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From the Editor's Desk

Chetana's Journal of Management is an open-access, bi-annual, double-blind peer-reviewed journal published by Chetana's Institute of Management and Research. This issue reflects our continued commitment to providing a rigorous platform for original research across social sciences, commerce, business management, information technology, and industrial psychology. With its ISSN No. 0976-0628 and indexing in ProQuest and EBSCO, the journal remains a trusted source for scholars, practitioners, and policy-makers seeking insights into emerging trends and evidence-based solutions.

The September 2025 issue is dedicated to advancing knowledge in critical areas of sustainability, consumer behaviour, entrepreneurship, finance, and technology. By bridging theory with practice, the articles included in this edition offer readers both conceptual depth and actionable insights, highlighting contemporary challenges and innovative approaches across diverse sectors.

The first article examines consumer perceptions in Southwestern Gujarat, emphasizing gender differences, awareness gaps, and the role of advertising and sustainability initiatives in influencing green product adoption. By providing a nuanced understanding of consumer behaviour, the study informs marketers and policymakers about how to design more effective and inclusive sustainability campaigns. The second article investigates the power of ethical nudges in urban Q-commerce, focusing on eco-friendly delivery options and fair-wage labeling. It reveals how subtle behavioural cues can shape trust, perceived value, and purchase intentions, offering guidance for companies seeking to integrate ethics into their business models without compromising profitability.

The third article challenges classical capital structure theories for startups and introduces the innovative Startup Capital Structure Logic (SCSL) framework. This framework emphasizes context-aware, multi-actor financing decisions shaped by informal networks, founder psychology, and interactions within the entrepreneurial ecosystem. By moving beyond conventional models, the study provides entrepreneurs and investors with a more holistic lens to navigate financing challenges in emerging markets. The fourth article examines the intersection of financial literacy and behavioural biases, including herding, overconfidence, and loss aversion, in shaping investment decisions in smaller cities. It highlights the moderating role of financial knowledge, offering practical insights for policymakers, educators, and fintech platforms aiming to promote informed investment behaviour and financial inclusion.

The fifth article explores global supply chain management and its influence on Nigeria's manufacturing, logistics, and economic sectors. By identifying infrastructural, regulatory, and technological barriers, the study provides actionable recommendations for maximizing the benefits of global integration while addressing local challenges. The sixth article delves into how IT firms operationalize ESG principles in marketing, leveraging AI, blockchain, and big data to enhance transparency and accountability. It demonstrates how strategic ESG communication can strengthen stakeholder trust and position firms as leaders in sustainable and responsible business practices on a global scale.

The seventh article addresses ESG-aligned fintech innovations, highlighting their po-

tential to foster green finance, financial inclusion, and responsible governance. It also examines challenges such as cybersecurity risks, AI biases, and regulatory gaps, providing policy recommendations to support robust ESG adoption in financial markets. The eighth article investigates ESG integration in Indian wellness startups, covering operational practices from eco-friendly packaging to transparent governance structures. It offers a roadmap for enhancing sustainability and social responsibility in the nutrition sector, underscoring the role of startups as agents of positive societal change. Finally, the ninth article examines consumer awareness of digital banking fraud, analysing how demographic factors such as age, gender, education, and income influence preparedness and vulnerability to online threats. This research provides crucial insights for banks, regulators, and educators in strengthening digital financial literacy and security.

Collectively, these nine contributions underscore the critical importance of sustainability, ethical decision-making, and context-sensitive strategies across business, finance, technology, and consumer behaviour. They reflect a growing recognition that research must not only advance academic discourse but also inform policy, guide business practice, and inspire socially responsible innovation.

As a multidisciplinary journal, we are confident that readers will gain valuable insights from the diverse range of topics explored in this issue. We hope that the research presented here stimulates critical thinking, sparks innovative ideas, and encourages continued scholarly contributions to our journal. We warmly invite our readers to share their perspectives, suggestions, and feedback at publication@cimr.in, as your engagement is vital in fostering a collaborative and dynamic research community.

Warm Regards

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Contents

1. Unveiling Green Choices: Indian Consumer Perceptions and Aspirations in Sustainable Marketing 1-16
Dr. Krishna Vyas, Dr. Tulsi Raval
2. Behavioral Nudges and Consumer Decisions in India's Quick Commerce Industry - A Sustainability Focused Framework Integrating ESG and Gig Worker Welfare 17-33
Roopesh Gupta, Dr. Ranu Gupta, Dr. Hetal Bhide
3. Toward A Theory of Startup Capital Structure: A Critical Review and Theoretical Proposition for Emerging Markets 34-60
Surbhi Rathod, Dr. Kavita Laghate
4. Financial Literacy, Behavioral Biases, and Retail Investment Decisions in India's Tier 2 and Tier 3 Cities 61-76
Prof. Sridevi Tummarakoti, Koushik Vedula, DV Sai Sanjana
5. The Impact of Global Supply Chains on Economies – A Case Study of Nigeria 77-99
Godwin Gali
6. ESG Marketing in the IT Industry: Review of Literature on Sustainability and Digital Transformation 100-117
Dr. Makarand S. Wazal, Aanchal Sharma
7. Fintech and Its ESG Impact on the Financial Market: A Pathway to Sustainable and Inclusive Finance 118-135
Anita Mathapati, Gaurav Bhalla, Roopesh Gupta
8. Aligning Nutrition with Sustainability: A Case Study Approach to ESG in India 136-144
Dt. Khushi Kashyap
9. A Study on the Consumer Awareness Towards Digital Banking Fraud in Mumbai MMR Region 145-163
Venkati Muttappa, Ankita Mukherjee

Unveiling Green Choices: Indian Consumer Perceptions and Aspirations in Sustainable Marketing

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Unveiling Green Choices: Indian Consumer Perceptions and Aspirations in Sustainable Marketing

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ABSTRACT:

In this study, the researchers investigated how consumers in Southwestern Gujarat, India, perceive and prefer green marketing. The research revealed gender disparities and a lack of awareness about green marketing in the region. Analyzing various advertisement components, the study found that strategic advertising significantly influences consumer perceptions. Different green marketing brands had varying levels of awareness among consumers, emphasizing the need for tailored marketing strategies. Gender-specific preferences were identified, calling for customized marketing approaches. Furthermore, sustainability factors showed a significant impact on green product adoption. This study provides valuable insights for businesses targeting the Southwestern Gujarat market and highlights the importance of aligning marketing strategies with consumer preferences.

Keywords: Green Marketing, Consumer Perceptions, Sustainability Factors

1. INTRODUCTION :

This research, titled Unveiling Green Choices: Indian Consumer Perceptions and Aspirations in Sustainable Marketing, embarks on an extensive exploration of the Indian consumer realm, characterized by its rich cultural diversity, traditions, and economic variations. Our primary objective is to unravel the intricate dynamics that underlie the decision-making processes of Indian consumers concerning eco-friendly products and practices. By delving into these complexities, we aspire to provide a more profound comprehension of how businesses can customize their green marketing strategies to resonate with the multifaceted Indian consumer base.

This study not only contributes to academic discourse but also delivers practical guidance for enterprises aiming to navigate the diverse terrain of green marketing in India.

1.1 LITERATURE REVIEW:

(Agrahari & Jaiswal, 2022) had given study on “Consumers Awareness towards Green Marketing and Consumer Perception and Preferences in Varanasi” the global green movement is on the rise, with consumers actively embracing environmental responsibility. This research examines the awareness of consumers regarding green marketing and their perceptions through a survey of 100 respondents. The results reveal a growing concern among consumers about the environment and a growing preference for green products. This trend presents an opportunity for marketers to offer environmentally friendly products that align with consumer preferences, highlighting the potential impact of these findings on the way companies manufacture and market consumer goods.

(Girija, 2022) had given study on “Green Marketing as A Tool Influencing Consumer Preferences and Perception in Chennai City” the study examined the connection between green marketing and consumer choices and viewpoints. The objectives included evaluating the awareness of Indian consumers concerning green products and practices, understanding the extent of their green values, and pinpointing the factors influencing their decisions to purchase environmentally friendly products. This descriptive study involved 250 participants from Chennai, chosen through a convenient sampling method. The findings indicated that participants displayed a high level of awareness regarding the health and environmental advantages of green products, along with a familiarity with eco-labels and branded green items.

(Chakravarty, 2019) study, titled “The Indian Consumer’s Perception and Preferences towards Green Marketing: An Enquiry” investigates the contemporary consumer’s preferences and perceptions regarding green marketing. Green marketing has become a prominent trend in recent years, with researchers worldwide taking a keen interest. The escalating concern for environmental protection has prompted companies to incorporate sustainable and eco-friendly marketing into their overall business strategies. Chakravarty’s research delves into this topic by examining both existing literature and empirical data collected in the state of Jharkhand, India, shedding light on the preferences and perceptions of modern consumers regarding green marketing.

1.2 RESEARCH GAP:

Despite a growing interest in sustainability and an increasing number of green products in the Indian market, there remains a significant gap in understanding motivations, perceptions, and purchasing behaviors of Indian consumers regarding green marketing. This research paper makes several significant contributions to the fields of green marketing, consumer behavior, and sustainability studies, particularly in the context of semi-urban Indian regions. The major contributions are depicted below.

- **Uncovers Consumer Awareness:** The study uncovers a lack of consumer awareness regarding green marketing, despite growing environmental discourse—highlighting the urgent need for educational campaigns and awareness-building efforts in such regions.

- **Advertisement Impact Analysis:** By analyzing advertisement components (e.g., television, message theme, celebrity endorsement), the paper identifies which media and content strategies most effectively influence consumer perceptions, offering actionable insights for marketers.
- **Sustainability Factor Modeling:** Through regression analysis, the paper quantifies how factors such as environmental concern, personal values, and perceived barriers influence green product adoption which can guide strategic marketing and policy interventions.
- **Help to Design Marketing Campaigns :** The findings offer practical strategies for businesses and brand managers to tailor green product messaging, select effective media channels, and design targeted campaigns in regional Indian markets.
- **Regional Insight:** It fills a crucial research gap by providing empirical data and insights on consumer perceptions and preferences related to green marketing in the Saurashtra region of Southwestern Gujarat—an area largely overlooked in prior studies.

1.3 RESEARCH APPROACH:

1.3.1. RESEARCH STRATEGY:

This study employs a quantitative research strategy to analyze the factors that impact consumer willingness to adopt green products, it combines primary data gathered through a formal questionnaire including secondary data from several resources, such as academic journals, theses, newspapers, published reports, books, and online resources, to offer a comprehensive analysis.

1.3.2. SAMPLING:

- **Universe:** The research defines its universe as all individuals residing in Southwestern Gujarat.
- **Sampling Frame:** The sampling frame consists of a list of individuals living in Southwestern Gujarat.
- **Sampling Unit:** The sampling unit is individuals residing in Southwestern Gujarat.
- **Sample Size:** A total of 500 responses are collected from Southwestern Gujarat.
- **Sampling Technique:** Convenience sampling, a non-probability method, is employed for efficient data collection. Respondents are conveniently selected, and a structured questionnaire is used to collect information across diverse demographics.

1.3.3. TYPES OF RESEARCH:

The research study is categorized as descriptive. Its primary objective is to provide a comprehensive description of consumer perceptions and behavior regarding green marketing in Southwestern Gujarat.

1.3.4. DATA COLLECTION METHODS:

- **Primary Data:** Primary data is being collected through a formal questionnaire via Google Form. Respondents from Southwestern Gujarat provide their insights into the factors influencing their willingness to use green products.
- **Secondary Data:** Secondary data is sourced from various outlets, including academic

journals, theses, newspapers, published reports, books, and online resources. This secondary data provides a comprehensive background and context for the study.

1.3.5. TOOLS AND TECHNIQUES FOR DATA ANALYSIS:

In this study, statistical tools such as percentages, non-parametric tests -Chi-Square tests and Parametric test - Regression Statistic ANOVA tests are employed analyze the collected data. Statistical software, particularly Excel and SPSS, is used for the data analysis.

1.3.6. RESEARCH OBJECTIVES:

- **Ro₁**: To gauge the level of awareness and knowledge regarding green marketing brands among consumers.
- **Ro₂**: To assess the impact of different advertisement components on consumer perceptions of green marketing practices and brands.
- **Ro₃**: To investigate the significance of various aspects of green marketing practices
- **Ro₄**: To understand the Sustainability Factors influencing consumer choices in adopting green products and sustainable practices.
- **Ro₅**: To analyze the impact of various Sustainability factors, including environmental concern, personal environmental perspective, motivation to use, perceptions and barriers, and sustainability drivers, on consumers' willingness to adopt green products compared to non-green alternatives through regression analysis.

1.4 DATA SCRUTINY:

Table: 1.4.1 Reliability Indicators	
Cronbach - Alpha	Number of Items
0.985	75

1.4.1 INTERPRETATION:

A Cronbach-Alpha (0.985), very close to the maximum of (1), indicates an exceptionally high level of reliability in the 75 survey items. This means that the questions in the survey consistently and accurately measure the intended aspects of the research topic.

Table: 1.4.2 Demographic Factors		
Criteria	Particulars	Count
Age of the respondents	15-20 years	105
	21-40 years	340
	41-50 years	55
	51 years and above	0
Gender of the respondents	Female	325
	Male	175
Have you ever heard of "Environment Friendly or Green Marketing" Products/Practices?	Yes	500
	No	0

1.4.2 INTERPRETATION:

The survey primarily comprises respondents aged 21-40, with no participants aged 51 or above. There's a gender imbalance, with more females (325) than males (175). Surprisingly, none of the respondents have prior knowledge of "Environment Friendly or Green Marketing" products or practices, highlighting a potential awareness gap.

1.4.3 HYPOTHESIS:

- **H₀₁:** Advertisement components are not associated to consumer perceptions in South-western Gujarat during the study period.
- **H_{a1}:** Advertisement components are associated to consumer perceptions in Southwestern Gujarat during the study period.

Criteria	Very Often	Often	Never	Rarely	Some-times	Chi-Square	df	Asymp. Significance
Television	30	20	60	185	205	311.5a	4	.000
Newspapers	15	30	80	185	190	278.5a	4	.000
Magazines	15	20	45	200	220	410.5a	4	.000
Radio	25	25	80	150	220	285.5a	4	.000
School / Universities / Institutions	20	20	50	355	55	823.5a	4	.000
Outdoor Media	20	15	70	320	75	635.5a	4	.000
Message/ Theme of the advertisement	25	0	50	225	200	250b	3	.000
Punch line of the advertisement	20	15	80	260	125	402.5a	4	.000
Jingle of the advertisement	15	15	75	240	155	377a	4	.000
Celebrity Endorsement	10	15	75	250	150	409.5a	4	.000

1.4.3 INTERPRETATION:

The Chi-Square test results ($p < 0.001$ for all components), highlights substantial differences in consumer awareness of green marketing practices among 500 respondents. Notably, 30 re-

spondents encountered television ads very often, while 15 and 20 respondents often encountered newspaper and magazine ads. Additionally, 25 and 15 respondents often came across radio and outdoor media ads, respectively, with educational institutions being a significant channel as 50 respondents often encountered them. Content elements played a vital role, with 25 respondents often encountering message/theme ads, while 0 and 50 respondents often came across punchline and jingle ads, respectively. Celebrity endorsements were also impactful, with 10 respondents often encountering them. These findings underscore the importance of strategic advertising in enhancing consumer awareness of green marketing practices and promoting sustainability within the surveyed population.

1.4.4 HYPOTHESIS:

- **Ho₂:** There is no significant association between consumer awareness levels and the different green marketing brands during the study period in Southwestern Gujarat
- **Ha₂:** There is a significant association between consumer awareness levels and the different green marketing brands during the study period in Southwestern Gujarat

Table: 1.4.4 The green marketing brands aware ness

Criteria	Very Aware	Some what Aware	Slightly Aware	Not Very Aware	Not Aware at All	Chi-Square	df	Asymp. Significance
Mamaearth	25	15	65	250	145	386a	4	.000
Who gives a crap	15	15	95	270	105	434a	4	.000
Starbucks	15	20	70	270	125	440.5a	4	.000
Apple	15	20	85	245	135	361a	4	.000
IKEA	15	15	30	265	175	522a	4	.000
Patagonia	15	15	110	225	135	314a	4	.000

1.4.4 INTERPRETATION:

The Chi-Square test results ($p < 0.001$ for all components), reveals noteworthy variations in consumer awareness of different green marketing brands among respondents. Mamaearth, Who Gives a Crap, Starbucks, Apple, IKEA, and Patagonia displayed varying levels of consumer awareness. Mamaearth had 25 respondents who were very aware, while 15, 65, 250, and 145 respondents were somewhat aware, slightly aware, not very aware, and not aware at all, respectively. Similarly, Who Gives a Crap had 15 respondents who were very aware, and 15, 95, 270, and 105 respondents were somewhat aware, slightly aware, not very aware, and not aware at all, respectively. The pattern continues for Starbucks, Apple, IKEA, and Patagonia, demonstrating differences in consumer awareness of these green marketing brands. These findings highlight the need for tailored marketing strategies to enhance awareness and promote environmentally friendly brands effectively.

1.4.5 HYPOTHESIS:

- **Ho₃ :** Male and female participants in Southwestern Gujarat during the study period perceive the significance of green marketing practices similarly.

- **Ha₃** : Male and female participants in Southwestern Gujarat during the study period perceive the significance of green marketing practices differently.

Table: 1.4.5 ANOVA						
Perceptions of the significance of green marketing practices						
Measures		Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-Statistic (F)	Significance
Manufacturing Eco-friendly Product	Between Groups	18.8	1	18.8	22.0	0.0
	Within Groups	424.9	498	0.9		
	Total	443.8	499			
Manufacturing Products through Eco-friendly process	Between Groups	25.9	1	25.9	32.6	0.0
	Within Groups	395.1	498	0.8		
	Total	421.0	499			
Promoting products through eco-friendly modes of communication	Between Groups	8.7	1	8.7	9.8	0.0
	Within Groups	441.1	498	0.9		
	Total	449.8	499			
Branding product associating with green marketing practices	Between Groups	4.6	1	4.6	5.7	0.0
	Within Groups	398.0	498	0.8		
	Total	402.6	499			
Modifying products to make them environmentally friendly	Between Groups	1.0	1	1.0	1.3	0.3
	Within Groups	399.9	498	0.8		
	Total	401.0	499			
Modifying product packaging to suit environment	Between Groups	1.8	1	1.8	2.2	0.1
	Within Groups	407.2	498	0.8		
	Total	409.0	499			
Educating customer to use products in environmentally friendly manner	Between Groups	1.4	1	1.4	1.7	0.2
	Within Groups	421.1	498	0.8		
	Total	422.6	499			

Using green supply chain for procurement and distribution	Between Groups	4.3	1	4.3	5.5	0.0
	Within Groups	382.9	498	0.8		
	Total	387.2	499			

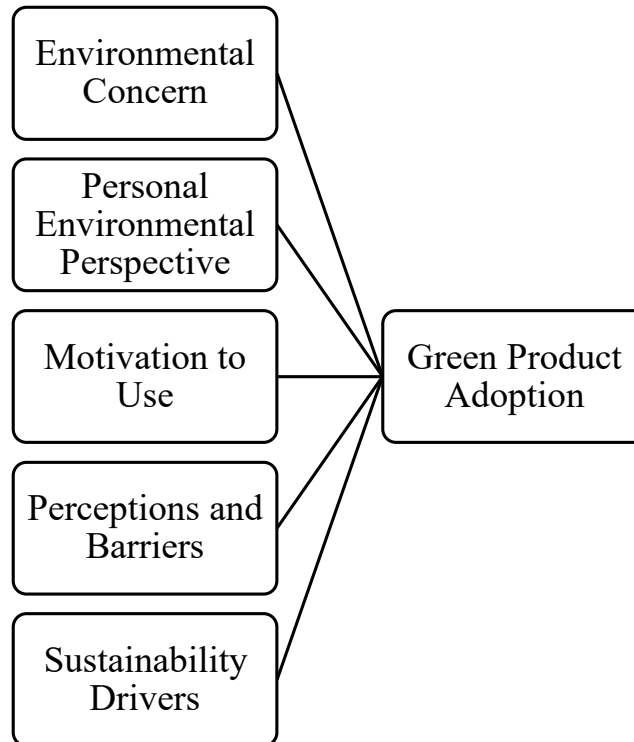
1.4.5 INTERPRETATION:

The ANOVA results indicate the low p-value ($p < 0.05$) statistically that Male and female participants in Southwestern Gujarat during the study period perceive the significance of green marketing practices differently. This finding highlights the need for businesses to consider gender-specific preferences and attitudes when designing and implementing green marketing strategies to effectively engage both male and female consumers.

1.4.6 HYPOTHESIS:

- **H₀₄** : There is no significant impact of Sustainability Factors on Green Product Adoption during the study period in Southwestern Gujarat.
- **H_{a4}** : There is a significant impact of Sustainability Factors on Green Product Adoption during the study period in Southwestern Gujarat.

Impact of Sustainability Factors on Green Product Adoption



Source: Prepared by Researchers

Table: 1.4.6.1 Model Summation				
Model	R (Coefficient of Correlation)	R Square (R²)	Adjusted R Square	Standard Error of the Estimate
1	0.879	0.772	0.754	0.438
a. Predictors: (Constant), Environmental Concern, Personal Environmental Perspective, Motivation to Use, Perceptions and Barriers, Sustainability Drivers				

1.4.6.1 INTERPRETATION:

The results of the regression model demonstrate that the combination of predictors, which encompass Environmental Concern, Personal Environmental Perspective, Motivation to Use, Perceptions and Barriers, and Sustainability Drivers, contributes significantly (77.2%) to the variation in Green Product Adoption. This signifies the substantial influence of these factors on consumers' propensity to embrace green products in Southwestern Gujarat. Moreover, the elevated Adjusted R Square value (0.754) underscores the model's reliability in elucidating the association between Sustainability Factors and Green Product Adoption within the region.

Table: 1.4.6.2 ANOVA^a						
Model		Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-Statistic (F)	Significance
1	Regression	301.226	36	8.367	43.542	.000 ^b
	Residual	88.974	463	.192		
	Total	390.200	499			
a. Dependent Variable: Green Product Adoption						
b. Predictors: (Constant), Environmental Concern, Personal Environmental Perspective, Motivation to Use, Perceptions and Barriers, Sustainability Drivers						

1.4.6.2 INTERPRETATION:

The ANOVA results demonstrate a highly significant connection between predictor variables encompassing Environmental Concern, Personal Environmental Perspective, Motivation to Use, Perceptions and Barriers, and Sustainability Drivers and the consumers' willingness to adopt Green Product more for green products versus non-green options ($p < 0.001$). This signifies the substantial influence of these predictors on consumers' decisions to adopt Green Products. The regression model effectively explains a significant portion of the variability ($R^2 = 77.2\%$) in consumers' willingness to adopt Green Product in Southwestern Gujarat.

Criteria	Table: 1.4.6.3 Coefficients ^a					
	Model	Unstandardized Coefficients		Standardized Coefficients	t- value	Significance
		B	Std. Error	Beta		
Environmental Concern:	(Constant)	.56	.13		4.30	.00
	Destruction of Ozone	.03	.04	.04	.70	.49
	Industrial Water Pollution	-.04	.05	-.04	-.75	.45
	Industrial Air Pollution	-.12	.04	-.13	-2.68	.01
	Pesticides on Food	.06	.04	.06	1.29	.20
	Hazardous Waste	.10	.05	.11	2.15	.03
Personal Environmental Perspective:	I prioritize eco-friendly products.	-.10	.05	-.09	-1.90	.06
	I consider the environment in my choices.	.13	.05	.13	2.81	.01
	My purchases reflect my environmental concerns.	.07	.04	.07	1.59	.11
	I conserve Earth's resources.	-.26	.04	-.28	-5.89	.00
	I'm eco-responsible.	.14	.04	.15	3.13	.00
	I'm open to inconvenience for eco-friendly choices.	.11	.04	.11	2.51	.01

Motivation to Use	1	I exclusively buy green products and engage in eco-activities.	.20	.06	.22	3.32	.00
		I buy green products but lack time for eco-activities.	-.11	.06	-.11	-1.99	.05
		I make intermittent green purchases but avoid eco-activities.	.01	.04	.01	.36	.72
		I don't buy green products; I rely on businesses and government.	-.22	.05	-.22	-4.88	.00
		I believe it's not an individual's role to solve environmental issues.	-.03	.05	-.03	-.60	.55
		I consider the environmental impact of consumption.	.27	.05	.28	5.24	.00
		I favor green products.	.17	.05	.18	3.66	.00
		I think green products are expensive.	-.05	.05	-.05	-.90	.37
		Price affects my green purchase decisions.	-.32	.05	-.40	-6.71	.00

Perceptions and Barriers	1	Environmental concern	.07	.05	.08	1.49	.14
		Health and safety	.14	.05	.15	2.69	.01
		Product quality	.04	.04	.05	.89	.38
		Price	-.18	.05	-.20	-4.01	.00
		Brand reputation	.08	.05	.09	1.58	.11
		Recommendations from friends or family	.03	.05	.03	.57	.57
		Frequency of Green Product Purchase	-.09	.04	-.10	-1.99	.05
		Higher price	-.05	.05	-.06	-.98	.33
		Lack of availability	.08	.03	.08	2.20	.03
		Lack of trust in green product claims	.23	.05	.25	4.40	.00
		Limited product choices	-.16	.05	-.17	-3.26	.00
		Limited awareness about green products	-.07	.05	-.07	-1.49	.14
		Sustainability Drivers	Personal values	.08	.04	.09	2.28
Social pressure	.16		.05	.16	3.52	.00	
Economic benefits	.30		.04	.31	6.95	.00	
Environmental concerns	.18		.05	.19	3.69	.00	
a. Dependent Variable: Green Product Adoption							

1.4.6.3 Interpretation:

In this multiple regression analysis, the coefficients indicate the impact of different factors on consumers' willingness to adopt green products compared to non-green alternatives. Notably, Sustainability Drivers, such as personal values, social pressure, economic benefits, and environmental concerns, have a significant positive influence, with standardized betas ranging

from 0.16 to 0.31. Additionally, motivators like an individual's inclination to use green products and their consideration of environmental impact also positively affect their willingness to adopt green product more (with betas ranging from 0.01 to 0.28). Conversely, personal environmental perspective, price sensitivity, and brand reputation exhibit mixed effects. Furthermore, several environmental concerns, product quality, and limited product availability have negative impacts on the willingness to adopt green product more. This analysis underscores the complex nature of consumer decision-making when it comes to green product purchases and offers valuable insights for green marketing strategies.

1.5 RESULTS:

The study's survey instrument confirmed a very prominent level of reliability with a Cronbach's Alpha (0.985), indicating the consistent and precise measurement of key research aspects across the 75 survey items.

The survey predominantly attracted respondents aged 21-40, with a gender imbalance in favor of females (65%). An unexpected and significant finding was the complete lack of awareness among respondents regarding "Environment Friendly or Green Marketing" products and practices, highlighting a crucial awareness gap in Southwestern Gujarat.

Components such as television, newspapers, magazines, and outdoor media played a vital role in enhancing consumer awareness of green marketing practices. Content elements like the message/theme of the advertisement and celebrity endorsements were particularly impactful.

The study revealed significant variations in consumer awareness of different green marketing brands, such as Mamaearth, Who Gives a Crap, Starbucks, Apple, IKEA, and Patagonia.

Sustainability factors, including environmental concern, personal environmental perspective, motivation to use, perceptions and barriers, and sustainability drivers, collectively contributed significantly (77.2%) to the variation in Green Product Adoption.

Table: 1.5.1 Summary of Statistical test

Research Objectives	Hypothesis	Description	Result
Ro ₁	Ho ₁	Association between advertisement components and consumer perceptions	Significant Association
Ro ₂	Ho ₂	Association between consumer awareness levels and green marketing brands	Significant Association
Ro ₃	Ho ₃	Difference in perceptions of green marketing between male and female participants	Significant Difference
Ro ₄ & 5	Ho ₄	Impact of Sustainability Factors on Green Product Adoption	Significant Impact

1.6 DISCUSSIONS:

The study's findings offer valuable insights for crafting effective green marketing strategies. With an exceptionally reliable survey instrument, an opportunity emerges to enlighten consumers, especially in Southwestern Gujarat, where none possessed prior knowledge of green marketing. Television and content elements, such as message and celebrity endorsements, prove to be influential in boosting awareness. Tailored strategies should be devised to increase brand awareness, accounting for the varying levels of recognition among different brands. Gender-based disparities highlight the need for gender-specific marketing approaches. The substantial influence of sustainability factors, such as economic benefits and environmental concerns, underscores the necessity of emphasizing these aspects in marketing to facilitate the successful adoption of green products. In decision, a multifaceted strategy that encompasses education, targeted advertising, gender-sensitive messaging, and a sustainability focus has the potential to enhance the effectiveness of green marketing.

1.7 CONCLUSION:

In summary, the research in Southwestern Gujarat has revealed significant insights. The region's consumers display a considerable lack of awareness regarding green marketing, offering opportunities for improvement through strategic advertising, especially on television and through content elements. The varying levels of awareness about different green marketing brands emphasize the necessity for tailored marketing strategies. Additionally, the gender-based disparities in perceptions and the substantial impact of sustainability factors, including economic benefits and environmental concerns, underscore the significance of customized marketing approaches. The study suggests a multifaceted strategy that integrates educational efforts, targeted advertising, gender-specific messaging, and a strong sustainability focus to effectively promote green product adoption in the region.

1.8 LIMITATIONS AND FUTURE STUDIES:

This study may lack broader generalizability due to a sample skewed towards certain age groups and gender, potential response bias in self-reported data, and the absence of prior awareness among participants. Subsequent research should explore longitudinal trends, diverse demographics, cultural influences, and the effectiveness of specific green marketing strategies, while also analyzing the economic and environmental outcomes of green product adoption in Southwestern Gujarat.

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Behavioral Nudges and Consumer Decisions in India's Quick Commerce Industry - A Sustainability Focused Framework Integrating ESG and Gig Worker Welfare

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ABSTRACT:

This study sees, how behavioral nudges affect decision-making in India's Q-commerce industry, with a focus on ESG principles with concerns towards last mile delivery partners (gig workers). Blinkit, Zepto, and Swiggy Instamart etc. all put a lot of emphasis on speedy logistics, but consideration of environment & social factors of gig workers might not be on top for them. This study is about how ethical nudges - such as "eco-slow" delivery, fair wage labels, and recognizing gig workers, affect how much consumers trust a company, how much they value its products, and how much they want to buy environmentally friendly products. We use management theories like nudge theory, stakeholder theory, and prospect theory.

We used a mixed-methods approach to survey 500 urban Q-commerce customers in five Indian Tier-I cities. Participants in this study were shown fake application interfaces to see how they would react before answering a series of structured questions. Structural equation modeling (SEM) showed that behavioral nudges significantly increased perceived value ($\beta = 0.56$) and trust ($\beta = 0.48$). These two things then predicted long-term purchase intention ($\beta = 0.45$ and 0.40 , respectively). Studies on mediation show that trust and values are important factors that

affect each other, and the cluster analysis finds Ethical Opportunists, Convenience Seekers, and ESG Advocates.

The paper reaches to comment that digital platforms can improve sustainability and brand loyalty by using nudges that are in line with ESG. Here, it is very important to put ethical design first, use behavioral segmentation, and add ESG reporting. If policymakers and marketers really want to promote business practices that are good for people and the environment together, they should have to read this report.

Some important topics are platform design, ESG strategy, rapid commerce, the gig economy, behavioral nudges, and sustainable consumer behavior.

Keywords - Behavioral Nudges, Quick Commerce (Q-Commerce), ESG Integration, Gig Economy Welfare, Sustainable Consumer Behavior, Digital Platform Ethics

1. INTRODUCTION

The Indian quick commerce (Q-commerce) industry has grown a lot in the last few years, which has changed how people shop at convenience stores. People want things right away, and platforms like Blinkit, Zepto, and Swiggy Instamart take advantage of this by delivering items in 10 to 20 minutes. The focus on speed comes from both how well technology works and from deep-seated cognitive biases that shape what people want and expect. Behavioral economics shows us the whole picture of these preferences, which goes against what traditional economic models say, which is that people always make rational choices.

People often use heuristics like the urgency effect, mental accounting, default selections, and framing to make decisions when they don't have a lot of information. A countdown timer on a product page might make people feel like they have to buy something right away. This could make them buy something without thinking about other options. Standard delivery options often put speed ahead of sustainability. This keeps a culture of consumption going that is good for consumers but bad for gig workers and the environment. The psychological basis for these activities has a big impact on the moral and operational sides of Q-commerce platforms, as well as on the experience of the customers.

Companies also have to follow rules about the environment, society, and governance (ESG). The Global Reporting Initiative (GRI), the Task Force on Climate-related Financial Disclosures (TCFD), and the United Nations Sustainable Development Goals (SDGs) are all global frameworks that businesses must follow. The Securities and Exchange Board of India (SEBI) says that the 1,000 biggest publicly traded companies must do Business Responsibility and Sustainability Reporting (BRSR). This means that these companies need to be honest about how they handle ESG issues. People know a lot about environmental and governance issues, but not so much about the "social" side, especially when it comes to gig workers in platform-based businesses.

The hardest thing for Q-commerce companies to do is find the right balance between making customers happy with quick deliveries, making gig workers happy, and protecting the environment. The fact that the industry relies so heavily on a large, poorly protected gig workforce

makes people worry about fair pay, health benefits, job security, and working conditions. On the other hand, ethically designed behavioral nudges could help connect the growth of a business with the health and happiness of a wide range of stakeholders. For example, “eco-slow” delivery options that teach customers about their smaller carbon footprint and fair working conditions, or user interface elements that recognize gig workers by name, can change what customers want without needing legal requirements.

