.27
	Vietnam	40.49	23.79	35.72	11.78	36.80	42.47
Advanced Industrial	UK	1.23	26.72	68.73	0.60	17.66	71.09
	France	2.61	24.30	62.82	1.52	17.42	70.04
	Australia	3.17	27.65	61.30	1.04	28.80	69.63

Source: Secondary data drawn from the World Bank.

Notes: Construction has been accommodated under services. Figures are in (%).

For most of the OECD countries around the world "services" is the largest component of their economies. Table 1 presents the percentage shares of sectors in respective GDPs for selected countries for two different years - 1991-92 and 2019-20. The figures show that for advanced industrial countries the service sector contributes around 70 percent to GDP, despite being manufacturing giants in absolute terms. Among South Asian countries India's agricultural contribution dropped from around 28 percent in 1991-92 to almost 17 percent in 2019-20. However, the service sector share picked up from 38 percent in 1991-92 to around 50 percent in 2019-20. For Sri Lanka however, agricultural contribution dropped from 27 percent in 1991-92 to just 7.26 percent in 2019-20. Share of services rose up to almost 56 percent in 2019-20 from 47 per cent in 1991-92. Similarly, among Southeast Asian countries, Vietnam's agricultural contribution dropped from 40 percent to almost 12 percent over the past three decades. For China however, the agricultural share was even lower at about 7 percent. India's agricultural share on the other hand, is the highest among the countries considered in table 1. Evidently, India's agricultural share did not decline in line with South Asian, ASEAN, and advanced industrial countries.

A couple of observations are in order. First, India's industrial share in GDP was below 25 percent in 1991-2019 (a drop from 26.44 % in 1991-92 to 24.59 % in 2019-20) while most Southeast Asian countries have had an industrial share of around 35 percent, considerably higher than India's. Second, during the post reforms era, India's structural transformation has been away from agriculture but has not moved significantly in favour of manufacturing industries but has rather moved more in favour of the tertiary or the services sector.

The focus of the present paper is entirely on service sector share as because the relative importance of the sector can be more appropriately captured by its share in state level gross value added (GVA). The statistics on service sector shares in GVA across India for 2019-20 (Economic Survey 2019-20, vol. 2, Table 3, pp. 256) reveals some remarkable disparities. For example, Delhi (84.1%), Chandigarh (86.7%), Karnataka (65.4%), Telangana (64.7%), Kerala (62.7%), Maharashtra (57.6%) and West Bengal (57.5%) among few others, have formidable shares of the service sector in state GVA. At the other extreme, states like Uttar Pradesh (48.8%) Jharkhand (44.8%), Odisha (41.8%), Uttarakhand (40.5%), Tripura (39.7%), Chhattisgarh (37.1%), Madhya Pradesh (35.9%) among a few others have service sector shares far below the national average. Two significant exceptions are Gujarat and Bihar. While Bihar, a primarily poor state (26.59% below the poverty line as per head count ratio

in 2011-12¹), had a service sector share of 61.1 percent in 2019-20, Gujarat had a service sector share of just 35.7 percent in the same year. Admittedly, industrial share of Gujarat² was at 44.50 percent, currently amongst the highest for Indian states. Table A1 in Appendix 1, presents the state-wise sectoral shares (%) in state level Gross Value Added (GVA) for India for 1991-92 and 2023-24 where industry has been merged with services. Computations are on the basis of RBI data for sectoral shares in GVA. Although wide inter-state variations exist in the shares for the same year, it is evident that almost all states have a higher service sector share in 2019-20 compared to 1991-92. Moreover agricultural share has dipped for most states with industrial or manufacturing share remaining the same or improving marginally. The objective of the study is presented next.

Research Objectives

The key objective of this paper is to explain state level share of the service sector across Indian states and union territories for the period 1990 to 2023 on the basis of state level socio-economic indicators, governance indicators, infrastructure indicators and the level of urbanisation.

In line with this objective, the fundamental research question that we address in this paper is that, “can we explain service sector share across Indian states on the basis of urbanisation, development, infrastructure and governance indicators?” In view of our exploratory motive, we include urbanisation, infrastructure, governance, female literacy, labour force participation, poverty, access to safe drinking water, health attainments, per-capita income, along with a host of interaction terms under a panel regression framework to explain the share of the service sector across Indian states. This approach to exploring the determinants of service sector share across Indian states is not reported in literature and is thus unique.

This paper is presented in the following sections. After having introduced to the topic in section 1, we present a brief review of relevant literature in section 2 followed by methodological and data related issues in section 3. Empirical results and analysis are presented in Section 4 while section 5 summarizes the entire study and concludes.

Review of Literature

The fact that service sector contributes to economic growth and development is an empirically well observed and has been sufficiently reported. An overview of available literature reveals that the principal focus of most of the studies in this area has been on impact of the service sector (and even service sector trade) on economic growth (e.g., Balakrishnan and Parameswaran 2007, Eichengreen and Gupta 2011, Dash and Parida 2012, Dasgupta and Singh 2005, Verma 2010, Wu 2007, among others). However, just a handful of studies are available on the socio-economic determinants of service sector share especially in the Indian context where rapid urbanisation is a relatively recent phenomenon. Consequently there exists sufficient scope for empirical research in this area. This paper fills this gap by explaining India's state level service sector share in terms of urbanisation along with a host of relevant socio-economic factors.

In the early 1990's an academic debate had emerged that questioned the sustainability of rapid progress of the service sector in India in terms of its size and percentage share in national income. According to Bhattacharya and Mitra (1990), the ever rising trend experienced by the service sector share in India's national income is a matter of debate. The authors investigated the growth patterns of the service sector and its implications for overall growth and inequality in India during 1950-87. The study raised the question whether rapid growth of the service sector in India can be sustained over a long periods of time without serious implications on balance of payments, inflation, and distribution of income.

Gordon and Gupta (2005), analyze the factors that explain the growth of the services sector in India. The authors demonstrate that growth of service throughout the 1990s was mostly due to rapid growth in communications, financial, and IT services. Among other factors the authors identified high income elasticity of service demand, use of services as inputs and the exports of services. Moreover, they observe that there is a substantial scope for further growth of India's tertiary economy given that deregulation of this sector continues. Another key observation is that growth of employment in the Indian service sector has been moderate.

In a significant study Chakravarty (2006) examine inter-sectoral state level domestic product data to study the factors explaining the growth of the service sector in India. Adopting a demand-side approach, the analysis

¹ Reserve Bank of India: Handbook of Statistics on Indian Economy, Table 154: Number and Percentage of Population below Poverty Line. (2011-12).

² Directorate of Economics and Statistics of the Respective State/UTs (accessed at www.mospi.gov.in).

considers that the state specific service sector output is dependent on the outputs of its agriculture and industry as well as on the output of the commodity-producing sector. The findings indicate that, a state's own industry is the key determinant of service sector growth. However, the commodity-producing sector outside the state also plays a key role in determining the performance of the service sector at the state level.

Uwitonze and Heshmati (2016) observe that service sector is an appropriate mode of structural transformation as because most less developed countries have a weak industrial base. With the process of structural adjustment and globalization several African nations have shifted more towards the service sector. The study identifies factors that determine the development of the service sector. These factors could be used for framing policies towards rapid development of the service sectors. On somewhat similar lines Iqbal *et al* (2018) carried out a comparative analysis of chosen developed and developing economies to discern key factors influencing service sector growth. Employing both static and dynamic panel data estimation methods, the findings imply that trade openness has a dampening effect on the growth of the service sector. In both types of countries per capita GDP and FDI positively influence service sector growth. However, according to authors, trade openness seems to have a negative influence on the same. For less developed countries, innovations have a positive and significant role in determining service sector growth.

An ARDL approach was adopted by Raboloko (2018) to study the factors influencing the growth of the service sector in Botswana for the period 1980-2015. The findings indicate that positive contributions to the growth of Botswana's services sector originate from gross national expenditure, domestic credit to the private sector, and gross fixed capital formation. However, a negative impact is observed in case of trade openness. Atif and Liu (2018) investigate the factors influencing the expansion of service sector in Pakistan. The study finds that increased per capita income, capital accumulation, and urbanization foster positive growth in the service sector. However, the paper observes an adverse effect of trade liberalization on Pakistan's services growth.

Kolko (2010) is of the view that service sector dominates USA and other advanced economies and the economic future of urban centres depends crucially on the service sector. Focusing on agglomeration of service industries, the study finds that the service sector is relatively more urbanized compared to the manufacturing sector. Using co-integration, error-correction and Granger causality, Hong (2012) finds a long run equilibrium relation between urbanisation and service sector growth in China. In particular, findings suggest that urbanisation Granger-causes service sector growth implying a unidirectional causality. On somewhat similar lines, Cheng (2013) observes a dynamic relationship between urbanisation and service sector growth for China. The study observes that Chinese urbanisation has been responsible for rapid growth of service sector industries. Moreover based on co-integration and causality tests, the findings suggest that Chinese urbanisation and service sector have been closely association over time.

Our line of exploration in this paper is quite new and innovative where focus is on service sector share and its correlates. We take per capita net state domestic product, the degree of urbanization, infrastructure indicators like roads and electricity availability, educational attainments, poverty and other relevant socio-economic indicators as explanatory variables under a panel data set-up in order to investigate the factors influencing the share of the service sector in India. We also incorporate selected governance indicators such police availability per lakh population and transmission and distribution loss in electricity among a few others, and examine how they explain the state-level share of service sector. In line with Daniels (2012), we take urbanisation as a crucial explanatory factor behind contribution of the service sector and allow urbanisation to interact with several key explanatory variables including education and infrastructure in our state level panel regression.

Methodology and Data

Statistical and Econometric Methods

The present paper uses the panel data linear regression model in log-linear form where service sector share at the state level is taken as the dependent variables. Independent variables include macroeconomic variables, infrastructure variables, social sector and governance variables. All variables are appropriately normalized. Moreover variables are in natural logarithm except the linear time trend term which is included in the regression model as because service sector share for India is trended over the study period. Two significant advantages of logarithmic transformation of variables in linear regression are that, (i) the regression coefficients can be interpreted as the elasticities of service sector share with respect to various factors, and (ii) linearization of long-run macroeconomic data which usually is nonlinearly trended. Moreover it may assist in reduction of heteroscedasticity in the errors. Log-transformations can potentially make the data more normal or symmetric. Especially the skewness of a variable may be controlled to a large extent by logarithmic transformation.

Equations are obvious from the regression results presented in table 3 and hence are avoided. Particularly, in log-linear terms, service sector share (SERVS) at the state level (the dependent variable) is explained by per capita income (PCNSDP), the degree of urbanisation (URBAN, or share of urban population), share of agriculture and allied activities in GVA (i.e., AGRI), industrial or manufacturing sector share in state GVA (INDUS), head count poverty ratio (BPL in percentage), social sector spending (SSS, which is taken as the sum of state level government expenditures on health and education expressed in per capita terms), population density (DENSITY, persons per square kilometer), female literacy rate (FLR), life expectancy at birth (LEB), per capita capital expenditure (CAPEX), labour force participation rate for urban areas (LFPRU), per capita state level electricity availability (ELECT, in MW per capita), highway length per 100 sq.km state area (ROADS). Two governance indicators are taken as explanatory variables. These are transmission and distribution loss (i.e., TDL in percentage) and percentage of population having access to safe drinking water (SDW). TDL represents a leakage from the system and is hence an indicator of poor governance (Dash and Raja, 2009). In addition police availability per lakh population (POLICE) is taken as a crime control instrument at the state level. All variables are appropriately normalized.

In sum, in order to explain service sector share we take development indicators, infrastructure indicators (including infrastructure spending), social-sector spending per capita (SSS) and governance indicators as explanatory variables where urbanisation plays a pivotal role. The uniqueness of our panel regression lies in the inclusion of selected interaction terms with the degree of urbanization in the regression models. Highly correlated variables are avoided in the same regression model in order to tackle collinearity issues and as such three alternative log-linear models are presented where all variables are not included in all models. In order to adjust for serial correlation in the residuals a one period lagged SERVS term is introduced as a regressor which results in a dynamic panel data model. Throughout this paper we take construction as a part of the service sector. Variable definitions and data sources are provided in Appendix 2. FDI at the state level is not considered as it is available only for a handful of states over the study period.

Data

The time period for the present study is 1990 – 2023 (i.e., 33 years) covering 33 Indian states and union territories. The data for the present study is entirely secondary in nature primarily drawn from the RBI: Handbook of statistics on the Indian Economy (various issues), Census of India (1991, 2001, and 2011) and CSO (Ministry of Statistics and Programme Implementation), NHFS (various issues) and NCRB (various issues). To understanding the degree of association between variables a simple correlation analysis is also done as a precursor to panel regression. Also, models with regression coefficients that are statistically insignificant at 10 percent level are not reported. Detailed list of all variables, definitions and data sources are in Appendix 1. A critical econometric issue in our panel regression is whether our key explanatory variables namely, PCNSDP, URBAN and ELECT are exogenous in determining SERVS. In Appendix 2, we present the two stage least squares – instrumental variable (2SLS-IV) results for testing the exogeneity of PCNSDP, URBAN, ELECT and ROADS.

Empirical Results and Analysis

The simple bivariate correlation coefficients across selected pairs of most crucial variables are presented in Table-2. Referring to the SERVS column, service sector share is found to be significantly positively associated with PCNSDP as well as URBAN.

Variable	SERVS	PCNSDP	INDUS	URBAN	AGRI	LEB	BPL	SEX	FLR	ELECT	ROADS
SERVS	1.000										
PCNSDP	0.539 (0.000)	1.000									
INDUS	-0.564 (0.000)	0.199 (0.107)	1.000								
URBAN	0.722 (0.000)	0.742 (0.000)	0.211 (0.051)	1.000							
AGRI	-0.542 (0.000)	-0.771 (0.000)	-0.119 (0.054)	-0.713 (0.000)	1.000						
LEB	0.201 (0.041)	0.499 (0.000)	0.277 (0.049)	0.397 (0.000)	-0.223 (0.058)	1.000					
BPL	-0.094 (0.366)	-0.433 (0.000)	-0.333 (0.022)	-0.332 (0.011)	0.354 (0.013)	-0.298 (0.051)	1.000				
SEX	0.346	0.237	-0.015	0.346	-0.088	0.213	-0.110	1.000			

	(0.001)	(0.061)	(0.265)	(0.001)	(0.396)	(0.088)	(0.288)				
FLR	0.514 (0.000)	0.681 (0.000)	0.199 (0.056)	0.609 (0.000)	-0.616 (0.000)	0.012 (0.906)	-0.414 (0.000)	0.331 (0.004)	1.000		
ELECT	0.297 (0.004)	0.787 (0.000)	0.347 (0.031)	0.678 (0.000)	-0.578 (0.000)	0.381 (0.000)	-0.369 (0.000)	0.216 (0.036)	0.436 (0.000)	1.000	
ROADS	0.239 (0.019)	0.394 (0.001)	0.399 (0.019)	0.443 (0.007)	-0.102 (0.093)	0.356 (0.006)	-0.199 (0.054)	0.271 (0.008)	0.158 (0.088)	0.257 (0.052)	1.000

Source: Computed by the researcher based on state level secondary data.

Notes: The bivariate correlations are computed on the basis of panel data for the state level covering 33 states and UTs for the period 1990-91 to 2023-24. Included observations equal 798. Figure in parenthesis are P-values.

Richer and relatively more urbanization states tend to have higher share of the service sector in GVA. However, states that are agriculturally dominant have lower service sector share as is evident from the negative and significant correlation between service sector share and AGRI. Life expectancy at birth (LEB) is significantly positively associated with service sector share meaning that overall health status influences service sector contribution. Higher poverty ratio is a deterrent for the service sector share and this is evident from negative association between BPL and SERVS. Better sex ratio states and states with higher level of female literacy tend to have higher service sector share. Both the physical infrastructure indicators ELECT and ROADS are significantly positively associated with SERVS indicating that physical infrastructure is a vital social overhead requirement or a pre-requisite for a vibrant service sector. A key observation in the first column in Table 2 is the significantly negative association (correlation value being -0.564, significant at 1%) between service sector share (SERVS) and industrial sector share (INDUS). The overall implication is that in India, states with higher service sector share tend to have lower industrial share.

We next turn to our panel regression results. Table 3 presents three alternative log-linear dynamic panel regression models for state level panel data where the service sector share in state level gross value added (SERVS) is explained by a host of explanatory factors. The industrial share in GVA (i.e., INDUS) is kept as a regressor throughout all models in order to control for the influence of industrialization on SERVS.

Table 3. Panel regression of service sector share on state-level factors			
Explanatory Variables	Model 1	Model 2	Model 3
CONSTANT	-0.399 (0.111)	-0.437 (0.091)	-0.479(0.099)
LOG(SERVS(-1))	0.738**(0.000)	0.739**(0.000)	0.738**(0.000)
LOG(PCNSDP)		0.133**(0.000)	
LOG(URBAN)	0.339**(0.000)		0.337**(0.000)
LOG(URBAN(-1))	0.002 (0.067)	0.011 (0.052)	0.001 (0.068)
LOG(AGRI)		-0.270**(0.000)	
LOG(BPL)	-0.091*(0.033)		-0.089*(0.043)
LOG(INDUS)	-0.131(0.132)	-0.119(0.114)	-0.147(0.213)
LOG(CAPEX)		0.556*(0.042)	
LOG(SSS)	0.009(0.058)	0.010(0.077)	0.017*(0.049)
LOG(ROADS)	0.045*(0.013)		
LOG(ELECT)		0.877*(0.047)	0.623*(0.039)
LOG(FLR)	0.001(0.091)	0.005(0.089)	
LOG(LEB)		0.312(0.059)	0.333(0.060)
LOG(TDL)	-0.141*(0.031)		-0.333*(0.047)
LOG(SDW)	0.017(0.069)	0.002(0.051)	
LOG(POLICE)	0.023(0.089)	0.031(0.097)	0.029(0.095)
LOG(SEX)	0.101(0.099)	0.099(0.101)	0.899(0.097)
LOG(LFPRU)		0.521(0.063)	0.545(0.097)
LOG(DENSITY)	0.013(0.087)	0.020(0.079)	
LOG(URBAN)*LOG(FLR)	0.029(0.066)	0.031(0.055)	0.176*(0.043)
LOG(URBAN)*LOG(ROADS)	0.008*(0.032)		
LOG(URBAN)*LOG(ELECT)		0.034*(0.048)	0.004*(0.033)
LOG(URBAN)*LOG(PCNSDP)		0.717 (0.067)	
LOG(URBAN)*LOG(LFPRU)	0.009*(0.037)		
LOG(URBAN)*LOG(SSS)		0.131 (0.064)	0.129 (0.049)
TIME	0.0006**(0.004)	0.0006**(0.008)	0.0006**(0.006)
Adjusted R-squared	0.811	0.811	0.812

F-statistic	286.62**	268.57**	297.36**
Durbin-Watson statistic	1.899	1.911	1.902
J-statistic (instrument rank)	2.478 (8)	2.586 (8)	2.333 (8)
(p-value)	(0.414)	(0.399)	(0.472)

Source: Estimated by the researcher based on secondary data.

Notes: (1) p-values are in parenthesis. (2) ** implies statistical significance at 1 percent and * implies the same at 5 percent, (3) Here *df* implies degrees of freedom. (4) No. of pooled observations is 1089, included observations equal 956. (5) Results are GMM estimates and are EVIEWS 10 generated.

In model 1, the degree of urbanization has a significant and positive influence on service sector share. Similarly an infrastructure factors like ROADS also has a significant and positive impact on service sector share. State level poverty has a negative and significant influence on service sector share. On the other hand the level of literacy has a positive influence on service sector share. The coefficient of TDL is statistically significant and negative (models 1 and 3) implying that poor governance states have lower service sector share. Both physical infrastructure in the form of ROADS and its interaction with urbanisation are significant and have positive influences on SERVS. Social sector spending (SSS, which covers both health and educational spending per capita) positively and significantly influence service sector share which suggests that service sector share depends crucially on the level of human capital. Sex ratio positively impacts service sector share and this is clear from the coefficient of SEX (insignificant only model 2 but significant at 10% levels in models 1 and 3). Importantly, the urbanisation-literacy interaction term is positive and significant implying that other things controlled, as education rises along with urbanisation, the service sector share rises. This interaction is most likely to act through the availability of skilled workers in the urban formal sector which depends largely upon education, infrastructure and work participation in non-agricultural activities. The URBAN-LFPRU interaction is also significant, indicating that other things unchanged, if work participation rises across similarly urbanized states, service sector share is expected to rise. Also, urbanisation interacts positively with ROADS and FLR (female literacy rate) implying that as infrastructure and educational attainments rise, the degree of urbanisation has an augmenting effect on service sector share.

