The Indian Journal of Commerce

A Quarterly Refereed Journal & UGC - CARE Listed Journal

Managing Editor

Sr. Prof. D. Chennappa

Department of Commerce, Osmania University, Hyderabad, Telangana

THE INDIAN JOURNAL OF COMMERCE

Quarterly Publication of the Indian Commerce Association

Notes for Contributors

Papers based on application oriented research or field studies in the areas of industry, commerce, business studies and management are invited. The length of a paper including tables, diagrams, illustrations etc., should not exceed 15 double space pages. Short communications (not more than 5 double spaced pages) relating to review articles, reports of conferences, summary/views on various governments reports, debatable issues etc., are also published, Book reviews and summary of Ph.D. dissertations not exceeding two double spaced pages are welcome. Manuscripts sent for publication in this journal should not have been published or sent for published or sent for publications elsewhere. All correspondence will be held with the senior (first) author only.

Two copies of the manuscript typed in double space on A4 size bond paper should be submitted Electronically.

All contributions submitted will be subjected to peer review. The decision of the Editorial Committee will be the final.

First page should consist of title of the paper, name(s), of author (s) with all details and abstract not exceeding 150 words. Second page should start with the title of the paper again, followed by the text.

In captions for tables, figures, and columns heading in tables, the first letter of the first world should be capitalised and all other words should be in lower case (except proper nouns). For example Table 5. Price ratios between edible groundnut kernel and other edible nut kernels. **Footnotes** in the text should be numbered consecutively in plain Arabic superscripts. All the footnotes, if any should be typed under the heading 'Footnotes : at the end of the paper immediately after conclusion'.

Follow the Author-date in-text reference : eg. Honda (1997) observed that... A study (Grover et. AI. 1998) found that.. When it is necessary to refer to a specific page (s), cite in the text as : Hooda (1997 P.105) Observed that... A study Hooda 1997a, Hooda 1997b, Hooda 1997c, so on.

Only cited works should be included in the **'References'** which should appear alphabetically at the end of the paper. Follow the reference citation strictly in accordance to the APA Referencing style.

For Example :

Book : Narasimham, N.V. (1994) *A model for the commodity price system analysis,* New Delhi : Himalaya Publications.

Journal Article : Alagh, Y.K. (1997). Agriculture trade and policies. *The Indian Journal of Commerce* L (192) : 1-11.

Government Publication : Government of India Ministry of Communications, Department of Telecommunications (1995). Annual report 1994-95. New Delhi : Government of India, Ministry of Communications, Department of Telecommunications.

Chapter in a Book : Gilberto Mendoza, (1995). A premier on marketing channels and margins. Pages 257-276 in Prices, products and People (Gregory J. Scott, ed.) London, Lynne Rienner Publishers.

A Cobb-Douglas Analysis of Mining & Quarrying Sector in India

JUSTIN JOHN STEPHEN, RAKESH KUMAR S. MANJHI AND HIMANSHU PARMAR

Abstract : *This study investigates the production relationship within the Indian mining and quarrying sector using the Cobb-Douglas production function. The study aims to achieve three key objectives, including describing the production relationship, analysing returns to scale, and determining factor shares. The Indian mineral industry plays a vital role in the economy, with a significant increase in the mineral production index and total value in 2021-2022. The sector consists of metallic and non-metallic minerals, driving industrial growth. The mining and quarrying sector contributed about 2.40% of Gross Value Added, with 93% of mines concentrated in eleven key states in India. The paper aims to estimate the function's parameters and analyse returns to scale and factor shares within the industry. By utilizing industry-level data from 1981 to 2023, the study explores the impact of labour, capital, and energy inputs on value added. The study utilizes linear regression and robust models to analyse the data, addressing issues such as normality, autocorrelation, and heteroskedasticity. The findings reveal that, a 1-unit consumption in energy leads to a -.402 percent point decrease in value added, highlighting the importance of reducing energy consumption for efficiency in the mining and quarrying industry. This also indicates energy used inefficiently, possibly more energy consumed without proportional increase in the value added or there is more wastage of energy or industries using outdated technology. The aggregate value of the coefficient is positive, suggesting increasing returns to scale. Most explanatory variables are significant at the 99% level, indicating their substantial contribution to defining the production model. The goodness of fit measure R^2 indicates that approximately 96% of the*

Dr.Justin John Stephen, Research Manager, Madras Institute of Development Study (MIDS), Chennai.

Dr.Rakesh Kumar S. Manjhi, Assistant Professor, Department of Accounting and Financial Management, The Maharaja Sayajirao University of Baroda.

Mr.Himanshu Parmar, Assistant Professor, Department of Business Economics, The Maharaja Sayajirao University of Baroda.

variations in the data can be explained using the specified model. Moreover, it was observed that a higher capital-to-labour ratio leads to a decrease in the rate of substituting capital for labour, indicating diminishing marginal returns to capital or increasing costs of substitution. This research underscores the importance of understanding production dynamics and resource allocation in the mining and quarrying sector to inform policy and investment decisions for sustainable economic growth in India.

Introduction to India's Mineral Industry

The mining and quarrying sector plays a crucial role in the Indian economy, providing raw materials for various industries. Lack of access to natural resources would jeopardize the progress of any community. Mineral development has the power to build new towns and enrich existing ones. Significant production capacity in other industries, such the construction and mining sectors, will be made possible by the development of mines and the best possible use of mineral deposits. According to a World Bank analysis from 2002 on mining operations worldwide, for every US dollar spent on a mine by a business, 2.80 US dollars are generated elsewhere in the economy.

India's mineral industry plays a vital role in the country's economy, with a rich history dating back to ancient civilizations like the Harappan. The sector encompasses a diverse range of metallic and non-metallic minerals, driving industrial growth and development. The trend in mineral production can be understood as India boasts a significant mineral production sector, contributing to various industries. The mineral production index for 2021-22 displayed positive growth, reaching 113.3, showcasing a 12.17% increase from the previous year. The total value of mineral production surged to Rs. 211857 crores, reflecting a substantial 31.96% rise over the previous year. Metallic minerals constituted a substantial portion, representing 57.65% of the total value, while non-metallic minerals accounted for the remaining 42.35%.Wholesale Price Index for minerals exhibited positive growth in 2021-22.The mining and quarrying sector contributed about 2.40% of Gross Value Added in the same year. On the other hand, the Indian mining industry is characterized by numerous small operational mines spread across different states. Notably, in 2021-22, 93% of mines were concentrated in eleven key states, showcasing regional disparities. The

distribution of mining leases varies significantly by area, providing insights into the geographic spread of mining activities across India. Several states stood out in terms of mineral production, with Odisha leading the pack. While some states reported increases in mineral production, others witnessed declines, highlighting the dynamic nature of the industry. India's mineral reserves and resources are crucial for sustaining its mining industry and overall economic growth, guiding future planning and development initiatives.

India's mineral business has a long history that dates back to the country's ancient civilizations and contributes significantly to the economy of the nation. The mineral production index increased by 12.17% in 2021-2022 to reach 113.3, while the total value increased by 31.96% to Rs. 211857 crores. Of Gross Value Added, the mining and quarrying industry generated around 2.40%. Small active mines dispersed over many states, with Odisha leading the way, are the industry's defining feature. India's natural resources and reserves are essential to the country's industry's survival and economic expansion.

