

INTERDISCIPLINARY DIMENSIONS OF CONTEMPORARY RESEARCH

BUSINESS, ECONOMICS AND SUSTAINABLE DEVELOPMENT PERSPECTIVES

Editors

Dr. V. Dheenadhayalan | Dr. V. Sampathkumari



Published By

Social Science Researchers Foundation - SSRF

Chennai, Tamil Nadu, India

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PREFACE

The contemporary business and economic environment is shaped by rapid technological change, evolving markets, global economic developments, and growing concerns for sustainability. Businesses and economies today face the challenge of achieving growth and competitiveness while addressing social, environmental, and developmental priorities. In this context, interdisciplinary research provides valuable insights into the complex relationships between business, economics, society, and sustainable development.

This book, *Interdisciplinary Dimensions of Contemporary Research – Business, Economics and Sustainable Development Perspectives*, brings together diverse scholarly contributions addressing emerging issues and developments across business, economics, finance, banking, management, entrepreneurship, sustainability, and related fields. The chapters explore contemporary challenges, changing economic conditions, business practices, financial systems, organizational perspectives, and sustainable approaches to development.

The contributions highlight the importance of responsible business practices, financial inclusion, innovation, entrepreneurship, effective economic policies, and sustainable approaches to organizational and societal development. They also examine how changing economic and business environments influence organizations, markets, communities, and broader development outcomes. A key strength of this volume is its interdisciplinary approach, bringing together perspectives from commerce, economics, management, finance, banking, and social sciences. By connecting theoretical perspectives with contemporary issues and practical insights, the studies contribute to a broader understanding of the opportunities and challenges shaping modern economies and businesses.

This Book is intended to serve as a useful academic resource for researchers, faculty members, research scholars, students, practitioners, and policy-oriented readers. It seeks to encourage further research, critical thinking, and informed discussion on business and economic development within the broader framework of sustainability. We sincerely thank all the contributing authors, editors, and academic contributors for their valuable efforts and scholarly contributions. Their collective work has enriched this volume and strengthened its academic relevance.

It is our hope that this book will encourage interdisciplinary research and contribute to a deeper understanding of business, economic, and sustainable development issues in the contemporary world.

Dr. V. Dheenadhayalan
Chief Editor

Dr. V. Sampathkumari
Editor

CONTENTS

Chapter No.	Title	Page No.
1.	Green Business Practices and Sustainable Management Dr. Kavita Arora & Dr. Neeraj Sharma	1
2.	A Study on Job Embeddedness Among Information Technology (IT) Employees in Kerala Surya. S & Dr. Jacob P.M	10
3.	A Study on Digital India: The New Engine of Economic Growth and Development Archana. K & Dr. S. Vennilaa Shree	15
4.	From Paper to Pixels: Evaluating Tamilnadu's Electronic Public Distribution System (TNEPDS) as a Model of Inclusive Digital Governance Mr. Sai Ashwin E & Dr M. Prathapan	19
5.	The Social Stratification of Liquidity: A Socio-Technical Evaluation of Digital Cash Systems and The Resilience of Physical Currency Muthulakshmi R, Bindu Achamma Koshy & Manoj Edward	25
6.	A Systematic Review of Big Data Analytics Techniques for Healthcare Decision Making Ms. Akshata M Pethe	30
7.	Digital Banking and Fintech in India: A Study of Growth Trends and Challenges in The BFSI Sector Mr. Basavaraj Dhavaleshwar & Mr. Amrut Jakkali	37
8.	Employee Well-Being Through Work-Life Balance: Implications for Productivity Ms. S. Vijayalakshmi	43
9.	International Economics and Trade: Strengthening Entrepreneurial Resilience in an Era of Global Conflicts and Economic Uncertainty Mrs A. M. Jamal Aisha Bee Fathima	49
10.	International Economics and Trade: Opportunities, Challenges, and the Future of Global Economic Integration Mrs. Geeta Kotabagi	56
11.	Public Finance and Fiscal Policy In India: A Comprehensive Analysis of Revenue Mobilization, Public Expenditure and Fiscal Sustainability Mr. Pradeep Shankrayya Bannigolamath	60
12.	Application Of Artificial Intelligence in Social Science Research: A Three Tier Framework Analysis G. Krishnaveni	67
13.	Monetary Economics and Banking: Interrelationship, Monetary Policy Transmission and Emerging Challenges Ms. Geeta F. Desai	75

14.	Cybersecurity Systems in Indian Banking: Challenges, Emerging Technologies, And Customer Protection Measures. Dr. P. Iswaryalakshmi & Dr. D. Akila Rani	84
15.	The Evolving E-Commerce Landscape Dr. Sriprasadh K	91
16.	An Analytical Study of Service Quality and Living Conditions in Old Age Homes Dr. Manjunatha M K, Mr. Punyakesh Gowda S, Kusuma C, Manikanta S, Kiran J	97
17.	Human Migration: Causes, Social Issues and Policy Measures Dr. Manjunatha M K, Mr. Shivu M, Mr. Thowsif Ahamed, Mr. H Veeresh, Mr. Prajwal C R	102
18.	A Study on Consumer Awareness and Attitudes Towards Sustainable and Eco-Friendly Products in Kanniyakumari District Dr. V. Leema Glory	107
19.	Drivers and Determinants of Inclusive Economic Growth In India: A Conceptual and Empirical Review Mr. Rameshkumar G.	113
20.	Circular Economy Practices in Artisanal Production: Evidence From Jaipur's Blue Pottery Industry Tanisha Ameriya, Samarveer Singh Shekhawat & Anika Singh	118
21.	Development Vs Sustainable Development With Reference To India Dr. Koel Roy Choudhury	123
22.	Behaviour of Financial and Non-Financial IPO's Earnings Performance Based on Market Timing Mrs. Pavithra Gowtham NS, Dr. Manjunatha MK, Mrs. Mahimamahesh	128
23.	Integrating Knowledge Across Disciplines: New Directions in Contemporary Research Dr. Nidhi Shekhar	133
24.	Interdisciplinary Dimensions of Financial Services: Theoretical Perspectives on Contemporary Research Dr. J. Santhi	142
25.	Effect Of HRIS On Employee Performance - Investigation Among the Bank Employees Dr. A.Yogalakshmi	149
26.	Greenwashing in Sustainable Marketing: Impact on Consumer Trust and Purchase Intention Ms. G Sangeetha & Dr V Shanthi	156
27.	Fintech & Inclusive Banking: The Role of Decentralized Finance (Defi) Protocols in Enhancing Credit Accessibility for MSMEs In Emerging Markets D.Harikesavan, Dr. P. Maria Doss, Dr. V. Dheenadhayalan, Dr. Ahmad Al. Shajrawi	163

CHAPTER – 1

GREEN BUSINESS PRACTICES AND SUSTAINABLE MANAGEMENT

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Abstract

This chapter examines the strategic transition from traditional, linear economic models—characterized by a "take-make-waste" philosophy—to systematic, circular business structures. In the modern corporate landscape, sustainable management has evolved from a voluntary corporate social responsibility (CSR) initiative into a core requirement for long-term financial viability and regulatory compliance. Utilizing foundational frameworks such as John Elkington's Triple Bottom Line (Profit, People, Planet) and Environmental, Social, and Governance (ESG) criteria, the chapter details how organizations can systematically integrate green practices across core operations. Specific focus is placed on operationalizing Sustainable Supply Chain Management (SSCM), reducing Scope 1, 2, and 3 emissions under the GHG Protocol, and leveraging Life Cycle Assessments (LCAs) for eco-design. Finally, the chapter addresses critical implementation challenges, including high upfront capital requirements and organizational inertia, offering strategic solutions for aligning executive incentives with environmental outcomes. Ultimately, the chapter argues that commercial profitability and ecological stewardship are not mutually exclusive, but rather deeply interdependent mechanisms essential for future corporate resilience.

Keywords: Sustainable Management, Circular Economy, Triple Bottom Line, ESG, Sustainable Supply Chain, Eco-Design, Corporate Resilience.

Introduction

In recent decades, businesses have faced increasing pressure from governments, consumers, investors, and society to operate responsibly. For decades, traditional business models operated under a simple, linear premise: take raw materials, make a product, and dispose of the waste. Success was measured strictly by short-term financial returns. These business models focused primarily on profit maximization. Traditional, often neglected environmental and social consequences. However, twenty-first-century market dynamics have fundamentally disrupted this narrow focus. The concept of sustainable development, popularized by the Brundtland Commission Report (1987), emphasizes meeting present needs without compromising the ability of future generations to meet their own needs.

Today, organizations face a convergence of resource scarcity, strict climate regulations, and a profound shift in consumer and investor expectations. Green business practices and sustainable management have emerged as essential approaches for organizations seeking long-term success. These practices not only reduce environmental harm but also improve operational efficiency, enhance corporate reputation, and create competitive advantages. Sustainable management is no longer an exercise in corporate philanthropy or a public relations shield; it is a core strategic requirement for long-term survival. Modern enterprises operate within a complex ecosystem where environmental degradation directly

threatens supply chain stability, resource costs fluctuate wildly, and carbon footprints carry actual financial liabilities. Green business practices represent the operational framework used to decouple economic growth from environmental degradation.

Meaning and Concept

Green Business Practices

Green business practices are environmentally responsible actions and strategies adopted by organizations to reduce their ecological footprint. These practices aim to conserve natural resources, minimize waste, reduce pollution, and promote sustainability throughout business operations.

Examples include:

- Using renewable energy sources such as solar and wind power.
- Reducing paper consumption through digital documentation.
- Implementing recycling and waste management programs.
- Designing eco-friendly products and packaging.
- Promoting energy-efficient technologies.

Sustainable Management

Sustainable management refers to the process of managing organizational resources and activities in a manner that balances economic growth, environmental protection, and social responsibility. To successfully integrate sustainability into an existing corporate structure, management must transition from shareholder primacy to stakeholder accountability.

Two primary frameworks guide this transition :-

The Triple Bottom Line (TBL)

Coined by John Elkington, the Triple Bottom Line expands the traditional measure of corporate success to include three distinct pillars:

1. **Profit (Economic):** The traditional financial bottom line, ensuring the business remains viable, pays fair wages, and drives economic value.
2. **People (Social):** The human capital element, focusing on fair labor practices, community engagement, employee well-being, and safe working conditions.
3. **Planet (Environmental):** The ecological footprint, focusing on reducing waste, minimizing greenhouse gas emissions, conserving energy, and managing natural resources responsibly.

The Circular Economy Model

In contrast, sustainable management champions a **Circular Economy**. This framework aims to eliminate waste by designing products for longevity, modularity, repairability, and ultimate recycling.

Biological materials are returned safely to the biosphere, while technical components are kept within closed-loop industrial cycles without losing their structural integrity.

Importance of Green Business Practices

1. **Environmental Protection:** Green practices help reduce pollution, greenhouse gas emissions, and resource depletion.
2. **Cost Reduction:** Energy efficiency, waste reduction, and resource conservation can significantly lower operational costs.
3. **Regulatory Compliance:** Governments worldwide are implementing stricter environmental regulations. Green practices help organizations comply with legal requirements.
4. **Enhanced Corporate Image:** Environmentally responsible businesses enjoy greater trust and loyalty from customers and stakeholders.
5. **Competitive Advantage:** Sustainable products and services can differentiate a company from its competitors.
6. **Long-Term Sustainability:** Responsible resource management ensures business continuity and resilience.

Principles of Sustainable Management

Sustainable management is guided by several key principles:

Principle	Description
Resource Efficiency	Using resources wisely and minimizing waste.
Environmental Responsibility	Reducing environmental impacts of business activities.
Social Equity	Ensuring fair treatment of employees, customers, and communities.
Ethical Governance	Maintaining transparency, accountability, and integrity.
Long-Term Perspective	Focusing on sustainable growth rather than short-term profits.
Stakeholder Engagement	Involving stakeholders in decision-making processes.

Core Green Business Practices across Operations - Transitioning to a green business model requires systemic overhauls across multiple operational departments.

Sustainable Supply Chain Management (SSCM)

A significant portion of a company's environmental footprint lies within its upstream and downstream supply chains (often classified as Scope 3 emissions). Sustainable sourcing involves:

Supplier Auditing: Requiring third-party certifications (such as Fair Trade or FSC certified wood) to verify that raw materials are harvested ethically.

Localization: Reducing "product miles" by sourcing components closer to end-consumer markets, thereby slashing transportation-related carbon emissions.

Key actions:

- Ethical sourcing of raw materials.
- Reducing transportation emissions.
- Monitoring supplier sustainability performance

Energy Efficiency and Renewable Energy Transition

Decarbonizing corporate operations requires a dual-track approach: reducing energy demand and switching power sources.

- **Demand Reduction:** Implementing smart building systems, automated HVAC controls, and retrofitting facilities with industrial-grade LED systems.
- **Sourcing Pivot:** Shifting corporate energy portfolios toward on-site solar installations or entering into corporate Power Purchase Agreements (PPAs) with wind and solar utilities.

Eco-Design and Green Manufacturing

Eco-friendly products are designed to minimize environmental impact throughout their life cycle.

Features include:

- Use of recyclable materials.
- Energy-efficient operation.
- Reduced packaging.

Sustainable management starts at the drawing board. Life Cycle Assessments (LCAs) are used to evaluate a product's environmental impact from raw material extraction to final disposal.

- **Dematerialization:** Using fewer raw materials to achieve the same structural utility.
- **Nanocomponent Design:** Building products from a single type of material to dramatically simplify the recycling process at end-of-life.

Waste Reduction and Recycling - Businesses can minimize waste through recycling programs, reusing materials, and adopting circular economy practices.

Examples: Recycling paper, plastic, and electronic waste: Using reusable packaging materials: Composting organic waste.

Water Conservation - Water-saving technologies and efficient usage practices help organizations reduce water consumption and protect water resources.

Measuring, Auditing, and Reporting Sustainability - What gets measured gets managed. Without standardized metrics, green business practices quickly devolve into vague assertions, exposing companies to accusations of **greenwashing** (falsely marketing an organization as environmentally friendly).

The ESG Framework

Investors increasingly use Environmental, Social, and Governance (ESG) criteria to evaluate corporate risk and performance.

Metric Category	Key Operational Indicators Evaluated
Environmental (E)	Greenhouse gas emissions (Scopes 1, 2, and 3), water scarcity management, hazardous waste mitigation.
Social (S)	Human rights compliance, workplace diversity, community relations, labor standards across the supply chain.
Governance (G)	Executive compensation alignment with sustainability goals, board diversity, shareholder rights, anti-corruption policies.

Global Reporting Standards - To ensure transparency and comparability across industries, organizations utilize standardized frameworks:

- **GRI (Global Reporting Initiative):** The most widely adopted framework for public reporting on economic, environmental, and social impacts.
- **GHG Protocol:** The standard for quantifying and managing greenhouse gas emissions, breaking them down into direct assets (Scope 1), purchased energy (Scope 2), and indirect value chain impacts (Scope 3).

Conceptual Framework for Green Business Practices and Sustainable Management



Explanation

The framework suggests that green business practices improve resource efficiency and environmental performance. ESG integration acts as a strategic mechanism through which organizations implement sustainable management practices. These practices contribute to economic performance, social responsibility, and environmental sustainability, ultimately leading to long-term corporate resilience and competitive advantage.

ESG Reporting in India and BRSR (Business Responsibility and Sustainability Reporting)

India has emerged as a leader among developing economies in institutionalizing sustainability reporting through the Business Responsibility and Sustainability Reporting (BRSR) framework introduced by the Securities and Exchange Board of India (SEBI). BRSR replaced the earlier Business Responsibility Report (BRR) and became mandatory for the top 1,000 listed companies by market capitalization from FY 2022–23 onwards. The framework provides standardized disclosure requirements related to Environmental, Social, and Governance (ESG) performance, enabling investors and stakeholders to evaluate corporate sustainability practices more effectively.

BRSR aligns Indian sustainability reporting with internationally recognized frameworks such as the Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), and Task Force on Climate-related Financial Disclosures (TCFD). It requires organizations to disclose quantitative and qualitative information regarding energy consumption, greenhouse gas emissions, employee welfare, diversity, ethical governance, stakeholder engagement, and responsible supply chain management.

The introduction of BRSR Core has further strengthened ESG accountability by requiring assessment of key sustainability indicators. This shift reflects growing investor demand for transparent and comparable sustainability data and encourages organizations to integrate ESG considerations into strategic decision-making processes.

Importance of BRSR

- Enhances corporate transparency and accountability.
- Facilitates ESG-based investment decisions.
- Improves stakeholder trust and corporate reputation.
- Supports long-term risk management and resilience.

Aligns Indian businesses with global sustainability standards

Sustainable Management Strategies

Corporate Sustainability Policies - Organizations should develop clear sustainability policies aligned with their mission and values.

Environmental Management Systems (EMS) - Systems such as ISO 14001 help organizations monitor and improve environmental performance.

Stakeholder Engagement - Engaging employees, customers, suppliers, investors, and communities ensures broader support for sustainability initiatives.

Sustainability Reporting - Many organizations publish sustainability reports to communicate their environmental and social performance.

Innovation and Technology - Investment in green technologies, research, and innovation can create sustainable business opportunities.

Challenges in Implementing Green Practices

Despite the benefits, organizations face several challenges:

1. **High Initial Costs:** Green technologies and infrastructure may require significant investment.
2. **Lack of Awareness:** Employees and managers may not fully understand sustainability concepts.
3. **Resistance to Change:** Organizational culture may resist new practices.
4. **Limited Resources:** Small and medium enterprises (SMEs) often have financial and technical constraints.
5. **Measurement Difficulties:** Assessing the impact of sustainability initiatives can be complex.

Opportunities and Benefits

Organizations that successfully implement green business practices can enjoy numerous opportunities:

1. **Market Expansion:** Growing consumer demand for sustainable products creates new markets.
2. **Innovation:** Sustainability encourages the development of new products, services, and business models.
3. **Investor Attraction:** Many investors prefer companies with strong environmental, social, and governance (ESG) performance.
4. **Employee Engagement:** Employees are often more motivated to work for socially responsible organizations.
5. **Risk Reduction:** Sustainable practices help organizations manage environmental and regulatory risks.

Case Examples: Sustainable Practices in Indian Businesses

The operationalization of the Triple Bottom Line and ESG metrics within the Indian corporate ecosystem is best understood through concrete industry benchmarks. Leading conglomerates have transitioned from basic CSR compliance to advanced, quantifiable sustainability frameworks.

Tata Group: Systemic Decarbonization and Resource Stewardship

The Tata Group coordinates its sustainability efforts through Project Aalingana, focusing on systematic decarbonization, circular economy architecture, and resource stewardship across its vast industrial footprint.

- **Carbon Neutrality Commitments:** Under its structured Net-Zero Transition Roadmap, key group entities like Tata Communications have set clear, near-term emissions reduction targets validated by the Science Based Targets initiative (SBTi). The strategy aims to achieve absolute carbon neutrality across Scope 1, Scope 2, and Scope 3 emissions by FY 2030, scaling to full Net-Zero across the value chain by FY 2035.
- **Operational Progress:** Group performance demonstrates a 21% reduction in combined Scope 1 and Scope 2 emissions compared to an FY 2022 baseline. Concurrently, corporate operations have scaled

renewable energy integration, transitioning multiple global offices to 100% renewable energy operations and reducing overall greenhouse gas (GHG) intensity by 29%.

Infosys: Maintaining Mature Corporate Carbon Neutrality

Infosys serves as a premier global benchmark for decoupling information technology operations from environmental degradation, operating under its refreshed ESG Vision 2030 framework.

- **Carbon Neutrality Performance:** Achieving carbon neutrality in fiscal 2020—decades ahead of the 2050 timeline established by the Paris Agreement—Infosys has successfully maintained a net-zero carbon footprint for consecutive fiscal years. The enterprise is actively expanding this framework to become fundamentally "climate positive" by 2030.
- **Energy and Resource Metrics:** Across its Indian technology campuses, 77.7% of all electricity is sourced directly from renewable energy utilities. This infrastructure is supported by 29.7 million square feet of space certified at the highest tiers of green building standards (LEED Platinum/GRIHA 5-star). Furthermore, the company has scaled its climate adaptation mechanisms by creating 40 on-site lakes and ponds, providing a collective rainwater harvesting capacity of 430 million liters.

ITC Limited: Pioneering "Sustainability 2.0" and Circular Manufacturing

ITC Limited represents a unique multi-business corporate case study, managing its environmental footprint through a proactive Sustainability 2.0 agenda aimed at driving deep decarbonization alongside rural livelihood creation.

- **Triple-Positive Multi-Business Metrics:** ITC remains an international corporate anomaly by maintaining its status as a "triple-positive" enterprise—standing concurrently carbon-positive, water-positive, and solid waste recycling-positive for over two decades. Currently, over 52% of the total energy consumed across ITC's massive network of 250+ factories, hotels, and offices is derived from renewable sources.
- **Supply Chain and Infrastructure Innovation:** To build climate-resilient value chains, ITC's Agri-Business leverages ITCMAARS (a phygital ecosystem), making ITC the first corporate entity in India to achieve the global *Farm Sustainability Assessment (FSA) 3.0 Silver benchmark* for crops like wheat and paddy. Within its hospitality infrastructure, the company operates under a strict "Responsible Luxury" ethos; multiple properties within the ITC Hotels portfolio have secured LEED Zero Carbon and LEED Zero Water certifications, representing a global first for the commercial hospitality sector.

These examples demonstrate that sustainability can be integrated into diverse business sectors while generating economic and social value.

Future Trends in Sustainable Management

Recent studies indicate that sustainability reporting quality is becoming an important determinant of corporate credibility and investor confidence. Research on Indian organizations demonstrates that firms

with stronger ESG disclosure mechanisms are generally better positioned to address environmental risks, stakeholder expectations, and long-term value creation. Furthermore, technological innovations such as artificial intelligence, data analytics, and digital ESG platforms are increasingly supporting sustainability measurement and reporting practices

The future of sustainable management is expected to be shaped by:

- Greater adoption of renewable energy.
- Expansion of the circular economy.
- Increased use of artificial intelligence for resource optimization.
- Stronger ESG regulations and reporting standards.
- Growing consumer preference for sustainable brands.
- Integration of sustainability into corporate strategy and governance.

Conclusion

Green business practices and sustainable management are no longer optional; they have become essential for organizational survival and growth. By integrating environmental responsibility, social equity, and economic performance, businesses can contribute to sustainable development while enhancing their competitiveness. Although challenges exist, the long-term benefits of sustainability—including cost savings, innovation, reputation enhancement, and risk reduction—far outweigh the difficulties. Postgraduate students and future managers must understand these concepts to lead organizations toward a more sustainable and responsible future.

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CHAPTER – 2

A STUDY ON JOB EMBEDDEDNESS AMONG INFORMATION TECHNOLOGY(IT)EMPLOYEES IN KERALA

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Abstract

In the contemporary business environment characterized by rapid technological shifts and evolving employee expectations, employee retention has become a critical challenge, particularly within the Information Technology (IT) sector. While human capital is a primary source of sustainable competitive advantage, the IT industry continues to struggle with high attrition rates. This study investigates the role of Job Embeddedness (JE) among IT professionals in Kerala, India. The research focuses on a population of 128,837 employees across Kerala's major IT hubs: Technopark (Thiruvananthapuram), Infopark (Kochi), and Cyberpark (Kozhikode). Grounded in Job Embeddedness Theory, the study explores how an employee's perceived "links," "fit," and "sacrifice"—regarding both their organization and community to influence their intention to stay. A descriptive research design was utilized, with primary data gathered via structured questionnaires. Data analysis was conducted using factor analysis, correlation analysis, and Structural Equation Modelling (SEM) with a sample size of 400 to evaluate the relationships between the dimensions. Findings reveal that Job Embeddedness significantly and positively influences employees, with organizational/community fit and sacrifice emerging as the strongest predictors. Analysis of demographic variables shows that age, designation, and work experience significantly influence JE, whereas gender does not. The study provides actionable insights for HR practitioners to design integrated retention strategies that foster deeper employee attachment and encourage positive discretionary behaviours, ultimately enhancing long-term organizational sustainability.

Keywords: Job Embeddedness, Employee Retention, IT Industry, Kerala IT Hubs, Human Resource Management.

Introduction

Employee retention has long been recognized as a critical factor in organizational success. Human resources constitute the core of any organization's values, ethics, and culture (Widarni, 2021). The loyalty, commitment, and competence of employees determine an organization's long-term performance and sustainability. (Pandita & Ray, 2018; Kim et al., 2017). Understanding the determinants of employee retention is therefore essential to designing effective retention strategies. Previous studies have identified several causes of employee turnover, including job stress, dissatisfaction, lack of commitment, limited career advancement, and poor interpersonal relationships (Firth, 2007; Clarke, 2001).

One construct that provides valuable insights into employee retention is Job Embeddedness (JE). Introduced by Mitchell et al. (2001), job embeddedness describes the extent to which employees are connected to their job, organization, and community. It encompasses factors such as fit, links, and sacrifice, which influence an employee's decision to remain in an organization. In the context of Kerala's

IT parks, understanding how Job Embeddedness influence employee retention is vital for addressing the persistent challenge of attrition. By examining these constructs together, this study aims to identify the key behavioral and attitudinal factors that encourage IT professionals to remain within their organizations. Insights from this research can help IT firms in Kerala design evidence-based retention strategies that promote employee well-being, strengthen organizational loyalty, and enhance overall performance.

Review of Literature

Job insecurity and workplace stress continue to threaten retention rates across industries. Research indicates that heightened insecurity erodes embeddedness, which subsequently weakens employees' intention to remain (Elshaer & Zahra, 2021). Stress undermines employees' sense of fit and diminishes the perceived benefits they associate with their jobs, ultimately lowering embeddedness levels (Martin & Lopes, 2022; Chatterjee & Roy, 2023). As organizations face rising stress-related attrition, enhancing JE has become a strategic tool for preserving stability and retaining key talent. For instance, research indicates that work embeddedness has a negative correlation with turnover intentions and a positive correlation with job performance and organisational commitment (Lee et al., 2004). These findings demonstrate how important it is to take into account a variety of factors, such as interpersonal relationships and the greater community context, when trying to understand employee retention

Statement of the Problem

The Information Technology (IT) sector is characterized by rapid innovation, high competition, and a constant demand for skilled professionals. Despite offering attractive compensation and career opportunities, many IT organizations continue to struggle with high employee turnover, leading to substantial costs related to recruitment, training, and productivity loss. Retaining competent professionals has therefore become a critical concern for organizational sustainability. Job embeddedness—representing the extent to which employees feel connected to their organization and community—plays a crucial role in shaping their decision to stay or leave.

Objectives of the Study

- 1.To study job embeddedness among Information Technology (IT) employees in Kerala
- 2.To assess the impact of demographic factors—such as age, gender, work experience, designation and educational qualification on job embeddedness among IT employees.

Hypothesis of the Study

- H₁₁: Job embeddedness has a significant influence among IT employees.
- H₁₂ Demographic factors (such as age, gender, experience, designation, and educational qualification) have a significant impact on job embeddedness among IT employees.

Materials and Methods

The research focuses on a population of 128,837 employees across Kerala's major IT hubs: Technopark (Thiruvananthapuram), Infopark (Kochi), and Cyberpark (Kozhikode). Grounded in Job Embeddedness Theory, the study explores how an employee's perceived "links," "fit," and "sacrifice"—regarding both their organization and community to influence their intention to stay. A descriptive research design was utilized, with primary data gathered via structured questionnaires. Data analysis was conducted using factor analysis, correlation analysis, and Structural Equation Modelling (SEM) with a sample size

of 400 employees using multistage stratified proportionate sampling technique to evaluate job embeddedness among the employees

Results and Discussions

Objective 1: To study job embeddedness, among Information Technology (IT) employees in Kerala

Job Embeddedness is significantly shaped by all six dimensions of the Job Embeddedness Model, with sacrifice-related factors being the most influential. The organizational context (especially sacrifice and fit) appears more predictive than community links, though both domains matter. The measurement model is psychometrically sound, with strong reliability and acceptable validity across constructs. The findings suggest that retention strategies should prioritize enhancing employees' sense of loss if they leave (e.g., benefits, relationships, recognition) and alignment with organizational/community values. The mean percentage score of level of Job embeddedness of IT employees is 71.16% which indicate that level of Job embeddedness of IT employees is good or medium. One sample Z test and the p value is less than 0.05 and Z value is positive, which indicates that the test is significant. Hence, we reject the null hypothesis and conclude that the level of Job embeddedness of IT employees is more than 50% i.e. good.

Objective 2: To assess the influence of employees' demographic characteristics (like age, gender, work experience, job designation, educational qualification etc.) on their job embeddedness at work.

The second objective examined the influence of demographic control variables— specifically Age, Educational qualification, Job Designation and Work Experience, on Job embeddedness at work of IT employees. The largest proportion of respondents (64%) fall in the 30–36 years age group, showing that the sample is heavily concentrated in this age bracket. Females constitute 55.3% of the sample, indicating a slight majority Males make up 44.8%, showing a relatively balanced but slightly lower representation. The largest group of respondents (48%) hold a B. Tech degree, showing that nearly half of the sample has a technical engineering background. Most respondents (51.5%) are Technicians/Analysts, showing that the workforce is heavily concentrated at the technical/analytical level. The largest group (37.8%) has 2–6 years of experience, showing that most respondents are in the early-to mid stages of their careers.

The analysis was conducted using one-way ANOVA. Age significantly influences Job Embeddedness. Younger employees (18–24, 24–30) are less embedded in their jobs. Older employees (30–36, 36+) are more stable, embedded. Educational qualification significantly influences Job Embeddedness. Diploma holders have the lowest scores, indicating weaker attachment to jobs. MBA/MTech/MSc holders have the highest scores, showing stronger embeddedness. Designation significantly influences both Job Embeddedness. Associates (entry-level) consistently score lowest job embeddedness indicating weaker organizational attachment. Employees with 2–6 years of experience are significantly less embedded compared to all other groups.

Summary of Findings and Suggestions

OBJECTIVE	FINDINGS	SUGGESTIONS
To study job embeddedness among Information Technology (IT) employees.	Job Embeddedness is significantly shaped by all six dimensions of the Job Embeddedness Model, with sacrifice-related factors being the most influential. The organizational context (especially sacrifice and fit) appears more predictive than community links, though both domains matter.	Organizations should align job roles, work values, and career development opportunities with employees' skills, aspirations, and personal values, housing support, welfare programmes to strengthen organizational fit. Retention strategies should prioritize enhancing employees' sense of loss if they leave (e.g., benefits, relationships, recognition) and alignment with organizational/ community values.
Objective 2: assess the influence of employees' demographic characteristics (like age, gender, work experience, job designation, educational qualification etc.) on their job embeddedness at work.	Age, designation, educational qualification, experience has influence on job embeddedness. Gender does not show any significant influence.	Organizations should design differentiated engagement and retention strategies that cater to employees at various career stages, such as mentoring for younger employees and leadership or advisory roles for senior employees. Greater responsibility, autonomy, and participation in decision-making. learning opportunities, career path should be provided across designations and educational qualifications.

Scope For Future Studies

The present study is confined to employees working in Information Technology parks in the state of Kerala. Future research may extend the scope by including samples from other states and regions of the country, which would enhance the generalizability and external validity of the findings. The studies on job embeddedness can be further explored across different industrial sectors such as healthcare, banking, finance, manufacturing, education, and public sector organizations to compare sector-specific dynamics.

Conclusion

According to the findings of the study, the fit and sacrifice dimensions of job embeddedness significantly influence employee retention among IT employees. Employees who perceive a strong alignment between their personal values, career goals, and organizational environment, as well as those

who perceive higher personal and professional costs associated with leaving the organization, demonstrate a stronger intention to remain with their employer.

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CHAPTER – 3

A STUDY ON DIGITAL INDIA: THE NEW ENGINE OF ECONOMIC GROWTH AND DEVELOPMENT

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Abstract

The "Digital India" campaign Launched in 2015, has shifted the country from a traditional economy into a technology-driven, knowledge-based society. This paper examines how localized digital infrastructure, enhanced internet access, and widespread digital literacy drive economic growth across both urban and rural India. By focusing on e-governance, financial inclusion via the Unified Payments Interface (UPI), and rural broadband connectivity through projects like BharatNet, the initiative has built a highly accessible ecosystem. However, this transition is not without hurdles. Issues such as regional infrastructure bottlenecks, cyber security threats, and a persistent digital literacy gap in rural areas continue to limit the program's full impact. This study analyzes these core growth drivers alongside structural challenges, offering strategic recommendations to ensure equitable, long-term economic development.

Keywords: Digital infrastructure, e-governance, digital literacy, rural entrepreneurship, UPI, economic growth.

Introduction

The global economic landscape has changed dramatically over the last two decades, with digital technology becoming a primary driver of national productivity. For a rapidly developing nation like India—home to over 1.4 billion people and a massive youth demographic—harnessing this digital shift is essential for sustainable development. In 2015, the Government of India launched the "Digital India" campaign with a clear mandate: to bridge the stark digital divide between urban and rural populations, modernize public infrastructure, and ensure that government services are digitally accessible to every citizen.

Rather than acting merely as a technological upgrade, digitalization has fundamentally restructured the Indian marketplace. By changing how small businesses operate, how public services are delivered, and how rural communities access financial systems, technology has become deeply embedded in modern commerce. Today, digital tools influence sectors ranging from agricultural supply chains and healthcare delivery to grassroots entrepreneurship and corporate governance.

However, expanding these digital benefits across a vast and diverse country presents significant logistical hurdles. While urban centers have adapted rapidly to a cashless, connected ecosystem, rural pockets still face erratic connectivity, low functional digital literacy, and rising vulnerabilities to cyber fraud. This paper analyzes the multi-layered impact of the Digital India initiative on the country's macroeconomic growth, assesses the structural bottlenecks slowing its progress, and outlines actionable pathways to achieve a truly inclusive digital economy.

Review of Literature

The socioeconomic impacts of India's digital transition are widely documented in recent academic literature. E-governance has emerged as a vital tool for democratic and financial empowerment. Bhattacharya et al. (2020) observed that digitalizing public services significantly minimizes bureaucratic red tape and increases transparency for everyday citizens. However, their research notes that elderly populations and remote rural communities continue to struggle with basic system navigation due to a lack of structured digital literacy programs.

The rapid shift toward digital financial transactions has also brought critical vulnerabilities to light. Yadav and Verma (2018) highlighted that as millions of first-time internet users adopt online banking and mobile wallets, cybercrime and data breaches have spiked. Their study emphasizes that India's data protection frameworks must evolve rapidly to secure sensitive personal and financial information in a massive, diverse user base.

On the entrepreneurial front, digital connectivity has fundamentally changed the startup landscape. Rai and Tiwari (2017) demonstrated that widespread internet access, paired with targeted government frameworks like *Startup India*, has allowed small and medium enterprises (SMEs) to lower their operational costs. Access to scalable cloud computing and digital payment options has enabled local startups to bypass traditional regional barriers and access national markets.

Finally, rural infrastructure remains the deciding factor for equitable growth. Chaudhury et al. (2018) found that expanding mobile internet in rural districts directly boosts local economies by connecting farmers and artisans with direct-to-consumer digital marketplaces. Yet, Pattanaik and Choudhury (2020) caution that these benefits remain unevenly distributed. Their research into "last-mile connectivity" reveals that high-speed internet deployment still lags in geographically isolated regions, threatening to widen the economic gap between urban and rural populations if left unaddressed.

Digital Infrastructure: The Key to Economic Development

At the Center of India's digital transformation is a concerted effort to build robust, physical digital infrastructure. The backbone of this movement is the BharatNet project (originally launched as the National Optical Fibre Network or NOFN), which aims to link over 250,000 Gram Panchayats (village councils) via high-speed optical fiber. This infrastructure lays the groundwork for schools, regional medical clinics, and local administrative offices to operate online.

This expanded connectivity has completely transformed regional commercial dynamics. Reliable internet access has drawn significant private investment into fintech, e-commerce, and agritech. For instance, in rural agricultural sectors, stable internet access allows farmers to bypass exploitative intermediaries. By using mobile applications to check real-time market pricing, monitor weather forecasts, and access scientific crop management advice, rural producers can optimize their yields and secure fairer profits.

Increasing Economic Development Using Digital Services

The rollout of public digital utilities has fundamentally reformed Indian public administration and consumer behavior. Through e-governance platforms like e-Office and e-District, the delivery of official documents, certificates, and welfare benefits has been streamlined, sharply reducing corruption and

administrative delays. To support this, programs like the Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) focus specifically on training rural citizens in functional digital skills. Centralized platforms such as DigiLocker and the UMANG app have also changed how citizens interact with the state by providing secure, paperless access to government services from a single dashboard.

Simultaneously, India's consumer economy has evolved through a payments revolution. The Unified Payments Interface (UPI) alongside platforms like Paytm and PhonePe has driven unprecedented formalization in the economy. UPI now processes over 10 to 12 billion transactions monthly, bringing millions of unbanked street vendors, small traders, and rural consumers into the formal banking system. This shift has not only expanded the national tax base but has also made the distribution of direct benefit transfers (DBT) highly efficient and leak-proof.

Promoting Entrepreneurship and Innovation

By removing traditional barriers to entry, Digital India has sparked a major wave of grassroots entrepreneurship. Low-cost data, paired with scalable cloud infrastructure, allows young innovators to launch digital enterprises with minimal upfront capital. This has driven rapid growth in specialized sectors like fintech, edtech, and healthtech.

This shift is strongly supported by policy frameworks such as the *Startup India* campaign and the *Atal Innovation Mission*, which provide early-stage funding, incubation centers, and mentorship. Today, Indian entrepreneurs are applying cutting-edge technologies like artificial intelligence, machine learning, and blockchain to solve localized structural challenges. These innovations are reshaping supply chain logistics, micro-lending platforms, and remote diagnostic healthcare, making essential services affordable and accessible to the broader population.

Overcoming the Digital Divide: Inclusion of Rural and Urban Areas

A primary goal of the Digital India framework is closing the persistent economic gap between rural and urban regions. For decades, rural populations suffered from systemic underinvestment in technology. To fix this, the government established a network of Common Service Centres (CSCs). These physical, village-level kiosks serve as local digital access hubs where rural residents can easily register for government welfare programs, pay utility bills, and access online banking.

The widespread availability of low-cost smartphones has accelerated this inclusion. Mobile devices have evolved from simple communication tools into essential lifelines for education, telehealth, and financial management. However, ensuring that this digital inclusion is sustainable requires continuous investment to guarantee that rural connectivity remains stable, affordable, and paired with ongoing digital literacy training.

Difficulties and the Future

While the progress of Digital India is undeniable, several major structural issues must be solved to sustain its long-term economic momentum:

The Digital Literacy Gap: While mobile phone ownership has skyrocketed, millions of citizens—particularly in rural districts and older demographics—lack the skills to navigate digital applications

safely. Without functional digital literacy, a large portion of the public remains locked out of the modern digital economy-.

Escalating Cyber Security Threats: The rapid, mass adoption of digital platforms has outpaced public awareness of digital safety, causing a sharp rise in phishing, identity theft, and online financial fraud. Protecting user privacy and building trust requires immediate, major upgrades to national cybersecurity infrastructure and consumer protection laws.

Persistent Infrastructure Gaps: Despite large-scale projects like BharatNet, last-mile connectivity remains unreliable in remote, mountainous, and tribal regions. Unstable internet connections prevent local businesses and schools from fully utilizing digital tools.

Rising Economic Inequalities: Technology can inadvertently widen social divides if access remains uneven. Urban centers and affluent demographics naturally adopt high-tech innovations much faster than underserved communities, risking a new form of digital and economic marginalization.

Scope For Further Study

Future research should focus on gathering empirical, field-level data regarding how digital platforms directly affect employment creation in rural economies. There is a strong need for targeted studies evaluating the long-term effectiveness of digital literacy programs like PMGDISHA in remote regions. Additionally, future research should explore the financial sustainability of public-private partnerships in rural infrastructure, look closely at consumer protections against cyber fraud, and assess how regional fintech platforms can better support women entrepreneurs in the informal sector.

Conclusion

The Digital India initiative has proven to be a defining pillar of modern India's macroeconomic growth. By building out digital infrastructure, supporting a thriving startup ecosystem, and digitalizing public utilities, the program has fundamentally changed the country's economic trajectory. However, technology alone cannot ensure equitable development. To achieve its full potential, policymakers must aggressively tackle the root challenges of rural infrastructure gaps, cyber vulnerabilities, and low digital literacy. By continuously refining and expanding this digital ecosystem, India will protect its domestic economic future and solidify its role as a leading innovator in the global digital marketplace.

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CHAPTER – 4

FROM PAPER TO PIXELS: EVALUATING TAMILNADU'S ELECTRONIC PUBLIC DISTRIBUTION SYSTEM (TNePDS) AS A MODEL OF INCLUSIVE DIGITAL GOVERNANCE

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Abstract

The Public Distribution System (PDS) has proven to be a crucial instrument in India for food security, buy delivery inefficiencies, multiple beneficiaries' identification and leakage have undermined its effectiveness. To solve these systematic system issues, Tamil Nadu's Electronic Public Distribution System (TNePDS) is the major digital transformation project. This case study explores the working mechanism of TNePDS, focusing on beneficiary registration, smart ration cards, Aadhar based system, biometric verification and monitoring system. The study aims to explore the impact of digital technologies on accountability, minimal diversion of commodities and greater transparency in welfare provision, using secondary data gathered from websites and government NFSA dashboards and policy reviews. The findings reveal that Tamil Nadu has been successful in embedding the One Nation One Ration Card (ONORC) scheme, automated almost all fair price shop with electronic point of sale machines and almost all ration cards are digitized, enabling the migrant households to transfer their entitlement. While facing challenges such as failure of biometric identification, low rural connectivity and threats of exclusion, the digital transformation of PDS in Tamil Nadu a strong governance model, balancing efficiency and inclusive. This study contributes to the debate on e-governance by giving lessons learnt for other states seeking transformation of their PDS system and by providing ideas about how technology can enhance the way welfare is distributed

Keywords: Digital Transformation, Public Distribution System, TNePDS, Aadhar, e-Governance, Tamil Nadu.