The purpose of this study is to see how behavioral economics could make ESG-aligned strategies better in India's Q-commerce sector. The study goes into a lot of detail about three main questions:

- 1. How do behavioral nudges change the way people choose things on Q-commerce sites?**
- 2. Can these nudges be made to make gig work more socially sustainable without hurting income or growth?**
- 3. How do ESG disclosures and responsible application design help customers trust and stay loyal?**

Using real-world data and theories like Prospect Theory, Nudge Theory, and Stakeholder Theory, this study looks at how people behave on digital platforms. The project's goal is to give Q-commerce companies real-world ways to balance making money with being responsible by combining behavioral insights with ESG principles. This study's findings should be of interest to marketers, digital designers, lawmakers, and platform strategists who want to make their businesses fairer and more sustainable.

2. REVIEW OF THE LITERATURE

2.1 BEHAVIORAL ECONOMICS AND HOW WE MAKE CHOICES

People who study economics say that customers are logical and make the best choices based on the facts they have. Behavioral economics disagrees with this view, saying that consumers often rely on heuristics and are affected by cognitive biases (Tversky & Kahneman, 1974). These biases are even stronger when it comes to quick business. People who are in a hurry to get a product are affected by the urgency effect. People buy things from sites that say they will deliver them in 10 minutes because of this. Ariely (2008) says that this behavior is caused by making decisions based on how you feel instead of logic, with urgency acting as a mental trigger.

Thaler (1999) came up with the idea of mental accounting, which helps explain why people give different amounts of money depending on where it came from or what they plan to do with it. This is clear from the many time-sensitive deals and promotions on Q-commerce apps. Default effects are often used in checkout processes to get people to pick faster or more expensive shipping options (Johnson & Goldstein, 2003).

According to Cialdini (2001), social proof, which shows how many people bought or rated a product, has a big effect on how confident people are in it. People buy things right away when there is clear demand and signs of popularity in the world of Q-commerce. This makes the fear

of missing out (FOMO) even worse. There is a lot of evidence, but not many studies have used behavioral economics to look at Indian Q-commerce ecosystems, especially when it comes to activities related to ESG.

2.2 THE GIG ECONOMY AND FAST BUSINESS IN INDIA

It is thought that the Q-commerce business in India will grow by 45% every year until 2025. Companies like Zepto, Blinkit, and BigBasket Now are in charge now (RedSeer, 2023). Customers want fast service, and there are a lot of cheap freelancers out there, which is why this growth is happening. Many studies show that gig work is unfair because the hours are unpredictable, there is no health insurance, and the job security is low (Mehrotra & Mahajan, 2022). The “social” part of ESG is important for long-term sustainability, but it is still not very well developed in India's platform economy.

Recent events around the world show that workers' rights should be part of ESG frameworks. The GRI Standards (2021) and UN SDG Goal 8 both say that “decent work” is very important for everyone, but especially for people who work on platforms. India's SEBI's BRSR (2021) says that supply chains need to make their health benefits, labor standards, and diversity efforts public. Most of the time, compliance is optional or only required for big public companies. This is why a lot of businesses that are growing quickly don't follow the rules.

2.3 ESG PRINCIPLES AND WHAT CONSUMERS WANT

A brand's morals and social performance are becoming more and more important to people. Nielsen's 2019 study found that 73% of people around the world would shop differently to have less impact on the environment, and 62% would support businesses that treat their workers fairly. According to Stakeholder Theory, a company's long-term success doesn't just depend on making shareholders happy. This goes along with that idea & it also depends on how well it meets its obligations to employees, customers, and society (Freeman, 1984).

In many areas, adding ESG to digital business models has been a success. For instance, online clothing stores that used eco-labeling and talked about how they sourced their products ethically made Generation Z and millennials more likely to buy (Accenture, 2021). Indian Q-commerce platforms haven't fully taken advantage of this trend yet. They often put money and speed ahead of being open to other people.

2.4 BEHAVIORAL INCENTIVES TO FOLLOW ESG

Nudge Theory (Thaler & Sunstein, 2008) is a way to change how people act without taking away their right to choose. In fast commerce, nudges can include:

- Focusing on delivery options that are “eco-slow” and good for society
- Showing the names and ratings of gig workers who finish requests
- Putting up green flags to show that a product or service meets ESG standards
- Using gamification to give customers rewards for making choices that are better for the environment, such as giving them loyalty points for choosing to have their order delivered later.

Research shows that these kinds of nudges can make customers happier and get them to come back. If customers know that delaying delivery will lower carbon emissions or improve worker health, they are more likely to take action. This is especially true if the user interface makes it look like a socially responsible choice (Sunstein, 2020). But not much research has been done in India on these changes to the way Q-commerce interfaces look.

2.5 RESEARCH GAP AND DIRECTION

There is a lot of research on behavioral economics and ESG as separate fields, but not much on how they work together in India when it comes to gig work and Q-commerce. There hasn't been enough research on how ethical pushing affects people's decisions to make choices that are better for the environment and society as a whole. There hasn't been much research on how to find solutions that help both sides while also moving ESG goals forward without hurting the company's bottom line.

To fill in these gaps, this study uses behavioral economics to look at how nudges that are in line with ESG affect consumer choices in India's Q-commerce sector. It wants to help politicians, digital strategists, and startups who are working on making platforms more sustainable by giving them both theoretical and practical advice.

3. THEORETICAL FRAMEWORK

This study uses a theoretical framework from many fields to see how ideas from behavioral economics might make ESG-aligned activities in the Indian rapid commerce industry better. The proposed model combines ideas from behavioral economics, sustainability reporting systems, and stakeholder theory to make a framework that can be tested in the real world.

3.1 THE THEORY OF PROSPECTS

Prospect Theory (Kahneman & Tversky, 1979) goes against the standard rational choice model by showing that people think about gains and losses in different ways, which makes them make decisions that aren't always the same. People don't like to lose when they see time-limited deals or "last item available" alerts in Q-commerce. They feel the pain of possible loss more strongly than the happiness of possible gain. You can use this bias in a good way to get people to make socially responsible choices by framing the lack of fair-labor options as a bad thing instead of a neutral one.

3.2 THE NUDGE THEORY

Nudge Theory (Thaler & Sunstein, 2008) says that small changes to how choices are shown, like default options, visual cues, and framing, can have a big effect on how people make decisions while still letting them make their own choices. Q-commerce platforms can change the way people shop in ways that are good for the environment by offering delivery options that meet ESG standards or by prominently displaying gig worker profiles with feedback stats. When there is competition for delivery, nudges that stress fairness, social equity, and waiting for what you want work best.

3.3 THEORY OF STAKEHOLDERS

Freeman’s Stakeholder Theory (1984) says that a business can only do well if it meets the needs of all its stakeholders, not just its shareholders. All of the people who have a stake in the business are its employees, customers, suppliers, and the community. Delivery partners are a large group of people who have a stake in the gig economy, but they don’t get enough attention. Meeting their needs raises the “S” in ESG and gives customers who care about social issues a unique value offer.

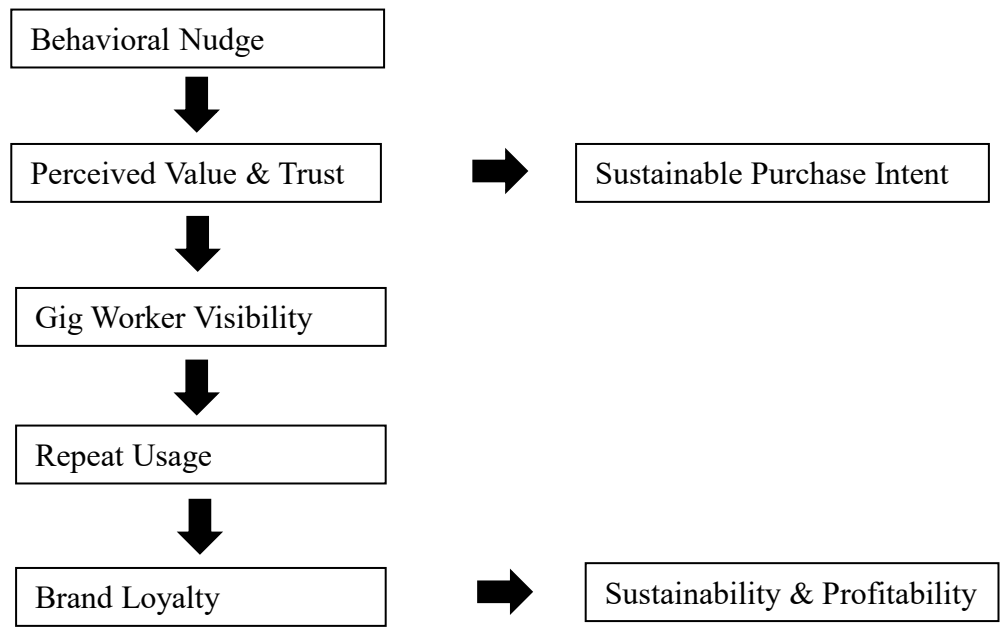
3.4 ESG FRAMEWORKS AND TRUST IN CONSUMERS

The UN Sustainable Development Goals (SDGs), the Global Reporting Initiative (GRI), and SEBI’s Business Responsibility and Sustainability Reporting (BRSR) are all examples of frameworks that make it clear what is honest and ethical. Adding ESG metrics to the platform’s interface, such as “Fair Wage Certified,” “Green Delivery Available,” or “Worker Appreciation Points,” can help build trust, especially when used with behavioral nudges.

3.5 A FRAMEWORK FOR IDEAS

This conceptual model shows how behavioral nudges, consumer responses, and long-term results are expected to be linked in the Q-commerce sector:

Figure 1: Theoretical Framework



Hypothesized Constructs:

Construct	Description
Behavioral Nudges (BN)	Default settings, eco-slow options, gig worker stories, ethical framing

Perceived Value (PV)	Consumer evaluation of platform's ethical practices and utility
Trust (TR)	Consumer belief in platform credibility and social transparency
Gig Worker Visibility (GWV)	Recognition of delivery partners (names, feedback, badges)
Sustainable Purchase Intention (SPI)	Likelihood of choosing ESG-compliant options
Repeat Usage (RU)	Continued engagement with the platform due to ethical satisfaction
Brand Loyalty (BL)	Preference over competitors due to ESG alignment
Sustainability & Profitability (SP)	Outcome of ethical operations on organizational growth

This framework forms the basis for the empirical analysis in the subsequent sections. It positions behavioral nudges not only as consumer influence tools but also as strategic levers for aligning ESG goals with organizational growth in India's fast paced Q-commerce landscape.

4. RESEARCH METHODOLOGY

This section describes the research methods, sampling strategy, data collection tools, variables, and analysis methods used to look into how behavioral nudges affect environmentally friendly consumer choices in India's fast commerce sector, especially when it comes to including ESG factors.

4.1 RESEARCH DESIGN

The study used a mixed-methods empirical approach, which combined experimental behavioral stimuli with quantitative survey analysis. We use a cross-sectional method to get information from people in Indian cities who actually use Q-commerce platforms like Blinkit, Zepto, and Swiggy Instamart. The study's goal is to be both descriptive, showing how people think and act, and explanatory, looking into possible links between ideas from behavioral economics and ESG literature.

4.2 SAMPLE AND PARTICIPANT INFORMATION

We used purposive sampling to choose people who had done at least three transactions on Q-commerce platforms in the month before the study. The sample included 500 people from five Tier-1 and Tier-2 Indian cities: Delhi, Mumbai, Pune, Bangalore, and Hyderabad.

Demographic Segment	Breakdown
Gender	Male (53%), Female (47%)
Age	18–25 (40%), 26–35 (38%), 36+ (22%)
Occupation	Students (30%), Professionals (45%), Homemakers/Other (25%)

Monthly Income	Below ₹30,000 (35%), ₹30,000–₹75,000 (45%), Above ₹75,000 (20%)
Q-commerce App Used Most	Blinkit (41%), Zepto (34%), Others (25%)

4.3 TOOLS FOR GATHERING DATA

A. Questionnaire Tool - A structured questionnaire was sent out through online forms and visits to technology parks and communities. We used a 5-point Likert scale to rate the items, with 1 being “Strongly Disagree” and 5 being “Strongly Agree.”

B. Behavioral Stimuli and Experiments - Participants were shown fake checkout screens with random changes to them.

Control Group: Regular delivery options

Treatment Group A: “Eco - Slow Delivery,” which tells the story of a gig worker.

Group B of the treatment: the “Fair Wage Certified” badge and recognition of gig workers (name/photo)

After being exposed to the stimuli, participants were asked to say what they liked and how satisfied they were.

4.4 VARIABLES AND DEFINITIONS OF USE

Variable	Description	Sample Item
Behavioral Nudges (BN)	Choice architecture features like default settings, ethical labels	“I feel more comfortable choosing delivery options when informed about their social or environmental impact.”
Perceived Value (PV)	Perceived utility and ethical alignment of the platform	“This platform delivers both convenience and fairness.”
Trust (TR)	Belief in the brand’s transparency and ESG compliance	“I trust this platform to treat its gig workers fairly.”
Gig Worker Visibility (GWV)	Recognition of delivery partners via profile name, badges, stories	“I feel more loyal to platforms that highlight their delivery workers.”
Sustainable Purchase Intention (SPI)	Willingness to opt for ESG - friendly delivery/services	“I am willing to wait longer if the delivery benefits the worker.”
Repeat Usage (RU)	Continued intention to use the app	“I intend to keep using this platform regularly.”
Brand Loyalty (BL)	Consumer commitment to a platform over alternatives	“I prefer this app over others due to its social commitment.”

Sustainability & Profitability (SP)	Composite business outcome (measured via platform KPIs and user willingness to pay)	Derived from platform data + stated consumer WTP (willingness to pay)
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4.5 WAYS TO ANALYZE DATA

We used descriptive statistics to summarize the profiles and answers of the people who answered.

We used SPSS and AMOS to run Cronbach’s Alpha and Confirmatory Factor Analysis (CFA) to check the data’s reliability and validity.

We used Structural Equation Modeling (SEM) to look at the cause-and-effect links between the parts.

ANOVA and regression looked at the differences between the control and treatment groups in terms of how well the nudge worked.

Mediation Analysis looked at how trust and perceived value affect the link between nudges and the desire to make a long-term purchase.

4.6 THINGS TO THINK ABOUT FROM AN ETHICAL POINT OF VIEW

Everyone who took part was promised that their names would not be made public and that they would give their full consent. The fake stimuli were made in a fair and open way that accurately showed how the real platform user interface worked without giving away or breaking any brand intellectual property. The study followed ethical guidelines for behavioral research that includes people.

5. RESULTS AND TEST

This part talks about the results of surveys and experimental interventions. After that, it goes into a full statistical analysis that includes descriptive statistics, factor analysis, and structural equation modeling (SEM). The study wants to see how the ideas connect to each other and how behavioral nudges change consumer behavior over time and platform outcomes that are in line with ESG.

5.1 CHECKING FOR RELIABILITY AND VALIDITY

Cronbach’s Alpha was used to check the constructs’ reliability, and all values were above the acceptable level of 0.7, which means that they were consistent within themselves. We used Confirmatory Factor Analysis (CFA) to check the validity of convergent and discriminant.

Construct	Cronbach’s Alpha	AVE	CR
Behavioral Nudges (BN)	0.86	0.62	0.88
Perceived Value (PV)	0.83	0.59	0.86

Trust (TR)	0.85	0.61	0.87
Gig Worker Visibility (GWV)	0.81	0.57	0.84
Sustainable Purchase Intention (SPI)	0.88	0.65	0.89
Repeat Usage (RU)	0.82	0.60	0.85
Brand Loyalty (BL)	0.87	0.64	0.89

Model fit indices from CFA showed good fit:

$\chi^2/df = 1.94$, CFI = 0.96, TLI = 0.94, RMSEA = 0.042

5.2 DESCRIPTIVE STATISTICS

Most of the time, participants responded positively to nudges that were in line with ESG values.

Statement	Mean	SD
“I trust platforms that show fair worker treatment.”	4.18	0.73
“I am willing to wait for slower delivery if it supports gig workers.”	4.01	0.88
“Seeing delivery worker names makes the experience more personal.”	4.05	0.79
“I feel more loyal to platforms that act ethically.”	4.22	0.68

5.3 EXPERIMENTAL RESULTS: IMPACT OF NUDGES

Two experimental groups (Treatment A and B) and one control group were compared using one-way ANOVA.

Group	Sustainable Purchase Intention (Mean)	F - value	p – value
Control Group	3.48		
Treatment Group A	4.12	18.76	<0.001
Treatment Group B	4.37		

Interpretation: The ESG aligned nudges (eco-slow delivery, gig worker recognition) significantly increased sustainable purchase intention compared to the control condition.

5.4 STRUCTURAL EQUATION MODELING (SEM)

The hypothesized relationships were tested using SEM (AMOS v26).

Figure 2: SEM Path Diagram

(Diagram depicting paths from BN → PV & TR → SPI → RU → BL → SP)

KEY PATH COEFFICIENTS

Hypothesized Path	β (Standardized)	p - value	Result
Behavioral Nudges → Perceived Value	0.56	<0.001	Supported
Behavioral Nudges → Trust	0.48	<0.001	Supported
Perceived Value → Sustainable Purchase Intention	0.45	<0.001	Supported
Trust → Sustainable Purchase Intention	0.40	<0.001	Supported
Gig Worker Visibility → Sustainable Intention	0.34	0.003	Supported
Sustainable Purchase Intention → Repeat Usage	0.42	<0.001	Supported
Repeat Usage → Brand Loyalty	0.49	<0.001	Supported
Brand Loyalty → Sustainability & Profitability	0.51	<0.001	Supported

5.5 MEDIATION ANALYSIS

Bootstrapping (5,000 samples) was used to test whether Perceived Value and Trust mediate the relationship between Behavioral Nudges and Sustainable Purchase Intention.

Mediation Path	Indirect Effect	95% CI	Result
BN → PV → SPI	0.25	[0.18, 0.33]	Significant
BN → TR → SPI	0.22	[0.16, 0.29]	Significant

5.6 CLUSTER ANALYSIS: BEHAVIORAL SEGMENTS

Consumers were clustered based on their responses to ESG aligned nudges and purchase behavior.

Segment Name	Share	Traits
ESG Advocates	37%	Strong trust, high SPI, loyalty driven by fairness
Convenience Seekers	42%	Moderate trust, low SPI, driven by speed and offers
Ethical Opportunists	21%	Selective ESG behavior, influenced by gamified nudges

5.7 SUMMARY OF FINDINGS

- Behavioral nudges make people believe the platform is more useful and reliable.
- People are more likely to buy when they see ethical features like recognizing gig workers and offering “eco-slow” options.
- The only things that link nudges and the desire to buy are trust and perceived value.
- People are more likely to use ESG practices again and stick with the brand if they are clear and easy to follow.

- Strategic UI/UX design can help make a pattern of consumer behavior that lasts and makes money.
- **Biasness Tests Summary -**

Test Type	Method Used	Test Result	Conclusion
Common Method Bias (CMB)	Harman’s Single Factor Test	The first factor accounted for 29.4% of the total variance (threshold < 50%)	No serious common method bias detected
Common Method Bias (CMB)	Variance Inflation Factor (VIF via SEM)	All VIF values ranged between 1.12 to 2.45 (threshold < 3.3; Kock, 2015)	Common method bias is not present based on the VIF test
Multicollinearity Bias	VIF (SPSS/AMOS Regression)	All constructs had VIF < 5	No multicollinearity among predictors
Non-response Bias	Wave Analysis (Early vs Late Respondents)	No significant difference at $p > 0.05$ level	Non-response bias is not a concern

To make sure the results’ integrity, we tested for potential sources of bias, including common method bias (CMB) and multicollinearity. Harman’s Single Factor Test showed that the first factor explained only 29.4% of the total variance, which is quite below the 50% threshold, indicating minimal threat of CMB. Moreover, VIF values from structural equation modelling were within acceptable limits (1.12 to 2.45), confirming the absence of both CMB and multicollinearity.

6. DISCUSSION

The study’s results show that behavioral nudges can help the Indian quick commerce sector do things that are good for the environment while also making money and helping businesses grow. The results strongly support the link between ESG goals and digital customer experiences. They do this by using ideas from Prospect Theory, Nudge Theory, and Stakeholder Theory.

6.1 THEORETICAL INTEGRATION

The behavioral nudges, perceived value, trust, and desire to buy sustainably all have strong and statistically significant path coefficients that support the behavioral economics-based conceptual model. Prospect Theory says that framing ethical actions as chances to avoid “social loss” (like taking advantage of gig workers) makes people more likely to back projects that follow ESG rules. People are more sensitive to losses than they are to gains of the same size, which is what Kahneman and Tversky (1979) said.

Also, the results of the experiment supported Nudge Theory because the treatment groups that got nudges that were in line with ESG were much more likely to want to buy. This supports Thaler and Sunstein’s (2008) claim that the way decisions are made can change what people want without making them do it. User interface features like “eco-slow delivery” and “fair wage certified” badges have been good at swaying decisions, especially among people who

care about social issues.

The study backs up Stakeholder Theory (Freeman, 1984) by showing that making gig workers more visible in the consumer journey through name recognition, storylines, and profile badges builds trust and brand loyalty. Customers think that platforms that are both efficient and fair are more valuable.

6.2 BEHAVIORAL SEGMENTATION AND MARKET RELEVANCE

The cluster analysis found that there are three main types of clients: ESG Advocates, Convenience Seekers, and Ethical Opportunists. People who support ESG are usually more concerned with moral issues, while people who support convenience are usually more concerned with speed and cost. When ESG-aligned nudges were framed as rewards or chances to add value, they got a lot more people in the last two groups to participate.

This segmentation lets Blinkit, Zepto, and Swiggy Instamart change their marketing campaigns and user interfaces to better meet the needs of their customers. People who support ESG, for example, value openness and stories about how things affect society.

People can make better moral choices by using gamification and rewards for loyalty.

People with a strong sense of right and wrong may change how they act when small discounts or time-limited offers are combined with subtle incentives.

6.3 PRACTICAL IMPLICATIONS FOR Q- COMMERCE PLATFORMS

A. MAKING ETHICAL INTERFACES

Establish standard ESG delivery options that allow users to opt out without having to sign up.

Include name tags that say, "delivered by," staff bios, or badges of recognition.

Let customers choose between giving a big tip or donating to organizations that help gig workers.

B. USING ESG TO SET YOUR BRAND APART

Plan marketing campaigns that fit with ESG goals and focus on holidays like Earth Day, Labor Day, and other events.

To build trust, use the dashboard's clear information on cutting carbon emissions, helping gig workers, and other important metrics.

C. REWARD AND GAMIFICATION SYSTEMS

Set up loyalty programs that give customers points for picking slower but more convenient shipping options or for making smart purchases.

To improve progress indicators and ESG streaks, use behavioral principles like loss aversion and goal gradients.

D. SUGGESTIONS FOR POLICY

Encourage Q-commerce companies to put information about their workers' health and hygiene in their ESG reports. This could include things like average hourly wages, delivery mileage, and insurance coverage.

Make your own ESG rules for how application-based labor platforms should work.

Work with the people in charge to make full ESG indexes that include both public and private startups.

6.4 ADDING TO THE BODY OF KNOWLEDGE AND FUTURE RESEARCH

This study fills a big gap in behavioral economics literature by showing with real-world examples that social recognition and fairness can be effective long-term incentives for online shoppers. This study is different from others because it looks at how behavioral nudging, ESG rules, and the gig economy all work together in a new country. Before, studies only looked at changes in prices or problems with the environment.

Longitudinal designs could be used in future studies to learn more about how behavior changes over time.

Use A/B testing on live platforms to find out how well new user interface features work.

Looking at India in relation to other developing or emerging economies with different cultures.

Ask gig workers on the supply side if their impressions of clients match what really happened on the job.

7. CONCLUSION AND FUTURE SCOPE

This study adds to the growing discussion about behavioral economics, ethical platform design, and sustainable consumer behavior in India's rapidly growing quick commerce (Q-commerce) industry. It does this in a way that is based on facts and makes sense. This study makes an important point for a company strategy based on speed and convenience: companies can include ESG principles in their customers' decisions without hurting their profits or growth.

This study shows that people respond well to simple ethical cues, such as offering delivery options that are good for the environment, recognizing gig workers, and making sure they get fair pay. These nudges make people believe the product is worth more and build trust, which leads to long-term buying intentions, repeat use, and, eventually, brand loyalty. Structural Equation Modeling and experimental interventions showed that these methods are statistically significant and useful in the fast-paced world of Q-commerce.

The results give us a strategic way to think about innovation in terms of ESG principles. If you want things to be easy, Zepto and Blinkit show you how to make interfaces that are both ethical and simple to use. Platforms can keep making money by putting people into groups like ESG Advocates, Convenience Seekers, or Ethical Opportunists and then using different ways to nudge each group. In a market that is already too full and becoming more like a commodity,

adding fairness, openness, and long-term viability to a brand gives it an edge.

The study also looks at the social side of ESG, which hasn't been a part of Q-commerce for a long time. Gig workers are important to the industry's quest for efficiency, but they often work in unsafe conditions. Platforms can balance operational efficiency with social equality by making it easier to find and use ethical solutions in the user interface. This boosts employees' self-esteem and deepens the emotional connection between the brand and the customer.

LIMITATIONS

The study's results are important, but there are some problems with them. It uses self-reported data and hypothetical stimuli, which may not be good at predicting how people will act in real life. The cross-sectional method makes it harder to understand how behavior stays the same over time. The study focuses on cities and may not accurately reflect how people in rural areas or those with lower incomes in India shop.

POSSIBLE DIRECTIONS FOR FUTURE RESEARCH -

Using long-term field experiments to see if changes in behavior last over time could be a way to build on this work.

- Looking at how nudges that are in line with ESG affect platform-level KPIs like cart size, retention, and profit.
- Getting feedback from gig workers to find out how well the parts that make them visible and give them credit work in real life.
- Adding economies in the global South to the framework, where platform-based activities are growing but not being properly regulated.

This study shows that including ESG in a smart way is both the right thing to do and good for business in today's competitive digital economy. Q-commerce platforms that get this link are likely to do well in both the market and in terms of culture.

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Toward A Theory of Startup Capital Structure: A Critical Review and Theoretical Proposition for Emerging Markets

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Toward A Theory of Startup Capital Structure: A Critical Review and Theoretical Proposition for Emerging Markets

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ABSTRACT:

This paper critically examines the relevance and limitations of classical capital structure theories—namely, Pecking Order Theory, Trade-Off Theory, and Agency Theory—when applied to startups, particularly within emerging market contexts. Traditional theories, developed for mature firms in institutionalized economies, often fall short in explaining the financing decisions of early-stage ventures that operate under high uncertainty, limited internal resources, and fragmented capital ecosystems.

To address this theoretical gap, the study proposes the Startup Capital Structure Logic (SCSL) framework, which reconceptualizes startup financing as a context-sensitive, multi-actor process. Drawing from institutional economics, lifecycle financing, and behavioral theory, SCSL emphasizes how financing decisions are shaped by informal networks, founder psychology, hybrid instruments (e.g., convertible debt, SAFE notes), and ecosystem actors such as accelerators and angel networks. In contrast to firm-level optimization models, this framework positions capital structure as an evolving outcome influenced by institutional voids, signaling pressures, and access asymmetries.

The paper contributes to literature by integrating classical and contemporary perspectives into a unified structure that reflects the realities of entrepreneurial finance in undercapitalized settings. These include the theoretical and practical aspects along with policy implications. The lifecycle-based capital approach, and the impact of new digital financing tools, which need to be addressed in future research.

This paper proposes an adaptive and ecosystem-aware approach which helps in understanding capital structure of startups in emerging economies and also adds to the theory of entrepreneurial finance by making it more inclusive.

Keywords: Startup financing · Capital structure · Emerging markets · Entrepreneurial finance · Pecking Order Theory · Hybrid instruments · Informal capital · Lifecycle financing ·

Behavioral finance · Venture capital · Ecosystem-based theory

1. INTRODUCTION

Capital structure choices are crucial in the high-stakes world of startups. A venture's viability, valuation trajectory, and capacity to win over investors are all significantly influenced by the financing mix of debt, equity, and hybrid instruments (Gompers & Lerner, 2001).

1.1 STATEMENT OF THE PROBLEM

Large, publicly traded companies in developed economies served as the setting for the development of traditional capital structure theories, including the Pecking Order Theory (Myers & Majluf, 1984), the Trade-Off Theory, and the Modigliani–Miller theorem (Modigliani & Miller, 1958). These theories are based on the presumptions of stable cash flows, efficient capital markets, access to credit, and rational actors—all of which are rarely met by early-stage startups, especially in emerging markets (Bruton, Ahlstrom, & Li, 2010; Khavul & Bruton, 2013).

2.1 A Critical Analysis of Pecking Order Theory (POT) in Startup Environments

1.2 RESEARCH GAP

While the determinants of capital structure have been widely studied in the context of mature firms (Sheikh & Wang, 2011), research on startups remains fragmented and under-theorized—particularly in the context of emerging economies. Most empirical investigations tend to generalize established firm behavior, often overlooking the distinctive characteristics that shape financing decisions in early-stage ventures. For instance, a recent study on Indian startups (Desh Bhagat University, 2023) highlights the influence of firm size, profitability, and liquidity even at the startup stage. Yet, traditional theories struggle to capture critical nuances—such as the founder's individual risk appetite, the absence of robust institutional frameworks, or the rise of alternative funding channels like crowdfunding and revenue-based financing. Moreover, the growing relevance of support systems, including accelerators and incubators, further complicates the conventional capital structure narrative (George et al., 2016; Khavul & Bruton, 2013).

1.3 AIM AND OBJECTIVES

This paper seeks to bridge critical theoretical gaps in our understanding of startup financing by pursuing the following core objectives:

1. To systematically evaluate classical capital structure theories and assess their applicability to startup enterprises.
2. To uncover conceptual limitations in explaining startup financing behavior, particularly in the context of emerging markets.
3. To develop a startup-specific capital structure framework that aligns more closely with the unique economic and institutional realities of these regions.

1.4 SCOPE OF THE STUDY

The analysis centers on startups in their early and growth stages, with a geographic focus on

emerging economies such as India, Brazil, and Nigeria. By design, the study does not include mature firms or late-stage startups, as these entities typically encounter fundamentally different financing challenges and capital dynamics.

1.5 THEORETICAL CONTRIBUTION

This research introduces a context-sensitive conceptual framework—termed the Startup Capital Structure Framework (SCSF)—which places emphasis on factors often overlooked in traditional models. It incorporates founder behavior, access to digital financing tools, and the role of institutional support systems like incubators and accelerators. Unlike classical theories grounded in stable, developed market assumptions, the SCSF reflects the lived experiences of resource-constrained, innovation-focused ventures operating within institutional voids and volatile economic environments (Bruton et al., 2010; George et al., 2016).

2. METHODOLOGY

2.1 RESEARCH APPROACH: STRUCTURED NARRATIVE LITERATURE REVIEW (SNLR)

This study adopts a Structured Narrative Literature Review (SNLR) as its primary methodological lens. While a Systematic Literature Review (SLR) is typically exhaustive, structured, and focused on quantitative measures, the SNLR takes a more balanced approach, combining methodological rigor with interpretive flexibility (Baumeister & Leary, 1997; Tranfield, Denyer, & Smart, 2003). This makes it especially useful for exploring interdisciplinary and still-emerging areas—like entrepreneurial finance and startup capital structures—where research is often fragmented and spread across a variety of conceptual frameworks.

The SNLR methodology permits a deliberate integration of foundational capital structure theories—including those advanced by Modigliani and Miller (1958), as well as the Trade-Off, Pecking Order, and Agency theories—with emerging contextual themes such as digital finance innovations, founder cognition, and institutional voids characteristic of many developing economies. Using this approach, the review seeks to create a synthesis that is both theoretically grounded and sensitive to real-world contexts, bridging classical finance theories with the practical realities faced by today's startups. In doing so, the SNLR serves a dual purpose: it not only critically examines existing models of capital structure but also lays the groundwork for a new conceptual framework that more accurately captures the evolving dynamics of startup financing—especially in emerging markets, where traditional assumptions often fail to hold.

2.2 REVIEW OF CLASSICAL CAPITAL STRUCTURE THEORIES

This section takes a critical look at the major capital structure theories that have shaped corporate finance and examines how relevant—or limited—they are when applied to startup firms, especially in the context of emerging markets.

2.2.1 REVISITING PECKING ORDER THEORY (POT) IN STARTUP FINANCE

Pecking Order Theory (POT), proposed by Myers and Majluf (1984), suggests that firms follow a specific hierarchy when choosing how to finance themselves. They typically rely first on internal funds, like retained earnings, then turn to debt, and consider external equity only as a last resort. This order reflects the problem of information asymmetry: insiders—such as

managers or founders—know more about the firm's true value than outside investors. Issuing new equity can therefore be costly, both in terms of reputation and valuation, because it may signal negative information to the market.

This theory has been largely validated in the context of mature, profitable firms with steady cash flows and accessible internal funds. For instance, Shyam-Sunder and Myers (1999) found that even when firms deviate from their optimal capital structure, they often still adhere to this hierarchical preference—demonstrating the theory's practical relevance in established corporate settings.

2.2.2 WHY STARTUPS DEVIATE FROM POT

However, the startup landscape—particularly in emerging markets—rarely mirrors these conditions. Startups often lack retained earnings, face unstable revenues, and operate in capital environments marked by credit rationing and institutional voids. Information asymmetry in startups is complex and multilayered—not just between founders and investors, but also involving regulators, financial institutions, and other market participants. Because of this, the assumptions behind the Pecking Order Theory often break down in early-stage ventures. In practice, the typical financing sequence is frequently reversed: startups rarely have internal funds to rely on, so they often start with informal equity from founders, family, and friends, followed by angel investors, venture capital, and, if available, structured debt at later stages. As Frank and Goyal (2003) note, “POT presumes internal funding is abundant, which is a flawed assumption for new firms in high-growth sectors.” Bharath et al. (2009) add that firms with limited informational quality—like most startups—are especially prone to financial mispricing, making the application of POT highly inconsistent.