Literature Review

Nurunnajib, A.F., Wulan, E.R., Awalluddin, A.S., Supian, S., & Subiyanto, S. (2018) discusse one of the production functions that show the relationship between the level of output and the level of input combinations which is called Cobb-Douglas production function. The estimation method used is the least square estimation with the settlement using Newton Raphson iteration. The Cobb-Douglas production function is applied to five selected manufacturing industries in West Sumatra. From the research results, the return to scale (RTS) of the rubber and plastic goods industry is 0.8424 and the return to scale of the food and beverage industry is 0.8496 in which the two industries produce RTS <1. Whereas return to scale of the publishing and printing industry is 1.0460, the return to scale of the textile industry is 1.0018, and the return to scale of the non-metallic mining industry is 1.3384. Each of these three industries produces RTS> 1.

A series of studies have utilized the Cobb-Douglas production function to analyze industrial performance in India. Ghoshal (2017) applied this model to the agricultural sector, finding that road infrastructure and the share of agricultural NSDP to state NSDP were significant factors in production inefficiencies.

R. Edokpia, M. Oladeinde (2017) applies the Cobb-Douglas production function to evaluate a manufacturing firm's productivity in Nigeria, finding it mostly technically efficient but with periods of operating below the production frontier, indicating a potential future decrease in productivity.

Khatun, Sadia Afroze (2017) explore the relationship between real GDP and labour/capital in selected Asian countries, emphasizing the importance of investing in the labour force and capital for sustained growth, with significant contributions of both factors to productivity and increasing returns to scale.

Peter, Pesala (2017) discusses the influence of workers, fixed capital, and factories on output growth in different industries during pre and post-globalization periods, highlighting specific industries where each factor had a significant impact on output growth, and suggesting government incentives related to fixed capital for industries lacking sufficient levels of fixed capital.

Bhatt (2014) focused on small and medium enterprises, determining that labour was a more influential factor in output than fixed capital.

Manonmani (2013) extended this analysis to the manufacturing sector, identifying increasing returns to scale in certain sectors and a higher percentage share of wages compared to capital. These studies collectively highlight the utility of the Cobb-Douglas production function in understanding the complexities of industrial performance in India.

M Manonmani (2013) discusses the use of a Cobb Douglas production function to measure the contributions of labour, capital, and technology in the Indian economy, emphasizing the importance of technological change in economic growth and the role of the production function as a tool for macroeconomic analysis.

Peter, P., & Vadlamudi, R. (2012) analyse the data by calculating Compound Annual Growth Rate (CAGR) for different years and different variables like workers, fixed capital and output collected for 62 manufacturing industries from the Annual Survey of Industries (ASI) in Andhra Pradesh. In general, Cobb-Douglas production function has been used in two variables framework and value added has been considered as output and labour and capital as inputs. The Cobb-Douglas production function analysis through panel data analysis was done. The study followed the 1998-99, National Industrial Classification (NIC). The main findings of the study are, firstly, not all industries influenced the output growth. Secondly, most of the industries (20 industries) did not provide employment opportunities. Thirdly, a few (18) manufacturing industries' fixed capital CAGR has negatively declined. Fourthly, a few (12) manufacturing industries' output CAGR has negatively declined. And, finally only manufacture of machinery and equipment industry's workers per factory employed average declined, and rest of the industries' average number of workers per factory employed increased.

Agarwal, A.L. (1986). discusses the decline in industrial production growth rate in Indian industries after the mid-sixties, emphasizing the importance of studying the selected periods and industries at different classification levels.

Somayajulu, V. V. N. and Jacob P. George (1983) discuss theoretical and empirical problems related to estimating production functions in Indian industries, analysing factors such as output growth, returns to scale, productivity indices, technical progress, and elasticity of factor substitution using data from 1946 to 1975.

Bhasin, Seth (1980) estimates production functions for Indian manufacturing industries, finding that the C.E.S. production function is the most suitable specification due to lower elasticity of substitution, with inter-industry differences in returns to scale and income distribution.

G. Narasimham, M. Z. Fabrycy (1974) aim to measure the relative efficiencies of manufacturing industries in India using a production analysis based on the Cobb-Douglas production function, considering variables like investment, education, and experience. It finds significant differences in the efficiency of input use among different industries.

Gupta (1972) analyses the production function of the Indian cement industry from 1946 to 1965, suggests guidelines for industry expansion based on factors like labour, capital, and raw material inputs, and emphasizes the importance of region-specific strategies for improving efficiency.

The Cobb Douglas production function is utilized to analyse industrial performance in various countries and sectors. Studies highlight the relationship between real GDP, labour, and capital, demonstrating their significant contributions to productivity and returns to scale. Findings from panel data analysis show varied impacts on output growth and employment opportunities across different manufacturing industries. The function's application extends to evaluating productivity in agriculture, manufacturing, and small enterprises in countries like India, Nigeria, and Asian nations. Different industries exhibit varying levels of returns to scale, emphasizing the importance of understanding input combinations for optimal output levels.

Objectives of the Study

1. To describe the Production Relationship: is to estimate the model to understand how value added in mining and quarrying responds to changes in key inputs like labour and capital, energy.

2. To analyse Returns to Scale: The estimated coefficients will be used to determine the returns to scale in the industry. This will reveal if increasing inputs lead to proportionally greater, equal, or less than proportional increases in value added.

3. To determine Factor Shares: By analysing the estimated coefficients, we can identify the relative contribution of labour and capital to the value added generated in the sector.

Data Source and Methodology

The production function can be explained as a technical association between the physical quantity of output and physical quantities of inputs, such as labour, capital, energy, Material and service of the firm, industry sector or country.

The most popular form of the production function is the Cobb-Douglas function which can be expressed as

$$Y\ (L,\ K) = AL^{\alpha}\ K^{\beta}$$

Where Y is the output or value added, A is a scalar that can be thought of as the general level of technology used in production, L is a measure of the flow of labour input such as number of workers or total man days, K is a measure of the flow of capital input, which is a measure of value of all machinery, equipment and buildings. α and β are coefficients or parameters that measure the contributions of L and K, respectively, to the production of the output. The equation of the cobb- Douglas production function shows how a specific plant, firm, industry or economy's output level Y is determined from its factor inputs, such as labour (L) and capital (K).

Often estimated parameters help in knowing the stage or scale of production. If the $\alpha + \beta = 1$. It is called constant returns to scale means a 1% increase in inputs leads to the same percentage point increase in output. If $\alpha + \beta < 1$, it is considered return to scale a is decreasing means a 1% increase in inputs lead to less than 1% increase in output. $\alpha + \beta > 1$, returns to scale are increasing indicating that a 1 percent increase in input leads to more than 1percent increase in output.

If the Cobb-Douglas production function is a nonlinear function between the factor inputs L and K and the output Y, to know the parameters, we need to estimate the function using the data. More specifically, to know the value of the parameters α and β, and A, we require to transform the nonlinear cobb-Douglas

to a linear function so the OLS estimator can be employed. This can be done easily by converting all variables into logarithmic values, it is made a log-log model. This property of the model is another reason for the popularity of the Cobb-Douglas function in empirical research. To convert it into log-log model, we take the natural log of both sides of

$Y (L, K) = AL^{\alpha} K^{\beta}$ which will give :

$$In\ Y = In(A) + \alpha\ In(L) + \beta\ In(K)$$

Once the equation is made a linear log-log model, the OLS estimator can be applied for estimating parameters. The mining & quarrying production data of India for the year 1981 to 2023, from the KLEMS database. We use gross value added as a measure of output in rupees lakh, while labour data is proxied by the number of persons engaged in the industry. For capital input, we use the gross value of plant and machinery in Rupees lakh. All these variables are converted into logarithms.