Coming to model 2, PCNSDP has a positive and significant impact on service sector share. However, agricultural states tend to have lower service sector share, other things remaining constant. Very similar to model 1, poverty as measured by BPL depresses service sector share while both CAPEX and ELECT have significant and positive impacts. Life expectancy at birth, i.e. LEB as a measure of health status has a significantly positive role in explaining service sector share. The labour force participation rate for urban areas (LFPRU) has a positive coefficient that is significant at 10 percent (only in model 2, but insignificant in others) indicating that other things unchanged, LFPRU has a positive influence on service sector share. In both models 1 and 2, population density (DENSITY) is a significant and positive factor behind higher service sector share. This is expected as urbanisation and population density are positively associated (the simple correlation between URBAN and DENSITY is 0.473, statistically significant at 0.1%). The URBAN-FLR interaction is also positive and statistically significant (at 10%) in model 2. In addition, coefficients of URBAN-ELECT and URBAN-PCNSDP are both positive and statistically significant which suggest that among similarly urbanized states, the ones with better infrastructure and higher per capita incomes are expected to have higher service sector share, other things unchanged. The coefficient of SDW is consistently positive across models 1 and 2 indicating that better access to safe drinking water enhances SERVS.

Model 3 uses a slightly different combination of variables but findings are similar to those of models 1 and 2. In model 3, the URBAN-ELECT interaction is significant suggesting that is consistent with model 2 findings. All throughout, the coefficient of POLICE turns out to be consistently significant at 10 percent implying that availability of crime control instruments or the law and order infrastructure is a contributing factor behind the service sector share at the state level. The URBAN-SSS interaction term is positive and significant in models 2 and 3 (at 10% and 5% respectively) implying that social sector spending coupled with urbanization enhances the service sector share in GVA. The one period lagged urbanization variable, i.e., URBAN(-1) has a positive coefficient (significant at 10%) in all three models thereby indicating that lagged or past levels of urbanisation have an influence on service sector share at present, or else, urbanisation has a lagged effect on service sector share. This is consistent with the findings of Hong (2012) and Cheng (2013) for the Chinese economy who demonstrate that urbanisation is a key driving force behind growth of service sector.

Throughout all models a one period lagged dependent variable in the form of SERVS(-1) is included as a regressor to adjust for serial correlations in the residuals. The resulting Durbin-Watson statistics are satisfactorily close to 2.0, thereby suggesting the absence of serial correlation in the residuals. The coefficient of time is highly significant throughout and is positive implying that over the study period service sector share in India has a rising

trend. Throughout all models, industrial or manufacturing sector share (INDUS) is kept as a control factor although its coefficient is statistically insignificant.

On the whole, macroeconomic factors like the extent of urbanisation, per capita NSDP and infrastructure (social overhead) have positive impacts on service sector share at the state level. States with higher social overhead capital expenditures are able to sustain a higher service sector share in respective state domestic products. Social factors like female literacy rate, life expectancy at birth, access to safe drinking water and sex ratio have positive influences on service sector share. A unique finding in this paper is that urbanisation has a synergistic relationship with several development and macroeconomic indicators like education, infrastructure, and labour force participation and this synergy drives up the service sector share. Also, combined expenditure on education and health is a significant factor that augments the service sector at state level. In contrast, poverty, agricultural share and poor governance have depressing influences on the service share. Finally good governance in the presence of crime control instruments has a significant and positive role to play in shaping the service sector. The Sargan J-statistic is insignificant in each case which implies acceptance of the null hypothesis of zero covariance of the instruments with the error. This is also an adequate test for over-identifying restrictions in a regression model. We summarize our study and conclude in the following section.

Summary and Conclusions

India has shifted significantly in favour of the service sector and away from agriculture and allied activities ever since the onset of the economic reforms of 1991. With rapid urbanisation since the 1990s, the tertiary sector has emerged as the growth engine of the Indian economy especially in the new millennia with more than fifty five percent of gross value added accruing on account of the service sector including construction. In fact, urbanized states with developed infrastructure, and higher per capita incomes have a formidable share of the service sector, contributing about sixty percent to their respective state domestic products. Our findings in this paper suggest that there is a clear spatial pattern to India's service sector contribution. Poverty, infrastructure bottlenecks, educational backwardness, and poor governance have depressing influences on the state level service sector share. Arguably, agrarian states with higher poverty rates, lower educational attainments, coupled with limited urbanisation and backward infrastructure, find it difficult to create a vibrant services or tertiary sector. At the other extreme, highly urbanized cosmopolitan cities like Delhi –NCR and the union territory of Chandigarh are almost entirely dependent on services for their economic growth and development and thus contribute more than eighty percent of state level gross value added from services. In sum, socio-economic and development indicators like urbanisation, per capita NSDP, social sector spending, state level capital expenditure have significant and positive influences on service sector share. In addition, better governance along with law and order infrastructure also have augmenting effects on the service sector. Finally, a very unique finding is that urbanisation in conjunction with education, infrastructure, social sector spending and labour force participation act as catalysts for the expansion of the service sector.

In conclusion, the process of urbanisation necessitates both demand as well as supply of a wide range of essential services including construction. As the urban formal sector steps up supply to meet the emerging services needs of the urban population, sizable amounts of employment opportunities are created. Arguably, this results in an in-migration of work force into the urban centres which further enhances the pace of urbanisation and continues to trigger the demand for services. In future research, the socio-economic determinants of the service sector size and contribution needs to be studied on the basis of international evidence where the role of urbanisation in determining the service sector size and contribution to GDP could be investigated.

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Consumer Satisfaction Towards Organic Produce: A Study in Western Tamil Nadu

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Abstract

This study examines the level of consumer satisfaction with organic products in Western Tamil Nadu, India, and how important variables like product features, consumer awareness, marketing strategies, environmental awareness, and health perception affect this satisfaction. The results of a mixed-method approach that included a pilot study and quantitative analysis using Structural Equation Modelling (SEM) show that, with a standardised regression coefficient of, product attributes have the biggest influence on customer satisfaction. Additionally, two notable positive factors that emerged were consumer awareness and environmental consciousness. The impact of health perception was favourable, but it was not as strong as that of marketing tactics and customer perception. These findings emphasise how crucial it is to provide premium organic products, enhance pricing and accessibility strategies, and take advantage of eco-friendly initiatives in order to raise customer satisfaction. The study also highlights how important ethical marketing techniques and focused awareness campaigns are building customer loyalty and trust. This study provides useful insights for stakeholders seeking to match their strategies with the changing demands of ethically conscious consumers and the more general requirements of corporate social responsibility by placing the analysis within the framework of Western Tamil Nadu.

Keywords: Consumer Satisfaction, Organic Products, Consumer Awareness, Environmental Awareness, Product Features.

Introduction

Consumer awareness of health benefits, eco-sustainability, and ethical farming practices have elevated organic products to a global market frontier (Seufert, et. Al., 2023). This growing awareness has changed consumer preference but also stimulated researchers and organizations to further investigate consumer satisfaction in this area. One of the most important indicators of consumer response in markets is consumer satisfaction, as it reflects the overall effectiveness of the offer of organic products (Hemmerling et al., 2015). In an Indian context, consumer awareness and satisfaction factor significantly — especially in Western Tamil Nadu, where the legacy of agriculture and changing consumption habits provide the right environment for organic product market expansion (Naspetti & Zanolli, 2021).

Demand for organic products largely depends on the willingness of consumers who are well-informed in the characteristics and the significance of biological farming system, eco-system, and health effects (Aertsens et al., 2011). The core of awareness is trust and confidence in the organic offerings which leads a consumer to seek everything regarded to organic. For example, Hemmerling et al. (2015) found that the lack of harmful substances leads consumers to have greater satisfaction and higher purchase intent towards organic products when they have more knowledge about this. This dynamic between conscious consumption and satisfaction emphasises the need to communicate the value proposition of organic products.

In addition to the awareness, satisfaction of the consumers getting organic products depend on the intrinsic properties of the organic products like quality, availability and price of the organic products. Organic products of high quality that fulfil the expectations of consumers help forge positive impressions and the loyalty of shoppers. Despite the promise shown by these products, limited availability and premium prices remain major limitations to broader diffusion especially in less informed markets (Naspetti & Zanolli, 2021; Willer & Lernoud, 2023). This identifies a key area for exploration in removing restrictions on accessibility and affordability, without compromising the principles of organic.

Another determinant of consumer satisfaction is health perception. Organic goods are believed to be healthier choice due to being free of harmful pesticides, artificial additives, and other harmful substances. Due to this, consumers are paying higher attention to organics, especially in terms of nutrition, safety and customer satisfaction and loyalty for organics (Hughner et al., 2007). In other research, health-promoting individuals are mentioned as more prone to choose organic foods because they believe they will contribute to a more positive wellness and a prophylactic attitude towards diseases (Saba & Messina, 2003).

Consumer satisfaction is also influenced by environmental awareness. Organic products are often viewed as environmentally friendly options that fit the ideals of sustainable living. This belief has a strong appeal among environmentally conscious consumers, who feel that their purchase decisions represent a form of payment to avert environmental disasters (Paul & Rana, 2012). According to Willer and Lernoud (2023), consumers who are highly environmentally conscious not only prefer organic products but actually enjoy their purchases even further because those choices reaffirm their professed commitment to sustainability.

Besides product characteristics and environmentally friendly practices, marketing strategies also play a vital role in creating consumer trust and turning satisfaction into a positive review for a product. Consumers appreciate when products are transparently labeled, backed by credible certifications, and when targeted ad campaigns effectively inform them of product offerings. Accurate labeling is key to endorsing consumers' trust about product authenticity and increasing consumer confidence in the organic market (Gracia & Magistris, 2008). Indeed, as highlighted by Naspetti and Zanolli (2021), transparency and consistency in marketing and promotional activities significantly influence the establishment and maintenance of consumer satisfaction.

The interplay between these factors, namely consumer awareness, product attributes, health perception, environmental sustainability, and their role/ impact on marketing plans, in line with these are relevant in western Tamil Nadu Saleena, T. A. (2019). The combination of the region's longstanding agricultural traditions and fast-changing consumer preferences make it an ideal place to research the determinants of satisfaction with organic products. This is intended to fill the voids in knowledge and provide recommendations to the participants in the organic market by studying the dynamics. It aims to inform the evolution of consumer-oriented strategies that control interest in organic better products as well as boost sustainable growth in the natural item industry (Willer & Lernoud, 2023).

In this study, it further emphasizes the significance of offering products that meet consumer expectations for these targets through this investigation. By doing so, it offers practical suggestions which provide for either enhancing product quality, increasing accessibility, or fine-tuning marketing approaches to address the specific requirements and preferences of consumers in Western Tamil Nadu. The research would therefore serve to contribute to the continuing development of the organic market, its ability to serve the needs of a well-informed and environmentally sensitive consumer group.

Objectives

To assess how consumer knowledge in Western Tamil Nadu affects consumers' satisfaction with organic products.

To evaluate how customer satisfaction is impacted by product qualities (quality, price, availability, and variety).

To investigate how perceptions of the environment and health influence consumers' satisfaction with organic products.

To examine how marketing tactics affect the development of customer satisfaction and trust.

To ascertain how total satisfaction is impacted by customer views of brand and value.

Hypothesis Development and Relevant Reviews

Consumer Awareness and Consumer Satisfaction

Consumer satisfaction in the organic food sector heavily relies on awareness and information. Data shows a good relationship between awareness of organic benefits such as health protection, environmental conservation, and ethics of organic farming practices, which lead to satisfaction (Saputra et al., 2024; Zhilla et al., 2024). Knowledgeable customers have a better understanding of products and develop more confidence and loyalty towards organic products instead of conventional ones. Saputra et al. (2024) note that informed consumers can better gauge product value, enhancing the fit between consumer expectation and satisfaction.

Educational initiatives and awareness campaigns are showing solid efforts in breaking information barriers. By highlighting the benefits and showcasing the potential dangers of conventional produce, organic product advertisements seem to encourage consumers to invest in organic food — promoting its superior nutritional value and sustainability as some of its most appealing attributes. Zhilla et al. (2024) which emphasize the importance of targeted education campaigns to increase satisfaction by teaching consumers the benefits of products that align with their values. These initiatives also educate consumers on the environmental and social benefits of choosing organic, which helps to build brand loyalty.

Awareness also helps improve perceived reliability and trustworthiness of products. That illusion is further exacerbated through transparent labeling, certifications, and communication of benefits, resulting in a much more fulfilling feeling for the consumer (which is essentially what they are after when they are looking to buy these products). Due to the crucial influence of awareness on consumer purchasing behavior and subsequently on the

organic product market, awareness in the broader sense and the studied elements have received increasing attention (Wellens & Erbrink, 2013).

H1: Higher levels of consumer consciousness have a positive impact on consumer satisfaction with organic products.

From Good Product Features to Good Consumer Satisfaction

With respect to the organic food industry, aspects like availability, price, quality, and variety of the product greatly affect consumer satisfaction. A major part of satisfaction and loyalty is fulfilling basic consumer needs, such as providing quality products at affordable prices (Relawati et al., 2024). This accessibility is crucial, because products that are more readily available to consumers and are in convenient locations decrease the barriers to purchase and, in turn, increase consumer satisfaction (Relawati et al., 2024). Having organic goods available all year round will keep the hassle out of question of availability and make the shopping experience rewarding.

A major aspect that directly influences the satisfaction is the quality of organic products. Organic products that are high-quality fulfill the desire expressed by consumers for taste, freshness, and safety, reinforcing how consumers perceive the value of organic products. According to Poudel (2024), the reliability and authenticity of organic products, along with competitive pricing is the leading factors that influence consumer satisfaction. When consumers feel like the price represents the quality and value of the product, their trust in the brand improves, leading to greater levels of satisfaction Delgado-Ballester, (2001).

Moreover, it is the variety that is key when it comes to different preferences among consumers. With a greater diversity of organic options, catering to individual needs can be accomplished, creating a much richer experience. All these factors together namely, accessibility, pricing, quality and assortment provide a complete value proposition for people who buy organic products every so often or people who buy organic products.

H2: The quality, price, availability, and variety of products influence consumer satisfaction with organic products.

Consumer Satisfaction and Health Perception

Health perception is a powerful driver for the organic food market, consumers increasingly perceive organic as better substitutes for conventional products. In this case, it is based on beliefs that organic foods are safer, healthier, and without harmful pesticides or synthetic additives (Kabir & Ko, 2025). Especially health-conscious consumers highly rate the nutritional benefits and safety attributes of organic foods that are related to significantly higher satisfaction levels. According to Kabir and Ko (2025), consumers that are more health-oriented often have higher loyalty and trust in organic brands since these products link to their health objectives.

Relawati et al. (2024) also add that Organic products' higher quality and more nutritional properties lead to higher satisfaction among consumers. These associations not only resonate with individual values and lifestyles but also promote the notion that organic food is a preventive decision for overall health. Organic products fulfil the requirements of health-conscious consumers and thus, build a strong value proposition which enhances loyalty and repeat purchase.

In addition, through health perception, a strong emotional bond forms between consumers and organic goods, and buying and consuming such products means investing in the welfare of oneself and the family. This link highlights the need to communicate clearly the health benefits of organic products through transparent labeling, certifications, and awareness campaigns.

H3: Awareness of health benefit positively influences consumer satisfaction with organic products.

Environmental Awareness and Consumer Satisfaction

Consumers are getting increasingly conscious, making environmental awareness a key influencer of satisfaction in the market for organic products. Because organic products fit better with environmentally friendly individuals' values of sustainable living and environmental protection, they gain extra satisfaction from consuming organic products (Indrawaty et al., 2024). Furthermore, they consider organic products as ethical purchases, which contribute to ecological practices, thus improving their overall satisfaction or providing a sense of fulfillment. Indrawaty et al. (2024) highlight the role of these choices in strengthening the congruence between consumer values and product characteristics, promoting trust and loyalty towards organic brands.

Furthermore, Kavya et al. (2024, p. 5) emphasize that the act of buying organic products can generate a deep sense of purpose and emotional bonding for environmentally conscious consumers. Organic eating habits buy more than products out in a physical space but compounds bigger issues such as farming practices and environmental sustainability. This personal relationship deepens customer loyalty and increases satisfaction with organic products.

The significance of marketing and awareness campaigns emphasizing the environmental segments of organic elements can also be drawn from the fact that environmental awareness and consumer satisfaction significantly vary positively. Clear communication regarding the positive environmental impacts of organic farmers — not limited to carbon footprint reduction, biodiversity conservation, and soil health — may resonate with environmentally-minded consumers as well.

Not only do organic products protect the environment and public health, but businesses can attract a growing consumer segment that prioritises sustainability as they create value by promoting organic products and services. Such initiatives not only foster personal satisfaction, but they also contribute to environmental stewardship and sustainable consumption at large.

H4: Higher environmental awareness positively affects consumer satisfaction with organic products.

Impact of Marketing and Satisfaction of Customers

The effectiveness of marketing strategies on consumer satisfaction with organic products. Establishing trust and ensuring satisfaction requires transparency and credibility, as well as efficient communication through advertising, promotions and labeling (Ponnusamy et al., 2024). Certification-backed accurate and transparent labeling provides consumers with peace of mind regarding the authenticity and quality of organic products. This trust develops more emotional bonds with brands and improves the customer experience.

These strategies are further enhanced by digital marketing campaigns. Ponnusamy et al. (2024) state that digital channels are critical to ensure that consumers are informed on the health, environmental and ethical benefits provided by organic products. These initiatives help educate consumers about the special characteristics of organic products, allowing them to shop with confidence Seyfang, G. (2006).

The importance also lies in advertisements and promotions in consumer satisfaction. According to Akter & Islam (2024), well-planned promotional activities convey the unique value of organic products. Such strategies are not just about improving awareness of a product, but also about creating an anticipation that promotes the satisfaction of the user, making them feel like part of an exclusive and reliable group. Brands build this relationship with their customers using discounts, loyalty programs and targeted advertising based on consumer preferences.

The benefits of marketing extend beyond the moment of purchase, creating long-term brand loyalty and even contributing to market growth. For example, utilizing such innovative and transparent marketing methods helps the business to reach consumer expectations and maximize trust capital, which in turn, leads to increased satisfaction among organic product consumers.

H5: The effectiveness of marketing strategies has a direct positive impact on the consumer satisfaction towards organic products.

Consumer Understanding and Consumer Satisfaction

The perception of consumers is an important factor that leads to satisfaction in the organic product market. Since customers positively view the price, brand, and product they bought, it translates positively towards how satisfied and fulfilled they feel before and after purchase. Transparent and dynamic pricing strategies can generate trust and confidence from consumers and increase their satisfaction (Narcı ve Tembelo, 2024). Pricing perceived as fair and indicative of quality boosts consumer engagement and long-term loyalty.

Similarly, Ahmadi et al. (2025) emphasize the role of brand equity in determining consumer satisfaction. The strong brand equity, established by consistent quality, being able to trust, and effective communication, is in accordance with the rise of consumers' expectations and improve their loyalty toward organic products. By providing a better and complete understanding of product attributes and benefits, consumer experiences are enriched, leading to satisfaction and in turn repeat purchases.

These results emphasize the importance of consumer perception in directing marketing efforts for long-lasting involvement and satisfaction. Transparent communication, detailed labeling, and addressing consumer concerns can all be key marketing initiatives for promoting the positive perception of genetically modified organisms (GMOs) Ngo, T. T. et. al., (2024). In addition, companies that connect their value propositions with consumer expectations are more likely to sustain satisfaction and loyalty with consumers.

By maintaining and highlighting good messaging and value, it can make consumers feel good about purchasing an organic product[3]. To sustain a competitive edge in the organic products arena, it is essential that perception aligns with satisfaction.

H6: A positive consumer perceptions increases the consumer sunction the content outcome positively.

Conceptual Framework

The following framework was developed according to the literature review. Consumer Knowledge, Product Characteristics, Health Awareness, Environmental Awareness, Marketing Impact, and Consumer Perception are the six independent variables that impact consumer satisfaction to create the conceptual framework. Drawing from the literature review in the above sections, these variables are considered as the key determinants of satisfaction with the organic products. Consumer Satisfaction (the dependent variable), represents the overall level of satisfaction deriving from product use. The model suggests that positive interaction with these independent variables provides satisfaction where awareness, perceptions, and marketing strategies are vital in making positive consumer experiences. The relationship provided a basis for analysis of the factors influencing satisfaction within the organic product market.