2.2.3 CONTEXTUAL CONSTRAINTS IN EMERGING ECONOMIES

Startups in emerging economies face additional challenges that further limit the relevance of POT, such as:

- Weak formal credit markets and underdeveloped investor ecosystems (Beck et al., 2005)
- Underdeveloped collateral systems and credit scoring mechanisms (La Porta et al., 1997)
- Dependence on informal equity networks and relational financing (Banerjee & Duflo, 2000)

In these contexts, startups' strategies for raising capital are driven more by the strength of their networks, social credibility, and the ability to signal key milestones than by any formal pecking order.

2.2.4 EMPIRICAL STUDIES UNDERMINING POT IN STARTUPS

- Cosh, Cumming & Hughes (2009), in a UK-based study, found that early-stage firms' financing choices were more strongly influenced by founder credentials, innovation potential, and market signaling than by a financing hierarchy.
- Robb & Robinson (2014) observed a clear preference for equity over debt in U.S. startups, citing its greater flexibility and risk-sharing benefits.
- Degryse et al. (2012) concluded that informational opacity—rather than the internal vs. external fund hierarchy—was the key determinant of capital choice among young firms.

2.2.5 TOWARD A MORE STARTUP-CENTRIC PERSPECTIVE

The mismatch between POT's assumptions and startup realities has prompted scholars to advocate for entrepreneurial finance models that better capture the nuances of early-stage funding. These models emphasize elements such as resource orchestration, staged capital deployment, and institutional embeddedness—factors that are largely absent from classical corporate finance theory.

2.2.6 REVISED THEORETICAL INSIGHTS

Given the limitations of the traditional Pecking Order Theory in explaining startup financing behavior—especially in volatile, resource-scarce environments—recent scholarship has pushed for a more nuanced reinterpretation. Rather than discarding the theory entirely, researchers have proposed evolving it in two important directions.

First, a contingent view of POT has emerged, suggesting that financing decisions in startups are not universal but rather path-dependent and context-sensitive. Lehner (2014) argues that the funding choices of early-stage ventures often reflect local institutional conditions, founder backgrounds, and market maturity—factors that classical POT overlooks.

Second, a behavioral reinterpretation of the theory has gained traction. This perspective integrates insights from cognitive psychology, highlighting how founder overconfidence, investor sentiment, and informal power dynamics shape funding trajectories. As Brown, Ibrahim, and Taylor (2012) contend, these behavioral variables often override strict hierarchical preferences, particularly in nascent entrepreneurial ecosystems where formal signals are weak and interpersonal relationships matter greatly.

Together, these developments point to a broader trend: adapting traditional finance theory to better reflect the lived complexity of startup realities, rather than assuming one-size-fits-all rules derived from mature firm behavior.

2.3 TRADE-OFF THEORY (TOT) : RETHINKING ITS ROLE IN STARTUP CAPITAL STRUCTURING

The Trade-Off Theory (TOT) presents a compelling framework for understanding capital structure in established firms. Building on the work of Kraus and Litzenberger (1973), the Trade-Off Theory suggests that firms strive for an optimal debt-to-equity balance, weighing the tax benefits of borrowing against the potential costs of financial distress. This classic framework focuses on three main dimensions:

- The interest tax shield offered by debt,
- The risk of bankruptcy, both tangible and reputational,
- And the agency conflicts associated with managing debt and equity stakeholders.

In large, mature firms—those with predictable cash flows, hard assets, and profitability—this model has demonstrated both theoretical soundness and empirical validation. For instance, Graham (2000) documented substantial tax-related advantages from debt financing among U.S. corporations, which fits well with the predictions of the Trade-Off Theory. However, when it comes to startups—particularly in emerging markets—this framework starts to unravel. The assumptions at the heart of TOT often break down in the uncertain and fast-changing

environments typical of early-stage ventures.

2.3.1 WHY TOT STRUGGLES TO EXPLAIN STARTUP BEHAVIOR

1. NO PROFITS, NO SHIELD

A core appeal of debt under TOT is the tax savings it brings. But most startups burn through capital in their early years and report net losses, making the so-called “tax shield” irrelevant. Without profits, there’s nothing to protect—rendering this benefit purely theoretical.

2. DISTRESS IS NOT JUST A RISK—IT’S EXPECTED

Startups face chronic instability: untested products, unpredictable revenues, and no collateral. As Altman & Sabato (2007) point out, the likelihood of default in small, new firms is substantially higher than in large corporations. For startups, borrowing isn’t about finding the perfect capital structure—it’s often a matter of survival.

3. NO CREDIT HISTORY, NO DEBT ACCESS

The Trade-Off Theory assumes that firms can take on debt if they wish—but for startups, this is often far from reality. As Berger and Udell (1998) point out, banks demand “hard” information, such as financial statements, assets, or proven performance—resources that most startups simply don’t have. In emerging markets, where lenders are particularly cautious and credit-scoring systems are underdeveloped, startups are frequently shut out of formal financing, regardless of what the theory might suggest.

4. INTANGIBLES DON’T GET YOU LOANS

TOT works better when firms own tangible, depreciable assets. Startups, by contrast, are typically asset-light—relying on ideas, IP, or software. As Titman and Wessels (1988) observe, such firms tend to avoid debt, not because they’ve calculated an optimal ratio, but because they simply don’t qualify for borrowing in the first place.

2.3.2 EMERGING MARKET REALITIES: A DIFFERENT TRADE-OFF EQUATION

In developing economies, the weaknesses of TOT become even more apparent. These ecosystems often feature:

- Underdeveloped financial infrastructure,
- Limited bankruptcy protections,
- And unpredictable policy environments.

This context drastically alters the calculus for entrepreneurs.

- Booth et al. (2001) studied firms across ten developing nations and found consistent deviations from the trade-off logic, with macroeconomic volatility and legal inefficiency emerging as stronger predictors of capital structure.
- Fan, Titman, and Twite (2012) showed that companies in Asia and Latin America often avoid debt altogether—not due to strategy, but due to institutional fragility and shallow credit markets.

- In India, Chakraborty (2010) found that profitability and firm size better explain capital choices than tax or distress concerns, further undermining TOT's relevance in the startup space.

2.3.3 CAN TOT STILL BE SALVAGED? TOWARD A MORE CONTEXT-AWARE FRAMEWORK

While TOT in its classical form may not explain startup capital decisions, scholars haven't discarded it outright. Instead, they propose adaptive versions that factor in the dynamic, high-risk nature of entrepreneurial ventures:

- Dynamic TOT models (Fischer, Heinkel, & Zechner, 1989) suggest that firms gradually move toward an optimal capital structure over time, making these models more relevant for scale-ups that have progressed beyond the early stages.
- Staged trade-off frameworks, inspired by Rajan and Zingales (1995), argue that debt is typically avoided in the beginning due to high financial risk, but is gradually introduced as revenues stabilize and asset bases grow.
- Most importantly, newer perspectives emphasize entrepreneurial trade-offs, where founders weigh not just financial costs but also personal risks and strategic control. Burchardt et al. (2016) show how founders must balance retaining equity (and control) against taking on personal liability through debt—a set of decisions that extends well beyond the traditional debt–tax–distress considerations.

2.4 RESOURCE-BASED VIEW (RBV) AND STRATEGIC FINANCING IN STARTUP CAPITAL DECISIONS

The Resource-Based View (RBV), introduced by Barney (1991), highlights that firms achieve and sustain competitive advantage by effectively leveraging resources that are valuable, rare, difficult to imitate, and non-substitutable—what is commonly called the VRIN framework. While RBV was not originally designed for financial theory, it has become increasingly relevant in entrepreneurial finance. For startups, capital structure decisions often go beyond simple financial optimization; they are closely tied to strategic management of key resources (Miller & Shamsie, 1996; Sirmon, Hitt & Ireland, 2007).

2.4.1 RBV REIMAGINED FOR STARTUP FINANCING

In startup contexts—especially within emerging economies—financial capital is not always the most abundant or accessible resource. Startups typically hold a distinct bundle of non-financial assets such as:

- Human capital: the knowledge, skills, and social ties of the founding team;
- Intellectual property: proprietary technologies or processes;
- Social capital: relationships with mentors, investors, or incubators.

In contrast to established firms with steady revenues and tangible collateral, startups often navigate financing decisions based on the strength and configuration of these intangible resources. For example, a founder with strong investor networks might lean toward equity financing from strategic partners rather than pursue bank loans. Similarly, a tech-focused startup may delay external funding to protect intellectual property and build in-house prototypes first.

Empirical studies reinforce this pattern. Brush, Greene, and Hart (2001) observed that women-led startups often avoid external funding in the early stages to preserve control and autonomy. George (2005) also highlighted how startups use their resource limitations creatively to spot and seize entrepreneurial opportunities—further suggesting that capital structure is not merely a financial decision but a resource orchestration strategy.

2.4.2 STRATEGIC FRAMING OF CAPITAL STRUCTURE: AN RBV PERSPECTIVE

From an RBV lens, startup capital structure can be seen as an extension of how entrepreneurs manage and deploy their available resources. Several strategic interpretations emerge:

1. BOOTSTRAPPING FOR OWNERSHIP AND AUTONOMY

Many founders use personal savings, reinvested earnings, or customer advances to postpone formal funding. This preserves equity and allows greater control in early decision-making. Winborg and Landström (2001) describe this as a strategic way to delay institutional dependency.

2. EQUITY AS A GATEWAY TO COMPLEMENTARY RESOURCES

Equity funding is not always sought for the money alone. Founders often prefer investors who bring mentorship, networks, or domain expertise. This use of equity aligns with RBV's idea of leveraging external assets to strengthen internal capabilities.

3. SELECTIVE USE OF DEBT FOR STRATEGIC SIGNALING

Even in risky environments, startups may use limited debt not for tax advantages but to signal legitimacy and fiscal discipline—particularly to future equity investors. Bhide (1992) found that some entrepreneurs used bank loans to establish credibility in early-stage markets.

4. LEVERAGING INSTITUTIONAL ACTORS

Incubators, accelerators, and corporate alliances can act as surrogate resource pools for startups, shaping their access to capital. Clarysse, Wright, and Van Hove (2015) demonstrate how affiliation with support institutions influences both the timing and type of financing pursued.

2.4.3 RBV IN EMERGING MARKET STARTUPS: NAVIGATING CONSTRAINTS

Startups in emerging economies often operate in environments with weak financial infrastructure and limited formal support. In these contexts, RBV becomes particularly salient. Founders must navigate institutional voids by creatively mobilizing what little they have—a process often described as bricolage.

Khanna and Palepu (1997) contend that firms in such contexts must build their own enabling environments. For startups, this means drawing on informal networks, community ties, and social legitimacy in place of traditional financing channels. Patel and Conklin (2009) showed that Indian SMEs often tapped into caste and kinship networks to secure early-stage funding, highlighting the critical role of social capital in shaping their capital structure.

2.4.4 TOWARD A SYNTHESIZED FRAMEWORK: RBV MEETS CAPITAL STRUCTURE THEORY

Recent research has begun to weave the Resource-Based View into broader frameworks of entrepreneurial finance. Two key contributions in this area are:

- The Strategic Fit Approach (Beck, Demirguc-Kunt & Levine, 2008): This model suggests that optimal financing choices are those that align not just with financial ratios but with the firm's unique internal capabilities and market conditions.
- Entrepreneurial Resource Mobilization Models Hsu (2004) examines how the quality of a startup's resources—like the founder's experience or the strength of its intellectual property—shapes not only the type of financing pursued but also the timing of these decisions.

In short, the Resource-Based View provides a valuable perspective for understanding why startups, especially in resource-constrained settings, make the capital structure choices they do. It shifts the focus from finance as merely a balance sheet issue to finance as a strategic decision, deeply intertwined with the management and deployment of critical resources.

2.5 INSTITUTIONAL THEORY AND CAPITAL STRUCTURE IN EMERGING ECONOMIES

While classical capital structure theories like the Pecking Order and Trade-Off models focus mainly on firm-level financial choices and market imperfections, Institutional Theory takes a step back to consider the broader environment in which firms operate. First introduced by Meyer and Rowan (1977) and later expanded by North (1990) and Scott (1995), this framework highlights how formal rules, informal norms, and regulatory systems shape business behavior. In recent years, it has become particularly relevant in entrepreneurial finance, especially in emerging economies where institutional systems are often fragmented or inconsistent.

2.5.1 INSTITUTIONAL SETTINGS AND CONSTRAINTS ON STARTUP FINANCING

Institutions, as defined by North (1990), are essentially the “rules of the game”—both written (laws, regulations, contracts) and unwritten (cultural values, social practices). In many developing economies, these rules are either underdeveloped or poorly enforced, creating what Khanna and Palepu (2010) call institutional voids. These voids contribute to financing constraints in several ways:

- Weak Investor Protection: Fragile legal enforcement and limited safeguards for minority shareholders create uncertainty and make equity investment less attractive (La Porta et al., 1998).
- Limited Transparency: A lack of reliable accounting standards and credit evaluation systems makes it difficult for financiers to accurately gauge a startup's risk (Demirguc-Kunt & Maksimovic, 1999).
- Social Norms Dominate: In many cases, financing decisions are driven more by personal or community relationships than by formal market mechanisms (Nee, 1998; Aldrich & Auster, 1986).

These conditions often force startups to adopt alternative financing routes—often informal, relationship-based, or self-financed—rather than rely on conventional capital markets.

2.5.2 HOW INSTITUTIONAL PRESSURES INFLUENCE ENTREPRENEURIAL BEHAVIOR

Startups operating in such environments must navigate a complex web of institutional pressures. DiMaggio and Powell (1983) identify three main types:

- **Coercive pressures:** arising from state policies or regulatory bodies (e.g., RBI or SEBI in India)
- **Mimetic pressures:** the tendency to imitate other startups perceived as successful, even when the fit is imperfect
- **Normative pressures:** stemming from professional norms or expectations set by stakeholders such as accelerators, investors, or industry mentors (Zimmerman & Zeitz, 2002)

In uncertain regulatory settings, these pressures often influence financing decisions more than internal firm considerations. For instance, startups may lean heavily on bootstrapping or family funds to avoid the risks associated with opaque legal systems. Puffer, McCarthy, and Boisot (2010) observed this pattern in Russia and India, where entrepreneurs frequently rely on informal networks because formal institutions are unreliable.

2.5.3 INSTITUTIONAL CONTEXT AS A DETERMINANT OF FINANCIAL PATHWAYS

A startup's position within its institutional environment plays a major role in shaping its capital structure. For example:

- In India, Chatterji et al. (2013) found that cities with strong startup ecosystems—like Bangalore and Hyderabad—provide better access to venture capital and formal debt, largely thanks to more robust local institutions.
- By contrast, Ayyagari, Beck, and Demircuc-Kunt (2007) observed that in Sub-Saharan Africa, smaller enterprises often rely primarily on internal funds because formal credit channels are limited or underdeveloped.
- Deeg and O'Sullivan (2009) highlight how institutional complementarities—like the alignment between legal systems and banking sectors—can make either debt or equity more viable.

Thus, institutional density and quality play a decisive role in shaping not only access to finance but also the strategic logic behind financing choices.

2.5.4 ENTREPRENEURIAL AGENCY AMID INSTITUTIONAL GAPS

Even in constrained environments, entrepreneurs are not just passive actors reacting to institutional pressures. Many engage in what Lawrence and Suddaby (2006) call institutional work, actively shaping or navigating around existing structures. Examples include:

- Establishing alternative funding channels, such as angel investor networks or local crowdfunding platforms,
- Registering firms in jurisdictions with more favorable regulatory frameworks (e.g., Delaware for Indian startups),
- Advocating for policy changes through public-private dialogue and initiatives like India's "Startup India" program.

These initiatives show that founders are not just shaped by their institutional environment—they can actively reshape it to create more favorable conditions for securing financing.

2.5.5 RETHINKING CAPITAL STRUCTURE THROUGH AN INSTITUTIONAL LENS

In short, Institutional Theory provides a useful lens for understanding why startups in emerging economies often make capital structure decisions that differ from the predictions of traditional models. It helps explain:

- Why equity financing may be hindered by a lack of transparency or investor confidence,
- Why debt remains inaccessible in environments with poor contract enforcement,
- And how informal, non-market institutions—such as family networks or community groups—step in to fill these gaps.

This context-sensitive perspective echoes Welter's (2011) call to embed entrepreneurial behavior in its broader spatial, temporal, and institutional setting. In doing so, it urges scholars and practitioners alike to rethink startup financing as a function of institutional embeddedness rather than pure financial logic.

2.6 AGENCY THEORY AND ENTREPRENEURIAL FINANCE

Agency Theory, developed by Jensen and Meckling (1976), focuses on conflicts of interest between principals (owners or shareholders) and agents (managers). These conflicts arise from information asymmetry, differing risk preferences, and misaligned incentives. The theory suggests that capital structure choices can help reduce agency costs by disciplining managerial behavior and aligning interests.

In the context of startups—particularly in emerging economies—Agency Theory needs some adaptation. Many startups are founder-led, which blurs the traditional principal-agent distinction. However, when external capital enters the picture—through venture capital, angel investors, or government funding—new agency challenges emerge, such as:

- Founders prioritizing personal vision over profitability;
- Investors pushing for premature scaling or exits;
- Strategic misalignment between founders and financiers.

2.6.1 DEBT AS A DISCIPLINARY MECHANISM

Classic agency theory views debt as a constraint on managerial opportunism. By reducing free cash flow, debt curbs excessive spending and aligns risk-taking with firm interests (Jensen, 1986).

In emerging market startups, this logic faces practical limitations:

- Debt is often unavailable or unaffordable due to collateral scarcity and weak credit histories (Berger & Udell, 1998).
- Formal lenders impose personal guarantees, transferring institutional risk to founders.
- Volatile environments make debt perceived as too risky, even when theoretically optimal.

Thus, despite agency theory's preference for debt, startups in emerging markets tend to adopt equity-heavy structures—ironically introducing new agency problems between founders and

equity investors.

2.6.2 VENTURE CAPITAL AND CONTROL RIGHTS

Venture capitalists address agency challenges through carefully designed contracts and governance mechanisms, such as:

- Convertible preferred equity to protect against downside risk
- Board seats and veto rights to influence key decisions
- Milestone-based funding to align incentives and ensure performance

Kaplan and Strömberg (2003) show how these structures separate control from ownership, reducing agency slack.

However, in environments with weak institutional support, these mechanisms often fall short:

- Local VCs may lack the resources or enforcement capacity to monitor effectively
- Founders may resist governance controls out of concern for dilution or loss of autonomy
- Conflicts over growth timelines and risk tolerance can lead to tensions that destroy value (Wright et al., 2005)

2.6.3 SIGNALING, PERCEPTIONS, AND CAPITAL CHOICES

Agency theory also intersects with signaling theory (Spence, 1973) in entrepreneurial contexts. Financing choices act as strategic signals to external stakeholders:

- Raising VC suggests market endorsement and growth potential;
- Avoiding debt may signal financial fragility or risk aversion;
- Heavy reliance on informal finance may imply opacity or weak scalability.

Although positive signals can help attract funding and talent, they can also create mounting performance pressures that influence a startup's operational priorities (Connelly et al., 2011).

2.6.4 AGENCY IN FAMILY-OWNED AND SOCIAL STARTUPS

Many startups in emerging markets are family-owned or mission-driven, requiring a more nuanced understanding of agency dynamics:

- Family firms typically experience lower traditional agency costs because ownership and management overlap, but they may face risks related to entrenchment and succession (Villalonga & Amit, 2006).
- Social enterprises often balance dual goals—social impact and financial returns—which can lead to mission drift when engaging with commercial investors (Battilana & Dorado, 2010).

To address these hybrid agency challenges, capital providers frequently employ tailored instruments, such as:

- Restricted equity or impact-linked debt to safeguard social objectives
- Hybrid governance boards that include both community and investor representatives

2.6.5 SUMMARY: AGENCY THEORY REVISITED

Agency Theory offers critical insights into startup financing, but must be contextualized for:

- Founder-led ownership models in early-stage ventures;
- Hybrid motivations (e.g., impact + profit);
- Thin formal institutions, making equity a dominant but agency-problem-prone tool.

Agency Theory is especially useful for understanding investor-founder dynamics in informal or evolving capital markets, where traditional control mechanisms often fall short.

Table 1 : Agency Costs and Capital Structure Strategies Across the Startup Lifecycle

Lifecycle Stage	Key Agency Problem	Capital Strategy
Idea / Seed	High information asymmetry; lack of operating history makes external evaluation difficult	Bootstrapping, grants, and capital from friends & family—sources requiring minimal formal oversight
Early Growth	Diverging expectations between founders and investors regarding risk, return, and control	Angel or VC funding with staged investments, board representation, and protective clauses to align incentives
Scaling	The risks include overexpansion, inefficient use of capital, or founder tunnel vision.	Startups may use debt (when available) to enforce financial discipline and strengthen internal governance to prevent strategic drift.
Exit / IPO	Conflicts can arise over exit timing and strategic priorities between founders, investors, and public markets.	Mechanisms such as lock-in clauses, dual-class shares (where allowed), and structured exit agreements are often used to manage misaligned objectives.

Table 2 : Comparative Summary of Capital Structure Theories in Startup Contexts

Theory	Core Premise	Startup Relevance	Key Limitations in Startups	Implications in Emerging Markets
Pecking Order Theory (POT) (Myers & Majluf, 1984)	Firms prefer internal financing, then debt, and lastly equity due to information asymmetry.	Startups often lack internal funds, so they default to external equity.	Assumes retained earnings are available; startups lack historical profits.	Internal financing is minimal; reliance on informal equity or bootstrap capital is high.

Trade-Off Theory (TOT) (Kraus & Litzenberger, 1973)	Firms balance tax benefits of debt against bankruptcy and agency costs to optimize capital structure.	Startups may not benefit from tax shields and often face high distress risk.	Difficult to estimate optimal capital due to volatile earnings and asset base.	Thin debt markets and weak legal enforcement reduce debt attractiveness.
Market Timing Theory (MTT) (Baker & Wurpler, 2002)	Firms issue equity when market valuation is high and repurchase when undervalued.	Some startups raise capital opportunistically during boom cycles or media hype.	Valuation-based timing requires market access and investor attention.	In nascent markets, few startups can time markets; valuation mechanisms are weak.
Agency Theory (Jensen & Meckling, 1976)	Debt and monitoring mechanisms reduce agency conflicts between owners and managers.	Founders = agents & principals; external investors (VCs) introduce new agency tensions.	Traditional agency tools (e.g., debt) are often inaccessible; equity exacerbates control tensions.	Investor protections are limited; control rights in equity contracts often poorly enforced.
Signaling & Control Rights Theory (Spence, 1973; Kaplan & Strömberg, 2003)	Financing choices act as signals of firm quality; structured contracts align interests.	VC contracts (convertible equity, milestone-based funding) signal quality & manage risk.	High-quality signaling requires institutional VCs and sophisticated governance.	Weak VC ecosystems and lack of legal clarity dilute effectiveness of signaling and control design.

3. TOWARD A UNIFIED STARTUP CAPITAL STRUCTURE LOGIC (SCSL)

While traditional capital structure theories have offered valuable insights into how companies finance themselves, they fall short when applied to startups—especially those in emerging markets. Startups operate in volatile, resource-constrained environments with weak formal institutions, often relying heavily on informal networks to secure capital. These realities call for a distinct approach—what we term the Startup Capital Structure Logic (SCSL).

3.1 WHY STARTUPS NEED THEIR OWN FINANCING LOGIC

Classical finance theories simply don't fit startups:

- Predictable cash flows are rare, so relying on internal financing (as the Pecking Order Theory suggests) often isn't feasible.
- Striving for an “optimal” balance between debt and equity (Trade-Off Theory) can feel

like a luxury startups can't afford.

- Market timing strategies are largely irrelevant when access to public markets is limited or nonexistent.
- Governance isn't driven by boards and shareholders—it's often dictated by passionate founders.
- And then there's the elephant in the room: weak legal systems and patchy institutions, which can twist even the best-laid financing strategies.

As scholars like Cassar (2004), Cosh et al. (2009), and Colombo & Grilli (2010) point out, startup financing is less about textbook formulas and more about navigating complex, evolving realities. What determines their funding choices is not just firm size or profitability—it's the founder's mindset, investor appetite, local institutions, and how far along the innovation curve they are. It's messy, adaptive, and anything but linear.

3.2 BUILDING THE STARTUP CAPITAL STRUCTURE LOGIC (SCSL) FRAMEWORK

We propose a fresh lens—Startup Capital Structure Logic (SCSL)—that doesn't reject classical theories, but reshapes them around how startups really work. It rests on three key pillars:

3.2.1. LIFECYCLE SENSITIVITY

A startup's financing strategy changes as it matures:

- Seed & Pre-revenue Stage: The money comes from wherever it can—founders, friends, family, or bootstrapping. Angel investors enter cautiously.
- Early Stage: Venture capitalists and institutional angels step in. Equity becomes the preferred route because startups often lack collateral or stable revenues.
- Growth Stage: More nuanced instruments like convertible notes and venture debt begin to appear, as business models strengthen.
- Later Stage: With some revenue stability, startups can finally approach banks and structured equity markets for refinancing.

Each stage of a startup's journey requires different financial tools, and founders often have to improvise along the way.

3.2.2 INSTITUTIONAL FRICTION

Startups in emerging markets encounter institutional challenges that strongly influence their financing decisions:

- Weak legal protections make debt financing risky for both lenders and borrowers.
- Limited credit scoring systems force founders to lean on personal networks rather than formal financial institutions.
- Bureaucracy, corruption, or lack of infrastructure often push startups toward informal finance.

These frictions distort the "ideal" scenarios envisioned by Western-centric finance theories. As Khanna and Palepu (2010) argue, these institutional voids don't just change the game—they are the game.

3.2.3 BEHAVIORAL STRATEGY

Startups are driven by people, not spreadsheets—and that changes everything:

- Dilution aversion: Founders often go to great lengths to avoid giving up ownership, even when external equity is available.
- Cautious debt use: Many delay taking on debt, not because it's unavailable, but because it can limit flexibility or increase the risk of financial distress.
- Strategic signaling: Founders rely on signals such as incubator memberships, patent filings, past entrepreneurial successes, and social networks to attract funding (Hsu, 2004; Connelly et al., 2011).

These aren't irrational moves—they're adaptive strategies in uncertain terrain.

3.3 COMPONENTS OF THE SCSL MODEL

Table 3 : Components of the SCSL Mode

Component	Startup Reality	Implication
Stage of Venture	Non-linear, risk-intensive, evolving	Financing must match stage-specific risk and return needs
Founder Objectives	Control preservation, future valuation, minimal dilution	Structures favor equity with protective covenants
Institutional Context	Informal networks, weak legal institutions, credit access gaps	Drives reliance on relational capital and hybrid finance
Investor Landscape	Angels, VCs, government schemes, fintech platforms	Influences structure, terms, and exit strategy preferences

3.4 WHAT THE SCSL PERSPECTIVE BRINGS TO THE TABLE

The Startup Capital Structure Logic (SCSL) framework provides a fresh lens to understand how startups—especially in emerging markets—actually make financing decisions. Its main contributions include:

1. GROUNDING THEORY IN REALITY:

SCSL bridges the gap between classical capital structure theories and the fast-moving, often messy world of entrepreneurship. It connects textbook finance with how founders genuinely raise and manage capital.

2. BRINGING CONTEXT TO THE FOREFRONT:

By explicitly accounting for institutional voids, regulatory gaps, and informal financing norms common in emerging economies, SCSL treats local realities as central to financial strategy—not as afterthoughts.

3. HIGHLIGHTING FOUNDER BEHAVIOR:

Unlike rigid models that assume rational markets and perfect information, SCSL recognizes

that founders' preferences, fears, and experiences influence every financial decision. Behavioral factors—like aversion to dilution or debt—can dramatically shape capital pathways.

4. EMBRACING HYBRID FINANCING MODELS:

The framework allows for analysis of modern, flexible financing tools that don't fit neatly into traditional categories—such as venture debt, SAFEs (Simple Agreements for Future Equity), revenue-based financing, crowdfunding, and AI-powered fintech lending. SCSL helps make sense of these innovations as part of the evolving capital structure landscape.

4. DISCUSSION AND IMPLICATIONS FOR EMERGING MARKETS

4.1 RETHINKING CAPITAL STRUCTURE THROUGH A STARTUP LENS

Traditional capital structure theories—such as Modigliani & Miller (1958) or Myers' Pecking Order Theory (1984)—assume stable cash flows, rational decision-making, and well-functioning markets. For startups in emerging economies, however, this idealized world is rarely the reality.

In these contexts, startups don't optimize capital structure in a textbook sense. Instead, they adapt. Financing decisions are less about calculating cost of capital and more about navigating uncertainty, plugging institutional gaps, and leveraging whatever networks or resources are available.

Rather than being a neat outcome of firm-specific characteristics, capital structure becomes a negotiated result—shaped by founder beliefs, local investor expectations, and the institutional fabric of the region (Khanna & Palepu, 2010). Founders often find themselves working around weak legal systems, limited access to formal credit, and fragmented capital markets. As Bruton, Ahlstrom & Li (2010) observed, these “institutional voids” make the startup finance journey more improvisational than optimal.

4.2 HOW STARTUPS IN EMERGING MARKETS STRATEGICALLY NAVIGATE FINANCE

In the absence of deep capital markets, startups in emerging economies lean into strategic behavior. This often takes the form of path-dependent decision-making, control-preserving financing, and informal capital networks.

Founders tend to resist equity dilution—particularly when external investors bring pressure that might compromise autonomy or strategic vision. Control matters deeply in these environments. As a result, startups often prefer to raise funds from personal networks, family-run businesses, or angel investors who share cultural or relational trust.

Moreover, financing isn't just about money—it's about timing, trust, and traction. Many early-stage ventures rely on reputation-based lending, incubator affiliation, or even community credibility to gain capital access. This stands in contrast to Western models where formal metrics and due diligence processes dominate.

As George, Kor, & Qian (2011) note, such behavior is not irrational—it's adaptive. In emerging markets, financial strategy is not just shaped by economic logic, but by social capital, per-

ceived legitimacy, and the need for flexibility in volatile environments.

Table 4 : Emerging Market Rationale

Behavior	Emerging Market Rationale
Dilution Aversion	Entrepreneurs prefer retaining ownership due to weak IP protection and limited legal recourse (Wright et al., 2005)
Reliance on Informal Capital	Trust-based finance is crucial where formal VC or banking institutions are inaccessible (De la Torre et al., 2010)
Preference for Convertible Instruments	Risk mitigation through hybrid structures helps circumvent high debt costs (Drover et al., 2017)

4.3 INSTITUTIONAL IMPLICATIONS: BUILDING BEYOND THE FIRM

Startups in emerging economies don’t just struggle within their own walls—they also battle against the structural limitations of their financial environments. Unlike developed markets, where a clear capital ladder exists—from seed funding to venture capital to IPO—many emerging ecosystems lack such continuity (Cumming, 2012; Beck et al., 2006). The result? Promising ventures often plateau, not because of weak ideas, but because of weak infrastructure.

Without reliable, stage-appropriate financing pathways, scalability becomes the exception rather than the norm. Entrepreneurs are forced to stitch together fragmented sources of funding—relying on informal loans, short-term fixes, or ad-hoc partnerships. This patchwork approach limits innovation and discourages long-term vision.

To bridge this gap, institutional innovations are needed. Blended finance models, public-private co-investment platforms, and state-backed credit guarantees can create more robust capital markets. These interventions not only de-risk early-stage investments but also build confidence among private players. As the OECD (2020) suggests, such mechanisms are critical to unlocking sustainable venture capital ecosystems in low-trust, high-volatility environments.

4.4 THEORETICAL IMPLICATIONS OF THE SCSL PERSPECTIVE

The Startup Capital Structure Logic (SCSL) framework offers more than just a practical roadmap—it also advances theory in meaningful ways:

1. AN INTEGRATIVE STRUCTURE

SCSL weaves together insights from multiple streams of thought—agency theory, lifecycle-based financing, signaling theory, and institutional economics (Jensen & Meckling, 1976; Berger & Udell, 1998). Instead of viewing these as competing explanations, SCSL offers a harmonized lens through which startup financing decisions can be better understood.

2. A CONTEXTUAL REFRAMING

Classical theories often assume predictable environments and rational actors. SCSL challenges

that. It recasts capital structure decisions in contexts marked by risk, institutional fragility, and entrepreneurial improvisation—bringing theoretical relevance to geographies and firm types previously seen as anomalies.

3. FUTURE-READY FLEXIBILITY

The model is intentionally adaptive, recognizing that the financing landscape is rapidly evolving. From crowdfunding to tokenized equity, from blockchain-based microfinance to AI-driven credit scoring, SCSL remains applicable to emerging tools and platforms that are reshaping access to capital (Block et al., 2018; Belleflamme et al., 2014).

4.5 PRACTICAL IMPLICATIONS

Table 5: Practical Implications

Stakeholder	Implication / Recommendation
Founders	Develop expertise in hybrid financing instruments and build negotiation skills early.
Accelerators	Go beyond pitching support to educating entrepreneurs on capital strategies aligned with SCSL logic.
Investors	Assess risk in context—consider ecosystem-level data, not just firm-level metrics.
Policy Makers	Create “capital ladders” by integrating grants, convertible instruments, and guarantee-backed debt.

These recommendations are grounded in research from emerging economies, which emphasizes the entrepreneurial ecosystem—rather than individual firms—as the primary unit of analysis (Isenberg, 2011).

4.6 SUMMARY

By framing capital structure as a contextual and strategic decision rather than a fixed financial ratio, the SCSL framework deepens theoretical understanding and informs more flexible policy design. It highlights that startup financing in emerging markets is an evolving process, influenced by local constraints, global capital flows, and the demands of innovation.