Introduction

The public distribution system (PDS) is one of the most important social schemes in India, ensuring food security for millions of households. Older distribution methods, however, have been beset by a variety of problems such as leaky ration cards, multiple rations cards, and lack of transparency. To tackle these challenges, the Government of Tamil Nadu launched the Tamil Nadu Electronic Public Distribution System (TNePDS), an initiative that digitizes ration distribution. The solution decreases misappropriation and inefficiency in the system, while also making sure that the benefits are distributed to the right persons using smart ration card, Aadhar linking and biometric verification. This digital revolution is a great step towards better governance and accountability and is applicable in Tamil Nadu as a prime example of how technology can enhance welfare delivery.

Review Of Literature

The digitalization of India's public distribution system (PDS) is always a topic of study that focuses on its transformative potential while it also highlighting its persistent shortcomings. Karthick and

Mayilvaganan (2025) studied the digital ration cards and e- POS machines in Mayiladuthurai district of Tamil Nadu. they found that although literacy and technical problem in rural areas remained, digitization made beneficiary identification more accurate and transport. In an analysis of Aadhaar based biometric infrastructures in the Kerala and Karnataka states for 9 years, Masiero (2020) shows that Aadhar has reduced the number of phantom beneficiaries and diverted funds but also significantly raised the risk of exclusion due to authentication failures and mismatching data.

In line with this, Vashistha, Sengupta and Gadhave (2025) pointed to the benefits of digitalization in enhancing accountability by making supply chains more transparent, reducing leakages, and providing real time monitoring. They also stressed the significance of data analytics. To support the academic perspectives, the press Information Bureau reported that 99.8% of ration cards and 98.7% of beneficiaries across the country had been “Aadhaar seeded,” and that 5.33 lakh e-POS devices were utilized for the distribution of foodgrains, which helped to minimize leakages and ensure portability of ration cards under One Nation One Ration Card (ONORC).

These observations are corroborated by later studies. In a systematic review that was published in the Indian journal of economics and development, devi and Siwach (2023) came to the conclusion that digitization is a “panacea” for many PDS inefficiencies but cautioned that governments need to think carefully about prerequisites before putting them into practice to avoid exclusionary effects. In the same manner, Shubhangi (2024) has analyses various technological reforms such as ONORC portability, digitized ration cards and authentication through Aadhaar which substantially reduced leakages and enhanced transparency but also had the potential to violate the rights of the vulnerable by eliminating formal avenues for grievance redressal.

These studies when taken together indicate that the TNePDS in Tamil Nadu is part of a larger national revolution in moving towards digital governance in food security. Overall, the literature supports that digitisation will enhance productivity, accountability and transparency, but it also emphasises the importance of inclusive design, offline capabilities and continued innovation as well as the risks of exclusion. The dual perspective highlights that digital transformation of the delivery of welfare services is a governance issue that must be managed in ways that balance efficiency and equity, not simply a technological improvement.

History of PDS in Tamil Nadu

The public distribution system (PDS) was first introduction in India as a rational measure to ensure food security during World War II. Over the year it grew into the largest charity programmer in the world, providing subsidized food grains to millions of households. Tamil Nadu has been a forerunner in strengthening the PDS by following a universal PDS approach which benefits all households instead of only those below poverty line

To cut down on duplication and enhance oversight in 2000s, Tamil Nadu started experimenting with computerizing ration records. By 2012, a pilot program to replace paper ration cards with electronic ones that stored household data was in place in the state. It was followed by the launching of the Tamil Nadu electronic public distribution system (TNePDS).

The inclusion of Aadhar numbers to the system was the next significant achievement. Aadhar seeding ensured that individuals got only one ration card and ghost entries were avoided. Fair price stores

implemented with Electronic Point of Sale [e-POS] devices that allow biometric authentication using fingerprints or iris scans in order to increase transparency.

By mid-2010s, Tamil Nadu had automated almost all fair pricing store and all ration cards were fully digitized. Integration with one nation and one ration card (ONORC) and linkage with national food security act (NFSA) database may enable transfer of benefits across state.

Right now, TNePDS is a completely digitalized approach to welfare delivery. It is designed to ensure that food grains are distributed to the right beneficiaries through a combination of smart card, Aadhaar authentication, SMS alerts and monitoring. This shift has also reduced misappropriation and leaks, and Tamil Nadu is now a model state for the effective implementation of food security programs using digital governance.

Timeline

WWII rationing → Universal PDS in Tamil Nadu → Smart Cards [2012] → Aadhaar integration → e-POS devices → ONORC portability

Mission

TNePDS aims to ensure food security to all the households in Tamil Nadu through open, efficient and responsible utilisation of digital technology for distribution of ration benefits. It aims to ensure that subsidize goods reach real and worthy families, cut down on supply chain leaks, and get rid of duplicate beneficiaries.

Vision

TNePDS purpose is to create a digitally powered welfare delivery system and set benchmark for inclusive governance in Tamil Nadu, Aadhar verification, smart ration cards and monitoring from a central point are being used. The long-term plans are to build up e-governance, empower citizen and other states to adopt similar digital innovations in the social sector.

Operational Framework

The Public Distribution System [PDS] of Tamil Nadu was operated with manual ration cards and paper-based register at fair pricing centers in the past. Sales were recorded on paper by the shopkeepers as the beneficiaries presented their cards. Although it was popular, there were problems with commodity diversion, ghost beneficiaries and duplicate ration cards and the absence of real – time monitoring. Lots of opacity and leakages in the supply chain.

The operating model got transformed to a fully electronic one with the launch of Tamil Nadu Electronic Public Distribution System [TNePDS]. Instead of the paper ration cards, families are now registered online and the smart ration cards are issued with QR code on the card. The beneficiaries may be uniquely identified as these are connected with the Aadhaar IDs. Electronic Point of Sale [e-POS] devices used in fair price stores are used for biometric verification of transactions. This way, only real families are able to subsidized goods and misrepresentation is prevented.

The system's centralized database allows the government to track the movement of commodities, monitor stock levels and analyze distribution trends as transactions are recorded in real time. Further the

beneficiaries are provided with SMS alert information about successful transactions and availability of rations thereby enhancing accountability and transparency. Also, migration is not a barrier to access to food due to seamless implementation with the One Nation One Ration Card (ONORC) program.

While there are risks of exclusion due to connectivity challenges and biometric mistakes, this shift reflects the importance of accountability and inclusivity in the governance in the delivery of welfare are seen in the structure of the operations.

Cost Efficiency and Resource Optimization

TNePDS's "revenue model" is best understood as a framework for resource optimization and cost effectiveness because it is a welfare program. Government funding, under the national food security act (NFSA), the Tamil Nadu government provides all of the system's funding, with assistance from the federal government.

The state saves significant amounts of money from leakages, with the elimination of duplicate ration cards and ghost beneficiaries through Aadhar identification.

Operational Efficiency, Centralized monitoring and automation of fair pricing store long administrative expenses, improve logistics and ensure timely commodity distribution.

The costs of smart card, e-POS and biometric systems technology are outweighed by the long-term benefits of reduced misrepresentation and accountability. As such, TNePDS does not directly generate revenue but rather economic value through savings, efficiencies and improved targeting of subsidies such that public funds are effectively used in delivering welfare.

Digital Transformation Strategies

Technology integration, Tamil Nadu has shifted from paper ration cards to smart cards, which were tied to Aadhaar for identification and which contained QR codes. A centralized database keeps track of transactions as they happen and biometric identification through e-POS devices ensure that the entitled beneficiaries receive entitlements.

Distribution of SMS alerts to be beneficiary service to notify households of transaction that have taken place and rations available. By minimizing laborious paperwork and giving citizens self-service choices, online portals and smartphone apps enable households to update information, apply for new cards, and file grievance.

Governance alignment TNePDS is linked to various national initiatives such as one nation one ration card (ONORC) program and national food security act (NFSA). This alignment makes it possible for benefits to be transferred between states, guaranteeing migratory workers 'food security and enhancing welfare service accountability.

Challenges Faced

Technical Challenges - Older people or manual labourers with worn fingerprints may have biometric authentication difficulties should be updated and maintained regularly. These technical problems lower efficiency and interface with the delivery of rations

Social Challenges - Lack of digital literacy in rural and marginalized communities contributes to social challenges and the reliance on middlemen as a barrier to the use of smart cards and grievance resolution. Aadhar seeding sometimes misuses out on the legitimate recipients, because of the data inconsistencies, raising issues of impartiality. The initial acceptance of digital reforms was also hampered by shops and recipients' resistance of change.

Problems of connectivity - The government has expanded the offline transaction capabilities of electronic point -of- sale (eps) system, enabling data to be stored offline and synced up once the internet is restored. crops in rural areas were planted earlier as a consequence, planting delay in rural areas were reduced.

Gaps in digital literacy - Awareness campaigns and assistance desks were created at fair price stores to assist beneficiaries, training programs also boosted the skills of the shopkeepers in using digital system.

Increased grievance redressal system - Families can now submit authentication issues through a stronger grievance redressal system. Beneficiaries should ensure that they update their Aadhaar details / adopt other methods of verification to avoid getting excluded.

The upgrade and maintenance of technical and upkeep difficulties involve the regular updating and maintenance of biometric equipment and e-POS devices. Ration may be difficult to distribute if they are malfunctioning or if there is a lack of technical assistances, especially in remotes areas

Initially, some beneficiaries and owners of fair price shop resisted the digitalization process, preferring traditional methods of paper- based transactions. This resistance will have to be addressed through awareness campaigns and training.

Future Plans

The electronics public distribution system (TNePDS) in Tamil Nadu is still being developed, with plans to integrate more deeply into the technology and governance system and to make governance reforms. Tamil Nadu electronics public distribution system (TNePDS) is still in the process of development, having ambition plans for deeper technological integration and for the governance reforms, allowing beneficiaries to monitor are going to make it more possible for citizens to analyse data from transaction and detect anomalies and predict demand to enhance supply chain efficiency.

The expectation is that the upgrade of biometric equipment to be multimodal (face, iris, fingerprint) will reduce authentication failures and exclude. Enhanced rural connectivity will ensure smooth operations of e-POS in remote fair price shops. Tanzania is therefore set to take tougher measures in tandem to ensure the safety of beneficiary information and ensure the trust of the system.

The vision and future aspiration have policy significance, if a state wants to revamp its PDS, it can take lessons from Tamil Nadu. By outlining the potential for technologically advanced and socially responsive welfare systems, the state provides insights into the possibility of achieving a balance between efficiency and equity in the context of digital governance.

Conclusion

TNePDS has been successful instance of the application of digital governance to transform the Public Distribution System of Tamil Nadu, India. The TNePDS is a successful case of digital governance in the implementation of public distribution system [PDS] in Tamil Nadu India. The shift from paper based to

fully digitalized ration distribution has significantly reduces leakages and eliminated the duplication of beneficiaries, while also ensure the greater transparency in ration distribution. Along with improving accountability, Aadhar, smart ration cards, biometric authentication and centralized monitoring have enabled citizen to have grater access to the system and trust in it. Tamil Nadu, with its pro-active strategies and measures showcases a commitment towards efficiency and inclusivity, even in the face of challenges such as biometric failures, rural connectivity gaps and the potential for exclusion.

The case study high the fact that digital transformation in welfare programs is not merely a technical solution, but also a governance innovation that has the potential to enhance food security and serve as a benchmark for other states. In the end, TNePDS illustrates how- governance can strike a balance between efficiency and justice, guaranteeing that social welfare programs continue to be open and citizen-focused in the digital age.

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CHAPTER - 5

THE SOCIAL STRATIFICATION OF LIQUIDITY: A SOCIO-TECHNICAL EVALUATION OF DIGITAL CASH SYSTEMS AND THE RESILIENCE OF PHYSICAL CURRENCY

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Abstract

As the global financial architecture steers away from traditional, paper-based cash assets toward instant, cloud-native digital payment rails, the structural transformation of money is triggering profound behavioral adjustments across diverse social strata. While conventional financial literature heavily prioritizes transaction velocities and corporate processing speeds, this study takes a step back to examine the deep socio-technical friction between expanding digital cash platforms and physical fiat alternatives. Relying on a mixed-methods approach that pairs a primary consumer survey (N=152) with a meta-synthesis of socio-economic literature up to 2026, we explore how core demographic realities—including age, employment stability, and academic backgrounds—shape a citizen's baseline trust in financial technology. The empirical metrics suggest a distinct societal divide: while electronic payment rails offer unparalleled convenience and frictionless settlement workflows for stably employed, formal-sector professionals, they simultaneously cultivate deep public anxieties surrounding continuous digital monitoring, identity vulnerability, and structural socio-economic exclusion. Conversely, tangible banknotes persist as an essential tool for personal privacy preservation, transparent financial budgeting among university-age demographics, and a critical survival mechanism during sudden technical network blackouts. Ultimately, this paper urges policymakers to pivot away from an aggressive, single-track "cashless" transition, advocating instead for an inclusive hybrid model designed to preserve physical currency pathways alongside on-going digital development.

Keywords: Socio-economic stratification, digital cash, data surveillance, financial inclusion, physical currency resilience, consumer behavior.

Introduction

The fundamental definition of money has always served as a mirror for underlying collective social agreements. From ancient token systems and commodity trade to modern paper banknotes, currency formats act as the structural framework for civic trust, community interaction, and regional market coordination. In our current era, this material baseline is facing a rapid, top-down re-engineering into purely digital cash models, an evolution accelerated by smartphone-based peer-to-peer applications, digital ledger assets, and widespread retail Central Bank Digital Currency (CBDC) frameworks. While corporate financial platforms treat this ongoing migration as a victory for lower operational overhead and settlement immediacy, social scientists are forced to look closely at the underlying human friction. Shifting human interaction away from concrete cash hunderovers toward abstract electronic data streams

changes how everyday citizens experience economic autonomy, personal privacy, and financial security. Hard currency demands absolutely no technological literacy, relies on no network grid, and guarantees complete, untraceable confidentiality. Digital cash platforms, by contrast, convert every routine purchase into a permanent data point, forging a delicate tension between processing efficiency and personal privacy. This study analyses modern consumer experiences to map out the distinct human and demographic forces dictating the survival of physical currency in an electronic era.

Statement of the Problem

The systemic momentum behind digital-only monetary networks risks introducing a deep social division: the technologically enabled majority versus the structurally marginalized minority. Vulnerable populations—such as lower-income households, elderly individuals struggling with complex smart app interfaces, and geographically isolated rural communities with unreliable internet connectivity—face active economic isolation as physical cash deposit points and acceptance channels steadily contract.

Furthermore, replacing cash channels with digital networks fundamentally alters the boundaries of personal privacy. Because electronic transactions leave behind an unbroken data log, they open the door to invasive corporate tracking, targeted consumer profiling, and data monitoring. There is a critical, urgent need to evaluate how distinct demographic segments balance the practical convenience of electronic payments against the psychological safety and fall back reliability provided exclusively by hard currency.

Research Objectives

- To investigate how primary demographic traits (including age distribution, formal employment, and student status) dictate a user's choice between physical banknotes and digital application infrastructure.
- To systematically analyze public anxieties surrounding data security breaches, digital surveillance tracking, and single-point-of-failure network outages across electronic payment systems.
- To draft actionable policy recommendations that expand digital financial inclusion without actively isolating cash-dependent or privacy-focused communities.

Literature Review

Contemporary social science literature has evolved from simply tracking technology adoption curves to questioning the broader human impacts of an algorithmic marketplace.

Socio-Digital Demographics: Contemporary field research reveals a noticeable generational divide in standard transaction behaviors. Younger, mobile-first cohorts express high baseline comfort using digital wallet ecosystems and integrated consumer finance interfaces. However, sociological researchers frequently point out that this tech-forward behavior is highly dependent on a regular, predictable income stream. Individuals managing tight, non-salaried budgets often intentionally depend on the visual, tactile accountability of physical cash to avoid digital overspending and enforce strict limits.

The Surveillance Capitalism Paradox: Within the framework of electronic financial interactions, classic economic theories surrounding surveillance capitalism are highly relevant. Transitioning from tangible

money to digital platforms forces everyday transactions to yield highly detailed behavioral records. While these data points are highly sought after by credit bureaus, data aggregators, and target marketers, they spark constant privacy anxieties among everyday users who object to having their habits logged.

Infrastructure Fragility and Systemic Vulnerabilities: Technical assessments of fully automated payment hubs continuously highlight the dangers of relying on systems with single points of failure. When extreme weather events, coordinated cyber threats, or power grid failures suddenly knock out local wireless data networks, purely digital economies instantly stall out. Consequently, researchers emphasize that maintaining physical cash infrastructure is not an outdated choice—it is an indispensable national security backup layer.

Data Analysis & Sociological Interpretation

The primary empirical metrics collected from our localized respondent cohort (N=152) clarify how different social segments balance digital velocity against structural privacy risks.

Technology Convenience vs. System Rigidity

Table 1: Perceptions of Operational Immediacy and Interface Usability

Behavioural Variable Assessed	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Digital cash channels dramatically optimize the speed of everyday life transactions.	104	27	11	6	4
2. Direct electronic deposit allows for dependable and fair payroll delivery.	68	43	32	5	4
3. Digital payment models feel fragile or rigid during network dropouts or app failures.	48	52	32	17	3
Source: Primary Data					

Interpretation: The field data indicates a clear public appreciation for the velocity of digital cash platforms. However, the high level of agreement regarding structural fragility—with 100 out of 152 participants confirming that digital app frameworks feel unreliable or rigid during unexpected network or cell tower dropouts—shows that consumers are keenly aware of their technical dependencies. This reality underlines why physical currency remains an essential social safety net.

Surveillance Anxieties and Privacy Value Metrics

Privacy Protection Metrics	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Cryptographic systems are advanced enough to safeguard personal financial data.	82	47	14	5	4

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Business, Economics and Sustainable Development Perspectives**

Privacy Protection Metrics	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
2. I worry that tracking digital transactions compromises my right to financial privacy.	66	54	19	6	7
3. Physical cash is vital to ensure zero trace and maintain true transactional privacy.	102	58	22	12	6
Source: Primary Data					

Interpretation: This matrix brings to light a profound sociological paradox. While individual users generally trust modern encryption to protect their accounts from simple theft, they remain deeply anxious about systematic data surveillance and institutional tracking. The clear public consensus that physical banknotes are necessary to ensure a completely private transaction history (160 affirmative responses) proves that hard cash performs a vital psychological role as an untrackable social alternative.

Discussion of Social Profile Findings

Evaluating our sample profiles reveals a direct relationship between an individual's specific phase of life and their cash management choices:

The Student Dynamic: Within our surveyed population, a sizable percentage consists of students aged 18–28 who do not yet earn a regular corporate salary. Interestingly, 82% of these younger students report relying heavily on physical currency for their primary daily purchases. This is a deliberate psychological strategy: holding tangible paper money makes spending real, serving as a natural self-control tool that protects them from the frictionless, impulsive spending common with mobile one-tap payments.

The Salaried Dynamic: Conversely, stably employed workers with steady incomes exhibit an overwhelming preference for digital banking app architectures. For this segment, the logistical advantage of automated monthly payroll clearings and instant electronic tracking easily outweighs personal anxieties regarding data trails and background profiling.

Key Findings

- Dual Financial Frameworks:** Modern society is not transitioning toward a completely cashless future. Instead, it is splitting into two distinct paths: digital channels handle high-value commercial transactions, while physical cash is preserved for personal budgeting, micro-transactions, and total transactional privacy.
- Infrastructure Fragility Awareness:** Consumers are highly conscious of how vulnerable a completely electronic financial ecosystem can be. App dropouts, server downtimes, and network failures keep a tangible backup currency highly relevant.
- Anonymity as a Public Right:** The strong desire to maintain cash access is not driven by illicit behaviors. Rather, it stems from a basic human wish to protect personal daily routines from continuous data harvesting and automated tracking.

Policy Recommendations

1. **Enact Legal Cash Mandates:** Central banking regulators must establish consumer protection laws that stop retail businesses from refusing physical banknotes, guaranteeing that lower-income or unbanked citizens are never locked out of standard commerce.
2. **Develop True Offline Digital Channels:** Financial technology developers must prioritize creating secure, device-to-device offline peer-to-peer transaction modes within mobile applications to ensure local trade continues during major power outages.
3. **Build Strict Consumer Privacy Protections:** Regulatory frameworks should grant users explicit, granular ownership over their digital transaction histories, barring banks and payment networks from sharing or monetizing payment data without explicit, voluntary opt-in consent.

Conclusion

The ongoing migration from physical currency to digital cash networks is far more than a routine technical upgrade in transactional speed; it is a profound re-engineering of our daily social contract. While electronic payment applications offer undeniable benefits in terms of speed and processing convenience, they simultaneously introduce structural challenges around technological exclusion, privacy risks, and single-point infrastructure dependencies. To build an equitable society, financial planners must step away from aggressive, all-or-nothing digital agendas. True financial progress lies in supporting a resilient hybrid ecosystem—one where digital innovations improve transactional convenience, while physical currency is preserved to guarantee baseline privacy, access, and security for everyone.

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CHAPTER - 6

A SYSTEMATIC REVIEW OF BIG DATA ANALYTICS TECHNIQUES FOR HEALTHCARE DECISION MAKING

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Abstract

The exponential growth of healthcare data from electronic health records (EHRs), medical imaging, genomics, wearable sensors, and clinical repositories has created both opportunities and challenges for data-driven decision making. Big Data Analytics (BDA) has emerged as a transformative paradigm enabling healthcare organizations to extract actionable clinical insights, optimize workflows, and improve patient outcomes. This paper presents a systematic review of BDA techniques in healthcare decision-making, conducted using the PRISMA 2020 framework. A comprehensive search across Scopus, PubMed, IEEE Xplore, Web of Science, and Google Scholar (2014–2024) yielded 52 peer-reviewed studies for final analysis. The review examines core BDA techniques—Machine Learning (ML), Deep Learning (DL), Natural Language Processing (NLP), Predictive Analytics, and distributed frameworks (Hadoop, Spark)—and their applications in clinical decision support, disease prediction, risk stratification, resource management, and precision medicine. Key findings indicate that ensemble ML methods and deep neural networks dominate the literature, while NLP on unstructured clinical text is gaining rapid traction. Persistent challenges include data heterogeneity, privacy concerns, interoperability gaps, and limited clinical adoption. This review provides a structured taxonomy of BDA techniques, a synthesis of their clinical applications, and a prioritized research agenda for advancing data-driven healthcare systems.

Keywords: Big Data Analytics, Healthcare Decision Making, Machine Learning, Deep Learning, PRISMA, Electronic Health Records, Predictive Analytics, Clinical Decision Support Systems

Introduction

The healthcare industry is undergoing a profound digital transformation driven by the rapid proliferation of data-generating technologies. Electronic Health Records (EHRs), medical imaging modalities, genomic sequencing platforms, Internet of Medical Things (IoMT) devices, and patient-generated data from mobile health applications collectively produce enormous volumes of data every day. According to recent estimates, the global healthcare data volume is expected to grow at a compound annual rate far exceeding that of most other industries, creating an unprecedented resource for clinical intelligence—yet also a formidable challenge for traditional data management and analysis tools.

Big Data, broadly defined by the characteristics of Volume, Velocity, Variety, Veracity, and Value (the '5 Vs'), represents a category of data challenges for which conventional relational databases and statistical methods are insufficient. Big Data Analytics (BDA) encompasses a suite of advanced computational techniques—from machine learning and artificial intelligence to distributed computing and real-time stream processing—specifically engineered to address these challenges. In healthcare, BDA is

enabling new possibilities in clinical decision support, precision medicine, epidemic surveillance, drug discovery, hospital operations management, and patient engagement.

Despite growing adoption, the field lacks a consolidated and up-to-date synthesis of BDA techniques and their outcomes in clinical decision-making contexts. Existing reviews tend to focus on specific subdomains or single techniques without providing a comprehensive, technique-level taxonomy across the full breadth of healthcare decision-making applications. Furthermore, many prior reviews predate significant advances in transformer-based NLP, federated learning, and real-time IoMT analytics that have emerged since 2020.

This systematic review addresses this gap by providing an evidence-based analysis of BDA techniques in healthcare decision-making. The primary objectives are: (1) to identify and categorize BDA techniques employed in healthcare decision-making research; (2) to map these techniques to specific clinical and operational domains; (3) to evaluate reported performance metrics and clinical outcomes; and (4) to identify key challenges and future research directions.

The remainder of this paper is organized as follows: Section 2 describes the research methodology including the PRISMA search protocol. Section 3 presents the literature review and synthesized findings by BDA technique. Section 4 provides discussion of implications, challenges, and future directions. Section 5 concludes the paper.

Research Methodology

Review Protocol and Design - This systematic review was designed and conducted in strict accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) 2020 guidelines, which provide a standardized and transparent framework for systematic literature reviews. The central research question guiding this review is: 'What Big Data Analytics techniques have been applied in healthcare decision-making, and what are their key applications, performance outcomes, and limitations?'

Search Strategy and Databases - A systematic literature search was conducted across five major academic databases: Scopus, PubMed/MEDLINE, IEEE Xplore, Web of Science, and Google Scholar, covering peer-reviewed literature published in English between January 2014 and December 2024. The following Boolean search string was employed:

("Big Data" OR "Big Data Analytics") AND ("Healthcare" OR "Medical" OR "Clinical") AND ("Decision Making" OR "Decision Support" OR "Prediction" OR "Classification")

Additional manual searches were performed through Google Scholar and reference list snowballing of highly relevant articles to capture studies not indexed in primary databases.

Inclusion and Exclusion Criteria

Studies were included if they: (1) focused on the application of BDA or a specific BDA technique in a healthcare context; (2) targeted a healthcare decision-making application; (3) were published in English in peer-reviewed venues between 2014 and 2024; and (4) reported quantitative performance metrics or qualitative evaluation outcomes. Studies were excluded if they: (1) were review articles or editorials without primary empirical contributions; (2) focused solely on data infrastructure without

analytics application; (3) applied only traditional statistical methods; or (4) lacked adequate methodological detail.

Study Selection – PRISMA Flow

The PRISMA selection process was carried out in four stages: Identification, Screening, Eligibility, and Inclusion, as summarized in Table 1 below.

Table 1: PRISMA Study Selection Summary

PRISMA Stage	Records (n)	Action / Reason
Identification	1,247	Records identified through database search (Scopus, PubMed, IEEE Xplore, WoS, Google Scholar)
Screening – Title & Abstract	842 removed	Duplicates removed (n=312); records excluded after title/abstract screening (n=530)
Eligibility – Full-Text Review	405 assessed	Full-text articles assessed; 353 excluded (did not meet inclusion criteria)
Included	52 studies	Final studies included in systematic review for qualitative synthesis

Data Extraction and Quality Assessment

A structured data extraction form was developed to record: (1) study metadata (authors, year, country, venue); (2) BDA technique(s) employed; (3) dataset(s) used; (4) healthcare application domain; (5) performance metrics (accuracy, AUC-ROC, F1-score, sensitivity, specificity); and (6) key findings and limitations. Quality of included studies was assessed using an adapted CASP (Critical Appraisal Skills Programme) checklist for computational healthcare research.

Literature Review and Findings

Overview of Identified Studies

The 52 studies included in the final review span 2014–2024, with a notable surge in publications between 2020 and 2023—consistent with global acceleration in healthcare digitalization partly driven by the COVID-19 pandemic. Geographically, studies originated predominantly from the United States (n=18), China (n=11), India (n=8), and European nations (n=10). The majority (n=38, 73%) were published in indexed journals, with the remainder in peer-reviewed conference proceedings. Table 2 shows the distribution of studies by BDA technique category.

Table 2: Distribution of Included Studies by BDA Technique Category

BDA Technique Category	No. of Studies	Primary Application Domain
Machine Learning (Classical)	18	Disease prediction, risk stratification, readmission prediction
Deep Learning / Neural Networks	14	Medical imaging, EHR sequence analysis, drug response
Natural Language Processing (NLP)	9	Clinical notes mining, adverse drug event detection
Distributed Processing (Hadoop/Spark)	6	Genomics, IoMT, large-scale real-time analytics
Predictive & Prescriptive Analytics	5	Hospital resource planning, epidemic forecasting

Machine Learning Techniques in Healthcare Decision Making

Classical machine learning techniques constitute the most widely studied category of BDA in the reviewed literature. Supervised learning algorithms—including Random Forests, Support Vector Machines (SVM), Logistic Regression, k-Nearest Neighbors (k-NN), and Naive Bayes—have been extensively applied for classification problems in clinical decision support. Ensemble methods, particularly Random Forest and gradient boosting variants (XGBoost, LightGBM), consistently demonstrate superior predictive performance across multiple healthcare domains.

Hospital readmission prediction is a critical quality and cost metric for healthcare systems. Studies employing gradient boosting classifiers on large EHR datasets reported AUC-ROC values exceeding 0.85–0.92, particularly for 30-day readmission in heart failure and diabetes patients, enabling targeted care management for high-risk populations. Disease onset prediction is another dominant application. ML models trained on longitudinal EHR data have demonstrated the ability to predict onset of Type 2 Diabetes, chronic kidney disease, and sepsis with clinically meaningful lead times of weeks to months, enabling proactive preventive interventions.

Unsupervised approaches—particularly k-means and hierarchical clustering—enable patient phenotyping and population segmentation, identifying clinically meaningful subgroups within heterogeneous populations to support targeted therapeutic strategies. Model interpretability remains a persistent challenge. The emergence of explainable AI (XAI) methods—including SHAP (SHapley Additive exPlanations) and LIME (Local Interpretable Model-agnostic Explanations)—is beginning to address this critical clinical need, with several recent studies integrating these techniques to enhance decision transparency.

Deep Learning for Healthcare Analytics

Deep learning architectures—Convolutional Neural Networks (CNNs), Long Short-Term Memory (LSTM) networks, and transformer-based models—have demonstrated remarkable capabilities in complex healthcare analytics tasks. CNNs have achieved radiologist-level performance in diabetic retinopathy detection, skin lesion classification, chest X-ray pathology detection, and histopathological analysis. These findings have significant implications for diagnostic decision support in resource-limited settings lacking specialist radiologists.

LSTM networks have proven particularly effective for time-series analysis of sequential clinical data, including vital sign monitoring in ICUs, continuous glucose monitoring in diabetes management, and ECG classification. Transformer-based architectures are increasingly applied to EHR sequence modeling, with domain-specific variants (ClinicalBERT, BioBERT) fine-tuned on clinical text corpora demonstrating strong performance on downstream healthcare NLP tasks.

A notable limitation across deep learning studies is the requirement for large, high-quality labeled datasets—often difficult to obtain due to privacy constraints and annotation costs. Transfer learning and federated learning—a distributed paradigm enabling multi-institutional model training without centralizing patient data—are gaining traction as practical strategies to address this challenge.

Natural Language Processing in Clinical Settings

A significant proportion of clinical information exists in unstructured free-text form within physician notes, discharge summaries, radiology reports, and pathology narratives. NLP techniques are

essential for extracting structured, actionable information from this rich data source. The reviewed studies demonstrate NLP applications spanning rule-based information extraction to transformer-based contextual understanding.

Named Entity Recognition (NER) and relation extraction techniques identify clinical entities (symptoms, diagnoses, medications, procedures) and their semantic relationships from unstructured clinical text, enabling automatic population of clinical databases. Adverse drug event detection from clinical notes has demonstrated high precision in pharmacovigilance applications. Pre-trained language models—Bio BERT, Clinical BERT, and domain-specific GPT variants—have substantially advanced clinical NLP, enabling organizations to extract actionable insights from previously inaccessible unstructured data and enriching clinical decision support systems.

Distributed Computing Frameworks: Hadoop and Apache Spark

Scalable distributed processing infrastructure is essential to realize the analytical power of BDA at healthcare data volumes. Apache Hadoop's MapReduce paradigm enables fault-tolerant batch processing of very large datasets across commodity hardware clusters, suitable for large-scale genomic datasets, historical EHR databases, and population health registries. Apache Spark extends this ecosystem with in-memory computation capabilities, enabling processing speeds up to 100x faster than MapReduce for iterative ML algorithms and interactive analytics.

Several studies describe Hadoop/Spark-based pipelines for processing large-scale IoMT sensor data streams for real-time patient monitoring. Architectures combining Apache Kafka for data ingestion, Spark Streaming for real-time processing, and HDFS for storage have been implemented for continuous vital sign monitoring, enabling real-time patient deterioration alerting. In genomics, Hadoop-based platforms support variant calling, genome-wide association studies (GWAS), and multi-omics integration for precision medicine applications requiring multi-terabyte data processing.

Predictive and Prescriptive Analytics

Predictive analytics leverages historical healthcare data to forecast future clinical events, resource demands, or patient outcomes. Reviewed studies document applications in epidemic forecasting, surgical outcome prediction, ICU length-of-stay estimation, and outpatient no-show prediction. Prescriptive analytics extends predictive models to recommend specific actions, representing the most advanced tier of healthcare decision support, with applications in dynamic bed management, chemotherapy dosing optimization, and personalized preventive care scheduling.

Hospital resource management is a high-impact domain. Predictive models for patient admission volumes, bed occupancy, and ED overcrowding enable proactive staffing and resource allocation decisions, with studies reporting significant reductions in patient wait times following BDA-driven system deployment. Epidemic intelligence systems leveraging social media streams, web search trends, and syndromic surveillance data have demonstrated early-warning capabilities for influenza outbreaks with lead times of one to two weeks ahead of official case reporting.

Discussion

Synthesis of Key Findings

This systematic review reveals that BDA has penetrated virtually every dimension of healthcare decision making—from individual clinical decisions to population-level public health policy. The

dominant trend is a shift from rule-based clinical decision support toward data-driven, learning-based models capable of identifying complex patterns in high-dimensional clinical data. Machine learning techniques—particularly gradient boosting ensembles and deep neural networks—consistently demonstrate strong predictive performance across diverse clinical tasks, often rivaling or exceeding individual clinical expert performance in well-defined classification tasks.

A critical observation is the growing convergence of multiple BDA techniques within integrated analytical pipelines. Modern healthcare analytics systems combine distributed computing infrastructure for data processing, NLP for unstructured text mining, machine learning for predictive modeling, and visualization tools for clinical presentation—reflecting the multi-faceted nature of real-world clinical data environments and decision support requirements.

Challenges and Limitations

Despite significant progress, several persistent challenges constrain widespread clinical adoption of BDA. Data quality and heterogeneity represent fundamental barriers: healthcare data is characterized by high missingness, inconsistency, and encoding variability across institutions and EHR systems. The lack of standardized formats and clinical terminologies—despite available standards such as HL7 FHIR and SNOMED CT—impedes development of generalizable BDA models and limits cross-institutional data sharing. Privacy, security, and regulatory compliance present significant challenges. Patient health data is subject to stringent regulatory frameworks (HIPAA in the US, GDPR in Europe) that constrain data collection, sharing, and use. Differential privacy, homomorphic encryption, and federated learning offer promising technical approaches to privacy-preserving analytics, but their computational overhead and implementation complexity remain practical barriers.

Model interpretability and clinical trust constitute critical adoption barriers. Healthcare professionals require transparent, explainable decision support tools that allow them to understand and appropriately override algorithmic recommendations. The black-box nature of many deep learning models is fundamentally at odds with clinical decision-making norms and regulatory requirements for high-risk AI applications. Integration of XAI techniques into healthcare BDA pipelines is therefore an important research priority.

Future Research Directions

Several promising directions emerge from this review. Multi-modal data integration—combining structured EHR data, medical imaging, genomic profiles, and patient-reported outcomes—within unified analytical frameworks represents a significant frontier for precision medicine. Federated learning architectures enabling multi-institutional model training without centralizing patient data offer a pathway to generalizable clinical predictive models while preserving privacy. The application of large language models (LLMs) to healthcare decision support is an emerging area of significant potential, leveraging their capacity to synthesize cross-domain clinical knowledge and process complex unstructured text. Real-time analytics for continuous patient monitoring—enabled by edge computing and IoMT advances—will expand clinical decision support from retrospective analysis to proactive, real-time intervention. Finally, development of standardized evaluation frameworks for healthcare BDA systems—encompassing predictive performance, clinical utility, health economic impact, and patient safety—is essential for accelerating evidence-based adoption.

Conclusion

This systematic review has provided a comprehensive and evidence-based synthesis of Big Data Analytics techniques applied in healthcare decision making, drawing on 52 peer-reviewed studies published between 2014 and 2024. The review demonstrates that BDA is fundamentally reshaping healthcare decision support, enabling predictive, precision, and proactive approaches to clinical and operational decisions that were previously beyond reach. Machine learning and deep learning techniques dominate the current literature, with strong performance documented across disease prediction, clinical risk stratification, medical image analysis, and NLP-driven clinical text mining. Distributed computing frameworks underpin the scalability of these approaches at the volumes demanded by modern healthcare data.

Persistent challenges—data quality, privacy constraints, interpretability limitations, and clinical adoption barriers—must be systematically addressed to fully realize the transformative potential of BDA in healthcare. Future research should prioritize federated and privacy-preserving analytics, multi-modal data integration, explainable AI for clinical use, and real-time IoMT-driven decision support. The continued convergence of advances in artificial intelligence, distributed computing, and healthcare informatics is expected to progressively overcome these barriers, enabling a new era of truly data-driven, personalized, and proactive healthcare delivery. This review contributes a structured taxonomy of BDA techniques and their clinical applications, a current literature synthesis, and a prioritized research agenda—providing a rigorous reference for researchers, clinicians, informaticists, and policymakers engaged in advancing data analytics in healthcare.

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CHAPTER - 7

DIGITAL BANKING AND FINTECH IN INDIA: A STUDY OF GROWTH TRENDS AND CHALLENGES IN THE BFSI SECTOR

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Abstract

The Banking and Financial Services sector in India has changed in a very deep way over the last ten years. Digital banking and fintech have moved from being a small add on to becoming the main engine of the whole system. This paper studies how digital banking and fintech have grown in India and what this growth means for the BFSI sector. It looks closely at the rise of the Unified Payments Interface and digital lending and neobanking and the digital rupee. The study uses secondary data drawn from reports of the Reserve Bank of India and the National Payments Corporation of India and leading market research firms. The findings show that India now leads the world in real time payments and that fintech has become a strong tool for financial inclusion. The paper also points out serious challenges such as fraud and data privacy and credit risk in digital lending. It ends with practical suggestions for banks and regulators and fintech firms. The main message is that digital banking is now the backbone of Indian finance and it needs strong and fair rules to stay safe as it grows.

Keywords: Digital Banking. Fintech. Unified Payments Interface. Financial Inclusion. Digital Lending. Digital Rupee. BFSI Sector.

Introduction

The BFSI sector stands for Banking and Financial Services and Insurance. It is one of the most important parts of the Indian economy. This sector handles the savings and payments and loans and insurance needs of more than one billion people. For many years this work was done only inside bank branches. A customer had to walk into a branch and stand in a long queue and fill many forms. The last decade has changed this picture in a very big way. Technology has moved banking from the branch counter to the mobile phone. This shift is known as digital banking and fintech. Fintech is a short word for financial technology. It means the use of software and mobile apps and data science to deliver financial services. Fintech firms in India work in payments and lending and wealth management and insurance. They use the internet and low cost smartphones to reach people who were left out before. India has become one of the largest fintech markets in the whole world. The India fintech market was valued at around 142 billion US dollars in 2025 and it is still growing at a rapid pace.

The single biggest driver of this change is the Unified Payments Interface. This system is known in short as UPI. It was built by the National Payments Corporation of India. UPI lets a person send money from one bank account to another in a few seconds using only a mobile phone. In the year 2025 UPI processed more than 228 billion transactions. In December 2025 alone it handled 21.63 billion transactions worth about 27.97 lakh crore rupees. This was the highest monthly figure ever recorded. The International Monetary Fund has named UPI the largest real time payment system in the world.

Three forces have come together to make this growth possible. The first force is the spread of cheap smartphones and low cost mobile data. The second force is the strong push by the government for a less cash economy and for financial inclusion. The third force is the support of digital public infrastructure such as Aadhaar and UPI. Together these three forces have created a rich ground for fintech to grow. This paper studies this growth and explains what it means for the future of Indian finance.

Review of Literature

Many scholars and institutions have studied digital banking and fintech in India. The Reserve Bank of India in its yearly reports has tracked the rise of digital payments and digital lending. It has noted that digital payments now form the largest share of all retail payments in the country. The NPCI has published a decade report on UPI. This report shows that UPI grew from just 2 crore transactions in the year 2016 to 2017 to over 24000 crore transactions in the year 2025 to 2026.