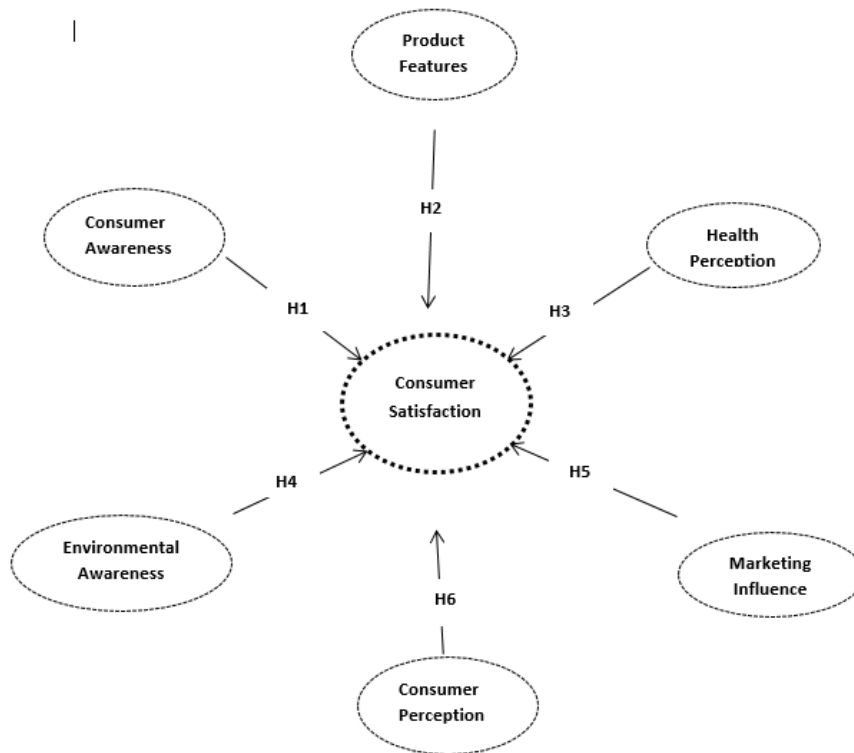


Figure 1: Conceptual Framework

Source: The Author's

Methods

Pre-test

A pilot study of 50 individuals was carried out, which provides early insights as to how the variables interact with each other in the population of interest. The purpose of this pre-test was to evaluate the reliability, clarity, and validity of the research tools, along with verifying any errors or changes that can be introduced before carrying out the complete research.

Exploratory Factor Analysis

The Exploratory Factor Analysis (EFA) demonstrates the appropriateness of this dataset since the KMO value = 0.906 indicating a high factorability of the correlations and the Bartlett's Test of Sphericity ($\chi^2 = 2088.626$, $df = 153$, $p < 0.001$) indicates that the variables taken together are not an identity matrix. The six extracted components accounted for 71.27% of the total variance, suggesting a strong underlying structure. Items load well on their respective product features (PF1-PF3), health perception (HP1-HP3), environmental awareness (EA1-EA3), marketing influence (MI1-MI3), customer satisfaction (CP1-CP3), and consumer awareness (CA1-CA3) as seen in the Rotated Component Matrix. These findings confirm the survey constructs, demonstrating they adequately reflect the variables of interest, facilitating subsequent analyses.

Table 1. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.906
Bartlett's Test of Sphericity	Approx. Chi-Square	2088.626
	Df	153
	Sig.	.000
Total Variance Explained		71.274

Table 2. Rotated Component Matrix^a

	Component					
	1	2	3	4	5	6
PF1	.724					
PF2	.705					
PF3	.677					
HP1		.614				
HP2		.600				
HP3		.492				
EA1			.482			
EA2			.405			
EA3			.673			
MI1				.731		
MI2				.710		
MI3				.692		
CP1					.660	
CP2					.801	
CP3					.614	
CA1						.799
CA2						.773
CA3						.870

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.^a

a. Rotation converged in 11 iterations.

Results

Reliability

To assess the internal consistency of the measurement items, a reliability analysis was conducted using Cronbach's Alpha. The results demonstrated that all constructs had acceptable reliability, with alpha values exceeding the recommended threshold of 0.7 (Nunnally, 1978). Specifically, constructs such as Health Perception (0.756), Environmental Awareness (0.855), and Customer Satisfaction (0.751) displayed strong internal consistency. Consumer Awareness (0.831) and Product Features (0.792) also met the reliability criterion, though earlier exploratory values of 0.698 and 0.633, respectively, suggested that these constructs were slightly refined during the development of the model. Marketing Influence (0.889) and Consumer Perception (0.854) demonstrated very strong internal consistency, reinforcing their inclusion in the structural model due to their robust reliability.

Table 3: Showing reliability analysis

Independent variable	Items	Cronbach's Alpha Value
Consumer Awareness	3	0.831
Product Features	3	0.792
Health Perception	3	0.756
Environmental Awareness	3	0.855
Marketing Influence	3	0.889
Consumer Perception	3	0.854
Dependent variable	Items	Cronbach's Alpha Value
Customer Satisfaction	3	0.854

Source: Primary Data

Structural Equation Modelling

The structural equation model was evaluated using several key fit indices, all of which indicated an excellent model fit. The values obtained for CMIN/DF = 2.65, GFI = 0.903, NFI = 0.907, CFI = 0.909, and RMSEA = 0.018 were well within the acceptable range, confirming that the hypothesized model adequately represents the data and provides a reliable basis for further analysis (Hair et al., 2010). These results suggest that the model effectively captures the relationships between the variables under study, and it is robust enough to support the investigation of the causal pathways.

The structural path analysis provided further insights into the relationships between the independent variables and the dependent variable, Customer Satisfaction. The strongest relationship was observed for Product Features, which exerted a substantial effect on satisfaction ($\beta = 0.54$, $p < 0.001$). This was followed by Environmental Awareness ($\beta = 0.33$, $p < 0.001$), Consumer Awareness ($\beta = 0.32$, $p < 0.001$), and Consumer Perception ($\beta = 0.23$, $p < 0.001$). These findings highlight the significant influence of product characteristics, consumer awareness, and environmental concerns on customer satisfaction. Health Perception ($\beta = 0.18$, $p = 0.002$) and Marketing Influence ($\beta = 0.15$, $p = 0.023$) also exhibited statistically significant but comparatively moderate effects, indicating their role in shaping satisfaction, albeit to a lesser degree.

Table 4: Measure for Structural model fit

Fitness Indicators	Measurement	Improved model block
CMIN/DF		2.65
P-Value		0.000
GFI		0.903
NFI		0.907
CFI		0.909
RMSEA		0.018
		Decision: Good fit model

Table 5:

Dependent variables	Path Direction	Independent variables	Standardized Regression (β)	P-Value
Customer Satisfaction	<-----	Consumer Awareness	0.32	***
	<-----	Product Features	0.54	***
	<-----	Health Perception	0.18	0.002
	<-----	Environmental Awareness	0.33	***
	<-----	Marketing Influence	0.15	0.023
	<-----	Consumer Perception	0.23	***

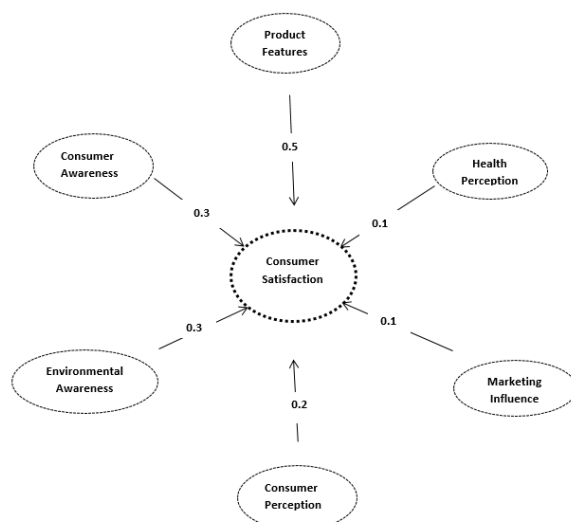


Figure 2: Results of Structural Equation Model
Source: Primary Data

Findings

The findings are useful as they offer important information on the factors affecting consumer satisfaction towards organic products in Western Tamil Nadu area. of Product Features as a cue played the most salient role in explaining user satisfaction and the strongest effect on consumer satisfaction. This finding implies that quality, availability, cost and variety of organic products play significant roles in the formation of consumers' satisfaction judgments. Optimizing these features of organic goods may make customer have better product experience, and thus contribute to more loyalty and repeat purchases.

Environmental Concern also significantly influenced consumer satisfaction. Consumers who were of the opinion that organic products were good for the environment were more satisfied. This demonstrates the growing relevance of ecological attitudes for consumer decisions, as the green-mindedness is an important antecedent for satisfaction about organic products. With the purchasing habits of the public increasingly scrutinized for the potential harm they cause in the environment, the demand for organic products may be increasing, underlining the importance of sustainability in the industry.

Consumer Awareness also appeared as an important determinant of satisfaction. Consumers who are aware about the health, environmental and ethical advantages of organic products seem to express greater satisfaction. This highlights the need to inform consumers, because an understanding of the advantages of organic products contributes to increased customer satisfaction and product linkage.

Consumer Perception, which represents how customers view the value of a product and their faith in the brand, also had a moderate impact on satisfaction. This research implies that consumers who consider organic items to be reasonably priced and consistent in branding are more likely to be satisfied with their purchases. It emphasises the significance of maintaining transparent and trustworthy communication in brand messaging, as well as constant product quality that meets consumer expectations.

Although satisfaction was influenced by health perception, this effect was not as strong as anticipated. This implies that people have a more basic level of anticipation because the health benefits of organic products are frequently expected or taken for granted. Because many customers already view health benefits as essential, they might not be a differentiator for satisfaction when it comes to organic products.

Finally, Marketing Influence, although statistically significant, had the least impact on consumer satisfaction. This finding indicates that while marketing efforts can influence consumer perceptions, the current marketing strategies may not be sufficiently resonant with the values of the target audience. Therefore, there is a need for refinement in marketing approaches, focusing on improving clarity, transparency, and alignment with consumer values to drive greater satisfaction and foster deeper engagement with organic products.

These findings collectively emphasize that while multiple factors contribute to consumer satisfaction with organic products, product-related features, environmental awareness, and consumer education are among the most critical elements.

Discussion

The results of structural equation modelling offer important new information about the factors influencing Western Tamil Nadu customers' satisfaction with organic products. Adjusted and R-squared R-squared is a measure of how well the model fits the data, or how well the proposed relationship fits the data. According to our data, product attributes have the biggest positive influence on customer satisfaction, indicating that offering high-quality, reasonably priced, and easily accessible organic items is essential. Customer satisfaction was also significantly impacted by environmental and consumer awareness, as more and more customers looked for eco-friendly and healthful options.

Additional research shows that while marketing influence, consumer perception, and health perception all positively impact satisfaction, their effects are less pronounced than those of product attributes. The focus on these results attests to conventional, successful marketing techniques including ingredient-specific patent labels and marketing tactics that prioritise customer satisfaction and trust. Consumer awareness has a positive impact on customer satisfaction, product features have a significant and positive impact on customer satisfaction, health perception improves customer satisfaction, environmental awareness suggests high customer satisfaction, marketing influence has a positive impact on customer satisfaction, and positive consumer perception has a positive impact on customer satisfaction. These findings support the following hypotheses.

This study adds significantly to the body of knowledge by thoroughly analysing the factors that influence consumer satisfaction from both an environmental and marketing standpoint. The study identifies a number of analytical facets that provide a more thorough examination of the significant factors influencing organic consumption. The findings have important ramifications for important stakeholders in the organic market since they will guide the development of more customer-focused strategic marketing campaigns.

The marketing tactics that steer towards customer preferences and expectations are the primary focus of this study's consequences. For instance, organic market participants can utilise the results to increase supply and reduce prices for organic products, making them more affordable for a wider range of consumers. The study also emphasises how important it is to communicate the environmental advantages of eating organic food since this can have a big impact on how customers behave. Promoting the environmental benefits of organic products could be a tactic to get customers interested in sustainable consumption.

Additionally, the results show that awareness campaigns must be customised for a particular customer segment. Researchers recognise that regional differences in customer preferences mean that companies should have regionally specific advertising methods to maximise market penetration. Localised marketing techniques that take into account the economic and cultural environments in which customers live can be used to strengthen consumer loyalty and trust in organic products.

The study contributes to the broader discussion on sustainable consumption habits in addition to the findings' immediate marketing implications. Additionally, as our consumer preferences for organic products continue to change, it is more crucial than ever for companies to make sure that their marketing and product offerings meet the evolving needs of their target market. The aforementioned study emphasises the necessity of creating marketing campaigns that are not only aesthetically pleasing but also in line with the larger sustainability objectives for the use of organic food.

The intricate connection between environmental concerns, marketing strategies, and customer pleasure is generally highlighted by these findings. By demonstrating how organic-market stakeholders can effectively navigate the complexities of consumer behaviour in a world of growing competition, the research contributes insightful viewpoints to the corpus of knowledge. These findings highlight the importance of businesses continuing to adapt their product concepts and marketing tactics to the latest developments in the organic food industry. In order to improve consumer happiness in the organic market space, other researchers and industry practitioners will use this study as a vital reference.

Conclusion and Future Research Directions

The study focuses on assessing the influence of product attributes, consumer awareness, and ecological consciousness as the significant determinants on consumer satisfaction towards purchase of organic products in Western Tamil Nadu. These results illustrate that amongst all the construct offered, product features (adequate quality, availability, and affordability) remains the strongest determinants of satisfaction, consistent with prior research indicating that product features drive consumer loyalty (Aertsens et al., 2011; Poudel, 2024). Likewise, consumer awareness proved to be an important factor, with higher awareness levels of health, environmental and nutritional benefits relating positively to satisfaction (Hemmerling et al., 2015; Saputra et al., 2024). Likewise, concern for the environment increases consumer satisfaction because those who are eco-conscious consider organic products sustainable (Indrawaty et al., 2024; Kavya et al., 2024).

Moreover, health perception, marketing efforts, and consumer perception positively but less strongly influenced them. By Gl ađ Graci a & Magistris, 2008; Akter & Islam, 2024:596) Transparency in marketing, valid labels, and specific promotional actions are also effective in building consumer trust and satisfaction. Particularly health-focused customers regarded organic products as safer and nutritionally higher, which in turn found connections to greater satisfaction levels (Kabir & Ko, 2025; Hughner et al., 2007).

The study highlights the need for improved quality, availability and pricing of organic products to strengthen consumer trust in the organic market. Importance of health and environmental benefits should be reinforced through awareness campaigns to improve consumer satisfaction even more (Paul & Rana, 2012; Relawati et al., 2024). This research contributes to the literature by developing an integrated framework that can help policymakers and businesses understand the interrelationship and dynamics among these factors.)

Longitudinal studies should be conducted in the future to observe shifts in consumer preferences and determinants of consumer satisfaction over time. It remains to be seen how such a research project will be developed but comparative studies are key to understanding the global dynamics of the organic market across regions or countries. In addition to this, utilizing more complex analytical tools like variety of machine learning models could improve the predictive capability of the suggested framework and allow for development of adaptive strategies by stakeholders to adapt to changing consumer behaviors (Narci & Tembelo, 2024).

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Decoding Financial Access and Performance in Women-Led MSMEs: A Structural Equation Modeling Approach

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Abstract

This study examines the evolving role of women entrepreneurs in Micro, Small, and Medium Enterprises (MSMEs), analyzing their contributions, challenges, and opportunities in the contemporary business landscape. Through a mixed-methods approach involving 250 women entrepreneurs, the research investigates the interplay between financial access, socio-cultural barriers, digital transformation, and policy support. The findings reveal that while women-owned enterprises constitute 20% of the 58.5 million MSMEs in India, they face persistent challenges in accessing financial resources, with sources of finance having the highest impact ($\beta=0.673$) on access to finance, followed by business lifecycle ($\beta=0.352$) and firm attributes ($\beta=0.296$). The structural equation modeling analysis demonstrates that financial obstacles negatively influence access to finance ($\beta=-0.231$), while access to finance positively affects MSME performance ($\beta=0.378$). Despite government initiatives and digital advancement opportunities, socio-cultural barriers and limited access to formal credit continue to constrain women entrepreneurs' growth potential. The study concludes that addressing these structural challenges through targeted policy interventions, enhanced financial inclusion, and capacity-building programs is crucial for fostering a more inclusive entrepreneurial ecosystem. These findings contribute to the growing body of literature on women entrepreneurship and provide practical implications for policymakers and stakeholders in the MSME sector.

Keywords: Women Entrepreneurship, MSMEs, Financial Access, Digital Transformation, Socio-cultural Barriers, Business Performance, Policy Support, Gender Equality, Economic Development, Financial Inclusion

Introduction

Entrepreneurship has become a powerful tool for economic development, innovation, and job creation, with Micro, Small, and Medium Enterprises (MSMEs) forming the backbone of many economies worldwide. Women entrepreneurs, in particular, play a crucial role in driving growth, fostering innovation, and enhancing inclusivity in the business landscape (Ayyagari, Demirguc-Kunt & Maksimovic, 2011). Their increasing participation in MSMEs has been facilitated by factors such as digitalization, supportive government policies, and social empowerment initiatives. However, despite their significant contributions, women entrepreneurs continue to face multiple barriers, including financial limitations, gender biases, and restricted access to business resources (Brush, de Bruin, & Welter, 2009). Understanding their evolving role within the MSME sector is essential to identify both the opportunities and challenges that shape their entrepreneurial journey.

Women-led MSMEs have demonstrated resilience and adaptability in diverse industries, from manufacturing and retail to technology-driven enterprises. Their ability to innovate and leverage digital platforms has enabled them to expand their businesses beyond local markets, contributing to regional and global economic growth (Goyal & Yadav, 2014). Several governments and financial institutions have recognized the importance of women entrepreneurs by introducing specialized funding schemes, skill development programs, and mentorship networks. However, access to financial capital remains a persistent challenge, as women often struggle to secure loans due to a lack of collateral, lower risk appetite, and biases within the financial system (Marlow & Patton, 2005). These financial constraints hinder their ability to scale their businesses, invest in technology, and compete in larger markets.

In addition to financial barriers, socio-cultural factors also play a significant role in shaping the entrepreneurial experience of women in MSMEs. Traditional gender roles, limited mobility, and work-life balance challenges often restrict women's ability to fully engage in business activities (Jamali, 2009). Many women entrepreneurs operate in informal or home-based businesses, limiting their access to networking opportunities, business collaborations, and market linkages. Furthermore, systemic challenges such as discriminatory legal frameworks, lack of property rights, and gender wage gaps create additional obstacles for women seeking to establish and sustain their ventures (Minniti & Naudé, 2010). Despite these challenges, successful women entrepreneurs have showcased remarkable perseverance by utilizing alternative business strategies such as e-commerce, microfinance, and community-driven enterprises.

The evolving role of women entrepreneurs in MSMEs underscores the need for a holistic approach to addressing the structural barriers they face. This study aims to explore the key factors influencing the success and sustainability of women-led MSMEs, focusing on financial inclusion, policy support, technological advancements, and gender-based challenges. By analyzing these elements, policymakers, financial institutions, and stakeholders can develop targeted strategies to foster an inclusive and supportive ecosystem for women entrepreneurs. Strengthening women's participation in MSMEs is not just a step toward gender equality but a crucial driver of economic resilience and sustainable development.

Role Women Entrepreneurs

According to the Government of India, a women-owned and controlled business is one in which at least 51% of the capital is owned and controlled by women, and at least 51% of the jobs created by the business are held by women (Ministry of MSME, 2024). In recent years, the participation of women in Micro, Small, and Medium Enterprises (MSMEs) has significantly increased, with over 22 million women-owned enterprises registered on the Udyam Registration Portal and Udyam Assist Platform as of November 2024 (Global SME News, 2024). Despite this progress, women entrepreneurs still account for only 14% of the total entrepreneurs in India, managing around 20% of the 58.5 million MSMEs (Economic Times, 2024). These statistics highlight the persistent gender gap in the sector despite positive growth trends.

To enhance women's entrepreneurial capabilities, the Ministry of Micro, Small, and Medium Enterprises (MSME) has introduced various training and skill development programs to equip women with business knowledge and skills. Several government schemes, including the Startup India Seed Fund Scheme (SISFS) and the Credit Guarantee Scheme for Startups (CGSS), have been launched to provide financial support. Since its launch in April 2021, the SISFS has approved ₹227.12 crore in funding for 1,278 women-led startups, while the CGSS, operational since April 2023, has guaranteed ₹24.6 crore in loans for women-led ventures (Press Information Bureau, 2024). These initiatives aim to reduce financial barriers and foster a more inclusive entrepreneurial ecosystem.