Table 6: Classical Theories vs. SCSL-DIG Framework Assumptions

Dimension	Classical Theories	SCSL-DIG Framework
Foundational Basis	Firm-level finance (Myers; Modigliani & Miller; Jensen & Meckling)	Integrates digital, institutional, and entrepreneurial contexts
Dominant Logic	Cost minimization, agency mitigation, signaling	Lifecycle fit, agility, and institutional embeddedness

Primary Assumptions	- Firms are rational - Markets are efficient - Information is asymmetric	- Startups evolve dynamically - Institutions and technology shape behavior
Financing Sequence	Internal → Debt → Equity (POT); Optimal mix (TOT); Control vs. cost (Agency Theory)	Varies by stage and environment: Bootstrapping, alternative finance, institutional aid
Role of Institutions	Largely absent or assumed constant	Central—rules, norms, and policy influence access and strategy
Relevance to Startups	Weak fit—assumes stable cash flows, tangible assets, and rational choices	High relevance—accounts for volatility, digital enablement, and soft capital sources
Geographic Sensitivity	Assumes universal capital market behavior	Tailored for emerging markets with weaker institutions and digital asymmetries
Innovation / Disruption	Treated as risk factors	Embedded as a natural part of startup dynamics
Investor Type Orientation	Banks, venture capital, equity markets	Angels, accelerators, crowd-funding, government schemes
Theoretical Integration	Isolated—each theory applied separately	Holistic—DIG drivers integrated with classical logic for dynamic modeling

5. CONCLUSION AND FUTURE RESEARCH DIRECTIONS

5.1 CONCLUSION

This paper has re-examined the foundations of capital structure theory through the lens of startups—particularly those operating in the volatile, resource-constrained environments of emerging markets. While classical frameworks such as Pecking Order Theory, Trade-Off Theory, and Agency Theory have offered enduring insights for mature firms in developed economies, they struggle to explain the financing choices of startups navigating uncertainty, institutional voids, and informal capital systems.

To address this disconnect, we proposed the Startup Capital Structure Logic (SCSL)—a more contextual and dynamic framework that integrates elements of institutional economics, lifecycle financing, and behavioral strategy. SCSL does not reject classical theory, but rather reframes it to reflect the entrepreneurial realities of ventures operating outside mature capital markets.

At its core, SCSL argues that capital structure in startups is not an abstract financial optimization problem. Instead, it is a multi-actor, path-dependent negotiation shaped by founder preferences, investor constraints, and the nature of the surrounding ecosystem. From bootstrapping and crowdfunding to venture debt and blended finance, startup financing is better understood as an adaptive process rather than a static ratio.

This shift in perspective has deep implications—not just for theory—but for how we design policies, evaluate risk, and train the next generation of entrepreneurs in emerging markets. By foregrounding context, behavior, and institutional complexity, SCSL offers a more grounded and actionable roadmap for understanding how startups build financial resilience in imperfect systems.

5.2 FUTURE RESEARCH DIRECTIONS

To further develop and validate the Startup Capital Structure Logic (SCSL) framework, several promising research pathways emerge:

5.2.1 EMPIRICAL VALIDATION ACROSS CONTEXTS

The SCSL model needs to be tested across a variety of institutional and geographic environments. Comparative studies between low-income and middle-income economies could reveal how differences in institutional maturity and capital accessibility shape financing behavior.

Example: A comparative analysis of India, Nigeria, and Vietnam could illustrate how institutional density influences capital strategy choices among startups in high-growth but structurally distinct markets.

5.2.2 LIFECYCLE-BASED CAPITAL TRANSITIONS

Longitudinal research can track how startups evolve their financing approaches from the seed stage to scale-up. Such studies would illuminate how hybrid instruments—like convertible notes or SAFE agreements—bridge early-stage funding gaps and how they transition into formal equity.

KEY QUESTIONS:

- How do founders' capital preferences shift across different lifecycle stages?
- When and why do startups pivot from informal to institutional finance?

5.2.3 FOUNDER BEHAVIOR AND CULTURAL INFLUENCE

Startups are often extensions of their founders' personalities, risk appetites, and decision-making styles. Yet these behavioral elements are underexplored in traditional finance theory. Future research should incorporate cognitive psychology, founder identity, and socio-cultural norms to understand financing choices more deeply.

Gap: A lack of interdisciplinary approaches that blend behavioral science with capital structure modeling.

5.2.4 THE ROLE OF ECOSYSTEM ENABLERS

Startup financing doesn't happen in isolation. Accelerators, incubators, angel networks, co-working spaces, and fintech platforms serve as key intermediaries in resource-scarce environments. Mapping these actors and their influence on funding access can provide a richer, ecosystem-level understanding of startup finance.

Suggested Methodology: Ecosystem mapping combined with social network analysis.

5.2.5 DIGITAL AND DECENTRALIZED FINANCE

The rapid rise of crowdfunding, blockchain-enabled tokens, and AI-driven lending is transforming the financial architecture available to startups. Extending the SCSL framework to include digital finance tools will be critical for relevance.

Potential Focus: How decentralized finance (DeFi) platforms are enabling capital access for early-stage ventures in the Global South—and what governance or risk concerns arise in this new paradigm.

5.3 CLOSING THOUGHT

To build a more accurate and inclusive theory of startup capital structure—particularly for ventures in emerging markets—we must shift beyond classical frameworks toward models that reflect complexity, context, and change. The SCSL framework marks a step in that direction. It invites researchers, policymakers, and ecosystem actors to collaboratively reimagine entrepreneurial finance as a dynamic, adaptive, and ecosystem-driven process—one that evolves alongside innovation itself.

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Financial Literacy, Behavioral Biases, and Retail Investment Decisions in India's Tier 2 and Tier 3 Cities

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Financial Literacy, Behavioral Biases, and Retail Investment Decisions in India's Tier 2 and Tier 3 Cities

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ABSTRACT:

In recent years, Tier 2 and Tier 3 cities in India have witnessed a surge in retail investor participation, largely driven by increasing internet penetration, fintech accessibility, and evolving aspirations. However, this expansion brings into focus critical behavioural and knowledge-based gaps among investors in these regions. This study explores the intersection of financial literacy and behavioural biases—such as herding, overconfidence, loss aversion, and regret aversion—and their combined influence on investment decision-making among retail investors in India's smaller cities.

Grounded in behavioural finance theory, the study builds upon the insights Agarwal et al. (2025) and Hans et al. (2024), who emphasize the psychological underpinnings of investor behaviours. While prior research (Kar & Patro, 2024; Khare & Kapoor, 2024) has addressed these factors in metro cities, limited empirical attention has been paid to non-metropolitan contexts. Using survey data from over 250 respondents across selected Tier 2 and Tier 3 cities, this paper examines the role of financial knowledge as a moderating factor that can reduce the

influence of Behavioral biases and enable more rational investment decisions.

Our intention of this study is to contribute to the growing literature on investor psychology in emerging markets by identifying patterns that are unique to semi-urban India. It is expected to offer valuable insights for policymakers, educators, and fintech platforms in designing targeted interventions that foster informed, bias-aware investing in these rapidly evolving financial ecosystems.

1. INTRODUCTION:

The last ten years witnessed a massive makeover that Indian finance has undergone, largely ushered in by democratized investing. The world has witnessed a parallel surge in retail investor presence in Tier 2 and Tier 3 cities, while the Internet saw the birth of so many fintech's and government financial inclusion programs (SEBI, 2020). Yet, while much of the landscape remains accessible, investor knowledge and investor behaviour still pose as problems. According to a survey by the National Centre for Financial Education (NCFE, 2019), less than 27% of the adult population in India can be described as financially literate.

In the meantime, Behavioral finance states that investor choices are not purely rational but are biased by psychological factors such as herding, overconfidence, loss aversion, and regret aversion (Kahneman & Tversky, 1979; Thaler, 1999). Earlier research is mostly concentrated on urban investors; hence, the decision-making pattern of retail investors in non-metro cities is yet to be established in India (Gupta & Dubey, 2022).

The present research, therefore, hopes to study the manner in which financial literacy levels and Behavioral biases come into conflict with retail investment behaviour in Tier 2 and Tier 3 cities of India. By studying this interface, the research would enrich the knowledge base necessary for framing appropriate investor education programs and policy reforms. The study's findings would help build an inclusive, behaviourally conscious, and economically supportive financial ecosystem for responsible investment across different socio-economic fronts.

2. BACKGROUND:

Retail investors are crucial players in the Indian capital market in providing liquidity and creating long-term capital. With the shifting economic scenario in India and the growing middle class, the number of retail participants in stock markets and mutual funds have exploded exponentially (Shafaq, 2023). Generally, retail investors are individuals investing their own money and not on behalf of institutions. Particularly during times of foreign portfolio investment volatility, retail investors have gained importance as stabilizers and dependers of the market (Chhimwal et al., 2021). The concerted actions of retail investors affect market movements and company valuations, which thereby urges an intensive study of these investment practices and consequent policy measures.

Retail participation, however, has grown beyond led metropolitan cities, emerging from Tier 2 and Tier 3 cities. As stated by Binani (2023), this demographic shift is bolstered by rampant digitization, easy accessibility to mobile trading apps, and regulatory measures aimed at building an inclusive financial system. For example, the mutual fund industry has witnessed

SIPs growing tremendously, with data from the Association of Mutual Funds in India (AMFI) marking over 60 million active SIP accounts by 2023, most of them coming out of semi-urban and emerging cities (Müller & Singh, 2024). Fintech has now intensified this transition, by providing low-cost, app-based investment mechanisms that new investors can use to enter the capital markets irrespective of geography (Migozzi et al., 2024).

Still, these developments come amid a few setbacks for retail investors in non-metro areas, such as poor financial literacy and susceptibility to behavioral biases that have an adverse bearing on investment outcomes. Therefore, studying the motivation and decision-making behaviour of retail investors in Tier 2 and Tier 3 cities becomes very important concerning the inclusive and informed presence of these investors in capital markets.

3. RESEARCH GAPS

- The focus of existing studies is predominantly on metropolitan or Tier 1 cities, overlooking the fast-growing investor base in Tier 2 and Tier 3 cities.
- There is limited empirical evidence linking Behavioral biases and financial literacy to investment decisions in smaller Indian cities.
- There is a dearth of collateral on how fintech platforms may influence or curb these biases among less financially literate investors.
- Insufficient segmentation of retail investors by geography, digital literacy, or financial behaviours has prevailed in India-specific research.
- A Few consider combined effects of literacy and behaviour, treating them as isolated constructs.

4. RESEARCH OBJECTIVES

- To assess the level of financial literacy among retail investors in Tier 2 and Tier 3 cities of India covered selected cities in Andhra Pradesh, Telangana, Maharashtra, Tamil Nadu, and some northern regions.
- To observe dominant Behavioral biases (herding, overconfidence, loss aversion) that affect investment decisions in these regions.
- To analyze the interrelation between financial literacy and behavioural biases.
- To analyze the joint impact of financial literacy and Behavioral biases on investment decisions.
- To suggest strategies for changing retail investor behaviours through targeted financial education and behavioural interventions.

5. SIGNIFICANCE OF THE STUDY

As the capital markets in India continue to mature, Tier 2 and Tier 3 city retail investors and their behaviours are playing an even more important role in the stability of the Indian financial environment and economic involvement. This research is important because it has put into the limelight the previously less researched investor class. The research sheds objective and analytic light on the actual participation by small city investors in their financial decisions by put-

ting into consideration these two aspects and behavioural biases. Such observations can guide the regulators such as the SEBI and RBI in designing policies, social technologists in creating easy-to-use platforms, and educators in designing effective financial literacy programmes.

6. LITERATURE REVIEW

S. No.	Title & Authors (Year)	Key Findings / What the Paper Says
1	Kumar & Goyal (2015) – Behavioural Biases in Investment Decision Making: A Systematic Literature Review	Investors are not always rational; biases such as herding, overconfidence, and loss aversion strongly influence investment decisions. Introduced a conceptual framework of key biases.
2	Mittal (2022) – Behaviour Biases and Investment Decision: Theoretical and Research Framework	Presented a theoretical framework for behavioural biases and stressed the need for deeper empirical testing of cognitive errors affecting investment decisions.
3	Kumar & Goyal (2016) – Evidence on Rationality and Behavioural Biases in Investment Decision Making	Found significant contrasts between rational decisions and bias-driven actions; confirmed that biases distort investment performance and portfolio outcomes.
4	Singh et al. (2016) – Behavioural Biases in Investment Decisions: An Exploration of the Role of Gender	Demonstrated gender-based differences; women tend to be more loss averse, while men display higher overconfidence in their investment decisions.
5	Nkukporu et al. (2020) – Behavioural Finance and Investment Decisions: Does Behavioral Bias Matter?	Overconfidence, regret aversion, and belief bias significantly affect investment outcomes; recommends incorporating behavior-aware advisory services.
6	Aigbovo & Ilaboya (2019) – Does Behavioural Biases Influence Individual Investment Decisions	Confirmed that behavioral biases have a measurable and persistent impact on investment choices, often causing deviation from rational models.
7	Suresh (2024) – Impact of Financial Literacy and Behavioural Biases on Investment Decision-Making	Found that financial literacy reduces the impact of behavioral biases but does not fully eliminate them; highlights the role of investor education.
8	Zahera & Bansal (2018) – Do Investors Exhibit Behavioral Biases in Investment Decision Making?	Systematic review shows widespread prevalence of biases; calls for behavioral nudges and structured bias-mitigation strategies.
9	Sharma et al. (2021) – Emergence of Behavioural Finance: A Study on Behavioural Biases During Investment	Identified primary behavioral factors influencing retail investors, particularly during volatile market conditions.

10	Athur (2014) – Effect of Behavioural Biases on Investment Decisions of Individual Investors in Kenya	Found that cultural and economic factors influence which biases dominate investment behavior among Kenyan investors.
11	Forbes (2009) – Behavioural Finance	Provided a foundational explanation of behavioral heuristics in finance and their implications for market pricing and portfolio management.
12	Virigineni & Rao (2017) – Contemporary Developments in Behavioural Finance	Discussed how biases like loss aversion and mental accounting affect decision-making under conditions of uncertainty.
13	Subrahmanyam (2008) – Behavioural Finance: A Review and Synthesis	Synthesized the development of behavioral finance research and confirmed the significant role of biases in influencing asset prices.
14	Bikas et al. (2013) – Behavioural Finance: The Emergence and Development Trends	Analyzed trends in behavioral finance studies; noted that high-risk investors are more affected by biases, especially in uncertain conditions.
15	Moosa & Ramiah (2017) – Financial Consequences of Behavioural Biases	Showed that biases such as framing and confirmation bias have long-term implications on wealth accumulation and risk-taking capacity.

Source: Compiled by authors

6.1. FINANCIAL LITERACY

The concept of financial literacy on a bigger scale is the capacity of a person to interpret and effectively apply a collection of financial talents with the aim of addressing their own finances, budgeting, and investing. The OECD states that financial literacy is the awareness, knowledge, skill, attitude, and behavior that can make prudent financial choices (OECD 2018). Measurement tools are standardized instruments and surveys like the OECD/INFE toolkit and the SEBI-NCFE Financial Literacy and Inclusion Survey (2019) that measures the knowledge of the fundamental financial concepts such as interest, inflation, and diversification.

6.2 FINANCIAL LITERACY TRENDS IN INDIA

Despite increasing policy focus, financial literacy is still fairly low in India. According to Maheshwari (2024), the literacy rate among Indian adults was lower than 27%. Patel et al. (2021) maintain that while worldwide research into the matter has amplified, India lags in the effective implementation of large-scale literacy programs. Digital penetration in Tier 2 and Tier 3 cities has enhanced accessibility to financial tools but does not necessarily equate to higher literacy-Azeez & Akhtar (2021). Lahiri and Biswas (2022) present the case that financial literacy positively impacts investment behavior in emerging economies. Unfortunately, populations in

rural and semi-urban areas are neglected.

6.3 BEHAVIORAL FINANCE THEORIES

6.3.1 PROSPECT THEORY

Kahneman and Tversky (1979), under Prospect Theory, postulated that individuals view outcomes as gains and losses with respect to a reference point instead of evaluating them with respect to absolute terms. People demonstrate loss aversion-a preference for avoiding the loss rather than acquiring an equally large gain. Hence, this theory tries to rationalize an investor holding depreciating stocks against their better judgment while hoping for a rebound.

6.3.2 OTHER BEHAVIORAL BIASES

Thaler (1999) described mental accounting whereby people treat money differently depending upon its source or intended use. Overconfidence bias allows investors to overestimate their competence or prediction ability (Jain et al., 2023). Anchoring causes investors to rely on irrelevant cues, such as past stock prices, in making decisions. Furthermore, herding occurs when individual investors begin to replicate the behavior of the large group, especially in uncertain market environments, as explained by Gupta and Shrivastava (2022).

7. RETAIL INVESTMENT BEHAVIOR

7.1 EMPIRICAL STUDIES

Retail investor behavior is affected by a mixture of financial knowledge and psychological biases. The work of Deogirikar (2023) revealed, for example, the surge in retail participation during the pandemic period, when the investors were making capital movements highly dependent on fintech platforms and peer suggestions. Nag and Shah (2022) examined Gen Z investors and found that, while being technologically savvy, they were basically clueless on financial fundamentals-as they should be. In Indonesia and Thailand, very similar instances were observed, where behavioral biases were influencing retail trading behavior (Kartini & Nahda, 2021; Paisarn et al., 2021).

7.2 GAPS IN LITERATURE

While researches in financial literacy and behavior are growing in number, the notable absence of in-depth studies on investors from Indian Tier-2 and Tier-3 cities remains. Empirical research focuses on metro cities and does not seem adequately equipped to address the socio-economic and cultural nuances that determine investor behavior of smaller towns (Mahida, 2022). Moreover, a combined effect of financial literacy and behavioral biases regarding investment decisions in these regions is scantily explored.

7.3 CONCEPTUAL FRAMEWORK

For this research, a framework is designed that posits Financial Literacy as a moderating factor that reduces the effect of Behavioral Biases on Investment Decisions. The hypothesized rela-

tionship can be diagrammatically represented as:

Financial Literacy → Bias Moderation → Improved Investment Decisions

8. RESEARCH METHODOLOGY

A mixed-method approach was employed, combining both quantitative and qualitative analysis to comprehensively understand retail investors’ financial literacy and behavioral biases.

For the quantitative component, random sampling was used to select respondents from Tier 2 and Tier 3 cities across multiple Indian states, including Andhra Pradesh, Telangana, Maharashtra, Tamil Nadu, and selected regions of North India. A total of 53 respondents participated in the study, comprising 31 females and 21 males. Notably, 72% of respondents were below 35 years of age, reflecting a predominantly young investor base.

Data was collected through a structured Google Forms questionnaire, designed specifically for this study. The questionnaire was divided into four sections: Demographics, Financial Literacy, Behavioral Biases, and Investment Behavior. Most items in the latter three sections were rated on a five-point Likert scale to quantify perceptions and attitudes. The collected data was analyzed using descriptive statistics to summarize responses and Pearson’s correlation to assess the relationships between financial literacy, behavioral biases, and investment behavior. Cross-tabulations were done to determine differences between demographic groups in terms of age, gender, income and education. The qualitative part involved a comprehensive literature review of the financial literacy and behavioral finance in India. This review has combined the existing body of empirical and theoretical research and pinpointed gaps in the research and helped formulate the conceptual framework of the study. Ingale and Paluri, (2022), argue that, better financial knowledge will help investors identify and cope with cognitive distortions. On the same note, Lahiri and Biswas (2022) contend that specific financial education should help to reduce the impact of irrational biases, which helps to make investment choices more rational and sustainable. These lessons depict the need to combine behavioral finance awareness with financial literacy programs in enhancing investments by investors in emerging markets such as India.

9. FINDINGS

Demographic Factor	Distribution (%)
Age Group (18–25)	62.3%
Gender	Male: 54% / Female: 46%
Education	UG: 45.3%, PG: 28.3%, Professionals: 15.1%
Occupation	Students: 47.2%, Salaried: 35.8%
Income	<₹3L: 41.5%, ₹3–6L: 22.6%, >₹10L: 18.9%
Investment Medium	Mobile Apps/Online: 69.8%

Source: Compiled by authors

The demographic profile of the respondents offers architect-level understanding into the investment landscape of Tier 2/3 cities in India. A majority of the participants (62.3%) were in the age group of 18-25, suggesting a youthful and maybe first-time investor base. Gender split was more or less equal, with 54% respondents identifying themselves as male and 46% as female. Looking at educational qualifications, undergraduate students formed the bulk of the respondents with 45.3%, followed by postgraduate students with 28.3%, while professionals like CAs and MBAs made up about 15.1%. Occupationally, almost half (47.2%) of the respondents were students, while salaried employees accounted for 35.8%, making for a mixed bag of professionals at an early stage and those well established. Income-wise, 41.5% were earning less than ₹3 lakhs yearly, 22.6% between ₹3 lakhs and ₹6 lakhs, and 18.9% more than ₹10 lakhs, thus reflecting the emerging middle-income group investor. Another salient point is that 69.8% of the respondents reported investing through mobile apps or online platforms. This demonstrates an unprecedented growing influence of fintech, even in Tier 2 and Tier 3 towns. This demographic profile thus goes to show that an emerging investor base is actually tech savvy, with varying degrees of financial experience and education.

9.2 BEHAVIORAL BIASES IN FINANCIAL DECISION-MAKING

Behavioral biases play a key role in retail investors' decisions, especially in situations where deep financial knowledge or historical exposure to markets are lacking. The study identifies and analyses five major biases:

1. HERDING BIAS

When herding takes place, investors do exactly what others do and rather than trusting their own analysis. In Tier 2/3 cities, it is many times due to lack of access to expert advice or strong community influences. As per Bikhchandani and Sharma (2001), herding is common in less-developed financial environments where asymmetric information prevails. So, investors may purchase shares or mutual funds without comprehending their fundamentals just because everyone else seems to be doing so.

2. OVERCONFIDENCE BIAS

An overconfidence bias is excessive belief in one's knowledge or prediction capability in the market. Investors under this bias usually trade excessively or execute risky investments without consulting experts (Barber & Odean, 2001). Those who said "I feel confident making investments without expert advice" held some degree of that bias. It can lead poor diversification and overestimation.

3. LOSS AVERSION

According to Kahneman and Tversky (1979), Prospect Theory was initiated with the thought of the investors who experience the pain of a loss with much more intensity than the joy derived from an equivalent gain. Similarly, respondents in our study who admitted avoiding investments after hearing about losses faced by others displayed typical loss aversion behavior. This leads to a desist from investment, especially in equity markets, which otherwise could be profitable in the long run.

4. DISPOSITION EFFECT

This bias is in selling good investments and holding bad ones too long. This was exhibited in the respondents who said that despite their stocks falling in value, they would usually not sell them. Disposition effect is emotional; it stems from the desire to avoid feelings of regret and the unwillingness to accept losses as a reality when it would, in fact, be rational to cut ties with the investment.

5. REGRET AVERSION

Investors often refrain from making investment decisions to prevent experiencing the emotional discomfort from making a wrong choice. This kind of mentality was witnessed in the respondents who often regretted having missed out on opportunities and who admitted to over-analysing. According to Zeelenberg and Pieters (2007), avoidance of regret results in paralysis of decision-making, especially during volatile market conditions.

The behavioral bias section of the questionnaire recorded the five great biases of herding, overconfidence, loss aversion, disposition effect and regret aversion. The respondents were requested to rate their answer out of 5-point Likert scale, with Strongly Disagree (=1) to Strongly Agree (=5), and then an averaged score would be prepared.

- Herding bias was exhibited when she responded to the question like I would rather go with the majority of investors, and over 40% of the respondents responded with moderate to strong-agreement, which implied that they followed the social signals or market trends but not on their own.
- Overconfidence was rated in accordance with the answers to the statements like, I have confidence in my ability to make investments without expert guidance with a high score around 35.
- Loss aversion and disposition effect indicators revealed that a good portion of the respondents would sell a declining stock later or would not invest in a thing at all due to a past loss-quite obviously emotional instead of rational decision-making. Such results are consistent with the prior literature, according to which psychological bias is more common among less financially literate populations, in particular, in lower-tier cities with less financial education access (Gupta and Shrivastava, 2022).

9.3 CORRELATION ANALYSES

A. FINANCIAL LITERACY VERSUS INVESTMENT BEHAVIOR (R=0.349)

The financial literacy and investment behavior Pearson correlation coefficient were 0.349. A moderate positive relationship between these variables is considered in this view. This implies that a financially literate investor would tend to have more active and engaged investment behaviour between Tier 2 and Tier 3 city investors. The observation continues to confirm the earlier studies by research, including those of Lahiri and Biswas (2022), who state that financial literacy plays a critical role in creating rational investment choices in emerging countries. Some of the fintech platforms developed in India and certain education undertakings that SEBI and AMFI are conducting in the country appear to be operating in line with this trend. Nev-

ertheless, the strength of correlation is moderate, which also implies the probability of other mediators to be in action; the other mediators may be behavioral bias, income, aversion to risk.

B. BEHAVIORAL BIAS SCORE VERSUS INVESTMENT BEHAVIOR (R=0.217)

On the other hand, behavioral bias scores and investment behavior had a correlation of 0.217; thus, an association from weak to moderate is evident. This shows that higher behavioral bias scores associated with higher erratic investment behaviors. This follows the literature of Behavioral Finance where the biases have been seen as distortions that disrupt the best investment choices (Ricciardi and Simon, 2000). There was an increased rate of herding and regret aversion tendencies that explained a reduced risk appetite and reduced portfolio reviews. Strongly agreeing respondents with the statements which concerned regret aversion and disposition were less likely to invest their money in instruments which are highly volatile like direct equities or crypto. Also, in spite of the access through the fintech platforms, these biases reside in the entrant, particularly in the new entrants in smaller cities who lack the historical experience of capital market.

9.4 OTHER OBSERVATIONS

A financial literacy check revealed that the respondents were generally in high awareness with the average score being 86 and this indicates that conceptual knowledge was well understood by the respondents. Some of the highlights: approximately 92 percent of those surveyed correctly identified diversification and 88 percent were aware of the benefits of compounding. The gaps in knowledge were observed in terms of inflation-adjusted returns, where 12-percent of the respondents did not want to determine the actual returns, and 11.5-percent of the respondents did not categorize either of the mutual funds or the fixed deposits as high-risk portfolio. The other minor weakness was observed in SIP knowledge where 12 percent of the respondents had incorrect beliefs that it was a Single Investment Plan. Financial literacy and salary were positively correlated-those with annual scorers above [?]6 lakhs scored 85% and those with annual scorers below [?]3 lakhs scored 72%-conclusion being that exposure and experience somehow influence literacy levels.

9.5 SUMMARY OF KEY PATTERNS

Factor	Trend Observed	Implication
High FL, Low Bias	Diversified, frequent investing	Rational and self-driven
Low FL, High Bias	Fewer instruments, rare portfolio reviews	Cautious or influenced by others
High Regret Aversion	Underinvestment in volatile assets	Missed opportunities
Overconfident Investors	Preferred direct stocks or crypto	Risk of poor decisions
Herding Bias	Common among new investors	Influenced by social circles

Source: Compiled by Authors

9.6 SIGNIFICANCE:

The results as evidenced by the findings depict the two-fold effect that financial literacy and biases have on investment behavior in Tier 2 and Tier 3 towns in India. With market access and digital investment platforms having begun to grow it is urgent that:

- Financial literacy projects receive an additional impetus-especially, on regional languages.
- Investor education needs to include an awareness module on behavioral biases (ie, the traps that investors can fall into, like herding or regret aversion).
- Fintech apps should have behavioral nudges that override biases (e.g. over-trading warnings or diversification prompts). - There should be improvements in policymaking both in terms of educational support and emotional decision-making support to achieve higher outcomes of investors. Increased participation can be reached not only through access, but also through ensuring that the investor has the knowledge and mindset that enable him to make rational decisions.

10. CONCLUSION

The results of the study are that financial literacy influences retail investment decisions in Tier 2 and 3 cities, thus supporting the regional peculiarity. Generally, the examined respondents rated well on the financial literacy foundations such as diversification, compounding, and risk-identification. Nevertheless, they did not possess some essential spheres of knowledge related to inflation-adjusted returns and awareness of SIP, which could not make completely informed decisions. The behavioral biases such as herding, overconfidence, loss aversion, disposition effect, and regret aversion are all proven to be valid and in some cases, negatively affect the behavior of investors. Herding and overconfidence also influence the younger lot; women are more loss-averse. This confirms that there is bias among even those financially literate-however, unlike in some other cases, there is overconfidence here. As such, it is doubtful whether pure knowledge can provide an unconditional protective shield against the risks that one faces in the investment front that is experienced in the emotional and psychological front. The interrelationship of financial literacy, behavioral biases and investment behavior is further supported through correlation analysis. Although greater financial literacy correlates with more productive investment and less prone to bias, the correlation is not strong, so the behavioral intervention should be supplemented by non-behavioral means. The Government of India has introduced some strong schemes in its endeavor to reconcile the gaps in financial education, and financial inclusion in unserved regions.

1. **Reserve Bank of India Financial Literacy Week:** It is an annual event of the RBI, whose week is devoted to the field of money issues that include responsible lending, about digital payments safety, and respect of complaints. It is mainly rural and semi-urban with outreach to the population carried out in different languages and through various grassroots-level organizations.
2. **National Centre of Financial Education (NCFE):** NCFE, sponsored by the regulators of the financial sector, organizes the programs of investor awareness and school-level financial

education in Tier 2 and Tier 3 cities. Such flagship programs as the program of money smart school and local workshops are the way to develop the basic financial knowledge.

- 3. Pradhan Mantri Jan Dhan Yojana (PMJDY):** PMJDY has become one of the most extensive programs of financial inclusion in the world in 2014, whereby zero-balance savings accounts are opened in rural or semi-urban regions of the country. PMJDY is not only concentrating on account opening, it is also assisting the customers to connect their accounts with insurance, pensions and direct benefit transfers(DBT) thereby establishing a solid foundation of financial literacy and formal investment behaviour among the segments of the population who had never opened a bank account.

11. FUTURE SCOPE OF STUDY

- Include rural, tribal, and additional Tier 3 regions to enhance geographic diversity.
- Conduct longitudinal studies to track changes in investor behavior over time.
- Use experimental methods to test the impact of behavioral nudges and financial education.
- Examine investor preferences and biases across specific sectors like mutual funds, crypto, and real estate.
- Investigate the role of fintech platforms in shaping financial decisions and reducing biases.

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The Impact of Global Supply Chains on Economies – A Case Study of Nigeria

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The Impact of Global Supply Chains on Economies – A Case Study of Nigeria

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Abstract:

Global Supply Chain Management is a complementary activity which entail the movement of goods, services and funds from countries that have sufficient of these resources to where they are needed in good time. Supply chain management is very vital in today's business as it intends to bridge the gap between developing countries and the developed countries by the provision of the wants of both economies. Nigeria as one of Africa's largest economies, has been deeply integrated into global supply chains across various industries, including oil and gas, agriculture, and manufacturing. However, the economic gain from the GSCM has been very low due to several factors such as unprocessed raw materials, unstable government policies, poor infrastructural amenities and poor workforce.

This paper seeks to measure the effect of SCM practices in the manufacturing sector, examine the impact of Global supply chain management (GSCM) practices on the economic development of Nigeria, as well as the constraints and benefits that global supply chains present to Nigeria's business sectors. The quantitative research technique was used to analyse the primary data collection from manufacturing, marketing, transport and logistics sectors of the economy using random sampling technique where descriptive statistics (mean) and inferential statistics (correlation analysis) tools were applied. The Pearson Correlation indicating a strong positive linear relationship between Global Supply Chain Management (GSCM) practices and economic growth and productivity of the sectors. But the null hypothesis was rejected indicating that there isn't sufficient statistical evidence to conclude a significant effect of GSCM practices on the economic growth in Nigeria.

Developing countries, including Nigeria, face numerous challenges in effectively managing global supply chains. To enhance efficiency, competitiveness, and economic growth, it is essential to adopt strategic principles that address infrastructural deficits, regulatory bottlenecks, and technological gaps.

Keywords: Supply Chain, industrialisation, international market, foreign investors, of economic growth and sustainable practices

INTRODUCTION

The concept of Globalisation of value chain has been a prominent feature of the world economy since the 17th century when colonial empires began to carve up the globe in search of raw materials and new markets for their manufactured goods and services. (Allen, R. C. (2011).

Global supply chains have significantly transformed the economic landscape of developing economies over three decades now. Globalisation is a phenomenon that involves functional integration between internationally dispersed activities (Dicken 1998:5). It involves all complementary activities associated with the movement of goods, services and funds from countries that have sufficient of these resources to where they are needed in good time. A supply chain is made up of several business entities (suppliers, manufacturers, wholesalers, distributors, retailers and customers) concerned with ensuring the flow of raw materials, component parts or finished goods from the source to the required destination. From the economics point of view Global Supply Chains(GSCs) is related to the principle of comparative advantage. In furtherance to this study there exist overlapping names and concepts, where different researchers use different terminology to discuss very similar ideas. Global commodity chains, value chains, value systems, production networks and value networks are just some of the terms used by researchers whose common ground is much greater than their divisions. (Sturgeon, T. J. (2001).

However, GSCs are fundamentally a business strategy of Transnational Corporations (TNCs), and are driven by their own business agenda and interests. Low labour costs alone are insufficient and is not a justification for relocating a part of TNCs' production processes. GSCs also rely on sophisticated and competitive networks of goods and information flow to make decision. Participating and upgrading along the chains require not only manufacturing skills but also some sound business skills that are often lacking in developing countries. GSC (2013). Globalisation of value chain. Globalisation is very important in this 21st century, since it intends to bridge the gap between developing countries and the developed countries by the provision of the wants of both economies. it is the integration of country's resources to the development of the country and other countries. Globalisation is very important in this 21st century, since it intends to bridge the gap between developing countries and the developed countries by the provision of the wants of both economies. Nigeria as one of Africa's largest economies, has been deeply integrated into global supply chains across various industries, including oil and gas, agriculture, and manufacturing.

This paper seeks to examine the impact of Global supply chain management (GSCM) on the economic development of Nigeria, as well as the constraints and benefits that global supply chains present to Nigeria's economic growth.