Market research firms have also studied this space in detail. Their reports agree that the Indian fintech market is one of the fastest growing markets in the world. They point to digital payments as the leading segment and to neobanking as the fastest growing segment. Studies on financial inclusion have shown that the Pradhan Mantri Jan Dhan Yojana gave bank accounts to more than 56 crore people. Scholars argue that this large base of accounts made the fintech boom possible because every digital payment needs a bank account behind it.

Other studies have looked at the risks of digital finance. Researchers warn that very fast growth in unsecured digital lending can raise credit risk. They also warn that digital fraud and weak data privacy are serious concerns. This body of work shows a clear gap. Most studies look at only one part of the story such as payments or lending or inclusion. There is a need for a paper that brings these parts together and gives a full picture of digital banking and fintech in the BFSI sector. This paper tries to fill that gap.

Objectives of the Study

The main objectives of this study are given below.

1. To study the growth of digital banking and fintech in India.
2. To understand the main segments such as payments and lending and neobanking and the digital rupee.
3. To examine the role of fintech in financial inclusion.
4. To study the rules that govern digital finance in India.
5. To find the main challenges and to suggest useful ways to solve them.

Research Methodology

This study is based on secondary data. Secondary data means data that is already collected and published by other bodies. The study draws on reports from the Reserve Bank of India and the National Payments Corporation of India and the Ministry of Finance. It also uses data from market research firms and public press releases and news reports. The nature of this study is descriptive and analytical. A descriptive study explains what is happening in the field. An analytical study looks at the data closely to draw meaning from it. The data covers the period from the year 2016 to the year 2026. This period was

chosen because it covers the full rise of UPI and modern fintech in India. No primary survey was done for this paper. This is one limit of the study and it is stated here in an honest way.

Growth of Digital Banking and Fintech in India

The growth of digital banking in India has been very fast. UPI is the clearest proof of this growth. In the year 2025 UPI crossed 228 billion transactions in a single year. The daily average in December 2025 was close to 698 million transactions. This means that people in India made about 698 million UPI payments every single day. As of March 2026 more than 703 banks were live on the UPI system. The number of active UPI users has crossed 839 million. This is nearly a quarter of the whole population of India.

UPI is now much more than a simple payment tool. It has become the base layer of Indian digital finance. By the financial year 2025 to 2026 UPI made up about 85 percent of all retail digital payments in the country. India now handles close to 49 percent of the global volume of real time payments. This is more than three times the share of Brazil which runs the Pix system. UPI has also gone global. It is now live in eight countries and it supports two way transfers with Singapore through the PayNow link.

The wider fintech market has grown along with UPI. The India fintech market was valued at around 142 billion US dollars in 2025 and some studies place the figure even higher. There are now more than 2500 active fintech firms in India. They work across payments and lending and wealth management and insurance and neobanking. Digital payments remain the largest segment with close to 43 percent of the market share. Neobanking is the fastest growing segment. All of this shows that India has built a deep and wide digital finance system in a very short time.

Key Segments of Digital Banking and Fintech

Digital banking and fintech in India can be split into a few key segments. Each segment plays a special role in the wider system.

Digital Payments - This is the largest and most mature segment. UPI leads this space by a wide margin. It supports both person to person payments and person to merchant payments. Person to merchant payments now make up about 63 percent of UPI volume. This shows that UPI has moved deep into daily shopping and small trade.

Digital Lending - This segment has grown very fast in recent years. Fintech firms and non banking financial companies give small loans through mobile apps in just a few minutes. They use data and technology to judge who is able to repay a loan. This is a great help for people and small firms who have no credit history. But this speed also brings risk. The Reserve Bank of India has warned that unsecured retail lending needs close watch. There is also a large credit gap for micro and small firms in India and this gap is a big chance for careful digital lenders.

Neobanking - A neobank is a bank that has no physical branch. It works only through a mobile app or a website. Neobanks partner with licensed banks in the background. They offer a smooth and simple user experience. This segment is small today but it is the fastest growing part of the fintech market.

Central Bank Digital Currency - The Reserve Bank of India has launched a digital form of the rupee. This is called the digital rupee or the e rupee. The retail pilot started in December 2022. The digital rupee is legal tender issued by the central bank itself. It is different from private crypto because it is safe and it

is backed by the state. The value of the e rupee in circulation was about 771 crore rupees at the end of March 2026. Adoption is still small when compared with UPI. The RBI is now testing the digital rupee for welfare payments and for cross border use.

Role of Fintech in Financial Inclusion

Financial inclusion means giving every person access to useful and affordable financial services. This includes a bank account and payments and credit and insurance. India has made huge progress in this field. The Pradhan Mantri Jan Dhan Yojana is the base of this progress. By August 2025 more than 56 crore Jan Dhan accounts had been opened. About 55 percent of these accounts belong to women. About two thirds of them are in rural and semi urban areas. Total deposits in these accounts crossed 2.68 lakh crore rupees.

These accounts form the base on which fintech has grown. A digital payment needs a bank account behind it. Once a person has a Jan Dhan account and an Aadhaar number and a mobile phone that person can join the digital economy. This link is often called the JAM trinity. JAM stands for Jan Dhan and Aadhaar and Mobile. The JAM trinity has allowed the government to send benefits straight into the accounts of poor people. This system is known as Direct Benefit Transfer. It cuts out middlemen and it reduces the leakage of public funds.

The digital rupee is now being tested to make this system even better. In some states the government has sent food subsidy through programmable digital rupee. This money can be spent only at fair price shops. This shows how digital finance can make welfare more honest and more targeted. The RBI financial inclusion index which measures access and usage and quality reached a value of 67 in March 2025. This rise shows that inclusion is getting deeper year after year.

Regulatory Framework

Strong rules are needed to keep digital finance safe and fair. In India the Reserve Bank of India is the main regulator for banking and payments. The NPCI runs the UPI system under the close watch of the RBI. The RBI has brought out clear rules for digital lending. These rules make sure that loans are given in an open way and that customers are not cheated. They set limits on how apps can collect and use customer data. They also raise the minimum capital that a payment firm must hold.

The RBI has also built a sandbox for new ideas. A sandbox is a safe space where firms can test a new product with a small group of users before a full launch. This helps new ideas to grow without putting the whole system at risk. For the digital rupee the RBI has taken a slow and careful path. It has run pilots for more than three years before any full launch. This careful path shows that the RBI values safety over speed. The main goal of all these rules is to protect the customer and to keep the whole financial system stable.

Challenges

Digital banking and fintech face many serious challenges. The first challenge is fraud. As more money moves online more criminals try to steal it. In the financial year 2024 to 2025 losses from UPI fraud were about 485 crore rupees. The good news is that this figure fell from about 1087 crore rupees in the year before. Still the number of fraud cases remains very high. Both public awareness and strong security are needed to fight this problem.

The second challenge is credit risk in digital lending. Fast and easy loans can lead some people to borrow more than they can repay. This can cause a rise in bad loans. The RBI keeps a close watch on unsecured lending for this very reason. The third challenge is data privacy. Fintech apps collect a large amount of personal data. This data must be kept safe and it must be used only in a fair way. A single data leak can harm millions of people at once.

The fourth challenge is the digital divide. Many people in rural areas still lack a smartphone or good internet or the skill to use digital tools. If care is not taken these people can be left behind. The fifth challenge is the low adoption of the digital rupee. People are happy with UPI and they see little reason to switch. The RBI must show a clear benefit to make the digital rupee popular among common users.

Findings

The main findings of this study are given below.

1. India has built the largest real time payment system in the world through UPI.
2. Digital payments now form the largest share of retail payments in the country.
3. Fintech has become a strong tool for financial inclusion through the JAM trinity.
4. Neobanking is the fastest growing segment of the Indian fintech market.
5. The digital rupee is still in an early stage and its adoption remains low.
6. Fraud and credit risk and data privacy are the biggest risks in this space.

Suggestions

Based on these findings this study offers a few practical suggestions.

1. Banks and fintech firms should invest more in fraud detection and in customer awareness.
2. Digital lenders should judge the ability to repay in a careful way so that bad loans stay low.
3. A strong and clear data privacy law must be followed by all players in the market.
4. Digital tools should be made simple and should support local languages so that rural users can join with ease.
5. The RBI should show clear benefits of the digital rupee such as offline use and lower cost to raise its adoption.
6. Banks and fintech firms should work as partners rather than as rivals so that trust and technology come together.

Conclusion

Digital banking and fintech have changed the face of Indian finance in a very deep way. In just one decade India has moved from long branch queues to instant payments on a mobile phone. UPI stands at the very heart of this change and it has made India a world leader in real time payments. Fintech has widened the reach of finance and it has pulled crores of new users into the formal system. The Jan Dhan accounts and Aadhaar and mobile phones have joined hands to make this inclusion possible.

Yet the journey is not free of risk. Fraud and credit risk and data privacy and the digital divide are real problems that need firm action. The digital rupee shows both the promise and the limits of new ideas. Strong rules and honest firms and aware customers must all work together. If this happens then digital

banking will stay safe and fair even as it grows fast. Digital finance is now the backbone of the Indian economy and it will shape the growth of the nation for many years to come.

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CHAPTER - 8

EMPLOYEE WELL-BEING THROUGH WORK-LIFE BALANCE: IMPLICATIONS FOR PRODUCTIVITY

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Abstract

In contemporary workplaces, employee well-being has emerged as a decisive factor in organizational success. Among the many influences on well-being, work-life balance plays a pivotal role in shaping motivation, satisfaction, and productivity. This study explores the relationship between work-life balance initiatives and employee performance, emphasizing how supportive organizational policies foster healthier and more positive work environments. Key practices such as flexible scheduling, remote work opportunities, and wellness programs are highlighted as mechanisms that strengthen balance and reduce stress. Using a mixed-method approach, the research integrates survey data from industrial and service sector employees with qualitative interviews to capture lived experiences. Findings reveal that employees who perceive greater alignment between personal and professional responsibilities report higher engagement, lower stress, and improved performance. Organizations that prioritize balance not only retain talent but also enhance their reputation. The study underscores the need for human-centered strategies that address holistic well-being rather than focusing solely on output metrics. Embedding work-life balance into organizational frameworks enables companies to meet diverse workforce needs and sustain long-term productivity. These insights are particularly relevant for leaders, HR professionals, and policymakers seeking to align organizational objectives with employee welfare.

Keywords: Work-Life Balance, Employee Well-Being, Productivity, Human Resource Practices, Organizational Success

Introduction

Employee well-being has become a central theme in organizational research, with work-life balance recognized as a critical determinant of both individual satisfaction and institutional success. Within occupational health psychology, work-life balance refers to the ability of employees to manage professional duties alongside personal commitments without compromising physical health, psychological stability, or social relationships. Empirical evidence consistently shows that employees who maintain balance experience greater job satisfaction, reduced stress, and stronger motivation, while imbalance often leads to burnout, absenteeism, and diminished performance. From an organizational standpoint, initiatives such as flexible scheduling, wellness programs, and supportive policies have been shown to improve retention, engagement, and productivity. The connection between well-being and productivity is therefore reciprocal: employees who achieve balance are more focused, creative, and efficient, contributing meaningfully to organizational growth. This perspective challenges the notion that productivity is driven by longer working hours, instead emphasizing sustainable practices that respect human needs. Consequently, work-life balance serves as a strategic bridge between employee wellness and organizational development, positioning it as a cornerstone of modern human resource management and long-term sustainability.

Objectives

1. To examine the relationship between work-life balance and employee well-being within organizational contexts.
2. To analyze the influence of work-life balance initiatives on employee productivity and performance outcomes.
3. To identify the challenges employees encounter in maintaining effective work-life balance across diverse work environments.
4. To evaluate organizational strategies and policies designed to promote employee well-being through balanced work practices.
5. To recommend sustainable practices that enhance both employee satisfaction and organizational growth.

Review of Literature

Work-Life Balance and Employee Well-Being Scholarly research consistently identifies work-life balance as a central factor in shaping employee well-being. Greenhaus and Allen (2011) emphasize that employees who manage personal and professional roles effectively are more likely to experience psychological resilience and higher job satisfaction. Maintaining equilibrium reduces stress levels and mitigates the risk of burnout, thereby strengthening workforce stability and overall health outcomes.

Work-Life Balance and Productivity The relationship between balance and productivity has been widely documented. Haar et al. (2014) found that flexible work arrangements foster concentration, creativity, and efficiency, which directly enhance organizational performance. Conversely, when employees struggle to balance responsibilities, absenteeism and reduced effectiveness often follow. These findings highlight the interdependence between employee well-being and productivity, suggesting that supportive policies are essential for sustained organizational success.

Organizational Strategies for Work-Life Balance Organizational initiatives play a pivotal role in promoting balance. Kossek and Ozeki (1998) argue that practices such as flexible scheduling, wellness programs, and family-supportive leadership not only improve individual satisfaction but also contribute to long-term institutional sustainability. More recent studies reinforce this perspective, showing that embedding work-life balance strategies within human resource frameworks enhances engagement, retention, and resilience across diverse workforces.

Research Methodology

Research Design - This study adopts a descriptive research design to investigate absenteeism patterns across gender groups. A descriptive approach is appropriate as it enables systematic observation, description, and interpretation of workplace behaviors without manipulation of variables.

Population and Sample - The study population consists of employees from diverse industries, with balanced representation of male and female workers. A random sampling method is employed to ensure proportional inclusion of gender categories. The sample size is determined using statistical procedures to ensure reliability and validity of the findings. N = 60

Data Collection - Data will be collected from both primary and secondary sources. Primary data will be obtained through structured questionnaires and semi-structured interviews, focusing on absenteeism frequency, underlying causes, and organizational policies. Secondary data will be drawn from published reports, human resource records, and prior academic studies.

Data Analysis - The data will be analyzed using percentage analysis to identify trends across gender demographics. Percentage analysis is an effective statistical technique that converts raw frequencies into relative proportions, thereby facilitating meaningful comparisons across categories.

Data Analysis and Interpretation

Table 1: Work-Life Balance and Well-Being

Option	Respondents	Percentage
Strongly Agree	20	33.3%
Agree	18	30.0%
Neutral	10	16.7%
Disagree	8	13.3%
Strongly Disagree	4	6.7%
Source: Primary Data		

Interpretation From the above, Most employees (33.3%) agreed that work-life balance enhances well-being, showing its strong link to mental and physical health.

Table 2: Work-Life Balance and Productivity

Option	Respondents	Percentage
Strongly Agree	22	36.7%
Agree	15	25.0%
Neutral	12	20.0%
Disagree	7	11.7%
Strongly Disagree	4	6.7%
Source: Primary Data		

Interpretation From the above, About 36.7% felt balance improves productivity, indicating that supportive policies boost focus and efficiency.

Table 3: Challenges in Work-Life Balance

Option	Respondents	Percentage
Long Working Hours	16	26.7%
Family Responsibilities	14	23.3%
Lack of Organizational Support	12	20.0%
Stress and Burnout	10	16.7%
Other (specified)	8	13.3%
Source: Primary Data		

Interpretation From the above, Long hours (26.7%) and family duties (23.3%) were key challenges, highlighting the need for flexible schedules and support.

Table 4: Organizational Strategies

Option	Respondents	Percentage
Strongly Agree	18	30.0%
Agree	16	26.7%
Neutral	12	20.0%
Disagree	9	15.0%
Strongly Disagree	5	8.3%
Source: Primary Data		

Interpretation From the above, Over (30%) found current strategies effective, though some neutrality suggests improvement in policy awareness is needed.

Table 5: Recommendations for Improvement

Option	Respondents	Percentage
Flexible Working Hours	20	33.3%
Remote Work Opportunities	12	20.0%
Wellness Programs	10	16.7%
Family-Supportive Policies	12	20.0%
Other (specified)	6	10.0%
Source: Primary Data		

Interpretation : Flexible hours (33.3%) and family-supportive policies (20%) were top preferences, emphasizing employee demand for adaptable work models.

Findings

Work-Life Balance and Well-Being The analysis shows that one-third of employees (33.3%) strongly agreed that maintaining balance enhances their well-being, while only a minority expressed neutrality or disagreement. This confirms a clear association between balanced work practices and improved mental and physical health.

Work-Life Balance and Productivity Approximately 36.7% of respondents strongly agreed that balance contributes to higher productivity. Although a small proportion (12%) disagreed, the overall trend indicates that supportive organizational policies significantly influence focus, efficiency, and performance outcomes.

Challenges in Work-Life Balance The most frequently cited barriers were long working hours (26.7%) and family responsibilities (23.3%). Lack of organizational support (20%) and stress or burnout (16.7%) also emerged as notable challenges. These findings highlight the need for flexible scheduling and stronger support systems.

Organizational Strategies While 30% of employees considered current strategies effective, a significant proportion expressed neutrality or disagreement. This suggests that although policies exist, awareness and consistent implementation require improvement.

Recommendations for Improvement Flexible working hours (33.3%) and family-supportive policies (20%) were the most preferred improvements. Remote work opportunities (20%) and wellness programs (16.7%) were also valued, reflecting employee demand for adaptable and holistic practices.

Discussion

The findings of this study confirm that work-life balance is strongly linked to employee well-being and productivity, echoing earlier research by Greenhaus and Allen (2011) and Haar et al. (2014). Employees who achieve balance report greater satisfaction, focus, and efficiency, while challenges such as long working hours and family responsibilities continue to hinder outcomes, consistent with Kossek and Ozeki's (1998) observations. Although organizational strategies show moderate effectiveness, gaps in awareness and implementation remain, aligning with Biron and Karanika-Murray's (2014) emphasis on process evaluation. Preferences for flexible hours, family-supportive policies, and remote work opportunities highlight evolving workforce expectations, supporting Olson et al.'s (2023) call for holistic approaches. Overall, the study contributes by reaffirming the reciprocal relationship between well-being and productivity while underscoring the need for adaptable, human-centered organizational practices.

Implication

The study's findings carry important implications for both organizational leaders and policymakers. For managers, prioritizing flexible scheduling, family-supportive policies, and remote work opportunities can directly enhance employee satisfaction, reduce stress, and improve productivity. HR professionals should focus not only on introducing wellness programs but also on ensuring their consistent communication and implementation, as gaps in awareness weaken their impact. At the policy level, embedding work-life balance into labor regulations and organizational frameworks can foster healthier workplaces and long-term sustainability. Overall, adopting adaptable, human-centered practices positions organizations to retain talent, build resilience, and strengthen their reputation in competitive environments.

Conclusion

The study reaffirms that work-life balance is a decisive factor in enhancing both employee well-being and organizational productivity. While many employees acknowledge the benefits of balance, persistent challenges such as long working hours and family responsibilities continue to hinder its achievement. Current organizational strategies demonstrate moderate effectiveness, yet gaps remain in awareness and consistent application. Employees clearly favor adaptable practices—particularly flexible scheduling, family-supportive policies, and opportunities for remote work—which provide autonomy and reduce stress.

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CHAPTER - 9

INTERNATIONAL ECONOMICS AND TRADE: STRENGTHENING ENTREPRENEURIAL RESILIENCE IN AN ERA OF GLOBAL CONFLICTS AND ECONOMIC UNCERTAINTY

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Abstract

The global business environment has undergone profound changes due to geopolitical conflicts, economic instability, trade restrictions, and disruptions in international supply chains. These challenges have significantly affected entrepreneurial activities, particularly among small and medium-sized enterprises (SMEs), which often operate with limited financial and operational resources. In response to these uncertainties, entrepreneurial resilience has emerged as a critical capability that enables businesses to adapt, recover, and sustain growth in dynamic international markets. This chapter explores the relationship between international economics, global trade, and entrepreneurial resilience by integrating perspectives from international trade theory, strategic management, and entrepreneurship. It highlights the importance of digital transformation, innovation, financial preparedness, supply chain diversification, and sustainable business practices in building resilient enterprises. A conceptual framework is also proposed to demonstrate how adaptive capabilities can transform external economic challenges into opportunities for long-term competitiveness. The chapter provides practical insights for entrepreneurs, educators, researchers, and policymakers seeking to promote sustainable business growth in an increasingly uncertain global economy.

Keywords: International Economics, International Trade, Entrepreneurial Resilience, Economic Uncertainty, SMEs, Digital Transformation, Supply Chain Management.

Introduction

International trade has long served as a catalyst for economic growth by enabling countries and businesses to exchange goods, services, technology, and knowledge across national borders. Advances in globalization have expanded market access, encouraged innovation, and created new opportunities for businesses to participate in global value chains. As a result, entrepreneurs have been able to reach wider customer bases, improve productivity, and strengthen their competitive position in international markets.

Despite these opportunities, the global business environment has become increasingly volatile. Events such as the COVID-19 pandemic, geopolitical conflicts, trade disputes, inflation, and fluctuations in energy prices have exposed vulnerabilities in international trade and disrupted business operations across industries. Supply chain interruptions, transportation delays, rising production costs, and changing consumer demand have compelled businesses to rethink conventional strategies and develop more adaptive approaches to sustain operations.

In this context, entrepreneurial resilience has become a key determinant of organizational success. Entrepreneurial resilience refers to the ability of business leaders to anticipate risks, adapt to changing circumstances, recover from disruptions, and identify new opportunities for growth. Rather than viewing

uncertainty solely as a threat, resilient entrepreneurs embrace change as a driver of innovation, strategic transformation, and competitive advantage.

Modern businesses must therefore complement traditional trade strategies with capabilities such as digital adoption, financial planning, supplier diversification, and continuous innovation. These capabilities enable firms to respond effectively to external shocks while maintaining operational continuity and long-term sustainability.

This chapter examines how international economics and trade influence entrepreneurial resilience during periods of global conflict and economic uncertainty. It also discusses practical strategies that can help entrepreneurs strengthen business adaptability and achieve sustainable growth in an increasingly complex international business environment.

Literature Review

International Economics and Global Trade

International economics examines the movement of goods, services, capital, technology, and knowledge across countries and explains how these exchanges contribute to economic development. Classical trade theories, particularly the concepts of absolute advantage and comparative advantage, demonstrate that specialization and efficient resource allocation enable nations to improve productivity and maximize economic welfare. Contemporary trade theories extend these ideas by emphasizing innovation, economies of scale, technological advancement, and global production networks as important drivers of international competitiveness. Globalization has significantly reduced trade barriers and increased access to international markets. However, recent geopolitical tensions, protectionist policies, exchange-rate fluctuations, and disruptions in global supply chains have altered the nature of international business. Consequently, organizations must continuously evaluate external economic conditions and adapt their strategies to remain competitive in an evolving global marketplace.

Entrepreneurial Resilience

Entrepreneurial resilience refers to the capacity of entrepreneurs and organizations to withstand uncertainty, respond effectively to crises, and recover while maintaining business continuity. Resilient organizations demonstrate flexibility, strategic thinking, innovation, and proactive decision-making during periods of disruption. Key characteristics of resilient entrepreneurs include strategic planning, sound financial management, continuous learning, effective leadership, adaptability, and the ability to recognize emerging market opportunities. Instead of avoiding uncertainty, resilient entrepreneurs leverage challenging circumstances to improve organizational performance, diversify business operations, and strengthen long-term competitiveness.

Global Conflicts and Economic Uncertainty

The increasing frequency of geopolitical conflicts and global economic disruptions has created significant challenges for international trade. Events such as the COVID-19 pandemic and regional conflicts have affected production systems, logistics, labour availability, and consumer markets worldwide. Rising inflation, energy price volatility, trade sanctions, and shortages of essential raw materials have further intensified business uncertainty. Small and medium-sized enterprises are particularly vulnerable because of their limited financial resources and dependence on international suppliers. To remain competitive, businesses must develop flexible operating models capable of responding quickly to changes in the external environment.

Research Gap

Although previous studies have explored international trade, supply chain management, and entrepreneurial resilience independently, relatively few have integrated these concepts into a unified framework that addresses prolonged geopolitical instability and economic uncertainty. Furthermore, practical guidance for entrepreneurs, management students, and policymakers remains limited.

This chapter addresses this gap by presenting an integrated perspective that combines international trade principles with resilience strategies such as digital transformation, innovation, financial preparedness, and sustainable business practices. The proposed framework offers practical insights for building adaptable and globally competitive enterprises.

Impact of Global Conflicts on International Trade

The international trading system has become increasingly vulnerable to geopolitical tensions, economic sanctions, trade restrictions, and unexpected global crises. These developments have altered the way businesses procure resources, manufacture products, and serve international markets. As economies become more interconnected, disruptions in one region often create ripple effects across global supply chains, affecting businesses of all sizes.

Entrepreneurs operating in international markets face multiple challenges, including rising transportation costs, inflation, exchange-rate fluctuations, shortages of raw materials, and delays in cross-border logistics. Such conditions increase operational risks and reduce business predictability, making strategic planning more complex. Small and medium-sized enterprises (SMEs) are particularly affected because they often depend on limited suppliers and possess fewer financial reserves to absorb prolonged disruptions.

Despite these challenges, global uncertainty has also encouraged firms to rethink conventional business models. Organizations that respond proactively by investing in innovation, digital technologies, and diversified market strategies are often better positioned to identify new opportunities and maintain long-term competitiveness.

Major Challenges Affecting International Trade

- Disruptions in global supply chains caused by geopolitical conflicts and transportation bottlenecks.
- Rising production and logistics costs due to inflation and energy price volatility.
- Limited availability of raw materials and critical industrial components.
- Currency fluctuations affecting import and export profitability.
- Declining consumer confidence during periods of economic slowdown.
- Increased uncertainty in international investment and expansion decisions.

These challenges highlight the need for entrepreneurs to adopt flexible and resilient business strategies that strengthen organizational preparedness and reduce exposure to external risks.

Entrepreneurial Resilience Strategies

Entrepreneurial resilience is not merely a reaction to crises but a strategic capability that enables organizations to adapt to changing market conditions and sustain long-term growth. Businesses that invest in resilience are more likely to recover quickly from disruptions while maintaining customer confidence and operational continuity.

Supply Chain Diversification - Overreliance on a single supplier or geographical region increases business vulnerability during periods of disruption. Developing multiple sourcing options and establishing relationships with suppliers across different regions can reduce operational risks and improve supply chain stability.

Digital Transformation - The adoption of digital technologies has become an essential component of resilient business operations. Technologies such as artificial intelligence, cloud computing, big data analytics, blockchain, and e-commerce platforms enable organizations to improve operational efficiency, strengthen customer engagement, and make data-driven decisions in rapidly changing markets.

Financial Preparedness - Financial resilience enables businesses to withstand temporary economic shocks without compromising long-term objectives. Maintaining adequate cash reserves, controlling operational costs, diversifying revenue sources, and implementing effective financial planning practices help organizations remain financially stable during uncertain periods.

Innovation and Continuous Improvement - Innovation enables organizations to respond effectively to changing customer preferences and emerging market opportunities. Continuous investment in product development, process improvement, and research activities enhances competitiveness and supports sustainable business growth.

International Market Diversification - Expanding into multiple international markets reduces dependence on a single economy and minimizes the impact of regional political or economic instability. Market diversification also creates opportunities for revenue growth and strengthens organizational resilience.

Human Capital Development - Employees play a critical role in organizational resilience. Continuous training, leadership development, knowledge sharing, and skill enhancement improve adaptability and enable organizations to respond effectively to unexpected business challenges.

Sustainable Business Practices - The integration of Environmental, Social, and Governance (ESG) principles contributes to long-term organizational sustainability. Environmentally responsible operations, ethical business practices, and stakeholder engagement enhance corporate reputation while improving resilience against future uncertainties.

Proposed Conceptual Framework

The proposed framework explains how external economic disturbances influence business performance through entrepreneurial resilience. It demonstrates that resilience acts as a strategic capability that enables organizations to transform external challenges into sustainable competitive advantages.

Independent Variables • Global Conflicts • Economic Uncertainty • Supply Chain Disruptions • Digital Transformation • Innovation Capability • Financial Flexibility • Government Policy Support
Mediating Variable Entrepreneurial Resilience
Dependent Variables • Business Sustainability • International Competitiveness • Export Performance • Business Growth • Long-term Profitability

The framework suggests that organizations capable of integrating innovation, digital technologies, financial preparedness, and strategic adaptability are more likely to withstand economic disruptions and achieve sustainable growth.

Managerial Implications

The findings of this chapter provide valuable insights for entrepreneurs, business managers, educators, and policymakers seeking to strengthen organizational resilience in an increasingly uncertain global economy. Business leaders should move beyond short-term crisis management and incorporate resilience into long-term strategic planning. Organizations that continuously monitor global market trends, adopt digital technologies, diversify supply networks, and encourage innovation are better equipped to respond to unexpected disruptions while maintaining business continuity.

For entrepreneurs, resilience should be viewed as a strategic investment rather than an emergency response. Building strong financial reserves, promoting a culture of continuous learning, and developing flexible business models can improve an organization's ability to withstand external shocks. Likewise, digital transformation enables firms to improve operational efficiency, enhance customer engagement, and make informed decisions using real-time data.

Educational institutions also have an important role in developing future entrepreneurs. Business schools should integrate topics such as international trade, digital entrepreneurship, crisis management, sustainability, and entrepreneurial resilience into management education. Practical learning through case studies, business simulations, and industry collaborations can better prepare students for the complexities of the global business environment.

Governments and public agencies should continue supporting SMEs through export promotion initiatives, financial assistance, entrepreneurship development programmes, and investments in digital infrastructure. Such initiatives can strengthen national competitiveness while improving the resilience of domestic enterprises.

Conclusion

The contemporary international business environment is characterized by rapid economic change, geopolitical uncertainty, technological disruption, and increasing market volatility. These developments have highlighted the importance of entrepreneurial resilience as a fundamental capability for sustaining business performance in global markets. This chapter examined the relationship between international economics, global trade, and entrepreneurial resilience by integrating concepts from international trade theory, strategic management, and entrepreneurship. The discussion demonstrated that organizations capable of embracing innovation, digital transformation, financial preparedness, supply chain diversification, and sustainable business practices are more likely to adapt successfully to uncertain economic conditions.

International trade continues to create opportunities for business expansion, access to advanced technologies, and participation in global value chains. However, these opportunities are accompanied by significant risks arising from geopolitical conflicts, trade restrictions, inflation, and supply chain disruptions. Consequently, entrepreneurs must adopt proactive strategies that emphasize adaptability, evidence-based decision-making, and continuous organizational learning. The proposed conceptual framework illustrates that entrepreneurial resilience functions as a strategic bridge between external

economic challenges and sustainable business outcomes. Organizations that invest in resilience are better positioned not only to overcome crises but also to transform uncertainty into innovation, competitive advantage, and long-term growth. Ultimately, resilience should be regarded as a continuous organizational capability that enables businesses to survive, adapt, and thrive in an increasingly interconnected and unpredictable global economy.

Limitations of the Study

This chapter is conceptual in nature and is based primarily on an extensive review of existing academic literature. It does not include empirical evidence collected through primary surveys, interviews, or case studies. Consequently, the proposed conceptual framework requires empirical validation across different industries, business sectors, and national contexts. Future studies incorporating quantitative and qualitative research methods may provide deeper insights into the practical application of entrepreneurial resilience strategies.

Future Research Directions

Future research may focus on the following areas:

- Examining the influence of artificial intelligence and digital technologies on entrepreneurial resilience.
- Comparing resilience strategies adopted by SMEs in developed and emerging economies.
- Investigating the effectiveness of government policies in strengthening business resilience during global crises.
- Assessing the contribution of Environmental, Social, and Governance (ESG) practices to sustainable international business performance.
- Exploring changes in consumer behaviour and digital commerce during periods of prolonged economic uncertainty.
- Conducting cross-country studies on supply chain resilience and international trade competitiveness.

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CHAPTER - 10

INTERNATIONAL ECONOMICS AND TRADE: OPPORTUNITIES, CHALLENGES, AND THE FUTURE OF GLOBAL ECONOMIC INTEGRATION

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Abstract

International economics and trade have become the foundation of global economic development. Countries engage in international trade to access goods, services, technology, and capital that may not be available domestically. Globalisation, digital transformation, and regional trade agreements have significantly influenced the pattern of international trade in the twenty-first century. At the same time, geopolitical tensions, climate change, supply chain disruptions, and protectionist policies have created new challenges for global commerce. This paper examines the concepts of international economics, the theories of international trade, recent trends, opportunities, challenges, and policy implications. The study concludes that international trade remains a powerful engine of economic growth, but sustainable and inclusive policies are essential for maximising its benefits.

Keywords: International Economics, Global Trade, Comparative Advantage, Globalisation, WTO, Trade Policy, Economic Development

Introduction

International economics studies how countries interact through trade, investment, financial markets, and the movement of labour and technology. International trade enables nations to specialise in producing goods and services where they have comparative advantages, thereby increasing global efficiency and improving living standards.

The rapid expansion of globalisation has transformed the international trading system. Developing economies such as India, China, Vietnam, and Brazil have become significant contributors to global trade through manufacturing, services, and digital innovation. According to the World Trade Organisation (WTO), international merchandise trade has expanded significantly over the past three decades despite temporary setbacks caused by the COVID-19 pandemic and geopolitical conflicts.

International trade not only contributes to GDP growth but also encourages innovation, employment generation, foreign investment, and technology transfer. However, growing concerns regarding trade imbalances, environmental sustainability, and economic inequality require policymakers to adopt balanced trade strategies.

Objectives of the Study

The objectives of this paper are:

- 1) To understand the concept of international economics and trade.
- 2) To examine the major theories of international trade.

- 3) To analyse the opportunities created by international trade.
- 4) To identify the challenges affecting global trade.
- 5) To suggest policy recommendations for sustainable international trade.

3. Review of Literature

Adam Smith argued that countries should specialise in producing goods in which they possess absolute advantages. Later, David Ricardo introduced the theory of comparative advantage, demonstrating that international trade benefits all participating countries even if one nation is more efficient in producing every product.

Paul Krugman expanded trade theory by emphasising economies of scale and imperfect competition. His work explains why countries with similar resources still trade extensively with one another.

Recent studies indicate that digital technologies, artificial intelligence, and e-commerce are reshaping international trade by reducing transaction costs and improving market accessibility.

Theoretical Framework

Absolute Advantage Theory - Adam Smith proposed that countries should specialize in producing goods they can manufacture more efficiently than others.

Comparative Advantage Theory - David Ricardo demonstrated that trade benefits all nations when countries specialise according to their relative efficiency rather than absolute efficiency.

Heckscher–Ohlin Theory - This theory suggests that countries export products requiring factors of production that are relatively abundant domestically.

New Trade Theory - New Trade Theory highlights economies of scale, product differentiation, innovation, and technological advancement as major drivers of modern international trade.

Importance of International Trade

International trade contributes significantly to economic development through:

- a) Efficient allocation of global resources.
- b) Increased employment opportunities.
- c) Higher productivity.
- d) Technology transfer.
- e) Foreign exchange earnings.
- f) Consumer access to diverse products.
- g) Improved international cooperation.

For developing countries, exports generate foreign exchange necessary for infrastructure development and industrialisation.

Current Trends in International Trade

Several important developments are shaping global trade:

- I) Digital Trade** - Digital platforms have enabled businesses, especially SMEs, to access international markets with lower costs.
- II) Regional Trade Agreements** - Trade agreements have promoted regional economic integration and reduced tariff barriers.
- III) Sustainable Trade** - Consumers increasingly prefer environmentally friendly products, encouraging businesses to adopt sustainable production practices.
- IV) Global Value Chains** - Production processes are now distributed across multiple countries, increasing efficiency while also making supply chains more vulnerable to disruptions.

Challenges Facing International Trade

Despite numerous advantages, international trade faces several challenges:

- Protectionism** - Many countries impose tariffs and import restrictions to protect domestic industries.
- Geopolitical Conflicts** - Political tensions disrupt supply chains and reduce trade flows.
- Climate Change** - Extreme weather events affect agriculture, transportation, and logistics.
- Exchange Rate Volatility** - Currency fluctuations increase uncertainty for exporters and importers.
- Technological Inequality** - Developing countries often lack digital infrastructure necessary to participate in digital trade.

India's Position in International Trade

India has emerged as one of the world's fastest-growing trading economies. Major exports include:

- 1) Pharmaceuticals
- 2) Information Technology services
- 3) Petroleum products
- 4) Engineering goods
- 5) Agricultural products
- 6) Gems and Jewelry

Government initiatives such as Make in India, Digital India, and improvements in logistics have strengthened India's export competitiveness. However, challenges remain, including infrastructure gaps, trade deficits in certain sectors, and compliance with international quality standards.

Policy Recommendations

To strengthen international trade, governments should:

- 1) Promote export diversification.
- 2) Invest in digital infrastructure.
 - 3) Improve logistics and transportation.
 - 4) Encourage research and innovation.
 - 5) Strengthen trade diplomacy.
 - 6) Support small and medium enterprises.
 - 7) Promote environmentally sustainable production.
 - 8) Enhance workforce skills through education and training.

Future Outlook

The future of international trade will increasingly depend on technological innovation, artificial intelligence, digital commerce, renewable energy, and resilient supply chains.

Developing countries have significant opportunities to participate in global value chains by investing in education, infrastructure, and innovation. International cooperation will remain essential for maintaining a stable global trading system.

Conclusion

International economics and trade continue to play a vital role in promoting global economic growth, employment, innovation, and technological progress. Although globalisation has created unprecedented opportunities, emerging challenges such as geopolitical uncertainty, climate change, and protectionist policies require coordinated international responses. Sustainable trade policies, digital transformation, and inclusive economic development will determine the future success of the global trading system. Countries that invest in innovation, infrastructure, and human capital are likely to benefit the most from international economic integration.

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CHAPTER - 11

PUBLIC FINANCE AND FISCAL POLICY IN INDIA: A COMPREHENSIVE ANALYSIS OF REVENUE MOBILIZATION, PUBLIC EXPENDITURE AND FISCAL SUSTAINABILITY

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Abstract

Public finance is a cornerstone of national development, shaping how governments mobilize resources, allocate expenditure, and manage debt. Fiscal policy serves as a dynamic tool to influence growth, employment, inflation control, and equity in income distribution. For emerging economies such as India, sound fiscal governance is vital to balance rapid expansion with long-term stability. This paper explores evolving trends in India's public finance, focusing on taxation, expenditure priorities, deficit management, and sustainability measures. The study relies on secondary sources including budget documents, economic surveys, and institutional reports. Key findings highlight the transformative role of Goods and Services Tax (GST), rising infrastructure investment, and modernization of financial administration. Digital tax platforms and compliance reforms have strengthened revenue systems, while strategic capital spending has supported growth. Despite these advances, challenges persist—public debt pressures, uneven regional finances, and the tension between consolidation and expansion. The analysis underscores the need for widening the tax base, enhancing efficiency in expenditure, and reinforcing cooperative federalism. Addressing these issues is essential to secure inclusive and sustainable fiscal outcomes for India's future.

Keywords: Public Finance, Fiscal Policy, Revenue Mobilization, Expenditure Management, Fiscal Deficit, GST, Sustainability, Inclusive Growth.

Introduction

Public finance is a vital branch of economics that examines government revenue, expenditure, borrowing, and financial administration. Unlike private finance, which focuses on individual or business decisions, public finance emphasizes how governments allocate resources to achieve social welfare and economic development.

In modern economies, the role of government extends beyond maintaining law and order. States actively provide public goods, build infrastructure, reduce inequalities, and stabilize the economy during fluctuations. Fiscal policy — decisions on taxation, spending, and borrowing — is the primary instrument for these objectives. During slowdowns, governments may stimulate demand by increasing expenditure or reducing taxes, while in inflationary periods they may cut spending or raise taxes to control demand. India, as one of the fastest-growing economies, faces the dual challenge of sustaining growth while maintaining fiscal discipline. Since independence, fiscal policy has evolved from planned development through public investment to market-oriented reforms after 1991, emphasizing responsibility and efficient resource use.

Milestones such as the Fiscal Responsibility and Budget Management (FRBM) Act, 2003, strengthened fiscal discipline, while the Goods and Services Tax (GST), 2017, unified indirect taxation and improved compliance. In recent years, fiscal policy has prioritized capital expenditure, infrastructure, social welfare, and transparency through digital taxation and direct benefit transfers.

Yet challenges remain: high public debt, rising welfare commitments, unemployment, and the need for balanced investment. Understanding the role and effectiveness of public finance and fiscal policy is therefore crucial for evaluating India's development path.

Review of Literature

Public finance has been examined from multiple perspectives. Classical economists emphasized minimal government intervention to preserve efficiency, but the Great Depression shifted thinking toward active state involvement. Keynes (1936) argued that fiscal measures, particularly public expenditure, could stabilize economies during recessions by boosting aggregate demand, laying the foundation for expansionary policies worldwide.

Musgrave (1959) outlined three core functions of public finance: allocation of resources, redistribution to reduce inequality, and stabilization of the economy. Stiglitz (2015) further stressed the role of government in correcting market failures and ensuring effective expenditure management to enhance social welfare.

Indian scholarship has focused on fiscal policy's role in growth and development. Reforms in taxation, expenditure rationalization, and fiscal responsibility have strengthened management. The Economic Survey repeatedly highlights fiscal consolidation alongside productive investment, while recent studies show capital expenditure has a strong multiplier effect on growth and employment. Research on GST suggests that despite initial hurdles, it improved tax integration, reduced cascading effects, and supported formalization of the economy.

Overall, the literature indicates that fiscal policy is not merely a revenue tool but a key instrument for inclusive and sustainable development.

Objectives of the Study

The major objectives of this research article are:

1. To understand the concept and importance of public finance and fiscal policy.
2. To analyze the structure of government revenue and expenditure in India.
3. To examine recent trends in India's fiscal policy.
4. To study the role of fiscal policy in economic development.
5. To identify challenges associated with fiscal sustainability.
6. To provide suggestions for improving fiscal management.