Apart from financial challenges, socio-cultural barriers significantly impact women's entrepreneurial journey. Many women entrepreneurs, especially in rural areas, struggle to access formal credit facilities and face limited policy support for mid-scale business growth. Women-led rural enterprises currently employ between 22 to 27 million people, yet they continue to face structural challenges in scaling their businesses (World Bank, 2024). Additionally, MSMEs offer flexible work schedules, allowing women to balance their domestic and professional responsibilities, further enhancing their participation in the economy.

As the saying goes, "Women are homemakers," but today, they are also nation-builders. By leveraging government initiatives, financial inclusion, and digital advancements, women entrepreneurs are shaping a new era of economic empowerment in India. With continued policy support and societal encouragement, women-led MSMEs will play an even greater role in India's vision of becoming a \$5 trillion economy. Addressing the existing gender disparities, increasing access to financial resources, and encouraging digital entrepreneurship will be crucial in ensuring sustainable growth for women in the MSME sector.

Review of Literature: Women Entrepreneurs in MSME Sector (2010-2024)

Women entrepreneurs play a vital role in the Micro, Small, and Medium Enterprises (MSME) sector, contributing to economic growth, employment generation, and social empowerment (Ministry of MSME, 2024). Despite various government initiatives and policy interventions, they continue to face significant challenges such as financial constraints, sociocultural barriers, and limited market access (Economic Times, 2024). This systematic review analyses the existing literature on women entrepreneurship in MSMEs, focusing on financial access, policy interventions, socio-cultural factors, digital transformation, and their overall contribution to economic development.

Growth and Contribution of Women Entrepreneurs

The MSME sector is often referred to as the growth engine of the Indian economy, significantly contributing to industrialization and employment generation. Women entrepreneurs have increasingly become a part of this sector, leading to positive socio-economic impacts. However, disparities remain evident, as women-owned MSMEs constitute only 20.37% of the sector, while male-owned enterprises dominate at 79.63% (Patel & Rewadikar, 2024). This gender gap highlights the need for targeted interventions to encourage more women-led businesses.

Financial Access and Government Support

Access to finance remains a critical issue for women entrepreneurs. Studies indicate that government policies, incentives, and subsidies significantly influence the success of women-led enterprises (Danabakyam & Kurian,

2012). Although initiatives such as the Start-up India Seed Fund Scheme (SISFS), Credit Guarantee Scheme for Start-ups (CGSS), and other financial support mechanisms have improved funding opportunities (Press Information Bureau, 2024), bureaucratic hurdles and gender biases in loan disbursement persist (Economic Times, 2024). Research by Singh & Raina (2013) emphasizes the role of financial literacy and access to technology in improving women's entrepreneurial participation. Despite these interventions, a significant credit gap remains, particularly for women-led rural enterprises, which employ between 22 to 27 million people but still struggle with access to formal credit (World Bank, 2024).

Socio-Cultural Barriers and Gender Disparities

Traditional gender roles and societal expectations continue to hinder women's entrepreneurial aspirations. Studies highlight that women face challenges related to risk management skills, education, and technological knowledge, contributing to lower participation rates in MSMEs compared to male entrepreneurs (Singh & Raina, 2013). Inheritance laws, property rights, and discriminatory banking practices further restrict women's access to capital and resources (Ministry of MSME, 2024). Research by Chavan & Murkute (2016) underscores the necessity of gender-sensitive policies to bridge these gaps and support women entrepreneurs. With India's female entrepreneurship rate at only 14%, significantly lower than other developing economies (Economic Times, 2024), addressing these challenges requires policy changes, gender-sensitive financial products, and mentorship programs (Global SME News, 2024).

Role of MSMEs in Women's Economic Empowerment

The contribution of MSMEs in empowering women through job creation and self-employment is well-documented. Ilahi (2018) analyzed NSSO data and found that women-owned enterprises accounted for only 20.37% of the MSME sector, with most being micro-enterprises. Similarly, research by Vejju (2018) highlighted the impact of Self-Help Groups (SHGs) in fostering women entrepreneurship in Andhra Pradesh, where female entrepreneurs constituted 60% of SHG-promoted enterprises. These studies suggest that localized efforts can effectively enhance women's participation in the MSME sector.

Digital Transformation and Market Expansion

The digital era has created new opportunities for women entrepreneurs. Studies indicate that e-commerce platforms, fintech solutions, and digital payment systems have helped women expand their businesses beyond traditional markets (Global SME News, 2024). The adoption of digital marketing strategies and online sales channels has increased women's business visibility, allowing them to compete in national and global markets (Economic Times, 2024). However, barriers such as digital literacy and access to technology remain significant, particularly in rural areas (Sanu, Ahmad, & Anjum, 2021). Government initiatives such as Digital India and Skill India aim to bridge this gap by offering training programs on digital tools, financial literacy, and online business management (Ministry of MSME, 2024).

Factors Influencing Women's Entrepreneurial Success

Several factors contribute to the success of women entrepreneurs in the MSME sector. Research by Kamal & Chandrakala (2023) found that prior work experience has a significant impact on entrepreneurial success, whereas factors like age, education level, and parental occupation have a relatively lower influence. Furthermore, studies indicate that women-led MSMEs generate more employment opportunities than male-led enterprises, though profitability remains higher in male-owned businesses (Sanu, Ahmad, & Anjum, 2021).

Policy Interventions and Future Prospects

To enhance women's participation in the MSME sector, policymakers must focus on financial inclusion, education, and socio-cultural transformation. Tiwari (2023) highlights the role of MSMEs in women's empowerment but also points out existing challenges such as gender biases, lack of infrastructure, and financial constraints. The World Bank (2024) recommends tailored financial solutions, mentorship programs, and business incubators to support women entrepreneurs. Strengthening these initiatives will be crucial in achieving gender parity in the MSME sector.

A review of the literature from 2010 to 2024 reveals that women entrepreneurs in MSMEs contribute significantly to economic development and social transformation. However, persistent challenges such as financial constraints, gender disparities, and socio-cultural norms continue to hinder their progress. A comprehensive approach involving policy reforms, financial support, and digital inclusion is essential for fostering a more inclusive entrepreneurial ecosystem. Future research should focus on assessing the long-term impact of government schemes and technological advancements on women-led MSMEs.

Research Gap

While numerous studies have explored the challenges faced by women entrepreneurs in MSMEs, there is limited research that quantitatively examines how financial access is influenced by various internal and external factors using advanced methods like Structural Equation Modeling (SEM). Additionally, existing literature often treats socio-cultural barriers, digital transformation, and policy support as separate elements rather than examining their combined impact. This gap creates a need for a more holistic framework that captures the complex interplay among these factors. By applying SEM, this study offers a deeper understanding of how these variables collectively affect financial access and the overall performance of women-led MSMEs in India.

Objective:

- To assess the growth and challenges of the MSME sector in India from the perspective of entrepreneurs.
- To analyze women's participation in the MSME sector by exploring their challenges, opportunities, and contributions.

Research Methodology

Research Design

This study adopts a mixed-methods approach, combining both quantitative and qualitative research methods. A descriptive research design is employed to analyze the participation of women entrepreneurs in the MSME sector, their challenges, opportunities, and the impact of government policies and digital transformation on their businesses.

Sampling and Data Collection

A primary data survey will be conducted among women entrepreneurs operating in the MSME sector across different regions in India. The study will use purposive and stratified random sampling to ensure representation across micro, small, and medium enterprises.

Sample Size: A Sample of 250 women entrepreneurs has been surveyed.

Sampling Method: A stratified random sampling technique will be used to ensure diversity in terms of business type, size, and geographical location.

Data will be collected using a structured questionnaire, divided into five sections:

- **Demographics (age, education, business experience, type of enterprise, and financial background).**
- **Financial Access (funding sources, credit accessibility, financial literacy).**
- **Socio-cultural barriers (gender discrimination, work-life balance, family support).**
- **Digital Transformation (technology adoption, e-commerce usage, digital literacy).**
- **Policy Support (awareness and effectiveness of government schemes).**

The questionnaire will include 5-point Likert scale statements to measure perceptions on financial access, socio-cultural barriers, digital transformation, and policy support.

Data Analysis

Quantitative data will be analyzed using descriptive statistics (mean, frequency, standard deviation) and inferential statistics (t-tests, chi-square tests, regression analysis) using SPSS. Qualitative data from interviews and open-ended survey responses will be analyzed using thematic analysis to identify key trends and insights.

Reliability and Validity

The survey instrument was pre-tested with a pilot study of 30 respondents to ensure reliability and validity. Cronbach's Alpha .678 will be used to test the internal consistency of Likert-scale responses.

Ethical Considerations

Participation in the study will be voluntary, and all responses will be kept confidential and anonymous. Informed consent will be obtained before data collection, ensuring compliance with ethical research guidelines.

Descriptive Statistics

Table No.1: Descriptive Statistics

Statistic	Age	Experience (years)
Valid Count	250	250
Missing	0	0
Mode	43 ^a	26 ^a
Median	41	16
Mean	39.72	15.45
Range	39	28
Minimum	20	1
Maximum	59	29

^a The mode is computed assuming that variables are discreet.

Distribution Plots

Age

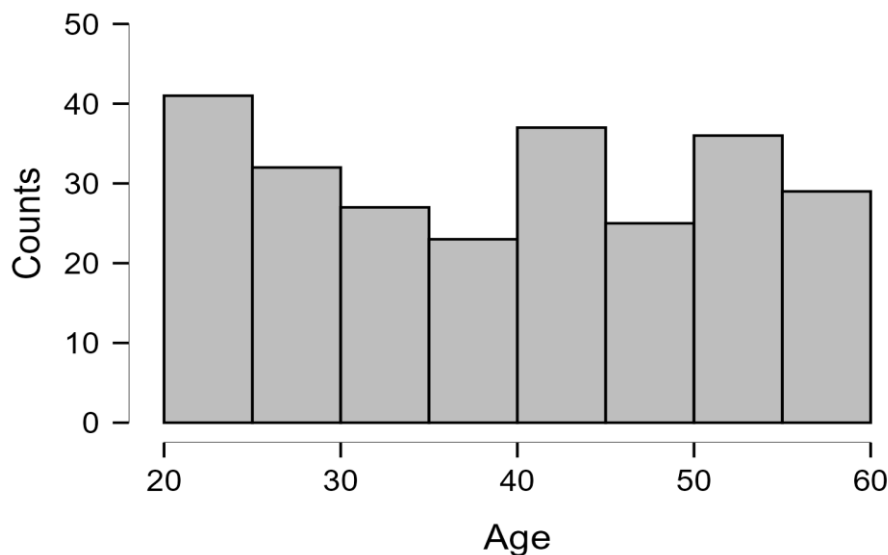


Chart-1 Age of the respondents

The descriptive statistics reveal key insights about the age and experience distribution of the given population. The average age is approximately 39.72 years, with a median of 41 years and a mode of 43 years, indicating that most individuals are in their early 40s. The age range spans 39 years, from 20 to 59 years, showing a diverse age group. Similarly, the experience level varies significantly, with a mean of 15.45 years and a median of 16 years, suggesting that half of the individuals have over 16 years of experience. The most frequently occurring experience level is 26 years, implying a substantial number of seasoned professionals. The experience range extends from 1 to 29 years, reflecting a workforce with both newcomers and highly experienced individuals. The close values of the mean and median for both variables suggest that the data is relatively symmetrically distributed, with no extreme skewness. Overall, the dataset represents a workforce with a broad mix of ages and experience levels, with a concentration of individuals in their early 40s and mid-career experience.

Table No. 2: Frequencies for Education

Education	Frequency	Percent
Graduate	66	26.4
Postgraduate	55	22
Diploma	67	26.8
High School	62	24.8
Missing	0	0
Total	250	100

Note. The following variables have more than 10 distinct values and are omitted: Age, Experience (years).

The frequency distribution of education levels provides insight into the educational background of the given population. Among the **250 individuals**, the highest proportion holds a **Diploma (26.8%)**, followed closely by **Graduates (26.4%)**. Individuals with a **High School education** make up **24.8%**, while those with a **Postgraduate degree** account for **22%**. The data indicates a fairly even distribution across all educational categories, with no extreme dominance of a single group. The fact that a **majority (73.6%) have at least a diploma or higher** suggests a well-educated workforce. Additionally, since there are no missing values, the data is complete and reliable for further analysis.

Table No. 3: Frequencies for Enterprise Type

Enterprise Type	Frequency	Percent
Micro	158	63.2
Small	69	27.6
Medium	23	9.2
Missing	0	0
Total	250	100

The frequency distribution of enterprise types indicates that a majority (63.2%) of businesses fall under the Micro category, making it the most prevalent type. Small enterprises account for 27.6%, while Medium enterprises make up only 9.2% of the total. This suggests that the business landscape is dominated by micro and small enterprises, which together constitute 90.8% of the total. The relatively low percentage of medium-sized enterprises implies that fewer businesses have scaled beyond the small enterprise level. With no missing data, the information is complete and reliable for further analysis. These insights highlight the predominance of smaller businesses, which may have implications for economic policies, support programs, and growth opportunities in the sector.

Table No. 4: Frequencies for Financial Background

Financial Background	Frequency	Percentage
Low	116	46.4
High	23	9.2
Medium	111	44.4
Missing	0	0
Total	250	100

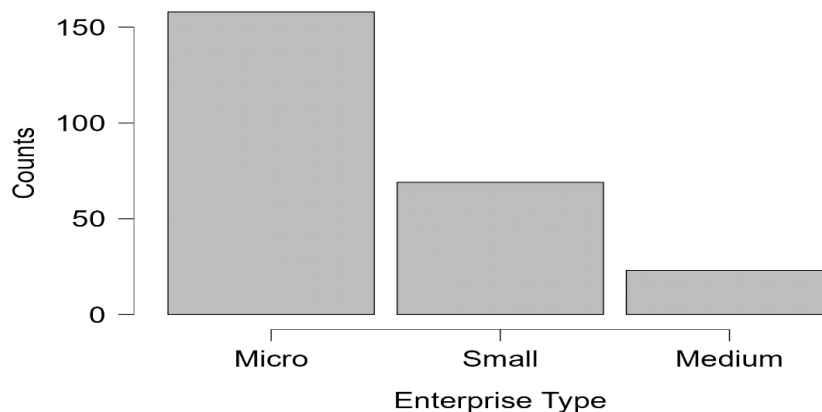


Chart-2 Enterprise Type

The frequency distribution of financial backgrounds shows that the majority of individuals fall into the Low (46.4%) and Medium (44.4%) financial categories, while only 9.2% belong to the High financial background group. This indicates that nearly 90.8% of the population has either a low or medium financial background, suggesting potential financial constraints for a significant portion of individuals. The relatively small percentage of individuals with a high financial background implies that wealth is not evenly distributed within the group. With no missing data, the findings are complete and reliable for further analysis. These insights could have important implications for financial support programs, accessibility to resources, and economic mobility within the population.

Regression Analysis

Variable	Coefficient	Standard Error	t-Statistic	p-Value	95% Confidence Interval
Intercept (const)	2.9280	0.207	14.112	0.000	[2.519, 3.337]
Average Socio-Cultural Barriers	0.0334	0.067	0.499	0.618	[-0.098, 0.165]

The regression analysis shows a positive relationship between **Average Socio-Cultural Barriers** and **Average Financial Access**. The equation for the regression line is:

Average Financial Access = $2.93 + 0.03 \times \text{Average Socio-Cultural Barriers}$.

Interpretation:

Intercept (2.9280): This is the predicted value of **Average Financial Access** when the **Average Socio-Cultural Barriers** is zero. In other words, without any socio-cultural barriers, the average financial access is around 2.93.

Coefficient for Socio-Cultural Barriers (0.0334): For each unit increase in **Socio-Cultural Barriers**, the **Average Financial Access** increases by approximately 0.03. However, this relationship is not statistically significant because the **p-value** (0.618) is much higher than the typical significance level of 0.05.

Standard Error: The standard errors for both the intercept and the coefficient estimate show the precision of the estimated values. For the **Average Socio-Cultural Barriers**, it is 0.067.

p-Value (0.618): This value is greater than 0.05, indicating that the effect of **Socio-Cultural Barriers** on **Financial Access** is not statistically significant. This suggests that **Socio-Cultural Barriers** might not be a strong predictor of **Financial Access** based on this dataset.

R-squared (0.001): The model explains only about **0.1%** of the variance in **Financial Access**. This very low value suggests that the **Socio-Cultural Barriers** are a weak predictor of **Financial Access** in this case.

R-squared: 0.001

This indicates that only **0.1%** of the variation in **Average Financial Access** is explained by the **Average Socio-Cultural Barriers**. The model doesn't seem to fit the data well.

Adjusted R-squared: -0.003

The adjusted R-squared takes into account the number of predictors. A negative value suggests that the model is not a good fit and that adding more predictors (even just one) does not improve the explanatory power.

F-statistic: 0.2494

This statistic tests whether the regression model as a whole provides a better fit than a model with no predictors. A low F-statistic value suggests that the model is not significantly better than simply predicting the mean of the dependent variable.

p-Value of the F-statistic: 0.618

This p-value is high, meaning that the overall regression model is not statistically significant. The independent variable (**Socio-Cultural Barriers**) does not explain much variation in **Financial Access**.

Regression Summary:

The analysis of the regression model reveals several key insights regarding the relationship between Socio-Cultural Barriers and Financial Access. The intercept value of 2.9280 indicates the predicted Average Financial Access when Socio-Cultural Barriers are absent, which is approximately 2.93. The coefficient for Socio-Cultural Barriers is 0.0334, suggesting that for each unit increase in Socio-Cultural Barriers, Average Financial Access increases by about 0.03. However, this relationship is not statistically significant, as evidenced by the p-value of 0.618, which is much higher than the typical significance level of 0.05.

The standard error for the coefficient estimates of Socio-Cultural Barriers is 0.067, showing the precision of the estimation. The low R-squared value of 0.001 indicates that only about 0.1% of the variation in Financial Access is explained by Socio-Cultural Barriers, suggesting that the model does not fit the data well. Furthermore, the negative adjusted R-squared of -0.003 suggests that adding this predictor worsens the model's explanatory power.

The F-statistic of 0.2494, coupled with a p-value of 0.618, indicates that the overall regression model does not significantly improve upon predicting the mean of the dependent variable, further reinforcing the conclusion that Socio-Cultural Barriers is not a strong predictor of Financial Access in this dataset.

Correlation analysis:

	Digital Transformation Score	Policy Support Score	Financial Access Q1	Financial Access Q2	Financial Access Q3	Financial Access Q4	Financial Access Q5
Digital Transformation Score	1	0.067466	-0.09205	0.154797	-0.0384	0.080754	-0.01773
Policy Support Score	0.067466	1	0.018794	-0.03431	-0.04432	-0.08896	-0.05538
Financial Access Q1	-0.09205	0.018794	1	-0.07027	-0.00269	-0.05143	-0.0105
Financial Access Q2	0.154797	-0.03431	-0.07027	1	0.007603	-0.10084	0.072054
Financial Access Q3	-0.0384	-0.04432	-0.00269	0.007603	1	0.034407	-0.00386
Financial Access Q4	0.080754	-0.08896	-0.05143	-0.10084	0.034407	1	0.077482
Financial Access Q5	-0.01773	-0.05538	-0.0105	0.072054	-0.00386	0.077482	1

Inference:

□ Digital Transformation Score and Policy Support Score:

- Weak correlation: The correlation coefficient between the Digital Transformation Score and the Policy Support Score is very low (0.067), indicating a very weak relationship between these two variables.

□ Financial Access Variables:

- Financial Access Q1 to Q5: The financial access variables show varying degrees of weak correlation with Digital Transformation and Policy Support.
- Financial Access Q2 has a moderate positive correlation with the Digital Transformation Score (0.1548). This suggests that, for this sample, there may be a slightly stronger relationship between certain financial access types and digital transformation.

Model Fit Indices for Measurement Models

Models	χ^2	df	P	χ^2/df	GFI	CFI	NFI	RFI	IF	TLI	RMR	RMSEA
One Factor Model	5194.319	377	<0.001	13.778	0.534	0.517	0.503	0.457	0.419	0.473	0.133	0.148
Two Factor Model	3916.429	376	<0.001	10.416	0.572	0.567	0.548	0.431	0.586	0.547	0.118	0.102
Three Factor Model	3216.429	374	<0.001	8.600	0.600	0.656	0.631	0.600	0.639	0.626	0.103	0.095
Four Factor Model	3046.615	371	<0.001	8.212	0.708	0.774	0.749	0.716	0.775	0.743	0.097	0.082
Five Factor Model	1990.761	367	<0.001	5.424	0.814	0.813	0.886	0.853	0.814	0.882	0.083	0.074
Six Factor Model	1025.934	362	<0.001	2.834	0.969	0.940	0.908	0.925	0.940	0.920	0.067	0.051

The SEM approach is used to examine the cause-and-effect relationship between the independent variables (firm attributes, financial obstacles, sources of finance, and life cycle of an MSME) on the dependent variable (access to finance) using maximum likelihood estimation. This study also attempts to examine the impact of access to finance on MSME performance (i.e., outcome variable).