Global supply chain management (GSCM) is a chain of several companies or firms that perform several functions such as manufacturing, supply of raw materials, transportation of materials, storage of goods, distribution of goods to final consumers and so on. Therefore, the purpose of this research study is to measure the practices of the impact of these chain of firms on the economic development of Nigeria as well as examine the challenges associated with the global supply chains practises, with emphasis on their role in trade expansion, industrialization, job creation and economic growth.

Developing countries, including Nigeria, face numerous challenges in managing global supply chains effectively. To enhance the efficiency, competitiveness, and economic growth, it is essential to adopt strategic principles that address infrastructural deficits, regulatory bottlenecks, and technological gaps. However, the flipside of globalisation also includes falling prices for producers as well as cases where upgrading of products or processes does not necessarily lead to increased profits and sustainable incomes. This section explores key approaches to improving global supply chain management (GSCM) and best practices among stakeholders of various sectors in Nigeria economy.

1.2 Statement of the Problem

The economic development in the Nigeria economy can be classified in two forms; the financial gains and the human capital gains. However, some of the roles of global supply chain practices dwell on the promotion of the viable business relationship between member of the group in different country and in different sectors, but the major objective is for growth and development of the economy of the countries where business is situated. The main worry is the variation in the benefits derived from varying countries are never equivalent, since developed countries benefit more from the chain compared to developing countries. Therefore, this study seeks provide reasons for this difference in the gains accrued to the beneficiaries due to SCM practices and hence, the need to answer some important questions in this research e study.

1.3 Objective of the Study

The general objectives of the study are:

1. Seeks to measure the effect of SCM practices in the manufacturing sector
2. To examine the impact of Global supply chain management (GSCM) on the economic development of Nigeria.
3. To identify the challenges and opportunities presented by the of Global supply chain management (GSCM) practices in Nigeria.

LITERATURE REVIEW

There are various scholars that have conducted research or has perform one form of related study on Global supply chain and its effects on businesses either locally or internationally. Therefore, this section reviewed some of the discovery of scholars that explores related research on the impact of global supply chain management in Nigeria and other countries focusing on its benefits and constraints.

Research by Gereffi et al. (2005) wrote on economic growth and Foreign Direct investment where they highlighted how global supply chains drive Foreign Direct Investment (FDI), leading to industrialisation, technological development and employment generation in developing economies. Nigeria has benefited from multinational investments in manufacturing, oil and gas, and agriculture sectors and the scholars elaborated the role of global supply chain in

achieving economic growth. (World Bank, 2021).

Pietrobelli, C., & Rabellotti, R. (2011), explained how participation in global supply chains enables developing countries to adopt advanced technologies and business practices. Their study showed that firms in developing countries engaging in international trade have improved productivity and efficiency through technology adoption and engaging in standard and best practices in their operations, so as compete with multinational firms.

Connelly, B. L., Ketchen, D. J., & Hult, G. T. M. (2013) emphasizes the roles played by global supply chains in the provision of access to larger markets, enabling firms and industries to increase exports. The agriculture and textile sectors have particularly seen growth due to rising demand in global markets as the strive to increase customers and contacts internationally.

Mahmood, S., Misra, P., Sun, H., Luqman, A., & Papa, A. (2024) The study findings indicate that SEZ establishments foster economic resilience by attracting foreign investment, promoting industrial diversification, and facilitating technology transfer. Energy projects, including development of renewable energy sources and energy infrastructure, enhance energy security and mitigate potential risks associated with energy scarcity. Through effective global supply chain management, responsible sourcing, green logistics.

Ovezmyradov, B. (2022). Here the researcher underscores how supply chain help to avoid external disruption such as pandemics, wars and trade restrictions that may affect the economic system by stockpiling of goods and providing such goods for use during the affected period. Therefore supply chain pose to manage the supply disruptions and to also manage the gap of lack of production the and distribution networks gap by closing the lag with the stockpiled goods to meet demand of consumers until the pandemic or disruption period is over.

Elizabeth J. Woods (2004). The researcher analyses the role of SCM in the context of operational effectiveness and strategies for all parties involved. SCM implies managing the relationships between the businesses responsible for the efficient production and supply of agribusiness products from farm level to consumers, to reliably meet consumers' requirements in terms of quantity, quality and price. In practice, this often includes the management of both horizontal and vertical alliances. Meeting customers' requirements involves integrated management of the transactions and relationships between firms as well as processes within firms. Managing these relationships provides an opportunity for negotiating the shares between chain members of the value produced within the chain. The researcher explained that for developing countries to benefit well, their products has to be beneficial to the chain.

Adebayo, I. T. (2012). The study tried to examine the level at which the Nigerian manufacturing companies are involved in SCM practices as well determine the effect of these practices on SCM performance. With a total of 31 companies forming the sample size of the study, the data collected was analyzed using both descriptive statistics (tables, mean and standard deviation) and inferential statistics (correlation and multiple regression analysis), the result showed that SCM practices definitely impacts on SCM performance.

Gunasekaran, et al. (2001) explored that SCM needs to be assessed for its performance in order to evolve an efficient and effective supply chain. The role of these measures and metrics in the success of an organization cannot be overstated because they affect strategic, tactical and

operational planning and control.

In addition to these there are other scholars that have carried out GSCs study in Nigeria, developing countries as well as the countries in the international community, but we only mentioned the few stated above for this study.

Supply Chain Practices

Supply Chain Management (SCM) Practices refer to the set of activities, strategies, and processes that organizations use to manage and improve the flow of goods, services, information, and finances from manufacturers through suppliers to end customers efficiently and effectively. Organisations involved need to focus on supply chain management practices that have impact on enhancing SCM activities and ultimately performances (Arawati, 2011).

The objectives of supply chain practices are thus;

- i. **Reduction of costs:** This is where the chain maintenance of the most effective minimal cost for all expenses is considered during practice. The cost of production, storage, transportation, logistics and other expenses are reviewed by members at all time in order to deliver the best to members internationally. These costs are compared relatively at every stage, since SCM is all about cost and benefit. The SCM have put in place tools in the system to check and control cost of operation always, as a matter of control there is standard price control system.
- ii. **Quality Control System:** The quality of services and goods rendered are also very important, because consumer's satisfaction is key. Therefore, at every stage of the supply chain the quality is ascertaining, so that the final product quality is consistent or close to expectation.
- iii. **Ensure timely delivery:** Timing is very important at every production or manufacturing stage, especially for Just in time production (JIT). For the supply chain to be effective, timing also has to be perfect, as such the time of delivery is paramount at every stage of the chain.
- iv. **Strengthen relationships with suppliers and customers:** For the supply chain to be able to achieve set goal and for the performance to effective there must be a smooth relationship between suppliers, manufacturers and consumers, so that each of the stage should be able to know and understand the needs of the other parties and should be ready to satisfy that need.
- v. **Increase overall competitiveness:** One of the major objective of SCM is to ensure that organisations involved are effective in their performance, this allows for healthy competition among members of group. This brings out the best in terms of customer's satisfaction for all members.

Key Elements of SCM Practices Include:

In Nigeria, where supply chain activities failures can be caused by poor infrastructural facilities availability, fuel scarcity, or port congestion and inconsistent government policies, good SCM practices help businesses like Dangote, Nestlé, or Jumia stay competitive and overcome some of these challenges by ensuring steady flow of products, reduced waste, and improved customer satisfaction. Some of the Key Elements of SCM Practices which enable members of the group performance to be effective Include:

1. Strategic Supplier Partnership

This refers to the long-term relationship and close cooperation between an organisation and its suppliers to achieve mutual benefits. Strategic partnerships with suppliers enable organisations to work more effectively with a few important suppliers who are willing to share responsibility for the success of the products. Suppliers who are willing to go extra mile in getting the right materials for the manufacturer in order to achieve the set product design at the best competitive price. For instance; Dangote Group partners with local and international suppliers for consistent delivery of raw materials (like limestone for cement production). By working closely with reliable suppliers, they reduce delays and improve production efficiency.

2. Customer Relationship Management (CRM)

This practice focuses on building and maintaining strong relationships with customers to increase customer satisfaction and loyalty. This practice allows manufacturers to develop link with customers in order to manage customers need and expectation, here they settle to meeting customer's satisfaction. This allows customers to have confidence in the organisation, its products and her management. Organisations need to view their relationship as asset to the customers which can improve sales. For instance; Jumia Nigeria uses CRM tools to track customer preferences, buying history, and offer personalized deals and information to help customers make informed decision on products qualities and quantities. This keeps customers engaged and encourages through repeat purchases. Also help customers to understand the business of organisation and their products to allow better planning.

3. Information Sharing

Shared information are of two aspects namely quantity information and quality information of SCM. Both type of information is equally important and are utilised by suppliers to win their end users loyalty in terms of finished products. Effective Supply Chain Management requires transparent and timely information exchange among supply chain partners to improve planning and coordination. According to Stein and Sweat (1998), supply chain partners who exchange information regularly are able to work as a single entity. Together, they can understand the needs of the end user better and hence can respond to market change quicker. For instance; Nigerian Breweries shares demand forecasts and inventory levels with distributors to avoid stock outs or overstock situations, especially during peak seasons like holidays and festive periods.

4. Inventory Management

This involves record management of stored and utilised materials and finished products by both suppliers and customers. This records of stored and used items are for future purposed

by either the manufacturers, suppliers or the users of the products. This involves maintaining optimal inventory levels to meet demand while minimizing costs. It is very important stored materials and products are preserved according to standards, to enable usage when the need arises. Inventory management is mainly to minimise, manage or maintain cost as well as time effect. For instance;

Shoprite Nigeria uses inventory tracking systems to monitor stock levels in real-time, ensuring popular items like rice, cooking oil, meat and vegetables are always available without over-stocking.

5. Logistics Management

It focuses on the efficient movement of goods from suppliers to manufacturers to customers. This flow of materials and products requires timing too. This is because manufacturers need to meet customers demand, thereby building customers confidence on product and organisation. It is also necessary for brand or product's loyalty. Logistics management involves communication, warehousing, transportation, quality assurance, distribution, record keeping and so on. For instance;

Indomie (Dufil Prima Foods) has a robust logistics network with warehouses and distribution centers across Nigeria to ensure quick delivery of noodles to even remote areas.

6. Quality Management

Ensures that products and processes meet defined quality standards throughout the supply chain. Quality assurance works for both raw materials, intermediate products and final products. This is another vital section of the SCM. This is where all the product confidence is built on, as such the quality management is not negotiable for SCM practices to be effective. In order to maintain the quality of products some of the members keep a separate section to handle quality assurance of the products at all stages. For instance; Nestlé Nigeria maintains strict quality checks for raw materials and finished goods. They work closely with farmers in Northern Nigeria to ensure high-quality raw milk for their products.

7. Outsourcing and Third-Party Logistics (3PL)

This is a situation where organisation contract out a section of its department to specialist to handle for professionalism and efficiency purpose. It Involves using external companies to handle certain supply chain functions like warehousing, transportation, or packaging. This part of SCM is only introduced after manufacturers and organisations have compared all options such as quality, time as well as cost and discovered that this is the best alternative for the organisation to outsource that area of the organisation's department or function to enable the organisation focus on primary duty. Most often organisation outsource certain part of responsibility or duty to enable management concentrate on the very important aspect of their duty for economic and business purpose. For instance; Konga e-commerce company outsources their delivery to GIG Logistics in order to reduce delivery times and operational costs.

8. Green Supply Chain Management

This focuses on environmental sustainability by reducing waste, recycling materials, and mini-

mizing carbon emissions. This section is for organisations that deal with recycle products, such as plastics, PVC materials, paper (pulp materials). They engage suppliers of this materials and train the suppliers at intervals how to handle these materials to keep them in useable state, such as cleaning this recycle materials, sorting them and package them for supply purpose or use. This section of SCM always work according to government standards. For instance; Coca-Cola Nigeria promotes recycling through partnerships like the Food and Beverage Recycling Alliance (FBRA) to collect and recycle Coke PET bottles.

9. Demand Forecasting and Planning

This section work with data collection from sales or marketing department and also the procurement or purchase department. The accounts department also play vital part here, since it deals with financial position of the company. Predicting customer demand to align with production and inventory of the company. This allows management of the organisation to know their business best to have control of every situation involving customers demand. For instance; PZ Cussons Nigeria uses sales data and seasonal trends to forecast demand for soaps and detergents, helping avoid shortages during festive seasons.

10. Risk Management in Supply Chain

This section help Identifying and mitigating risks that could disrupt supply chain operations. These risks are from suppliers not meeting company's demands, poor quality risk, poor marketing or sales risk, over demand risk, workers or labour challenges risk, financial risk; unable to meets demand, etc. all risk have better management strategies. Therefore, management should prepare to manage any form of challenge the organisation is faced with, in order to get effective performance for SCM operations. For instance; During the COVID-19 pandemic, pharmaceutical companies like Emzor Pharmaceuticals adopted local sourcing strategies to reduce dependence on imports, managing risk from global supply disruptions.

EMPIRICAL THEORY ON GLOBAL SUPPLY CHAIN

Introduction

Several empirical theories underpin global supply chain management (GSCM), providing a framework for understanding its dynamics, efficiency, and impact on economic development. These theories help explain how supply chains operate, how businesses optimize their networks, and how economies benefit from integration into global markets. This section reviews key empirical theories that support GSCM, with a particular focus on their relevance to Nigeria.

1. Global Value Chain (GVC) Theory

The Global Value Chain (GVC) theory, developed by Gereffi et al. (2005), this is a specialised form of division of labour where production is fragmented across multiple countries or states into stages, allowing firms to specialize in specific stages of manufacturing processes or service provision. This theory emphasizes on governance structures, upgrading opportunities, and the distribution of economic benefits across different nations. In Nigeria, this theory is relevant

in sectors such as agriculture and oil and gas, where integration into global value chains influences production efficiency and trade patterns. For instance, Multi-choice Ltd are in charge of Entertainment business they run entertainment business various Africa countries.

2. Transaction Cost Economics (TCE) Theory

This theory was initiated by Ronald Coase (1937) and later by Williamson's (1975) Transaction Cost Economics theory, this theory measures the cost and benefits associated to employing a particular type of economic activity and it explains how firms decide between in-house production and outsourcing the production or economic activity based on cost efficiency. This theory highlights the role of contract enforcement, opportunism, and asset specificity in global supply chain decisions. For Nigeria, TCE theory is useful in analysing how businesses engage with international suppliers, navigate regulatory frameworks, and mitigate risks associated with cross-border trade. Other scholars that contributed to this theory recently are Benito and Tomassen (2010) have examined the implications of governance costs for the exploitation of technology in a knowledge-intensive firm, Buckley and Hashai (2014), for example, emphasize that the knowledge-intensity of the firm will impact on its organizational structure. The core concept of this theory is that most firms compare the market cost or external cost to cost of operation, if operation cost is lower, then better internalise firm's operation broad. For instance, Jumai E-commerce and her business relationship with GIG Logistics to handle all Jumai deliveries.

3. Resource-Based View (RBV) Theory

The Resource-Based View (RBV) theory, proposed by Barney (1991), posits that firms achieve competitive advantage by leveraging unique resources of the firm either tangible or intangible assets and capabilities which are the firm's capacity to employ its resources effectively to achieve desired outcomes. This include the skills, routines, processes, and organizational structures that enable a firm to coordinate and leverage its resources to create value, In the context of GSCM, RBV theory suggests that Nigerian firms must develop specialized skills, technological capabilities, and infrastructure to enhance their competitiveness in global supply chains. Generally, the Resource-Based View theory suggests that competitive advantage grew from the strategic leveraging of valuable, rare, inimitable, and non-substitutable resources and capabilities, which enable firms to surpass rivals and achieve superior financial performance on the long term bases. (Somashekar, C. (2014). For instance, Konga and Jumai specialises in E-commerce, GIG Logistics specialises in logistics

4. Network Theory

Network theory examines how firms establish relationships with suppliers, customers, and other stakeholders within supply chains. According to this theory, strong networks enhance knowledge sharing, reduce uncertainty, and improve operational efficiency. Nigeria's participation in global supply chains can benefit from fostering strategic partnerships with multinational corporations and leveraging digital platforms to strengthen business networks. For instance, Peterson and Zetasan (PZ) where records of sales for the various divisions were managed for future forecasting.

5. Just-in-Time (JIT) and Lean Supply Chain Management Theory

Just-in-Time (JIT) and Lean Supply Chain Management theories focus on reducing waste, improving efficiency, and ensuring timely production and delivery. Originally developed in Japan's manufacturing sector, these principles have been widely adopted in global supply chains. In Nigeria, adopting JIT strategies can help minimize delays caused by infrastructural challenges and enhance production efficiency. For instance, Dangote cement and its customers.

6. Institutional Theory

Institutional theory explores how regulatory environments, social norms, and governmental policies shape supply chain practices. It highlights the role of institutional pressures in determining how firms comply with international trade regulations, sustainability standards, and corporate governance requirements. Nigeria's regulatory framework and policy consistency play a crucial role in determining the country's attractiveness to global supply chain investors. The following are the key components of institutional theory of trade: Institutions can include legal systems, property rights regimes, trade agreements, cultural norms, and social conventions. Transaction Costs: These costs can include search and information costs, bargaining and negotiation costs, monitoring and enforcement costs, and coordination costs. Comparative Institutional Advantage: The Institutional Theory of Trade suggests that countries may possess a "comparative institutional advantage" in certain industries or types of trade due to the quality and effectiveness of their institutional environment. Path dependence suggests that historical institutional arrangements and policy choices can have long-lasting effects on economic outcomes and patterns of trade. For instance, Nigerian Brewery Ltd., they manage farms in Niger State, Edo State, etc while the manage factories is Lagos State, Oyo State, etc

Conclusion

These empirical theories provide a comprehensive understanding of global supply chain management and its impact on developing economies like Nigeria. While the Global Value Chain (GVC) theory explains the structure of supply chains, Transaction Cost Economy (TCE) and Resource Base View (RBV) theories address cost efficiency and competitive advantage respectively. Network theory, JIT principles, and institutional theory further enhance our understanding of how firms optimize their global supply chain operations. By aligning policies and business strategies with these theoretical insights, Nigeria can strengthen its role in global supply chains and drive sustainable economic growth.

Opportunities of Global Supply Chains in Nigeria

There are several opportunities associated with being a member of the group or carrying out its practices, which help to overcome the negative effect of the policies of the countries where member carry-out their business. Majorly the advantage for existing members is that the domestic environment does not affect them very much, since their operating domain is globally and not locally. There only challenge is the local regulation, as such some many opportunities are open to members as thus;

1. Economic Growth and Job Creation

Global supply chains facilitate foreign direct investment (FDI), which allows the establishment of multinational companies in Nigeria and as such resulting in both vertical and horizontal expansion of organisations, assist in opening the economic causing growth in the nation Gross Domestic Product (GDP). The advent of Global Supply Chain spurred economic growth through the creation employment opportunities in several sectors, particularly in sectors such as manufacturing, agribusiness and logistics. It also encourages collaboration of business organisations in order to maximise profit apart from Job creation.

2. Technology and Knowledge Transfer

Participation in global supply chains exposes Nigerian businesses to advanced technologies and best practices from international partners through strategic partnership and international networking which also allows the transfer of skills and knowledge geographically. This knowledge sharing and transfer enhances productivity and efficiency amongst members as well as helping local industries improve their competitiveness.

3. Market Expansion

By integrating into global supply chains, Nigerian businesses can access international markets, expanding their consumer base beyond domestic boundaries. This is particularly beneficial for industries such as agriculture, leather and textiles, where exports have grown due to global demand for such products.

4. Infrastructure Development

The need for efficient transportation and logistics to support supply chain operations has encouraged infrastructure investments, including road networks, ports, transportation and communication systems, which benefit both businesses and the general population. This infrastructural development could be carried out by both the public and the private sectors of the economy, but it is objectively to facilitate economic growth as well as ease the social life of citizens of the country.

Challenges of Global Supply Chains in Nigeria

The flaws and constraints for members are majorly globally and universal, as such it is shortly lived, because the general group most often go all out to solving their challenge since it is universal. Some of the common challenges experienced are thus;

1. Supply Chain Disruptions and Vulnerability

Nigeria's dependence on global supply chains makes the country's economy vulnerable to external crisis, due to the existence of external link any disruption in the international community will surely affect the country, such as geopolitical tensions, pandemics, and trade restrictions. For example, the COVID-19 pandemic disrupted supply chains, leading to shortages and scarcity of products and increased costs.

2. Infrastructural Deficiencies

Despite some of the progress recorded internationally in terms of availability of infrastructure, Nigeria's infrastructure remains inadequate for seamless global supply chain integration due to the political instability, poor leadership style, poor road networks, unreliable power supply, and congested ports which hinder efficient trade and logistics operations in the country.

3. Regulatory and Policy Challenges

Nigerian businesses are challenged by faults caused by the Government structures and policies such as Bureaucratic red tape, inconsistent in Government policies, and trade restrictions which create barriers for businesses looking to engage in global supply chains. These Regulatory deficiencies include multiple taxation often increase costs and discourage foreign investment. Inconsistent or poor government fiscal policies such as withdrawal of incentives from the businesses, poor infrastructural amenities to reduce cost of operation or production cost.

4. Limited Value Addition and Industrialization

Nigeria primarily exports unprocessed agricultural materials rather than processed goods, which is low in value, limiting the country's economic benefits in global supply chain participation. This lack of industrialization goods causes the country missing out on higher-value manufacturing and processing activities.

5. Poor Environmental and Social Concerns for Workforce

Global supply chains in developing countries that only contribute to the unprocessed products can lead to exploitative labour practices and environmental degradation of such countries, since their products is of low value. For instance, countries with mining industries and agriculture suffer deforestation, pollution, and poor working conditions for their workforce because of the low cost of their products

METHODOLOGY

This research study adapts a social survey research design method whereby questionnaires were administered for strategic Primary data collection on a sample population of 160 workers from different companies in varying sectors such as manufacturing sector, transportation sector, communication sector and logistics. In order to get the required information for the research study quantitative method of data analysis was applied.

Having regard of the characteristics of our research population and considering the size of the population where respondents were drawn to complete our questionnaires, we draw our sample size using the Krejcie and Morgan (1970) method of determining sample size for research activities using the Table 1 below.

Form the Table 1; it shows that we administered 160 Questionnaires to three section of the Global Supply Chain group that is the Manufacturing Sector, Suppliers, Transport and Logistics. We received 60% of the questionnaires out of which 10% were invalid and 90% were utilized for the study. Therefore, we had respondents for the 87 questionnaires. The breakdown to the three sections were Manufacturing with 36 results, suppliers with 23 results and Trans-

port and logistics 14 each.

The administered questionnaires are proportionate to the total population of the sampled sites of the program. To determine the number of respondents from each of the sites, Taro Yamane's (1967) method was utilized. The Method is given as:

$$Pr = \frac{n \times SS}{N}$$

Where:

- Pr = Proportion of respondents
- n = Population of each of the selected area
- SS = Sample Size; and
- N = Total Population of all the selected areas

According to Odoh (1995), simple random sampling technique ensures that each element within the population has an equal chance of being represented i.e. each element has an equal probability of being represented. To this end, any employee in the various section as mentioned above, who is willing to respond to our questionnaire is sampled though he/she must be working under any of the mentioned organization in the different section of Global Supply Chain. This means every employee have the probability of being sampled in so far as he/she is within the Selected Companies staff member either in the manufacturing section or Distribution or Supplier section or the Transport and Logistics section.

The questionnaire information was tested in order to ascertain its reliability of the questionnaire using Cronbach's Alpha test with Statistical Package for Social Sciences (SPSS) version 27, so that we will ascertain that the internal contents of the questionnaire would enable us to achieve the objectives of the research study.

The Cronbach's Alpha for the research questionnaire is 0.9, and it is made of 16 questions; this gave confidence to the researcher to proceed with research technique selected for the study. The questionnaire is sub-divided into four sections, namely section one: Demography of the respondent, section two: The effects of Global Supply Chain Practices, section three: The impact of GSCM on the selected sector and economic growth of the country and section four: The Challenges associated with GSC practices and possible recommendations. In totality every aspect of the questionnaire contributed to achieving the objectives of the research study as the questions were all aligned toward the objectives of the study.

The Pearson product moment correlation coefficient test was calculated at 5% level of significance with 95% confidence level. To answer the research questions as well, the researcher adopted the mean score, with a group mean.

Decision Rule

The answering of research questions have it at Where; is the average and the 5-Likert scale average for decision making = 3.0, the decision rule is given as;

- High if the item statement and group mean is greater than 3.0

- Average or Medium if the item statement and group mean is 3.0
- Low if the item statement and group mean is less than 3.0

The decision rule on the postulated hypotheses stated that, if p-value is less than alpha (p-value < α), we reject the null hypothesis, while if p-value is greater than alpha (p-value > α), we accept the null hypothesis. For purpose of this study, alpha was taken at 5% level of significance.

RESEARCH DATA

Primary data is collected through the distribution of instrument questionnaires to the sample workers in the different organisations from the manufacturing sector, marketing sector, transport and logistics sectors.

The data was analysed quantitatively using tables and descriptive statistics such as frequency distribution tables and simple percentages while hypotheses were tested using the inferential statistics (correlation analysis) on SPSS version 27 statistical tools which are basically quantitative methods.

The data was extracted from 90 questionnaires distributed to four selected sectors of the Global Supply Chain group, which serve as random samples for the population under study.

RESULTS AND DISCUSSION

A total of 160 questionnaires were distributed for the collection of information, however, only 90 were well completed which is 57% for the analysis. But, 96 questionnaires were returned which is 60% of the sample size. For each section of the group namely Manufacturing sector, Suppliers sectors, Transportation and Logistics the no. and percent of valid questionnaires received are thus Manufacturing has 38 questionnaires which is 63%, Suppliers has 24 Nos which is 48%, Transportation and Logistics has 14 Questionnaires each that is 56%. This signifies that the division with the lowest respondents from percent is Suppliers / Distribution, while the highest is Manufacturing division with 63%. The over all mean for the distribution is 55.75% which shows that the distribution is slightly right skew. Therefore, we can go ahead to do the analysis for Global supply chain practice. To ascertain effect of the GSCM practice on the productivity of the organization.

Table 3 from the research study display the level of effect the Global Supply Chain Management practice has on the vary selected organization operation. This measurement is shown as thus:

Likert Scale 1 = N.A – Not at all meaning the practice has no impact on the organization operation, scale 2 = V.M – Very Moderate means the practice effect is very moderate on the organization operation. The scale 3 = S.M – Slightly Moderate is average, while the Likert scale 4 = H. – Highly Significant meaning the effect is more, and the scale 5 = V.H. – Very Highly Significant is the highest level of impact. This effect is thus for Manufacturing the lowest is 8% while the highest is 43%, for the Suppliers the lowest is 5% and the highest is 43%, for transport and logistics the least is 0% and the highest is 36%. The over all mean for Manufacturing is 3.24, which is moderate, Suppliers is 4.17, which is high, transport is 4.0 is also high, while Logistics is 3.86 which is slightly high.

Table 4 from the research study the effectiveness of Global Supply Chain on the economic growth or productivity of the sectors selected.

Using the Likert scale 1 represents V.IN means very ineffective to the selected sector's economic growth or productivity. Likert scale 2 - INEF represents ineffective, scale 3 – M is moderately effective, scale 4 – EFF means effective and scale 5 – V.EFF means Very effective. The Table 4 analysis is thus for the different selected sectors; Manufacturing sector lowest percent, highest percent and the group mean score are 5%, 48% and 3.05 respectively which is moderate. The suppliers scores are 0%, 46% and 4.25 group mean respectively, this shows that the sector is very effective. Transport sector scores are 0%, 50% and 4.0 group mean respectively which signifies that it is effective and Logistics scores are 0%, 34% and group mean of 4.29 which is very effective. Form the research findings Logistics is the most effective of the four selected sector.

This study signifies that the productivity effect of Global Supply Chain on the various sectors align with GSCM practices operational activities. The studies highlighting the positive correlation between GSCM practices and improved organizational performance, including environmental and financial benefits. Which partly the conclusion of the first test.

The Second part of the test is the Hypothesis testing where the Impact of GSCM is tested on the various sector to ascertain its effectiveness.

Some of the basic assumptions of the correlation analysis were met. The variables used for the analysis were extracted from the questionnaires and all the analysis were carried out using Statistical Package for Social Science (SPSS) version 27.

The decision rules applied in this study are;

- Reject H_0 if P-value is less than or equal the level of significant = 0.05.
- Accept H_0 if P-value is greater than the level of significant = 0.05

Hypothesis one:

- H_0 : The Global Supply Chain Management (GSCM) practices has no significant impact on the economic growth and productivity of various organisations
- H_1 : The Global Supply Chain Management (GSCM) practices has significant impact on the economic growth and productivity of various organisations
- Dependent Variable: Economic Growth
- Independent variable: Global Supply Chain Management (GSCM)

Different Sectors or Divisions	GSCM Practices Grades	Economic Growth or Productivity
Manufacturing Sectors	3.24	3.05
Suppliers	4.17	4.25
Transport Sector	4.00	4.00
Logistics	3.86	4.29

The Pearson Correlation Coefficient (r) = 0.95, indicating a strong positive linear relationship between Global Supply Chain Management (GSCM) practices and economic growth and productivity of the sectors.

- The t – Statistics testing (t) = 3.88
- The p - value P = 0.06.
- The sample No. N = 90

Hypothesis Testing

- **Null Hypothesis (H_0):** GSCM practices have no significant effect on economic growth.
- **Alternative Hypothesis (H_1):** GSCM practices have a significant effect on economic growth.

Given that the p -value (0.06) is slightly above the common significance level of 0.05, we fail to reject the null hypothesis. This suggests that, based on this data, there isn't sufficient statistical evidence to conclude a significant effect of GSCM practices on economic growth. Therefore, while the Pearson correlation coefficient indicates a strong positive relationship between GSCM practices and economic growth, the p -value suggests that this relationship isn't statistically significant at the 0.05 level. It's important to note that the small sample size ($n=90$) may have limited the power of this analysis. Further research with a larger dataset is recommended to draw more definitive conclusions.

RECOMMENDATION FOR ENHANCING THE GLOBAL SUPPLY CHAIN PRACTICES

To maximize the benefits of global supply chains while mitigating challenges, Nigeria should adopt the following strategies:

1. **Strengthen Infrastructure:** Government should Invest in roads construction, ports expansion and construction, and constant energy supply to facilitate, seamless trade and logistics operations. The government can also encourage the private sector to partner with the government in providing infrastructural amenities.
2. **Enhance Industrialization:** The Government should encourage building of industries by provide the necessary resource and encouragement to investor through the provision of incentives. This Promote value addition to materials by encouraging local manufacturing and processing industries to research on products manufacturing.
3. **Improve Regulatory Frameworks:** The government should introduce policies that will improve the regulatory framework to check the excesses of agencies and to Simplify trade regulations and ensure policy consistency to attract investors. Implement consistent and transparent trade policies to attract foreign investments. Streamline customs procedures and reduce bureaucratic delays to facilitate smoother cross-border trade. Encourage fair labour practices and corporate social responsibility initiatives.

- 4. Develop Human Capital:** The government should Invest in education and skills development centres as well as encourage private sector to invest in educational institution and also create and train workforce capable of handling advanced supply chain processes or skills.

The government should foster public-private partnerships to provide specific - industry training programs.

The encouragement of research and development (R&D), logistics and supply chain management training will also help to increase the acceptance of GSCs in the country.

- 5. Promote Sustainability:** Organisation should be encouraged to carry out project that will promote environmental law and labour regulations to ensure responsible business practices.

Strengthen intellectual property rights and contract enforcement to foster a reliable business environment.

- 6. Enhancing Regional and International Trade Agreements**

Strengthen Nigeria's participation in regional trade agreements such as the African Continental Free Trade Area (AfCFTA).

Foster diplomatic relations to ease trade restrictions and improve international or global market access.

Promote integration with global supply networks through strategic partnerships.

- 7. Promoting Sustainable and Ethical Supply Chain Practices**

Implement policies that ensure environmental sustainability in supply chain operations.

Adopt circular economy principles to minimize waste and enhance resource efficiency as well as encourage ethical practices will go a long way in boosting the businesses.

- 8. Leveraging Digitalization and Technology**

Data and digital record collection and storage as well as Adopt block chain technology for supply chain transparency and fraud prevention. Also permit the utilization artificial intelligence and big data analytics for demand forecasting and risk management, to enable

Promotion of e-commerce platforms to connect local producers with international buyers.

This will enable the global system to become a unified system of operation.

CONCLUSION

Global supply chains present both opportunities and challenges for Nigeria. While they contribute to economic growth, job creation, and technology transfer, issues such as infrastructure deficiencies, regulatory hurdles, and supply chain vulnerabilities must be addressed. By implementing strategic policies and investments, Nigeria can optimize its participation in global supply chains, ensuring sustainable economic development.

The literature underscores that while global supply chain management offers significant opportunities for Nigeria in terms of economic growth, technology transfer, and trade expansion, challenges such as infrastructural weaknesses, policy inefficiencies, and supply chain vulnera-

bilities persist. Addressing these challenges through strategic policy interventions, investment in infrastructure, and sustainable practices can enhance Nigeria's position in global supply chains.

Improving global supply chain management in Nigeria requires a multifaceted approach, incorporating infrastructure development, policy reforms, technology adoption, and capacity building. By addressing these key areas, Nigeria can strengthen its global supply chain position, attract investments, and drive long-term economic growth.