Results and Interpretation

Table-1 : Descriptive Statistics on Mining & Quarrying

Variable	Mean	Std. Dev.	Min	Max
In Value Added	1.657	.044	1.559	1.713
In Energy	1.422	.045	1.31	1.498
In Capital	1.48	.104	1.245	1.622
In Service	1.452	.097	1.248	1.597
In Labour	1.21	.025	1.152	1.23

Table-2 : Matrix of Correlations on Mining & Quarrying

Variables	In VA	In K	In S	In L	In E
In Value Added	1.000				
In Capital	0.955	1.000			
In Service	0.928	0.992	1.000		
In Labour	0.238	0.078	0.053	1.000	
In Energy	0.815	0.922	0.951	0.053	1.000

The table-2 shows evidence of a strong positive correlation (0.955) between value added and capital suggesting increased capital investment (machinery, equipment) leading to a significant rise in value added. This implies that investing

in capital is likely to enhance productivity, resulting in higher economic output for the sector. Similarly, value-added shows a high Positive correlation (0.928) with services indicating a positive relationship. Hence improving services (maintenance, logistics, support) contributes to overall value added in mining and quarrying. Moreover, efficient and reliable services are likely to ensure smoother operations, thereby increasing output. A weak correlation of (0.238) between Value added and Labour suggests that labour's impact on value added is less prominent. Labour efficiency and skill development might play a role, but it's not the primary driver of value-added. This could indicate increasing automation or a shift towards capital-intensive processes in the industry whereas a strong positive correlation of (0.815) between value-added and energy implies that increased energy use is often associated with higher output levels. However, it's crucial to consider efficient energy use and sustainable practices to optimize economic outcomes.

Table-3 : Linear Regression on Mining & Quarrying

In Value Added	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
In Energy	-.402	.121	-3.31	.002	-.648	-.156	***
In Capital	.57	.131	4.34	0	.304	.836	***
In Service	-.016	.177	-0.09	.928	-.374	.342	
In Labour	.278	.057	4.89	0	.163	.393	***
Constant	1.073	.107	9.99	0	.856	1.291	***
Mean dependent var		1.657	SD dependent var			0.044	
R-squared		0.964	Number of obs			43	
F-test		257.119	Prob > F			0.000	
Akaike crit. (AIC)		-280.965	Bayesian crit. (BIC)			-272.159	

*** p<.01, ** p<.05, * p<.1*

Table-4 : Linear Regression (Robust) on Mining & Quarrying

InValue Added	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
InEnergy	-.402	.098	-4.12	0	-.6	-.205	***
InCapital	.57	.128	4.44	0	.31	.83	***
InService	-.016	.159	-0.10	.921	-.338	.306	
InLabour	.278	.063	4.43	0	.151	.405	***
Constant	1.073	.09	11.92	0	.891	1.256	***
Mean dependent var		1.657	SD dependent var			0.044	
R-squared		0.964	Number of obs			43	
F-test		362.751	Prob > F			0.000	
Akaike crit. (AIC)		-280.965	Bayesian crit. (BIC)			-272.159	

*** p<.01, ** p<.05, * p<.1*

Table-5 : Skewness/Kurtosis Tests for Normality

Variable		Pr (Skewness)	Pr (Kurtosis)	adj chi2(2)	Prob>chi2
Residuals		0.4205	0.0226	5.57	0.0616

The probability values of skewness and kurtosis 0.4205 and 0.022 indicate normality of the data, as the significance level is greater than the conventional level of 0.05 percent.

Table-6 : Breusch-Godfrey LM Test for Autocorrelation

lags(p)	chi2	df	Prob > chi2
1	14.499	1	0.0001

H0: no serial correlation

Table-7 : Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity

Ho: Constant variance

Variables: Fitted values of In VA

chi2(1)	=	2.14	Prob > chi2 =	0.01436

The Breusch-Pagan test for heteroskedasticity shows that the probability value of the chi-square statistic is less than 0.05. Therefore, the null hypothesis of constant variance can be rejected at a 5% level of significance. It implies the presence of heteroscedasticity in the residuals. So, to correct heteroscedasticity the following Robust model has been constructed in table number four.

The above table number four presents the results of OLS (Robust) after correcting for heteroskedasticity in the model. Thus, the problem of heteroscedasticity is not present anymore. This gives robust standard errors, which are different from standard errors in table-3. Here robust standard error for the variable InE is 0.098, which is different from 0.121 given in table-3.

The results provide an estimate of the coefficients or parameters of labour, capital, energy, material & service. It can be noticed that estimates, while statistically significant, also make sense. The 0.278 is the estimate for labour, -.402 is the estimate for Energy, -.016 is the estimate for services and 0.57 is for capital. The -.402 estimate for β_1 indicates that a 1 percent growth in the energy causes a -.402 percent point decrease in the value added, this suggests that finding

ways to reduce energy consumption could be an important strategy for improving efficiency in the mining and quarrying industry. However, the aggregate value is more than one, $\alpha + \beta > -0.402 + 0.57 - 0.016 + 0.27 = .43$ which implies sum coefficient (0.43) is positive, which satisfactorily indicates increasing returns to scale. If all other inputs are held constant, a 1% increase in each of these four factors (energy, capital, service, and labour) would likely lead to a 0.43% increase in value added.

For instance, a 10 percent increase in all inputs would lead more than a 10 percent increase in the physical output. Except for Service all the explanatory variables are significant at 99% level. This shows that most of the variables are contributing to define the production model significant. Moreover, the measure of the goodness of fit R^2 with a value of 0.96 reveals that approximately 96% of variations in the data can be explained using this specified model.

The Marginal rate of substitution will measure the responses of the production scale with a change in the quantity of inputs (Cobb and Douglas 1928). For example, the marginal rate of substitution related to energy with one of the other input factors such as capital can be obtained from the following relation:

$$MRTS_{E/K} = \frac{-0.40}{0.57} \times \frac{K}{E}$$

The above relationship indicates more capital relative to labour, the MRTS decreases, and vice versa, implying that as a firm increases the ratio of capital to labour (more capital-intensive production), the rate at which it can substitute capital for labour diminishes. This might suggest diminishing marginal returns to capital or increasing costs of substitution as one input becomes relatively more abundant compared to the other.