The structural model depicts the relationship between the latent variables. Figure 2 represents the structural equation model which is the combination of a measurement model and a structural model. The hypothetical

relationships between the latent variables are depicted with their corresponding standardized regression coefficient value.

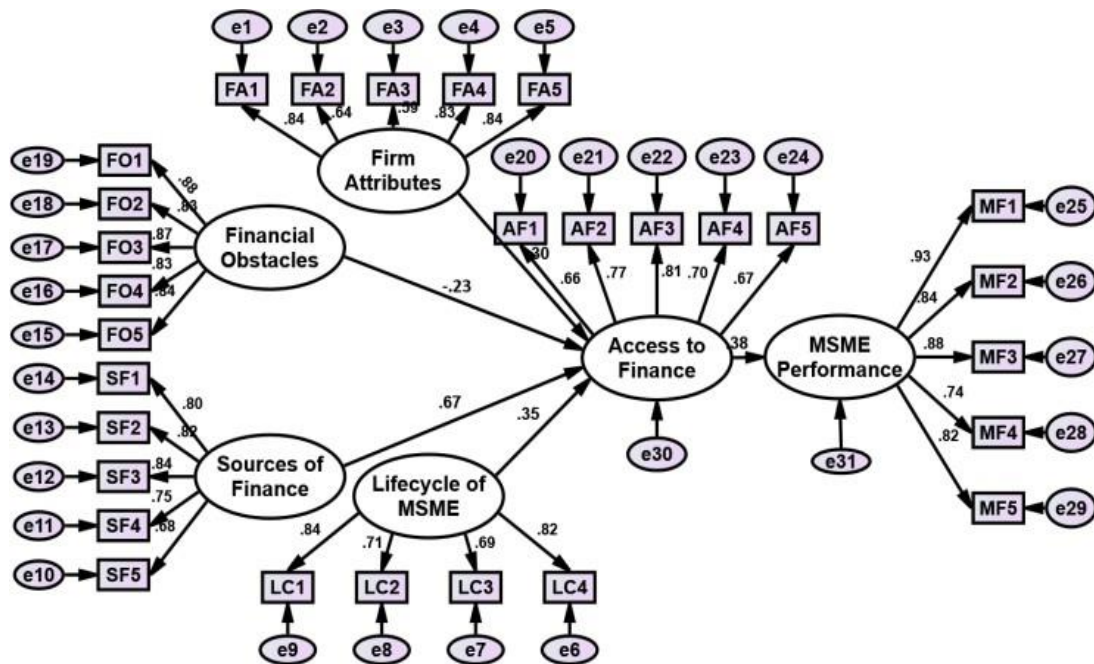


Figure 2. Structural Equation Model

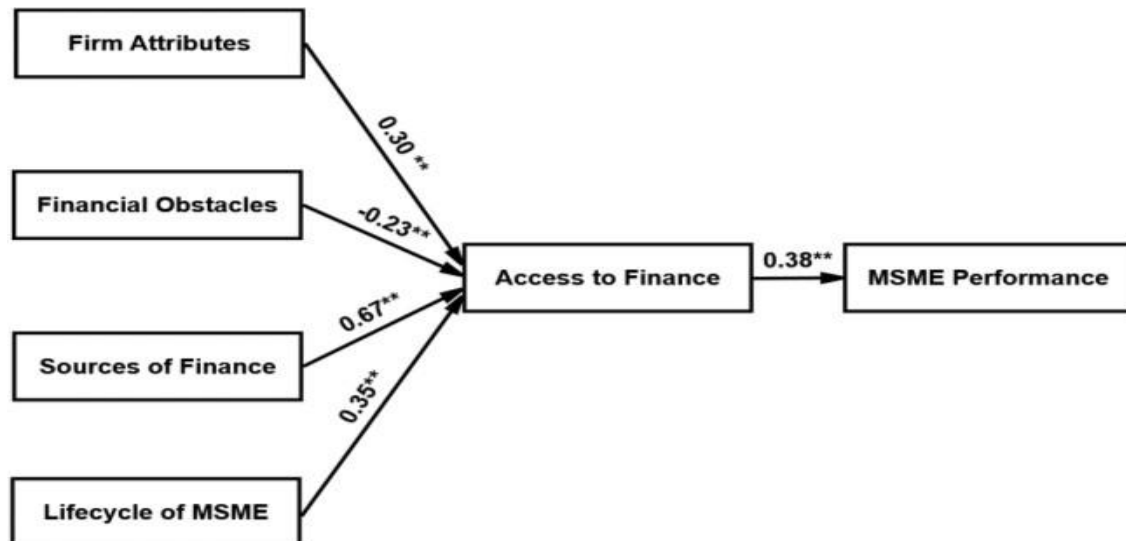


Figure 3. Path Analysis

The extension of the regression model is seen in the path analysis (Figure 3), which indicates the kind of cause-and-effect relationship between the selected variables. Among the four independent variables of “access to finance”, the variable “sources of finance” has the highest standardized regression coefficient (0.673), whereas the variable “firm attributes” has the lowest standardized regression coefficient (0.296) to the dependent variable (i.e., access to finance).

All the variables (except financial obstacles) have a positive impact on access to finance. Based on the regression coefficient values, it was found that the sources of finance have the highest effect (0.673) on the MSME’s access to finance, followed by the life cycle of MSME (0.352), and firm attributes (0.296).

Regression Weights of the SEM

Path	Std. Estimate	C.R.	P	Hypothesis Result
Firm Attributes □ Access to Finance	0.296	6.624	<0.001**	Hypothesis 1 Significant
Finance Obstacles □ Access to Finance	-0.231	3.373	<0.001**	Hypothesis 2 Significant
Source of Finance □ Access to Finance	0.673	10.008	<0.001**	Hypothesis 3 Significant
Lifecycle of MSME □ Access to Finance	0.352	7.417	<0.001**	Hypothesis 4 Significant
Access to Finance □ MSME Performance	0.378	6.678	<0.001**	Hypothesis 5 Significant

Note: ** significant at the 1 % level.

From the results, it is evident that firm attributes, financial obstacles, sources of finance, lifecycle have significant effect on access to finance of MSME. On the other hand, access to finance has significant positive effect on the performance of MSME. All these hypothetical relationships are significant at 1% level.

The model fit indices of the structural model are Chi- square/Degrees of Freedom (3.025), Root Mean Square Error of Approximation (0.029), Root Mean Square Residual (0.021), Goodness of Fit (0.915), Adjusted Goodness of Fit(0.907), Comparative Fit Index(0.928), Tucker Lewis index(0.955), and Normed Fit Index(0.967).The most frequently used model fit indices of the model are within the recommended values, hence, SEM has an absolute fit.

Findings

Participation in the MSME Sector:

Women-led enterprises account for approximately 20% of the 58.5 million MSMEs in India. The study sample reveals that a vast majority (63.2%) of these businesses fall under the micro-enterprise category, indicating that most women entrepreneurs are still operating at a smaller scale with limited resources and reach.

Key Influencers of Financial Access:

Structural Equation Modeling (SEM) results demonstrate that financial access is significantly shaped by:

- **Sources of finance ($\beta=0.673$)** – the most influential factor, suggesting the availability and variety of funding options (e.g., banks, microfinance, personal funds) greatly enhance accessibility.
- **Business lifecycle stage ($\beta=0.352$)** – indicating that women entrepreneurs at growth or expansion stages tend to have better access to finance.
- **Firm attributes ($\beta=0.296$)** – such as years of operation, business size, and sector type also positively influence financial access.

Negative Impact of Financial Obstacles:

Financial obstacles negatively affect access to finance ($\beta=-0.231$), confirming that traditional barriers like lack of collateral, limited credit history, and bureaucratic hurdles persist, especially for first-time and rural entrepreneurs.

Access to Finance and Performance:

The study found a **positive relationship between access to finance and business performance ($\beta=0.378$)**. Enterprises with better financial access reported higher profitability, capacity for growth, and resilience to market fluctuations.

Socio-Cultural Barriers:

Although widely recognized as challenges by respondents in qualitative responses, **regression analysis showed no statistically significant link between socio-cultural barriers and financial access ($p=0.618$)**. This suggests that while such barriers are real, they may not directly affect financial transactions as strongly as assumed.

Digital and Policy Support:

Correlation analysis revealed **weak yet positive associations between digital transformation, policy support, and financial access**. This highlights their emerging importance in expanding business operations and overcoming geographic limitations, though they are not yet fully leveraged by many women entrepreneurs.

This study offers a comprehensive understanding of the financial and structural dynamics affecting women-led MSMEs in India. It establishes that access to finance is a critical enabler of enterprise performance, significantly influenced by tangible elements like funding sources, business maturity, and organizational characteristics. While financial barriers remain a strong deterrent, the findings challenge the commonly held belief that socio-cultural limitations are the most dominant obstacle—statistically, their impact was found to be negligible in isolation. Despite progressive policy frameworks and technological advances, women entrepreneurs still face considerable hurdles in accessing mainstream financial systems. Digital inclusion and tailored policy support are emerging as promising tools but require deeper penetration and awareness to make a measurable impact. The study validates the role of Structural Equation Modeling in revealing these multifaceted relationships and provides empirical backing for policy and institutional reforms.

Recommendations

Develop Lifecycle-Based Financial Solutions:

Design and roll out financial instruments aligned with the specific stages of business development (start-up, growth, maturity). For instance, early-stage MSMEs may benefit from seed capital and unsecured loans, whereas mature enterprises might need working capital, equipment finance, or credit lines for expansion.

Ease of Access to Credit:

Simplify the loan application and approval processes by:

- Reducing collateral requirements for women entrepreneurs.
- Allowing alternate credit scoring methods (e.g., based on business cash flow or digital transaction history).
- Establishing dedicated women-focused financial desks in public and private banks.

Capacity Building and Financial Literacy:

Implement comprehensive training programs covering:

- Basic and advanced financial management.
- Legal and regulatory compliance for MSMEs.
- Digital skills, e-commerce operations, and marketing strategies.
- Navigating government schemes and documentation procedures.

Promote Digital Adoption:

Expand digital outreach by:

- Providing low-cost access to smartphones and internet connectivity in rural areas.
- Offering hands-on workshops on using fintech platforms, digital payments, and inventory management tools.
- Supporting online marketplaces and linking them to global trade platforms.

Strengthen Institutional and Policy Frameworks:

- Establish **gender-responsive procurement policies**, mandating government departments to procure a certain percentage of goods/services from women-led MSMEs.
- Create regular review and feedback mechanisms to assess the real-world impact of government schemes like CGSS and SISFS.
- Encourage the formation of women-centric industry associations and incubators for collective bargaining and shared resources.

Facilitate Market Access and Networking:

- Organize trade fairs, exhibitions, and B2B networking events exclusively for women-led enterprises.
- Support participation in international trade missions and exhibitions under subsidized travel and registration programs.
- Build online platforms that connect rural and urban women entrepreneurs for knowledge exchange and collaboration.

Discussions

Timely access to finance plays a significant role in the survival and growth of MSMEs. Federal (or state)

governments of many countries play a major role in offering assistance through various initiatives and schemes for nurturing MSMEs.

The results revealed that the available sources of finance enhance the MSME's access to finance. (Godke Veiga & McCahery, 2019; Khan, 2015; Singh & Wasdani, 2016). For example, the availability of various sources of finance may help them fulfill their financial need to manage the working capital, expand the business, or deal with any unexpected financial crunch in the business. This may be through personal funds or loans from financial institutions or money lenders obtained in a short time with less effort, thus directly enhancing their access to finance. (Bilal *et al.*, 2017; GodkeVeiga & McCahery, 2019; Karedza *et al.*, 2014; Khan, 2015; Rocca *et al.*, 2011; Singh & Wasdani, 2016; Zelalem & Wubante, 2019). The model examined in this study provides a clear picture that the MSME's access to finance is influenced by its attributes, the available sources of finance, and the life cycle stage it is in.

The empirical findings also revealed that the life cycle of MSME has a significant positive impact on access to finance. The need for the different sources of finance may vary according to the stage in which the MSME is in. Hence, the second most important factor, is the lifecycle of an MSME, because MSMEs in the conception/development stage have more access to loans through government schemes; the MSMEs in the commercialization stage have more access to loans from banks and other financial institutions, and the MSMEs in the growth or maturity/expansion stages have access to finance from various sources based on their reputation and financial stability.

The third most important factor, which has a positive influence on the MSME's access to finance is firm attributes. A firm's attributes enhance its access to finance because the financial institutions or money lenders approve the loan after careful analysis of the various characteristics of the firm. Favorable firm attributes increase an MSME's access to finance, whereas unfavorable attributes decrease the access.

Financial obstacles have a significant negative impact on an MSME's access to finance because financial obstacles prevent MSMEs from getting loans from financial institutions or money lenders to meet the needs of their business (Naidu & Chand, 2012; Pandula, 2011; Wang, 2016).

Meanwhile, access to finance also has a significant positive impact on MSME performance. Ease access to finance helps MSMEs to grow faster and at par with reputed companies in a highly competitive business environment. If the MSMEs have access to the required quantity of funds at the required time at a low interest rate, in addition to fewer procedures, it would help them to meet the financial needs of their business. Timely investments in the business will help the enterprise to rise from financial crises and fulfill its financial commitments (i.e., accounts payables, interest payments, tax payments, etc.), purchase raw materials to increase production based on sudden unexpected demands, and expand its business.

Suggestions:

Financial Infrastructure Enhancement

- Develop specialized financial products tailored to women entrepreneurs' needs
- Implement simplified loan application processes with reduced collateral requirements
- Create dedicated funding channels for different business lifecycle stages
- Establish alternative credit assessment methods that consider women entrepreneurs' unique circumstances

Capacity Building Framework

- Institute comprehensive business management training programs
- Provide specialized technical and digital skills development
- Offer mentorship programs pairing experienced entrepreneurs with newcomers
- Create industry-specific training modules addressing sector-specific challenges

Digital Transformation Support

- Facilitate access to digital tools and platforms
- Provide training in e-commerce and digital marketing
- Support the adoption of digital financial services
- Create online networking platforms for women entrepreneurs

Policy and Regulatory Reforms

- Streamline business registration and compliance procedures
- Implement gender-responsive procurement policies
- Develop targeted incentives for women-led MSMEs
- Create mechanisms for regular policy review and adaptation

Market Access Enhancement

- Establish dedicated market linkage programs
- Create platforms for B2B networking and collaboration
- Facilitate participation in trade fairs and exhibitions
- Support export promotion initiatives for women-led MSMEs

Ecosystem Development

- Create women-focused business incubation centers
- Establish support networks and industry associations
- Develop partnerships with large corporations for market access
- Implement monitoring and evaluation systems to track progress

These suggestions require a coordinated effort from government agencies, financial institutions, private sector stakeholders, and civil society organizations. Implementation should be phased, with clear metrics for success and regular evaluation of outcomes. The focus should be on creating sustainable, scalable solutions that can adapt to the evolving needs of women entrepreneurs in the MSME sector.

Conclusion

This study sheds light on the pivotal role that women entrepreneurs play in the Micro, Small, and Medium Enterprises (MSME) sector—an economic engine that continues to drive innovation, employment, and inclusive growth in India. While women-led MSMEs make up roughly 20% of the sector, their full potential remains largely untapped due to persistent financial and structural barriers. Through a mixed-methods approach and the application of Structural Equation Modeling (SEM), the research presents a data-driven and holistic understanding of the determinants influencing financial access and business performance among women entrepreneurs.

The findings clearly establish that access to finance is a key enabler of business success, with the sources of finance ($\beta=0.673$) emerging as the most influential factor. This is followed by the lifecycle stage of the enterprise ($\beta=0.352$) and firm-specific attributes ($\beta=0.296$), all of which contribute significantly to a woman entrepreneur's ability to secure necessary financial resources. Notably, financial obstacles ($\beta=-0.231$) continue to act as a strong deterrent, highlighting the urgent need to reform traditional lending practices and enhance credit accessibility for women-owned businesses.

Although socio-cultural factors are often cited as barriers to women's participation in entrepreneurship, the study's regression analysis found no statistically significant relationship between these factors and direct financial access. This suggests that while such barriers affect broader entrepreneurial engagement, they may not independently impede financing decisions—especially when firm-level and financial variables are more dominant. Nonetheless, qualitative data and literature evidence affirm their ongoing relevance in shaping women's entrepreneurial experiences, particularly in rural or traditionally conservative regions.

Additionally, the role of digital transformation and policy support, though showing weaker statistical correlations, cannot be understated. These factors serve as essential enablers that amplify reach, reduce transaction costs, and connect women entrepreneurs to wider markets. However, many of these tools remain underutilized due to low digital literacy and limited awareness of available schemes—especially among micro-enterprises in underdeveloped areas.

The study therefore concludes that an integrated approach—combining financial reforms, digital empowerment, socio-cultural sensitization, and inclusive policy frameworks—is vital to creating a thriving ecosystem for women-led MSMEs. Such an approach should not only aim to remove the visible barriers but also strengthen the underlying infrastructure that supports sustainable business development.

Importantly, empowering women entrepreneurs is not merely an act of promoting gender equality; it is a strategic imperative for accelerating economic resilience, job creation, and community development. Their success holds

transformative potential not just for families and local economies, but for the nation's long-term growth trajectory. The insights from this study can inform government agencies, financial institutions, and development practitioners in designing more inclusive, data-backed policies that unlock the economic power of women in the MSME sector.

Policy Recommendations

To bridge existing financial and structural gaps in the MSME ecosystem for women entrepreneurs, the following policy-level interventions are recommended:

Gender-Responsive Financial Policies

- **Establish Women MSME Financing Frameworks:** Design lending programs within public and private banks specifically for women-led MSMEs with relaxed collateral requirements and flexible repayment terms.
- **Subsidized Interest Rates:** Introduce interest subvention schemes for first-time women borrowers to encourage credit uptake and ease initial business pressures.
- **Credit Guarantee Extensions:** Expand the scope of the Credit Guarantee Scheme for Startups (CGSS) to offer higher guarantees (up to 90%) for women entrepreneurs in high-risk sectors like manufacturing and technology.

Simplification of Bureaucratic Processes

- **Single Window Digital Platforms:** Develop user-friendly portals that consolidate MSME registration, subsidy applications, tax compliance, and scheme access—tailored for lower digital literacy levels.
- **Fast-Track Approvals:** Introduce fast-track mechanisms for loan sanctions, business registrations, and scheme enrollments for verified women entrepreneurs.
- **Grievance Redressal Cells:** Set up dedicated helpdesks and redressal cells to support women facing procedural challenges in availing benefits or resolving credit-related disputes.

Inclusive and Targeted Capacity Building

- **Mandatory Training Tie-Ins:** Link government financial support to the completion of certified training programs in entrepreneurship, financial literacy, and legal compliance.
- **Localized Outreach:** Partner with NGOs, SHGs, and women's cooperatives to deliver grassroots-level awareness and training in local languages.
- **Women Business Mentorship Hubs:** Establish mentorship networks at district and state levels to connect emerging entrepreneurs with experienced businesswomen.

Policy Support for Digital Transformation

- **Digital Starter Kits:** Provide subsidized tech bundles (e.g., smartphones, POS machines, e-wallets) to women entrepreneurs in underserved areas.
- **Digital Inclusion Incentives:** Offer tax credits or digital infrastructure grants to women-led MSMEs that adopt e-commerce, cloud-based accounting, or digital inventory systems.
- **Integration into Government E-Marketplaces (GeM):** Simplify onboarding for women MSMEs onto national procurement portals and ensure priority listing in public tenders.

Market Access and Value Chain Integration

- **Women-Specific Procurement Mandates:** Mandate that a certain percentage of public procurement is sourced from women-led MSMEs (e.g., 5–10%).
- **Export Promotion Cells:** Set up dedicated export advisory services and trade facilitation cells for women-owned businesses, especially those in crafts, textiles, and agro-based products.
- **Cluster-Based Policy Models:** Develop MSME clusters focused on women entrepreneurs with common infrastructure, shared logistics, and co-marketing opportunities.

Policy Monitoring and Impact Assessment

- **Establish Gender-Disaggregated Data Systems:** Require all MSME-related data collection (credit access, scheme utilization, business performance) to be disaggregated by gender for better targeting.

- **Annual Women MSME Impact Reports:** Publish national and state-level reports evaluating the impact of policies on women entrepreneurs.
- **Policy Advisory Committees:** Include women entrepreneurs and representatives from women-led business groups in MSME policy formulation and review bodies.