Research Methodology

Research Design - The present study follows a descriptive and analytical research design to examine the role of public finance and fiscal policy in India. The study analyses various components of government finance, including revenue generation, public expenditure, fiscal deficit management and fiscal reforms.

Sources of Data - The study is based on secondary data collected from reliable sources such as:

1. Union Budget Documents, Ministry of Finance, Government of India
2. Economic Survey of India
3. Reserve Bank of India (RBI) reports
4. Reports of the Comptroller and Auditor General of India (CAG)
5. Academic journals, books and research articles

Period of Study - The study considers recent trends in Indian fiscal policy with special reference to developments after major fiscal reforms such as GST implementation and fiscal consolidation measures.

Method of Analysis: The collected data has been analyzed using:

1. Descriptive analysis
2. Comparative analysis
3. Trend analysis
4. Interpretation of fiscal indicators

Conceptual Framework of Public Finance

Public finance consists of four major components:

Public Revenue Government revenue is classified into:

- **Tax Revenue:** Direct taxes (income, corporate, capital gains) and indirect taxes (GST, customs, excise). Tax reforms, especially GST, simplified India's indirect tax system and improved compliance.
- **Non-Tax Revenue:** Includes interest receipts, dividends from public enterprises, fees, and resource revenues (spectrum, minerals).

Public Expenditure Government spending is divided into:

- **Revenue Expenditure:** Non-asset creating expenses such as salaries, pensions, subsidies, interest payments, and maintenance.
- **Capital Expenditure:** Asset-creating investments like roads, railways, defence, and digital infrastructure. Recent policy emphasis on capital expenditure aims to boost growth and employment.

Public Debt Borrowing finances fiscal deficits and development.

- **Internal Debt:** Loans from citizens and financial institutions.
- **External Debt:** Borrowing from international organizations. While debt supports investment, excessive borrowing raises fiscal stress through higher interest obligations.

Fiscal Policy in India

Fiscal policy is a key instrument for ensuring economic stability and development. In India, it operates through taxation, expenditure, and borrowing decisions that shape overall economic activity.

Objectives of Fiscal Policy

- **Economic Growth:** Investment in infrastructure, education, and health enhances productivity and

supports long-term growth.

- **Employment Generation:** Public spending programmes create jobs directly and indirectly.
- **Price Stability:** Adjusting taxes and expenditure helps manage inflationary and recessionary pressures.
- **Reducing Inequality:** Welfare schemes and progressive taxation reduce income disparities.

Major Fiscal Policy Reforms

- **FRBM Act (2003):** Introduced to strengthen fiscal discipline, limit deficits, and improve transparency in financial management.
- **GST (2017):** Unified indirect taxation, eliminated multiple levies, reduced cascading effects, and created a common national market.
- **Digital Tax Administration:** Technology-driven reforms improved online filing, monitoring, compliance, and refund systems, reducing evasion.

Recent Trends in Indian Fiscal Policy

Recent developments in India's fiscal policy reflect a clear shift toward consolidation, transparency, and growth-oriented spending. Fiscal deficit levels have gradually declined due to sustained consolidation efforts, strengthening financial stability. At the same time, capital expenditure has been prioritized, with greater investment in infrastructure projects that enhance productivity and create long-term growth potential. GST revenues have shown steady improvement, broadened the tax base and supported fiscal sustainability. The expansion of digital tax systems has modernized compliance, reduced evasion, and improved efficiency, while rising public investment in infrastructure has generated employment and boosted productivity. Government expenditure patterns have also evolved, moving away from primarily administrative costs toward productive investments in areas such as renewable energy, healthcare, skill development, and the digital economy. This emphasis on capital expenditure has become a cornerstone of India's growth strategy, as it creates assets and delivers lasting economic benefits. Fiscal policy has further reinforced growth through the multiplier effect, with public spending on roads, railways, ports, and digital connectivity stimulating demand, generating jobs, and encouraging private sector participation. Together, these trends highlight how fiscal policy continues to play a pivotal role in strengthening India's competitiveness and supporting inclusive development.

Analysis of Fiscal Policy and Public Finance in India

Fiscal Deficit Management

Fiscal deficit represents the gap between total government expenditure and total revenue (excluding borrowings). It indicates the borrowing requirement of the government. A moderate fiscal deficit can support economic growth by financing productive investments. However, persistent high fiscal deficits may increase public debt and create inflationary pressures.

India has adopted a balanced approach by focusing on:

- Fiscal consolidation
- Increasing revenue collection
- Improving expenditure efficiency

- Promoting productive capital expenditure

Tax Reforms and Revenue Mobilization

Tax revenue is the backbone of public finance. A strong taxation system enables the government to finance development programs.

Major developments in India's taxation system include:

1. Goods and Services Tax (GST)

GST has transformed India's indirect taxation structure by replacing multiple state and central taxes with a unified system.

Major outcomes:

- Increased formalization of the economy
- Improved tax compliance
- Reduction in tax evasion
- Better movement of goods across states

2. Digital Tax Reforms

The introduction of online filing systems, faceless assessment and technology-based monitoring has improved efficiency and transparency in tax administration.

Public Expenditure and Development

Government expenditure plays a crucial role in economic and social development. Infrastructure Development: Investment in infrastructure creates a foundation for long-term economic growth.

Major areas include:

- Transportation networks
- Renewable energy
- Digital infrastructure
- Urban development
- Social Sector Development

Fiscal policy supports welfare and human development through expenditure on:

- Education
- Healthcare
- Rural development
- Social security schemes

Role of Fiscal Policy in Inclusive Growth

Inclusive growth means economic development that benefits all sections of society. Fiscal policy contributes to inclusive growth through:

- 1. Poverty Reduction:** Government welfare programs provide financial support and improve living standards of vulnerable sections.
- 2. Employment Generation:** Public investment projects create employment opportunities and encourage private investment.
- 3. Regional Development:** Government spending helps reduce regional inequalities by promoting infrastructure and economic activities in less-developed areas.
- 4. Human Capital Development:** Investment in education, healthcare and skill development improves productivity and income opportunities.

Challenges of Public Finance and Fiscal Policy in India

Despite significant improvements, India faces several challenges in fiscal management.

Rising Public Debt: Increasing government borrowing creates pressure through higher interest payments and reduces fiscal flexibility.

Limited Tax Base: Although tax collection has improved, a large section of the economy remains outside the formal taxation system.

Growing Subsidy Burden: Subsidies on food, fuel and agriculture are important for welfare but require efficient targeting to avoid excessive fiscal pressure.

Centre-State Fiscal Imbalance: Differences in revenue capacity and expenditure responsibilities create challenges in maintaining balanced federal finances.

Balancing Growth and Fiscal Discipline: The government must maintain a balance between –

- Supporting economic growth through expenditure
- Maintaining fiscal sustainability

Suggestions for Improving Fiscal Sustainability

Based on the analysis, the following measures are suggested:

1. **Broadening the Tax Base:** More taxpayers should be brought into the formal taxation system through digitalization and economic formalization.
2. **Improving Quality of Public Expenditure:** Government spending should focus more on productive sectors rather than only consumption-based expenditure.
3. **Strengthening Tax Administration:** Advanced technology, data analytics and better compliance mechanisms can improve revenue collection.
4. **Efficient Subsidy Management:** Targeted subsidies using digital platforms can reduce leakages and improve effectiveness.
5. **Promoting Cooperative Federalism:** Better coordination between central and state governments is necessary for effective fiscal management.

6. Encouraging Public-Private Partnerships: Private participation can supplement government resources for infrastructure development.

Findings of the Study

The major findings of the study are:

1. Public finance has become a major instrument for achieving economic development and social welfare.
2. Fiscal policy plays an important role in maintaining economic stability.
3. Tax reforms, especially GST, have improved revenue mobilisation and transparency.
4. Increased capital expenditure has supported infrastructure development and economic growth.
5. Fiscal sustainability remains a major challenge due to debt and expenditure pressures.
6. Effective financial management is essential for achieving long-term inclusive growth.

Conclusion

Public finance and fiscal policy remain central to India's economic development, performing vital functions such as resource mobilization, stabilization, redistribution, and growth promotion. Over the years, India's fiscal system has undergone significant transformation through taxation reforms, digitalization, and improved expenditure management. Milestones like the introduction of GST, expansion of digital tax systems, and emphasis on capital expenditure have marked important progress in strengthening fiscal governance. At the same time, balancing growth with fiscal discipline continues to be a challenge. Rising public debt, expanding welfare commitments, and the demand for infrastructure investment require careful prioritization and responsible financial management. A sustainable fiscal framework must therefore focus on enhancing revenue efficiency, improving the quality of expenditure, and fostering cooperation across different levels of government. With continued reforms and prudent management, public finance can serve as a powerful instrument for guiding India toward inclusive, stable, and sustainable economic development.

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CHAPTER - 12

APPLICATION OF ARTIFICIAL INTELLIGENCE IN SOCIAL SCIENCE RESEARCH: A THREE TIER FRAMEWORK ANALYSIS

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Abstract

This study examines the evolving role of Artificial Intelligence (AI) in social science research in a progressive structure namely, Tool -- Workflow—Actor and attempts to present a Framework for current and future analysis. The term Artificial Intelligence includes the application of Large Language Models (LLMs), Generative AI (GenAI), Machine Learning (ML), Natural Language Processing (NLP) in the research process. The AI as tool can be denoted as with the limited researcher directed task done by AI in the research process; AI in workflow can be defined as the application of one or more AI tools and applications at multiple stages of research process relevant to specific purposes: AI, as an Actor, is treated as a source of observations or as an interacting/simulated social entity: respondent, participant, stand-in, or epistemic co-producer. The three tier framework attempts to create a structure for analysis of existing scholarship on the AI applications in Social Science research. This study has been done based on PRISMA Scoping Style Review by a single reviewer with the assistance of AI.

Keywords: Social Science Research, Artificial Intelligence (AI), Algorithmic Bias, Algorithmic Fidelity, Validity Risk, Tool, Workflow, Actor, Framework Analysis.

Research process:

This study has three objectives:

- To analyse the predisposition of AI applications in Social Science research
- To identify the pattern of AI applications in Social Science Research based on Tool – Workflow – Actor tiers
- To identify criterion /dimensions related to AI applications and set it as framework for the analysis.

This study follows the Scoping Style Review process of identifying relevant literature using search string, data extraction based on the above mentioned three tier and analysis of pattern and implications based on framework presented in the study.

Search string logic: (AI OR "large language model" OR LLM OR "generative AI") AND ("social science research" OR "qualitative analysis" OR "survey" OR "research methodology") — combined with tier-specific sub-searches (e.g., "synthetic respondents," "silicon sampling," "CAQDAS," "multi-agent research system")

Literature Screening Process:



Operational Definition:

AI Role was assigned using the following operational definitions, applied to each study's primary framing of what the AI system did within the research process:

- Tool — AI performs a bounded, researcher-directed task within a human-led workflow (e.g., transcription, coding, annotation), and its output is checked against a human-generated benchmark.

- **Workflow** — AI is integrated across multiple stages of the research pipeline (e.g., literature retrieval, hypothesis generation, analysis sequencing), functioning as methodological infrastructure rather than a single-task assistant.
- **Actor** — AI stands in for, or acts as, a research subject, respondent, or co-researcher, generating data or decisions that would otherwise require a human participant or investigator.

Limitations of the Study:

The literature review was done in open access journals through web search by the researcher as a single coder and verification with the help of AI research assistance. This study can be strengthened with the additional research rigour and extended literature review in Scopus Indexed and Web of Science Journals.

Literature Analysis by Tier - The total no of (28) studies identified through the process distribute across three tiers: Tool --9, Workflow – 7 and Actor – 12. This shows the progression of AI applications in social science research towards the higher levels.

AI as Tool - The existing literature on this tier reveals certain key findings: 1. The performance of LLMs on bounded classification tasks is equivalent to human coding but not to fine tuned supervised models; 2. The qualitative analysis application consistently require a structured protocol and human verification and 3) AI applications are time and cost efficient in various research stages. (Gilardi, Alizadeh and Kubli 2023; Ziems et al. 2024; Nguyen-Trung 2025). Currently, the AI is embedded in Computer Assister Qualitative Data Analysis Softwares (CAQDAS) such as NVivo, ATLAS.ti, and MAXQDA which shows the acceptance and prevalence of AI tool tier in Social Research.

AI as Work Flow - The Workflow tier reframes AI not as a task-level assistant but as methodological infrastructure spanning multiple research stages. The studies in this tier have stressed upon the following aspects: 1. GenAI can improve the scale, scope and efficiency of research process but cautions against algorithmic bias, replication and environmental cost (Bail 2024); 2. LLMs can simulate human like responses in the entire research pipeline but its validity has to addressed at the research design and the execution level (Grossmann et al 2023) and the three tier analogy of Xiong 's(2026) study is closely related to this tier.

AI as Actor - Its foundational papers establish the core technique of using LLMs as proxies for human respondents or experimental subjects. Argyle et al (2023) coined the terms 'Silicon sampling' and 'Algorithmic Fidelity' using GPT-3as respondents in their study based on American National Election Studies. Several experimental studies were also undertaken in this tier by Horton, Filippas and Manning (2023), Manning, Zhu and Horton's 'Automated Social Science' (NBER, 2024). Beyond individual-respondent simulation, the Actor tier extends to multi-agent and governance applications. OASIS (2024) demonstrates population-scale (up to one million agents) social simulation extending classic agent-based-modeling traditions such as Schelling's segregation model.

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Business, Economics and Sustainable Development Perspectives**

Framework for Analysis:

Sl.No	Criterion / Dimensions	AI as Tool	AI as Workflow	AI as Actor
1	Role	Assists researchers in discrete, bounded tasks, checked against a human benchmark	Orchestrates and automates interconnected, multi-stage research processes as methodological infrastructure	Performs research functions with delegated or autonomous agency, standing in for a subject, respondent, or co-researcher
2	Research Purpose	Annotation, Coding, Measurement & Validation, Report Writing and Presentation	Literature Retrieval & Synthesis, Hypothesis Generation, Research Design & Instrument Development, Multi-Stage Pipeline Integration	Synthetic Data Generation, Simulation, Human-Participant Substitution, Deliberation & Governance Simulation
3	AI Tools & Techniques	Statistical tools, Thematic / Content Analysis tools, task-specific LLM / Generative AI prompting	Multi-agent orchestration frameworks (e.g., LangChain, AutoGen, CrewAI), RAG pipelines, workflow-integrated LLM / Generative AI	LLM / Generative AI conditioned as simulated respondents or agents; multi-agent generative simulation platforms
4	Validity, Risks & Ethics	Hallucination; tool immaturity / fast-changing landscape	Automation bias; reproducibility / prompt & model sensitivity; accountability	Algorithmic bias; “black-box” issues; validity (construct, population, ecological); accountability
5	Human Involvement & Decision-Making Authority	Human-in-the-Loop — human control over every step	Human-on-the-Loop — human-directed AI functionalities; human monitors and can intervene	Human-in-Command — AI proposes / executes within human-set goals; human retains override & validation authority before downstream use
6	Governance Requirements	Policy on disclosure of AI usage and purpose – Individual and Institutional (e.g., ICMJE / COPE / WAME / PLOS-style standards)	Governance of workflow design, security, interoperability (e.g., MCP / A2A), and auditability	AI governance, meaningful human oversight, accountability, legal and ethical compliance (e.g., EU AI Act Art. 14)

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Analysis based on Framework:

This section consolidates the 28 included studies against the tier framework and draws a set of inferences that follow from reading the evidence base as a whole, across tiers.

S.No	Study	Year	Discipline	Tier	Contribution / Note
1	Gilardi, Alizadeh & Kubli	2023	Comm. / Poli. Sci.	Tool	Landmark accuracy benchmark: zero-shot ChatGPT annotation exceeded MTurk crowd-coding by roughly 25 points.
2	Ziems et al.	2024	Computational SS	Tool	Counterweight at scale: LLMs generally lag fine-tuned classifiers across 25 CSS benchmarks and 13 models.
3	Morgan	2023	Qual. Methodology	Tool	Early framing of ChatGPT as an exploratory qualitative-coding assistant.
4	Nguyen-Trung	2025	Qual. Methodology	Tool	Structured four-stage thematic-analysis protocol that keeps the researcher positioned as interpretive authority.
5	Purdue e-Pubs case study	2024	Library & Info. Sci.	Tool	Data-management practices case study; not elaborated individually in the Section 5 narrative.
6	“Harnessing ChatGPT for Thematic Analysis”	2024	Health Services Research	Tool	Efficiency and consistency gains offset by hallucination and nuance loss in clinical qualitative coding.
7	Primary-care thematic-analysis study	2024	Health Communication	Tool	Same efficiency / hallucination pattern documented in primary-care interview data.
8	Maternal-health thematic-analysis study	2024	Public Health	Tool	Same efficiency / hallucination pattern documented in maternal-health interview data.
9	“Co-Refine”	2026	HCI / Qual. Methodology	Tool	Embeds continuous, in-process consistency checking inside CAQDAS tools rather than post-hoc review.
10	Bail	2024	Sociology	Workflow	Framing piece: GenAI reshapes survey, experiment, and content-analysis pipelines; warns of ‘junk science.’
11	Grossmann et al.	2023	Multidisciplinary	Workflow	Argues the entire research pipeline, not single tasks, is being restructured by LLM capability.
12	Musslick et al.	2025	Cognitive Sci. / Phil. of Science	Workflow	Maps automation bottlenecks (interpretability, epistemic trust) across the full discovery cycle.
13	Xiong	2026	Multidisc. / Methodology	Workflow	Source of this paper’s own typology; names orchestration frameworks (LangChain, AutoGen, CrewAI) as the tier’s technical signature.
14	Postgraduate-research systematic review	2025	Higher Education	Workflow	Reflexive review of AI’s effect on research productivity and ideation, not a domain-study deployment.

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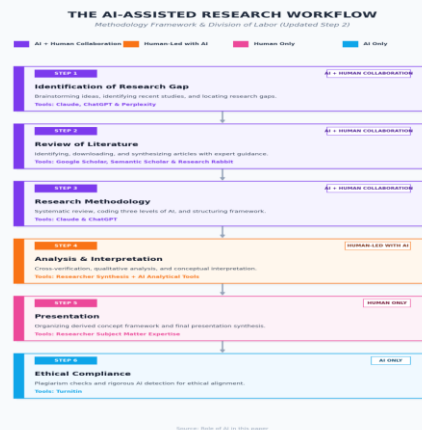
15	Academic writing / reading review (PRISMA+SALSA)	2026	Social Sciences / Higher Ed.	Workflow	136-study comparable precedent; reflexive review of AI's effect on academic writing.
16	Sebastian, Moon & Camburn	2025	Education Research	Workflow	Not elaborated individually in the Section 5 narrative.
17	Argyle et al.	2023	Political Science	Actor	Founding paper: coins 'silicon sampling' and 'algorithmic fidelity.'
18	Horton, Filippas & Manning	2023	Economics	Actor	Founding paper: introduces 'Homo Silicus,' LLMs as economic agents.
19	Aher, Arriaga & Kalai	2023	Psychology	Actor	Founding paper: 'Turing Experiments'; documents a systematic 'hyper-accuracy distortion.'
20	Manning, Zhu & Horton	2024	Economics / Methodology	Actor	Collapses Workflow and Actor into a single automated loop; raises a circularity concern.
21	Abdurahman et al.	2025	Psychology	Actor	Proposes a discipline-wide validity checklist (construct, population, reliability, transparency).
22	"Threat of analytic flexibility"	2025	Psychology / Methodology	Actor	Documents researcher degrees of freedom (prompt, model, temperature); calls for pre-registration.
23	"Evaluating LLMs as Synthetic Social Agents"	2025	Sociology	Actor	Not elaborated individually in the Section 5 narrative.
24	Rossi, Harrison & Shklovski	2024	Sociology / STS	Actor	Epistemological critique: LLM-generated data rest on assumptions different from earlier synthetic-data traditions.
25	"Not-quite-human tastes"	2026	Sociology (cultural)	Actor	Domain-specific validation failure: LLM survey surrogates overstate cultural omnivorousness.
26	OASIS	2024	Computational SS	Actor	Population-scale (up to one-million-agent) social simulation extending classic agent-based-modeling traditions.
27	Deliberation-simulation study	2026	Poli. Sci. / Delib. Democracy	Actor	Explicitly frames Actor-tier simulation as decision support, not replacement.
28	Climate-governance simulation study	2026	Environmental Policy	Actor	Same 'support, not replace' framing applied to pre-rollout policy testing.

Implications:

- The framework analysis shows predominantly the application of AI in research process gained maturity at Tool tier into Workflow and strongly progressing into treating it as Actor and also caution is raised about ethical and environmental issues.
- The typology of application of AI in this study is theoretically based upon Xiong's (2026) Classification and this study attempts to analyse the current literature on AI applications in Social Science research based on this typology and in certain criterion and dimensions set here as framework.

- Further rigorous research and validity tools and standards to be followed in various stages of research on this topic to ensure its authenticity.
- Finally, in this paper, the researcher attempted to experiment as to whether LLMs such as ChatGPT & Claude (free versions) can play as a orchestrated workflow tool to do research on ‘AI applications in Social Sciences research’ and it has been implemented in progressive stages such as idea generation/ problem identification, systemic literature review, identifying research design and the three tier AI role Framework analysis. The process is supervised by researcher and its analysis is cross verified based on existing literature on a sample basis. The control of the process, analysis and interpretation is done by the researcher. The AI workflow process can be implemented successfully but lags in identifying and coding research stages, AI role and tools in certain literature documents. However, the researcher clearly declares that the validity of the results produced here have to be testified by human resources which needs further research.

Role of AI in this paper:



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CHAPTER – 13

MONETARY ECONOMICS AND BANKING: INTERRELATIONSHIP, MONETARY POLICY TRANSMISSION AND EMERGING CHALLENGES

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Abstract

Monetary economics and banking together form the backbone of modern economic systems, shaping liquidity, credit, inflation, and overall stability. Monetary economics explores the functions of money, determinants of supply and demand, interest rates, inflation, and the role of monetary policy, while banking provides the institutional framework for mobilizing savings, creating credit, facilitating payments, and channeling resources across sectors. The interaction between central banks and commercial banks is crucial, as monetary authorities influence liquidity and credit conditions, which banks transmit to households and firms through lending and deposit rates. In India, the Reserve Bank plays a pivotal role in monetary management and regulation, addressing challenges such as inflation control, financial stability, digital banking, financial inclusion, non-performing assets, cybersecurity, and the rise of non-bank intermediaries. International evidence highlights that monetary tightening affects not only inflation and growth but also bank profitability and resilience, underscoring the need for coordinated policies that balance price stability, economic growth, financial inclusion, and banking soundness.

Keywords: *Monetary economics, money supply, banking, monetary policy, central bank, commercial banks, inflation, credit, financial stability, India.*

Introduction

Money and banking together form the foundation of modern economies, influencing production, consumption, investment, saving, and trade. Monetary economics examines how changes in money, credit, and interest rates affect output, employment, and prices. While traditional theories emphasized the link between money supply and price levels, modern approaches incorporate expectations, financial markets, exchange rates, and stability concerns. Banking complements this by providing the institutional mechanism for mobilizing deposits, creating credit, and facilitating payments. Commercial banks perform financial intermediation, while central banks regulate liquidity, supervise institutions, and maintain overall stability in the monetary system.

The interaction between monetary economics and banking becomes especially visible during inflationary pressures, crises, or economic slowdowns. Central banks may tighten policy by raising interest rates or reducing liquidity, prompting banks to adjust lending and deposit rates, thereby influencing credit demand, investment, and consumption. Conversely, accommodative policies encourage borrowing and growth during downturns. Recent global evidence, including IMF research, highlights that monetary tightening can challenge bank profitability and resilience, showing that monetary policy cannot be separated from banking conditions.

In India, this relationship is particularly significant because the banking system remains the primary channel for financial intermediation. The Reserve Bank of India (RBI) plays a pivotal role by using

monetary policy and regulatory instruments to influence liquidity and credit conditions, while also supervising banks to safeguard financial stability. The RBI's framework thus serves as a crucial bridge between theoretical monetary economics and practical banking operations, ensuring that monetary management aligns with the goals of price stability, economic growth, and financial resilience.

Objectives of the Study

The major objectives of this article are:

1. To explain the meaning and scope of monetary economics.
2. To examine the functions and importance of money in an economy.
3. To analyze the role of commercial banks in economic development.
4. To explain the relationship between money supply and banking activities.
5. To examine major monetary policy instruments and their effectiveness.
6. To analyze the transmission of monetary policy through the banking sector.
7. To examine the role of the Reserve Bank of India in monetary management and banking regulation.
8. To identify emerging challenges in monetary economics and banking.
9. To suggest measures for strengthening monetary and banking stability.

Conceptual Foundations of Monetary Economics

Monetary Economics

Monetary economics is a branch of economics concerned with the study of money, monetary institutions, monetary variables and their influence on economic activity. It examines questions such as:

- What constitutes money?
- Why do people demand money?
- How is money created?
- What determines the money supply?
- How do interest rates affect economic decisions?
- What causes inflation and deflation?
- How does monetary policy influence economic activity?
- What is the relationship between money, banking and financial stability?

The importance of monetary economics arises from the fact that changes in monetary conditions can influence the spending decisions of households and businesses. Interest rates influence the cost of borrowing and the reward for saving, while liquidity conditions affect the availability of credit.

Functions of Money

Money performs several fundamental economic functions.

- **Medium of exchange:** Money facilitates transactions by eliminating the difficulties associated with barter.
- **Unit of account:** Money provides a common measure for expressing the prices and values of goods and services.
- **Store of value:** Money allows individuals and institutions to transfer purchasing power from the

present to the future.

- Standard of deferred payment: Money provides a common basis for settling future obligations such as loans, wages and contracts.

These functions make money indispensable for a complex market economy.

Demand for Money

The demand for money refers to the amount of money that economic agents wish to hold in liquid form. Individuals may hold money for transactions, precautionary purposes and financial or speculative motives.

The Keynesian approach identifies three major motives:

1. Transaction motive – money is held to meet regular expenditure.
2. Precautionary motive – money is held to meet unexpected needs.
3. Speculative motive – money may be held because individuals expect changes in interest rates or asset prices.

Modern monetary economics also considers income, interest rates, inflation expectations, financial innovation and payment technologies as important determinants of money demand.

Money Supply and Monetary Creation

Money supply represents the quantity of money available within an economy at a particular point in time. Depending on the definition used, monetary aggregates may include currency, demand deposits and other highly liquid financial assets.

A significant portion of modern money is created through the banking system. When commercial banks provide loans, they generally create corresponding deposits in the banking system. Thus, bank credit plays an important role in determining the availability of money and liquidity in the economy.

The traditional textbook deposit-multiplier model illustrates how an initial deposit can support multiple rounds of deposits and lending, subject to reserve requirements and other assumptions. However, actual modern banking systems are more complicated because lending decisions depend on capital requirements, liquidity, credit risk, borrower demand, profitability, regulation and banks' expectations.

Therefore, money creation should not be understood simply as a mechanical process controlled by a single reserve ratio. Central bank policy, bank balance sheets and private-sector demand for credit jointly influence monetary and credit conditions.

Banking: Meaning and Economic Importance

A bank is a financial institution that accepts deposits and provides loans and other financial services. Banking institutions perform several functions that are essential for economic development.

Mobilization of Savings - Banks collect savings from households, businesses and other entities. Instead of allowing savings to remain idle, banks channel these funds toward productive activities.

Credit Creation - Commercial banks provide loans for consumption, housing, education, agriculture,

trade, industry and services. Credit availability supports entrepreneurship, investment and employment.

Financial Intermediation - Banks act as intermediaries between surplus units and deficit units. Savers may not have sufficient information or expertise to lend directly to borrowers. Banks reduce this information and transaction problem through financial intermediation

Payment and Settlement Services - Modern banking systems provide mechanisms for transferring funds through cheques, electronic transfers, cards, mobile applications and other digital payment systems.

Risk Management - Banks help individuals and businesses manage financial risks through diversification, lending practices, guarantees and other financial services.

Promotion of Financial Inclusion - Banks facilitate access to formal financial services for households and enterprises that may previously have depended on informal financial channels. Financial inclusion improves savings, payment access and access to formal credit.

Relationship Between Monetary Economics and Banking

The relationship between monetary economics and banking can be understood through four major dimensions.

Money and Bank Deposits - Bank deposits constitute an important component of broad money. Changes in banking activity can therefore influence monetary conditions.

Interest Rates and Bank Lending - Central bank policy rates affect the funding conditions faced by financial institutions. Changes in policy rates can influence deposit rates and lending rates.

Credit and Economic Activity - Bank credit affects consumption and investment. When credit becomes cheaper and more easily available, economic activity may increase. When credit becomes expensive or restricted, spending and investment may decline.

Financial Stability - Banks are highly interconnected with households, businesses, financial markets and governments. Weaknesses in the banking system can therefore affect the broader economy. Monetary authorities must consider financial stability alongside price stability.

Monetary Policy and Its Instruments

Monetary policy refers to the actions undertaken by a central bank to influence money, liquidity, interest rates and credit conditions in pursuit of macroeconomic objectives.

The major objectives of monetary policy generally include:

- Price stability
- Sustainable economic growth
- Financial stability
- Adequate liquidity
- Exchange-rate stability where relevant
- Support for employment and economic activity

The major instruments of monetary policy:

Policy Interest Rate - The policy rate is a key instrument through which the central bank signals its monetary-policy stance. An increase in the policy rate generally makes borrowing more expensive and may reduce credit demand. A reduction can have the opposite effect.

Open Market Operations - Central banks can buy or sell securities to influence liquidity in financial markets. Purchases generally inject liquidity, while sales can absorb liquidity.

Reserve Requirements - Central banks can impose reserve-related requirements on banks. Such requirements influence the amount of funds that banks must maintain rather than lend.

Standing Facilities and Liquidity Operations - Central banks provide mechanisms through which eligible financial institutions can obtain or place liquidity. These facilities help maintain orderly money-market conditions.

Qualitative and Regulatory Measures - Central banks may also use supervisory and regulatory measures to influence credit quality, risk-taking and financial stability.

Monetary Policy Transmission Through Banking

Monetary policy is effective only when policy decisions are transmitted to the broader economy. The banking sector plays a central role in this transmission process.

Interest Rate Channel - When the central bank changes its policy rate, money-market rates and bank funding costs may respond. Banks can subsequently alter lending and deposit rates. Borrowing costs influence consumption and investment decisions.

For example:

Higher policy rate → Higher market/bank lending rates → Lower borrowing → Lower consumption and investment → Lower aggregate demand → Reduced inflationary pressure

Conversely:

Lower policy rate → Lower borrowing costs → Higher credit demand → Higher consumption and investment → Increased economic activity

The strength and speed of this mechanism depend on banking competition, loan repricing structures, borrower expectations and financial-market conditions.

Credit Channel - The credit channel operates through changes in the availability of bank credit. Monetary tightening can reduce banks' willingness or capacity to lend, especially when banks face capital or liquidity constraints.

Bank Lending Channel - Changes in monetary conditions can affect bank balance sheets and their ability to extend loans. Smaller or financially constrained banks may be more sensitive to changes in liquidity and funding conditions.

Asset Price Channel - Monetary policy affects interest rates and can influence the prices of bonds, equities and real estate. Changes in asset prices influence household wealth, investment incentives and collateral values.

Exchange Rate Channel - Changes in interest rates can affect capital flows and exchange rates. Exchange-rate movements influence import prices, exports and inflation.

The importance of transmission has been emphasized by central-bank researchers. Recent BIS discussions highlight that monetary policy affects financial conditions through multiple interconnected channels rather than through a single interest-rate mechanism. (Bank for International Settlements)

Inflation and the Role of Banking

Inflation is a sustained increase in the general price level that reduces the purchasing power of money. Controlling inflation is one of the most important objectives of monetary policy.

When inflation is demand-driven, monetary tightening can reduce aggregate demand by increasing borrowing costs and discouraging excessive credit expansion. However, inflation may also result from supply shocks such as energy-price increases, food shortages, geopolitical disruptions or supply-chain problems. In such circumstances, monetary policy cannot directly increase the supply of goods.

Banking conditions influence the effectiveness of inflation control. A well-capitalized and liquid banking system can transmit monetary policy more smoothly. However, aggressive monetary tightening may create stress for borrowers and financial institutions.

Recent IMF research indicates that most banks may be relatively protected against general inflation movements because some income and expense exposures move together, but particular banks can have substantial vulnerabilities to rapid increases in inflation and interest rates.

This creates a policy challenge: monetary authorities need to control inflation without unnecessarily generating financial instability.

Role of the Reserve Bank of India

The Reserve Bank of India is the country's central bank and plays a critical role in monetary management and banking regulation.

Its major responsibilities include:

- Formulating and implementing monetary policy.
- Maintaining price stability while supporting growth.
- Regulating and supervising banks and certain financial institutions.
- Managing currency issuance and circulation.
- Managing foreign exchange reserves and foreign-exchange-related functions.
- Supporting the stability of the financial system.
- Acting as banker to the government.
- Acting as banker to banks.
- Managing liquidity in the financial system.

The RBI's Monetary Policy Committee plays an important role in determining the policy rate and assessing economic and inflation conditions. The RBI also uses liquidity-management operations to ensure that monetary-policy intentions are transmitted through financial markets. The RBI Bulletin provides regular information on monetary policy decisions, liquidity operations, banking developments and economic conditions, demonstrating the broad scope of monetary management in India.

Banking Sector and Financial Stability in India

India's financial system has undergone significant changes through banking reforms, technological development, digital payments, improved regulation and increased competition. An IMF assessment published in 2025 concluded that India's financial system had become more resilient compared with the

earlier assessment, although risks associated with growing non-bank financial intermediation and interconnectedness require continued monitoring. (IMF e-Library)

Capital Adequacy: Banks require adequate capital to absorb unexpected losses. Strong capital buffers improve the ability of banks to withstand financial shocks.

Liquidity Management: Banks must maintain sufficient liquid resources to meet withdrawal and payment obligations. Excessively low liquidity can create instability, while excessive idle liquidity may reduce lending efficiency.

Non-Performing Assets: Non-performing assets remain an important concern because poor loan quality reduces bank profitability and can constrain future lending.

Risk Management: Banks face credit risk, market risk, liquidity risk, operational risk, cyber risk and other forms of financial risk. Effective risk-management systems are essential for financial stability.

Banking and Non-Bank Financial Institutions: The financial system increasingly includes NBFCs and other non-bank intermediaries. These institutions can expand access to credit and diversify financial intermediation, but their interconnectedness with banks may also transmit financial stress.

Financial Inclusion and Monetary Economics

Financial inclusion refers to the availability and effective use of affordable and appropriate financial services by individuals and businesses.

From the perspective of monetary economics, financial inclusion can influence the way monetary policy reaches households and firms. If a significant section of the population remains outside the formal financial system, changes in policy interest rates may not affect them directly.

Banking inclusion can improve:

- Savings mobilization.
- Access to formal credit.
- Insurance and pension participation.
- Digital payment adoption.
- Financial literacy.
- Household financial resilience.

Therefore, financial inclusion is not merely a social objective; it also contributes to the efficiency of financial intermediation and monetary-policy transmission.

Major Challenges in Monetary Economics and Banking

Inflation Uncertainty: Central banks face difficulty when inflation is caused simultaneously by demand and supply factors. Excessive monetary tightening may weaken economic growth, whereas insufficient tightening can allow inflation expectations to become persistent.

Monetary Policy–Financial Stability Trade-off: Interest-rate increases may reduce inflation but can simultaneously increase debt-servicing costs and create stress for vulnerable borrowers and financial institutions. The IMF has noted that when inflation is high and financial stress is rising, central banks may face a trade-off between price stability and financial stability. (IMF)

Cybersecurity Risks: Increasing digitalization has made banking more efficient but has also expanded

the potential attack surface for cybercriminals.

Non-Performing Assets: Poor asset quality can weaken bank profitability and restrict credit expansion.

Non-Bank Financial Intermediation: Growing linkages between banks and non-bank financial institutions can create channels through which financial stress spreads across the system. International financial-stability assessments have highlighted the importance of monitoring these interconnected risks. (IMF)

Climate and Environmental Risks: Climate-related events can affect borrowers, collateral values, agricultural lending and insurance markets. Banks increasingly need to incorporate environmental risks into their risk-management frameworks.

Financial Literacy: The effectiveness of financial and monetary systems depends partly on people's understanding of interest rates, inflation, savings, borrowing and investment. Greater financial literacy can improve household financial decisions and strengthen the effectiveness of monetary-policy communication. (Bank for International Settlements)

Emerging Trends: Several developments are likely to shape the future relationship between monetary economics and banking.

Artificial Intelligence: AI can improve credit scoring, fraud detection, customer service and risk assessment. At the same time, inappropriate models can create bias and operational risks.

Central Bank Digital Currencies: Central bank digital currencies may influence payment systems, monetary transmission and the structure of deposits. Their introduction requires careful consideration of privacy, cybersecurity, monetary-policy transmission and banking-system effects.

Open Banking: Greater sharing of financial data with customer consent can increase competition and enable innovative financial products.

Green Finance: Banks are increasingly expected to finance environmentally sustainable activities and assess climate-related financial risks.

Greater Macro prudential Regulation: Monetary policy primarily focuses on macroeconomic objectives, whereas macro prudential policy addresses systemic financial risks. Greater coordination between the two can help strengthen financial stability.

Policy Suggestions

Based on the discussion, the following measures can strengthen monetary and banking systems:

- **Maintain credible monetary policy:** Central banks should communicate policy objectives clearly and consistently.
- **Strengthen banking supervision:** Risk-based supervision should identify vulnerabilities before they become systemic problems.
- **improve monetary transmission:** Competition, efficient financial markets and transparent interest-rate mechanisms can improve the transmission of policy decisions.
- **Maintain adequate capital and liquidity:** Banks should preserve sufficient buffers to withstand adverse shocks.
- **Strengthen cybersecurity:** Banks should invest continuously in cyber-risk management, customer awareness and operational resilience.
- **Promote responsible digital lending:** Technology-based credit should be accompanied by proper assessment of borrower repayment capacity.

- Improve financial inclusion: Formal financial services should reach underserved households, rural communities and small enterprises.
- Enhance financial literacy: Individuals should understand interest rates, inflation, credit costs, savings and basic financial risk.
- Monitor NBFC-bank interconnectedness: Regulators should closely monitor financial linkages that could transmit systemic risks.
- Coordinate monetary and macro prudential policies: Price stability and financial stability objectives should be addressed through complementary rather than conflicting policy frameworks.

Conclusion

Monetary economics and banking are inseparable pillars of modern economies, with money facilitating transactions and storing value, while banks mobilize savings, create credit, and allocate resources. Central banks shape monetary conditions through policy rates, liquidity management, and regulation, and commercial banks transmit these decisions to the real economy via lending and deposit channels. The relationship between monetary policy and banking has grown more complex with inflation, interest rates, financial stability, digitalization, financial inclusion, and non-bank intermediaries becoming deeply interconnected. Global evidence, including IMF findings, shows that monetary tightening can strain bank balance sheets and financial stability, especially when institutions face concentrated risks.

In India, the challenge lies in sustaining a banking system that is stable, inclusive, and innovative while supporting long-term growth. The Reserve Bank of India plays a crucial role by ensuring effective policy transmission, adequate capital and liquidity, responsible digitalization, and stronger financial literacy. Looking ahead, monetary economics must integrate money, banks, markets, and technology, recognizing that policy outcomes extend beyond inflation and interest rates to credit markets and financial resilience. Ultimately, a successful system should deliver stable purchasing power, efficient intermediation, and a resilient financial structure, achievable through credible institutions, prudent regulation, and informed policy choices.

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CHAPTER – 14

CYBERSECURITY SYSTEMS IN INDIAN BANKING: CHALLENGES, EMERGING TECHNOLOGIES, AND CUSTOMER PROTECTION MEASURES.

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Abstract

Despite bringing numerous advantages for Indian customers and making banks more efficient, fast adoption of digital banking in India also made Indian banks susceptible to cyber risks such as phishing, malware, data breaches, and identity theft. Cybersecurity is essential in order to ensure the protection of confidential information in the Indian banking sector. Several cybersecurity guidelines and frameworks have been proposed by the RBI to help banks to increase their resilience to possible cyber threats. In addition, advanced technologies such as artificial intelligence, encryption, multifactor authentication, and security operation centres are used by Indian banks to ensure digital transactions and protect their customers from any losses. Nevertheless, the threat of exploitation of technological and human weaknesses remains relevant and represents serious obstacles for the Indian banking sector. The purpose of this study is to assess cybersecurity systems that Indian banks use, to determine major cyber threats, and to assess existing security systems.

Keywords: Cybersecurity, Indian Banking System, Digital Banking, RBI Guidelines, Data Protection, Financial Fraud, Artificial Intelligence.

Introduction

The Indian banking sector has undergone a remarkable transformation with the increasing adoption of digital technologies, internet banking, mobile banking, Unified Payments Interface (UPI), and other electronic payment systems. The growth of digital banking has enhanced customer convenience, improved financial inclusion, and accelerated economic development. However, the extensive use of digital platforms has also exposed banks and customers to various cyber threats and security risks.