Conclusion

Based on the analysis, it is evident that the Indian mining and quarrying sector contributes significantly to the economy, amounting to about 2.40% of Gross Value Added and being concentrated in eleven key states in India. The study utilized the Cobb Douglas production function for analysis, using data spanning from 1981 to 2023 for estimation and analysis. In the process, it was found that a higher capital-to-labour ratio leads to diminishing marginal returns to capital or increased costs of substitution, and the study employed linear regression and robust models to address issues related to data interpretation. The literature

review revealed that the Cobb Douglas function has been widely utilized in various sectors like agriculture and manufacturing, with a focus on important factors such as labour, capital, and technology for efficiency. From an economic standpoint, the study underscored the significance of understanding production dynamics for informed policy decisions, with the strong model explanatory power (R^2 = 0.96) further emphasizing its applicability in guiding economic policies and investments. The findings reveal that, a 1-unit consumption in energy leads to a -.402 percent point decrease in value added, highlighting the importance of reducing energy consumption for efficiency in the mining and quarrying industry. Also indicates energy used inefficiently, possibly more energy consumed without proportional increase in the value added or there is more wastage of energy or industries using outdated technology. Overall, the analysis shed light on the importance of input ratios and production dynamics, highlighting the crucial role of understanding the production relationship in shaping economic policies and investments.

Policy Implications

The study on the production relationship within the Indian mining and quarrying sector utilizing the Cobb Douglas production function unveils various implications. Firstly, the identified increasing returns to scale point towards targeted policy interventions that could enhance production efficiency and increase output within the mining sector. Secondly, understanding the significant factors affecting production, such as capital, energy, material, and services, can streamline resource allocation strategies to optimize productivity. Thirdly, as the mining and quarrying sector significantly contributes to India's Gross Value Added, the findings can guide strategies for economic growth and development. Furthermore, insights from the study can pinpoint areas for improvement to boost the competitiveness of the Indian mining and quarrying industry at both national and global levels. Lastly, the research paves the way for future investigations in industrial performance using the Cobb Douglas production function, laying a foundation for deeper exploration of production relationships in various sectors and regions. In essence, these findings offer practical implications for policymakers, industry stakeholders, researchers, and economists seeking to refine production processes, allocate resources effectively, and stimulate economic growth in the Indian mining and quarrying sector.

References

Agarwal, A.L. (1986). On Estimation of Cobb-Douglas Production Function in Selected Indian Industries. *Artha Vijnana : Journal of The Gokhale Institute of Politics and Economics, 28*, 152-170.

Banerji, A. (1974). Production functions for selected Indian industries. *Journal of Development Studies, 10*, 213-229.

Bhasin, V. K., & Seth, V. K. (1980). Estimation of production functions for Indian manufacturing industries. *Indian Journal of Industrial Relations*, 395-409.

Bhatt, N.J. (2014). Productivity in Small and Medium Enterprises of India : A Cobb-Douglas Production Function Approach. *Journal of Management and Research, 13*, 29.

Edokpia, R. O., & Oladeinde, M. H. (2017, July). An Application of the Cobb-Douglass Production Function in the Quantitative Assessment of the Productivity of a Manufacturing Firm in Nigeria. *July 2017, 1*(2), 222–229. https://doi.org/10.36263/nijest.2017.02.0025

Estimation of Production Functions for Indian Manufacturing Industries on JSTOR. (n.d.). www.jstor.org. https://www.jstor.org/stable/27768569

Ghoshal, P., & Goswami, B. (2017). Cobb-Douglas Production Function For Measuring Efficiency in Indian Agriculture: A Region-wise Analysis. *Economic Affairs*, *62*(4), 573. https://doi.org/10.5958/0976-4666.2017.00069.9

Gupta, G. S. (1972). Production function and factor productivity in the indian cement industry. *Indian Journal of Industrial Relations*, 359-385.

Khatun, Tahmina and Sadia Afroze. "Relationship between Real GDP and Labour & Capital by Applying the Cobb-Douglas Production Function: A Comparative Analysis among Selected Asian Countries." (2017).

Manonmani, M. (2013, December 1). Measuring Contributions of Labour, Capital and Technology in Indian Manufacturing Sector - A Cobb Douglas Production Function Approach. *Review of Professional Management- a Journal of New Delhi Institute of Management*, *11*(2), 33. https://doi.org/10.20968/rpm/2013/v11/i2/88696

Narasimham, G. V. L., & Fabrycy, M. Z. (1974, January). Relative efficiencies of organized industries in India, 1949–58. *The Journal of Development Studies*, *10*(2), 230–241. https://doi.org/10.1080/00220387408421486

Nurunnajib, A.F., Wulan, E.R., Awalluddin, A.S., Supian, S., & Subiyanto, S. (2018). Application of Cobb-Douglas Production Function to Manufacturing Industries in West Sumatra Indonesia.

Peter, Pesala. "Indian Manufacturing Industry in the Era of Globalization : A Cobb-Douglas Production Function Analysis." *Indian Journal of Economics and Development* 5 (2017): 1-11.

Peter, P., & Vadlamudi, R. (2012). Andhra Pradesh Manufacturing Industry in the Era of Globalization: A Cobb-Douglas Production Function Analysis. The IUP Journal of Managerial Economics, 7-17.

Somayajulu, V. V. N. and Jacob P. George. "Production Function Studies of Indian Industries-A Survey." (1983).

Multidimensional Impact of Artificial Intelligence in Business : It's Challenges and Opportunities

SHIV KUMAR RABIDAS

Abstract : *A number of intelligence products and services have been emerging during recent years, which have commercial utility and their socio-economic impact. The question arises whether AI really have the potential to transform the world or it just only a hype. In the present business scenario Artificial Intelligence is transforming the business world at a rapid pace. AI have been used in various sectors like healthcare, transport, agriculture, education, e-commerce, entertainment, finance gaming and many more. AI has resulted in increased operating efficiency, maximization in production and profitability, cost saving, time saving and quick decision-making. This paper examines the Artificial Intelligence (AI's) impact in the business taking full-time employees from various natures in the state of Bihar. Primary data has been collected through online survey and personal visit to the organization. Significant Artificial Intelligence's (AI's) impact on business has been measured considering four key variables. Artificial Intelligence's (AI's) impact on operational efficiency, cyber security, customer satisfaction, and predictive analysis in the business has been analyzed. The study concludes that there is a positive Artificial Intelligence (AI) on operational efficiency, cyber security, customer satisfaction, and predictive analysis in the business.*

Keywords : AI Innovations, Operational Efficiency, Cyber Security.

Introduction

In the world of business, Artificial Intelligence (AI) has emerged as a transformative force. It has brought a revolution in the digital world. Although the work is performed by AI very effectively & efficiently it cannot replace humans. In India, the Adoption of AI in different sectors is at the initial stage but companies have been adopting AI gradually to perform the job. It is creating

Dr. Shiv Kumar Rabidas, Assistant Professor & Head Department of Commerce, S.P Jain College, Sasaram (Rohtas), Bihar. E-mail id : shivkmr163@gmail.com.

competition in the market. It is used in different functional areas of companies like marketing, sales, finance, and production. In addition to functional jobs, it can transform businesses through creative ideas. it provides solutions for challenging tasks, which aids in the rapid expansion of businesses. From routine work to analytical work, all these are performed by AI.

The Use of Artificial Intelligence (AI) in Business

(a) Financial Tasks : By evaluating past data and finding trends that might estimate future financial performance; AI enhances financial forecasting and assists organizations with strategic planning, forecasting, and budgeting. AI monitors financial transactions, it protects from fraudulent and suspicious transactions.

(b) Customer Support : Earlier customer executives used to handle customer calls and customer support. AI replaces Customer executive job.. Handling inquiries, providing customer support 24*7 basis and managing basic tasks are performed by AI-driven chatbots and virtual assistants.. This has resulted in improved customer service and satisfaction and reduced operational costs.