Future Scope of Research:

Future research could explore longitudinal changes in women entrepreneurship patterns to assess the long-term impact of current policy interventions. Cross-cultural comparative studies examining successful models from diverse economies could yield valuable insights for policy adaptation. Additionally, investigating the intersection of gender, technology adoption, and entrepreneurial resilience during economic disruptions presents an important research avenue. Further exploration of innovative financing mechanisms specifically designed for women entrepreneurs and evaluation of mentorship program effectiveness would enhance understanding of sustainable support systems. Finally, research examining the spill over effects of women's entrepreneurial success on community development and intergenerational entrepreneurship could provide a more holistic perspective on their socioeconomic impact.

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Corporate Financial Performance and its impact on Environmental, Social, Governance and ESG Performance: A Study of Indian Firms

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Abstract

Companies are increasingly paying attention to “Environmental”, “Social”, and “Governance” (ESG) disclosures to create long-term value. In this context, the “financial performance” of companies also plays a crucial role in determining the extent of engagement in ESG activities. Enhanced financial performance results in increased ESG engagement, whereas superior ESG engagement does not always translate to better financial performance (Lin et al., 2019). Consequently, we observe a dearth of studies that investigate the impact of “Corporate Financial Performance (CFP) on ESG Performance (ESGP)”, especially in the Indian context.

Thus, the purpose of this paper is to examine the impact of “Corporate Financial Performance (CFP)” on “ESG Performance (ESGP)” using an imbalanced panel dataset of 304 firm-year observations of Indian firms listed on the Nifty100 ESG Index over the period of 5 years (2018 to 2022). The relationship is empirically investigated by employing the fixed-effect regression analysis between CFP as measured by accounting-based measure, Return on Assets (ROA) and market-based measure, Tobin’s Q and ESGP as measured by Environmental Scores (ES), Social Scores (SS), Governance Scores (GS) and overall ESG Scores (ESGS) obtained from the Bloomberg database. The findings indicate that Tobin’s Q affects “Environmental Score (ES)”, “Social Score (SS)”, “Governance Score (GS)” and “ESG Score (ESGS)” positively and significantly. On the other hand, ROA has statistically insignificant effects on ESGP. Market measures are more adequate for assessment of future and long-term performance. Accounting measures, especially the return on assets, are subject to bias from managerial manipulations. Generally, a high Tobin’s Q ratio may indicate that the company is experiencing a period of overvaluation. This study indicated the overvaluation of share price in the market leads to higher ESG activities in Indian companies.

Keywords: ESG Performance (ESGP); Corporate Financial Performance (CFP); Nifty100 ESG Index; India.

Introduction

Environmental, Social, and Governance (ESG) refers to the basic modern dimension of corporate social responsibility (CSR) (Miralles-Quiros et al., 2019). Specifically, CSR refers to “policies and practices of corporations that reflect business responsibility for some of the wider societal good” (Matten and Moon, 2008), however, ESG places lesser emphasis on the overall corporate ethics and primarily centres on three specific aspects: Environmental, Social, and Governance concerns. The term ESG (Environmental, Social, and Governance) was popularly used first in a 2004, report titled “Who Cares Wins”, which was a joint initiative of financial institutions at the invitation of the United Nations. In recent times, the ESG performance of firms has become increasingly important for policymakers and investors (Nekhili et al., 2019; Tarmuji et al., 2016; Velte, 2017). More and more companies have realized that ESG is a key driver for competitive advantage, operational efficiency, and reputation establishment (Alsayegh et al., 2020; Aouadi and Marsat, 2018; Buallay, 2019; Filbeck et al., 2019). Companies as identified as green typically receive greater media attention, which can draw more investment from the capital market (Liu and Hamori, 2020).

In India, Securities & Exchange Board of India (SEBI) has introduced measures to enhance ESG disclosure level through Regulation 34(2)(f) of the Listing Obligations and Disclosure Requirement (LODR). Researchers have widely focused on analyzing the impact of ESG Performance on a firm’s economic and financial performance (Do and Kim, 2020; Landi and Sciarrelli, 2019; Velte, 2017). But, ESG objectives should be viewed not merely as elements impacting a company’s financial performance, but as integral components of a firm’s overall performance that must be actively pursued. Although firms with greater profitability have greater financial flexibility, it strongly affects managerial decision-making (Pasquale Ruggiero and Sebastiano Cupertino, 2018). Considering that the firms have limited financial resources which need to be allocated efficiently in various investment activities (Ahmed et al., 2021), managers may tend to allocate resources to initiatives that are more remunerative in the short term, rather than ESG investments. Managers’ personal interests often clash with a strategic ESG-

focused approach, especially during times of financial downturn. In such instances, managers must find motivation to justify ESG objectives by articulating how they contribute to a sustainable future financial scenario. Firms should engage in pursuing ESG initiatives for increasing stakeholders' satisfaction beyond expectations and regulations through investments in pursuits where they can attain that goal. The high profit-generating entities have great potential to invest their returns towards building ESG performance, and thus, the reverse of the relationship between ESG and CFP also holds true.

The current study aims to investigate the impact of Corporate Financial Performance (CFP) on ESG Performance (ESGP), using "firm-level panel data" from 2018 to 2022 on 304 firm-year observations from the Indian listed companies' constituent of the Nifty100 ESG Index.

This paper is organized as follows: Section 2 suggests a connection between CFP-ESGP. Section 3 represents objective and hypothesis, Section 4 outlines the methodology employed for the statistical analysis. In Section 5, the study findings are presented and in section 6, discussion and conclusion. Section 7 represents implications subsequently followed by limitations and future work in Section 8. Section 9 represents references.

Review of literature

Carroll (1979) classified "corporate social responsibility (CSR)" investments into "environmental, social, and governance" frameworks. Subsequently, CSR and ESG have been interchangeably employed in literature. Various studies indicate both favourable and unfavourable connections between "ESG" practices and "corporate financial performance (CFP)". Many studies indicate both favourable and unfavourable connections between "ESG performance (ESGP)" and "corporate financial performance (CFP)". Perhaps the pioneering proposition on ESG and CFP often referred to as trade-off theory dates back to the neoclassical researchers (Friedman, 1970; Vance, 1975; Wright & Ferris, 1997). They argue that a company's sole societal responsibility is to maximize financial returns for its shareholders. According to this perspective, allocating funds to ESG initiatives needlessly increases operational expenses, ultimately resulting in reduced profitability. On the contrary, proponents of stakeholder theory (Freeman, 1984; Jones, 1995) assert that besides firm owners, other stakeholders are equally essential to an enterprise's success for more beneficial contracting that opens new avenues of growth and stability (Fatemi & Fooladi, 2013).

Empirical studies have widely acknowledged the one-way influence of investments in ESG-related activities on "corporate financial performance (CFP)". Some observed a positive association between environmental performance and CFP (King & Lenox, 2002; Lee et al., 2016; Stanwick & Stanwick, 1998). Zhao et al. (2018) Examined this phenomenon within China's "energy and power generation sector", and the findings from "panel-based regression" confirm that superior "ESG performance" significantly boosts the financial performance of Chinese companies. From the perspective of a strong corporate governance mechanism and resulting firm value, Achim et al. (2016) investigated a sample of firms listed on the Bucharest stock exchange. Their study demonstrates a positive relationship between the caliber of "corporate governance" and the "market value" of the analysed companies. Therefore, a strong performance in "corporate governance indicators" holds the potential to increase "firm value". Thus, achieving a high score in "corporate governance indicators" can maximize "firm value". Therefore, achieving a high score on "corporate governance indicators" can enhance the value of a firm. In the banking industry, a higher score on corporate governance and employee dimensions led to a higher CFP, whereas product responsibility and society dimensions do not show any positive effects on CFP (Esteban-Sanchez et al., 2017). Although the definition and methodological approach to examine ESG and firm performance vary substantially in the existing studies (Nelling & Webb, 2009; Peloza & Papania, 2008; Surroca et al., 2010), there is, however, a consensus that ESG-related investments do affect the financial performance of a firm (Xie et al., 2019; Yu et al., 2018). Firms that pollute the environment or have unfair employee relations may suffer penalties or consumer boycotts, which results in financial losses and is unattractive for investors (Garcia et al., 2017). Hence, companies are motivated to invest in "environmental, social, and governance" initiatives.

However, being a responsible corporate entity comes with a price, demanding firms to actively cultivate and maintain their social reputation, which can yield intangible benefits. In contrast, ESG activities incur tangible costs. As a result, stakeholders may find it difficult to assess this long-run value proposition (Broadstock et al., 2019). Hence, a few studies also indicate an adverse correlation between ESG performance and firm performance. For example, Garcia et al. (2017) examined companies from BRICS countries and concluded a negative association between profitability and environmental performance. Similarly, Jain et al. (2017) indicates a negative link between a firm's ESG score and corresponding CFP. Nevertheless, Achim and Borlea (2014) studied the impact of environmental investment on the accounting performance of the listed Romanian firms measured by ROA. Their findings support the idea that environmental investments significantly increase a company's internal financial strain, thereby reducing its overall financial performance. Friede et al. (2015) conducted an extensive systematic literature review and found that the relationship between ESGP and CFP is well-founded.

Most of the researchers found a non-negative connection, with a significant majority of studies demonstrating a positive relationship between “ESG performance (ESGP)” and “corporate financial performance (CFP)”. Furthermore, using a large global data set, a recent study found a non-negative relationship between most of ESG activities with CFP (Xie et al., 2019). Hence, from a strategic management viewpoint, good performance on various dimensions of ESG can have a much wider connotation (Waddock & Graves, 1997) than a cost, a restriction, or a donation. Besides, it can serve as a major source of innovation and competitive advantage (Michael E Porter & Kramer, 2006) which shall lead to improved CFP in the future (McGuire et al., 1990). In addition, the slack resource theory proposes that instead of firms’ ESG influencing CFP, it is the better CFP that leads to an enhanced ESG performance (Waddock & Graves, 1997). According to them, there might be a two-way relationship where ESG impacts CFP while CFP also affects ESG simultaneously, referred to as the positive/negative synergy hypothesis. Improved financial standing enables firms to deploy more financial resources in socially responsible activities such as employee relations, society, and the environment (Preston & O’Bannon, 1997). Enhanced financial performance results in increased ESG engagement, whereas superior ESG engagement does not always translate to better financial performance Lin et al. (2019). Consequently, we observe a dearth of studies that investigate the impact of “Corporate Financial Performance (CFP) on ESG Performance (ESGP)”, especially in the Indian context.

Objective and hypothesis

This study aims to investigate the impact of “Corporate Financial Performance” measured by “ROA”, “accounting-based” metrics and “Tobin’s Q”, “market-based” metrics on “ESG Performance” measured by “Environmental Scores (ES)”, “Social Scores (SS)”, “Governance Scores (GS)” and “Overall ESG Scores (ESGS)” in the context of Indian firms under the Nifty100 ESG Index.

We propose the following hypotheses for empirical investigation:

Hypothesis H1: Corporate Accounting Performance (ROA) directly and positively impacts the ESG Performance (ESGP).

H1a: ROA directly and positively impacts Environmental Scores (ES).

H1b: ROA directly and positively impacts Social Scores (SS).

H1c: ROA directly and positively impacts Governance Scores (GS).

H1d: ROA directly and positively impacts Overall ESG Score (ESGS).

Hypothesis H2: Corporate Market Performance (Tobin’s Q) directly and positively impacts the ESG Performance.

H2a: Tobin’s Q directly and positively impacts Environmental Scores (ES).

H2b: Tobin’s Q directly and positively impacts Social Scores (SS).

H2c: Tobin’s Q directly and positively impacts Governance Scores (GS).

H2d: Tobin’s Q directly and positively impacts Overall ESG Score (ESGS).

4. Research Methodology

In this section, the sample and data collection methods are outlined, including the variables used in the study. Additionally, it delves into the model employed to attain the study’s objective.

Sample Description

The sample data is sourced from the Nifty100 ESG Index as of March 29, 2023. The NIFTY100 ESG Index reflects the performance of companies based on the ESG risk score assigned to the company, where the weight of each constituent is derived from its free-float market capitalization and modified ESG risk score. The final sample is taken for 304 firm year observations after excluding financial and banking companies, and those with missing data (Table1). The data on financial variables, control variables and ESG disclosure scores collected from Bloomberg database.

Table 1: Sample Selection

Sample Selection	2018	2019	2020	2021	2022	Total
Nifty100 ESG Index Companies in the database	89	89	89	89	89	445
Financial and banking companies	23	23	23	23	23	115
Missing data companies	4	3	3	7	9	26
Final Sample	62	63	63	59	57	304

Variable Measurement

To explore the connection between “Corporate Financial Performance (CFP)” and “ESG Performance (ESGP)”, “ROA” and “Tobin’s Q” are used as indicators for “CFP”, while “Environmental Scores (ES)”, “Social Scores (SS)”, “Governance Scores (GS)”, and overall “ESG Scores (ESGS)” represent ESGP in the regression equation. Additionally, the study incorporates control variables such as firm size, debt-equity ratio, and industry dummies.

Table 2: Description of Variables

Variable Type	Variable Name	Variable Code	Variable Definitions	Consistent with Literature
Independent	Corporate Financial Performance (CFP)	ROA	Ratio of Net Income/Total Assets	Fernando García et al. (2020), Pasquale Ruggiero et al. (2018), Renard Y.J. Siew et al. (2013). Chelawat H., Trivedi I.V. (2016), Velte P. (2017), Dalal K. K., Thaker N. (2019), Kumar S., Dua p. (2020).
		Tobin’s Q	Ratio of Equity Market value to Equity Book value	
Dependent	ESG performance (ESGP)	ES	Environmental Scores	Jha M. K. and Rangrajan K. (2020), Velte Partrick (2017), Jyoti G. and Khanna A. (2021), Pasquale Ruggiero et al., (2018), Fernando García et al. (2020) and Preeti Sharma et al. (2020).
		SS	Social Scores	
		GS	Governance Scores	
		ESGS	Overall ESG Scores	
Control	Company scale	SIZE	The natural logarithm of a company's Total Assets	Garcia et al. (2017), Landi and Sciarelli (2019), Miralles-Quiros et al. (2019), Paltrinieri et al. (2020), Sun et al. (2019).
	Financial leverage	LEV	Ratio of Net Debt to Shareholders' Equity	
	Industry	INDS	The industry dummies obtain a value of 1 for the firm’s industry and 0 otherwise.	

Model

The research utilizes fixed effect regressions in panel data, validated by the “statistically significant chi-square” from the Hausman test. The data is scrutinized for “multicollinearity”, “heteroscedasticity”, “autocorrelation”, “stationarity”, and “normality”. Robust “standard errors”, accounting for “heteroscedasticity” and “autocorrelation”, are computed as “regression estimates” in STATA 13.

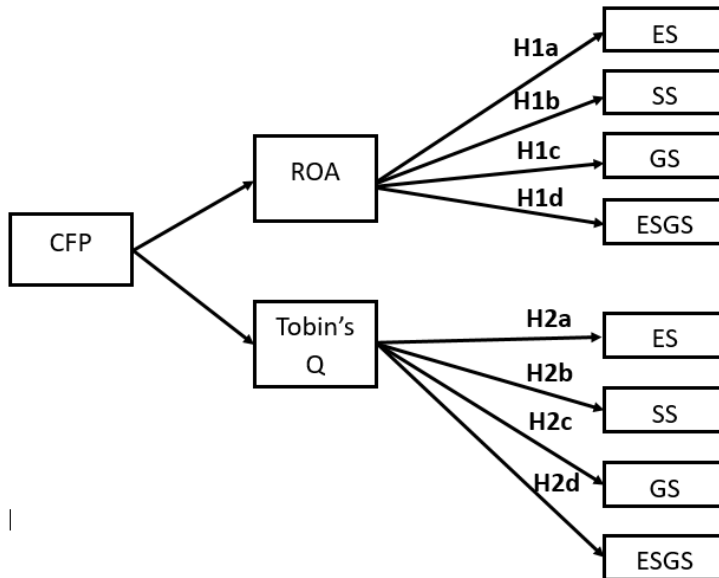
To test the effect of CFP on ESGP (Figure 1), one-year lagged variables of ESGP is used as CFP will not immediately lead to better ESGP. The following model, therefore, compares the CFP of the year t with the ESGP variables of the year t+1 to analyse the impact of CFP on ESGP, starting from 2018 to 2022:

$$Y_{it+1} = \beta_0 + \beta_a X_{it} + \beta_s C_{it} + v_{it}, \text{ where:}$$

Y_{it} : is ESG disclosure score,

X_{it} : is CFP measure,
 C_{it} : is a vector of control variables for firm i at time t .
 t : 2018, 2019, ...2022.

Figure 1: Research Design



Results

The analysis of the relationship between “CFP-ESGP” is presented through summary statistics, correlation matrix, and regression analysis with fixed effects.

Descriptive Statistics and Correlation Matrix: Summary statistics and correlation matrix for the sample data:

Table 3: Descriptive Statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
ESG	318	49.902	11.373	22.36	76.98
E	318	34.283	20.976	0	81.184
S	319	31.87	12.355	3.658	69.891
G	319	83.405	6.16	57.676	98.615
ROA	329	10.848	13.223	-74.98	95.18
TQ	324	12.04	34.683	0.37	566.62
size	330	9.14E+11	1.85E+12	1.35E+10	1.71E+13
lev	328	63.421	580.594	-182.98	10186.44

Table 4: Pearson’s correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) ESG	1.000							
(2) E	0.928*	1.000						
(3) S	0.862*	0.677*	1.000					
(4) G	0.656*	0.528*	0.460*	1.000				
(5) ROA	-0.085	-0.083	-0.050	-0.038	1.000			
(6) TQ	-0.154*	-0.154*	-0.104	-0.099	0.046	1.000		
(7) size	0.404*	0.404*	0.277*	0.400*	-0.268*	-0.195*	1.000	
(8) lev	-0.062	-0.071	-0.024	-0.018	-0.128*	0.889*	0.077	1.000
VIF	1.273	2.22	1.928	1.514	1.26	1.787	1.778	1.793

Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The descriptive statistics in Table 3 display the “mean”, “standard deviation”, “minimum” and “maximum” value of variables used in the study. The average ESG scores in our sample are approximately 50 which indicates a positive response of companies to ESG while compare individual component, “G (83)” is much higher than that of “E (34)” and “S (32)”. Among the sample companies, the average Tobin’s Q (12.04) is higher than that of ROA

with 10.85. In Table 4, the pairwise correlations are presented. “Values below 0.70” among “independent variables” in the “correlation matrix” confirmed the absence of multicollinearity issues in the data. Further, variance inflation factors (VIF) in the data also lie below 5; the multicollinearity therefore should not affect the results. “ROA” has a negative correlation with “E, S, G and ESG” but it is insignificant while “Tobin’s Q” has a negative correlation with “E, S, G and ESG” but it is significant in respect of “E and ESG”, hence, needs to be further explored. Also, the “control variable” firm size has a significant positive correlation with “E, S, G and ESG”, however, leverage shares a negative correlation with “E, S, G and ESG” but insignificant.

Regression Analysis

Table 5 presents the results of the fixed-effect regression analysis conducted to assess the influence of ROA on E, S, G, and ESG and impact of Tobin’s Q on E, S, G and ESG in Table 6, for the sample firms.

Table 5: Regression Results for the Impact of ROA on E, S, G and ESG.

	(1) ESG	(2) E	(3) S	(4) G
ROA	-.018 (.049)	.008 (.111)	-.009 (.057)	-.021 (.015)
size	7.641*** (1.769)	15.042*** (3.705)	7.895*** (1.936)	2.716*** (.959)
lev	0.0001 (0.0002)	0.0002 (0.0003)	0.0001 (0.0002)	0.00001 (0.0002)
_cons	-150.818*** (46.676)	-361.768*** (97.894)	-175.568*** (51.051)	12.334 (25.265)
Observations	254	254	255	255
R-squared	.909	.87	.894	.808
Adj R ²	.875	.822	.855	.738
F-stat	7.872	6.762	7.001	2.752
Prob>F	.0001	.0002	.0002	.0440
Industry Effects	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes

Robust standard errors are in parentheses

*** $p < .01$, ** $p < .05$, * $p < .1$

Table 6: Regression Results for the Impact of Tobin’s Q on E, S, G and ESG.