Cyber security refers to the protection of computer systems, networks, and digital information from unauthorized access, attacks, and damage. In the banking sector, cyber security plays a vital role in safeguarding customer information, maintaining trust, and ensuring uninterrupted financial services. Cyber-attacks such as phishing, ransomware, malware, identity theft, and data breaches have become increasingly sophisticated, making cyber security a major concern for banks and financial institutions.

In India, the Reserve Bank of India (RBI) has implemented several regulatory frameworks and guidelines to strengthen cyber security practices in banks. Indian banks have adopted advanced security mechanisms including encryption technologies, multi-factor authentication, artificial intelligence-based fraud detection systems, and continuous monitoring through Security Operations Centres. Nevertheless, the dynamic nature of cyber threats requires continuous improvement in cyber security strategies and customer awareness.

The present study focuses on the cyber security systems implemented in the Indian banking sector, the challenges faced by banks in combating cyber threats, and the emerging technologies that can strengthen the security of digital financial services. The findings of this study will contribute to understanding the importance of cyber security in maintaining the stability and reliability of the Indian banking system.

Review Of Literature

Ali and Shah (2024) examined the barriers to the adoption of Artificial Intelligence-enabled cyber security systems in the banking sector. The study identified technological, organizational, and environmental challenges affecting the implementation of AI-based cyber security mechanisms. The authors emphasized the need for regulatory support and skilled professionals to enhance cyber security effectiveness.

Kalyani and Gupta (2024) conducted a systematic literature review on Artificial Intelligence and Machine Learning in banking. The study found that AI and ML technologies have significantly improved fraud detection, customer trust, and operational efficiency. However, increasing cyber threats and data security issues remain major challenges for the banking industry.

Kumar, Kuhar, and Sharma (2025) analyzed the adoption and significance of Artificial Intelligence in the Indian banking system. Their findings revealed that AI has transformed banking operations through automation and enhanced security measures, while challenges related to infrastructure and cyber security continue to affect implementation.

Tran (2025) reviewed the evolution of cyber security in banking from traditional security approaches to Industry 4.0 technologies. The study highlighted the importance of Artificial Intelligence and blockchain technologies in strengthening banking security and emphasized the need for continuous technological advancements to combat sophisticated cyber threats.

Waliullah et al. (2025) investigated the impact of cybersecurity threats on digital banking adoption. The study identified phishing attacks and malware as the most prevalent threats and concluded that multi-factor authentication, biometric security, and AI-based fraud detection play a crucial role in enhancing digital banking security.

Ali and Shah (2026) proposed a taxonomy of barriers and mitigation strategies for Artificial Intelligence-based cyber security in banking. The study classified barriers into technological, organizational, and environmental dimensions and suggested appropriate mitigation measures to improve cyber security resilience in financial institutions.

Rohith Eshwar, Praveen Kumar, and Divya (2026) examined India's regulatory framework for AI in banking and fintech. The study emphasized the importance of consumer protection, data privacy, ethical

AI practices, and regulatory readiness to ensure secure and responsible adoption of AI technologies in the banking sector.

Research Gap

Most previous studies have focused on Artificial Intelligence, cyber security threats, and regulatory frameworks separately. Limited empirical research has been conducted on the cyber security systems adopted by Indian banks, particularly regarding the effectiveness of RBI cyber security guidelines and the role of emerging technologies in strengthening banking security. Therefore, the present study aims to bridge this gap by examining cyber security frameworks, major cyber threats, RBI guidelines, and the role of AI and emerging technologies in securing the Indian banking system.

Objectives

1. To study the cyber security framework adopted by Indian banks.
2. To identify major cyber threats affecting the banking sector.
3. To analyse RBI guidelines for cyber security management.
4. To evaluate the role of AI and emerging technologies in securing banking systems.
5. To suggest measures for strengthening cyber security in Indian banks.

Cyber Security System in the Indian Banking System

Cybersecurity in the Indian banking system refers to the policies, technologies, and controls adopted by banks to protect customer data, financial transactions, and digital infrastructure from cyber threats. The system is primarily regulated by the Reserve Bank of India (RBI), which has issued a comprehensive Cyber Security Framework for banks.

Major Components of the Cyber Security System

1. RBI Cyber Security Framework

- Board-approved cybersecurity policy.
- Appointment of a Chief Information Security Officer (CISO).
- Continuous risk assessment and monitoring.
- Cyber Crisis Management Plan (CCMP).
- Annual vulnerability assessment and penetration testing (VAPT).

2. Security Operations Centre (SOC)

Banks maintain 24×7 Security Operations Centres to:

- Detect cyber threats in real time.
- Monitor suspicious activities.
- Respond quickly to cyber incidents.

3. Multi-Factor Authentication (MFA)

Indian banks employ:

- Passwords and PINs.
- OTP-based verification.
- Biometric authentication.
- Risk-based authentication mechanisms for digital payments.

4. Data Protection Measures

- Encryption of sensitive information.
- Secure cloud infrastructure.
- Firewalls and intrusion detection systems.
- Access controls and privilege management.

5. Artificial Intelligence and Zero-Trust Security

RBI has emphasized:

- AI-enabled threat detection.
- Zero-trust architecture.
- Protection against vendor and third-party risks.

6. Anti-Phishing Initiatives

To combat fraudulent websites, RBI introduced:

- **.bank.in** domains for banks.
- **.fin.in** domains for financial institutions.

Table 1: Awareness of RBI Cybersecurity Guidelines and Compliance Level (Chi-Square Test)

Awareness Level	High Compliance	Moderate Compliance	Low Compliance	Total
High	40	10	5	55
Moderate	15	25	10	50
Low	5	10	30	45
Total	60	45	45	150
Source: Computed Data				

Interpretation

The table reveals that respondents with a high level of awareness regarding RBI cybersecurity guidelines exhibit higher compliance levels. Among the 55 respondents with high awareness, 40 show high compliance. In contrast, respondents with low awareness tend to have low compliance, with 30 out of 45 respondents falling into this category. Therefore, awareness of RBI cyber security guidelines appears to be associated with the level of compliance among banks.

Table 2: Cyber security Practices among Different Types of Banks (One-Way ANOVA)

Bank Type	Number of Respondents	Mean Cyber security Score	Standard Deviation
Public Sector Banks	50	3.85	0.62
Private Sector Banks	50	4.25	0.54
Foreign Banks	50	4.50	0.48
Total	150	4.20	0.55
Source: Computed Data			

Interpretation

The table indicates that foreign banks have the highest mean cyber security score (4.50), followed by private sector banks (4.25) and public sector banks (3.85). This suggests that foreign banks have adopted stronger cyber security practices compared to public and private sector banks. The relatively low standard deviation values indicate consistency in responses among the respondents.

Table 3: Adoption of AI and Emerging Technologies (One-Way ANOVA)

Bank Type	Number of Respondents	Mean AI Adoption Score	Standard Deviation
Public Sector Banks	50	3.60	0.71
Private Sector Banks	50	4.10	0.58
Foreign Banks	50	4.45	0.50
Total	150	4.05	0.60
Source: Computed Data			

Interpretation

The results show that foreign banks have the highest mean score (4.45) in adopting AI and emerging technologies, followed by private sector banks (4.10) and public sector banks (3.60). This indicates that foreign banks are more proactive in implementing advanced technologies for cybersecurity, whereas public sector banks have comparatively lower adoption levels.

Table 4: Major Cyber Threats Faced by Banks (Chi-Square Test)

Cyber Threat	Public Banks	Private Banks	Foreign Bank	Total
Phishing	20	25	15	60
Malware	15	10	12	37
Ransomware	8	7	10	25
Data Breach	7	8	13	28
Total	50	50	50	150
Source: Computed Data				

Interpretation

The table shows that phishing attacks are the most common cyber threat faced by banks, accounting for 60 cases, followed by malware attacks (37 cases). Data breaches and ransomware incidents are comparatively less frequent. Private banks experience a higher number of phishing attacks, while foreign banks report more data breach incidents. This indicates that the nature and frequency of cyber threats vary across different types of banks.

Findings

1. The study reveals that higher awareness of RBI cyber security guidelines leads to better compliance among banks.
2. Foreign banks exhibit stronger cyber security practices compared to public and private sector banks.
3. Public sector banks show relatively lower cyber security scores, indicating the need for improved security infrastructure.
4. The adoption of AI and emerging technologies is highest among foreign banks, followed by private sector banks and public sector banks.
5. Phishing attacks are identified as the most common cyber threat faced by Indian banks, followed by malware attacks and data breaches.
6. Cybersecurity threats vary across different categories of banks, indicating the need for sector-specific security measures.
7. The results indicate that advanced technologies such as AI-based fraud detection, multi-factor authentication, and encryption enhance the security of banking systems.
8. Continuous monitoring and adherence to RBI cyber security guidelines contribute significantly to strengthening cyber security management.
9. Customer awareness and employee training play a vital role in preventing cyber fraud and minimizing security breaches.
10. Effective cyber security measures are essential for maintaining customer trust and ensuring the stability of digital banking services.

Suggestions

1. Public sector banks should strengthen their cyber security infrastructure and adopt advanced security technologies.
2. Banks should conduct regular cyber security awareness programs for employees and customers to reduce phishing and social engineering attacks.
3. The implementation of RBI cyber security guidelines should be continuously monitored to ensure compliance.
4. Banks should invest in Artificial Intelligence, machine learning, and blockchain technologies to improve threat detection and fraud prevention.
5. Multi-factor authentication and end-to-end encryption should be implemented across all digital banking channels.
6. Regular vulnerability assessments and penetration testing should be conducted to identify and address security weaknesses.

7. Banks should establish robust incident response mechanisms and Security Operations Centres (SOC) for real-time threat monitoring.
8. Collaboration among banks, regulatory authorities, and cybersecurity agencies should be strengthened to combat emerging cyber threats.
9. Customers should be educated regarding safe digital banking practices and the importance of protecting sensitive information.
10. Continuous technological upgradation and cybersecurity audits should be carried out to enhance the resilience of the Indian banking system.

Conclusion

The rapid proliferation of digital banking in the Indian banking sector has improved customer convenience and made financial services more inclusive. Nevertheless, the increased reliance on digital technology has opened up banks to different forms of cyber attacks like phishing, malware, ransomware, and data breaches. The study concludes that robust cyber security systems play an important role in securing financial data and customer trust. According to the results of the analysis, foreign banks have developed better strategies for cyber security and use advanced technology in comparison to the public sector and private banks. In addition, the level of awareness and compliance with RBI cyber security guidelines greatly impacts cyber security management. Moreover, the implementation of Artificial Intelligence and new technology is beneficial for securing the banking sector.

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CHAPTER – 15

THE EVOLVING E-COMMERCE LANDSCAPE

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Abstract

The evolution of digital commerce in 2026 has transformed from novelty into routine, yet the industry faces intensifying challenges across operational, technological, customer-facing, and competitive dimensions. While global supply chains remain volatile and cybersecurity threats escalate, businesses must balance resilience with efficiency to sustain trust and profitability. Rising return rates, fraud losses, and customer expectations demand sharper product accuracy, calibrated policies, and unified service systems. Technological shifts, particularly mobile dominance, AI integration, and social commerce, redefine customer engagement but also expose firms to volatility and privacy risks. Inflation, pricing pressures, and market saturation further complicate survival, pushing brands toward differentiation, authenticity, and community-building. Ultimately, adaptability and disciplined data management emerge as the decisive factors enabling firms to convert disruption into opportunity. This study maps fifteen critical challenges shaping business-to-consumer e-commerce, highlighting that success lies not in resisting change but in leveraging it to deliver seamless, trustworthy, and competitive experiences.

Keywords: E-commerce, AI Integration, Digital Commerce, Digital India, Operational Resilience

Introduction

In the current year, the promise of digital commerce had settled into something closer to habit than novelty. Across continents, buyers no longer thought twice about ordering groceries, electronics, or luxury goods from a screen; the transaction had become as unremarkable as walking into a shop once was. And yet, beneath that surface of stability, the terrain had grown more treacherous, not less. The very forces that made e-commerce accessible — cheap infrastructure, instant marketing reach, a global audience a click away — had also made it merciless. Anyone with a product and a modest marketing plan could open a storefront within days. That ease of entry was both the industry's great gift and its great curse.

It produced, in effect, two economies operating side by side. At one end stood the giant corporations, pouring resources into personalization engines, AI-driven service desks, and omnichannel systems that stitched together every point of contact a customer might have with a brand. On the other stood the small and the scrappy — merchants who could not match that spending but who instead carved out loyalty through community, specificity, and the kind of authenticity that mass infrastructure often struggles to fake. Different as their strategies were, both groups answered to the same unforgiving conditions: fiercer competition, costlier operations, and customers whose patience grew thinner each year. Adaptability was no longer a virtue in this environment; it was the price of admission. A brand that failed to keep moving risked discovering, often too late, that it had gone out of style overnight. What follows is an account of fifteen challenges now facing business-to-consumer e-commerce — grouped into four broad currents: the operational, the technological, the customer-facing, and the competitive.

Taken together, they form less a list of problems than a map of where the industry's pressure points lie, and where, for those paying attention, its opportunities are hiding in plain sight.

The Machinery Behind the Storefront

Every online store rests on an invisible scaffolding of suppliers, warehouses, and delivery networks. When that scaffolding holds, customers notice nothing at all — the package simply arrives. When it buckles, the failure is immediate and public: a delayed shipment, a scathing review, a margin quietly eaten away. Operational resilience, then, was not a back-office concern in 2026 but a front-line one.

Global supply chains had not returned to the predictability they once offered. Conflicts, shortages in raw materials, and shifting trade policy kept surfacing as bottlenecks, and businesses that had built their operations around just-in-time delivery found themselves especially exposed. Large corporations could absorb the shocks — they had diversified sourcing and forecasting systems built for exactly this kind of turbulence — but smaller businesses often found themselves scrambling to secure inventory at rising prices, watching a single late shipment bring an entire storefront's sales to a halt. The remedy, where one existed, was proactive rather than reactive: carrying extra safety stock, even at the cost of higher holding fees; sourcing from multiple suppliers rather than one; partnering with regional fulfilment centres to shorten the distance between shelf and doorstep. But stock alone was not the whole answer. What mattered as much as having inventory was seeing it — real-time visibility into where goods sat and how fast they moved. No marketing plan, however brilliant, could outrun a stockout that no one saw coming.

If supply chains were the industry's circulatory system, cybersecurity was its immune response — and in 2026, that system was under constant siege. E-commerce had long been a favored target for cybercrime, but the scale of the threat had grown sobering: phishing campaigns multiplying, ransomware attacks growing bolder, skimming operations quietly siphoning data from shopping carts. The stakes were not abstract. Consumers extended enormous trust to online retailers, trusting that their payment details and personal information would be kept safe. A single breach could shatter that trust permanently, and the damage rarely stopped at reputation — stricter global privacy laws now attached real legal consequences to failure.

The figures made the danger concrete: global e-commerce fraud losses hovered near \$48 billion annually, with merchants losing an average of roughly 3 percent of total revenue to fraud — a number capable of swallowing the entire profit margin of a smaller retailer. In response, businesses had begun investing heavily in defence: multi-factor authentication for staff, AI-driven fraud detection systems, end-to-end encryption woven into every transaction. These were no longer optional safeguards but the basic cost of staying in business. Then there was the matter of returns — a problem that had quietly become one of the industry's most expensive habits. Free and easy returns were now simply expected by shoppers, but for retailers they represented a growing drain, with online return rates climbing as high as 25 percent. Each returned item set off a small chain reaction: shipped back, inspected, then either restocked, marked down, or written off entirely, with a growing share now flowing into dedicated resale channels rather than the trash. Every step along that chain cost money, and items that lingered too long in transit lost value with each passing day.

Retailers pushed back where they could — sharpening product descriptions, refining sizing charts, experimenting with virtual try-on tools — all in pursuit of a single goal: getting the purchase right the first time. Fewer returns meant not just healthier margins but happier customers, since streamlined returns processes tended to improve satisfaction on both ends of the transaction. Much of this traced back to a deceptively simple fact: a significant share of returns happened simply because the product on the screen did not match the product in hand. Accurate attributes, precise dimensions, and honest specifications could prevent a return before it ever occurred. Closely tied to this was the perennial balancing act of return policy itself. Generosity built trust, but unchecked generosity ate into margins just as surely as fraud did. The art lay in calibration — offering enough flexibility to remain competitive without inviting exploitation, and being transparent enough about the rules that customers felt informed rather than misled. That balance mattered more than it might first appear: an estimated 9 percent of all retail returns were believed to be fraudulent, amounting to roughly \$76 billion in industry-wide losses in a recent year. A policy built purely on trust, with no safeguard against repeat abuse, could bleed a business slowly and invisibly.

The Machinery of Experience

If the first current concerned what happens behind the scenes, the second concerned what customers actually touch and see — the technology shaping how they discover, browse, and buy. Chief among these shifts was the near-total dominance of mobile. By 2026, 77 percent of all online shopping traffic arrived through a phone, rendering a desktop-first website something close to an artifact of an earlier era. A clumsy interface, a slow-loading page, or a confusing checkout flow on a small screen was often all it took to lose a sale. Shoppers expected live order updates, one-click checkout, and design that felt as natural on a phone as flipping through a magazine. Merchants responded by investing in mobile payment options, streamlined cart workflows, and progressive web apps — the baseline requirements of doing business today, not competitive advantages so much as survival tools. Artificial intelligence, meanwhile, had woven itself into the operational core of retail — scheduling warehouse labour, forecasting demand, automating reordering with precision manual systems could rarely match. But this reliance carried its own quiet tension. Employees needed to learn to trust the systems making these calls, and managers had to ensure automation was augmenting human judgment rather than replacing it outright. For smaller firms, adopting these tools posed both a financial and a cultural challenge. The businesses that thrived were the ones that used AI to absorb the repetitive work while preserving the human qualities — judgment, empathy, adaptability — that no algorithm could fully replicate.

That same tension showed up vividly in customer service. AI-powered chat and support systems now offered round-the-clock coverage, fielding routine questions about orders and shipping with impressive efficiency. But the limits of that efficiency became obvious the moment a problem grew complicated. A bot that could not resolve a genuine grievance tended to leave behind frustration, and frustration curdled quickly into bad reviews and lost loyalty. The strongest companies had learned to build hybrid systems — letting AI absorb the FAQs and routine status checks while routing anything sensitive or unusual to a human being. That blend of speed and empathy, often underpinned by consistent product data across every channel a customer might use, was what made shoppers feel genuinely attended to rather than merely processed.

Social media, too, had completed its transformation from marketing channel to full-fledged sales floor. Platforms like TikTok now enabled purchases without ever leaving the app, and the scale of that shift was no longer marginal — U.S. social commerce sales were projected to cross \$100 billion in 2026, up roughly 18 percent year over year, now accounting for close to 7 percent of all U.S. e-commerce activity. But this new terrain came with its own volatility. Algorithmic changes could make visibility unpredictable overnight, and influencer campaigns that performed spectacularly one month might falter the next, as several recent multichannel efforts had shown. Data privacy concerns compounded the uncertainty, as customer information moved between platforms with little transparency about where it ended up. The businesses that navigated this landscape successfully tended to treat social commerce as one instrument in a larger orchestra rather than the whole performance — building strong brand narratives, maintaining consistent product information, and preserving the same quality of service across these channels as anywhere else. Behind the scenes, this required real organizational discipline: managing visuals and content across fast-moving platforms demanded structured systems to keep brand materials consistent and easy to find.

The Customer at the Center

No amount of technological sophistication or operational polish could compensate for a poor customer experience. By 2026, meeting expectations had become harder than ever — not because customers had become less reasonable, but because the standard for “good enough” kept quietly rising. Shoppers moved fluidly between channels, browsing a product on a mobile app, purchasing on a desktop, then raising a question on social media — expecting the story to hold together seamlessly wherever they picked it up, which was, at its core, the promise multichannel retail had always made and not always kept. When it broke down, the failure was jarring: a customer who explained their issue over live chat, only to have to repeat the entire story on a follow-up phone call. These small inconsistencies did outsized damage to trust. The companies getting this right had invested in unified service systems that synchronized order history and conversation logs in real time, so that by the time a representative picked up the phone, they already understood the shopper’s history and could move the conversation forward rather than starting over.

Business-to-business commerce presented its own, quieter version of this challenge. B2B buyers were not individuals making impulse purchases but organizations navigating budgets, procurement rules, and multi-year contracts. Generic pricing and catalogue structures simply didn’t serve them. What they wanted instead were curated catalogues, account-based discounting, and reordering dashboards that removed friction from repeat purchases — all of which depended on a product categorization structure sturdy enough to support real complexity. They also expected flexible payment terms and rapid support. Delivering personalization at this scale demanded systems, and strategy, considerably more sophisticated than what most B2C playbooks called for. Underlying both of these was the broader, relentless climb in customer expectations. Real-time order tracking, generous return policies, and loyalty rewards had shifted from pleasant extras to assumed baselines. Meeting them meant real investment — in technology, in warehouse capacity, in staffing — and for smaller businesses that investment could feel disproportionately heavy. Competing against retailers offering free shipping and round-the-clock support was not a fair fight on paper, yet many smaller brands still found ways to win it through sheer attentiveness.

That attentiveness mattered more than ever, because acquiring new customers had grown expensive. Paid advertising channels were saturated, and organic reach on social platforms had thinned considerably. Retention, not acquisition, had become the priority — and retention was rarely a matter of luck. A single bad shipping experience, a clumsy cart, a delayed refund: any of these could be enough to send a customer to a competitor. The inverse was equally true — a genuinely good experience tended to produce repeat business and word of mouth, the very foundation that thoughtful retail strategy is built to support. The businesses that protected customer satisfaction did so through deliberate means: loyalty programs with rewards substantial enough to matter, product recommendations tailored to real behavior, support teams empowered to resolve problems quickly, and post-purchase surveys that closed the feedback loop. None of it was effortless. But in a marketplace overflowing with choice, loyalty had come to depend less on price than on trust — and trust, once earned, was worth protecting at real cost.

The Weight of the Wider Market

Beyond the storefront and the supply chain lay forces no individual business could fully control — the broader economic currents shaping the ground everyone stood on. Inflation was chief among them. The costs of materials, labour, and transportation had climbed steadily, touching nearly every corner of e-commerce operations, from packaging to the final mile of delivery. Larger firms could respond by renegotiating supplier and carrier agreements from a position of leverage. Smaller firms had fewer such levers to pull; maintaining margin while absorbing rising costs, or passing those costs on to already price-sensitive customers, was a genuine dilemma with no easy resolution. The most practical responses tended to be incremental — diversifying suppliers, investing in automation to offset labor costs, tracking expenses closely enough to catch problems before they compounded.

Pricing pressure compounded the difficulty. Online shopping had cultivated a culture of comparison — customers opening multiple tabs, hunting for coupon codes, checking competitor sites before committing to a purchase. Competing on price alone was a trap with a predictable ending: a slow spiral of shrinking margins and thin loyalty. The businesses that broke free of that cycle did so by offering something beyond the product itself — faster delivery, exclusive bundles, free shipping, or simply a brand story compelling enough that customers were willing to pay a little more for it. Pricing pressure was not going away. Differentiation remained the only durable answer to it. And underlying all of this was the sheer density of the marketplace itself. New online stores appeared daily, many chasing the same narrow niches with strikingly similar products. In a landscape this crowded, visibility became one of the hardest problems to solve. The businesses that stood out were rarely the ones trying to appeal to everyone; they were the ones with sharply defined positioning, distinctive product lines organized around a catalogue structure built to scale, and consistent marketing that reinforced rather than diluted their identity. Community offered another route through the noise — brands that cultivated genuine belonging, through shared content, active social participation, or membership programs, tended to forge connections that mass campaigns simply could not replicate. In 2026, authenticity had become one of the few competitive advantages that scale alone could not buy.

Turning Challenges into Openings

Read individually, each of these fifteen challenges can feel like its own small crisis. Read together, they tell a more useful story: that e-commerce has always been an industry defined by adaptation, and that the businesses willing to treat disruption as a prompt for change — rather than threats to be endured — are the ones that tend to come out ahead. A common thread runs beneath nearly all of it: data. Whether the task is keeping product information consistent across channels, refining a product page to reduce returns, or maintaining a coherent brand presence across a dozen social platforms, accurate and well-organized data sits quietly behind almost every customer interaction that goes right. The businesses of 2026 that manage to reduce friction — in their supply chains, their service desks, their marketing — are, more often than not, the ones that have taken that unglamorous foundation seriously. It is rarely the flashiest investment a company makes. It is, nonetheless, often the one that determines whether all the others pay off.

Conclusion

E-commerce continues to emerge with new techniques and approaches that reach consumers through a widening range of tools. As those tools evolve alongside new ideologies, fresh challenges continue to surface. Meeting them, one by one, is what allows the industry to deliver better e-commerce services going forward.

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CHAPTER - 16

AN ANALYTICAL STUDY OF SERVICE QUALITY AND LIVING CONDITIONS IN OLD AGE HOMES

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Abstract

This study examines the service quality and living conditions of elderly resident in old age home, with special reference to Ashraya Charitable Trust, Mysuru. Data were collected from questionnaires, interviews and observation. The findings show high satisfaction with accommodation, safety, cleanliness, food and medical facilities. However, loneliness and lack of family interaction remain major concerns. The study suggests strengthening emotional support, family involvement and social activities to improve there overall well-being and quality of life of elderly residents.

Key words: Elderly Residents, Mysuru, medical facilities

Introduction

The Study focuses on understanding the services and living conditions provided to elderly residents. Changes in family structures, urbanization, industrialization and migration have increased the need for old age homes that provide care, shelter, safety and support to senior citizens. The study examines important aspects such as accommodation, medical facilities, food, cleanliness, safety, staff behaviour, social interaction and emotional well-being. It also measures the satisfaction of residents through questionnaires and personal interaction. It faced by elderly residents, particularly loneliness, lack of family interaction, health concerns and dependency. The study aims to suggest practical improvements in service quality and living conditions that elderly peoples can live with dignity, security, care and emotional well-being.

Background of the Study

The changing family structure, rapid urbanization, industrialization and migration for education and employment have reduced the support available to elderly people. The shift from joint families to nuclear families has increased the need for old age homes to provide care, shelter and security. Elderly residents may face loneliness, lack of family interaction, health problems and financial dependency. In particular, reduced contact with family member can lead to emotional neglect and feelings of isolation. Therefore, proper healthcare, emotional support, social interaction and a safe living environment are importunities for improving the qualities of life.

Objectives

1. To analyze the quality of services provided in old age homes
2. To examine the living condition of residents
3. To measure satisfaction levels of elderly people

Limitations

- Small sample size
- Time constraints

- Possible bias in responses

Scope For Future Study

- Comparative study
- Impact of technology

PROFILE OF OLD AGE HOME

- Name: Ashraya Charitable Trust(R) Old age and Orphanage Home
- Location: #No. 9, Munavvara Rd, 2nd Stage, R. S. Naidu Nagar, Mysuru, Karnataka

Vision

To create a safe, respectful, and caring environment where elderly individual can live with dignities, security, and emotional well-being.

Mission

- To provide quality healthcare and daily living support to senior citizens
- To ensure a comfortable and hygienic living environment
- To promote emotional well-being through social interaction and activities
- To treat every resident with dignities, respect, and compassion

Motive for Establishment

The old age home was established with the primary aim of providing care, support, and shelter to elderly individual who are neglected, abandoned, or lack family support. The motive is to ensure that senior citizen live with dignities, respect, and proper care during their later stages of life. It also aims to address social issues such as loneliness, lack of healthcare, and emotional distress among the elderly.

Environment (Atmosphere/Surroundings/Living Conditions)

The environment of the old age home plays a crucial role in the well-being of the residencies. A peaceful, clean, and friendly atmosphere helps elderly individuals feel comfortable and secure.

- Clean and hygienic surroundings
- Proper ventilation and lighting
- Safe and secure premises
- Friendly and supportive staff behavior

Facilities Provided:

- Accommodation
- Food and Nutrition
- Medical care and Regular checkup
- Recreational activities
- Emotional and Social support

Identification of the Social Issue/s

The study identifies several social issues affecting elderly residents, mainly loneliness, lack of family interaction, health-related problems, financial dependency, and lack of social awareness. Changes in family structure, nuclear families and migration have reduced the support available to elderly people. A major concern is emotional loneliness, as many residents have limited contact with their family members. The study therefore highlights the need for stronger family support, social interaction, healthcare and community involvement to improve the dignity and overall well-being of senior citizens.

Review of Literature

- According to **Samina Vertejee et al. (2020)**, the quality of services in old age homes plays a crucial role in determining the living experience of elderly residents. Their study found that residents' experiences vary from comfort to depression, highlighting the importance of trained caregivers and proper management in improving service quality.
- According to **Alex Hall et al. (2025)** emphasizes that service quality in elderly care is multi-dimensional, including relationships, continuity of care, and personalized services. The study has trust, communication, and individualized care are essential for improving the well-being of elderly individuals.
- According to **Lee-Fay Low et al. (2011)** conducted a study on care models for older person and concluded that integrated and well-managed care services improve the efficiency and quality of elderly care systems.
- According to **Taina Kivimäki et al. (2020)**, safety and living conditions are essential components of elderly care, including physical, emotional, and social safety. These factors directly influence the quality of life Style of elderly individuals.

Data Analysis/Results and Discussion

SL NO	PARTICULARS	PERCENTAGE	
		YES	NO
1	Are you comfortable living here?	100	0
2	Do you feel safe here?	100	0
3	Are medical facilities adequate?	100	0
4	Do you feel happy living here?	75	25
5	Do you feel lonely?	45	55
6	Do you interact with other residents?	100	0
7	Do you participate in activities (games, yoga, etc.)?	100	0
Source: Primary Data			

Interpretation

- The data shows that 100% of respondents feel comfortable living the old age home, indicating a high levels of satisfaction with living conditions and facilities.
- The chart shows that 100% of respondents feel safe in the old age homes. This indicate a high level of security and trust, suggesting that the environment is safe and well-managed for all residents.
- All 20 respondents (100%) state that medical facility are adequate, indicating a very high level of satisfaction with healthcare service provided in the old age home.
- A majority of respondents (75%) feel happy living in the old age home, indicating generally positive living conditions, while 25% are not satisfied, suggesting there is still scope for improving emotional well-being and comfort.
- A slight majority of respondents (55%) do not feel lonely, but a significant 45% still experience loneliness, indicating that emotional support and social interaction need improvement in the old age homes.
- All respondents (100%) reported that they interact with other residents, indicating strong social engagement and peer interaction within the old age home.

Interdisciplinary Dimensions of Contemporary Research Business, Economics and Sustainable Development Perspectives

SL NO	PARTICULARS	PERCENTAGE			
		EXCELLENT	GOOD	AVERAGE	POOR
1	How do you rate the accommodation?	55	45	00	0
2	How is the cleanliness of the home?	55	45	0	0
3	How do you rate the quality of food?	65	35	0	0
Source: Primary Data					

Interpretation

- The data shows that 55% of respondents rate the accommodation as excellent and 45% as good, indicating a high level of satisfaction with accommodation facilities.
- The data show that a majority of respondents have a positive view of cleanliness in the old age homes. 55% rated it as excellent and 45% rated it as good, while no one considered it average or poor. This indicates that the cleanliness standards are well-maintained and satisfactory for all residents.
- The data indicates that the majority of respondents are satisfied with the quality of food. 65% rated it as excellent and 35% rated it as good, with no ratings for average or poor. This shows that the food quality is high and well-appreciated by the residents.

SL NO	PARTICULARS	PERCENTAGE		
		REGULATOR	SOMETIMES	NEVER
1	How often do you receive medical checkups?	100	0	0
2	Do your family members visit you?	0	15	85

Interpretation

- All 20 respondents (100%) reported that they receive medical checkups regularly, indicating a very high standard of healthcare support in the old age home with no cases of irregular or insufficient medical attention.
- A large majority of respondents (85%) reported that their family member never visit them, while only 15% receive occasional visits, highlighting a serious lack of family interaction and support for the elderly residents.

Suggestions to Overcome Issues

The old age homes should provide more emotional support and counselling to reduce loneliness among residents. Family members should be encouraged to visit and communicate with residents regularly. More social and recreational activities such as games, yoga, music and cultural programmes should be organized. The management should continue maintaining good standards of food, cleanliness, accommodation and medical care. Staff should also be properly trained to provide compassionate and personalized care to elderly residents.

Conclusion

The study concludes that the residents are generally satisfied with the basic facilities, safety, healthcare, food and living conditions provided by the old age homes. However, loneliness and lack of family interaction remain important concerns. Therefore, greater attention to emotional support, family

involvement and social activities can help improves the overall quality of lifes style and well-being of elderly residents.

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CHAPTER - 17

HUMAN MIGRATION: CAUSES, SOCIAL ISSUES AND POLICY MEASURES

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Abstract

Human migration is a continuous social process involving movement within or across national boundaries for temporary or permanent settlement. This chapter examines the major causes, forms and social consequences of migration, with emphasis on the Indian context. The study is based on a student societal project and a questionnaire survey of 20 respondents. The reported findings show strong links between migration, employment and financial problems, while education and family circumstances also influence migration decisions. The project identifies overcrowding, pressure on public services, discrimination, family separation, labour exploitation and environmental stress as important social concerns. Based on the project findings and its reviewed literature, the chapter suggests rural employment generation, skill development, migrant protection, inclusive urban planning and balanced regional development. The study concludes that migration should not be viewed only as a problem; with appropriate institutional support, it can contribute to household welfare and wider economic and social development.

Keywords: Human migration; Internal migration; Employment; Education; Social issues; Migrant workers; Rural–urban migration; Migration policy.

Introduction

Human migration has existed since early human history. Early communities moved in search of food, water and shelter, while later movements were influenced by trade, exploration, political change and economic opportunity. The Industrial Revolution strengthened rural-to-urban migration as people moved towards industrial centres. In the contemporary period, globalization, improved transportation and communication, economic disparities, conflict, education and environmental change have made migration more complex. Migration may be internal, occurring within a country's boundaries, or external, involving movement between countries. Internal migration may be short-term, long-term, seasonal or circular. In India, differences in employment, wages and access to services encourage movement from rural and less-developed areas towards urban and economically stronger destinations.

Review of Literature

The literature reviewed in the student project presents migration as a multidimensional process. The push–pull perspective explains movement through pressures at the place of origin, such as poverty and unemployment, and attractions at the destination, such as better employment and services. Greenwood (1985) emphasized economic opportunities, regional differences and demographic change. Satpathy et

al. (2014) identified employment, income, education and healthcare as major determinants, together with social factors such as marriage and family needs.

Tsegay (2023) described migration as being shaped by personal, socio-economic and political factors. Aswani and Bhat (2022) highlighted the effects of labour migration on employment, labour markets, rural development and economic growth. Pitoski et al. (2021) presented migration as a multidimensional process involving economic, political, environmental and social drivers. Ivanova et al. (2024), based on a review of 58 studies, reported that climate hazards such as droughts, rising temperatures and extreme events can influence migration, depending on socio-economic conditions.

Objectives of the Study

1. To understand the meaning, forms and major causes of human migration.
2. To identify major social issues affecting migrants and destination communities.
3. To examine employment, financial, educational and family-related factors associated with migration
4. To Assess practical measures for reducing negative impacts and improving migrant welfare.

Scope of the Study

The chapter focuses on the causes and consequences of human migration discussed in the student societal project, combining its questionnaire findings with the literature reviewed in that project. The survey results are descriptive and relate to the 20 respondents included in the original project.

Methodology

The study adopts a descriptive societal-study approach. Primary information was collected through a questionnaire administered to 20 respondents. The analysis presented in the project uses frequencies and percentages. The available project does not specify the sampling technique, field location or data-collection period; these details are therefore not added here. Secondary sources discussed in the original project were used to provide conceptual and contextual support.

Results and Findings

The principal responses reported in the original project are summarized below.

Survey aspect	Response	Percentage
Migration within the same state	Yes	95%
Migration for employment	Yes	90%
Migration for education	Yes	70%
Family-related reason	Yes	40%
Financial problems as a reason	Yes	90%
Family-related reason	No / Not sure	60%
Source: Primary Data		

The findings indicate a strong internal dimension to migration in the surveyed group, with 95% reporting migration within the same state. Employment and financial problems are the most prominent reported factors, each receiving 90% affirmative responses. Education is also important, with 70% responding affirmatively. Family-related reasons received 40% affirmative responses, while 35% responded

negatively and 25% were unsure. These results support the literature's view that migration decisions are shaped by multiple economic and social conditions.

Migration may improve income, employment and access to education, but its benefits depend on the conditions under which people move. The survey should be treated as descriptive evidence from a small group rather than as a representation of the wider population.

Major Social Issues Associated with Migration

Unemployment, poverty and job insecurity - Migrants may enter low-paid or informal employment when opportunities and skills are limited. This can increase poverty, job insecurity and vulnerability to exploitation.

Urban overcrowding and pressure on services - Rapid rural-to-urban movement can increase demand for housing, transport, water, sanitation, electricity and healthcare. Weak planning may contribute to congestion and poor-quality settlements.

Discrimination and social exclusion - Migrants may face discrimination based on language, culture, religion or economic status. Such barriers can restrict access to employment, education, healthcare and social opportunities.

Cultural adjustment and family separation - Migration can require adjustment to new languages, traditions and lifestyles. Work-related migration may separate family members and contribute to loneliness, emotional stress and weaker family relationships.

Labour exploitation and insecurity - Unskilled migrants can be vulnerable to low wages, unsafe working conditions and limited legal protection. The project also identifies trafficking and forced labour as serious risks in extreme situations.

Environmental pressure and loss of human capital - Population concentration can increase pollution, waste and pressure on natural resources. When educated and skilled people leave their origin areas, the loss of human capital may contribute to brain drain.

Discussion

The project findings and literature indicate that migration rarely results from a single cause. Employment and financial conditions are particularly prominent in the survey, while education, family circumstances and environmental conditions provide additional pathways. Migration can therefore be understood as both an opportunity and a source of social vulnerability. The outcome depends on access to decent work, skills, social protection, housing and essential services.

Measures to Address Migration-Related Issues

Rural employment and balanced development - Promote rural industries, small businesses, agriculture and allied activities, and create locally available skill-based employment. Investment in rural and semi-urban areas can reduce distress-driven migration.

Skill development and education - Expand vocational training, quality education and job-oriented courses so migrants can access better employment and reduce vulnerability to exploitation.

Affordable housing and urban infrastructure - Destination cities should strengthen affordable housing, public transport, water, sanitation, healthcare and other basic services through planned urban development.

Migrant worker protection - Effective enforcement of labour laws, fair wages, safe working conditions and accessible legal support can reduce exploitation. Safe and legal migration channels can also reduce trafficking risks.

Social inclusion and family support - Awareness programmes, community integration, counselling, migrant support groups and affordable communication facilities can reduce discrimination and support family and social well-being.

Climate and disaster preparedness - Sustainable development, natural-resource protection and disaster-risk reduction can reduce forced migration associated with droughts, floods, heatwaves and other environmental pressures.

Conclusion

Human migration is a complex and continuing social process shaped by economic, financial, educational, family, political and environmental factors. The survey of 20 respondents shows particularly strong affirmative responses for employment and financial problems, followed by education. At the same time, migration may create overcrowding, pressure on public services, discrimination, family separation, labour insecurity and environmental stress.

Migration should therefore not be viewed only as a social problem. Policies should expand opportunities in origin areas, protect migrants in destination areas and promote balanced regional development. Rural employment, skill development, inclusive urban planning, labour protection, social integration and climate resilience can help migration contribute more positively to individuals, families and communities.

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CHAPTER – 18

A STUDY ON CONSUMER AWARENESS AND ATTITUDES TOWARDS SUSTAINABLE AND ECO-FRIENDLY PRODUCTS IN KANNIYAKUMARI DISTRICT

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Abstract

The present study examines consumer awareness and attitudes towards sustainable and eco-friendly products in Kanniyakumari District. Primary data were collected from 150 respondents using a structured questionnaire and convenience sampling. The data were analyzed using percentage analysis, mean and standard deviation, awareness score, Garrett ranking technique and Pearson Product-Moment Correlation. The study finds that consumers have a moderate to high level of awareness and a favourable attitude towards eco-friendly products. Environmental concern, health benefits, and product quality are major factors influencing purchase decisions, while price and availability remain key barriers. The study suggests that effective green marketing, consumer education, affordable pricing, and better product availability can promote sustainable consumption.

Keywords: Consumer Awareness, Eco-Friendly Products, Sustainable Products, Green Marketing, Consumer Attitude, Purchase Intention.

Introduction

Growing environmental problems such as pollution, climate change, waste generation, and depletion of natural resources have increased the importance of sustainable consumption. Sustainable and eco-friendly products help reduce environmental impact through recyclable, reusable, biodegradable, and less harmful materials. Consumer awareness and attitudes play a significant role in the acceptance and purchase of such products, while factors such as price, quality, availability, health benefits, and environmental concern influence purchase decisions. Green marketing also helps businesses create awareness and promote environmentally responsible products. In Kanniyakumari District, consumers have access to eco-friendly products through local markets, supermarkets, online platforms, and social media. Therefore, the present study examines consumer awareness and attitudes towards sustainable and eco-friendly products among 150 respondents in Kanniyakumari District.

Statement of the Problem

The growing concern over environmental degradation has created a need to promote sustainable and eco-friendly products. However, consumer awareness does not always result in actual purchase behaviour due to factors such as price, availability, lack of information, product quality, and convenience. There is a need to understand the level of consumer awareness and attitudes towards eco-friendly products in Kanniyakumari District. The study therefore examines consumer awareness, attitudes, purchase decisions, and the factors influencing the adoption of sustainable and eco-friendly products among 150 respondents.