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Table 1 – Quantities of Questionnaire Distributed, Collected and Utilised as Sample for the

Global Supply Chain Management

Source/Sectors	Total Sample	Proportional Sample – (Returned)	Approximated Pro- portional Sample (Useful)
Manufacturing Sector			
Unique Leather Co. Lrd	10	8	8
N-Sama Global Industries	10	6	6
Salient Industrial Ltd	10	7	7
Fas Agro Industries Ltd	10	5	5
M.C. Plastics Co. Ltd.	10	6	6
Tower Nig. Ltd	10	4	4
	60	36	36
Suppliers			
Avery Nig. Ltd	10	4	2
TekniTeed Nig. Ltd	10	7	3
Fouani Nig. Ltd	10	6	5
Mikano Nig. Ltd.	10	8	8
Jubaili Bros	10	5	5
	50	30	23

Transport and Logistics Company			
DHL Int' Ltd.	10	7	6
Fedex Couriers Services	10	5	5
A.A. Rano Airlines	10	6	6
UAS Airlines	10	5	5
Max Airlines	10	7	6
	50	30	28
Grand Total	160	96	87

Table 2 – Analysis of the Distribution of Questionnaires

Category of respondents	Questionnaire administered	Questionnaire returned	% returned	Questionnaire duly filled	% duly filled
Manufacturing	60	40	67.0%	38	63.3.0%
Distribution / Supplier	50	25	50.0%	24	48.0%
Transport	25	16	64.0%	14	56.0%
Logistics	25	15	60.0%	14	56.0%
Total	160	96	60.0 %	90	57.0%

Table 3 – Analysis of Global Supply Chain Management Practices

S/No	To what Extent the Organisation engage in GSCM	N.A 1	V.M 2	S.M 3	H 4	V. H 5	To- tal	Mean Score	Decision or Comments
1	Manufacturers	3 (8%)	7 (17%)	9 (24%)	16 (43%)	3 (8%)	38	3.24	Moderate
2	Suppliers	1 (5%)	1 (5%)	2 (9%)	9 (38%)	11 (43%)	24	4.17	High
3	Transporters	0 (0%)	1 (8%)	3 (22%)	5 (36%)	5 (36%)	14	4.00	High
4	Logistics	0 (0%)	1 (8%)	4 (29%)	5 (36%)	4 (29%)	14	3.86	High

Table 4 – Effect of GSCM on the Economy Growth or Productivity of the Sectors

S/ Nos	The Impact of GSCM on Economic Growth or Productivity scales	RESPONDENCE – Impact of GSCM on Sectors							
		V.IN 1	INEF 2	M 3	EFF 4	V.EF 5	Total	Mean score	Decision or Com- ment
1	Manufacturers	2 (5%)	8 (21%)	8 (21%)	18 (48%)	2 (5%)	38	3.05	Moderate
2	Suppliers	0 (0%)	0 (0%)	3 (12%)	10 (42%)	11 (46%)	24	4.25	Very Effective
3	Transporters	0 (0%)	1 (8%)	2 (15%)	7 (50%)	5 (27%)	14	4.00	Effective
4	Logistics	0 (0%)	0 (0%)	4 (32%)	5 (34%)	5 (34%)	14	4.29	Very Effective

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ESG Marketing in the IT Industry: Review of Literature on Sustainability and Digital Transformation

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ESG Marketing in the IT Industry: Review of Literature on Sustainability and Digital Transformation

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ABSTRACT:

This study examines how IT firms apply ESG principles in marketing, particularly in promoting sustainability and carbon-neutral commitments. As the demand for corporate responsibility intensifies, this review assesses the effectiveness of various marketing strategies employed by tech firms to promote their sustainability initiatives. It also considers how technologies like AI, blockchain, and big data are being used to strengthen transparency and accountability in ESG reporting. The review evaluates how stakeholders and consumers perceive the credibility and outcomes of ESG activities in the IT sector. The findings aim to provide insights into the intersection of sustainability and digital transformation, highlighting the importance of strategic communication in fostering trust and engagement among stakeholders in the IT sector. This study ultimately contributes to a deeper understanding of how tech companies can align their business models with sustainable practices while meeting the growing expectations of consumers and investors. This alignment not only enhances corporate reputation but also positions tech companies as leaders in the global shift toward sustainable development, paving the way for innovative solutions that address pressing environmental and social challenges. Such efforts can improve corporate reputation and position IT firms as global leaders in sustainable innovation.

Keyword: Marketing, ESG, ESG Marketing, Digital Transformation, Sustainable Practices

INTRODUCTION

ESG marketing has become increasingly important for IT companies, as sustainability expectations shape their strategic direction. With digital transformation revolutionizing industries,

IT companies now come under additional pressure to prove their potential to be sustainable in transparent and effective ways when it comes to marketing.

This paper systematically reviews literature on how digital transformation influences ESG marketing and communication in IT firms. The research examines how various technologies, including artificial intelligence, blockchain, and big data, can improve ESG transparency and accountability to build consumer and stakeholder trust. It also discusses the difficulties and trends of ESG in digital transformation, gives suggestions for successful references, and evaluates marketing effectiveness. Finally, this review seeks to contribute to a broad understanding of how IT firms could adapt their business models to sustainability.

Companies have increasingly adopted Environmental, Social, and Governance (ESG) standards as a way to address sustainability, ethics, and corporate responsibility. ESG marketing incorporates these values into marketing and advertising campaigns that can boost brand reputation, encourage customer retention, and support the generation of long-term value. In this paper, we investigate the core ideas of ESG marketing, based on insights from appropriate research papers.

ESG (Environmental, Social, And Governance) is a fundamental component in modern marketing, matching business as normal with societal or environmental opportunity. It is a way for companies to create a positive corporate brand image, increase stakeholder confidence or trust, and differentiate themselves from their competitors. While ESG practices help in managing risk and long-term financial performance by mitigating environmental, social, and governance risks (Tuteja, 2024) (Zhang, 2023).

ESG marketing involves embedding environmental, social, and governance themes into promotional strategies to highlight responsible business practices. ESG marketing has its genesis in the corporate social responsibility (CSR) movement, which promoted the idea that businesses had a role to play in addressing social and environmental challenges. ESG has grown by adding governance practices and became the integrated framework for sustainable business management (Otero, 2024) (Nascimento et al., 2024).

ESGs have become an important part of integrated corporate strategy to build corporate value by contributing to financial performance, product and services, market position, and overall competition. ESG practices also attract effective risk management and long-term sustainability, providing them as the must-have for value creation for shareholders and stakeholders (Zhang, 2023) (Izmaylov, 2024).

As with employee engagement, ESG is critical for brand reputation. Firms that incorporate ESG principles into their marketing campaigns are considered responsible and ethical, and this improves the company's brand image. A good image for a company is capable of attracting investors, customers, and the best employees, which is beneficial for the sustainable competitive advantage of the company (Chusniyah et al., 2023) (Singh et al., 2024).

Consumers are increasingly turning to conscious consumption with a focus on ESG practices. Studies have shown that consumers are inclined to favor businesses with a commitment to environmental, social, and ethical business practices. For rallying consumer behavior, trust and loyalty are created by ESG practices, and it brings positive word of mouth (Serena et al., 2024)

(Nugroho et al., 2024). This alignment will serve to increase brand confidence while, in the meantime, uplifting the tendency of the consumer segment that is becoming conscious of the fact that brands need to be 'organismic' in order to respect the environment.

But there are drawbacks to ESG marketing, like greenwashing, the absence of standards, and regulatory scrutiny. Exaggerating ESG claims, a practice known as greenwashing, often results in public distrust and reputational damage. One resolution for these issues, for instance, lies in businesses integrating sincere and transparent ESG strategies (Routray, 2024) (Lagodiyenko, n.d.).

Future ESG marketing will likely place stronger emphasis on stakeholder engagement, transparent reporting, and integration across business operations. Organizations will also require innovative ways to convey their ESG initiatives and for marketing goals to be in line with sustainability (Zhang et al., 2024) (Verma & Diwan, 2024).

RESEARCH GAPS

Although ESG marketing has been studied in general, there is still little research focusing specifically on the IT industry—particularly on how claims about carbon neutrality affect consumer trust and loyalty. Most current studies highlight the environmental side of green IT, while social and governance dimensions tend to receive far less attention. here is also limited discussion about how technologies like AI, blockchain, and big data can improve ESG transparency or help reduce the risk of greenwashing, especially in the area of sustainability reporting and audits. Another issue is the lack of standardized frameworks and clear performance indicators, which makes it difficult to compare results across regions or industries—particularly within IT

OBJECTIVE OF THE PAPER

The aim of this paper is to examine how IT firms approach sustainability, particularly through ESG-driven initiatives such as carbon neutrality and marketing strategies. It also evaluates how these campaigns influence consumer perceptions, including trust, attitudes, and purchase behaviour. Another objective is to explore how digital technologies are being used in IT services to make ESG reporting and accountability more transparent. By reviewing challenges, emerging practices, and lessons from digital transformation, this study highlights how IT companies can provide services that meet both sustainability expectations and the needs of consumers and investors.

SCOPE OF THE PAPER

This paper presents a broad review of studies on ESG practices and marketing strategies within the IT sector. It serves as an easy-to-follow reference for current approaches, trends, and perspectives on ESG-focused marketing in technology.

METHODOLOGY

This study applied a structured process to select sources for the literature review. We reviewed journal papers, conference proceedings, and industry reports published between 2015 and 2025,

covering both foundational perspectives and the latest developments. The review focused only on studies relevant to IT applications, marketing strategies, or technology-driven ESG practices, and excluded works that discussed ESG in a general sense without industry-specific focus. A total of 68 studies met the criteria and were analysed to identify themes, challenges, and directions for future research.

THE ROLE OF ESG IN SHAPING IT (INFORMATION TECHNOLOGY) INDUSTRY PRACTICES

In recent years, ESG — short for Environmental, Social, and Governance — has become a game-changer for how IT companies plan and run their businesses. Companies now see ESG as essential for staying competitive — it helps them grow sustainably, protect their brand, and meet the rising expectations of investors, customers, and regulators.

On the environmental side, IT firms are being pushed to shrink their footprint, especially given the industry's heavy energy use. That means designing energy-smart systems, finding better ways to recycle or reuse old devices, and choosing hardware suppliers who prioritise sustainability. To move closer to carbon neutrality, many companies now power their data centres with renewable energy, which cuts greenhouse gas emissions dramatically.

The social side of ESG pushes IT companies to focus on diversity, inclusion, and fair treatment of people. For instance, groups like the British Chambers of Commerce have urged employers to make workplaces more diverse. This has led firms to pay closer attention to fair hiring, employee well-being, and supporting local communities. Firms that invest in diversity gain fresh perspectives, which often sparks creativity and innovation. Many IT firms also run CSR programs — from teaching people about digital tools to expanding access to technology in remote areas — helping reduce inequality and empower communities.

Governance in ESG is about how IT firms set rules and lead with ethics and transparency. This means being transparent, keeping systems secure, and following regulations closely. With more eyes on them than ever, IT companies are under pressure to prove they can lead responsibly and govern ethically. Building a culture of ethics and responsibility helps firms earn the trust of clients, investors, and regulators.

In short, ESG isn't just a buzzword — it's reshaping how the IT industry works. Its importance in IT keeps growing, as companies look for sustainable ways to build value and expand. By using ESG as a benchmark, IT firms can work more efficiently, perform better financially, and strengthen their market position. Following ESG principles isn't just about meeting regulations — it's a strategy for long-term success.

Data envelopment analysis (DEA) based on ESG efficiency shows that the majority of IT firms are found to have enlarged output compared to input variation, which means the possibility of better operational performance by adopting ESG practices (Arunkumar et al., 2025). Board-level ESG committees are correlated with favourable IT outcomes, including fewer cybersecurity breaches and better internal controls, suggesting the operational benefits of ESG embedding (Haislip, 2024). Research reports a positive association between strong governance practices and financial indicators, which means a strong ESG framework can increase financial performance within the IT industry (Ghalambor & Alisha, 2024). Higher environmental and

social scores are associated with superior financial performance, thus confirming the financial benefits of equitable integration of ESG practices (Karminsky et al., 2023).

ESG performance has positive effects on corporate value in most sectors where IT firms rely on green technological innovation to increase value (Luo, 2024). The three-dimension ESG holistic view (including environment, social, and governance) of business in the process of creating business value and sustainable development is essential to be utilized in the business environment (Luo, 2024). ESG integration has a lot to offer, but in IT, there's also a lot of work to be done. Companies frequently face challenges with the launch of ESG frameworks and the ongoing need for them to be consistently updated in response to changing standards. The different effects of the different components of ESG require a balanced approach for an all-rounded benefit (Ghalambor & Alisha, 2024) (Karminsky et al., 2023).

IMPACT OF SUSTAINABILITY ON CONSUMER BEHAVIOR IN IT (INFORMATION TECHNOLOGY) MARKETING

Sustainability has quickly become a key factor shaping how people choose IT products, with more buyers paying attention to a company's environmental and social record. This shift reflects a growing awareness of sustainability and the influence of digital marketing that highlights eco-friendly practices. As a result, companies are reworking their marketing strategies to highlight sustainability, aiming to build brand loyalty and attract values-driven consumers.

As concern for the environment grows, buyers are starting to judge IT products through a sustainability lens, pushing companies to rethink their marketing strategies. In this context, sustainability covers a wide range of actions — reducing environmental harm, supporting social well-being, creating fair economic opportunities, and ensuring justice. For IT firms, this could mean building energy-efficient devices, sourcing materials responsibly, or offering take-back and recycling programs.

As people become more conscious of their own footprint, they seek brands that reflect their values, fuelling demand for sustainable IT solutions. This trend has sparked a major shift in consumer behaviour, with buyers demanding greater transparency and accountability from IT firms. With research and reporting so easily available online, consumers now have instant access to information about a company's sustainability record. Today, shoppers are more likely than ever to weigh a brand's environmental stance before making a purchase.

In response, IT marketers are adopting more transparent communication, openly sharing their sustainability practices and highlighting how their products make a positive difference. Companies that communicate their sustainability commitments clearly and convincingly often enjoy stronger customer loyalty and a larger market share.

Another big change is the rise of the eco-conscious consumer, which is reshaping marketing messages. Tech companies are increasingly weaving sustainability into their marketing, emphasizing how their products can help build a greener future. This approach not only appeals to eco-minded buyers but also fosters a sense of shared responsibility and community ownership. When IT firms put sustainability at the heart of their campaigns, they create stronger emotional bonds with customers, boosting loyalty and advocacy.

Another factor shaping consumer behavior is the rise of the circular economy. This model promotes reusing and recycling products to cut waste and make better use of resources. In response, IT companies are creating longer-lasting products that are easier to repair and recycle.

Consumers are especially attracted to brands that offer take-back or recycling programs, as these demonstrate real commitment to sustainability. Integrating sustainability into marketing not only boosts a company's reputation but also helps them reach a wider audience.

As more organizations factor sustainability into purchasing decisions, IT firms that lead in this area are more likely to win contracts and partnerships. This shows how sustainability is becoming a competitive advantage, especially in B2B markets where 'Green IT' is gaining traction. This paper's findings indicate that sustainable digital marketing strategies can successfully drive consumer behavior by leveraging consumer values and trust. These tactics are based on open communication and educational programs to close the gap between consumer awareness and behavior (Yao, n.d.).

Content related to sustainability in digital marketing that is relevant and interesting and that comes from a source that is trustworthy can bring about significant changes in the consumers' behavior by persuading them to adopt more sustainable practices. Environmental concern serves as a moderator, strengthening the moderated mediation of these tactics (Yu, 2024).

Using narratives and storytelling, brands can develop an authentic relationship between themselves and consumers, inspiring them to make sustainable decisions and contribute towards the eco-generating movements. The attitudes, beliefs, and values of consumers are increasingly influencing their purchase decisions and there is an expanding market for eco-friendly products. Open communication of sustainability efforts will be essential in building the consumer's perception and influencing action (Anjorin et al., 2024).

Environmental attitudes and lifestyles, as well as the willingness to pay for green products, have a considerable impact on purchase behavior and future purchase intention. These dimensions are especially important in the context of online retailers to design green practice strategies (Stofejova et al., 2023).

It is essential in shaping Trust and Reputation. Sustainability-driven reputation reduces perceived risk and increases consumer trust, consequently leading to a positive effect on purchase intention and premium price. Trust and perceived risk are two mediating factors in the relationship between sustainability reputation and consumer behavior (Unal & Tascioglu, 2022).

The image it receives through the sustainability initiatives can differentiate brands in the market and create stronger relationships with environmentally-oriented customers (Balasenthil, 2024).

Although the cost of sustainable manufacture is high and the Supply Chain complexity is intense, firms have opportunities to differentiate and enhance consumer loyalty when marketing activities are connected with green strategy (Anjorin et al., 2024).

IT practitioners have positive green marketing attitudes, which may imply that reward structures through economic and psychological motivations can help in continuing the good environmental work in the IT industry (Castro et al., 2016). Consumers' purchase intentions are

highly affected by sustainability information, especially when they are actively looking for that information. But out of the mainstream, sustainability information may not be enough to stimulate behavior unless it is woven into the decision contexts already used by people (O'Rourke & Ringer, 2016).

In addition to the positive effects of sustainability on consumer behavior, one of the challenges is to communicate sustainability information to mainstream consumers. Although people's purchase intention was found to increase (direct users) or not influenced (nondirect users), this certainly suggests a necessity for greater use of integrated and interactive communication strategies (cf., O'Rourke & Ringer, 2016) when it comes to reporting about sustainability and the energy transition into the future.

Many businesses find high costs are involved in sustainable production and supply chain challenges, which makes it hard for a business to have effective sustainable marketing strategies, according to Anjorin et al., (2024).

Notwithstanding these difficulties, the increasing consumer demand for sustainability is an opportunity for companies to innovate and distinguish themselves. To take advantage of this, businesses need to focus on being transparent and engaging in their marketing, with great stories that will appeal to consumer values and way of life.

DIGITAL TRANSFORMATION: TRENDS & CHALLENGES OF ESG INTEGRATION

Digitalisation is becoming a powerful tool for driving corporate sustainability, particularly in boosting ESG performance. As digital tools spread across industries, companies are adopting them not only to improve efficiency but also to align their strategies with global sustainability goals. This digital shift is playing a big role in transforming business operations. Evidence shows that digital transformation strengthens ESG outcomes in many ways. Researchers note that digital tools can drive green innovation and help offset rising carbon emissions (Zhang et al., 2024; Chen, 2024). Better social governance now depends heavily on transparency and active engagement with stakeholders (Yang et al., 2023; Liu et al., 2024). Governance also benefits from tighter internal controls and reduced agency costs (Yuan, 2023; Feng & Nie, 2024).

Certain industries are seeing stronger ESG gains from digital transformation than others. In manufacturing, digital transformation has boosted both environmental performance and social responsibility (Yang, 2024). In transport and logistics, digital projects have raised ESG performance, particularly in state-owned and large firms (Yu et al., 2024). Green innovation is often the key link between digital transformation and improved ESG performance. Studies show that digital transformation drives green innovation, which in turn improves environmental and governance outcomes (Yu & Li, 2023; Wang, 2024).

This underlines the importance of tying digital strategies directly to sustainability goals. However, the impact of digital transformation on ESG varies depending on several factors. For instance, subsidies, leadership experience, and local regulations can all strengthen the positive effects of digitalisation (Yang et al., 2023; Tian et al., 2024). Research also shows that high-polluting industries and firms with cooperative cultures tend to gain more from digital adoption (Tian et al., 2024; Xiao et al., 2024). Yet, bringing AI and machine learning into ESG models comes with hurdles: better data is still needed, calculations can be complex, and ethical

questions remain (Shan, 2024).

The effects of digital transformation on ESG aren't uniform — they vary across industries and regions. For instance, its impact on ESG is stronger in eastern and central China than in the west (Li, 2024). Some studies warn that the ESG benefits of digitalisation may diminish over time. This suggests firms must keep investing in digital tools to sustain and grow their ESG performance (Chen, 2024).

Ethics play a crucial role in digital transformation, especially in areas like data privacy and algorithmic bias. Other challenges include high upfront costs and the difficulty of reshaping organizations (Shan, 2024). Digitalisation also promotes green innovation, helping firms design eco-friendly technologies and processes. This strengthens environmental performance and supports broader sustainability goals (Yu & Li, 2023; Wang, 2024). It also fosters stronger engagement with stakeholders, from customers to investors to regulators. This deeper engagement supports stronger social responsibility and governance practices (Xiao et al., 2024).

Digital tools improve governance by boosting transparency, reducing information gaps, and strengthening internal controls. These changes strengthen governance and, in turn, overall ESG performance (Yuan, 2023; Liu et al., 2024). As more companies chase digital transformation, ethical issues — from fairness to accessibility — need attention to make sure new technologies support social values and remain inclusive.

Digitalisation makes businesses more efficient by streamlining processes and cutting waste. Studies also show that efficiency gains often go hand-in-hand with better environmental and social outcomes (Tian et al., 2024; Yang & Zhao, 2024). Taken together, these benefits build trust, strengthen reputation, and help firms achieve sustainable growth in a fast-changing business world.

To keep improving ESG results, companies need to keep investing in digital technologies. That means embracing tools like AI, blockchain, and the Internet of Things (Chen, 2024; Shan, 2024). Governments and regulators also play a big part in enabling digital transformation. Policies that support digital infrastructure and green innovation can boost ESG outcomes even further (Tian et al., 2024; Yang & Zhao, 2024). But companies must also tackle tough ethical issues like data privacy and algorithmic bias. Firms also need to build up their internal capabilities to successfully carry out digital transformation (Shan, 2024). Sharing knowledge across industries can speed up digital adoption and spread best practices in ESG. This is especially important for SMEs, which often lack the resources to invest heavily in digital transformation on their own (Ni et al., 2037; Xiao et al., 2037).

Digital transformation is proving to be a strong driver of ESG progress across all three pillars — environmental, social, and governance. But the journey isn't easy, with hurdles like poor data quality, regional differences, and ethical concerns. By focusing on green innovation, efficiency, and strong governance, firms can get the most out of digital transformation for sustainability. Sustaining ESG gains will demand long-term investment in digital tech, supportive policies, and collaboration with industry partners.

MEASURING THE IMPACT OF ESG MARKETING

Measuring the impact of ESG-focused marketing isn't straightforward. It involves figuring out how these efforts shape business transformation, company value, customer perception, and overall sustainability. More and more, ESG marketing is seen as key to aligning business activities with sustainability goals, while also boosting firm value and performance.

When companies integrate ESG into their marketing, it not only reshapes operations but also shapes how consumers see the brand — and ultimately, its success in the market. Such campaigns are central to business transformation, embedding sustainability at the core of operations. This approach also gives companies a competitive edge, as it matches society's growing demand for responsible corporate behaviour (Otero, 2024; Pamplona, 2024). Examples like Copel show how strategic ESG marketing can act as a transformative force, improving both organizational and social outcomes (Pamplona, 2024).

Adopting ESG tends to improve both company valuation and financial performance, particularly in developed countries such as those in the OECD. Stronger ESG performance boosts profitability and efficiency, which in turn raises market valuation (Dsouza et al., 2024). In Europe, ESG efforts — especially social initiatives — have been shown to raise firm value and performance (Tahmid et al., 2022).

ESG marketing also steers consumer choices toward more sustainable products and services. Research models suggest ESG marketing — across environmental, social, and governance dimensions — shapes consumer purchase intentions (Vlad & Luca, 2020). But if firms focus only on the environmental side and neglect social or governance issues, consumers may grow sceptical and push back (Routray, 2024).

Companies with stronger marketing skills tend to run ESG programs more effectively and make better investment choices. This effect is especially strong when economic policies are stable (Hu, 2023). Interestingly, studies suggest a U-shaped link: both very low and very high eco-marketing investment improve ESG performance, while moderate investment has little effect (G'ulomovna, 2024).

Clear and standard ESG metrics are vital for integrating sustainability into business strategy. Overly complex measurements can stifle innovation, while standardized metrics make integration smoother and more sustainable (Passerini et al., 2024). A balanced approach that measures all three ESG pillars is seen as the best way to drive sustainable business (Prabowo & Anggoro, 2024).

Overall, ESG marketing delivers positive results, but companies must keep working to balance all three ESG pillars while staying authentic. If firms overemphasize environmental issues, they risk greenwashing, which can backfire and erode trust. This shows why balanced attention to social and governance issues is just as important. The effectiveness of ESG marketing also depends on a firm's marketing strength and the wider economic and regulatory environment. The key takeaway is that balanced ESG strategies are essential for long-term business success. As businesses maneuver through these complicated issues, creating transparency and stakeholder engagement become essential in order to build trust and show the commitment to ESG principles is real.

SUCCESSFUL ESG MARKETING STRATEGIES

ESG is now central to reshaping marketing strategies and driving organizational change. Firms that genuinely weave ESG into their marketing not only gain a competitive edge but also create benefits for society and the environment (Otero, 2024). Companies like Patagonia and Google show how aligning practices with ESG goals can make a real impact, both in operations and brand perception. They engage stakeholders while balancing short-term wins with long-term goals (Benhard, 2024). Leading Korean firms in electronics and automotive have tailored their ESG strategies to tackle challenges unique to their industries. They've done this by adopting creative approaches and making ESG part of everyday business (Park et al., 2024). Korea Midland Power Co. Ltd highlights success in ESG by focusing on climate response, clean energy, and strong governance. Their strategy emphasizes early risk identification and performance-driven practices (Jung et al., 2023).

In Indonesia, MSMEs have gained a competitive edge by incorporating ESG factors into their digital marketing. This approach not only boosts profitability but also advances environmental sustainability (Oktavianti et al., 2024). Companies with ESG committees often see better IT outcomes — from fewer cybersecurity incidents to more accurate earnings forecasts. This shows a clear positive link between ESG activities and IT performance (Haislip, 2024).

While IT governance (ITG) focuses on service delivery and support, 'green ITG' blends ITG with sustainability, stressing the need for eco-friendly business practices. Research on ESG and ITG suggests that when applied globally, they help standardize technology use and improve identity management (Haislip, 2024).

Even proven ESG marketing strategies face challenges — especially greenwashing, where firms exaggerate environmental claims while ignoring social and governance aspects. This can undermine consumer trust and draw regulatory scrutiny, highlighting the need for a balanced approach to ESG (Routray, 2024). Adaptability is also key. Companies like Sands China Limited and Yunnan Baiyao show how flexible strategies help businesses navigate uncertainty (Chow & Tan, 2024; Wee, 2024).

FUTURE RESEARCH IN ESG MARKETING & DIGITAL TRANSFORMATION

The intersection of ESG marketing and digitalisation is a growing research focus, driven by sustainability needs and fast digital advancements. This convergence is reshaping how companies handle ESG commitments, creating new opportunities for transparency, efficiency, and strategic impact. Future ESG marketing in a digital context will likely involve better use of digital tools for data management, tailoring strategies to each firm, and using marketing tech to embed ESG values into society. These points are explored further in current discussions on future research trends.

Digital transformation is key to making ESG data tracking and reporting more transparent and efficient. This helps firms respond to stakeholder pressure and regulatory demands (Truant et al., 2023; Kong, 2024). Digital tools also make it easier to monitor and manage environmental footprints, improving ESG performance and helping firms adapt to changing markets and regulations (Kong, 2024; Gao & Wang, 2024). Future research could develop integrated 'Digital

ESG' (DESG) frameworks to study how digitalisation affects both consumer and corporate behavior (Tan et al., 2025). The impact of digitalisation on ESG also depends on external conditions and company traits, meaning strategies need to be tailored (Wang, 2024). Strengthening dynamic capabilities is another way digitalisation can improve ESG, helping companies plan for sustainable growth (Wang, 2024; Gao & Wang, 2024).

Marketing technologies can help embed ESG norms into wider social values. This involves using marketing tools to promote sustainability values and link company operations more closely with society (Matveev et al., 2024). Models of sustainable development suggest that digital tools can help firms balance economic goals with social responsibilities (Matveev et al., 2024). Future studies could also look at how marketing can embed ESG values into consumer behavior and measure the wider social impact of corporate ESG efforts (Huh et al., 2024).

Another avenue is to explore how firms across industries and regions can customize digital and ESG strategies to fit their performance and sustainability goals (Wu, 2024). The mix of ESG marketing and digital transformation holds huge promise for corporate sustainability — but also presents challenges. Since no comprehensive theory of Digital ESG (DESG) exists, and impacts vary by industry, more theoretical research is needed. At the same time, government backing and policy guidance are crucial for effective digital and ESG integration, meaning collaboration between firms and policymakers will be vital to overcome barriers to sustainable development (Tan et al., 2025; Gao & Wang, 2024).

KEY FINDINGS

SEVERAL COMMON THEMES STAND OUT ACROSS THE REVIEWED STUDIES:

1. Research shows that applying ESG in marketing boosts brand reputation, builds trust among stakeholders, and supports financial performance (Zhang, 2023; Singh et al., 2024).
2. Technologies like AI, blockchain, and big data are seen as valuable tools for increasing ESG transparency, tracking emissions, and strengthening stakeholder engagement (Chen, 2024; Yu & Li, 2023).
3. Evidence suggests sustainability-focused marketing influences buying behavior, especially among environmentally aware consumers (Serena et al., 2024; Anjorin et al., 2024).
4. Overemphasizing the environmental side while ignoring social and governance aspects can trigger consumer scepticism and accusations of greenwashing (Routray, 2024).
5. Many researchers call for standard ESG metrics to make marketing claims more credible and comparable (Passerini et al., 2024).
6. The impact of digital transformation on ESG varies by region, ownership type, and corporate culture (Li, 2024; Yuan, 2023).

SUGGESTIONS

1. IT companies should share ESG through clear, relatable stories that show real-world impact. To build trust, these messages must be backed by transparency and avoid the trap of greenwashing.
2. Where ESG accountability or stakeholder engagement is lacking, technologies like AI, blockchain, and big data can help close the gap. Maintaining balance across environmental, social, and governance pillars is key to credibility.
3. Actively involving stakeholders — from customers to employees to communities — through feedback and education strengthens relationships and builds ownership. Adopting standard ESG metrics can help integrate sustainability into core business and track progress more clearly.
4. Staying committed to digital tools and ESG — while keeping up with regulations — is essential for long-term success.
5. Tracking public perception helps companies spot target niches and peer networks. Creative storytelling and fresh digital campaigns can boost engagement.
6. Collaboration with other IT firms fosters shared learning and greater impact. Finally, creating durable, repairable, and recyclable products — along with take-back programs — shows a real commitment to responsible business.

CONCLUSION: INTEGRATING ESG PRINCIPLES INTO IT MARKETING STRATEGIES

Bringing ESG principles into IT marketing is now widely seen as key to sustainable growth and building a strong corporate image. ESG not only aligns marketing with social and environmental goals but also helps companies earn consumer trust and credibility. This is especially important in IT, where rapid change and global reach mean even old problems can quickly escalate into industry-wide risks. By integrating ESG, IT firms are building sustainable business models that address global challenges and create long-term value for society (Magomedova, 2024). Clear disclosure of ESG commitments boosts reputation and stakeholder trust — crucial in the competitive IT industry (Zhou, 2023). ESG efforts also strengthen resilience, helping businesses manage environmental and social risks (Zhao, 2025). Strong communication — with clear ESG messaging — can improve brand image and build customer loyalty (Lagodiyenko, n.d.). Storytelling about ESG outcomes, supported by strong PR, can boost both visibility and credibility (Lagodiyenko, n.d.). Balance across all three ESG pillars is vital to avoid greenwashing and prove that progress is genuine (Routray, 2024). Companies must show that their marketing claims are backed by real ESG practices to avoid greenwashing risks (Routray, 2024). Following ESG disclosure rules is crucial to reduce legal and financial risks (Routray, 2024). Effective ESG integration means aligning marketing with other functions so that sustainability fits seamlessly into overall business strategy (Benhard, 2024). Companies like Google, Microsoft, and Patagonia show how ESG can be embedded in both operations

and marketing — setting examples for the rest of the industry (Benhard, 2024). The communication industry, for example, has adopted initiatives like Green ICT to support sustainable development goals (Huang, 2024). While ESG brings many benefits to IT marketing, it must be applied thoughtfully and genuinely in campaigns.

Overemphasizing the environmental pillar while neglecting social and governance risks consumer suspicion and regulatory backlash. A balanced focus on all three ESG pillars is the only way to achieve real, credible change in marketing.

SUGGESTED AREAS FOR FUTURE RESEARCH:

- Development of standardized ESG marketing performance metrics for the IT sector.
- Exploration of AI-driven personalization of ESG messages to enhance consumer engagement.
- Comparative analyses between B2C and B2B ESG marketing strategies in IT.

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Fintech and Its ESG Impact on the Financial Market: A Pathway to Sustainable and Inclusive Finance

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Fintech and Its ESG Impact on the Financial Market: A Pathway to Sustainable and Inclusive Finance

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ABSTRACT :

Fintech has revolutionized the financial transactions scenario. The innovations like digital payment options, peer to peer lending, block chain etc. have contributed to accessibility, convenience and efficiency. And at the same time, they are aligned to sustainability goals. ESG- Environmental, Social, and Governance principles are guiding the business domain and financial market cannot remain unaffected.

This study examines how the financial market is influenced by Fintech along with ESG directives. It is based on qualitative analysis of scholarly articles and Government policies to explore the ESG effect of Fintech on Financial market. It aims to explore how ESG aligned Fintech is promoting green finance, achieving better financial inclusion and help in implementing adequate corporate governance in financial market.

It also discusses the challenges in adoption of Fintech in emerging economies like India – such as cyber security threats, biases of AI-systems, data privacy violations, and regulatory loophole that need to be addressed. Based on secondary data from authentic sources of Government regulatory bodies and international organizations, this paper evaluates how Fintech is exploring the opportunities in the domain of sustainable, equitable and transparent financial ecosystem.

The paper findings shows that Fintech are the great facilitators in implementing ESG objectives- by providing equal access to finance, promoting responsible investing, and transparency in Governance. But this potential will not be fully explored if the challenges are not timely addressed. The paper concludes with policy recommendations for integration of ESG principles into Fintech regulatory system, investment strategies and corporate accountability.

Keywords - Fintech, ESG (Environmental, Social, Governance), Green finance, financial inclusion, data privacy, transparency.

INTRODUCTION:

Sustainability now guides every aspect of business, requiring a long-term vision of sustainable development. Fintech has changed financial markets and transactions. Fintech innovations like digital payment systems, peer-to-peer lending, algorithmic trading, block chain applications, and others transformed financial services. It increased speed, efficiency, and service access while lowering transaction costs. Now that our processes are efficient and effective, we must consider sustainability. This development is guided by Environmental, Social, and Governance (ESG) goals.