	(1) ESG	(2) E	(3) S	(4) G
TQ	.18*** (.034)	.334*** (.064)	.159*** (.034)	.069*** (.025)
size	7.028*** (1.397)	14.315*** (3.039)	7.418*** (1.606)	2.338*** (.773)
lev	-.01*** (.002)	-.018*** (.003)	-.008*** (.002)	-.004*** (.001)
_cons	-136.353*** (36.854)	-345.381*** (80.23)	-164.408*** (42.385)	21.504 (20.498)
Observations	253	253	254	254
R-squared	.923	.884	.902	.814
Adj R ²	.894	.841	.866	.745
F-stat	33.75	25.495	18.725	4.273
Prob>F	.0000	.0000	.0000	.0061
Industry effects	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes

Robust standard errors are in parentheses

*** $p < .01$, ** $p < .05$, * $p < .1$

Tables depicts the significant value of the “F-statistics” validating the “statistical significance” of the model. In table 5, ROA has negative but insignificant effect on S, G and ESG while positive but insignificant effect on E. In addition, Leverage also has a positive but negligible relationship with E, S, G and ESG. Table 6 show that “Tobin’s Q” has positive and significant effect on E, S, G and ESG at 1% level of significance. In addition, Leverage has a negative and significant relationship with E, S, G and ESG at 1% level of significance. Size is positively and significantly related to E, S, G and ESG at 1% level of significance in both the tables.

Discussion and Conclusion

The studies of the relationship between CFP and ESGP, showing a mixed interaction (Margolis, J.D.; Walsh, J.P., 2003, Lu, W., et al., 2014). These results indicate the necessity for additional empirical examination. Although many studies support the idea that ESG activities could help companies to establish a competitive advantage over their rivals, as these activities enhance reputation (Porter, M.E., et al., 2006, Porter, M.E., et al., 2011), foster innovation, attract talents and increase customer and investor loyalty (among other things), managers need reliable and valid evidence to adopt ESG practices. Managers engage in ESG activities only when they contribute to enhancing a company's financial performance. This paper takes a unique approach by acknowledging the multifaceted nature of firms' performance. ESG performance, represented by ESGP, holds equal significance alongside financial performance in managerial decision-making. Effectively managing companies requires allocating limited financial resources across various investments to meet the expectations of all stakeholders, not just shareholders. Therefore, our primary objective has been to explore how the availability of financial resources influences firms' ESGP. Specifically, we have examined the proposed positive correlation between CFP and ESGP.

This study employs a data set of “Nifty100 ESG Index” during the last 5 years (2018–2022) to investigate the “causal nexus” between CFP and ESGP. This study gives an “empirical investigation” of the relationship between “CFP and ESG” using a “panel dataset” of 304 firm-year observations based on Indian-listed firms. The study reveals interesting results and confirms a negative CFP-ESGP relationship in respect of accounting measure (ROA) while a positive CFP-ESGP relationship in respect of market measure (Tobin's Q).

ROA affects all scores negatively but insignificantly except Environmental Score (ES). On the other hand, Tobin's Q affects “Environmental Score (ES), Social Score (SS), Governance Score (GS) and the overall ESG Score (ESGS)” positively and significantly. Results in respect of market measure (Tobin's Q) are consistent with slack resources theory which suggests a positive CFP–ESGP relationship, but conversely accounting measure (ROA) is consistent but statistically insignificant with the managerial opportunism hypothesis which postulates a negative CFP–ESGP relationship. Market measures are more reliable for the assessment of long-term performance of a company. A firm's behaviour can be explained using market indicators, but accounting data are less noisy because they indicate what is actually happening in the company. Accounting measures, especially the return on assets, are subject to bias from managerial manipulations. Tobin's Q is an economic ratio used to compare a company's share's market value to its book value. It is a means of estimating whether a given share is overvalued or undervalued. Generally, a high ratio may indicate that the company is experiencing a period of overvaluation. This study indicated the overvaluation of share price in the market leads to higher ESG activities in Indian companies.

The contribution of this paper is based on findings of the regression, we can state that there is a positive CFP-ESGP relationship in respect of market measure (Tobin's Q) while negative CFP-ESGP relationship in respect of accounting measure (ROA). Hence, companies must have ample financial resources and manage them effectively to achieve their ESG goals. Therefore, ESG initiatives should be meticulously planned, just like any other business activity, and adequately funded to achieve their objectives. To cater to the diverse needs of stakeholders, managers need to focus strategically on ESG activities. This involves carefully selecting ESG initiatives to invest in and managing the available resources prudently to attain both financial and ESG objectives.

Implications

This research carries several implications. The findings presented here offer valuable insights to researchers, allowing them to analyse the cause-and-effect relationship between “Corporate Financial Performance (CFP)” and “Environmental”, “Social”, and “Governance” Performance (ESGP) in a developing country such as India. Our study results contribute significantly to the existing body of literature on CFP-ESGP relationships. Unlike previous studies, our robust findings support the presence of causality between CFP and ESGP variables.

Results in respect of market measure (Tobin's Q) are consistent with slack resources theory which suggests a positive CFP–ESGP relationship, but conversely accounting measure (ROA) is consistent but statistically insignificant with the managerial opportunism hypothesis which postulates a negative CFP–ESGP relationship. Market measures are more adequate for assessment of future and long-term performance. It captures shareholders' value creation without being subject to accounting measure shortfalls. A firm's behaviour can be explained using market indicators, but accounting data are less noisy because they indicate what is actually happening in the company. Accounting measures, especially the return on assets, are subject to bias from managerial manipulations. Tobin's Q is an economic ratio used to compare a company's share's market value to its book value. It is a means of estimating whether a given share is overvalued or undervalued. Generally, a high ratio may indicate that the company is experiencing a period of overvaluation. This study indicated the overvaluation of share price in the market leads to higher ESG activities in Indian companies.

Limitations and Future Work

This research study comes with certain limitations. Firstly, our measurement of “Environmental, Social, and Governance Practices (ESGP)” relies on Bloomberg “ESG scores”, utilizing a proprietary method. Consequently, it remains uncertain whether these scores comprehensively cover all ESG factors. To enhance the study, future research could incorporate reputational indices as a measure of non-financial performance, capturing intangible benefits derived from higher ESGP within the CFP-ESGP relationship framework. Secondly, our analysis is based on a limited number of companies listed on the Nifty100 ESG Index in India. Subsequent studies in this area could explore the CFP-ESGP relationship on a larger sample size. Furthermore, this study exclusively focuses on Indian firms. A valuable extension would involve conducting a cross-country comparative study, allowing for a comparison of results between developed and developing economies. In terms of methodology, this study employs multiple regression methods to evaluate the relationship between CFP and ESGP. In the future, researchers could consider employing path analysis, incorporating more variables for both CFP and ESGP. This approach would enable a deeper understanding of the direction and intensity of relationships among various variables, revealing intricate details within the Indian context.

Moreover, the literature highlights that the relationship between “ESGP” and “CFP” is significantly influenced by the context. Results tend to vary based on contextual variables, with the country’s business environment being a critical factor. Future research endeavours could benefit from exploring “mediating” or “moderating” contextual variables to understand their impact. Different countries exhibit diverse business and regulatory environments, leading to varying patterns. Therefore, it remains to be determined whether a comprehensive “cross-country comparison” study is necessary to establish generalized conclusions regarding the “CFP-ESGP” relationship.

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Determinants of Customer Satisfaction in Indian Telecom: A Multivariate Analysis of Uttar Pradesh

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Abstract

The Indian telecom industry serves as a cornerstone for economic growth and connectivity. Despite its rapid expansion, ensuring customer satisfaction remains a persistent challenge, particularly in densely populated regions like Uttar Pradesh. This study investigates the key determinants of customer satisfaction within the Indian telecom sector, focusing specifically on Uttar Pradesh. Data were collected from a diverse group of telecom users and analyzed using SPSS 22.0. Employing multivariate techniques, particularly Factor Analysis through Principal Component Analysis (PCA), the study reduces 22 service-related variables to identify the underlying determinants of customer satisfaction. The findings indicate that service quality and network reliability are the most influential predictors of customer satisfaction, followed closely by competitive pricing and responsive customer support. This research offers actionable insights for telecom operators to develop customer-centric strategies, enhance service delivery, and improve customer retention. Additionally, the study provides important implications for policymakers seeking to address regional disparities and strengthen the telecom infrastructure in Uttar Pradesh.

Keywords: Customer Satisfaction, Indian Telecom Industry, Determinants of Satisfaction, Service Quality, Factor Analysis.

Introduction

Mobile network providers play a vital role in modern life by enabling voice calls, text messaging, and data transfer, facilitating connectivity for both personal and professional purposes. India's strong GDP growth of 9.5% in 2021 and 8% in 2022 underscores its position as one of the fastest-growing economies globally, driving an increasing demand for affordable and reliable communication services to support development (Saxena et al., 2022). Initially, communication in India relied predominantly on one-to-one calls or SMS. However, technological advancements and the proliferation of mobile networks have expanded their role significantly, transforming how individuals and organizations operate on a daily basis. (Kar, A., & Goyal, K. 2020)

The Digital India initiative has been pivotal in prioritizing internet and broadband penetration across the country, recognizing mobile platforms as the primary medium for internet access. This initiative aligns with the rapid growth of mobile network providers, creating a synergy between government policies and technological breakthroughs. Such developments are critical for promoting long-term economic growth and ensuring equitable access to the benefits of digital connectivity (Olczyk & Kuc 2022; Kumari, S., et al. 2024). This collaboration has spurred efforts to bridge the digital divide, empowering citizens in urban and rural areas alike with enhanced access to education, healthcare, and economic opportunities. (Agarwal & Panda, 2018).

Customer satisfaction remains a key factor for the success of service providers. It fosters client loyalty, driving repeat business and positive word-of-mouth recommendations, which are vital in the competitive telecom industry (Islam, T., et al. 2015; Wilson et al., 2016). Akpoyomare, O. B. E., et al. (2014) emphasize that retaining and delighting existing customers is more cost-effective than acquiring new ones. As the telecom industry has evolved with the introduction of 5G technologies, mobile providers now offer baseline services such as free internet and calling. However, it remains unclear whether these features alone drive customer satisfaction or whether other factors also play a significant role.

This study explores this question by examining customer satisfaction in Uttar Pradesh (India), a state with over 200 million residents and a competitive telecom market. Since the liberalization of the telecom industry in the 1990s, major operators such as Bharti Airtel, Vodafone-Idea, Reliance Jio, and BSNL have made substantial

investments in network infrastructure, expanding coverage and making smartphones more affordable. This growth has significantly improved access to education and healthcare while enhancing the quality of life for millions. Research indicates that service quality, brand image, pricing, and network quality are crucial determinants of customer satisfaction. Shah (2012) highlighted these factors as key influencers in the selection of mobile service providers. Abd-Elrahman (2023) identified elements such as honesty, assurance, cellular quality, empathy, and assistance as having a significant impact on customer satisfaction. In Bangladesh, Hafez & Akther (2017) found that value-added services (VAS) significantly boost customer loyalty and usage, with perceived value, quality, and brand image serving as critical drivers. Yulisetiari & Prahasta (2019) emphasized the importance of price, service quality, customer value, and brand image in shaping customer satisfaction. Recent studies reinforce these findings. Haq et al. (2023) explored the performance of 3G and 4G services in Pakistan, identifying their impact on customer satisfaction and telecom operators' revenue. Similarly, Balaji and Senthilkumar (2024) conducted an empirical study on user satisfaction with various services provided by mobile operators, providing insights into customer perceptions and expectations.

Objectives of the Study

Understanding the factors influencing customer satisfaction and loyalty is critical for the growth and success of the telecom sector, especially in competitive and diverse markets like Uttar Pradesh. By examining user demographics, service quality, and usage patterns, this study aims to uncover actionable insights that can help service providers tailor their offerings. The primary aims of the study are listed below:

- To identify the key factors influencing customer satisfaction and loyalty in the Indian telecom sector, with a focus on Uttar Pradesh.
- To analyze the impact of demographic variables such as age, gender, education, and occupation on mobile usage patterns and preferences.
- To evaluate the role of service quality elements, including network coverage, data speed, and pricing, in shaping customer satisfaction.
- To provide actionable insights and recommendations for mobile service providers to enhance user experience and foster customer loyalty.

Literature Review

Customer satisfaction has been a widely researched topic in the telecommunications industry due to its critical role in fostering customer loyalty and enhancing business performance. In the dynamic telecom market, where technological advancements and intense competition shape customer expectations, understanding the determinants of satisfaction is pivotal for sustaining market share and profitability.

Service Quality and Customer Satisfaction

The quality of service offered by mobile network providers is one of the most critical determinants of customer satisfaction. Parasuraman et al. (1988) introduced the SERVQUAL model, identifying reliability, responsiveness, assurance, empathy, and tangibles as the core dimensions of service quality. These dimensions have been validated in various studies within the telecom sector. Shah (2012) found that network coverage, call quality, and customer support are crucial factors influencing customer satisfaction in India's telecom market. Recent studies by Goyal, K. & Kar, A. (2019) highlight that advanced network infrastructure, seamless internet services, and effective complaint resolution significantly impact customer satisfaction and loyalty.

Role of Pricing and Value Perception

Pricing strategies also play a pivotal role in shaping customer satisfaction. Competitive pricing combined with value-added services has been shown to enhance customer loyalty (Dubey & Srivastava, 2016). For instance, the introduction of bundled plans offering free data and calls has transformed consumer expectations in the Indian telecom market. Yulisetiari & Prahasta (2019) emphasized that perceived value, which combines price fairness and quality of service, directly influences customer retention. Furthermore, affordability has been a key focus of providers like Reliance Jio, contributing to their dominance in the Indian market (Olczyk & Kuc, 2022).

Impact of Technological Advancements

The advent of 4G and 5G technologies has reshaped the telecommunications landscape, offering higher speeds and improved reliability. According to Balaji and Senthilkumar (2024), the transition to advanced technologies necessitates better network infrastructure and customer education to maximize satisfaction. Mobile operators must continuously invest in upgrading their networks to meet evolving customer expectations. Similarly, Haq et al. (2023) identified the performance of 4G services as a significant driver of customer satisfaction, indicating the importance of keeping pace with technological advancements.

Demographic and Regional Influences

Demographics and regional factors also play a crucial role in determining customer satisfaction. Abd-Elrahman (2023) observed that demographic variables such as age, gender, and income level influence the perception of service quality. In the Indian context, the diverse socio-economic and cultural landscape amplifies the need for localized strategies. Recent studies by (Olczyk & Kuc, 2022; Asrani, 2020). emphasize the importance of bridging the urban-rural digital divide to enhance customer satisfaction in states like Uttar Pradesh.

Customer Loyalty and Retention

Customer satisfaction is a precursor to loyalty, which translates into long-term profitability for service providers. Johnson & Gustafsson (2000) highlighted that retaining existing customers is more cost-effective than acquiring new ones. The introduction of value-added services and personalized offerings has been shown to foster loyalty (Dubey & Srivastava, 2016). Providers that invest in understanding and addressing customer pain points are better positioned to build lasting relationships with their clientele.

Research Gap

While existing literature provides insights into various determinants of customer satisfaction, there is limited research focusing on the regional variations and unique customer needs in Uttar Pradesh. Moreover, with the rapid deployment of 5G technologies, the impact of these advancements on customer satisfaction remains underexplored. This study aims to address these gaps by identifying the key factors influencing customer satisfaction in Uttar Pradesh's telecom sector, offering actionable insights for both practitioners and policymakers.

Materials and Methods

This study employed a structured research methodology to uncover the determinants of customer satisfaction and loyalty in the Indian telecom sector. A quantitative approach was adopted, utilizing a questionnaire to collect primary data from mobile users in Uttar Pradesh.

Research Instrument

A well-structured questionnaire was developed, consisting of 22 service-related characteristics along with several variables pertaining to customer satisfaction and loyalty. The instrument was divided into two sections. Section 1 focused on gathering demographic information, including age, gender, education, occupation, mobile network name, and monthly usage. Section 2 addressed questions related to service quality, customer satisfaction levels, and customer loyalty. To ensure clarity, relevance, and reliability, a pilot survey was conducted with a small sample before finalizing the questionnaire. All questions were measured using a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Data Collection

The data was collected through multiple channels, including email, social media platforms, and personal contacts. Google Forms was used to disseminate the questionnaire, enabling wide accessibility and convenience for respondents. A total of 319 valid responses were received and analyzed, providing a robust sample size for the study.

Sampling Design

The respondents were selected from various regions across Uttar Pradesh, ensuring geographic diversity. The sampling strategy aimed to include users of different telecom operators and varying monthly usage patterns, making the results broadly representative.

Data Analysis

The data was analyzed using SPSS 22.0. Factor analysis was employed to reduce the 22 service-related variables and identify underlying determinants of customer satisfaction. The statistical methods used ensured robust results and meaningful insights.

Factor Analysis Model

Factor analysis aims to represent each variable in the original dataset as a linear combination of a few underlying factors, thereby explaining the relationships and dimensionality of the data. The process involves several steps: first, normalizing the original data matrix $V = (V_{ij})_{n \times m}$; then computing the correlation matrix R from the standardized data using the formula

$$R = \frac{1}{n-1} V^T V.$$

Principal Component Analysis (PCA) is performed on this correlation matrix to identify the eigenvalues λ and corresponding eigenvectors α . Common factors are extracted based on the eigenvalues, selecting p factors such that $\lambda_1 \geq \lambda_2 \geq \dots \geq \lambda_p \geq 0$.

These factors are used to derive the loading matrix $A = (a_{ij})_{p \times m}$, which is then rotated for better interpretability using methods such as varimax rotation, transforming A to A^* . Factor scores f_i for each common factor for each sample are calculated using various estimation methods, such as the regression method or the Bartlett method. Finally, a comprehensive evaluation index (y) is determined by combining the factor scores and corresponding eigenvalues in a linear manner.

$$y = \sum_{i=1}^p \frac{\lambda_i}{\sum_{j=1}^p \lambda_i} f_i.$$

The variables n , m , and p in these formulas stand for the number of samples, indicators, and common factors, respectively.

Ethical Considerations

The study adhered to ethical research practices, ensuring participant confidentiality and informed consent. Data collection and analysis were conducted responsibly to maintain the integrity of the research process.

By employing this structured approach, the study effectively identified critical factors influencing customer satisfaction and loyalty in the telecom sector. The methods ensured the reliability and validity of the findings while providing actionable insights for mobile service providers.

User Demographics and Service Usage Insights

This section provides an overview of the demographic characteristics and usage patterns of mobile network users based on survey data. Key demographic factors include age group, gender, educational qualification, profession, mobile operator preferences, and monthly expenditure on mobile services.

The survey revealed a balanced gender distribution among respondents, with 50.8% female and 49.2% male participants. Age-wise, a significant proportion (74%) of the respondents belonged to the 20–25 age group, highlighting the predominance of younger users in the dataset. These youthful demographic points to a strong demand for data-driven and technology-oriented services. Regarding educational qualifications, 62.4% of the respondents were postgraduates, indicating a well-educated user base, which could influence their expectations and preferences for advanced mobile services.

The analysis of mobile operator preferences revealed that Reliance Jio dominated the market with a 56% share, followed by Bharti Airtel (29%), Vodafone Idea (13%), and BSNL (2%). This dominance reflects Jio's competitive strategies and strong market positioning. Monthly expenditure on mobile services was primarily concentrated in the INR 200–300 range, indicating moderate spending patterns among users. A noteworthy finding was that 91.5% of respondents preferred prepaid connections, while 59.9% used multiple SIM cards, showcasing a trend of leveraging various network providers for optimal benefits.

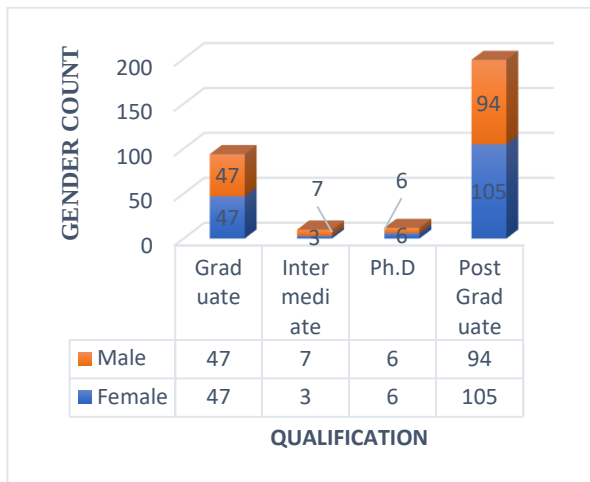
From a technological perspective, 4G networks were the most prevalent, with 87.5% of respondents utilizing 4G services. 5G adoption remains nascent at 7.8%, while older technologies like 3G and 2G are nearing obsolescence with minimal usage rates of 2.8% and 1.3%, respectively. This highlights a rapid shift toward advanced network technologies and a growing reliance on high-speed internet connectivity.