Objectives of the Study

1. To assess the level of consumer awareness towards sustainable and eco-friendly products in Kanniyakumari District.
2. To identify the factors influencing consumers' purchase decisions towards sustainable and eco-friendly products.
3. To analyse the relationship between consumer awareness and purchase intention towards sustainable and eco-friendly products.

Limitations of the Study

- The sample is restricted to 150 respondents in Kanniyakumari District.
- The study uses convenience sampling, so the findings may not represent every consumer in the district.
- The information provided by respondents is based on their personal opinions and experiences.
- Time and resource limitations may restrict the geographical coverage of the study.

Review of Literature

Joshi and Rahman (2015) examined green purchase behaviour among consumers and found that environmental knowledge, environmental attitude, and concern for the environment significantly influence consumers' intention to purchase green products.

Asha, Rathiha and Vidhya (2017) conducted a study titled "Consumer Awareness Towards Green Products" in Kanyakumari District. The study examined consumers' awareness and knowledge of green products and their environmental benefits. Primary data were collected from 123 respondents to assess awareness of various green product attributes. The study highlighted the importance of green marketing and promotional activities in creating consumer awareness. It concluded that improved awareness can encourage consumers to prefer environmentally friendly products.

Soumya V. V. and G. Anusha (2024) conducted a study titled "A Study on Factors Influencing Green Consumers to Purchase Eco-Friendly Products in Kanyakumari District." The study examined the factors affecting consumers' decisions to purchase eco-friendly products. It found that environmental knowledge and awareness of eco-friendly products were important factors influencing green consumer behaviour. The researchers used descriptive analysis and Garrett Ranking Technique to analyze the data. The study suggested that increasing environmental awareness can encourage consumers to adopt eco-friendly products.

Research Methodology

The present study adopts a descriptive research design to examine consumer awareness and attitudes towards sustainable and eco-friendly products in Kanniyakumari District. The study is based on both primary and secondary data. Primary data were collected from 150 respondents through a structured questionnaire covering demographic characteristics, consumer awareness, attitudes, purchase behaviour, and purchase intention towards sustainable and eco-friendly products.

The respondents were selected using the convenience sampling method from different parts of Kanniyakumari District. Secondary data were obtained from books, journals, research articles, reports, and reliable online sources related to sustainable consumption, eco-friendly products, consumer behaviour, and green marketing. The collected data were coded, classified, tabulated, and statistically analyzed using percentage analysis, mean and standard deviation, awareness score, Garrett ranking technique and Pearson Product-Moment Correlation. The results were interpreted at the 5 per cent level of significance, wherever applicable, to draw meaningful conclusions regarding consumer awareness and attitudes in Kanniyakumari District.

Data analysis and Interpretation

The data collected from 150 respondents were analysed using appropriate statistical tools. Percentage analysis, descriptive statistics, Garrett Ranking Technique, and Pearson correlation were used for analysis. The results are presented in tables and interpreted based on the objectives of the study.

Consumer Awareness level of the respondents

Awareness Level	No. of Respondents	Percentage
Low	28	18.67
Moderate	68	45.33
High	54	36.00
Total	150	100

Source: Primary Data

The above table shows that 45.33% of the respondents have a moderate level of consumer awareness, representing the largest group. 36.00% of the respondents have a high level of awareness, while 18.67% have a low level of awareness.

Results : Awareness Score Analysis, Mean Deviation and Standard Deviation

Measure	Value
Mean Awareness Score	5.61
Mean Deviation	2.15
Standard Deviation	2.52
Variance	6.33
Source: Computed Data	

The estimated mean awareness score of 5.61 indicates that the overall awareness level of respondents is moderate. The standard deviation of 2.52 indicates a moderate variation in awareness scores among the respondents. The mean deviation of 2.15 also suggests that the individual awareness scores show some variation around the average score.

Garrett Ranking Technique

The Garrett Ranking Technique was used to rank the factors based on the preferences expressed by the 150 respondents. The respondents were asked to rank the selected factors according to their level of importance. The ranks were converted into Garrett scores using the appropriate percentile values, and the average Garrett score for each factor was calculated. A higher average Garrett score indicates a higher level of importance.

Factors Influencing Purchase	Mean Garrett Score	Rank
Environmental concern	67.42	I
Health benefits	61.85	II
Product quality	56.73	III
Price	48.26	IV
Brand image	40.91	V
Source: Computed Data		

The table indicates that environmental concern occupies the first rank with the highest mean Garrett score of 67.42, followed by health benefits with 61.85 and product quality with 56.73. Price ranks fourth, while brand image occupies the fifth rank. Thus, environmental concern is the most important factor influencing consumers to purchase sustainable and eco-friendly products.

Correlation Analysis

Hypotheses:

H₀: There is no significant relationship between consumer awareness and purchase intention towards sustainable and eco-friendly products.

H₁: There is a significant relationship between consumer awareness and purchase intention towards sustainable and eco-friendly products.

Variables	Pearson Correlation (r)	p - value	Significance Level	Result
Consumer Awareness & Purchase Intention	0.624	0.001	5% (0.05)	Significant

Interpretation

The calculated Pearson correlation coefficient is 0.624, indicating a moderate positive relationship between consumer awareness and purchase intention. At the 5% level of significance, the p-value is 0.001, which is less than 0.05.

Decision: Since p-value (0.001) < 0.05, the null hypothesis (H₀) is rejected.

There is a significant positive relationship between consumer awareness and purchase intention towards sustainable and eco-friendly products among consumers in Kanniyakumari District. This indicates that higher consumer awareness is associated with greater purchase intention.

Findings

1. Most of the respondents have a moderate level of awareness about sustainable and eco-friendly products.
2. The mean awareness score of 5.61 shows that the overall awareness level is moderate.
3. Environmental concern is the most important factor influencing consumers to buy eco-friendly products.
4. Health benefits rank second, followed by product quality.
5. Price ranks fourth, while brand image ranks fifth.
6. There is a positive relationship between consumer awareness and purchase intention, with a correlation value of 0.624.
7. The result is statistically significant because the p-value (0.001) is less than 0.05. Therefore, higher awareness leads to greater intention to purchase sustainable and eco-friendly products.

Suggestions

Manufacturers and marketers should increase consumer awareness through social media, advertisements, exhibitions, and awareness programmes. Clear information about environmental benefits, ingredients, recyclability, and sustainable production should be provided on product labels. Companies should offer affordable and quality eco-friendly products and improve their availability in both physical and online stores. Government and educational institutions should promote environmental awareness and responsible consumption. Businesses should also avoid misleading environmental claims and adopt transparent green marketing practices to build consumer trust.

Conclusion

The study concludes that consumers in Kanniyakumari District show a considerable level of awareness and a generally positive attitude towards sustainable and eco-friendly products. Environmental concern, health benefits, and product quality are important factors influencing consumers' purchase decisions, while price and availability may act as barriers to wider adoption. The study also indicates a positive relationship between consumer awareness and purchase intention towards eco-friendly products. Therefore, increasing consumer awareness through effective green marketing, providing clear information about environmental benefits, maintaining reasonable prices, and improving product availability can encourage consumers to choose sustainable alternatives. Overall, greater awareness and positive attitudes among consumers can contribute to the promotion of sustainable consumption and environmental protection in Kanniyakumari District.

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CHAPTER - 19

DRIVERS AND DETERMINANTS OF INCLUSIVE ECONOMIC GROWTH IN INDIA: A CONCEPTUAL AND EMPIRICAL REVIEW

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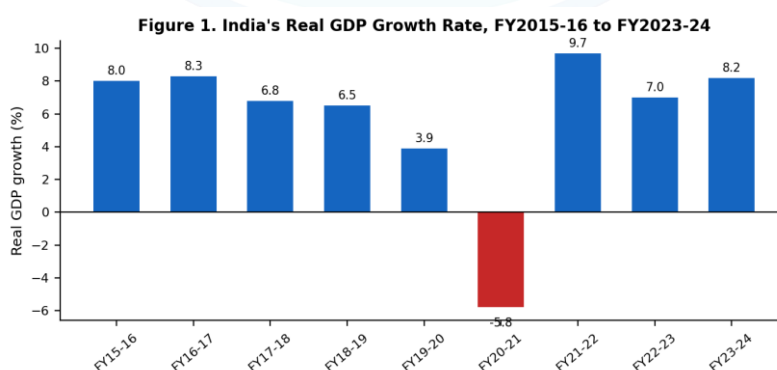
Abstract

Economic growth and inclusive development are separate objectives but are nevertheless linked in the policies pursued by governments of emerging economies. In this paper, we examine the main causes of economic growth in India, reviewing recent empirical research and placing it in the context of established theories of growth. We offer an overview of empirical research utilizing time series data on GDP growth and FDI in India, synthesizing the research findings available in literature, including time-series, panel-data and cross-sectional studies of macro-financial stability, human capital formation, FDI and regional development. Our analysis supports the finding of the important role of physical capital formation, financial development, and FDI-related inflows for economic growth, while showing conflicting evidence on the impact of education spending and equally clear evidence about regional disparities limiting the prospects of inclusive development. A coordinated policy architecture linking macroeconomic stability, human capital investment, and place-based regional policy is proposed as necessary for growth in India to become durably inclusive.

Keywords: *Economic growth, inclusive development, human capital, foreign direct investment, regional disparity, India.*

Introduction

In traditional models of development, economic growth is seen simultaneously as the goal and means of development policy; nonetheless, the case of India illustrates that it is not sufficient for a country to experience substantial aggregate growth for the people to enjoy satisfactory living standards and adequate spatial balance. India's economic situation has been very volatile over the last decade, being characterized by a GDP growth of 8.0-8.3% between FY2015 and FY2017, a decline to 3.9% in FY2019-20, a drop by 5.8% during FY2020-21, and then returning to the level of 8.2% by FY2024 (NSO; World Bank).



Source: Compiled by author(s) from National Statistical Office / World Bank national accounts data.

This upheaval and the great recovery after the pandemic have happened during the period of reforms, investments from abroad, and an emphasis on the help in infrastructure (International Monetary Fund -IMF, 2024). Moreover, the independent analysis of the work of states shows that the gap between the states that developed faster and states that developed in a slower way has increased in sixty years (Economic Advisory Council to the Prime Minister -EAC-PM, 2024). The present research studies the growth concepts and combines the previous studies dedicated to the determination of the growth in India.

Theoretical Framework

The neoclassical growth theory suggests that capital accumulation, labor force increase, and new technology are the main causes of output growth (Solow, 1956). Endogenous growth theory develops this by considering technological change as a fruit of knowledge and human capital investment (Romer, 1986). The capability approach, in turn, looks at development differently by presenting it not solely as an increase in income (Sen, 1999). Therefore, an adequate explanation of inclusive growth in India needs to involve not only the proximate causes of output but also the distributional mechanisms, which either promote this growth and spread its benefits among the widest groups of population or do not allow for this happening of this at all.

Literature Review

Macro-financial Stability and Investment

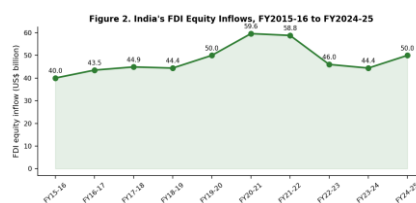
An ARDL analysis shows that growth in output (GDP) in India is influenced by financial sector development and controlled inflation. Multiple regression of data for the period 2000-2023 also find that consumption, fixed investment, export and employment have also been beneficial for GDP growth, which is in line with the neoclassical theories on capital accumulation.

Human Capital Formation

Using Johansen co-integration and FMOLS on 1980-2017 data, the Human Capital Index is found to hold a long-run equilibrium relationship with real GDP (Parika & Singh, 2020). State-level panel analysis similarly finds human capital investment to causally precede state income growth (Naik & Bairagya, 2024). However, this literature cautions that findings vary by the specific human-capital measure used, implying education expenditure alone is an incomplete proxy for effective human capital formation.

Foreign Direct Investment and the External Sector

FDI equity inflows into India have risen substantially over the past decade, from around US\$40 billion in FY2015-16 to a peak of nearly US\$60 billion in FY2020-21, before moderating to around US\$44-50 billion in subsequent years (Department for Promotion of Industry and Internal Trade [DPIIT], 2025), as shown in Figure 2.



Source: Compiled by author(s) from DPIIT FDI Fact Sheet data (RBI-reported FDI equity inflows).

Using a Vector Error Correction Model on 2000-2024 data, FDI inflow is shown to raise GDP while FDI outflow lowers it, revealing a bidirectional dynamic (Mallick & Tanwar, 2025). Earlier OLS-based evidence similarly finds a statistically significant positive relationship between FDI and GDP (Merajothu, 2020), corroborated by sector-level analysis linking FDI to favourable monetary policy and business climate (Barot, 2025).

Regional Disparity and the Inclusion Gap

While overall growth has been impressive, an analysis of 60 years of data at the state level by the EAC-PM highlights that western and southern states such as Delhi, Telangana, Karnataka, and Haryana are continuing to have significant success with respect to the country average. On the other hand, some states such as West Bengal have witnessed a decline in their relative rankings. According to the said article, using night light data, it can be stated that national inequality according to state-level club convergence measure is not declining.

Table – 1: Summary of Reviewed Empirical Studies on Drivers of Growth in India

Study	Method / Period	Key Finding
Dogga, Kuruva & Kashyap (2025)	ARDL, 1990s-2020s	Financial-sector development and moderated inflation are significant long-run correlates of GDP growth.
Sinha (2024)	Multiple regression, 2000-2023	Consumption, fixed-asset investment, exports and employment each positively affect GDP growth.
Parika & Singh (2020)	Johansen co-integration, FMOLS, 1980-2017	Human Capital Index has a long-run equilibrium relationship with real GDP.
Naik & Bairagya (2024)	Panel data, Indian states	Human capital investment causally precedes state-level income growth.
Mallick & Tanwar (2025)	VECM, 2000-2024	FDI inflow raises GDP; FDI outflow lowers it - a bidirectional dynamic.
Merajothu (2020)	OLS regression, 2000-2019	FDI has a statistically significant positive effect on GDP.
Saha & Iqbal (2024)	Club convergence, night-time light data	State-level regional disparity in India is not converging nationally.
EAC-PM (2024)	Descriptive, state series 1960-61 to 2023-24	Western/southern states pulling further ahead; some eastern states losing relative ground.

Source: Compiled by author(s) from the studies cited in Section 3.

Research Objectives

(a) Review the theoretical foundations linking economic growth to inclusive development. (b) Synthesise empirical evidence on the macro-financial, human-capital, and external-sector determinants of Indian growth. (c) Examine evidence on regional disparity as a constraint on inclusiveness. (d) Derive policy-relevant insights for aligning growth strategy with inclusive development.

Research Methodology

This paper adopts a descriptive-analytical approach based on secondary sources: peer-reviewed articles, working papers, and institutional reports published primarily between 2017 and 2026, drawn from SAGE Journals, the Munich Personal RePEc Archive, SSRN, the Institute for Social and Economic Change, EAC-PM, DPIIT, IMF, and the World Bank. GDP-growth and FDI figures are official National Statistical Office / World Bank and DPIIT series respectively, presented descriptively rather than re-estimated. Literature findings are attributed to their original authors rather than presented as new econometric analysis.

Discussion

The literature reflects mostly a coherent view of reasons behind growth of India: the stability of finance sector (Dogga et al., 2025), exports and investment (Sinha, 2024), and foreign direct investment (Mallick & Tanwar, 2025; Merajothu, 2020) are positively correlated with each other and economic growth, reflecting a similar upward trend in FDI level as described by Figure 2. In terms of human capital contribution to economic growth, there has been more variability in investigation results depending on measurement (Parika & Singh, 2020; Naik & Bairagya, 2024). The most evident gap in growth inclusivity has a regional aspect. While GDP reached its pre-pandemic level rather quickly (Figure 1), disparities across different states became even more prominent (EAC-PM, 2024; Saha & Iqbal, 2024).

When analyzed together, Figures 1 and 2 and Table 1 indicate that both India's overall growth and its ability to attract capital have continued to remain strong despite setbacks. Countries have experienced recession and pandemic challenges, but India's growth has rebounded. Nevertheless, even though something can have resilience on a national level, this does not have the same meaning on regional levels. According to FDI literature (Section 3.3) and the literature on regional disparities (Section 3.4), capital inflow has increased significantly at the aggregate level, but it looks like this capital was drawn to a small number of states with established industries in their territory.

The aforementioned pattern aligns with the concept of cumulative causation already remarked upon in regions economics – the idea that initial advantage in territories, which comes in the form of the availability of infrastructure, skilled labour, and institutions, enlarges the gap in terms of new investments rather than reducing it.

Policy Implications

Three priorities emerge from this review. First, macro-financial stability and financial deepening should remain a policy anchor, given their demonstrated and consistent association with growth across independent studies using different methods and time periods. Second, human-capital policy should shift emphasis from expenditure levels alone toward the quality, targeting, and distributional reach of education and health investment, given the sensitivity of empirical findings to the specific measure of

human capital employed. Third, and most directly relevant to inclusiveness, FDI promotion and capital-formation policy should be explicitly coupled with place-based regional development instruments, such as differentiated infrastructure investment, skill-development missions, and ease-of-doing-business reforms targeted at lagging states, so that investment and growth are not permitted to concentrate further in already-advantaged regions. Complementing national-level fiscal transfers with outcome-linked regional development financing may help ensure that the capital inflows documented in Figure 2 translate into broader-based state-level growth rather than reinforcing existing disparities.

Conclusion

This review finds converging evidence that macro-financial stability, investment, and FDI are robust drivers of India's aggregate growth, more mixed evidence on human-capital expenditure, and strong evidence that regional disparity is persistent and, on several measures, widening. Growth and inclusive development in India therefore remain distinct outcomes requiring distinct, coordinated policy instruments. Future research would benefit from state- and district-level analysis linking these proximate drivers directly to inclusion and capability-based indicators.

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CHAPTER - 20

CIRCULAR ECONOMY PRACTICES IN ARTISANAL PRODUCTION: EVIDENCE FROM JAIPUR'S BLUE POTTERY INDUSTRY

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Abstract

The transition towards a circular economy has gained increasing attention as a means of improving resource efficiency and promoting sustainable production. However, limited research has examined how circular economy principles operate within traditional artisan industries, particularly informal production systems. This study investigates the extent to which circular economy practices are present in Jaipur's Blue Pottery industry and their potential economic implications for artisans, consumers, and the wider sector. The study adopts a mixed-method exploratory approach, combining semi-structured interviews with eight Blue Pottery artisans, direct observations of four workshops, and a consumer perception survey of 100 respondents. The research examines production practices, material use, consumer behaviour, and resource management through a circular economy framework. The findings indicate partial circularity within Jaipur's Blue Pottery industry. Material reuse, demand-responsive production, and the repair or discounted sale of defective products indicate resource efficiency and potential value retention, while artisan interviews report an average 12% reduction in material costs associated with reuse. Consumer findings indicate strong sustainability perceptions and stated willingness to pay for handmade products, with respondents reporting a mean stated willingness-to-pay premium of 15.4%. However, reliance on externally sourced raw materials, kiln-dependent production, limited waste recovery, and the absence of formal monitoring mechanisms constrain the development of a more comprehensive circular production system. The study extends circular economy analysis to traditional informal artisanal production and provides evidence relevant to the sustainable development and economic resilience of traditional handicraft industries.

Keywords: Circular economy; Jaipur Blue Pottery; Traditional handicrafts; Consumer behaviour; Resource efficiency; Informal economy

Introduction

The transition towards a circular economy has emerged as a significant response to the environmental and economic limitations of conventional linear production systems, which extract, produce, consume, and dispose of resources in a one-directional manner, contributing to resource depletion, waste generation, and environmental degradation (Ghisellini et al., 2016; Geissdoerfer et al., 2017). The circular economy offers an alternative framework focused on reuse, repair, recycling, and refurbishment, thereby improving resource efficiency and extending product lifecycles (Kirchherr et al., 2017; Korhonen et al., 2018). Much of the existing literature, however, focuses on industrial manufacturing and formal supply chains, with comparatively little empirical attention given to traditional artisan industries and informal production systems, where circular practices such as material

conservation and repair may operate without formal recognition within established frameworks (Gregson et al., 2015). Recent research on Indian SMEs and handicraft enterprises further highlights the importance of resource efficiency, sustainability, resilience, and structural constraints within small-scale traditional production systems (Agarwal et al., 2023; Nudurupati et al., 2022). Examining these practices therefore provides an opportunity to assess forms of circularity that may operate without formal recognition as circular-economy interventions.

Jaipur provides an appropriate setting for such an investigation because of its established handicraft traditions, which form an important part of the city's cultural and economic landscape. Within this context, Blue Pottery is a distinctive traditional craft that was revived in Jaipur during the twentieth century, uses a quartz-based composition rather than clay and is produced through skilled, predominantly handmade techniques within artisan workshops (Mathur & Shukla, 2014). These characteristics make Blue Pottery a suitable case for examining resource use, production practices, and potential circularity within traditional informal production. Against this background, this study investigates the extent to which circular economy principles are reflected in Jaipur's Blue Pottery industry and examines their potential economic implications for artisans, consumers, and the wider sector, with particular attention to resource use, production efficiency, material recovery, repair practices, and consumer behaviour.

Methodology

This study adopts a mixed-method exploratory case study design focused on Jaipur's Blue Pottery industry. The approach combines qualitative evidence from semi-structured artisan interviews and direct workshop observations with descriptive quantitative evidence from a structured consumer perception survey, enabling examination of circular practices from both producer and consumer perspectives.

Primary data were collected between November 2025 and February 2026. Semi-structured interviews were conducted with eight Blue Pottery artisans selected through purposive sampling, examining material use, reuse practices, defect handling, repair, production patterns, and waste management. Direct observations were conducted across four workshop–showroom units at different locations, focusing on production processes, material handling, reuse, defect correction, and observable resource-management practices. A structured survey of 100 respondents examined sustainability perceptions, stated willingness to pay for handmade products, attitudes towards repair, and factors influencing Blue Pottery purchases.

Interview and observational evidence were analysed thematically by identifying recurring patterns relating to resource efficiency, material reuse, defect management, repair, and production practices. Survey responses were analysed descriptively using frequencies and percentages. Evidence from the three primary sources was then triangulated to identify areas of convergence and divergence between producer and consumer perspectives. Findings were interpreted in relation to the conceptual framework established in the preceding section.

Results & Discussion

The primary evidence from artisan interviews, workshop observations, and the consumer survey indicates that Jaipur's Blue Pottery industry exhibits partial and largely informal circularity. The strongest evidence concerns material reuse, retention of value from defective products, demand-

responsive production, and consumer interest in handmade products. Together, these findings indicate potential economic benefits through resource efficiency and value retention, although they do not establish a fully circular production system or a causal relationship between circular practices and profitability.

Production Practices and Resource Efficiency

Material reuse emerged as the clearest circular characteristic on the producer side. The eight interviewed artisans reported an average of 8% unused material after production, of which approximately 85% was reused. Reuse was reported by all eight artisans and was also observed across all four workshop–showroom units. This indicates that material reuse forms part of routine production practices among the artisans studied.

The practice also has a direct economic dimension. Artisans reported an average 12% reduction in material expenditure through reuse, equivalent to approximately ₹1,350 per batch, from an average reported raw-material expenditure of ₹11,250. This is consistent with research identifying resource efficiency and cost reduction as potential benefits of circular-economy adoption among Indian SMEs (Nudurupati et al., 2022). For the artisans studied, reuse therefore appears to function both as resource conservation and as a means of controlling production costs. However, the reported savings should not be interpreted as an equivalent increase in profit, as complete operating costs and profitability were not measured. Artisans reported that approximately 80% of production was demand-driven, particularly through tourist orders and restocking of popular products. Such alignment between production and demand may help limit unnecessary inventory and is consistent with the importance of demand conditions within Indian handicraft enterprises (Agarwal et al., 2023). However, because unsold inventory was not independently measured, the study cannot establish that demand-responsive production eliminates overproduction.

Defect management provides a further mechanism for retaining economic value. Artisans reported an approximate average defect rate of 18%, ranging from 10% to 25%. Three artisans reported repairing defective products, five reported selling them at a discount of approximately 20–40%, and four indicated that defective pieces could also be retained as design or colour references. Workshop observations recorded repair in two units and discounted sale in two others. Artisans reported approximately 60% recovery of original value through repair or discounted sale, indicating that defective products do not necessarily result in complete economic loss. This is consistent with the circular principle of retaining product value through recovery and continued use (Kirchherr et al., 2017). However, the 60% estimate is artisan-reported and should therefore be regarded as indicative rather than independently verified.

Consumer Behaviour and Market Value

The consumer survey provides evidence of a substantial demand-side component to the potential economic value of Blue Pottery. Eighty per cent of respondents reported a positive willingness to pay (WTP) a premium for handmade products, while 20% reported no such willingness. Among respondents willing to pay more, the mean stated willingness-to-pay premium was 15.4%, compared with 17.5% among foreign respondents and 12.8% among local respondents. Among willing respondents, 38% selected a premium of 10–20%, 26% selected 20–30%, and 11% selected more than 30%. This finding

aligns with Christoph et al. (2015), who reported consumer WTP premiums of nearly 17% for handmade products, closely comparable to the 15.4% mean and the 17.5% premium among foreign respondents observed here. The foreign-local gap is similarly consistent with GI consumer behaviour research showing that product attributes, origin labelling, and price jointly shape heterogeneous WTP across segments, with weaker reference pricing and stronger cultural-heritage emphasis plausibly driving higher premiums among foreign consumers (Krithika et al., 2026).

Sustainability perceptions further point to potential consumer value. Seventy-four per cent of respondents reported considering sustainability when purchasing products, and 71% believed handmade products to be more sustainable. Both proportions were notably higher among foreign respondents (84% and 80%, respectively) than among local respondents (62% and 60%). These findings are broadly consistent with research linking traditional craft production to sustainability and socioeconomic value within Indian craft ecosystems (Anand et al., 2026). Consumer priorities also reveal clear market differentiation. Handmade value was the most important factor overall, selected by 32% of respondents, followed by design at 28%, while price and durability each accounted for 20%. Handmade value was selected by 44% of foreign respondents but only 18% of local respondents. Conversely, price was selected by 33% of local respondents compared with 9% of foreign respondents. Attitudes towards repair provide a further indication of potential product-life extension. Sixty per cent of respondents stated that they would repair a damaged item rather than replace it, including 69% of foreign and 49% of local respondents. This measures stated preference rather than actual behaviour, but indicates consumer acceptance of continued product use, consistent with the circular-economy principle of extending product lifecycles (Geissdoerfer et al., 2017).

Economic Evaluation

Two mechanisms link the observed practices to potential economic benefit: cost efficiency from material reuse and value retention through defect recovery and consumer willingness to pay. This pattern is consistent with evidence from Indian SMEs, where circular practices generate cost savings within resource and implementation constraints (Nudurupati et al., 2022). Moitra et al. (2025) similarly found consumer demand for sustainable handicraft attributes, though only 40% of their respondents reported willingness to pay a premium, against 80% here, suggesting the present sample places unusually high value on craftsmanship-related attributes. The findings also suggest circular practices arise as much from economic necessity as from environmental intent: reuse reduces input expenditure, defect recovery limits loss, and demand-responsive production aids inventory management. This aligns with Dorland and Jørgensen (2025), who found financial motivation to outweigh environmental motivation in consumer repair decisions, and with wider evidence on artisan livelihoods and economic resilience in Indian craft production (Anand et al., 2026; Bhaskar & Ramananda, 2023). As throughout this section, these results indicate the economic potential of circular practices rather than a demonstrated increase in profitability.

Conclusion

This study finds that Jaipur's Blue Pottery industry shows partial, informal circularity rather than a fully closed-loop system. On the producer side, artisans reuse about 85% of unused materials, cutting material costs by 12% on average, while repair or discounted sale of defective goods and demand-responsive production add further value retention. These savings should not be read as higher

profitability, since full costs and revenues were not measured. On the consumer side, 80% of respondents stated they would pay more for handmade products, with a 15.4% average willingness-to-pay premium among those willing. Foreign consumers showed stronger sustainability preference and willingness to pay, while local consumers were more price-sensitive, pointing to market differentiation. Stated willingness to pay, however, does not guarantee realised prices or artisan income gains. Circularity is limited by production defects, dependence on external inputs, weak monitoring, and the absence of a closed material loop. Given the small, cross-sectional, self-reported sample, findings remain exploratory. Strengthening circularity would require better resource monitoring, kiln efficiency, artisan training, and branding or market support, with future research extending coverage to more sectors, larger samples, and systematic measurement of material, energy, and waste flows.

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CHAPTER - 21

DEVELOPMENT VS SUSTAINABLE DEVELOPMENT WITH REFERENCE TO INDIA

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Abstract

While the traditional means of development is to focus on national income, Sustainable Development has gained momentum in the last few years. The Sustainable development is based on development with social development and environmental protection. India has adopted SD as means of long-term growth of the country. Government of India has initiated several programmes for implementation of Sustainable development goals. Inclusive growth with SD is the only way in which India can protect its environment along with maintaining social equity.

Keywords: SDG, Development, Environmental Impact, India

Introduction

Sustainable development is an important framework that is shaping the way the nation will progress in the future. It aims at balancing immediate human wants along with protecting the long term health of our environment. Understanding the fundamental difference between development and sustainable development is important for policy makers, governments and society to frame policies and protect this planet.

The Idea of development and sustainable development (SD)

The term development is the traditional concept followed by countries. It relates to the creation of material wealth by a nation to fulfil the basic needs of individuals within the society. By the early 1990s, this concept was further expanded to include social and human factors along with national growth of the country. At the same time, the concept of sustainable development gained impetus with its emphasis on environment and people. There was lot of attention on SD with the publication of Brundtland report by the World Commission on Environment and Development in 1987. As a step further, the United Nations adopted the Sustainable development goals(SDG) as a path of development with emphasis on economic development along with social development and environmental protection. There are 17 SDGs which aims at eradicating poverty, gender equality, aim at sustainable agriculture and ensure peace and prosperity for all people by 2030.

Distinction between development and sustainable development

The key differences between development and SD can be observed on several focus areas. The most important difference is that while traditional development focusses on the national income of the country, SD is focussed on integration of social and economic development along with environmental protection. Another area of difference is that while development is concentrated on search of material wealth, SD is people centred. The SD model believes that human wellbeing is more important than only accelerating national income. Traditional development is based on exploitation of nature while SD is oriented towards conservation and effective utilisation of nature. SD believes in coexistence of human being with nature.

Importance of SD

Environmental Impact of unsustainable Development - The excessive industrialization has severe impact on the nature causing land degradation, deforestation and air and water pollution. It also leads to loss of biodiversity and creates adverse climate change. These issues have a negative impact on the health and well-being of human being, animals and plants. The world is facing many challenges due to climate change. There is a need for strong regulation to protect the environment.

Social and economic impact of unsustainable development - The excessive exploitation of natural resources has led to negative impact on nature. This has impact on the livelihood of human beings causing poverty and economic inequality. The impact is felt more by the marginalized and vulnerable groups than the rich. Development has to improve the quality of human being in society.

Sustainable Development as a solution

With development as a goal having its adverse consequences, the world has moved towards sustainable development as strategy for long term development. SD helps in creating a balance between growth, social development and environment. This is needed for supporting the planet and the living beings on earth. The following points highlights the reason for focussing on SD.

1. **Resource conservation:** SD promotes the protection of natural resources. The SD believes that maintaining the natural resources like forest cover, clean water and fertile land is important for long term survival of human being.
2. **Economic growth:** The SD encourages sustainable business practices that helps in conserving natural resources and conserving the environment which is important for protecting the environment. It also encourages businesses to work on solutions for minimizing waste thereby creating long term prosperity.
3. **Environmental Protection:** The main objective of SD is to promote the environment by adopting business practices that minimize the impact on nature. We have to protect the environment for the future generations.
4. **Social equity:** Another important component of SD is social equity by equitable distribution of national income. The Governments are prompted to adopt inclusive growth as their national agenda with particular focus on improving the lives of the marginalized communities. Empowerment of women is also an important part of ensuring social development of the country.

Sustainable Development in India

Though India has witnessed exponential growth in the last decades, its core national policy has been SD. It aims at growth, environmental sustainability and social inclusion. **Economic growth and sustainability:** India 's rapid economic growth in the last decades have helped to lift millions out of poverty and improve their standard of living. However, it has a adverse effect on the environment causing degradation of land, increased pollution and unsustainable consumption of natural resources. Striking a balance between growth an environmental protection has become imperative. India 's government has taken several measures to promote green technologies and renewable energy. Solar energy has been the key area of focus under the national solar mission. Efforts have also been made to promote sustainable agriculture practices by investing in technologies like organic farming, drip irrigation and sustainable water management systems. These will help in reducing environmental damage while maintaining productivity.

Environmental Protection: One of the key challenges in sustainable development is preserving the environment while promoting industrial expansion and urbanization. The national action plan on climate change (NAPCC) was launched in the year 2008. The programme aims at combating climate change. The mission focuses on sustainable water management, afforestation, energy conservation and protecting the sensitive Himalayan ecosystem. Government has introduced Jal Shakti Abhiyan for rain water harvesting, recharging of ground water and watershed management. **Social development and inclusion:** No SD can be considered successful unless it addresses social equity. Government has adopted inclusive growth as one of the pillars of inclusive growth. The MGNREGA is an employment generation programme aimed at rural youth. It also contributes to SD by promoting water conservation community development projects. Women empowerment is another key area for social development. Programs like self-help groups, Beti Bachao Beti Padhao focuses on removing inequalities by providing education to girl child.

Strategies for realizing SDGs

India has committed to achieving SDGs by adopting inclusive growth strategy. Some of the important strategies and programs adopted by India for achieving sustainable development are as follows;

1. **National action plan on climate change:** This is one of important programmes adopted by India for climate change. The NAPC comprises of eight National missions that includes National solar mission, sustainable agriculture practices and others.
2. **National solar mission:** This program aims to promote solar energy adoption and reduce carbon emission. It sets targets solar power capacity installation and encourages solar projects by providing financial assistance.
3. **National rural livelihood mission:** NRLM aims at poverty elevation and rural development. It provides livelihood opportunities to the poor through sustainable agriculture, micro enterprises and social inclusion.
4. **Smart cities mission:** The smart city's mission seeks to develop urban areas that are sustainable, efficient and liveable. It emphasises on smart and green infrastructure, waste management and sustainable urban planning.
5. **Swachh Bharat Abhiyan:** This program aims at promoting cleanliness and proper sanitation facilities through waste management practices. This will help to enhance public health and improve cleanliness in cities.
6. **National mission for sustainable agriculture:** NMSA is aimed at sustainable farming practices social health management water use efficiency and enhancing the livelihood all farmers.
7. **National biodiversity action plan:** The objective of this programme is to protect India's rich biodiversity by mapping action plans, protected areas and community development.
8. **National mission on sustainable Habitat:** The focus of this programme is to promote sustainable urban planning. The programme aims at energy efficiency, waste management and green building practices in urban areas.

Challenges in implementation of SDGs

1. **Environmental degradation:** One of the biggest challenges is environmental degradation. Global warming is causing adverse impact on the nature.

2. Water scarcity: Another challenge in India is the heavy dependence on monsoon for water. Unless water conservation policies are adopted, large parts of India faces water scarcity specially during the summer months.
 3. Climate change: This is another challenge faced in India due to which agriculture is getting affected. The rise in temperature is also leading to loss of biodiversity.
 4. Income inequality: Poverty and income inequality has been a challenge for India even though India has seen very high rates of economic growth. Without social inclusion, it is not possible to achieve SDGs.
 5. Corruption and governance issues: A major challenge facing India has been the corruption and issues of delivery of basic services.
 6. Population pressure: With the rise in population, there is a conflict on natural resources available in the country including land, water and forests.
 7. Social disparities: Unless the marginalised sections of the population are integrated into the mainstream society, social development of all citizens is not possible.
- Overcoming these challenges is important to ensure a more sustainable and equitable future for India.

Areas of focus for achieving SDG

1. Social development: Reduced poverty and social development will result from adopting socially inclusive policies. There is need to economically empower the marginalized communities by providing them sustainable livelihood.
2. Gender equity: It is not possible to achieve sustainable development without attaining women empowerment. Women play an important role in any society and no development is possible without economic and social development of women.
3. Affordable healthcare and education: Affordable healthcare and education is critical for achieving sustainable growth. Improvement in quality of education is important creating skilled manpower in the country. Access to healthcare is necessary for improving the quality of life.
4. Redistribution of resources: Inclusive growth requires redistribution of resources. This helps in reducing regional disparities and income inequalities.
5. Employment opportunities: Inclusive growth requires creating employment opportunities for youth. Along with jobs, skill development is also required for people to migrate from low paying agriculture based jobs to high paying manufacturing and service sector based jobs.
6. Community engagement and participation: Sustainable development requires active participation of local communities on decision making and development. Benefits of development should be shared by all in the community for creating a more prosperous and harmonious society.

Conclusion

Concentration on material wealth was the traditional approach to development. However, SD is key to protecting the environment and for equal distribution of benefits of growth. India has adopted SD as its growth strategy by incorporating environmental and social inclusion policies. The roads ahead is challenging. However, there cannot be any compromise for economic prosperity, environmental health and social equity.

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CHAPTER - 22

BEHAVIOUR OF FINANCIAL AND NON-FINANCIAL IPO'S EARNINGS PERFORMANCE BASED ON MARKET TIMING

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Abstract

This paper examines whether the timing of an initial public offering (IPO) in relation to overall market conditions shapes the earnings performance a firm reports in its listing year. Drawing on a sample of 106 companies that listed on the Bombay Stock Exchange (BSE) between April 2024 and March 2025, the study classifies each issue month as a “hot” or “cold” period using a three-month moving average of IPO volume, and then uses regression analysis to test whether this classification predicts issue-year Return on Net Worth (RONW), Return on Capital Employed (ROCE) and Return on Assets (ROA) for financial and non-financial issuers alike. The results indicate that market timing itself has no statistically significant bearing on any of the three performance measures once firm-level controls are introduced. Instead, pre-IPO profitability emerges as the strongest predictor of post-listing RONW and ROCE, while issue price and firm age are associated with more efficient asset use. Large issue sizes and high leverage, by contrast, are linked to weaker post-IPO efficiency. The overall picture suggests that in the Indian context, a firm’s internal financial strength matters far more for post-IPO success than the state of the broader market at the time of listing.

Keywords: India, Initial Public Offerings, Earnings Performance, Market Timing, Hot and Cold Markets

Introduction

IPOs remain one of the principal routes through which Indian companies raise growth capital and gain visibility with a wider investor base. The BSE, as one of the country's leading exchanges, has witnessed a steady stream of both financial and non-financial firms going public in recent years. Not every issuer, however, converts a successful listing into strong subsequent earnings — some firms improve markedly after listing while others struggle. Market-timing theory offers one explanation: it holds that managers prefer to float shares when investor sentiment and valuations are favourable, on the expectation that such conditions translate into stronger subscription and more advantageous pricing. Whether that advantage actually carries through to post-listing earnings, and whether it does so differently for financial versus non-financial issuers, is the question this study takes up. Clarifying this relationship is useful to investors deciding when to participate in new issues, to firms weighing when to go public, and to regulators interested in the broader health of the primary market.

Literature Review

A substantial body of prior research has examined market timing and IPO performance from different angles. Several studies find that firms opportunistically time equity issuance to periods of favourable mispricing, particularly where corporate governance is weak, and that this behaviour is not confined to India — it has also been documented for seasoned equity offerings and in other emerging markets. Work specific to Indian IPOs generally reports that long-run abnormal returns tend to be

negative and that performance patterns differ across pre- and post-crisis periods, with newer and loss-making ventures typically underperforming despite short-term listing gains.

A separate strand of literature has used hot-and-cold market classifications — based on issue volume, underpricing, or moving averages — to show that issue size, premiums, and subscription levels fluctuate with broader market sentiment, and that certain calendar periods (such as 2017–18 in India) can be identified as distinctly “hot”. Related studies link earnings management around the IPO year to inflated listing-day returns and to weaker long-run profitability, suggesting that reported issue-year earnings should be interpreted with some caution. Other work has connected post-IPO capital structure and efficiency to variables such as issue price, firm age, profitability, sales growth, operating cash flow and leverage, generally finding that larger issues and higher leverage tend to erode post-listing efficiency while stronger pre-issue fundamentals support it. Taken together, this literature motivates testing market timing alongside a fuller set of firm-level controls rather than in isolation, which is the approach adopted here.

Hypotheses

H1: Market timing has a significant impact on earnings performance.

H2a–H2g: Issue price, issue size, firm age, profitability, sales growth, cash flow from operations, and leverage each significantly moderate the relationship between market timing and earnings performance.

Methodology

Sample - The sample consists of 106 firms that completed IPOs on the BSE between 1 April 2024 and 31 March 2025. Hot and cold market periods were identified from the monthly count of IPOs, and their influence on issue-year earnings performance was then assessed using regression analysis.