(c) Customer Analytics : Market and customer-related insights are taken by AI by processing customer data. Customers' needs, changing purchase patterns, customer feedback, behaviour, and product preference are analysed which helps in marketing and product recommendations.

(d) Data Interpretation and Analysis : It is a core function of AI. AI algorithms help businesses with demand forecasting, inventory management, and strategic planning by analyzing past data to forecast future trends.

(e) Detection and prevention from cyber threats : Using the vast set of data it identifies possible threats, developing new algorithms to protect from cyber attacks of our digital assets and belongings.

Challenges of using AI in Business

As I have discussed a numerous benefits of using AI in business. However, it has some challenges which restrict the effective and successful adoption of AI in the business, which are as bellows.

(i) Data Related Challenges : The resulting output is depending on the quality of the data. Accurate data have a accurate result and inaccurate data have a inaccurate result. To get a desire task it requires a vast amount of qualitative

and quantitative data. However, obtaining, gathering, and preserving the required data is a challenging job to the enterprise. Inadequate, erroneous, or out-of-date data can result in inaccurate outcomes and wrong decision.

(ii) Shortage of AI Professional : Lack of AI skilled professional including machine learning expert, AI engineers, and data scientists are the second challenge of AI adoption in business. Implementing and managing AI initiatives effectively hampered by a lack of internal expertise. Training of existing employee is time taking and costly procedure.

(iii) Cost related Issues : Investment in AI infrastructure, hiring AI professional, purchasing software and hard ware, annual maintenance charges, renewal of software and license Aids in business cost. Bearing these cost is challenging to the small businesses.

(iv) Complexity in Integration with existing System : It can be difficult to integrate AI into an existing IT infrastructure, especially if the systems are antiquated or not made to accommodate AI. Implementation of AI requires modification, improvement in the existing system. Sometimes it cause disruption in the business process and necessitate a time of adjustment.

(v) Regulatory Compliance : Adoption of AI in business requires compliance of various legal procedures. Laws and regulations vary by industry and region. Information technology Act, 2000, Personal Data Protection Bill (PDPB) and Digital Personal Data Protection Act, 2023, For financial work RBI guidelines to be followed regarding data security, customer protection, and risk management, SEBI guidelines, patent laws, The Ministry of Health and Family Welfare for health, The Ministry of Electronics and Information Technology (MeitY) for manufacturing and smart cities.

Literature Review

- **Enholm, I. M., et al. (2022)** analyzed in their study that Artificial intelligence (AI) comprised of a broad range of technologies that provide businesses several benefits in the form of increased economic value. In order to gain business value organizations moving towards AI. However, businesses are still facing difficulties in adopting, using, integrating AI`s in daily operations.

- **Budhwar, P et al. (2022),** In their study they analyzed various AI driven application like Bio metrics, speech recognition, sensors, chatbot, Chat GPT, Internet of Things (IOT), mobile technology, gig technology, geo-tagging.

These things have increased revolution in industrial concern. AI have been used in muman resource management, for managing the employees, recruiting the personnel, and decision making.

- **Jain, R. (2023),** focuses the Artificial Intelligence (AI) in business and found the multidimensional significant impact on business performance, increased productivity, cost reduction, smooth business operation, quick decision making, Adoption of AI, however, is not without its difficulties. These include issues about data security and privacy, moral issues, and possible employment displacement.

- **Bharadiya, J. P. (2023)** explores in the study that, AI helps examining customer purchase pattern, survey feedback of the customer satisfaction, browsing behavior at various online shopping platforms, This boosts customer happiness and revenue growth by helping firms take advantage of cross-selling and up selling opportunities.

Objectives of the Study

(i) To analyze the Artificial Intelligence's (AI's) impact on business operations including operational efficiency and business innovations.

(ii) To analyse the future growth of AI.

Research Methodology

The study is conducted on 100 respondents in the Bihar state. Respondents comprised of full time employees from various nature of organizations representatives like finance, manufacturing, technology and customers. Significant Artificial Intelligence's (AI's) impact on business has been measured considering four key variables. These variables are AI's impact on the operational efficiency, cyber security, customer satisfaction, Predictive analysis. Data has been collected through online mode and personal interviews with the respondents to know the AI's impacts, its current adoptions and future of AI in the business.

Data Interpretation

Reliability Test

Values of Cronbach`s Alpha	No. of Respondents
.897	100

Source : Test based on questionnaire.

A reliability test was conducted to know the reliability of data. It is calculated on 100 respondents and found Cronbach's Alpha value .897. This value confirms good representation of quality data and considered reliable for the study.

Table-1 : Gender Wise Frequency of the Respondents

Gender	Frequency	% of participation
Male	67	67%
Female	33	33%
Total	**100**	**100%**

Source: Compilation from questionnaire

Table no.1 exhibits that out of 100 respondents, 67 were male and 33 were female. The number of male respondents was found more than the female.

Table-2 : Frequency of Respondents on AI's Impact on the Operational Efficiency of the Business

	Very High Impact	High Impact	Medium Impact	Low Impact	No Impact	Total
Frequency	54	23	13	7	3	100

Source: Compilation from questionnaire

Table no2 depicts respondent's responses on AI's Impact on operational efficiency on business. Majority of the respondents opinioned very high impact, 23% opinioned high impact, 7 respondents low impact and only 3 respondent's opinioned no AI's Impact on operational efficiency on the business.

Table-3 : Frequency of Respondents on AI's Impact on the Cyber Security

	Very High Impact	High Impact	Medium Impact	Low Impact	No Impact	Total
Frequency	54	24	10	7	5	100

Source: Compilation from questionnaire

Respondent's frequency on AI's impact on the cyber security presented in Table no 3. Out of 100 respondent 54 favoring very high impact, while 24 favored high impact, only 7 respondents favored low impact. The number of favoring no impact is very low.

Table-4 : Frequency of Respondents on AI's Impact on Customer Satisfaction

	Very High Impact	High Impact	Medium Impact	Low Impact	No Impact	Total
Frequency	60	22	8	5	5	100

Source: Compilation from questionnaire

Frequency of Respondents on AI's impact on customer satisfaction is recorded in Table 4. 60% respondent's satisfaction level is very high, 22% showed high satisfaction level, 8% medium satisfied, five percent respondents low satisfied and only 5% respondents have no satisfaction.

Table-5 : Frequency of Respondents on AI's Impact on Predictive Analysis

	Very High Impact	High Impact	Medium Impact	Low Impact	No Impact	Total
Frequency	64	21	7	3	5	100

Source: Compilation from questionnaire

Table no 5 depicts the representation of the respondents on AI's impact on predictive analysis. Only 3 respondents argued that there is low AI's impact on predictive analysis, 64 respondents strongly favored, 21 respondent favoring high impact, the number of favoring low impact respondent's are less than the respondents favoring no impact.

Hypothesis

H_{O1} **:** There is no significant AI's impact on the operational efficiency of the business.

H1 : There is a significant AI's impact on the operational efficiency of the business.