Customer satisfaction levels, as detailed in Figure 5, indicated that over 60% of respondents were satisfied with critical service features such as network coverage, data speeds, Value-Added Services (VAS), customer support, and payment systems. However, satisfaction with added benefits and promotional offers was lower, at just over 45%, suggesting an area for improvement. A major pain point identified was network availability during travel, with only 41.7% of respondents expressing satisfaction, underlining a key service gap.

Customer loyalty trends, illustrated in Figure 6, emphasize the importance of service features in operator selection. Over half of the respondents acknowledged the competitiveness of operators and their ability to meet customer needs. However, while 53% were willing to recommend their operator, only 45.8% expressed a willingness to repurchase from their current provider. This indicates that although general satisfaction exists, there is a need for operators to strengthen customer loyalty by addressing service gaps and offering more value-driven packages.

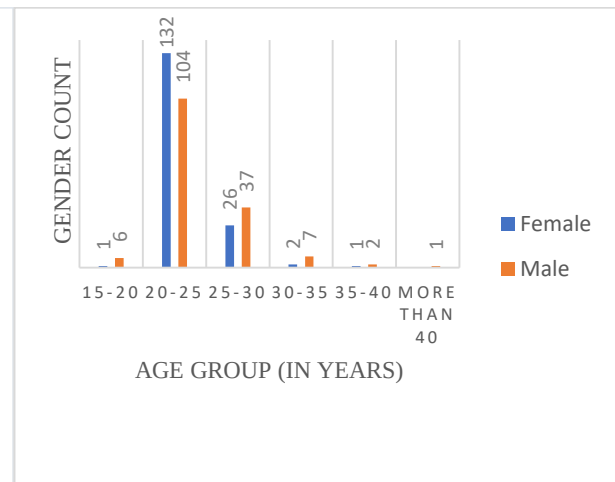
Finally, advertisements had a moderate influence, with 41.4% of respondents admitting they were impacted by marketing efforts. Additionally, nearly half of the respondents emphasized the need for operators to reduce operational costs, reflecting a preference for cost-efficient services that could translate into more competitive pricing. Collectively, these insights provide a clear roadmap for mobile network providers to enhance their offerings and improve customer retention strategies.

Figure 1: Count of Gender according to qualification



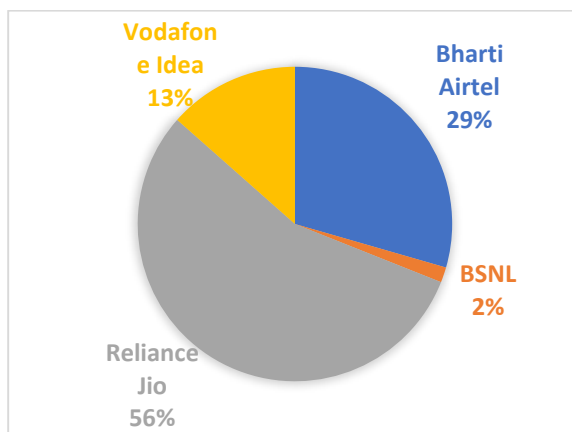
Source: Primary Data

Figure 2: Count of Gender in each age group



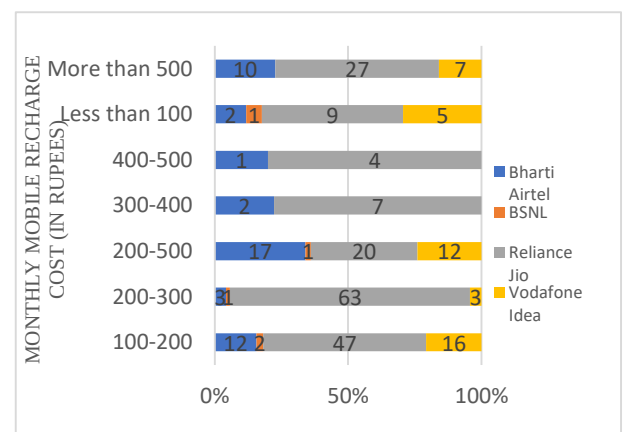
Source: Primary Data

Figure 3: Percentage division of usage of particular mobile network



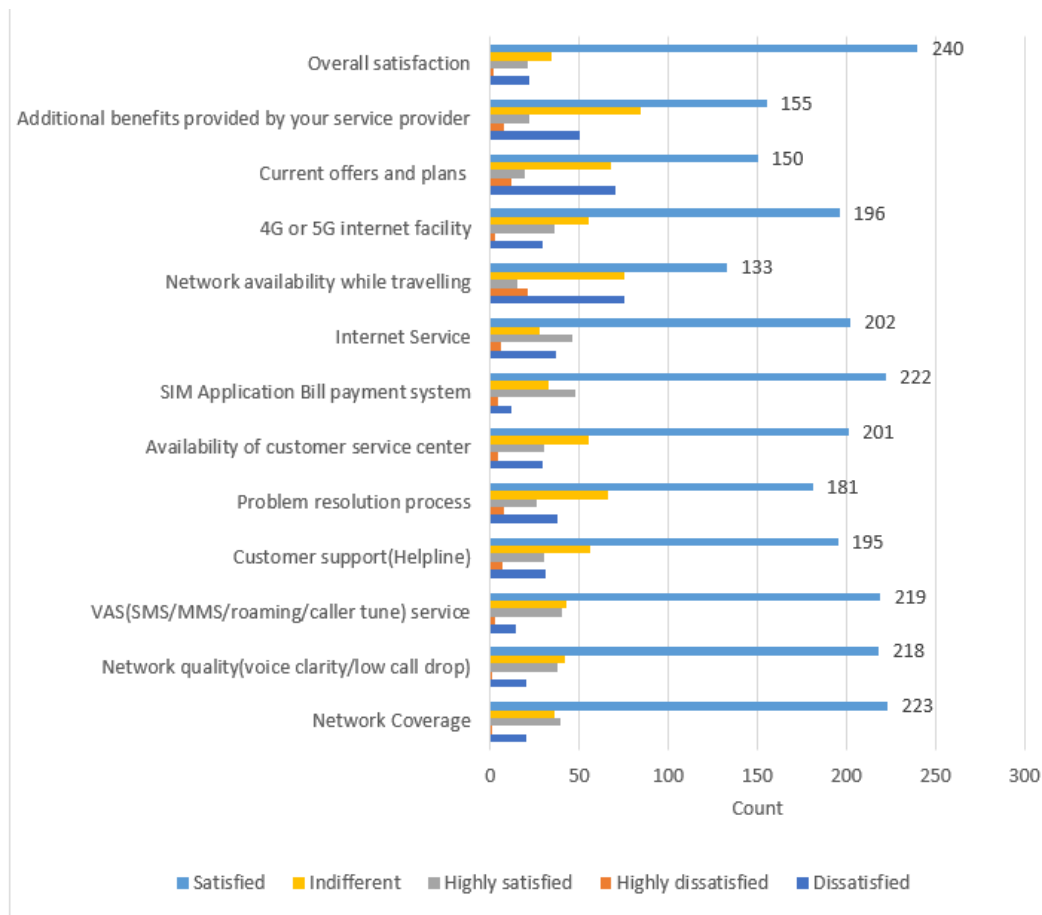
Source: Primary Data

Figure 4: Monthly Mobile Recharge Cost (in Rupees) under each Mobile Network Providers



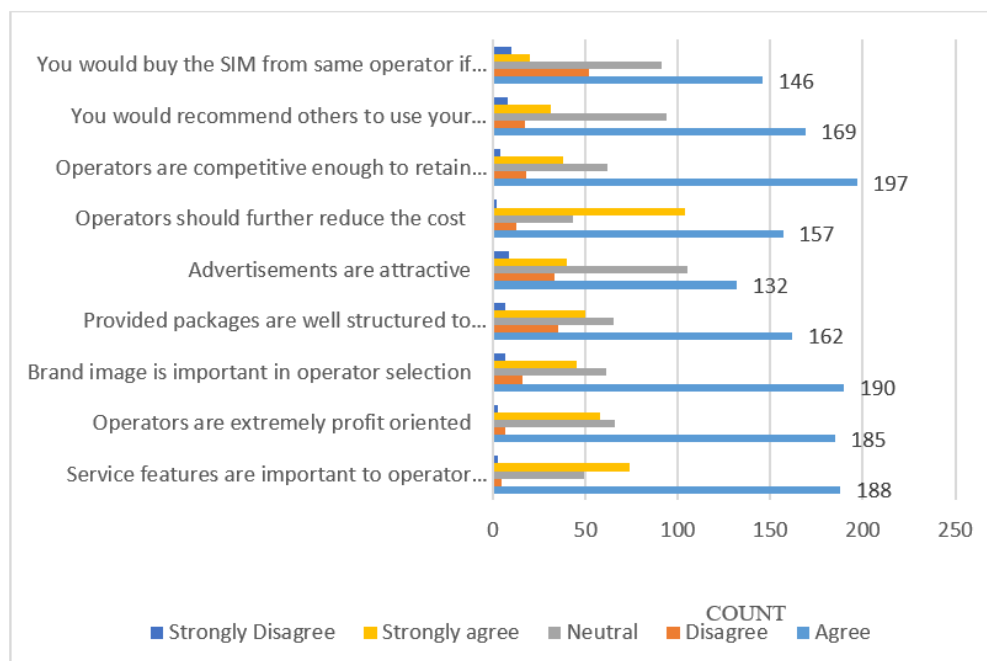
Source: Primary Data

Figure 5: Customer Satisfaction level towards Service Quality



Source: Primary Data

Figure 6: Customer Satisfaction level and loyalty



Source: Primary Data

Multivariate Analysis: Factor Analysis

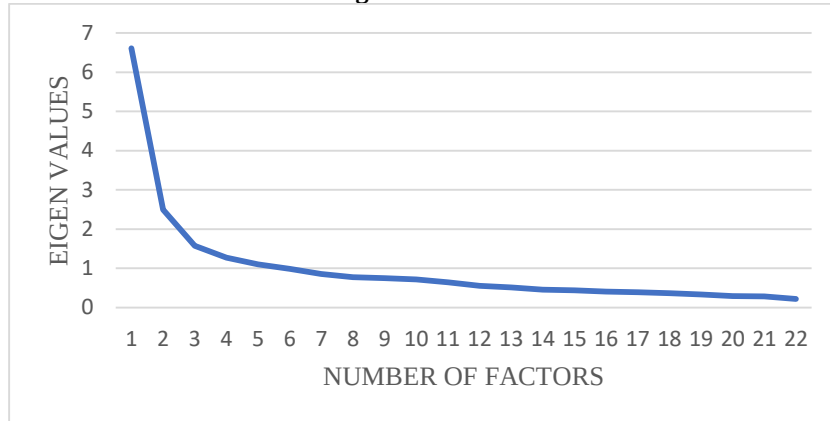
In this section, Principal Component Analysis (PCA) combined with the Varimax rotation method using Kaiser normalization was applied. The selection criterion for significant factors was based on eigenvalues greater than 1, as detailed in Table 3. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy indicated a robust value of 0.875, while Bartlett's Test of Sphericity confirmed the dataset's suitability for factor analysis. The analysis was conducted on 22 variables encompassing customer satisfaction, customer loyalty, and service attributes. This rigorous approach facilitated the extraction of five significant factors. These factors were identified through PCA and further clarified via Varimax rotation with Kaiser normalization, adhering to the eigenvalue threshold of greater than 1, as shown in Table 3.

Table 3: Total Variance Explained

Items	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.610	30.047	30.047	6.610	30.047	30.047	3.185	14.480	14.480
2	2.493	11.331	41.378	2.493	11.331	41.378	3.143	14.287	28.767
3	1.574	7.155	48.532	1.574	7.155	48.532	2.745	12.479	41.246
4	1.268	5.764	54.296	1.268	5.764	54.296	2.006	9.116	50.362
5	1.097	4.986	59.282	1.097	4.986	59.282	1.962	8.920	59.282
6	.988	4.489	63.772						
7	.855	3.885	67.657						
8	.769	3.497	71.154						
9	.750	3.408	74.562						
10	.712	3.235	77.797						
11	.644	2.927	80.724						
12	.551	2.504	83.228						
13	.513	2.332	85.561						
14	.457	2.078	87.639						
15	.439	1.995	89.633						
16	.408	1.853	91.487						
17	.391	1.779	93.266						
18	.364	1.654	94.920						
19	.329	1.498	96.418						
20	.293	1.330	97.747						
21	.281	1.278	99.025						
22	.215	.975	100.000						

Source: SPSS 22.0 (Extraction Method: Principal Component Analysis)

The Principal Component Analysis reveals that five components were significant (eigenvalues > 1). Factor 1 accounted for 14.480% of the total variance post-rotation, followed by contributions of 14.287%, 12.479%, 9.116%, and 8.920% by the remaining factors. Together, they explained 59.282% of the total variance. The rotation of components distributed the explained variance more evenly, enabling a more interpretable structure. This analysis effectively reduced dimensionality and uncovered key underlying factors in the dataset. The scree plot "elbow" identified through the scree test marks the natural cutoff for significant components. Factors to the left of the elbow are deemed significant and retained for further analysis. As depicted in Figure 7, the first five principal components sufficiently describe the dataset. Beyond the fifth component, eigenvalues drop sharply, indicating diminishing importance of subsequent components.

Fig 7: Scree Plot

Source: SPSS 22.0

Principal Component Analysis (PCA) was used as the extraction method to reduce dimensionality and uncover the underlying structure of the dataset. This was followed by Varimax rotation with Kaiser Normalization to achieve clearer and more interpretable factors. The results, as shown in Table 4, highlight significant loadings for variables within each factor. For example, the first factor showed significant loadings on variables X1 to X5, the second on X6 to X8, and so on. This rotation method maximized the variance of squared loadings, effectively reducing cross-loadings and enhancing interpretability.

Table 3: Rotated Component Matrix

Variable	Component				
	1	2	3	4	5
Network Coverage (X ₁)	0.747				
Network quality (voice clarity/low call drop) (X ₂)	0.783				
VAS (SMS/MMS/roaming/caller tune) service (X ₃)	0.666				
Internet Service (X ₄)	0.603				
Overall satisfaction (X ₅)	0.572				
Customer support (Helpline) (X ₆)		0.827			
Problem resolution process (X ₇)		0.843			
Availability of customer service center (X ₈)		0.718			
Network availability while travelling (X ₉)			0.783		
4G or 5G internet facility of your service provider (X ₁₀)			0.713		
Current offers and plans provided by your service provider (X ₁₁)			0.814		
Additional benefits provided by your service provider (X ₁₂)			0.777		
Brand image is important in operator selection (X ₁₃)				0.568	
Provided packages are well structured to fulfill customer needs (X ₁₄)				0.711	
Advertisements are attractive (X ₁₅)				0.695	
Service features are important to operator selection (X ₁₆)					0.610
Operators are extremely profit oriented (X ₁₇)					0.736
Operators should further reduce the cost (X ₁₈)					0.819

Source: SPSS 22.0

The Varimax method, an orthogonal rotation technique, was employed for factor loading rotation. This method optimized the variance of squared loadings, reducing cross-loadings and ensuring clearer interpretability. The results demonstrated high convergent validity, and the absence of significant cross-factor loadings confirmed discriminant validity. Coefficients below 0.5 were suppressed to refine clarity, and a scree plot was generated to visualize factor significance. Rotated factor loadings above 0.7 were achieved for most variables, demonstrating a robust fit for factor analysis and supporting construct reliability.

Table 4: Average Variance Extracted (AVE) and Composite Reliability (CR)

Construct	Variable	Loadings Squared	Error Variance	CR	AVE
	X ₁	0.558009	0.441991		
	X ₂	0.613089	0.386911		

Output Quality (F ₁)	X ₃	0.443556	0.556444	0.80832	0.46108
	X ₄	0.363609	0.636391		
	X ₅	0.327184	0.672816		
Problem Oriented Solutions (F ₂)	X ₆	0.683929	0.316071	0.83954	0.63670
	X ₇	0.710649	0.289351		
	X ₈	0.515524	0.484476		
Flexibility (F ₃)	X ₉	0.613089	0.386911	0.85529	0.59694
	X ₁₀	0.508369	0.491631		
	X ₁₁	0.662596	0.337404		
	X ₁₂	0.603729	0.396271		
Consumer Behaviour (F ₄)	X ₁₃	0.322624	0.677376	0.69764	0.43705
	X ₁₄	0.505521	0.494479		
	X ₁₅	0.483025	0.516975		
Perceived value (F ₅)	X ₁₆	0.3721	0.6279	0.76806	0.52818
	X ₁₇	0.541696	0.458304		
	X ₁₈	0.670761	0.329239		

Source: SPSS 22.0

The table presents the Average Variance Extracted (AVE) and Composite Reliability (CR) for all variables across the five constructs: Output Quality (F₁), Problem-Oriented Solutions (F₂), Flexibility (F₃), Consumer Behavior (F₄), and Perceived Value (F₅). All constructs exhibit AVE values exceeding 0.5, except for Output Quality (F₁) and Consumer Behavior (F₄), indicating acceptable levels of convergent validity.

Problem-Oriented Solutions (F₂) had the highest AVE at 0.63670, followed by Flexibility (F₃) at 0.59694, Perceived Value (F₅) at 0.52818, Output Quality (F₁) at 0.46108, and Consumer Behavior (F₄) at 0.43705. Additionally, all constructs displayed CR values above the threshold of 0.70 recommended by Hair et al. (2009), signifying high internal consistency. The model's robust reliability and validity underscore its utility for examining the dataset's underlying constructs.

This analysis provided valuable insights into the relationships among variables related to customer satisfaction and service aspects. The methodological rigor ensured reliability and validity, establishing a strong foundation for further exploration and interpretation of the extracted factors.

Results and Discussion

This study investigates the demographic characteristics, usage patterns, customer satisfaction, and loyalty of mobile service users in Uttar Pradesh, India. The analysis, based on a dataset of 319 respondents, sheds light on key trends and actionable insights for service providers to enhance their offerings.

The demographic analysis highlights variations in network usage based on age, gender, education, occupation, and monthly expenditure. Younger users predominantly favor data-centric services, driven by their reliance on the internet for social and professional activities, while older users prioritize network reliability for communication. Educational and occupational differences further influence operator preferences, with affordability, network quality, and brand perception emerging as critical factors. Notably, the market penetration of major providers such as Jio, Airtel, Vodafone-Idea, and BSNL varies significantly across demographic groups, emphasizing the importance of tailored service offerings.

Customer satisfaction is strongly linked to service quality dimensions such as network coverage, data speed, and customer support. While promotional offers like unlimited calling and free data initially attract users, long-term retention depends on the consistent delivery of high-quality services. Pricing strategies also play a pivotal role; respondents consistently favored providers that balance affordability with robust network performance.

Factor analysis revealed five core components influencing customer satisfaction and loyalty: network quality, pricing and value for money, customer service, brand reputation, and innovative offerings. These findings suggest that operators must invest in infrastructure to improve network reliability and speed, particularly in underserved rural and semi-urban regions. Furthermore, targeted marketing strategies such as cost-effective data plans for younger users and premium-quality plans for professionals can help providers cater to the diverse needs of their customer base.

The study underscores the critical role of customer satisfaction in fostering loyalty and driving growth in the competitive telecom market. By focusing on consistent service quality, personalized offerings, and proactive customer support, service providers can better meet the evolving expectations of consumers. These insights offer a strategic roadmap for operators aiming to enhance user experiences and achieve sustained success in the dynamic telecommunications landscape.

Conclusion

This study provides an in-depth exploration of demographic characteristics, usage patterns, and satisfaction levels of mobile users, offering critical insights into the factors driving customer satisfaction and loyalty in the Indian telecom sector. Variables such as age, gender, education, profession, mobile operator, and monthly usage revealed distinct consumer behavior patterns. Multivariate analysis identified five key determinants of satisfaction: service reliability, network coverage, pricing, customer support, and value-added services.

The findings emphasize the importance of tailored services, competitive pricing, and investments in network infrastructure to enhance satisfaction and loyalty. Providers should prioritize expanding rural connectivity and leveraging personalized marketing strategies to reduce churn and foster deeper customer relationships.

Despite its contributions, this study is geographically limited to Uttar Pradesh and does not account for emerging technologies like 5G and IoT-enabled services. Future research should address these gaps by expanding the scope and exploring technological advancements' role in satisfaction. Longitudinal studies could also capture how satisfaction evolves with changing market dynamics.

Ultimately, this study offers actionable insights for telecom operators, emphasizing adaptability and innovation to meet evolving consumer expectations and achieve sustainable growth in a competitive industry.

Declaration of Competing Interest

The authors hereby declare that there are no financial interests, personal relationships, or other conflicts of interest that could have influenced or biased the findings, analysis, or interpretations presented in this research paper. All efforts have been made to ensure the objectivity and integrity of the study.

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