Variables - Earnings performance — the dependent construct — is captured through three ratios: Return on Net Worth (RONW), Return on Capital Employed (ROCE) and Return on Assets (ROA), each computed for the issue year following standard definitions used in the CMIE Prowess database. Market timing, the independent variable, is a dichotomous indicator (hot = 1, cold = 0) derived from a three-month moving average of monthly IPO counts: months above the median are classified as hot and those below as cold, with a finer quartile-based split (very cold, cold, hot, very hot) also computed for robustness. Seven control variables are included: issue price, issue size (log of proceeds), firm age (log of 1 + years since incorporation), profitability (year-on-year change in net profit), sales growth, change in cash flow from operations, and leverage (debt-to-equity).

Model

Three OLS regressions are estimated, one for each performance measure, with market timing and the seven controls as predictors and industry and year dummies included throughout:

$$\text{RONW}_{i,t} = \alpha_1 \text{Price}_{i,t} + \alpha_2 \text{Isize}_{i,t} + \alpha_3 \text{Age}_{i,t} + \alpha_4 \text{Profitability}_{i,t} + \alpha_5 \text{SG}_{i,t} + \alpha_6 \text{CFO}_{i,t} + \alpha_7 \text{Leverage}_{i,t} + \alpha_8 \text{Mkt_timing}_{i,t} + \text{Industry} + \text{Year}$$

$$\text{ROCE}_{i,t} = \alpha_1 \text{Price}_{i,t} + \alpha_2 \text{Isize}_{i,t} + \alpha_3 \text{Age}_{i,t} + \alpha_4 \text{Profitability}_{i,t} + \alpha_5 \text{SG}_{i,t} + \alpha_6 \text{CFO}_{i,t} + \alpha_7 \text{Leverage}_{i,t} + \alpha_8 \text{Mkt_timing}_{i,t} + \text{Industry} + \text{Year}$$

$$\text{ROA}_{i,t} = \alpha_1 \text{Price}_{i,t} + \alpha_2 \text{Isize}_{i,t} + \alpha_3 \text{Age}_{i,t} + \alpha_4 \text{Profitability}_{i,t} + \alpha_5 \text{SG}_{i,t} + \alpha_6 \text{CFO}_{i,t} + \alpha_7 \text{Leverage}_{i,t} + \alpha_8 \text{Mkt_timing}_{i,t} + \text{Industry} + \text{Year}$$

Results and Discussion

Descriptive Statistics

Table 1 summarises the sample. Earnings performance varies widely across the 106 firms: RONW ranges from -173.94% to 45.84% (mean 9.92%), ROCE from -74.41% to 62.25% (mean 14.80%), and ROA from -17.23% to 211.23% (mean 57.59%). Fifty-nine percent of the sample listed in a “hot” market month. Issue price, issue size, age, profitability, sales growth and CFO all display considerable dispersion, reflecting a sample that spans young loss-making firms and long-established, well-capitalised issuers. Leverage is comparatively modest on average (mean 0.51), indicating that most sample firms rely more on equity than debt.

Table 1: Descriptive Statistics (N = 106)

Variable	Min	Max	Mean	SD
RONW (%)	-173.94	45.84	9.92	20.57
ROCE (%)	-74.41	62.25	14.80	14.82
ROA (%)	-17.23	211.23	57.59	47.31
Market Timing	0	1	0.59	0.49
Issue Price	1.00	1960.00	257.43	284.82
Issue Size	0.20	96738.40	2104.60	10842.17
Age (yrs)	0.30	36.00	2.68	6.07
Profitability	-963.13	685.18	18.41	143.74
Sales Growth	-44.80	275.99	31.85	47.88
CFO	-3935.71	30870.00	209.70	3035.49
Leverage	0.00	4.50	0.51	0.85

Source: Computed Data

Correlation Analysis

Correlation results (not tabulated in full here for brevity) show that RONW and ROCE are very strongly correlated with one another ($r = 0.87$), as would be expected given their shared basis in profitability. Market timing is negatively and significantly correlated with issue size ($r = -0.21$) and leverage ($r = -0.23$), suggesting that hot-market issuers tend to raise smaller amounts and carry less debt, but market timing shows no significant correlation with RONW, ROCE or ROA. Profitability correlates positively and significantly with both RONW ($r = 0.224$) and ROCE ($r = 0.268$), foreshadowing its importance in the regression results below. Issue size and leverage are strongly positively correlated with one another ($r = 0.409$), consistent with larger issuers carrying more debt on average.

Regression Results

*Table 2: Regression of IPO Determinants on Post-IPO Performance (standard errors in parentheses;
** $p < 0.05$, *** $p < 0.01$)*

Variable	RONW	ROCE	ROA
Market Timing	-6.022 (4.236)	-4.767 (2.999)	-2.177 (9.256)
Issue Price	0.000 (0.007)	0.005 (0.005)	0.042 (0.015)**
Issue Size	1.73E-5 (0.000)	0.000 (0.000)	-0.001 (0.000)
Age	0.205 (0.340)	0.178 (0.241)	1.432 (0.744)

**Interdisciplinary Dimensions of Contemporary Research
Business, Economics and Sustainable Development Perspectives**

Profitability	0.031 (0.014)**	0.027 (0.010)***	-0.002 (0.030)
Sales Growth	0.027 (0.042)	0.021 (0.030)	0.149 (0.093)
CFO	0.000 (0.001)	-1.76E-5 (0.000)	0.001 (0.001)
Leverage	-2.745 (2.660)	-0.309 (1.883)	12.803 (5.811)**
Constant	12.852 (4.186)	15.076 (2.963)	33.991 (9.146)
Adj. R ²	0.095	0.149	0.041
Prob > F	0.039	0.000	0.030

Source: Computed Data

Across all three specifications, market timing carries a negative coefficient but never reaches statistical significance, so H1 is not supported: the hot/cold classification of the issue month does not by itself predict issue-year earnings performance. Among the controls, profitability is the standout predictor, significant and positively signed for both RONW and ROCE, confirming that firms already generating strong profits before listing tend to sustain that strength afterward. Issue price is significantly and positively associated with ROA, implying that appropriately priced issues are linked to more efficient asset use, though this does not extend to the equity-based measures. Leverage shows a significant positive association with ROA even as its (insignificant) coefficients on RONW and ROCE are negative, suggesting that while heavier debt use can coincide with efficient asset deployment for some firms, it does not translate into better equity returns. Issue size, age, sales growth and CFO are not significant predictors in any of the three models.

Conclusion

The evidence from this sample of 106 BSE-listed IPOs points to a fairly clear conclusion: market timing, as measured by whether a firm lists during a statistically “hot” or “cold” month, does not meaningfully explain issue-year earnings performance once standard firm-level controls are accounted for. What does matter is a firm's own financial standing going into the offering — pre-IPO profitability in particular, along with sensible issue pricing and greater business maturity, is associated with stronger post-listing returns. Conversely, very large issue sizes and heavier leverage are linked to weaker post-IPO efficiency, consistent with concerns about aggressive fundraising and over-reliance on debt. For investors and issuers alike, the practical implication is that firm fundamentals — not the mood of the broader market at the time of listing — should be the primary basis for evaluating an IPO's likely earnings trajectory. The study's findings are necessarily bounded by its scope: it covers only BSE-listed firms with complete public disclosures over a single financial year, so extending the analysis to other exchanges, longer time horizons, and other national markets would be a useful next step for future research.

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CHAPTER – 23

INTEGRATING KNOWLEDGE ACROSS DISCIPLINES: NEW DIRECTIONS IN CONTEMPORARY RESEARCH

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Abstract

Contemporary research is increasingly shaped by problems that extend beyond the boundaries of individual academic disciplines. Issues such as climate change, artificial intelligence, financial instability, public health, digital transformation, social inequality, sustainable development, and cybersecurity involve multiple interacting economic, social, technological, legal and behavioural factors. Consequently, research based exclusively on one discipline may provide only a partial understanding of such complex phenomena. Interdisciplinary research addresses this limitation by bringing together concepts, theories, methods and perspectives from two or more fields to develop a more comprehensive understanding of research problems. This chapter examines the meaning, evolution and significance of interdisciplinary research in the contemporary academic environment. It distinguishes interdisciplinary research from multidisciplinary and transdisciplinary approaches and discusses its major methodological and conceptual dimensions. Particular attention is given to the role of interdisciplinary research in business, management, finance, economics, law, technology and sustainability. The chapter also examines the contribution of artificial intelligence, big-data analytics and digital technologies to interdisciplinary inquiry. Further, it identifies challenges relating to disciplinary boundaries, methodological differences, collaboration, research evaluation and ethical considerations. The chapter argues that effective interdisciplinary research requires intellectual openness, methodological flexibility, collaborative capacity and the ability to integrate diverse forms of knowledge. It concludes that interdisciplinary research is not merely an alternative research strategy but an increasingly important approach for addressing the complex and interconnected challenges of contemporary society.

Keywords: *Interdisciplinary research, contemporary research, multidisciplinary research, transdisciplinary research, research methodology, artificial intelligence, sustainability, knowledge integration.*

Introduction

The nature of research has changed considerably in the twenty-first century. Traditional academic structures have generally organised knowledge into distinct disciplines such as economics, finance, management, law, psychology, sociology, engineering and computer science. These disciplinary boundaries have contributed significantly to the development of specialised knowledge. However, the problems faced by contemporary society rarely remain confined within such boundaries.

For instance, climate change is simultaneously an environmental, economic, technological, political and social issue. Financial market behaviour involves finance, economics, psychology, statistics and technology. Artificial intelligence raises questions not only about computer science but also about employment, ethics, law, privacy, education and organisational behaviour. Similarly, sustainable

business requires an understanding of environmental science, economics, finance, management, consumer behaviour and public policy.

These developments have increased the importance of **interdisciplinary research**, in which knowledge from different academic areas is brought together to examine a common research problem. Interdisciplinary research is particularly relevant when a research question cannot be adequately addressed using the theories or methods of a single discipline. Instead of treating disciplines as isolated areas of knowledge, interdisciplinary inquiry views them as complementary sources that can contribute to a broader explanation.

The growing availability of digital data has further strengthened this approach. Researchers can now combine financial information, demographic characteristics, behavioural indicators, geographical information and technological data to investigate complex relationships. Consequently, contemporary research is increasingly moving from **disciplinary specialisation towards knowledge integration**. The purpose of this chapter is to examine the major dimensions of interdisciplinary research and explain its relevance to contemporary academic and practical problems.

Concept of Interdisciplinary Research

Interdisciplinary research can broadly be understood as an approach that integrates knowledge, concepts, theories or methods from different academic disciplines to investigate a common problem. The important feature is not simply the presence of researchers from different disciplines. The essential element is **integration**.

For example, suppose researchers want to understand why young investors make high-risk investment decisions. A finance researcher may examine risk and return, a psychologist may study behavioural biases, an economist may examine incentives and opportunity costs, and a data scientist may develop predictive models. If each researcher works independently and produces separate findings, the project is multidisciplinary. However, if these perspectives are integrated into a common analytical framework, the study becomes interdisciplinary.

Thus:

Different disciplines + interaction + integration = Interdisciplinary research

The objective is to generate knowledge that may not have emerged from an isolated disciplinary approach.

Interdisciplinary, Multidisciplinary and Transdisciplinary Research

These three approaches are related but conceptually different.

Approach	Main Feature	Example
Multidisciplinary	Different disciplines examine the same issue independently	Economists and psychologists separately study investor behaviour
Interdisciplinary	Concepts and methods from different disciplines are integrated	Finance and psychology are combined to explain investment decisions
Transdisciplinary	Academic knowledge is integrated with practical or community knowledge	Researchers, regulators, investors and technology experts jointly develop an investor-protection framework

Multidisciplinary research therefore emphasises **coexistence**, interdisciplinary research emphasises **integration**, while transdisciplinary research extends integration beyond academia.

This distinction is important because contemporary research increasingly involves collaboration among universities, industries, governments, communities and technology organisations.

Need for Interdisciplinary Research in Contemporary Society

Complexity of Contemporary Problems

Modern problems are characterised by multiple interconnected variables. A single cause may produce several consequences, while one outcome may have several causes. Consider unemployment. It cannot be explained exclusively through economics. Technological change, educational quality, labour-market regulations, demographic conditions, organisational practices and psychological factors may all influence employment outcomes. Interdisciplinary research allows researchers to examine these relationships simultaneously.

Technological Transformation

Technologies such as artificial intelligence, machine learning, blockchain, cloud computing and the Internet of Things are transforming almost every sector. Their implications extend beyond technology itself.

For example, artificial intelligence in recruitment raises questions about:

- algorithmic bias,
- employment,
- privacy,
- labour law,
- organisational efficiency,
- human decision-making, and
- ethics.

Therefore, understanding AI requires collaboration among technology experts, management researchers, lawyers, psychologists and social scientists.

Globalisation

Economic and social activities increasingly cross geographical boundaries. International trade, global financial markets, migration, digital platforms and multinational businesses create problems that require economic, legal, cultural and technological perspectives.

Sustainability

Sustainable development represents one of the clearest examples of interdisciplinary research. Environmental protection cannot be separated from economic growth, business strategy, consumer behaviour, finance, public policy and technological innovation.

Major Dimensions of Interdisciplinary Research

Economic and Managerial Dimension

Economics explains resource allocation, incentives, markets and decision-making. Management examines organisational processes, strategy, leadership and performance.

Their integration can provide valuable insights into business decisions.

For example, a firm's pricing decision can be examined through:

Economics: demand and elasticity

Finance: profitability

Marketing: consumer perception

Psychology: price perception

Management: strategic positioning

Data science: demand forecasting

An interdisciplinary approach therefore produces a richer understanding of pricing decisions.

Finance and Behavioural Science

Traditional finance generally assumes rational decision-making. Behavioural science demonstrates that individuals may be influenced by emotions, cognitive biases, social influences and psychological factors.

Combining finance with psychology helps explain phenomena such as:

- Overconfidence,
- Loss aversion,
- Herd behaviour,
- Disposition effect,
- Excessive trading, and
- Risk perception.

This combination has contributed to the development of behavioural finance.

Finance and Data Science

The rapid growth of digital financial information has created opportunities for integrating finance with statistics, computer science and data analytics.

Financial researchers can use large datasets to analyse:

- Credit risk,
- Fraud,
- Stock-market behaviour,
- Customer segmentation,
- Portfolio performance,
- Financial inclusion, and
- Investment behaviour.

Machine-learning techniques can complement conventional statistical methods by identifying complex patterns within large datasets.

Law, Economics and Public Policy

Many public-policy problems require simultaneous consideration of legal and economic factors.

For example, taxation involves:

Law → statutory provisions and compliance

Economics → incentives and resource allocation

Finance → financial implications

Public policy → distributional objectives

Behavioural science → taxpayer behaviour

An interdisciplinary framework can therefore provide a more complete understanding of taxation than any single perspective.

Technology and Business

Digital transformation has created a strong relationship between information technology and business management.

FinTech is an important example. It combines:

- Finance,
- Banking,
- Computer science,
- Data analytics,
- Cybersecurity,
- Law, and
- Consumer behaviour.

Digital payment systems demonstrate this integration particularly well. Their success depends not only on technological infrastructure but also on trust, convenience, regulation, cybersecurity and consumer adoption.

Methodological Dimensions

Interdisciplinary research can employ different methodological approaches depending upon the nature of the research question.

Quantitative Methods - Quantitative methods are useful for measuring relationships among variables.

Common techniques include:

- Correlation,
- Regression,
- Structural equation modelling,
- Factor analysis,
- Time-series analysis,
- Panel-data analysis, and
- Predictive modelling.

Qualitative Methods - Qualitative approaches provide detailed understanding of experiences, perceptions and social processes.

Researchers may use:

- Interviews,
- Focus Groups,
- Observations,
- Case Studies, And
- Thematic Analysis.

Mixed Methods - Mixed-method research combines quantitative and qualitative evidence.

For example, a researcher studying digital banking adoption may first conduct a survey to identify statistical relationships and subsequently interview customers to understand why those relationships exist.

This approach can be particularly useful for interdisciplinary studies because different disciplines often rely on different forms of evidence.

Role of Artificial Intelligence in Interdisciplinary Research

Artificial intelligence has emerged as an important facilitator of interdisciplinary research.

AI can assist researchers in:

- Analysing large datasets,
- Identifying patterns,
- Generating predictions,
- Processing textual information,
- Analysing behavioural data,
- Identifying relationships between variables, and
- Supporting decision-making.

For example, an interdisciplinary study of financial fraud may combine finance, criminology, law and computer science. Machine-learning models can identify unusual transaction patterns, while criminological theories can help interpret fraudulent behaviour and legal analysis can examine regulatory implications.

However, AI should not replace human reasoning. Researchers must critically evaluate data quality, model assumptions, bias, explainability and ethical implications.

Interdisciplinary Research and Sustainable Development

Sustainability has transformed the research agenda across business and social sciences.

A firm's environmental performance may affect:

- Financial performance,
- Investor decisions,
- Consumer preferences,
- Corporate reputation,
- Regulatory compliance, and
- Long-term business sustainability.

Consequently, sustainability research increasingly combines environmental science with economics, finance, management and public policy.

For example, **green finance** connects financial decision-making with environmental objectives. Researchers may study whether environmentally responsible firms receive better access to capital, whether investors value ESG performance, and whether sustainability initiatives influence corporate profitability.

Such questions cannot be adequately answered through finance alone.

Benefits of Interdisciplinary Research

Comprehensive Understanding - Multiple perspectives allow researchers to understand a problem from different angles.

Innovation - Interaction between disciplines can generate new ideas, models and research methods.

Better Problem Solving - Complex practical problems can be addressed more effectively when their economic, technological, social and legal dimensions are considered together.

Improved Policy Formulation - Governments can develop more effective policies when research incorporates evidence from multiple disciplines.

Practical Relevance - Interdisciplinary research often addresses real-world problems rather than purely disciplinary questions.

Challenges of Interdisciplinary Research

Despite its benefits, interdisciplinary research presents several challenges.

Differences in Terminology - The same concept may have different meanings across disciplines. Researchers must therefore establish common definitions.

Methodological Differences - A qualitative researcher and a quantitative researcher may have different views regarding what constitutes reliable evidence.

Coordination Problems - Interdisciplinary projects often involve researchers with different research cultures, expectations and working methods.

Evaluation Difficulties - Traditional academic evaluation systems may be organised around disciplinary boundaries, making interdisciplinary work difficult to assess.

Publication Challenges - Some journals have narrow disciplinary scopes and may be reluctant to publish research that crosses conventional boundaries.

Ethical Complexity - When research combines personal, financial, behavioural and technological data, ethical issues relating to privacy, consent, security and algorithmic bias become more significant.

Strategies for Effective Interdisciplinary Research

Successful interdisciplinary research requires deliberate integration rather than simply bringing researchers together.

First, researchers should develop a common research question.

The research problem should be sufficiently broad to require multiple perspectives but sufficiently focused to remain manageable.

Second, disciplines should be connected through a conceptual framework.

A conceptual framework provides a common structure for integrating theories and variables.

Third, researchers should establish methodological compatibility.

Different methods can be combined when their assumptions and purposes are clearly understood.

Fourth, communication should be continuous.

Researchers must explain disciplinary concepts in accessible language rather than assuming that collaborators understand specialised terminology.

Fifth, research teams should define responsibilities clearly.

Clear roles reduce duplication and improve coordination.

Sixth, interdisciplinary training should be encouraged.

Researchers increasingly require basic knowledge beyond their primary specialisation.

Illustrative Interdisciplinary Research Framework

Consider the research problem:

“Factors influencing digital investment behaviour among retail investors.”

An interdisciplinary framework could integrate:

Discipline	Contribution
Finance	Risk, return and investment decisions
Economics	Income, incentives and opportunity cost
Psychology	Risk perception and behavioural biases
Demography	Age, education and income
Statistics	Testing relationships
Data Science	Predictive analysis
Technology	Digital investment platforms
Law	Investor protection and regulation

The resulting framework would provide a substantially broader explanation than a finance-only study. This example demonstrates that interdisciplinary research does not mean abandoning disciplinary expertise. Instead, it means **connecting specialised knowledge to construct a more complete explanation.**

Future Directions of Interdisciplinary Research

The future of research is likely to be increasingly interdisciplinary.

Several developments will contribute to this transformation.

AI-enabled research - AI will allow researchers to analyse increasingly complex datasets and connect information across disciplines.

Digital research ecosystems - Cloud-based platforms will make international and interdisciplinary collaboration easier.

Open science - Greater sharing of datasets, research methods and analytical tools will facilitate collaboration.

Convergence of disciplines - Emerging fields such as FinTech, behavioural economics, computational social science, health informatics and environmental economics demonstrate the emergence of hybrid research areas.

Greater industry–academia collaboration - Universities, businesses, governments and civil-society organisations are likely to collaborate more closely on research addressing practical challenges.

Conclusion

Interdisciplinary research represents an important evolution in the production of knowledge. The increasing complexity of contemporary problems has made it difficult for individual disciplines to provide complete explanations. Economic behaviour is influenced by psychology; financial decisions

increasingly depend upon technology; business performance is affected by environmental and social factors; and technological innovation creates legal and ethical questions.

The central strength of interdisciplinary research lies in **integration**. It brings together theories, concepts, methods and evidence to examine problems from multiple perspectives. When properly designed, such research can generate more comprehensive explanations, innovative solutions and stronger practical outcomes.

However, interdisciplinary research also requires researchers to overcome methodological, conceptual, organisational and institutional barriers. Successful interdisciplinary inquiry depends upon effective communication, shared research objectives, methodological openness and respect for different forms of expertise.

The future of research is therefore unlikely to be defined solely by deeper specialisation. Instead, it will increasingly depend upon the ability to **connect specialised knowledge across disciplinary boundaries**. In this sense, interdisciplinary research can be viewed not merely as a research methodology but as a broader approach to knowledge creation—one that is particularly suited to the interconnected challenges of contemporary society.

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CHAPTER - 24

INTERDISCIPLINARY DIMENSIONS OF FINANCIAL SERVICES: THEORETICAL PERSPECTIVES ON CONTEMPORARY RESEARCH

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Introduction

For much of its academic history, research on financial services was treated as the near-exclusive preserve of economics and finance, with questions of interest rates, capital allocation, risk pricing, and regulatory compliance dominating scholarly attention. Over the past two decades, however, the boundaries of this field have become considerably wider. Banking, insurance, and financial intermediation are no longer studied merely as economic mechanisms; they are increasingly examined as socio-technical and human systems in which consumer psychology, organisational behaviour, workforce capability, and digital transformation play defining roles.

This shift has been driven by three parallel developments. First, the rapid digitalisation of financial services — through fintech, mobile banking, and data-driven decision systems — has drawn scholars from computer science, information systems, and technology management into what was once a purely financial-economic conversation. Second, growing recognition that financial decisions (whether to save, insure, invest, or borrow) are rarely made through the purely rational calculus assumed by classical economic theory has opened the field to behavioural economics and cognitive psychology. Third, the realisation that financial institutions are, above all, people-driven organisations have brought human resource management (HRM) and organisational behaviour theory into direct conversation with banking and insurance research.

This chapter responds to this convergence by asking a foundational question: what theoretical frameworks allow us to understand financial services as an interdisciplinary field, and how do banking, insurance, and human resource management perspectives interact within it? In addressing this question, the chapter does not attempt an exhaustive empirical investigation; rather, it undertakes a theoretical combination, drawing on established and emerging frameworks across disciplines to construct an integrative conceptual lens. The chapter is organised as follows. Section 2 reviews the theoretical and conceptual foundations relevant to banking, insurance, human resource management, and financial literacy/inclusion as cross-cutting constructs. Section 3 proposes an integrative framework linking these strands. Section 4 discusses the cross-disciplinary synergies that emerge from this synthesis. Sections 5 and 6 outline implications and limitations, and Section 7 concludes.

Theoretical and Conceptual Background

Financial Services as an Interdisciplinary Domain

A useful starting point is the recognition that financial innovation itself has been described in the literature as an inherently interdisciplinary subject of study. Nejad (2022) observes that research on

financial innovation spans multiple academic traditions, each employing different methodologies, units of analysis, and data sources, and calls for a move away from a narrow, technology-centric view toward an ecosystem-oriented perspective that accounts for the interaction between technological change, institutional frameworks, and market structures. This ecosystem view is instructive for the present chapter: it suggests that no single disciplinary lens — whether pure finance, technology studies, or organisational theory — is sufficient to explain how contemporary financial services function.

Methodologically, this kind of cross-disciplinary synthesis is well supported by the literature-review tradition itself. Cooper (1988) provided one of the earliest taxonomies for organising knowledge synthesis across fields, while Webster and Watson (2002) argued that a rigorous literature review should draw on concepts developed in one discipline to extend theory in another. More recently, Torraco (2016) and Snyder (2019) have described the integrative literature review as a method particularly suited to emerging, fragmented, or fast-evolving research areas — a description that fits contemporary financial services research closely, given its rapid absorption of behavioural, organisational, and technological perspectives. This chapter adopts a similar integrative orientation, treating banking, insurance, and human resource management not as separate silos but as interconnected sub-systems of a broader financial services ecosystem.

Banking: Institutional and Human-Capital Perspectives

Banking research has traditionally been anchored in institutional and regulatory theory, examining how capital adequacy, monetary policy, and prudential regulation shape bank behaviour. However, the digital transformation of banking has increasingly foregrounded a second, human-centred dimension of the sector: the capability, adaptability, and skill composition of the banking workforce. Industry-level analyses point to a structural shortage of digitally skilled banking professionals, compounded by the retirement of experienced staff and by automation that is displacing entry-level roles faster than reskilling programmes can respond (Wolters Kluwer, 2026). This is significant for theory-building because it repositions workforce capability — traditionally an HRM concern — as a matter of institutional and strategic risk for banks, rather than a peripheral operational issue.

Complementary evidence suggests that banks are increasingly required to compete with financial technology firms not merely on products but on talent, with institutions investing in leadership development, customer-interaction skills, and compliance-related training to remain competitive in a digitally reshaped labour market (BDO, 2022). Taken together, these observations indicate that banking theory today cannot be fully separated from organisational and human-capital theory: the institutional performance of a bank is contingent, in part, on how effectively it manages, develops, and retains its human resources under conditions of rapid technological change.

Insurance: Risk, Behaviour, and Decision Theory

Insurance research offers one of the clearest illustrations of interdisciplinary theorising within financial services. Classical insurance economics assumes that individuals are risk-averse expected-utility maximisers who purchase coverage in proportion to their objective exposure to risk. However, Richter, Ruß, and Schelling (2019) demonstrate that actual insurance-purchasing behaviour frequently departs from this assumption, incorporating well-documented behavioural patterns — such as framing effects,

loss aversion, and inconsistencies in risk attitudes over time — that are better explained by Prospect Theory than by traditional expected-utility models. Their analysis underscores that a purely economic account of insurance demand is incomplete without insights drawn from cognitive and behavioural psychology.

A related and widely applied theoretical lens is Ajzen's (1991) Theory of Planned Behaviour, which posits that an individual's behavioural intentions — and, in turn, their actual behaviour — are shaped by attitudes, subjective norms, and perceived behavioural control. This framework has been extensively used to explain insurance purchase decisions, financial planning behaviour, and savings intentions, precisely because financial choices of this kind are rarely reducible to economic calculation alone; they are embedded in social expectations and perceived self-efficacy. The insurance sector, therefore, exemplifies how financial services scholarship increasingly requires the integration of psychological and sociological constructs alongside economic ones.

Human Resource Management in Financial Institutions

Human resource management theory contributes a further essential dimension to the interdisciplinary study of financial services: the recognition that financial institutions are, fundamentally, knowledge- and service-intensive organisations whose performance depends heavily on their human capital. Huselid's (1995) foundational work on strategic HRM established that coordinated systems of HR practices — encompassing selection, training, performance appraisal, and compensation — are significantly associated with lower employee turnover, higher productivity, and stronger corporate financial performance. This finding has particular relevance to banking and insurance organisations, where service quality, regulatory compliance, and customer trust are directly mediated by front-line staff.

Empirical extensions of this theory within the banking sector reinforce its relevance. Qureshi, Ramay, and Marwat (2007), studying banking organisations, found that HR practices such as selection, training, performance appraisal, and employee participation were positively associated with organisational and market performance, with selection and training emerging as particularly strong predictors. These findings suggest that HRM is not merely a support function within financial institutions but a strategic lever that shapes financial outcomes — a conclusion that bridges HRM theory directly with the financial-performance concerns traditionally studied within banking and finance.

Financial Literacy and Inclusion as Cross-Cutting Theoretical Constructs

A final theoretical strand that cuts across banking, insurance, and broader financial services research is the theory of financial literacy and financial inclusion. Lusardi and Mitchell (2014) provide an influential account of the economic importance of financial literacy, demonstrating that individuals with greater financial knowledge are better equipped to plan for retirement, manage debt, and participate effectively in formal financial systems. This body of theory is significant because it links individual cognitive and educational factors to system-level outcomes such as financial inclusion and market stability.

Ozili (2020) extends this discussion by cataloguing multiple competing theories of financial inclusion — including public good theory, dissatisfaction theory, and vulnerable-group theory — each offering a

different explanation for why individuals remain excluded from formal financial systems. In more recent work, Ozili (2025) proposes a financial literacy theory of financial inclusion, arguing explicitly that low financial literacy is itself a determinant of low financial inclusion, thereby offering a causal theoretical bridge between individual-level cognitive capacity and system-level access to banking and insurance services. Considered together, these theories demonstrate that financial literacy and inclusion function as connective theoretical tissue linking consumer psychology (relevant to insurance and banking behaviour), institutional design (relevant to banking regulation), and human capital development (relevant to HRM-oriented financial education initiatives).

Towards an Integrative Theoretical Framework

The preceding review suggests that financial services research can be usefully organised around four interacting theoretical pillars, summarised in Table 1. Rather than treating banking, insurance, HRM, and financial literacy as separate literatures, this chapter proposes that they be understood as differentiated expressions of the same underlying interdisciplinary phenomenon: the interaction between institutional-economic structures, human cognition and behaviour, organisational capability, and technological change.

Table 1. Integrative theoretical pillars of interdisciplinary financial services research

Theoretical Pillar	Core Theoretical Anchors	Relevant Sub-Domain
Economic-Institutional	Financial innovation ecosystem theory (Nejad, 2022); regulatory and institutional theory	Banking regulation, market structure
Behavioural-Cognitive	Prospect Theory and behavioural economics (Richter et al., 2019); Theory of Planned Behaviour (Ajzen, 1991)	Insurance purchase decisions, consumer finance
Organisational-Human Capital	Strategic HRM theory (Huselid, 1995); HR-performance linkage (Qureshi et al., 2007)	Workforce management in banks and insurers
Technological-Transformational	Digital workforce transformation (BDO, 2022; Wolters Kluwer, 2026); financial literacy/inclusion theory (Lusardi & Mitchell, 2014; Ozili, 2020, 2025)	Fintech adoption, digital financial inclusion

This framework does not position the four pillars as mutually exclusive; rather, it treats them as overlapping lenses that jointly determine outcomes within any given financial services context. A bank's digital transformation strategy (technological-transformational), for instance, cannot succeed without a workforce that has been reskilled and motivated through effective HR practices (organisational-human capital), operating within a regulatory environment that permits innovation (economic-institutional), and

serving customers whose adoption behaviour is shaped by trust, risk perception, and financial literacy (behavioural-cognitive). The explanatory power of the framework lies precisely in this interdependence.

Discussion: Cross-Disciplinary Synergies

First, there is a clear convergence between HRM theory and technology-driven workforce literature: Huselid's (1995) strategic HRM framework, developed originally in a general organisational context, finds direct contemporary application in the banking sector's efforts to close digital skills gaps and retain talent under competitive pressure from fintech firms (BDO, 2022; Wolters Kluwer, 2026). This suggests that strategic HRM theory, rather than being a peripheral add-on to banking research, may be central to explaining why some financial institutions manage digital transformation more successfully than others.

Second, behavioural theories developed for insurance decision-making (Richter et al., 2019) and for financial literacy and inclusion (Lusardi & Mitchell, 2014; Ozili, 2025) share a common theoretical DNA: both reject the assumption of a purely rational financial decision-maker and instead emphasise cognitive, educational, and psychological determinants of financial behaviour. The Theory of Planned Behaviour (Ajzen, 1991) provides a unifying mechanism here, since attitudes, subjective norms, and perceived control plausibly shape not only insurance purchase decisions but also savings behaviour, borrowing decisions, and engagement with formal banking channels. This suggests scope for a more unified behavioural theory of financial services demand that spans banking, insurance, and inclusion research rather than treating each as a separate behavioural literature.

Third, the methodological argument for interdisciplinarity advanced by Nejad (2022) and reinforced by integrative-review scholars such as Snyder (2019) and Torraco (2016) applies with equal force to the HRM-finance interface as it does to the technology-finance interface. Just as financial innovation research benefits from an ecosystem-oriented perspective that integrates technological, institutional, and market factors, research on human resources within financial institutions would benefit from situating HR practices within the broader institutional and technological ecosystem in which banks and insurers now operate, rather than studying HR outcomes in isolation from digital transformation and regulatory change.

Implications

Theoretical Implications - The integrative framework proposed in this chapter suggests that future theory-building in financial services should explicitly model the interaction between institutional, behavioural, human-capital, and technological variables, rather than advancing single-discipline explanations. This has implications for how constructs are operationalised in future research: for example, studies of fintech adoption might usefully incorporate HRM variables (such as staff digital competence) alongside customer-side behavioural variables (such as perceived risk and trust).

Managerial and Practical Implications - For practitioners, the framework implies that decisions traditionally treated as separate — HR investment, digital strategy, product design, and customer communication — should be planned in a coordinated fashion. Banks and insurers seeking to expand financial inclusion, for instance, may find that customer-facing financial literacy initiatives are more

effective when supported by well-trained, adequately incentivised front-line staff, consistent with the HR-performance linkages identified by Huselid (1995) and Qureshi et al. (2007).

Policy Implications - At the policy level, the financial literacy theory of financial inclusion (Ozili, 2025) suggests that regulators and policymakers aiming to expand access to banking and insurance services should treat financial education not as a peripheral consumer-protection measure but as a structural precondition for inclusion. Simultaneously, workforce-related findings on the banking skills gap (Wolters Kluwer, 2026) suggest that policy support for reskilling programmes in the financial sector may be as important to systemic financial stability as prudential regulation itself.

Limitations and Future Research Directions

This chapter is conceptual and theoretical in nature; it analyses existing theoretical and empirical literature but does not itself present new primary data. Its integrative framework, while grounded in established theory, would benefit from empirical validation across different national, regulatory, and institutional contexts, particularly given that much of the HRM-banking literature reviewed here originates from specific country contexts and may not generalise universally. Future research could usefully test the proposed four-pillar framework using mixed-methods or structural equation modelling approaches, examining, for instance, whether HRM practice bundles moderate the relationship between digital transformation investment and customer-level financial inclusion outcomes. Further comparative research across banking, insurance, and other financial-service sub-sectors (such as asset management or microfinance) would also help establish the boundary conditions of the framework proposed here.

Conclusion

This chapter has argued that contemporary research on financial services — spanning banking, insurance, and related domains — is best understood as an inherently interdisciplinary undertaking. By reviewing theoretical contributions from institutional economics, behavioural economics, strategic human resource management, and financial inclusion theory, the chapter has shown that no single disciplinary lens adequately captures the complexity of how modern financial institutions function and evolve. The integrative four-pillar framework proposed here — economic-institutional, behavioural-cognitive, organisational-human capital, and technological-transformational — offers one way of organising this complexity and provides a starting point for future theoretical and empirical work that treats banking, insurance, and human resource management not as isolated fields but as interconnected dimensions of a single, rapidly evolving financial services ecosystem.

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CHAPTER - 25

EFFECT OF HRIS ON EMPLOYEE PERFORMANCE - INVESTIGATION AMONG THE BANK EMPLOYEES

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Abstract

HRIS (Human Resource Information System) has turned out to be a crucial tool which helps to enhance the effectiveness and efficiency of HRM in contemporary firms. The article presented here is an effort to investigate the impact posed by HRIS on the performance of employees. The entities are enabled through HRIS in automating the routine activities in HR, maintaining accurate records of employees, facilitating appropriate information access and supporting proper communication between the management and the employees. Such potentials help in reducing the administrative work-load and enable the HR professionals and the employees in emphasizing over the strategic functions. The study has been done among the employees of the private banks in Chidambaram and the respondents among those employees have been selected by adopting simple random sampling. From the respondents, the author has collected the data through questionnaire. Sample size of the study is 100. The collected data has been analyzed by implementing regression. Results of the analysis reveal that proper execution of HRIS leads to improvement in the performance of employees by enhancing the work procedures, reducing the errors, promoting the development of employees and augmenting the accessibility of information. But, HRIS's effectiveness relies on the factors like organizational support, data security, technological infrastructure, employee training and system usability. It has been concluded through the study that the entities which execute and enhance HRIS in a strategic and continuous manner get the ability of improving the employee performance and achieving the organizational goals.

Keywords: HRIS, Employee Performance

Introduction

Digital technology is seen to develop in a rapid mode and in this aspect, the organizations are transforming the manner of designing, managing and assessing the functions of HR. (Ammupriya and Preetha, 2023). With the intensification of competition and increase in demands towards efficiency, several firms have started to adopt the digital tools in HR for streamlining the work procedures and for enhancing the employee performance. One such innovative solution is the implementation of HRIS within the firms. It is an integrated model which helps in collecting, storing, analyzing and retrieving information related with HR for supporting strategic and administrative functions, as mentioned by Gupta and Mittal (2025). When implemented within the entities, HRIS has been witnessed to enhance the efficiency in workflow, reduction of administrative burdens, enhancement of accuracy in decision making and enrichment of the employee experience. But, with the development of HRIS adoption, it has become important to understand human dynamics which determine the effectiveness of HRIS (Begum, et al., 2020).

Human Resources Information System (HRIS)

HRIS means the digital infrastructure which has been designed for supporting the strategic and administrative functions of HRM. It helps in integrating the storage of data, processing of information and automation of workflows, which enables the entities to manage the personnel data, payroll, attendance, recruitment, evaluation of performance and development of employees (Alrawashdeh, et al., 2022). Hence, it can be rightly stated that HRIS acts as the socio-technical solution, wherein technology improves the accessibility, accuracy and speed of the activities of HR. as mentioned by Vadithe, et al. (2025), HRIS has been described as the technological resource by many scholar, which enhances the process of making decisions through the provision of actual information which is comprehensive and reliable. With the help of HRIS, the employees get an easy access to information related with their job like performance objectives, work schedules, modules of training and records related with feedback, ultimately enhancing coordination and reducing ambiguity. The managers are also provided with analytical tools through HRIS, which help them in generating information about planning towards workforce and supervision of performance. (John and Velmurugan, 2024; Samman and Obaidly, 2024). When considered theoretically, HRIS and the model of technology acceptance are closely related with each other. The model mentioned here proposes that perceived ease of use and perceived usefulness help in determining the proper adoption of the system. When considered from the organizational perspective, HRIS has turned out to be an important tool towards digital transformation as it helps in streamlining the administrative procedures, reinforcing transparency and contributing towards efficiency, ultimately influencing the organizational outcomes and employee behavior (Obaidly, et al., 2022).

Employee Performance

The level to which a person completes the task assigned to him/her with organizational expectations and standards is referred to as the employee performance (Tang and Vandenberghe, 2021). Employee performance comprises of efficiency and effectiveness of the work behaviors which lead to the accomplishment of the organizational goals. Hence, Kundi,et al., (2021) had mentioned that performance is a multi-dimensional term and includes task performance, adaptive performance and contextual performance. The performance of the main duties within the organization refers to task performance and the behaviors which support reliability, cooperation and initiative within the organization refers to contextual performance, as stated by Alomari (2023). The potential to adjust the changing demands of work and novel technologies refers to adaptive performance. The framework proposed by Campbell highlights that employee performance is the combination of his/her skill, knowledge, situational elements and motivation. The factors which determine the employee performance are timely access to information, evident goals, resource availability, leadership quality and job design. When the entities wherein the organizational settings are determined by technology, performance is related closely with system support, digital knowledge and alignment of the employee skills with the organizational procedures. Tang and Vandenberghe (2021) had stated that performance is the reflector of the organizational success as it indicates the employee's ability in meeting the targets, maintaining the quality and contributing to the productivity of the organization.

The Influence of HRIS on Employee Performance

It is highly believed that HRIS helps in improving the employee performance. This is because HRIS helps in streamlining the work-flows, getting access to data and enhancing the organizational potentials towards decision-making which is driven by technology. As per the resource-oriented perspective, difficult, valuable and rare technologies lead to competitive advantage together with improvement in productivity of the human resources. In the words of Alomari (2023), adoption of HRIS provides aspects like talent management, automated appraisal of performance, tracking of attendance and employee self-service all of which help in getting timely and accurate job performance. Ammupriya and Preetha (2023) had defined employee performance as the extent to which the employees perform their work as per the standards of the organization. Aldmour (2020) had carried out empirical studies which stated that usage of HRIS is related with the enhanced quantity and quality of work-related outcomes. Further, HRIS helps in reducing administrative work overloads which help the employees to do their core task effectively. In the present digital world, the potential of the organization to have a control over HRIS has turned out to be essential to ensure that the employees get sufficient technological support. Therefore, empirical evidence and theoretical studies prove that HRIS improves the employee performance.

Statement of problem

The organizations in the prevailing competitive environment of business have started to adopt technology for improving the management of HR and to improve the employee performance. HRIS has been established to support varied functions of HR like management of employee-related records, payroll, recruitment, performance appraisal, attendance, communication and training. Though such systems help in improving the efficiency, accuracy and speed of the HR functions, several entities face challenges to achieve the anticipated augmentations in the employee performance.