Table-6 : Testing of Hypothesis 1 by Analysis of Variance (ANOVA)

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	140.286	4.000	35.071	7.967	0.000	2.466
Within Groups	422.625	96.000	4.402			
Total	562.911	100.000				

Interpretation : Calculated F value 7.967 is greater than the Critical value at 5 percent level of significance 2.466 Hence, null hypothesis is rejected and the alternative Hypothesis (H1) is accepted, confirming that There is significant AI's impact on the operational efficiency of the business.

H_{O2} : There is no significant AI's impact on the cyber security.

H2 : There is significant AI's impact on the cyber security.

Table-7 : Testing of Hypothesis 2 by Analysis of Variance (ANOVA)

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	155.015	4	38.753	8.71	0.00	2.47
Within Groups	422.625	95	4.448			
Total	577.64	99				

Interpretation : Calculated F value 8.71 > the Critical value at 5 percent level of significance 2.47. Hence, null hypothesis (H_{O2}) is rejected and alternative Hypothesis (H2) is accepted, confirming that there is significant AI's impact on the cyber security.

H_{O3} : There is no significant AI's impact on customer satisfaction.

H3 : There is significant AI's impact on customer satisfaction.

Table-8 : Testing of Hypothesis 3 by Analysis of Variance (ANOVA)

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	148.769	4.000	37.192	10.254	0.000	2.467
Within Groups	344.591	95.000	3.627			
Total	493.360	99.000				

Interpretation : Calculated F value 10.254 > the Critical value at 5 percent level of significance 2.46. There is a significant difference between mean square of two groups. Hence, null hypothesis (H_{O3}) is rejected and alternative Hypothesis (H3) is accepted, confirming that there is significant AI`s impact on customer satisfaction.

H_{O4} **:** There is no significant AI's impact on Predictive analysis.

H4 : There is significant AI's impact on Predictive analysis.

Table-9 : Testing of Hypothesis 4 by Analysis of Variance (ANOVA)

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	140.189	4.000	35.047	10.790	0.000	2.467
Within Groups	308.571	95.000	3.248			
Total	448.760	99.000				

Interpretation : Calculated F value 10.790 > the Critical value at 5 percent level of significance 2.467. There is a significant difference between mean square of two groups. Hence, null hypothesis (H_{O4}) is rejected and alternative Hypothesis (H4) is accepted, confirming that there is significant AI's impact on Predictive analysis.

Conclusions

On the basis of literature review and result of the hypotheses it is concluded that adoption of Artificial Intelligence (AI's) in the business have been increasing and it has brought digital revolution in the business environment. There is a significant impact on the operational efficiency, enhanced cyber security, improved customer satisfaction and helpful in data interpretation and predictive analysis in the business.

References

Bharadiya, J. P. (2023). Machine learning and AI in business intelligence : Trends and opportunities. *International Journal of Computer (IJC)*, *48*(1), 123-134.

Budhwar, P., Malik, A., De Silva, M. T., & Thevisuthan, P. (2022). Artificial intelligence– challenges and opportunities for international HRM: a review and research agenda. *The InTernational Journal of human resource management*, *33*(6), 1065-1097.

Enholm, I. M., Papagiannidis, E., Mikalef, P., & Krogstie, J. (2022). Artificial intelligence and business value: A literature review. *Information Systems Frontiers*, *24*(5), 1709-1734.

Jain, R. (2023). The Impact of Artificial Intelligence on Business : Opportunities and Challenges. *Available at SSRN 4407114*.

Measurement of Sovereign Bond's Sensitivity an Application of Convexity Model

BASUDEB BHATTACHARYA

Abstract : Purpose- *The study aims to investigate the impact of convexity on sovereign bond (G-Sec) by analyzing sensitivity of price to change in yield with varying maturity period. Due to the sensitive volatility during the crisis period, investors had to adjust their investment strategies in light of difficult preconditions. The crisis era is noteworthy not because it was a financial crisis but rather because of the large yield revisions it brought about. These circumstances implied higher earnings associated with increased exposure to convexity. This research work will be beneficial for the investors who are seeing changes in market yields on sovereign bond may take the advantage of this convex methodology.*

Design/Methodology - *The present study is based on sovereign bond and it employs convexity model which is a key factor in this assessment of sovereign bond's sensitivity. The various maturity period of sovereign bond (G-Sec) series from 2024 to 2073 were taken into consideration for this empirical analysis. The study also uses regression and correlations to illuminate the relations among variables.*

Findings - *The findings of this study indicates that the prices move more in response to changes in yields when the convexity measure is higher. Bond that has a highest maturity level has a larger convexity and a higher price sensitivity. Thus, it can be said that price sensitivity increases with duration.*

Originality - *This study is one of the few research published till date which will add substantial values in sovereign bond and ought to significantly advance the concept of previously available models.*

Keywords : Sovereign Bond, Price, Yields, Price, Convexity, Duration, Sensitivity.

Dr.Basudeb Bhattacharya, Assistant Professor, Department of Commerce, Bir Bikram Memorial College, Agartala, Tripura. Email : bhattacharya.basudeb83@gmail.com

Introduction

For government bonds, investors are often protected from default risk of any kind because central government bond specially enjoy sovereign guarantee. In the study of (Karmakar, 2023) opined that G-Sec are referred to as risk-free gilt-edged instruments because they essentially have no default risk. The study of (Blanco, 2001) emphasizes the significance of the government bond which is distinguished from other securities by their low default risk, great liquidity in the market with variety of maturities. One of the fundamental principles of sovereignty which distinct government bond from other bonds (Eaton & Gersovitz, 1981) (Panizza, Sturzenegger, & Zettelmeyer, 2009). The outcome of the lack of a bankruptcy procedure and a supranational legal body that might force creditors to pay them back. As a result, numerous theoretical works have explored different justifications for the existence of government bond (Aguiar & Amador, 2013). Furthermore, research continues to examine legislative and prescribed procedures to enhance sovereign bond performance and bring them more akin to a corporate bond standards (Krueger, 2002)(IMF, 2013). According to (Krishnamurthy & Jorgensen, 2012) government bonds are taken as collateral since they are usually safe and liquid.

As a result, in order to raise money for public expenditure and a variety of needs, including operating costs, debt repayment, interest payments on existing debt, and other essential government spending, governments are issuing sovereign bonds. Sovereign bonds constitute a substantial source of funding for governments, in addition to tax revenue. It might, however, be a trade-off between risk and return, depending on the country's health that issued it and its financial situation. Meanwhile, an empirical literature has revealed over time the distinct characteristics of governmental bonds and its default (Mitchener & Trebesch, 2023). For a number of reasons, sovereign bond offers an insightful prism through which to examine political risk (Tomz & Wright, 2009).The Government of India recently announced for securities that will be repurchased at auction for a total of Rs 60,000 crore (RBI, 2024). The reason behind is to use this excess to pay off some of its debt ahead of time in an effort to reduce future repayment constraints and manage its debt load proactively. In tandem, this boosts investor trust on sovereign bonds. Repurchases have the potential to lower interest costs for the government by increasing demand for bonds, which in turn lowers rates. In the preceding fiscal year, the Indian government borrowed a record amount from the market, but for the first time in nearly two decades, there was no devolution on primary dealers for sovereign bonds. Investors in fixed income will be focusing on the government's commitment to budgetary

consolidation. Over the next couple of years, India's G-Sec market may see inflows of up to hundred billion dollar oncefunctioning issues are resolved, causing significant institutional investors to choose debt in the world's fastest-growing major economy, including sovereign wealth funds and central bank reserve. Banks have made significant gains through interest and trading income on government bonds in recent years due to rate cuts.