MEANING OF ESG?

Non-financial ESG principles evaluate a company's long-term value, ethics, and sustainability. ESG principles guide businesses in addressing environmental, social, and governance risks and opportunities.

It examines how a company impacts people, the environment, and its transparency.

E - Environmental principles cover how a business impacts climate change, carbon emissions, energy efficiency, resource use, pollution, waste management, and water use and conservation. Fintech enables paperless banking.

S—Social principles emphasize how a company treats its employees, inside and out. Their employee rights and welfare, DEI, community engagement, customer protection, data privacy, and health and safety policies demonstrate this. Fintech helps non-bankers access financial services.

G—Governance principles are organizational rules and systems. It includes having a diverse and independent board, being transparent, paying executives fairly, following the law, and fighting corruption and bribery. Fintech promotes open reporting, audit trails, and regulatory compliance.

All stakeholders, customers and regulators should consider ESG principles for long-term sustainability. ESG matters in FinTech. ESG principles are essential for responsible and sustainable finance as FinTech changes the financial industry. FinTech companies are evaluated on ESG compliance and profitability. This impacts investor confidence, regulator support, and market performance. Eco-friendly FinTech promotes digital solutions that reduce the financial sector's carbon footprint and enable green finance. Green investment platforms, energy-effi-

cient infrastructure, virtual customer service, and paperless onboarding enable it. FinTech has improved financial services and social inclusion, especially in underserved areas. Non-bankers can use digital wallets, mobile banking, AI-driven credit scoring, and money-education apps. Strong FinTech governance ensures compliance with financial industry and global laws on consumer rights, data privacy, and financial services non-discrimination. Fintech's open algorithms and decision-making simplify lending, investing, and insurance. Clear digital platform fees, risks, and terms Data governance rules like AML and KYC to protect user data and prevent misuse. Many businesspeople like ESG. ESG-compliant investments are preferred. ESG makes global sustainability rules easier to follow in Fintech. ESG ratings put companies ahead of competitors and boost global financial market trust.

LITERATURE REVIEW:

Fintech is transforming the financial sector and could promote green finance and eco-efficiency (Chueca Vergara & Ferruz Agudo, 2021; Koemtzopoulos et al., 2025). ESG considerations in investment decisions are becoming essential for sustainable development (Zairis et al., 2024). Fintech had transformed financial services like payments and financing (Anifa et al., 2022). Research on Fintech is growing rapidly, focusing on financial aspects, technology transfer, and innovation (Abad-Segura et al., 2020). FinTech innovations are transforming the financial services industry, offering new financial inclusion and sustainable development opportunities. FinTech uses big data to create inclusive financial products and improve risk management (Mhlanga, 2024). Green finance, ESG, and sustainable agriculture all incorporate FinTech (Chueca Vergara & Ferruz Agudo, 2021; Zairis et al., 2024; Mapanje, 2023).

FinTech companies are becoming "greentech" by pursuing carbon neutrality and eco-efficiency (Koemtzopoulos et al., 2025). However, data privacy and security remain issues (Mhlanga, 2024). FinTech has a major impact on financial geography, regulation, and governance (D. Wójcik, 2020). FinTech can help smallholder farmers in sub-Saharan Africa access financial services (Mapanje et al., 2023). ESG factors and FinTech are transforming sustainable finance and agriculture in developing regions. FinTech innovations improve banking operational efficiency and financial inclusion (Mavlutova et al., 2022; Mapanje, 2023). ESG integration is influencing business models and investment strategies, but implementation processes need more research (Aldowaisi et al., 2022; Rau & Yu, 2023). The EU is creating a financial sustainability regulatory framework (Bruno & Lagasio, 2021). FinTech innovations are improving banking performance and lowering transaction costs with AI and IoT (Andronie et al., 2023). However, ESG measurement and data quality remain problematic (Rau & Yu, 2023). Recent research shows that environmental, social, and governance (ESG) practises in finance and industry are becoming more important (Abad-Segura et al., 2020; Gao et al., 2021). Blockchain technology is enabling FinTech applications, improving financial services trust and efficiency (Renduchintala et al., 2022).

Companies are using ESG strategies to create shareholder value and reduce carbon emissions (Baratta et al., 2023). Green innovations are essential for financial inclusion and carbon neutrality (Brahmi et al., 2023). Trust in FinTech depends on ethics, including privacy and bias (Aldboush & Ferdous, 2023). ESG has changed over 17 years, affecting economic outcomes and risk prevention (Li et al., 2021). Green finance is growing as an environmental solution,

but the green investment gap remains (Desalegn & Tangl, 2022). Recent research shows that sustainability and digital transformation are becoming increasingly important in business (Daugaard & Ding, 2022). Environmental and financial disclosure, IT adoption, and good governance boost firm performance and sustainability (Jing Lin & Md. Qamruzzaman, 2023). Corporate Social Responsibility research emphasizes aligning businesses with global climate agendas based on the UN Sustainable Development Goals (ElAlfy et al., 2020). Micro, small, and medium-sized enterprises require digital transformation and big data to achieve sustainability (Martínez-Peláez et al., 2023).

Blockchain improves sustainable supply chain traceability and transparency (Paliwal et al., 2020). FinTech requires sustainable human resource management, including flexible work arrangements and upskilling (Wu & Kao, 2022). Financial inclusion is promoted by machine learning and artificial intelligence improving credit risk assessment in emerging economies (Mhlanga, 2021). This collection of papers examines FinTech and its effects on the financial sector. Green finance may solve environmental and climate change issues, but inconsistent definitions and a lack of incentives make it difficult (Ozili, 2022). FinTech has changed banking governance, creating global networks and territorial ecosystems with positive and negative socio-economic effects (Gancarzyk et al., 2022). FinTech shapes financial ecologies (FEs), affecting territorial projects and communities (Gancarzyk & Rodil-Marzábal, 2022). Bitcoin, crowdfunding, mobile payments, and blockchain dominate FinTech research (Bajwa et al., 2022).

Card, e-payment, mobile, and cryptocurrency payments present social, economic, technical, awareness, and legal challenges (Khando et al., 2022). The field continues to evolve, providing opportunities for research and development (Brika, 2022). Recent research shows that fintech development improves corporate ESG performance in emerging markets, particularly for smaller firms and technology companies. Fintech can improve ESG performance by reducing internal financing constraints and increasing government incentives (Du et al., 2022). In India, technology implementation and selective sustainability practises make ESG framework adoption in the service sector difficult (Efthymiou et al., 2023). Fintech has improved financial inclusion in India, especially for the middle class (Asif et al., 2023).

A sustainability data infrastructure framework is needed to address ESG data issues and support disclosure compliance (Duran & Tierney, 2023). Capital market investors value fintech and technology companies based on ESG factors, particularly environmental and governance initiatives (Horobeţ et al., 2023). Fintech can promote green finance and make financial businesses more sustainable (Chueca Vergara & Ferruz Agudo, 2021). Recent research examines how fintech affects ESG performance and financial markets, particularly in emerging economies like India. Research shows that fintech development improves corporate ESG performance by reducing financing constraints and improving environmental information disclosure (Du et al., 2022; Huang, 2025). The implementation of ESG practices in India is time-sensitive, with private banks taking the lead (Prasad & Mondal, 2025).

RESEARCH GAP:

Existing studies acknowledge FinTech's role in green finance and eco-efficiency, but empirical research on FinTech firms' ESG implementation and scaling, particularly in developing

regions, is scarce.

In India, FinTech can improve environmental sustainability, financial inclusion, and ethical governance. However, there is a lack of context-specific research on ESG implementation in the Indian FinTech ecosystem. The literature does not provide enough empirical evidence on how Indian FinTech firms measure, implement, and report ESG metrics, especially in a developing regulatory framework. India's rapid digitalization and deep socio-economic disparities make this gap more significant. The sector's ability to contribute to national sustainability and inclusion goals is limited by inconsistent policy frameworks that do not incorporate ESG considerations into FinTech innovation.

RESEARCH OBJECTIVES:

1. To assess FinTech's impact on India's environmental sustainability.
2. To evaluate Indian FinTech innovations' impact on social inclusion in terms of inclusion of women, rural and unbanked population.
3. To examine FinTech's governance implications for transparency, accountability, data privacy.
4. To identify the most significant risks, gaps, and limitations of aligning Indian FinTech practices with ESG standards.
5. To propose suggestions for policy and regulatory measures to incorporate ESG principles into FinTech platform design, regulation, and expansion in India.

RESEARCH METHODOLOGY:

This study examines fintech and ESG principles in the financial market using a qualitative and exploratory approach. Instead of statistically testing a hypothesis, patterns, thematic insights, and policy implications are identified.

RBI (Financial Inclusion Index, Payment System Indicators), NPCI (digital transaction growth), World Bank Global Findex (inclusion metrics), BIS, and IMF secondary datasets are used in the study. McKinsey, PwC, and KPMG fintech and ESG benchmark reports are used.

The study analyses secondary numerical data like UPI adoption, digital lending growth, and ESG fund flows using Trend analysis.

DATA ANALYSIS, DISCUSSION:

Sustainability and environmental impact are important in all industries, including payments. Oxford Economics studied the environmental impact of cash and digital payments in Italy, Germany, and Finland for the European Digital Payment Industry Alliance (EDPIA).

In Germany, Italy, and Finland, cash payments at the point of sale have a global warming potential 5.9, 2.1, and 23.6 times higher than digital ones. In 17 of 18 environmental impact

categories, digital payments are significantly less harmful than cash payments. Only in Italy does cash outperform digital payments in the impact category of ionizing radiation.

The production of terminals and cards for shop digital payments has the greatest environmental impact. Operation and use of ATMs have the greatest environmental impact for cash payments in shops. Smartphone payments had little impact on global warming potential in 2022, which was surprising. Terminal and card production for shop digital payments had the greatest environmental impact.

Thus, all options that reduce new “infrastructure” are essential to reducing the industry’s footprint. Moving to a cardless system, using smartphone-based alternatives to payment terminals like (non)-digital QR-code stickers by retailers with smartphone payments, and extending payment terminal lifespan are options.

Data centre energy use is crucial during operation. The operation phase has less global warming potential if they are more efficient and use less fossil-based electricity.

Policymakers can reduce digital payments’ impact with regulation. Our results showed that printing paper receipts in all three countries had a greater impact on terminal operation than electricity usage. The requirement to print at least one receipt on paper in Germany worsens the environmental impact of digital payments.

Existing data in India shows the following.

OBJECTIVE 1— TO ASSESS FINTECH’S IMPACT ON INDIA’S ENVIRONMENTAL SUSTAINABILITY.

1. DIGITAL TRANSACTION GROWTH (CASH-TO-DIGITAL SUBSTITUTION)

Digital payment transactions increased 44% from 2,071 crore in FY 2017–18 to 18,737 crore in FY 2023–24, according to the Ministry of Finance. Look at Table 1. From 1,962 lakh crore to 3,659 lakh crore, digital payments increased 11% in FY 2023–2024. Digital transactions are rising due to fintech tools like UPI, online banking, and mobile banking. Demonetization and COVID-19 boosted India’s economy in 2016.

Table1: Digital Payment Transactions

Metric	FY 2017-18	FY 2023-24	CAGR
Transaction Volume	2,071 crore	18,737 crore	44%
Transaction Value	₹1,962 lakh crore	₹3,659 lakh crore	11%

Source: PIB, 2024 (Source: RBI, NPCI & Banks)

Table 2: UPI Transactions

Metric	FY 2017-18	FY 2023-24	CAGR
Transaction Volume	92 crore	13,116 crore	129%

Transaction Value	₹1 lakh crore	₹200 lakh crore	138%
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Source: PIB, 2024

IMPACT ON ESG

Digitization boosts efficiency and the environment. Less cash, paper receipts, and logistics reduce resource use and carbon emissions. Better Aadhaar-UPI integration saved \$41 billion. It reduced waste and leaks in many programs and improved direct benefit transfers. Indian Ministry of Finance, Department of Economic Affairs published 2024 G20 Task Force Report that details how digital payments affect carbon emissions (PWC, 2024). Money, checks, coins, cards, ATMs, branches, and KYC are checked. We should consider data center construction's carbon emissions. In February 2024, PWC published "Impact of Digital Payments on Greenhouse Gas Emissions in India." Fintech makes bank accounts and loans easier to get through PMJDY and PMMY, helping more people join the economy. Socially helping with money and government services.

OBJECTIVE 2 : FINTECH'S SOCIAL INCLUSION IMPACT

Fintech companies are using digital solutions, mobile platforms, and new financial services to change how people and businesses use financial assets. Fintech may help erase borders of unequal access to finance and make the underprivileged a more meaningful part of the economy. The next data shows how technologies are reducing income, geography, gender, education, and other socio-economic disparities and empowering marginalized communities through investments.

1. SCBS HAVE GAINED DEPOSIT ACCOUNTS AS BANKS BECOME MORE ACCESSIBLE AND FINTECH INCLUDES MORE PEOPLE.

Table 3: Bank Account Volume and Value

	The to Total deposits with Scheduled Commercial Banks (Amt. in Rs. Crore)
As on 31-03-2018	1,17,94,005
As on 30-03-2024	2,17,17,259

Source: RBI <https://financialservices.gov.in/beta/en/analytics-banking>

2. RURAL AND SEMI-URBAN BRANCHES CONTRIBUTE SIGNIFICANTLY TO TOTAL DEPOSITS, INDICATING INCREASED RURAL PARTICIPATION IN FORMAL BANKING AS OF MARCH 2023.

Table 4: Deposits by Population Group with All Scheduled Commercial Banks (₹ Crore, as of March 2024)

Population Group	Deposit Amount (₹ Crore)	% Share of Total Deposits
Rural	5,00,000 (approx.)	~23%
Semi-Urban	4,50,000 (approx.)	~21%
Urban	6,00,000 (approx.)	~28%
Metropolitan	5,73,344 (approx.)	~26%

Source: Based on RBI population group-wise deposit data, figures are approximate.

3. GENDER-WISE PARTICIPATION

women's participation in bank deposits has continued to rise. Women own 39.2 per cent of bank account in the country and the proportion is even higher at 42.2 per cent in rural areas, according to a government report. (Table 5)

Table 5: Gender-wise Participation in Banking (Number of Savings Bank Accounts)

Gender	Number of Accounts (in Crores)	% of Total Savings Accounts
Male	45.0	60%
Female	30.0	40%

Source: Ministry of Statistics and Programme Implementation, State-wise and Gender-wise Deposits of Scheduled Commercial Banks

4. SOCIAL INCLUSION-FOCUSED PMJDY SCHEME:

PIB (28 AUG 2024) reports that PMJDY has covered 53.14 crore beneficiaries with Rs. 2,31,236 crore in deposits since its inception. PMJDY bank accounts increased 3.6 times from 15.67 crore in March 2015 to 53.14 crore on 14-08-2024.

Regarding inclusion, 55.6% of Jan-Dhan account holders are women and 66.6% in rural and semi-urban areas.

Table 6: PMJDY data

Financial Year	PMJDY Account (in Crores)	PMJDY Deposits (in Rs. Crores)
2014-15	14.72	15670
2015-16	21.43	35672
2016-17	28.17	62972
2017-18	31.44	78494
2018-19	35.27	96107
2019-20	38.33	118434
2020-21	42.20	145551
2021-22	45.06	166459

2022-23	48.65	198844
2023-24	51.95	232502
Till Aug 2024	53.13	231236

Source: PIB (28 AUG 2024) <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2049231>

5. As shown in Table 7, the Y-o-Y growth rate in PMMY loans clearly shows an upward trend from 2015-16 to 2023-24, indicating an increase in the number of loans being sanctioned and amount disbursed despite some fluctuations in the no. of loans. It also shows increase in loan sizes. Exceptional is the year 2020-21 due to the COVID-19 pandemic observed all over economy. It shows better reach of funds to the micro and small level businesses leading to economic development of country.

Table 7: Details of Loans disbursed under PMMY (FY 2015-16 to 2024-25) Y-o-Y growth rate

Year	No. of Loans Sanctioned (in cr.)	Amount Sanctioned (Rs. Lakh Crore)	YoY Growth Rate (Loans)	YoY Growth Rate (Amount)
2015-16	3.49	1.37		
2016-17	3.97	1.8	13.75	31.39
2017-18	4.81	2.54	21.16	41.11
2018-19	5.98	3.22	24.32	26.77
2019-20	6.22	3.37	4.01	4.66
2020-21	5.07	3.22	-18.49	-4.45
2021-22	5.38	3.39	6.11	5.28
2022-23	6.23	4.56	15.80	34.51
2023-24	6.67	5.41	7.06	18.64
2024-25	5.42	5.49	-18.74	1.48

Source: Annual reports 2024-25, Ministry of Finance, Govt. of India

6. Table 8 (below) shows women's high loan account participation, proving that this scheme has reached women in need. Although their loan share is average 45% over 9 years, their loan size is smaller.

Table 8: Share of Women in total number of Mudra accounts and amount sanctioned

Year	Total - No. of A/c (%)	Total - Sanctioned Amt. (%)
2015-16	79%	60%
2016-17	73%	44%
2017-18	70%	41%
2018-19	62%	41%
2019-20	63%	43%
2020-21	66%	41%

2021-22	71%	49%
2022-23	71%	47.74%
2023-24	63.63%	41.76%
Average of 9 years data	69%	45%

Source: Mudra Annual Reports (2015-16 to 2023-24)

Table 9: Urban vs Rural Bank Account Ownership (Jan 2024, PMJDY Data)

Area	Number of Bank Accounts (Crores)	% of Total Accounts
Rural	22.5	60%
Urban	15.0	40%

Source: PMJDY (Pradhan Mantri Jan Dhan Yojana) official data, Ministry of Finance, Government of India

All the data above shows fintech platforms, especially mobile and digital payment services, have meaningfully advanced inclusion, notably reducing gender disparities in financial access. Fintech facilitators, mobile and digital payment services, have reduced gender gaps in financial services. Fintech instruments reduced entry costs for new entrants, especially rural and pre-banked citizens, boosting formal financial system use. Internet accessibility and availability have increased digital transactions with Fintech and sustainable green financing. The fintech infrastructure in non-metro areas is so widespread that rural merchants and consumers can use digital finance. Digital platforms like mobile banking, stock trading apps, and other Fintech enable better investment. Fintech is modernizing the Indian financial scene and opening up previously limited opportunities to a wider audience. Fintech promotes social equity and Sustainable Development Goals (1, 5, 8, 10). Policy synergies like PMJDY, Aadhaar, and UPI have boosted fintech's inclusivity. Rural connect, digital literacy, and data privacy remain issues.

OBJECTIVE 3: ASSESS FINTECH GOVERNANCE

Fintech (financial technology) is bringing lot of innovations like digital payments, robo-advisory, blockchain, neobanking, and peer-to-peer lending. It has proved to be very useful in increasing the reach and access of financial services across the country. Improvement in financial inclusion and efficiency in operation has been evident through data. However it has also posed various challenges for governance.

strong governance is the need of time as it ensures ethical data handling, compliance, and consumer protection, crucial for sustainable trust in financial systems. Board independence, audit committee and executive accountability—areas where fintechs must improve. Transparency, disclosure, and responsible reporting are important for sustainable finance. Ensuring digital governance (algorithmic transparency, AI ethics) is now an essential component of ESG frameworks. ESG-aligned governance requires balancing profit motives with societal interests.

Different Indian regulators oversee fintech. In India, the RBI manages the currency, credit, and monetary policy, while SEBI manages the capital market. PFRDA manages India's pension system. The Indian insurance industry is regulated by the IRDAI. Other self-regulatory groups do this. Depending on the business and industry, one or more of these regulators may control

fintech companies. A stockbroking fintech will be regulated by the stock exchanges, SEBI, the Ministry of Finance, and MeitY. However, IRDAI, the Ministry of Finance, MeitY, and self-regulatory groups like the Insurance Brokers Association of India will regulate insuretechs.

Different regulators and rules cover different fintech business parts, complicate things. But Government is trying to regularise it through RBI Act, 1934, SEBI Act, 1992, PMLA, Companies Act, 2013, IT Act, Foreign Exchange Management Act, 1999, KYC Master Directions, 2016, and others. Recent laws include the Payment and Settlement Systems Act, 2007, the Digital Personal Data Protection Act, 2023 ("DPDP Act"), the IRDAI (Insurance Web Aggregators) Regulations, 2017, the RBI Guidelines on Regulation of Payment Aggregators and Payment Gateways, 2020 and so on. In May 2024, the RBI finalized guidelines for a Fintech Self-Regulatory Organisation (SRO-FT) to establish sector-wide conduct standards.

With government initiatives governance in fintech is becoming more structured and proactive with mechanisms such as SROs, DPDP Act and their stronger enforcement.

Still, risks of fraud, loopholes in laws, and data privacy issues raise some concerns.

OBJECTIVE 4: TO IDENTIFY THE MOST SIGNIFICANT RISKS, GAPS, AND LIMITATIONS OF ALIGNING INDIAN FINTECH PRACTICES WITH ESG STANDARDS.

According to (CERT-In, 2025), out of all reported fintech frauds, phishing attack are 38% where fraudsters pose as RBI and UPI support desks and use advanced methods like deepfake texts and videos to target users, especially in smaller cities.

(RBI, June 2025) reported that account takeover (ATO) frauds increased by 310% year-on-year, particularly affecting neobanks and digital wallets.

Data presented by government in the Lok Sabha session shows that India lost ₹107.21 crore to cyber fraud in the first three quarters of FY 2024-25, with 13,384 cases as reported by commercial banks and financial institutions between April and December 2024.

Despite of the benefits of fintech enhancing ESG goals achievement, following risks and gaps are still observed:

- Awareness of Cybersecurity & increase in Financial Fraud is an evident risk. In this context G-aspect faces performance pressure.
- Data Privacy & Ethical Use is another risk. Unauthorized data disclosures in instances like Razorpay sharing donor details, Mass data exposure of Aadhaar data raises the concern over implementation data privacy acts.
- Due to multiple co-existing regulations, data governance remains a significant ESG challenge.
- Bias in AI algorithms poses a risk of unethical decisions

While digital innovation has enhanced inclusion and supported ESG goals, risks of cybersecurity threats, ethics in use of data and decision making, regulations enforcement, and algorithm-

mic biases of AI remains the challenges for integration of ESG- reliable systems.

Strengthening governance through transparent and rigorous implementation of laws and regulations with mandatory disclosures, informed consents of users, stricter licensing, debt recovery norms, screening of new fintech apps, and advocating explainable models of AI will help in dealing with these risks.

OBJECTIVE 5: TO PROPOSE SUGGESTIONS FOR POLICY AND REGULATORY MEASURES TO INCORPORATE ESG PRINCIPLES INTO FINTECH PLATFORM DESIGN, REGULATION, AND EXPANSION IN INDIA.

The major shortcomings of India's fintech ecosystem that hinders ESG goals are identified as follows. Further recommendations are given as follows:

ESG goals	Risks	Recommendations
Environmental	Lack of green benchmarks; energy-heavy infrastructure	<ul style="list-style-type: none"> Green fintech efforts should be given incentives Fintech firms must do Mandatory disclosures of sustainability metrics implemented Subsidies/ tax exemptions can be provided for energy-efficient infrastructure used by fintech.
Social	Digital divide, algorithmic bias, predatory lending	<ul style="list-style-type: none"> Use of local languages, voice-based UI can help further social inclusion Financial literacy programs to increase users awareness of digital systems and cybersecurity. Central grievance redressal portal to be set for all licensed digital lending platforms. Fintech performance metrics to be given as targets for more participation of unbanked or backward population
Governance	Data privacy issues, regulatory fragmentation, fraud	<ul style="list-style-type: none"> Strengthen enforcement of Data Privacy under DPDP Act. Credit score, E-KYC etc. must be transparent AI Monitoring of digital transaction for security enhancement Complaint tracking and redressal system at central level

Further it is recommended that Indian Fintech should be aligned with Global ESG and Fintech standard. Fintech policies should be aligned with SDG 8, 10 and 13. ESG audit should be conducted for Fintech and their ESG-compliant performance should be incentivised. ESG integrated Fintech will definitely receive enhanced public trust and strengthen financial resilience.

CONCLUSION:

This study highlights the potential of fintech in driving sustainable and inclusive finance through integration of Environmental, Social, and Governance (ESG) principles. Fintech innovations, especially in digital payments systems has improved financial inclusion, and significantly contributed to environmental sustainability by reducing paper-based cash transactions. Social inclusion is enhanced by bridging access gaps across gender and rural divides. It has also helped to strengthen governance through enforcement of regulatory frameworks and self-regulatory organizations.

However, the study also highlights ESG risks persistent in fintech ecosystem. Cyber fraud, data privacy violations, biased decision-making by algorithms and issues in digital ending practices raise the concerns in ethical and transparent applications of fintech and long term sustainability. A robust policy and integrated regulatory framework which will ensure strict implementation of ethical standards and practices in fintech, making ESG disclosures mandatory are required. Ethical, accessible fintech services and data privacy will make fintech more appealing to public. Transparency in governance and accountability for customer complaints resolution will this system more reliable.

When fintech regulatory frameworks will be aligned with global ESG standards and green innovations in the applications of fintech are promoted, fintech will essentially contribute towards economic growth, as well as sustainable development. Integrating ESG principles in fintech governance is important for empowering underserved population, build environment-friendly infrastructure, reducing cyber fraud and meet the ESG goals of India.

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Aligning Nutrition with Sustainability: A Case Study Approach to ESG in India

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Aligning Nutrition with Sustainability: A Case Study Approach to ESG in India

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ABSTRACT:

The booming wellness economy has put the spotlight squarely on sustainability and responsible business practices, especially among India's rapidly expanding nutrition startups. This paper explores how new Indian wellness brands are incorporating Environmental, Social, and Governance (ESG) principles into their daily operations, transforming the traditional approach to health entrepreneurship. As consumers become increasingly eager for transparency, clean ingredients, and ethical practices, startups like OZiva, Plix, Wellbeing Nutrition, and Curefoods are influencing dietary choices, they're reimagining how businesses can serve both society and the environment. Using a comparative case study approach, we look at efforts around eco-friendly packaging, energy-saving manufacturing, comprehensive hiring policies, consumer awareness campaigns, and transparent governance. While many startups are making impressive strides, they still face challenges like limited access to green infrastructure, a lack of clear ESG benchmarks, and high compliance costs. We've pieced together insights from publicly available data, industry reports, and ESG disclosures to emphasize both the innovative strides and some inconsistencies in current practices. By spotting the gaps and the drivers of growth, we propose a clear path forward—one that includes supportive policies, active investor engagement, and stronger partnerships across sectors. At the end of the day, this work shows how nutrition startups aligned with ESG values can do more than improve health they can also help move India toward bigger goals of sustainability and social fairness.

Keywords: ESG, nutrition startups, sustainability, wellness industry, clean label, governance, India

INTRODUCTION

As people become more conscious of their health, the environment, and doing what's right, the world of nutrition is shifting in a pretty big way. These days, it's not just about what we eat, it's about how our choices align with our values. We're seeing a new wave of startups stepping into the scene, blending innovation with ethics and sustainability. They're not just adapting to new diets; they're shaping what consumers want through fresh, responsible business ideas. Inter-

estingly, this movement ties into ESG principles traditionally a big deal for major corporations but now, even small startups are jumping on board, embedding these values into their DNA. India is leading the charge in this wellness revolution. With more people accepting healthy lifestyles, a booming middle class eager to spend, and a bright startup scene, the country is becoming a hotbed for innovative nutrition brands. Companies like OZiva, Plix, Wellbeing Nutrition, and Curefoods are using tech, influencers, and direct-to-consumer models to connect with health-savvy Millennials and Gen Z. But these startups aren't just about launching cool products; they're also committed to making a difference. They're working on reducing their environmental impact by using sustainable sourcing and eco-friendly packaging, tackling social issues like making wellness accessible to all, and maintaining transparency through clear labels and certifications. That said, these innovative ventures face their own obstacles. Getting funding for ESG initiatives isn't always straightforward; regulations can be unclear, and sourcing sustainable materials can be costly. Plus, existing ESG frameworks tend to cater more to manufacturing giants, leaving a gap when it comes to measuring impact for health and service-focused startups. This can make it tricky for these companies to display their progress and attract investors, especially as they aim to grow. Consumer expectations are also climbing higher. Today's knowledgeable buyers want beyond a product—they want authenticity, purpose, and openness. Social media fuels this demand, spotlighting both successes and missteps in real time. For nutrition startups, ESG isn't just a box to check; it's now part of their brand identity. Ignoring these expectations could mean losing out to competitors and risking their reputation. This paper takes a deep dive into how startups like OZiva, Plix, Wellbeing Nutrition, and Curefoods are balancing wellness goals with ESG commitments. Through case studies, it reveals the challenges these companies face—from operational obstacles to regulatory gaps—and emphasizes best practices and promising opportunities. The goal? To create a blueprint for the next wave of ESG-minded nutrition entrepreneurs. Eventually, this research aims to connect the dots between ESG principles and real-world wellness practices, especially in the Indian context, offering practical insights to help these startups thrive while staying true to their values.

RESEARCH OBJECTIVES

1. To analyze how emerging Indian nutrition startups integrate Environmental, Social, and Governance (ESG) principles into their business operations.
2. To identify sector-specific challenges faced by wellness startups in adopting and scaling ESG practices.
3. To compare ESG strategies across selected startups with a focus on environmental innovation, social responsibility, and governance transparency.
4. To recommend scalable and sector-relevant ESG frameworks tailored to the Indian wellness and nutraceutical industry.

LITERATURE REVIEW

Environmental, Social, and Governance (ESG) frameworks have shifted from simple compliance tools to key drivers of innovation, especially for early-stage businesses. Companies that actively incorporate ESG practices often see improvements in their processes, better risk management, and increased long-term profitability (Eccles et al., 2014).

In the nutrition and wellness space, growing awareness around conscious consumption has made ESG a critical factor in building trust and gaining market share. Brands that align with sustainability tend to enjoy stronger customer loyalty and more meaningful engagement (World Economic Forum, 2020). In India, the wellness startup scene is increasingly recognizing the importance of ESG. Many are adopting eco-friendly packaging, using clean-label ingredients, and practicing transparent communication as standard parts of their brand identity. However, the lack of clear, sector-specific ESG benchmarks customized for the Indian market makes it difficult to evaluate and compare startups systematically (Ghosh & Karmakar, 2021).

Consumer research further emphasizes how transparency about ESG practices influences buying decisions. A global survey showed that 73% of consumers are prepared to adjust their habits if it means supporting environmentally friendly options, indicating a rising demand for ESG-aligned products (Nielsen, 2019).

That said, implementing ESG principles isn't without challenges for startups. Limited financial resources dedicated to sustainability efforts, a shortage of trained ESG professionals, and unclear compliance guidelines designed specifically for wellness entrepreneurs all pose major challenges (Mishra & Jain, 2022). These issues set the stage for this study, which aims to explore how Indian nutrition startups are adopting and practicing ESG principles in real-world scenarios.

RESEARCH METHODOLOGY

This study adopts a mixed-methods qualitative approach to understand how Indian nutrition and wellness startups are integrating Environmental, Social, and Governance (ESG) principles into their business operations and future strategies. This approach allows for a rich exploration of both documented practices and stakeholder perspectives.

Case Selection Criteria: Four Indian startups—OZiva, Plix, Wellbeing Nutrition, and Curefoods—were purposively selected based on their visibility, ESG-relevant initiatives, and diversity in business models within the wellness sector. The inclusion criteria were:

- Active operation in the Indian nutrition/wellness space for a minimum of two years.
- Demonstrated ESG-aligned initiatives such as sustainable sourcing, ethical communication, and inclusive employment.
- Representation across product formats (supplements, ready-to-eat meals, functional beverages).

Data Collection Sources: The data collection was structured into two tiers:

1. SECONDARY SOURCES:

- 1.1 Company websites, blogs, and investor pitch decks
- 1.2 Sustainability and ESG disclosures
- 1.3 News media interviews with founders and executives
- 1.4 Third-party ratings, certifications, and industry reports (e.g., Invest India, Deloitte)
- 1.5 Social media and product packaging content

2. PRIMARY DATA (INTERVIEWS AND SURVEYS WITH CONSUMERS ONLY):

To enhance the credibility of the findings, structured interviews and surveys were conducted exclusively with consumers. The objective was to understand their awareness, perception, and behavioral response to ESG-aligned branding and practices by wellness startups.

2.1. Consumer Interviews: A total of 20 consumers were selected through purposive sampling and interviewed using a semi-structured guide. Questions focused on their awareness of ESG principles, perception of company initiatives, and willingness to support ESG-compliant brands. Interviews were transcribed, anonymized, and analyzed thematically.

2.2. Consumer Survey: A structured survey was disseminated online and offline, collecting responses from 100 consumers. The survey included a mix of Likert-scale, multiple-choice, and open-ended questions covering:

- 2.2.1 Awareness of ESG practices in wellness brands
- 2.2.2 Importance of sustainability and ethics in purchase decisions
- 2.2.3 Trust in ESG claims and desire for third-party certification
- 2.2.4 Influence of ESG factors on brand loyalty and recommendations

Analytical Framework: Data from both primary and secondary sources were analyzed thematically using the following ESG categories:

1. **Environmental:** Material sourcing, packaging innovations, energy efficiency, and carbon footprint reduction strategies.
2. **Social:** Inclusivity, employee wellness, consumer education, and accessibility to underserved populations.
3. **Governance:** Compliance, transparency in labeling, ethical marketing, and consumer data handling policies.

This integrated methodology ensured triangulation of data, allowing for a robust analysis that reflects both documented strategies and lived consumer experiences within the startup ecosystem.