Need for the study

The manner in which the management of human resources is done within the organization has been transformed with the increased utilization of technology. HRIS (Human Resource Information System) has turned out to be a crucial tool to automate and improve varied activities in HR like recruitment, management of employee-related records, payroll, attendance, training, communication and performance appraisal. Since the entities have started to rely on technology for the management of their employees, it has become highly crucial to recognize if adoption of HRIS leads to augmentation of the employee performance. The significance of this type of study has gone up with the importance given for employee performance to achieve the goals of the organization. The overall organizational effectiveness is affected by productivity of the employees, accuracy, efficiency, commitment and job satisfaction. The managers and employees are provided with accurate and timely information, decrease the administrative workload, simplify the work procedures and promote quality decision-making through HRIS. Hence, recognizing the relationship of HRIS with employee performance helps in determining the degree of contribution made by technology to improve the workplace outcomes.

Objectives

The central aim of the study is to explore and analyze the effect posed by HRIS in an organization on the performance of the employees.

Review of literature

Ika and Fetty (2020) made a study to examine the effect posed by HRIS on the effectiveness of the performance of employees in Brankas. From the twenty-first century, usage of data has helped the business strategies and decision-making processes. HRIS is the best example to use savings in the administrative expenditures and further follow practices which prove to be beneficial for the organizations through the collection of data, sharing and processing. Aim of this study was to identify the effect posed by the effectiveness of HRIS on the performance of employees. The study was quantitative in nature and data was collected through questionnaire. Analysis was causal and descriptive in nature. Hypothesis testing, determination of coefficient, linear regression and descriptive analysis had been adopted. Findings revealed that HRIS had an effect over the employee performance.

Titania, et al., (2024) analyzed the effect of HRIS on the employee performance and management of employee performance. HRIS has turned out to be an important tool for managing the HR efficiently and effectively. The present study collected and analyzed prior literatures which assessed the effect posed by HRIS on varied elements of the employee performance management like employee retention, career development, feedback and performance appraisal. Results of the study showed that HRIS had a positive effect over the management of the performance of employees. It was proved that HRIS enhanced the efficiency and accuracy of performance appraisal, thereby enabling continuous and highly organized feedback process and facilitating effective planning of career development. Further, HRIS usage is also related with enhanced satisfaction of employees and increased rates of retention. HRIS was also found to streamline the administrative processes and also helped in the enhancement of the performance of employees and accomplishment of the goals of the organization.

Noni, et al., (2026) made a study to examine the improvement in performance when implementing HRIS within the firms. The study was done through the mediation of the variables of work centrality and job involvement. For improving the effectiveness of HRM and strengthening the employee performance, modern organizations having the work environments which are digitally driven have started to adopt and implement HRIS. The authors of the study had examined the effect posed by HRIS on employee performance, work centrality and job involvement. Work centrality and job involvement had also been examined as mediators. Non-probability sampling was used to select the respondents of the study and the sample size of the study was 200. The respondents were the employees who had direct experience in using HRIS. Smart-PLS 4 had been used for analyzing the measurement model and the structural model. Outcomes of the analysis revealed that all the three variables were enhanced through HRIS. It was explored that job involvement had a positive effect over employee performance, however, there was no effect on performance by work centrality. It was found through the mediation analysis that the relationship of HRIS with employee performance was mediated by job involvement, but work centrality did not mediate the relationship. The results of this study suggested that employee performance was improved through adoption of HRIS mainly through the development of increased involvement of employees in job and not by reinforcing the work centrality.

Syuryatman, et al., (2025) examined the effect posed by HRIS on the employee performance. the study was done with reference to the moderating role of Resonant Leadership Style. It was an explanatory and quantitative study. The authors had collected primary data for the study through a questionnaire from 350 employees from Hyper-mart in Indonesia. Analysis of the data was done using Smart-PLS 4.0. Findings revealed that there was a positive effect of HRIS on employee performance. This means that adoption of HRIS enables the employees to finish their work with effectiveness and achieve their goals

with efficiency, thereby improving the performance. Further, the style of Resonant Leadership moderated the relationship between the dependent and independent variable. The leaders having resonant style possess the ability of strengthening the HRIS's effectiveness, promotion of improved task completion and performance-related outcomes. The results of this study emphasized the significance of leadership style and technological systems to enhance the employee performance.

Rand (2019) examined the effect posed by HRIS on the employee performance. The study was done with reference to the mediation of employee engagement. The respondents of the study were the employees of five star hotels of Jordan. Conceptual framework was designed on the basis of the content analysis of prior studies and the theory of social exchange. The study was quantitative in nature and respondents were selected through simple random sampling. Data was collected with the help of questionnaires from 221 HR workers. Analysis of data and verification of the variables were done through SEM. Results showed that HRIS positively affected work engagement and employee performance. Work engagement had a partial mediation over the relationship of HRIS with employee performance.

RESEARCH METHODOLOGY

The respondents of the study are the employees of private banks in Chidambaram. The method used for selecting the respondents for the study is simple random sampling. The number of respondents of the study is 100. The tool used to collect data for the study is a questionnaire and analytical instrument used is regression.

Analysis and interpretation

To examine the influence of HRIS on employee performance, a simple linear regression analysis was conducted.

Relationship between HRIS and Employee Performance

R	R Square	Adjusted R Square	F	Sig.
0.923 ^a	0.852	0.844	107.826	0.000(a)

a Predictors: (Constant), HRIS

Coefficients(a)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.125	.141		.886	.378
HRIS is effectively integrated with other systems used by the bank.	.035	.046	.047	.766	.446
HRIS allows different HR activities to be managed through a common system.	.234	.069	.226	3.372	.001
I can access HRIS when required for my work.	.242	.055	.272	4.362	.000
HRIS enables smooth sharing of information across relevant departments.	.218	.072	.210	3.044	.003
HRIS reduces duplication of HR-related work.	.292	.061	.305	4.822	.000

Dependent Variable: Employee Performance

Interpretation

The results indicate a strong and statistically significant relationship between HRIS and employee performance, with $R = 0.923$ and $R^2 = 0.852$, showing that HRIS explains 85.2% of the variation in employee performance. The regression model is statistically significant ($F = 107.826$, $p < 0.001$), confirming that HRIS has a meaningful overall influence on employee performance. Among the HRIS factors, reducing duplication of HR-related work has the strongest positive effect ($\beta = 0.305$, $p < 0.001$), followed by accessibility of HRIS ($\beta = 0.272$, $p < 0.001$). Common-system management of HR activities ($\beta = 0.226$, $p = 0.001$) and smooth information sharing ($\beta = 0.210$, $p = 0.003$) also significantly contribute to employee performance, whereas system integration alone is not statistically significant ($p = 0.446$).

Findings

The present study identifies that the HRIS adoption has got a positive effect on the employee performance. On making effective usage of HRIS, the organizations get the ability of streamlining the activities of human resources and further, it gives the managers and the employees an accurate and quick access to required information.

Suggestion

It has been suggested by the author of this study that the entities need to consider HRIS as the administrative tool and also as the strategic resource to improve the employee performance. Accurate execution, training for employees, support of the management, data safety and regular evaluation of the system may enable the firms to get increased benefits from HRIS, thereby improving the overall effectiveness of the organization.

Conclusion

HRIS has turned to be a crucial element of contemporary HRM. The present study shows that proper adoption and implementation of HRIS positively affects the organizational effectiveness and mainly the employee performance. Through the automation of the regular activities of HR, enhancing the information access, decreasing the errors and promoting proper decision-making, the employees are enabled to carry

out their work with effectiveness. It has also been highlighted that the HRIS enhances the opportunities given to employees for training & development, job satisfaction, communication, work efficiency and employee productivity. The managers are also enabled to have an access to exact information about the employees, supervise the performance, recognize the training needs and arrive at better decisions regarding the employees with the help of HRIS. Such advantages help in achieving the objectives of the organization and also in improving the employee performance.

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CHAPTER – 26

GREENWASHING IN SUSTAINABLE MARKETING: IMPACT ON CONSUMER TRUST AND PURCHASE INTENTION

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Abstract

Sustainable marketing has become an important strategic approach as consumers, regulators and other stakeholders increasingly expect firms to demonstrate environmental responsibility. At the same time, the expansion of green claims has increased the risk of greenwashing, in which environmental benefits are exaggerated, presented without adequate evidence, or communicated in ways that create a misleading impression. This chapter examines how perceived greenwashing can influence consumer trust and purchase intention within sustainable marketing. The discussion is based on a structured review of established and recent academic literature on greenwashing, green trust, green brand credibility, consumer skepticism and green purchase intention. The literature consistently indicates that perceived greenwashing can weaken trust, increase skepticism and confusion, damage brand credibility, and reduce consumers' willingness to purchase products positioned as sustainable. Green trust emerges as an important mechanism connecting firms' environmental communication with consumer responses. Transparent information, credible environmental evidence, non-deceptive communication, meaningful sustainability practices and recognized certification can therefore help firms strengthen trust and support purchase intention. The chapter proposes a conceptual framework in which perceived greenwashing negatively influences consumer trust, while consumer trust positively influences purchase intention. The framework also recognizes consumer skepticism, perceived transparency and green brand credibility as important explanatory factors. The chapter concludes that sustainable marketing is most effective when environmental communication is supported by verifiable organizational action rather than symbolic claims.

Keywords: Greenwashing, sustainable marketing, consumer trust, green trust, purchase intention, green marketing, consumer skepticism, brand credibility.

Introduction

Environmental sustainability has moved from being a specialist concern to a major issue in marketing, business strategy and consumer decision-making. Firms increasingly communicate environmental commitments through product labels, advertisements, packaging, websites, social media and corporate sustainability reports. Such communication can help consumers identify products that are intended to reduce environmental harm. However, when environmental claims are vague, exaggerated, selective or unsupported by evidence, consumers may perceive the communication as greenwashing. Greenwashing is therefore not only an environmental communication problem; it is also a marketing and consumer trust problem.

Delmas and Burbano (2011) describe greenwashing as misleading communication about environmental performance or environmental benefits and explain that it can undermine confidence in green products and firms. Lyon and Montgomery (2015) further show that greenwashing is a broad

concept covering different forms of misleading environmental communication. These perspectives are important because consumers often cannot directly verify the environmental performance of a product at the point of purchase. They consequently rely on signals such as labels, certifications, advertising messages, corporate reputation and brand credibility.

Consumer trust is particularly important in sustainable marketing because environmental attributes are frequently difficult to observe before purchase. A consumer may not be able to independently verify whether a product was produced with lower emissions, whether packaging is genuinely recyclable, or whether a claimed environmental benefit is substantial. When consumers believe that a firm is communicating honestly, trust can reduce uncertainty and support purchase decisions. In contrast, perceived greenwashing can increase uncertainty and skepticism, making consumers less willing to believe sustainability claims.

Previous empirical research provides evidence for this relationship. Chen and Chang (2013) found that greenwash was negatively associated with green trust, with green consumer confusion and perceived risk helping to explain the relationship. Zhang et al. (2018) reported that greenwashing perceptions negatively affect green purchasing intentions and that green word-of-mouth partially mediates this relationship. More recent research similarly indicates that perceived greenwashing can reduce green trust and purchase intention, while authentic and transparent environmental practices can strengthen consumer responses.

The contemporary relevance of the issue is also evident in digital marketing. Social media, influencer marketing and online retail platforms allow environmental claims to spread rapidly. Consumers can encounter sustainability messages through short videos, sponsored content, product descriptions and user-generated reviews. This increases the importance of credible environmental communication because misleading claims can affect not only individual purchase decisions but also online word-of-mouth and brand reputation.

Objectives of the Chapter

1. To explain the concept and significance of greenwashing in sustainable marketing.
2. To examine the relationship between perceived greenwashing and consumer trust.
3. To analyse how consumer trust influences purchase intention toward sustainable products.
4. To identify the roles of consumer skepticism, transparency and green brand credibility in the greenwashing–purchase intention relationship.
5. To propose practical strategies for firms to reduce greenwashing risk and strengthen sustainable marketing effectiveness.

Conceptual Understanding of Greenwashing

Greenwashing occurs when an organization creates an overly positive impression of its environmental performance without providing a sufficiently accurate representation of its actual environmental impact. It may involve direct falsehoods, incomplete disclosure, ambiguous language, irrelevant claims, selective presentation of positive information, or the use of environmental imagery that creates an impression of sustainability without adequate evidence.

Lyon and Montgomery (2015) emphasize that greenwash can take multiple forms rather than representing a single communication practice. This is important for marketers because consumers may interpret a claim as misleading even when the wording is technically defensible. For example, a firm may highlight that a package contains recycled material while failing to disclose that most of the package remains non-recyclable. The individual claim may be true, but the overall communication may create a misleading impression.

Parguel et al. (2015) demonstrate that even advertising execution can contribute to perceived greenwashing. Nature-related visual cues and environmental imagery can influence perceptions independently of the substantive environmental performance of the product. This indicates that greenwashing is not limited to factual statements; it can also arise from the overall design and framing of marketing communication.

From a consumer perspective, greenwashing is especially problematic because environmental information often involves information asymmetry. Firms usually possess more information about production processes, supply chains and environmental performance than consumers do. Consumers therefore depend on signals provided by the firm and by third parties. When these signals are inconsistent or unreliable, consumers may respond with skepticism and avoid sustainability claims altogether.

Greenwashing in Sustainable Marketing

Sustainable marketing seeks to integrate environmental and social considerations into product development, pricing, distribution and promotion while creating value for consumers and other stakeholders. Effective sustainable marketing should therefore connect communication with substantive organizational practices. When communication is stronger than actual performance, a gap can emerge between what the firm says and what it does. This gap is one of the central conditions associated with greenwashing.

Greenwashing can be attractive to firms in the short term because environmental positioning may differentiate products, attract environmentally concerned consumers and strengthen corporate reputation. However, misleading claims can create long-term costs. Once consumers identify inconsistencies, trust may decline, negative word-of-mouth may increase and the credibility of future sustainability claims may be weakened. Delmas and Burbano (2011) note that external pressures, organizational conditions and individual-level factors can all contribute to greenwashing.

The digital environment increases both the opportunities and risks. A sustainability claim can be communicated globally at very low cost, but consumers can also compare claims, share evidence and criticize firms publicly. Consequently, sustainable marketing increasingly requires traceable evidence, transparent reporting and consistency across advertising, packaging, corporate communication and actual business practices.

Consumer Trust and Green Trust

Consumer trust refers broadly to the willingness of a consumer to rely on a brand or firm when the consumer cannot fully control or verify the outcome. In sustainable marketing, green trust refers specifically to confidence that a firm's environmental claims, products or practices are credible and dependable.

Green trust reduces perceived uncertainty. When consumers trust a brand's environmental claims, they may be more willing to interpret sustainability information positively and consider purchasing the product. Conversely, perceived greenwashing can undermine this trust. Chen and Chang (2013) found a negative relationship between greenwash and green trust and highlighted the roles of green consumer confusion and green perceived risk. Their findings suggest that misleading claims can make consumers less confident about whether a product actually provides the environmental benefits promised.

Recent research continues to support this mechanism. Rahman (2023) examined green advertising receptivity, non-deception, green brand image and transparency in relation to green brand trust and purchase intention. The study highlights the importance of transparent and non-deceptive marketing in building trust. Similarly, research published in 2026 found that greenwashing concerns negatively affect green brand trust, while green trust can subsequently influence purchase intention. These findings reinforce the view that trust is a central mechanism linking environmental communication with consumer behaviour.

Greenwashing and Purchase Intention

Purchase intention refers to a consumer's willingness or likelihood to purchase a particular product or brand. In sustainable consumption, purchase intention is affected by perceived environmental benefits, price, product quality, environmental concern, trust, credibility and perceived risk. Greenwashing can weaken purchase intention because consumers may conclude that the environmental benefit is uncertain or that the firm is attempting to manipulate them.

Zhang et al. (2018) found that perceived greenwashing has a direct negative effect on green purchasing intentions. Their study also showed that green word-of-mouth partially mediates the relationship, while green concern strengthens the negative association. Similarly, Chen et al. (2019) reported that greenwashing was negatively associated with green purchase intention and that green skepticism mediated this relationship. These findings indicate that the effect of greenwashing may operate through psychological responses rather than through a simple direct reaction.

Research on green brand equity also suggests an indirect pathway. Greenwashing can damage green brand associations and brand credibility, which can reduce green brand equity and ultimately weaken purchase intention. This is strategically important because a consumer may not immediately reject a product because of one misleading claim, but repeated exposure to inconsistent claims can gradually weaken the brand's credibility and willingness to buy.

Role of Consumer Skepticism and Confusion

Consumer skepticism is a critical response to environmental claims. Skeptical consumers question whether sustainability messages are accurate, whether evidence is sufficient and whether the firm is motivated by genuine environmental responsibility or commercial gain. A moderate level of skepticism can encourage consumers to seek information and evaluate claims carefully. However, excessive skepticism can result in a broader loss of confidence in green marketing.

Green consumer confusion is another important mechanism. When firms use unclear terminology such as 'eco-friendly', 'natural', 'green' or 'environmentally responsible' without explaining measurable criteria, consumers may struggle to compare products. Confusion can increase perceived risk and reduce

the ability of consumers to distinguish genuine sustainable products from products supported mainly by promotional claims.

Therefore, firms should not assume that adding more environmental language will automatically improve purchase intention. Communication should be specific, understandable and supported by evidence. Consumers should be able to understand what environmental benefit is being claimed, how it is measured and what limitations apply.

Role of Transparency and Green Brand Credibility

Transparency is the extent to which firms provide clear, relevant and accessible information about their environmental practices and performance. Transparency can strengthen credibility because it allows consumers and other stakeholders to evaluate claims rather than simply accept them. Important transparency practices include providing measurable information, explaining methodologies, disclosing limitations, using independent certification where appropriate and maintaining consistency between product-level claims and broader corporate sustainability performance.

Green brand credibility is closely connected to trust. A credible brand is one whose environmental claims are perceived as believable and consistent with its actions. When firms repeatedly communicate evidence-based sustainability achievements, credibility can develop over time. When claims are exaggerated or contradicted by observable practices, credibility can decline quickly.

Recent evidence from sustainable food marketing and fashion-related research also suggests that authenticity and trust are important pathways between sustainability signals and purchase intention. The implication for marketers is clear: sustainability should be treated as an organizational practice first and a promotional message second.

Proposed Conceptual Framework

Based on the literature reviewed in this chapter, the following conceptual relationship is proposed: Perceived Greenwashing → Consumer Skepticism/Confusion → Green Trust → Purchase Intention. Transparency and green brand credibility are proposed as positive factors that can reduce the harmful effects of perceived greenwashing. Green trust is expected to have a positive relationship with purchase intention, while perceived greenwashing is expected to have a negative relationship with both trust and purchase intention.

The framework can be expressed through the following propositions: (1) perceived greenwashing negatively influences consumer trust; (2) perceived greenwashing positively influences consumer skepticism and confusion; (3) consumer skepticism and confusion negatively influence green trust; (4) green trust positively influences purchase intention; (5) green brand credibility positively influences green trust; and (6) transparency weakens the negative effect of perceived greenwashing on green trust.

Managerial Implications

Use specific environmental claims rather than broad and unsupported expressions. Claims should explain the environmental benefit and the basis for the claim.

Align sustainability communication with actual operational performance. Marketing communication should reflect measurable environmental improvements rather than symbolic positioning.

Use credible third-party certifications or independent verification where appropriate. External evidence can reduce uncertainty and strengthen perceived credibility.

Disclose limitations as well as benefits. Balanced communication is more credible than presenting only favourable environmental information.

Train marketing and communication teams to identify potentially misleading environmental wording, imagery and comparisons.

Monitor consumer feedback and online word-of-mouth. Repeated questions or complaints about environmental claims can signal a credibility problem.

Build long-term green brand trust through consistent behaviour. Trust cannot be created by advertising alone; it depends on repeated alignment between promises and performance.

Research Implications and Future Scope

Future empirical research can test the proposed framework using survey data from consumers of specific product categories such as fashion, food, cosmetics, household products or electronic goods. Researchers may examine perceived greenwashing as an independent variable, green trust as a mediator, and purchase intention as the dependent variable. Consumer skepticism, environmental knowledge, transparency and green brand credibility can be tested as mediating or moderating variables.

Comparative research across age groups, educational backgrounds, income groups and levels of environmental concern may provide further insight into how consumers respond to greenwashing. Future studies can also compare traditional advertising with social media and influencer-based sustainability communication. Such research would be valuable because consumers increasingly encounter environmental claims through digital platforms.

Longitudinal research is another useful direction. Green trust develops over time, and the effect of a single misleading claim may differ from the effect of repeated exposure to questionable communication. Experimental studies could also manipulate the level of environmental evidence, transparency and greenwashing intensity to examine changes in trust and purchase intention.

Conclusion

Greenwashing represents a major challenge for sustainable marketing because it can create a gap between environmental communication and actual environmental performance. The literature reviewed in this chapter indicates that perceived greenwashing can increase consumer skepticism and confusion, weaken green trust and reduce purchase intention. The evidence also indicates that green trust, brand credibility and transparency are important factors in encouraging consumers to respond positively to genuine sustainability initiatives.

For firms, the strategic lesson is that sustainable marketing should be based on substantive environmental performance, accurate communication and verifiable evidence. Consumers are increasingly capable of comparing claims, seeking information and sharing experiences. Therefore, short-term promotional benefits from exaggerated environmental claims can be outweighed by long-term damage to trust and brand credibility.

The proposed framework highlights green trust as a central link between sustainable marketing communication and consumer purchase intention. Firms that communicate clearly, disclose meaningful evidence, avoid misleading claims and consistently demonstrate environmental responsibility are more likely to create credible sustainability positions. In this way, sustainable marketing can move beyond promotional symbolism and contribute to genuine consumer value, responsible business practices and stronger long-term relationships.

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CHAPTER – 27

FINTECH & INCLUSIVE BANKING: THE ROLE OF DECENTRALIZED FINANCE (DEFI) PROTOCOLS IN ENHANCING CREDIT ACCESSIBILITY FOR MSMEs IN EMERGING MARKETS

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Abstract

Micro, Small and Medium Enterprises (MSMEs) are fundamental to employment generation, entrepreneurship, innovation and economic development in emerging markets. Nevertheless, limited access to formal credit remains a persistent constraint because of inadequate collateral, information asymmetry, limited credit histories, informality and high transaction costs. Recent developments in Financial Technology (FinTech) have created alternative mechanisms for credit assessment and delivery, while Decentralized Finance (DeFi) introduces blockchain-based lending, smart contracts, tokenisation and programmable financial transactions. This chapter examines the potential role of DeFi protocols in improving credit accessibility for MSMEs in emerging markets. It adopts a conceptual and secondary-data approach based on recent academic studies, multilateral reports, government publications and documented fintech and DeFi initiatives. The discussion identifies five major mechanisms through which DeFi may support MSME finance: reduction of information asymmetry, automation of lending processes, tokenisation of real-world business assets, expansion of liquidity sources and creation of alternative credit histories. Evidence from India, Kenya and Latin America indicates that digital finance and blockchain-enabled models can improve access to working capital under appropriate conditions. However, conventional DeFi lending remains heavily dependent on over collateralisation, limiting its usefulness to asset-poor MSMEs. Other concerns include cybersecurity, smart-contract vulnerabilities, regulatory uncertainty, digital exclusion, foreign-exchange risk and the difficulty of verifying off-chain business information. The chapter proposes a Hybrid DeFi-Inclusive Banking Framework in which blockchain infrastructure is integrated with regulated banks, fintech platforms, digital identity, consent-based financial data, credit guarantees and real-world asset tokenisation. The chapter concludes that DeFi should be treated as a complementary financial infrastructure rather than a substitute for regulated banking, with its contribution to MSME inclusion depending on responsible regulation, reliable data and appropriate risk-sharing mechanisms.

Keywords: *FinTech, Decentralized Finance, DeFi, MSMEs, Inclusive Banking, Credit Accessibility, Blockchain, Smart Contracts, Emerging Markets*

Introduction

Micro, Small and Medium Enterprises (MSMEs) play a vital role in emerging economies through employment generation, entrepreneurship, regional development and supply-chain participation. Despite their economic importance, access to finance remains one of the major

constraints faced by MSMEs. The International Finance Corporation (IFC) reports that the MSME financing gap in emerging market and developing economies was estimated at approximately **US\$5.7 trillion**, based on 2019 data, and that women-owned MSMEs represent a substantial share of this gap (International Finance Corporation [IFC], 2025). Small enterprises frequently face greater difficulty in obtaining bank finance than larger enterprises because they may lack audited financial statements, established credit histories, formal collateral and long-standing relationships with lenders. These conditions create information asymmetry between borrowers and financial institutions and may result in higher borrowing costs, longer approval processes and credit rationing.

India illustrates the scale of this challenge. The Ministry of Micro, Small and Medium Enterprises reported in 2024 that the overall credit gap in India's MSME sector had been estimated at approximately ₹20–25 trillion. The Government has consequently promoted digital mechanisms such as the Udyam registration ecosystem, PSB Loans in 59 Minutes, Trade Receivables Discounting System (TReDS) and other digital public infrastructure to improve access to credit.

At the same time, FinTech has transformed conventional financial intermediation. Digital lenders can use transaction data, mobile payments, banking information and other alternative data sources for credit assessment. Khan and Ahmad (2025) found that fintech financing can reduce corporate credit constraints by mitigating information asymmetry, particularly for smaller and younger enterprises.

A further development is **Decentralized Finance (DeFi)**. DeFi uses blockchain networks, smart contracts and digital assets to provide financial services with reduced dependence on traditional intermediaries. DeFi lending protocols allow users to supply liquidity and borrowers to obtain funds according to rules encoded in smart contracts.

For MSMEs, the potential attraction is significant. Business transactions, invoices and receivables can potentially be represented digitally, while smart contracts can automate loan disbursement and repayment. However, most existing DeFi systems rely heavily on crypto-assets as collateral and therefore do not automatically solve the fundamental financing problem of enterprises that lack collateral.

The central issue is therefore whether DeFi can be adapted from primarily crypto-based finance into **inclusive, real-world and enterprise-oriented finance**.

MSMEs and the Credit Accessibility Problem

Credit accessibility has several dimensions: eligibility, affordability, availability, timeliness and suitability.

Information Asymmetry - Lenders need reliable information to assess whether an MSME can repay a loan. Small enterprises may not have extensive formal financial records, even when they generate stable revenues. Digital financial footprints can reduce this information gap. The Asian Development Bank (2024) highlights India's Account Aggregator framework as an important example of consent-based financial data sharing that can help lenders assess MSME creditworthiness.

Collateral Constraints - Many MSMEs do not possess sufficient fixed assets to satisfy conventional collateral requirements. This is particularly important for microenterprises and young businesses. The

challenge is also present in DeFi. OECD (2024) notes that DeFi lending commonly relies on over collateralisation. Although this reduces lender risk, it may exclude borrowers who have income-generating businesses but limited digital assets.

High Transaction Costs - Processing small business loans involves documentation, verification, underwriting, monitoring and recovery costs. Smart contracts may automate some of these processes and reduce manual intervention. Therefore, the potential value of DeFi is not simply cheaper money. It may lie in making **small-value transactions more programmable and scalable**.

Decentralized Finance and MSME Lending

DeFi refers broadly to blockchain-based financial applications that use smart contracts to execute financial transactions. Important components include lending protocols, stablecoins, tokenisation, decentralised exchanges and programmable settlement.

Smart Contracts - Smart contracts are computer programmes deployed on a blockchain that automatically execute predefined actions when specified conditions are satisfied.

In MSME lending, a smart contract could specify:

Loan approval → disbursement → repayment schedule → payment monitoring → collateral release/default action

This can potentially reduce processing delays and administrative costs.

Liquidity Pools - DeFi lending protocols often pool assets supplied by liquidity providers and make those assets available to borrowers. Such structures can broaden the source of funding beyond a single financial institution. However, liquidity does not automatically mean inclusive credit. Eligibility rules, collateral requirements and risk pricing remain important.

Tokenisation of Real-World Assets - Tokenisation involves representing a real-world financial or economic claim digitally.

Potential MSME assets include:

- Trade Receivables;
- Invoices;
- Purchase Orders;
- Inventory Claims;
- Equipment;
- Leases;
- Other Contractual Cash Flows.

Tokenisation could potentially make such assets easier to transfer, finance and monitor. Its effectiveness, however, depends on legal recognition of the underlying asset.

Potential Role of DeFi in Enhancing MSME Credit

Reducing Information Asymmetry - A major advantage of digital finance is the ability to use alternative information.

An MSME may have: **Bank Transactions + Digital Payments + Invoices + E-Commerce Sales + Tax Records + Supplier Transactions** even when it has no traditional credit history. When such information is verified and shared with consent, it can support alternative credit assessment.

Automating Lending - Smart contracts can reduce manual steps in loan administration.

For MSMEs this may lead to:

- Faster Processing;
- Automated Repayment;
- Transparent Transaction Records;
- Reduced Reconciliation Requirements;
- Continuous Monitoring.

However, technology can only automate a sound decision. It cannot eliminate credit risk.

Expanding Sources of Finance - DeFi can theoretically connect borrowers with a broader pool of capital. This has particular relevance for emerging economies where domestic financial institutions may not have sufficient risk appetite for smaller businesses. A documented pilot in Kenya used DeFi-enabled Buy-Now-Pay-Later financing for informal food vendors. Mercy Corps Ventures reported that **77% of participating vendors were using credit or comparable inventory financing for the first time**. These were pilot results rather than economy-wide evidence, but they demonstrate how digital finance can reach previously underserved microenterprises.

Alternative Credit Histories - One of the most promising applications is creation of a digital credit history based on actual business activity. Regular repayment of small loans could generate a portable record that supports future financing.

The process could be:

Small digital loan → repayment → verified transaction record → improved credit profile → larger formal loan

This can help enterprises move gradually into the formal financial system.

Cash-Flow-Based Lending - For MSMEs, future business cash flows may be more important than fixed assets. A future DeFi-enabled credit system could combine:

Banking data + payment history + invoices + business revenues + tax records + receivables
to estimate repayment capacity.

This would represent a shift from **collateral-based lending to cash-flow-based lending**.

Evidence From Emerging Markets

Table 1. Selected Emerging-Market Applications

Country/Region	Application	Potential MSME Benefit
India	Account Aggregator and digital lending ecosystem	Consent-based data for credit assessment
Kenya	DeFi-enabled BNPL pilot	Inventory financing for informal vendors
Colombia	Digital/alternative-data microenterprise finance	Working-capital access for underserved entrepreneurs
ASEAN	DeFi ecosystem development	New forms of digital financial intermediation

India's institutional environment is particularly relevant because open banking and digital public infrastructure already provide mechanisms for secure financial-data sharing.

The Asian Development Bank (2024) argues that India's Account Aggregator framework can help address MSME financing barriers by enabling authorised lenders to access financial information with borrower consent.

In Colombia, initiatives supported by development institutions have explored alternative-data finance for microentrepreneurs. These initiatives demonstrate that the financial-inclusion value of DeFi may be strongest when combined with local fintech systems and reliable borrower information.

In Kenya, digital-credit pilots demonstrate the potential of small-ticket and short-duration products for informal enterprises.

These examples suggest that the most realistic early applications of DeFi for MSMEs may not be large unsecured business loans. Instead, they are likely to involve:

working capital + invoice finance + inventory finance + receivables + trade finance.

DeFi and Inclusive Banking

Financial decentralisation does not automatically produce financial inclusion.

A platform can be decentralised and still be inaccessible to low-income users because of:

- Technical Complexity;
- Digital-Literacy Requirements;
- High Transaction Costs;
- Lack Of Identity Infrastructure;
- Volatility;
- Collateral Requirements; And

- Limited Consumer Protection.

OECD (2024) concludes that DeFi's inclusiveness is constrained by overcollateralisation and the technical complexity of non-custodial systems.

This leads to an important principle:

Decentralised finance should not be assumed to be inclusive finance.

Inclusive finance requires accessibility, affordability, consumer protection and suitability. Therefore, banks, fintech companies and regulated financial institutions may remain important even in a DeFi-enabled system.

Major Challenges

Over collateralisation - Most established DeFi lending protocols require substantial collateral. Aave, for example, uses collateralised borrowing and liquidation mechanisms. This limits the applicability of conventional DeFi to collateral-poor MSMEs.

Oracle and Off-Chain Data Risk - Business information often exists outside the blockchain. For example, an invoice token may exist on-chain, but the underlying invoice must be verified off-chain. This creates dependence on data providers, auditors and trusted institutions.

Smart-Contract Vulnerabilities - Software errors, protocol exploits and governance attacks can create financial losses. Unlike traditional processes, automated smart contracts can execute transactions immediately once their conditions are met.

Regulatory Uncertainty - DeFi operates across traditional regulatory boundaries involving payments, lending, securities, digital assets and cross-border transactions. The Financial Action Task Force's 2026 work indicates that many jurisdictions continue to face challenges in applying anti-money-laundering and counter-terrorist-financing frameworks to qualifying DeFi arrangements.

Foreign-Exchange Risk - A business borrowing in a dollar-linked digital asset but earning domestic-currency revenue may face additional exchange-rate risk.

This is especially important in emerging markets with volatile currencies.

Digital Exclusion - DeFi applications may require technical knowledge not possessed by many small entrepreneurs. For MSME inclusion, the user interface must therefore be simple even when the underlying technology is complex.

Hybrid DeFi-Inclusive Banking Framework

The limitations of fully decentralised lending suggest the importance of a hybrid model.

Figure 1. Proposed Framework





The strength of this model is that each participant performs a specific function.

FinTech provides analytics and customer interfaces.

Blockchain provides programmability and shared records.

Banks/NBFCs provide regulated lending and customer protection.

Government and development institutions can provide guarantees and first-loss support.

This structure is more compatible with inclusive finance than a purely permissionless lending system.

Risk-Sharing and Blended Finance

Credit-risk management is essential for expanding MSME finance.

Governments and development institutions can support digital lending through:

- Credit Guarantees;
- First-Loss Facilities;
- Concessional Finance;
- Regulatory Sandboxes;
- Technical Assistance; And
- Digital-Capacity Building.

The IFC's 2025 Catalytic First Loss Guarantee Facility illustrates how first-loss mechanisms can encourage private financial institutions to finance underserved businesses and other development priorities.

A similar approach could support MSME-focused blockchain lending.

The basic structure could be:

Private Capital + Verified MSME Data + DeFi Infrastructure + Credit Guarantee

Such a model can reduce the need for excessive collateral while retaining risk controls.

Relationship With Financial Inclusion and Development

DeFi-enabled MSME finance may contribute to several Sustainable Development Goals.

Table 2. DeFi, MSME Finance and SDGs

SDG	Potential contribution
SDG 1 – No Poverty	Enterprise finance can support income generation and resilience.
SDG 5 – Gender Equality	Alternative-data finance may reduce collateral-related barriers for women entrepreneurs.
SDG 8 – Decent Work and Economic Growth	Improved working capital can support enterprise growth and employment.
SDG 9 – Industry, Innovation and Infrastructure	Blockchain and FinTech encourage digital financial innovation.
SDG 10 – Reduced Inequalities	New financing channels may reach underserved enterprises.
SDG 16 – Strong Institutions	Transparent digital records may improve accountability.
SDG 17 – Partnerships	Effective implementation requires government, banking, fintech and development partnerships.

Thus, the contribution of DeFi extends beyond financial technology. Properly designed systems could connect financial inclusion with entrepreneurship, innovation and sustainable development.

Implications for India and Other Emerging Markets

India offers an especially relevant environment for hybrid digital finance because of its large banking system and mature digital public infrastructure.

A possible future architecture could connect:



Such an ecosystem could potentially reduce documentation, improve information availability and strengthen access to working-capital finance.

However, DeFi in India remains subject to a cautious regulatory environment. Therefore, future MSME applications are more likely to develop around **regulated and permissioned financial infrastructure** rather than unrestricted retail DeFi.

This model could also be adapted by other emerging markets according to their own digital identity, payment and financial-regulation systems.

Future Research Directions

Future researchers can examine DeFi and MSME finance through empirical studies focusing on:

- Impact Of Alternative Data On MSME Loan Approval;
- Effect Of Smart Contracts On Loan-Processing Costs;
- Willingness Of Msmes To Use Blockchain-Based Finance;
- Women-Owned MSME Participation;
- Tokenised Invoice Financing;
- Credit-Guarantee Mechanisms;
- Cybersecurity Risks;
- Stablecoin And Foreign-Exchange Exposure; And
- Differences Between Conventional Fintech Lending And Defi Lending.

A longitudinal study could measure whether enterprises receiving digital or DeFi-enabled finance experience improvements in: **Sales + Employment + Productivity + Business Survival + Credit History**.

Such evidence would be particularly valuable because much of the existing literature remains conceptual or based on small pilots.

Conclusion

MSMEs in emerging markets face a persistent financing challenge because of information asymmetry, collateral shortages, limited credit histories and high lending costs. FinTech has already begun to address these constraints through digital lending and alternative-data credit assessment. DeFi provides another technological layer through smart contracts, tokenisation, liquidity pools and programmable finance. The potential benefits of DeFi for MSMEs include faster transactions, greater transparency, broader sources of funding, automated loan administration and the creation of digital credit histories. Tokenisation may also enable business assets such as invoices and receivables to become more easily financeable.

Nevertheless, current DeFi systems are not inherently inclusive. Heavy reliance on over collateralisation, technological complexity, cybersecurity risks, regulatory uncertainty and digital

exclusion can restrict access. The distinction between **technological decentralisation** and **financial inclusion** is therefore essential. The chapter proposes a Hybrid DeFi–Inclusive Banking Framework that combines DeFi infrastructure with regulated financial institutions, alternative-data credit assessment, digital identity, tokenised real-world assets and risk-sharing mechanisms.

The future opportunity lies not in replacing banks with blockchain but in combining the strengths of each. Banks provide trust, regulation and risk management; FinTech provides data-driven innovation; blockchain provides programmable infrastructure; governments provide enabling institutions and consumer safeguards. Accordingly, the contribution of DeFi to MSME finance should ultimately be measured not by the size of the cryptocurrency market or the number of blockchain transactions, but by whether underserved enterprises can obtain **appropriate, affordable, timely and productive credit**.

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ABOUT THE EDITORS



Dr. V. Dheenadhayalan, Founder of the Social Science Researchers Foundation - SSRF (Registered under Trust Act & NGO DARPAN, MSME), & Chief Editor of IJSSRF, is a distinguished academic leader with more than 27 years of experience in teaching, research, and institutional development. He currently serves as Associate Professor and Head of the PG Department of Commerce at Sri Subramaniaswamy Government Arts College, Tiruttani, on deputation from Annamalai University. His academic foundation includes degrees from the University of Madras (B.Com., M.Com., M.Phil., Ph.D.), an MFM from Pondicherry University, and an MBA (Finance) from Annamalai University. He also holds diplomas in computer applications and statistical analysis, along with SLET and SET certifications. Dr. Dheenadhayalan has authored over 137 international journal articles, 24 national papers, and 67 book chapters, and has guided 17 M.Phil. and Ph.D. scholars. His books and research contributions span finance, banking, income tax, and statistics. Notably, his article in Yojana was translated into nine Indian languages and archived in Parliamentary records. He has participated in more than 241 national and international conferences and workshops, holds five patents, and served as Principal Investigator for a UGC Major Research Project. His editorial leadership includes board memberships in 16 reputed journals and the strategic curation of multi-volume academic publications. A passionate educator and digital content creator, he delivers e-learning through his YouTube channel and has authored course materials for various university programs. His accolades include multiple national and international awards recognizing his excellence in teaching and research. Dr. Dheenadhayalan is a Life Member of several professional bodies and serves on the International Advisory Board of Scope Database. His mission remains clear : to elevate commerce education and empower future scholars through rigorous, accessible, and impactful academic work.



Dr. V. Sampathkumari, Managing Trustee of the Social Science Researchers Foundation - SSRF (Registered under Trust Act & NGO DARPAN, MSME), & Associate Editor of IJSSRF, is an accomplished Associate Professor in the P.G. & Research Department of Commerce at Sri Kanyaka Parameswari Arts and Science College for Women, Chennai. With an impressive academic career spanning over 25 years in undergraduate teaching, 18 years in postgraduate instruction, and 5 years of guiding M.Phil. scholars, she has established herself as a specialist in Corporate Accounting, Management Accounting, Human Resources, and Marketing. She holds a Ph.D. in Commerce, M.Phil., M.Com., and SET all earned with distinction. Her professional achievements include guiding three Ph.D. candidates, with more under her supervision, and authoring over 50 research publications in reputed UGC-CARE and Scopus journals on topics such as artificial intelligence in marketing, work-life balance, and digital consumer behavior. Recognized for her excellence, Her contributions to teaching and academic excellence have earned her several prestigious recognitions, including the Young Achiever Award (2012), 100% Result Award for consecutive 100% results from 2013-14 to 2025-26, Teaching Excellence Award (2022), and Best Senior Faculty Award (2025). In 2026, she received the Golden Guru Award, Best Associate Professor Award, Best Young Achiever Award, Academic Excellence Award, Lifetime Achievement in Education Award, and Iconic Women Award, recognizing her sustained contributions to education, research, and academic leadership. Since 2008, she has actively contributed as an external examiner, guest lecturer, research guide, and academic resource person.



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