Banks and Insurance companies are the largest investors in sovereign bond and at the time of market uncertainties taking the opportunities to produce profit from changes in yields or balance low interest revenue through trading income (Acharya & Steffen, 2015), (Andreeva & Vlassopoulos, 2019), (Molyneux, Reghezza, Torriero, & Williams, 2021). Furthermore, (Kim, Kim, & Ryan, 2019) and (Beatty, Chamberlain, & Magliolo, 1995) find that in order to mitigate the effect on banks' capital, banks may decrease the average maturity period. The world financial crisis that began in 2008 was the cause of the worst recession which had a negative impact on many different types of businesses and industries. The world's financial markets were shook by Lehman Brothers' collapse. The bond risk premium abruptly increased to five percent from its usual range of zero. (McKibbin & Stoeckel, 2009). However, because interest rates have dropped to their lowest points in history, the banking system's holdings of government bonds are risky (Sy, 2005) as because majority of the government bonds held by banks and other financial institutions are long-term fixed-rate bonds. For this reason, understanding the convexity model is crucial for making investment decisions. Convexity adjustments can be fairly considerable when the value of a security may be dispersed over a wider range of values and there is a longer maturity period (Burgess, 2019). Hence one can more effectively manage bond investments and calculate the effect of various yield components on bond prices if comprehend the ideas of approximation modified duration and convexity adjustment. It is a tool for risk management as well as a gauge of how susceptible bond values are to changes in interest rates. When computing price changes based on duration, the yield variations might be taken into consideration. This is due to the non-linear relationship between bond price and yield. Researchers and professionals still frequently allude to the parallel shift of the interest rate curve even if it is an unlikely theory (Lajili & Rakotondratsimba, 2012).

Convexity shape also provide information about the yield curve's behaviour. Compared to low convex yield curves, which are flatter, high convexity yield curves are frequently steeper. By comprehending the convexity of the yield curve, investors can predict future changes in interest rates and adjust their investment

strategies. Duration and convexity have multiple applications, ranging from financial institution credit pipeline hedging to future liability immunization. It is a crucial instrument for determining and controlling interest rate risk exposure. Compared to bonds with equal risk associated with interest rate, as signposted by modified duration, the more convex bond will offer less downside and more upside in the event that rates rise.

Figure-1- Convexity of a Benchmark Bond (G-Sec)
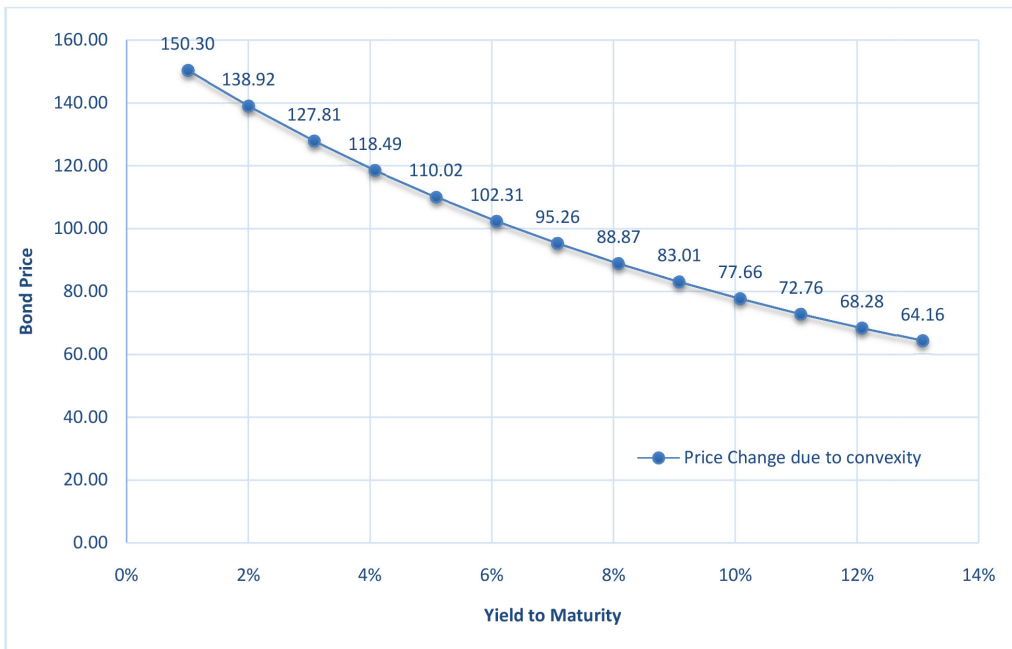
Unfortunately, there are limits to the duration's utility as a gauge in sensitivity of interest rate. Although the statistic computes a bond yields and price movements have a linear connection, but in practice the price and yield movements that have a convex connection. The above graph of G-Sec benchmark bond illustrates how prices would change in response to a change in yields with a curved line.

Convexity is a metric used to quantify how changes in interest rates affect the price of bonds. The price of the bond increases with a decrease in the yield and decreases with an increase in the yield. This pricing phenomena that happens when changes in upstream prices cause downstream prices to respond

differently, depending on the features of price and yield relationship may be seen in Figure-1 as a convexity curve. When there is an advantageous shift in yields, or a decrease in yield, convexity causes the bond price to climb more than it would when there is an unfavourable shift in yields, or an increase in yield, of the same amount. Convexity adjustment is a technique used to enhance estimates of how bond prices fluctuate in response to changes in interest rates, more on the upward than the downward side; convexity decreases when higher yields cause the price-yield curve to flatten.

The duration is actually longer with lower yields, so when rates decline, investors may book profit from enhanced rate sensitivity. On the other hand, duration shortens as yields rise, which again benefits investors by reducing the price effect of rising rates. When a bond is positively convex, prices are increasing more quickly than they are decreasing more slowly in addition to being higher than the linear approximation. Therefore, bond prices rise more quickly than they fall (Schrier, 2023). Therefore, convexity is more beneficial on the upside than the downside for the same reason. Based on empirical results on convexity, this paper investigates the degree to which sovereign bond prices with different maturities are sensitive to fluctuations in interest rates by using as accurate as the convexity-augmented formula and to provide suggestions and important didactic advantages and much more computationally efficient based on empirical results of convexity.

Literature Survey

Interest rate fluctuations and inflation are the primary elements that affect the risk of investing in government bonds (Muharam, 2013) (Yusuf & Prasetyo, 2019). The maturity and interest rate risk are the factors for pricing bond (Livingston & Zhou, 2005), (Knowles & Su, 2005), (Ajlouni, 2012). In terms of it analysis, sensitivity analysis is the standard method of risk evaluation used to assess the risk associated with government bonds and this introduces the idea of duration, which is a measure of the security value's to its rates (Jorion, 2007). In order to improve the approximation of bond pricing, (Fisher & Weil, 1971) established convexity as Modified Duration might be imprecise for significant interest rate fluctuations.Convexity is an interest rate-to-bond price derivative (Bodie, Kane, & Marcus, 2008). It is a well-established which represent the bond's yield and duration, as well as its convexity, can be used to calculate the bond's relative value and gauge its risk acquaintance (Christensen & Sorensen, 1994), (Chance & Jordan, 1996). Duration shows how the bond price responds to each percentile change of yield. Duration is a useful indicator of how sensitive bond prices are

to fluctuations in interest rates (Xu, 2020).Through multiple numerical examples, (Shirvani & Wilbratte, 2005) demonstrated that the convexity-augmented Macaulay formula produces more accurate coupon bond price volatility estimates. Sensitivity analysis with the help of duration with convexity has been made studied by (Maruddani & Hoyyi, 2017) and shown to have a lower error value than alternative techniques.