RESULTS AND DISCUSSION

The findings from the study reveal varied levels of ESG integration among Indian nutrition startups, reflecting both the strategic intent and operational limitations within the ecosystem. Insights were drawn from secondary data, such as corporate communications and third-party reports, and significantly enriched through structured survey data from 150 consumers

ENVIRONMENTAL INITIATIVES

Startups demonstrated noteworthy innovations in environmental sustainability, particularly through packaging and ingredient sourcing. OZiva and Plix adopted recyclable and biodegradable packaging materials, with OZiva emphasizing organic and plant-based sourcing. However, only 61% of surveyed consumers were aware of such practices, pointing to a communication gap. While 58%

of respondents were willing to pay a premium for sustainable packaging, many expected clearer certification labeling.

Table 1: Environmental ESG Practices in Nutrition Startups

Startup	Environmental Initiatives	Challenges Faced
OZiva	100% recyclable packaging, plant-based and organic ingredients	High cost of sustainable inputs, limited green suppliers
Plix	Biodegradable sachets, reduced carbon packaging design	Shorter shelf life, fragile packaging integrity
Wellbeing Nutrition	Solar-powered units, eco-friendly secondary packaging	Scaling logistics infrastructure across product categories
Curefoods	Portion-controlled meals, zero-plastic delivery containers	High unit cost for sustainable packaging materials

SOCIAL RESPONSIBILITY

Consumers highly valued social ESG efforts. Campaigns around women empowerment, community nutrition awareness, and mental health advocacy were mentioned as key trust signals in interviews. Survey results supported this:

1. 67% of consumers acknowledged that ESG branding positively influenced their buying decisions.
2. 70% indicated they would recommend a brand more actively if it clearly communicated its ESG values.
3. 33% could recall rural outreach or underprivileged initiatives, pointing to a need for better communication in this area.

Table 2: Social ESG Initiatives in Nutrition Startups

Startup	Social Impact Initiatives	Challenges Faced
OZiva	Women's wellness campaigns, educational blogs and digital outreach	Limited engagement in rural and Tier 2/3 regions
Plix	Influencer-driven youth mental health awareness programs	No formal system to track behavioral or social impact
Wellbeing Nutrition	COVID-19 wellness kit distribution, immunity awareness drives	Outreach is largely urban-centric, lacking rural visibility
Curefoods	Employment of local women in kitchens and delivery services	High attrition, lack of upskilling opportunities for women

GOVERNANCE PRACTICES

Governance-related ESG practices were moderately understood and valued by consumers:

1. 74% believed that wellness brands should publish third-party ESG audit reports to build trust.
2. 45% of respondents expressed confusion about the authenticity of ESG claims, highlighting the demand for transparency and validation.
3. Consumers preferred factual, packaging-based disclosures over promotional claims by influencers, and brands like Wellbeing Nutrition benefitted from holding Clean Label certifications.

Table 3: Governance ESG Practices in Nutrition Startups

Startup	Governance Practices	Challenges Faced
OZiva	Ingredient traceability, Clean Label certification	No ESG audit or standardized compliance metrics
Plix	Transparent labeling, ethical influencer marketing	Lack of a clear long-term ESG strategy
Wellbeing Nutrition	Third-party lab testing, product verifications	No sector-specific ESG benchmarks for nutraceuticals
Curefoods	Full nutrition disclosure, allergen and content labeling	Absence of external governance assessments or reporting systems

CONCLUSION

This study looks into how emerging Indian nutrition startups are aligning their business practices with ESG principles. Examining brands like OZiva, Plix, Wellbeing Nutrition, and Curefoods, it’s clear that while many of these companies are committed to sustainability, inclusivity, and good governance, the level of integration varies quite a bit. What’s impressive is their environmental initiatives—things like using recyclable and biodegradable packaging, switching to solar-powered facilities, and reducing emissions in logistics. On the social side, efforts such as wellness campaigns, promoting women’s employment, and mental health programs show a real move toward social responsibility. When it comes to governance, practices like obtaining clean-label certifications and clear, transparent labeling suggest a shift toward more responsible communication with consumers. That said, the study also points out some gaps. The lack of industry-specific ESG frameworks for the wellness sector makes it difficult for startups to compare, set benchmarks, or scale their efforts effectively. Most of these brands don’t have formal ESG audits or impact measurement tools in place. Challenges like the high cost of sustainable packaging, fragmented supply chains, and limited awareness among investors also slow down progress. Despite these obstacles, there’s a lot of potential in this space. With consumers increasingly seeking products that are clean-label, ethically sourced, and environmentally friendly, startups that prioritize ESG early on could build stronger brand trust and attract more investment over time. To really release that potential, there’s a need for better policy support, financial incentives, more investor engagement, and platforms for sharing knowledge about ESG approaches in nutrition. Collaborations between government and private players could also help create a clearer, more sustainable path forward. Overall, ESG isn’t just a passing trend for India’s nutrition startups; it’s becoming a driving force for meaningful transformation. With the right support and strategic focus, these companies could set global standards for sustainable

health entrepreneurship.

LIMITATIONS OF THE STUDY

1. The study is based on secondary data, which may not reflect internal ESG processes or informal initiatives undertaken by startups.
2. The case study method, while insightful, restricts the generalizability of results across the broader wellness startup ecosystem.
3. ESG practices in the nutrition sector lack standardized benchmarks in India, limiting objective evaluation.
4. Rapidly evolving business models and practices may render some findings time-sensitive.

FUTURE SCOPE OF THE STUDY

1. Future research could include primary data collection through interviews and surveys to gain deeper insights into ESG implementation.
2. Expanding the sample size to include more startups will improve generalizability and comparative robustness.
3. Developing a tailored ESG assessment framework for the wellness and nutraceutical sector could guide consistent measurement.
4. Longitudinal studies can track the evolution of ESG strategies and their business impact over time.

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A Study on the Consumer Awareness Towards Digital Banking Fraud in Mumbai MMR Region

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A Study on the Consumer Awareness Towards Digital Banking Fraud in Mumbai MMR Region

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ABSTRACT:

Digital Banking Frauds have increased with the growth in digital transaction. Scammers are finding new technique to trick victim and steal their hard earned money. Some of the strategies that unsuspecting client fall for include spoofing, ransomware, phishing, malware, and identity theft. Primarily, there are a number of factors which contribute to the rise in digital banking fraud including lack of advanced digital hacking techniques, which give rise for quick money, and psychological manipulation.

The objective of this research is to explore customer awareness knowledge of online banking frauds. Additionally, it aims to investigate the typical behaviours, attitudes and activities of the clients that probably reflect their level of readiness to deal with digital banking frauds. This research finding depict that a consumer awareness of digital banking is significantly impacted by age, gender, occupation, level of education and income.

Keywords: Online Banking, frauds, digitisation, awareness, preparedness.

INTRODUCTION

India is currently at the forefront of the digital revolution, with the banking and payments space leading the bandwagon. Digital payment transactions have grown to 8,840 crores in FY 2021-22 from 2,071 crores in FY 2017-18 (pib.gov.in). Digital banking offerings have not

only reduced operating costs for the banks in terms of physical infrastructure but have also resulted in customer delight with banking now at a fingertip. Bank applications have become a one-stop solution for a range of financial needs (savings, investments, credit, insurance, utility, and other payments). Technology, which earlier acted as a support function for banking services, has now become the basis of all bank offerings.

The rapid digitization of banking services has also resulted in increased occurrences of digital banking fraud. Digital banking frauds (card and internet payments) accounted for almost 50% of the total fraud cases in the banking system (Indian Express, 2023)

THEORETICAL BACKGROUND

The Fraud Diamond Model is a theory applied in the evaluation of fraud risk assessment. Another name for the fraud diamond model is the fraud triangle model. This model was developed by Donald Cressy in 1951. This model is used to explain the occurrence of fraud from many different angles.

This model considers three important elements such as pressure, attitude, and rationalization. Pressure focuses on the financial or personal problems that an individual might face, which might force them to commit fraud. There are numerous situations where an individual might face financial difficulties, such as personal debt, addiction, a lavish lifestyle, or other problems that create a need for money.

Another reason people are drawn to commit fraud is the easy money available. Lack of internal controls, an uncertain future, and easy access to confidential information are the reasons that contribute to the presence of fraud opportunities.

The third angle seen in this process is rationalization. It involves personal justification, which an individual gives themselves, that committing fraud is not ethically wrong or is an essential thing for survival. Some individuals feel that this kind of crime is a temporary phase and convince themselves that this fraud is a victimless crime.

LITERATURE REVIEW

1. TYPES OF DIGITAL BANKING FRAUD

Digital banking frauds have increased drastically with the major adoption of online banking services. Most common fraud include are phishing, SIM swapping, malware and vishing. As drawn by Mandi (2010) and Yazdanifard.et.al.(2011),online transaction ,although have offered speed and convenience, have also resulted in serious issues like cyberattacks, scams and fraudulent malware campaign.Cavaliere.et.al.(2021) have pointed to an increase in cybercrimes with major internet penetration and transaction volumes, particularly in metro cities like Mumbai.Alsatad & Bilgrami.et.al.(2017) elaborates phishing as a dominant mode of fraud, where fraudsters cheats users by pretending to be legitimate bank representatives to steal confidential data.

Technological Innovations have also led to complex issues like spoofed websites (Grazioli& Jarvenpoa,2000) ,social engineering (Dzomira,2014) and Trojan-based attacks (Ahmed.

et.al.,2021).Ali,Hussin &Abed (2019),mentions that no single technique can currently prevent all types of online frauds, indicating the persistent and evolving nature of digital threat.

2. CONSUMER AWARENESS

The role of consumer awareness in digital fraud preventions are frequently discussed. Ahmed.et.al.(2021) found that although the case of reported fraud is increasing, consumers are now more alerts because of awareness campaigns and experience. Even though, this awareness changes based on education, digital literacy, and prior exposure. Ratha (2016) and Gudup (2016) states the importance of consumer protection and the needed for banks to prioritize security and awareness initiatives.

Tiwari & Sharma (2021) mentioned that despite the growth of mobile apps for routine banking, many consumers lack awareness about safety practices, making them vulnerable to fraud. On the other hand, Menezes and Pinto (2016) mentioned that digital banking requires continued awareness and vigilance from consumers ,particularly with regards to protecting personal data.

Many studies ,including Zaabi & Tubarshat (2015),have criticize traditional awareness programs, and supported advanced tech-driven awareness strategies to build customer trust. Dzomira (2017) and Chirmake.et.al (2006) on further note call for greater transparency and real-time fraud education from banks.

3. PREVENTIVE MEASURES

Banks and financial regulators have adopted various technique and strategies to prevent digital fraud. For example,RBI guidelines and APEX Court rulings implemented a “zero liability” policy for unauthorized transaction, transferring accountability to banks unless customer negligence is proven.(Rathna,2016).

Ahmed.et.al.92021) evaluated 42 preventive tools including encryption ,education campaign, and secure authentication technique .Software Tools like encrypt and anti-spyware solutions are developed to detect and block phishing or malware attacks.(Yazdani ford, Yusoff & sade,2011).

Ali,Hussina Abed (2019) stated that though technical innovation exist, their effectiveness is inconsistent.Eneji.et.al.(2019) stated that biometric security and behavioural data can be applied to detect suspicious activity. On the other hand, Joshi & Kumar (2020) were in the support for continuous training of consumers to mitigate hacking, phishing and cyber-attack risk.

4. TECHNOLOGICAL INTERVENTIONS

Modern digital fraud preventions depends on AI,machine learning and blockchain. Zhor.et.al.(2021) mentioned that future fraud detection will be made advanced through Ai-based system.Yu & Asgarkhani (2015) supported their arguments that trust-building technology (such as structural assurance and situational normality) can help reduce perceived risk among customers.

Chang (2008) mentioned that fraudsters exploit consumer-behaviour and decision-making biases, making psychological factors important for fraud detection. Wang, leh & Yap (2009) found that adoption of e-banking depends on perceived risk, not only just technological readiness. So it is necessary to pair tech solutions with consumer trust-building efforts.

5. RESEARCH GAPS

Despite end number of studies focusing on digital fraud and cybersecurity, there are hardly any empirical studies focussing on consumer awareness and preparedness in the Mumbai Metropolitan Region (MMR). Although earlier research (Saxena,2020;Iyer.et.al.,2021) discussed digital frauds broadly ,few have analysed correlation between demographic factors (gender,income,digital comfort etc.) and consumer awareness levels in a metro-specific context .On the other hand ,most of the studies lack a micro-level analysis of consumer preparedness or behavioural responses post-fraud exposure, which is important for policy and banking sector intervention.

RESEARCH OBJECTIVES

Hence filling the existing gap, the research objective is framed based on it. The research objectives of this paper are as follows:

- To study the respondent's awareness of frauds involving digital banking.
- To evaluate the preparedness level of the respondents to tackle digital banking frauds.
- To determine whether there is any correlation between awareness levels towards digital banking frauds and factors like gender, age, income levels, comfort and frequency of digital banking transactions etc.

RESEARCH METHODOLOGY

Researchers have used a combination of primary and secondary data for research purposes. Primary research has been conducted using a structured questionnaire that had dichotomous questions, likert scale- based questions, and multiple -choice questions. The sampling type selected for this research was stratified random sampling. We sent a google form questionnaire to 105 people, out of which 99 people responded to it. This data was collected from people who are residing in MMRDA regions such as Mumbai, Thane and Navi Mumbai. Secondary data was collected from journals, magazines, and newspaper articles. Here analysis has been conducted using pie chart and for validating hypothesis testing multiple regression has been conducted.

HYPOTHESIS

H_{01} : Age has no impact on consumer awareness of online banking fraud.

H_{11} : Age has an impact on consumer awareness of online banking fraud.

H_{02} : Gender has no impact on consumer awareness of online banking fraud

- H₁₂: Gender has an impact on consumer awareness of online banking fraud.
- H₀₃: Occupation has no impact on consumer awareness of online banking fraud.
- H₁₃: Occupation has impact on consumer awareness of online banking fraud.
- H₀₄: Education has no impact on consumer awareness of online banking fraud.
- H₁₄: Education has impact on consumer awareness of online banking fraud.
- H₀₅: Income has no impact on consumer awareness of online banking fraud.
- H₁₅: Income has impact on consumer awareness of online banking fraud.
- H₀₆: Higher frequency digital transaction has no impact on consumer awareness of online banking fraud.
- H₁₆: Higher frequency digital transaction has impact on consumer awareness of online banking fraud.

DATA ANALYSIS AND INTERPRETATION

1. USAGE PARAMETERS

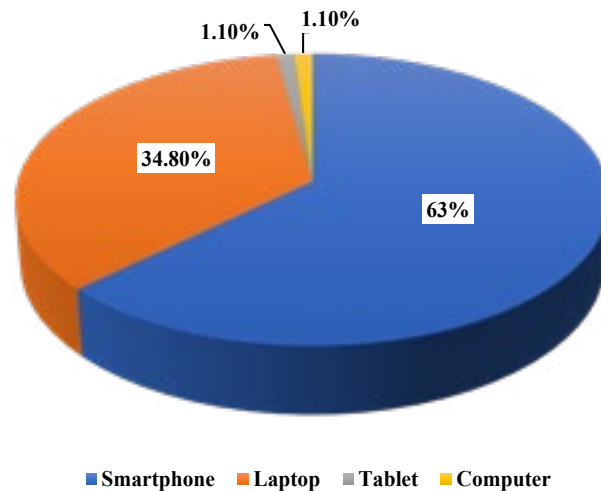


Figure 1: Device used for digital banking

It can be elaborated from Figure 1 that a smart phone is a preferred device for digital banking transactions, with almost two third of the respondents using the device, followed by laptops. This underlines the technological advancements in mobile applications as well as the ease of the user interface.

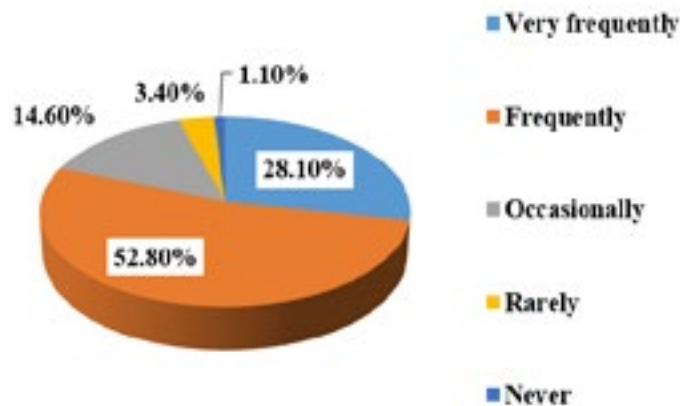


Figure 2: Frequency of use of digital banking

It can be elaborated from figure 2 in terms of the frequency of the digital banking transactions; around 75% of the respondents do the transactions frequently or very frequently, underlying the confidence of customers in the digital banking platforms. This significantly reduces the need for physical banking infrastructure (bank branches).

2. PROACTIVE MEASURES / ALERTNESS TOWARDS ONLINE BANKING FRAUDS

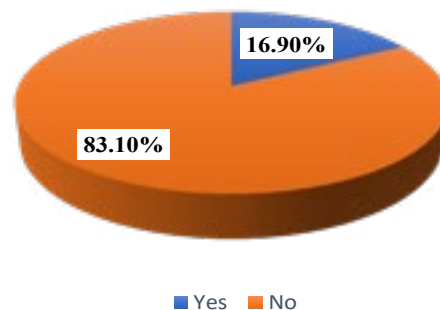


Figure 3: Use of Public Wi-Fi network

Here, it can be stated from Figure 3 that the majority of the population does not prefer public wifi for security purposes. But still, around 16.9% of the respondents are using public wifi and should be aware of its consequences.

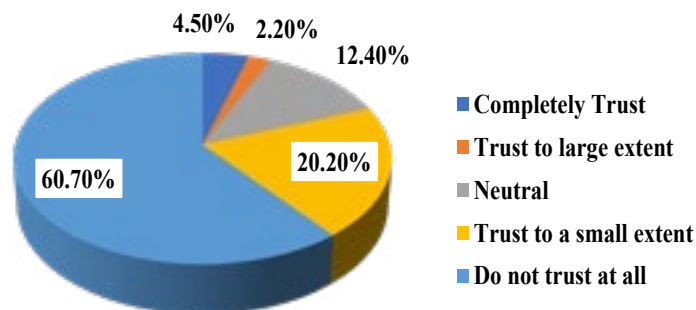


Figure 4: Trust on Public Wifi

It can be stated from Figure 4 around 80% of the respondents do not use the public wifi or do not trust the public wifi for online banking transactions. This indicates that respondents are fairly aware of risk posed by the public wifi, especially considering the transactions are financial in nature.

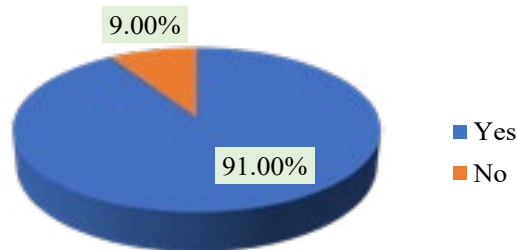


Figure 5: Awareness of 2 Factor Authentication

It can be elaborated from Figure 5 that vast majority of the respondents (90%) are aware of 2 factor authentication.

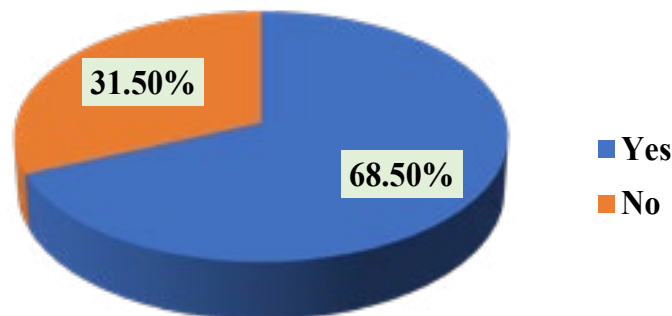


Figure 6: Is 2 Factor Authentication Time Consuming

It can be stated from Figure 6 around 70% of the respondents do not think 2 factor authentication is time consuming. This question holds significance since there is a tendency for people to become impatient when it takes time to login into the accounts and some scammers may trick people into fraud using this impatient attitude.

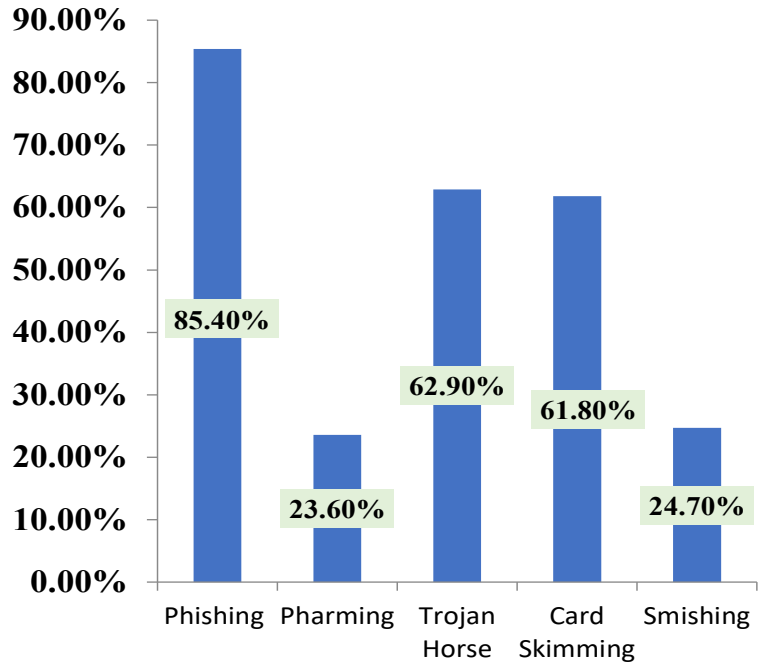


Figure 7: Awareness of online banking fraud

It can be stated from Figure 7 that the vast majority of respondents (around 86%) were aware of phishing, followed by card skimming and Trojan horse (around 60%). Respondents were less aware of pharming and smishing (around 24%). The range of responses indicates that there is still a lot of room to create awareness about these online banking fraud techniques.

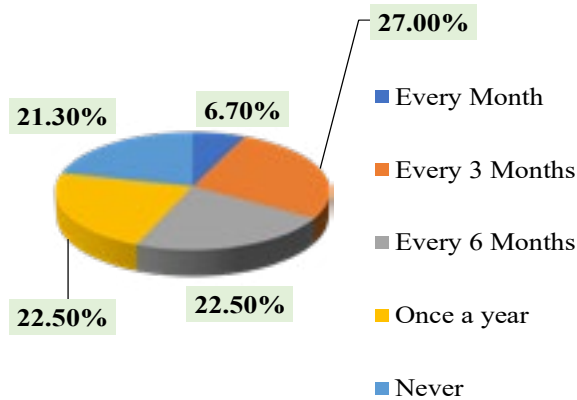


Figure 8: Frequency of changing password

It can be stated from Figure 8, that the majority of respondents prefers online transactions to be carried out on a 3 months' basis. The next respondent prefers transactions that can be carried out once a year or every 3 months' basis.

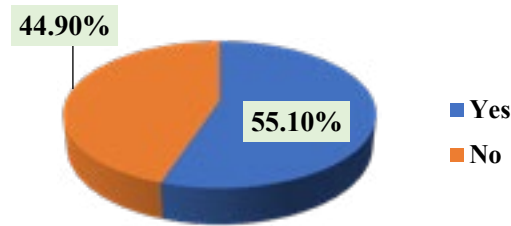


Figure 9: Awareness of bank initiative to tackle online banking fraud

As elaborated in Figure 9, around 45% of the respondents (a significant number) are not aware of initiatives taken by their respective banks to tackle the menace of online banking fraud. Banks are expending resources in this area, but the impact is not seen as inferred from the above responses

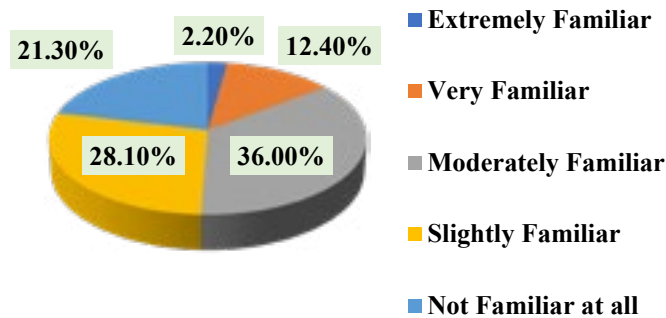


Figure 10: Familiarity of bank’s online banking fraud reporting process

It can be elaborated from Figure 10 that, on similar lines, 50% of the respondents have little or no idea about the process of reporting fraud to the banks. This re-emphasises the need for banks and regulator to create awareness.

Table 1: Summary Hypothesis Testing Finding

Factor	P Value	Action	Result
Age	<.05	Null hypothesis rejected	Age has impact on the preparedness towards mitigating digital banking fraud
Gender	<.05	Null hypothesis rejected	Gender has impact on the preparedness towards mitigating digital banking fraud
Occupation	<.05	Null hypothesis rejected	Occupation has impact on the preparedness towards mitigating digital banking fraud

Education	<.05	Null hypothesis rejected	Education has impact on the preparedness towards mitigating digital banking fraud
Income	<.05	Null hypothesis rejected	Income has impact on the preparedness towards mitigating digital banking fraud
Frequency of Digital Transaction	<.05	Null hypothesis rejected	Frequency of digital transactions has impact on the preparedness towards mitigating digital banking fraud

CHI SQUARE TEST FINDINGS

Table 2: Age

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Preparedness * Age	99	100.0%	0	0.0%	99	100.0%

This information from Table 2 suggests that data related to age and preparedness to handle online banking fraud, there is no value missing.

Table 3: Age Cross Tabulation

Preparedness * Age Cross tabulation							
Count							
		Age					Total
		18-34	35-44	45-54	55-64	Above 65 years old	
Preparedness	Not prepared at all	8	0	0	0	0	8
	Slightly Prepared	19	7	0	5	6	37
	Moderately Prepared	0	37	1	0	0	38
	Very prepared	0	0	13	1	0	14
	Extremely	0	0	0	2	0	2
Total		27	44	14	8	6	99

As we can categorise from Table 3, that majority of the population belongs from 35 to 44 age group. Here significant population feel that they are slightly prepared or moderately prepared for this situation. In 35-44 age group, majority population are moderately prepared for online banking fraud.

Table 4: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	185.745a	16	.000
Likelihood Ratio	163.250	16	.000
Linear-by-Linear Association	14.245	1	.000
N of Valid Cases	99		

a. 18 cells (72.0%) have expected count less than 5. The minimum expected count is .12.

As we can categorise from Table 4, all the tests, including the Pearson chi square test, likelihood ratio, and linear by linear association depict that both variables have a significant relationship with each other.

GENDER

Table 5: Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Preparedness * Gender	99	100.0%	0	0.0%	99	100.0%

This information suggests that in table 5 data related to gender and preparedness to handle online banking fraud, there is no value missing.

Table 6: Preparedness*Gender Cross tabulation

	Gender		Total
	Male	Female	
Not prepared at all	8	0	8
Slightly prepared	26	11	37
Moderately prepared	20	18	38
Very prepared	0	14	14
Extremely prepared	0	2	2
Total	54	45	99

Table no 6 states that though male population is in majority, there is not much of difference between males and females. If we compare gender wise, females are more prepared compared to male for online banking fraud.

Table 7:Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29.613a	4	.000
Likelihood Ratio	38.817	4	.000
Linear-by-Linear Association	26.650	1	.000
Linear-by-Linear	99		

a. 4 cells (40.0%) have expected count less than 5. The minimum expected count is .91.

Table 7 states that a low p-value suggests that there is a strong association between the categorical variables.

OCCUPATION

Table 8:Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Preparedness * Occupation	99	100.0%	0	0.0%	99	100.0%

Table 8 suggests that data related to occupation and preparedness to handle online banking fraud, there is no value missing.

Table 9: Preparedness * Occupation Cross tabulation

	Occupation					Total
	Employed	Business	Retired	Student	Not Employed	
Not prepared at all	8	0	0	0	0	8
Slightly prepared	28	3	0	4	2	37
Moderately prepared	27	4	3	2	2	38
Very prepared	7	6	1	0	0	14
Extremely prepared	0	0	2	0	0	2
Total	70	13	6	6	4	99

Here from table 9 it can be stated that the majority of the population are employed. Also it seems that the majority of the population are slightly or moderately prepared for the online banking fraud. Since employed people form the major part of survey, statistics shows that preparedness level of them is high to handle online banking fraud.

Table 10: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-square	51.244a	16	.000
Likelihood Ratio	33.709	16	.006
Linear by Linear Association	1.998	1	.158
N of Valid cases	99		

The summary of Table 10 suggests that there is a lack of a significant relationship between variables based on the Pearson chi-square and the likelihood ratio test. Also, a linear-by-linear test suggests that there is a lack of linear relationship between the variables.

DIGITAL FREQUENCY TRANSACTION

Table 11 : Case Processing Summary

The summary of Table 10 suggests that there is a lack of a significant relationship between variables based on the Pearson chi-square and the likelihood ratio test. Also, a linear-by-linear test suggests that there is a lack of linear relationship between the variables.

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Preparedness * Digital Frequency	99	100.0%	0	0.0%	99	100.0%

Table 11, related to individual preparedness to handle online banking transactions and digital frequency of online transactions, is entirely complete. There is no value missing.

Table 12: Preparedness * Digital Frequency Cross-tabulation

	Digital Frequency					Total
	Never	Rarely	Occasionally	Frequently	Very Frequently	
Not prepared at all	1	2	3	2	0	8
Slightly Prepared	0	0	0	31	6	37
Moderately Prepared	0	0	0	19	19	38
Very Prepared	0	0	0	0	14	14
Extremely Prepared	0	0	0	0	2	2
Total	1	2	3	52	41	99

Table 12 depicts that the majority of the population is slightly or moderately prepared for online banking fraud. Also, most of the respondents prefer to do online banking transactions on

a frequent basis.

Table 13: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	107.660a	16	.000
Likelihood Ratio	78.414	16	.000
Linear-by-Linear Association	44.846	1	.000
N of Valid Cases	99		

a. 19 cells (76.0%) have expected count less than 5. The minimum expected count is .02.

Table 13 suggests that all three tests, Pearson chi-square, likelihood ratio, and linear by linear, depict a strong relationship between the two variables.

EDUCATION

Table 14: Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Preparedness * Education	99	100.0%	0	0.0%	99	100.0%

This information related to Table 14 suggests that data related to education and preparedness to handle online banking fraud have no value missing.

Table 15: Preparedness*Education Cross-tabulation

	Education					Total
	Up to High school	Diploma	Bachelor	Master	PhD	
Not prepared at all	2	1	5	0	0	8
Slightly prepared	0	0	23	12	2	37
Moderately prepared	0	0	0	38	0	38
Very prepared	0	0	0	0	14	14
Extremely prepared	0	0	0	0	2	2
Total	2	1	28	50	18	99

Here in Table 15, the majority of the respondents either hold a master's degree or bachelor's degree. Here, the majority of them are slightly prepared or moderately prepared. Here are people who have a master's degree; the majority of them are moderately prepared.

Table 16: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	171.266a	16	.000
Likelihood Ratio	150.233	16	.000
Linear-by-Linear Association	66.207	1	.000
N of Valid Cases	99		

a. 18 cells (72.0%) have expected count less than 5. The minimum expected count is .02.

Table no 16 depicts a significant relationship between the categorical variable being studied, as suggested by the very low value across multiple chi-square tests.

INCOME

Table 17: Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Preparedness * Income	99	100.0%	0	0.0%	99	100.0%

Table 17 analysis suggests that data related to income and preparedness to handle online banking fraud have no value missing.

Table 18: Preparedness*Income Cross-tabulation

	Income				Total
	upto Rs 500000	500000- 10,00000	10,00000- 15,00000	More than 15,00000	
Not prepared at all	8	0	0	0	8
Slightly Prepared	19	11	3	4	37
moderately prepared	0	23	15	0	38
Very Prepared	0	0	1	13	14
Extremely Prepared	0	0	0	2	2
Total	27	34	19	19	99

In table no. 18, the majority of the population falls under the Rs 500000-10,00000 income bracket. The next highest would be people with incomes up to Rs 500000. Here, the majority of them are slightly prepared or moderately prepared for most banking fraud.

Table 19: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	124.229a	12	.000
Likelihood Ratio	125.218	12	.000
Linear-by-Linear Association	53.484	1	.000
N of Valid Cases	99		

a. 12 cells (60.0%) have expected count less than 5. The minimum expected count is .38.

Here in Table 19, the Pearson chi-square suggests that there is a highly significant connection between the variables being studied. The likelihood ratio (chi-square) suggests that there is a significant association between the variables. The linear- by -linear ratio suggests that there is a linear relationship between two categorical variables.

CONCLUSION

Researchers suggest that age, gender, occupation, an individual with a higher frequency of digital transactions, education, and income have a significant impact on consumer awareness of online banking fraud. Further analysis suggests that people in the age group of 35-44 are more prepared to tackle online banking fraud. The overall analysis suggests that males are more prepared to tackle online banking fraud compared to females. The research reveals that salaried people are more prepared to handle online banking fraud compared to businessmen and other occupation-specific individuals. Individuals who are more frequently doing digital transactions are more ready to tackle online banking fraud. It seems educated people, especially those who hold master's degrees, are more ready to tackle online banking fraud. People who fall under the salary scale of Rs. 5,00,000-10,00,000 are more ready to tackle online banking fraud.

Digital banking is no longer a luxury or a service only available to select. Members across social and economic strata are using digital banking (especially payment services) for convenience. The above research highlights that there is still considerable scope to improve awareness of digital banking fraud. Regulators and banks have taken appropriate initiatives on their part. The informative communication can be streamed on television channels and social media platforms more frequently, so that it sticks in the minds of customers.

Scammers will continue to find new and innovative ways to loot gullible customers. Certain attitudes, behaviours, and disciplines, like not using public wifi for financial transactions, changing passwords frequently, not blindly trusting any person or communication related to money matters, greed to make easy money, frequency of use and comfort of digital banking, and constantly keeping an eye or ears open for knowing the fraudulent techniques used by online scammers, can help prepare customers to fight the menace of digital banking frauds in a better way.

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