Published simultaneously (Flesaker, 1993) who developed a convexity adjustment for calculating the predicted Libor rate in a continuous and discrete scenario and (Ritchken & Sankarasubramanian, 1993) who discovered a convexity formula for averaging contracts, were the significant references on the convexity adjustment. A lot of progress was made in the years that followed. Later efforts by (Benhamou, 2000) and (Hagan, 2003) expand the convexity adjustment to a wider range of payoffs. Alternatively, by employing other tactics and methodology to measure the volatility changes studied by (Pelsser, 2001).

Objectives of the Study

1. To assess the association between price and yields of G-Sec.

2. To determine the sensitivity of the bond's price to change in yield of Government Bonds with varying maturity period series.

3. To provide suitable measures on risk management for future endeavors.

Methodology :

The research paper relies on secondary data that was collected from the published report of Clearing Corporation of India Ltd with varying maturity periods of sovereign bonds (popularly known as G-Sec) from 2024 to 2073. The Convexity Model as developed by (Macaulay, 1938) has been used in this paper to show the volatility of price to change in yield of sovereign Bonds with varying maturity period series. The results are analyzed by using statistical tools viz; Regression, Correlation etc. Further results is compared based on these methods to determine the development of sovereign bonds. Bond's price is determined by several elements, the most significant of which is the YTM, or actualized interest rates. This is evident since the present value of a bond's projected future cash flows determines its value. The cash flows of a coupon-paying bond are known in advance, but the bond's current value must be calculated by the investor taking the discounting rate into consideration.

$$\text{Bond Price (P)} = \sum\nolimits_{t=1}^{n} \frac{c_1}{y^1} + \frac{c_2}{y^2} + \frac{c_t}{y^t} \cdots\cdots\cdots \quad \text{(Fabozzi, 1999)}$$

--------- equation (i)

Where,

C = Coupon, n = number of cash flows, F = face value, Y = yield to maturity, t = term to maturity.

The yield that guarantees that the present value of future cash flows equals the purchase price, providing the bond is held to maturity. It is the current rate of return if coupons are reinvested at the current yield until the bond expires. As a result, the denominator of the bond pricing function is what the YTM and interest rate relate to. Bond yields are calculated by dividing the bond's annual coupon rate by its current market value. The yield is given in percentage form.

$$\text{Yield to Maturity (YTM)} = \frac{C + \dfrac{F - P}{t}}{\dfrac{F + P}{2}} \quad \text{(Purnomo, Wijaya, \& Pratama, 2022)}$$

---------- equation (ii)

Where,

C = coupon, F= face value, P = price, t = term to maturity.

Duration is essentially a measure of risk associated with interest rates on bond prices. Duration measures the bond's price sensitivity to a 100 basis point change in interest rates (Fabozzi, 1999). Because a larger portion of their future cash flows will be discounted at the new rate, bonds with longer durations are more vulnerable to interest rate risk. Frederick Macaulay first proposed the concept; his Macaulay duration is shown as follows :

$$\text{Duration (D)} = \frac{\sum\nolimits_{t=1}^{n} \dfrac{t \times Ct}{(1+y)^2}}{\sum\nolimits_{t=1}^{n} \dfrac{Ct}{(1+y)^t}} \quad \text{(Zhang, 2022)} \qquad \text{-------equation (iii)}$$

Where,

C = Coupon, n = number of cash flows, t = term to maturity and y = yield to maturity.

The most suitable duration metric for option-free bullet bonds is Modified duration, on which our analysis is based. It is computed by taking the yield plus one plus the Macaulay duration.

$$\text{Modified Duration (MD)} = \frac{Duration}{1 + \dfrac{Yield}{2}} \quad \text{(CCIL, 2012)} \qquad \text{---------equation (iv)}$$

Convexity is a measurement of the price of the securities movements' in relation to fluctuation of interest rates based on duration changes (Macaulay, 1938). Similar to duration, convexity provides information on how the price of a bond is impacted by the changes of rate of interest. Side by side interest rate sensitivity's second order criterion is represented by the non-linear character of the price-yield relationship. For this reason, convexity is a longer measure than time. Whether rates rise or fall, the duration-measured price shift is assumed to have the same impact on prices. The fact that the price gain for a given yield shift is really greater than the price decline is a crucial characteristic of bond values.

$$\text{Convexity (C)} = \frac{(V-)(V+) - 2P_O}{P_O \times (0.01)^2} \quad \text{(CCIL, 2012)} \qquad \text{------------ equation (v)}$$

Where, P_O denotes the current price before change any yield. The bond prices determined by adding or subtracting 100 bps to the YTM are represented by V+ and V-.

Therefore the changes in price due to Convexity for 100 bps is the variance between holding bond price and effective bond price due to convexity.

The convex relationship explains a rise in the required yield results in a different percentage price change than a fall in the required yield. When evaluating price sensitivity for bigger, non-linear fluctuations in interest rates, convexity is more useful since it takes into account the bond's price-yield relationship.

Hypotheses :

H_{01} : There is no significant association between price and yield with convexity.

H_{A1} : There is significant association between price and yield with convexity.

H_{02} :   There is no significant difference in the sensitivity of price if there is a 100 bps change in the yield.

H_{A2} :   There is a significant difference in the sensitivity of price if there is a 100 bps change in the yield.

Data Analysis and Interpretation

Here assessed the risk associated on interest rate with the portfolio of sovereign bond using the duration/convexity method. This method uses the bond price-yield connection to estimate how bond prices will fluctuate in response to changes in yields. A bond's volatility increases due to change in rate of interest with its maturity period. Bond prices and yields have a convex price-yield connection, hence small yield variations are also taken into consideration using a convexity metric. Duration calculates the expected change in the bond price in response to changes in rate of interest. It discounts all cash flows to their present value, taking into account principle and interest payments as well. When a bond has a lower coupon, its duration is longer; when a bond has no coupon, its duration is equal to its maturity. Bond duration, which is a measure of risk associated with interest rate, is used to calculate the average bond maturity time. Duration is a measure of how sensitive bond prices or bond range prices are to changes in interest rates. Two factors influence bond price fluctuations in reaction to changes in interest rates: the changed duration and convexity of the bond. The proportional importance of these factors depends on the magnitude of the interest rate shift as well as the bond's maturity and coupon rate. While duration may be a reasonable estimate of the potential price impact of small changes in rates, it may not be as helpful for assessing the long-term effects of major changes in interest rates. This is due to the convex rather than linear connection between bond yields and bond prices. The most accurate measure of a bond's interest rate sensitivity is the product of convexity yields and modified duration. However, it should be noted that the assumption that the yield curves are parallel serves as the foundation for the approximation of bond price changes caused by changes in rate of interest.Convexity quantifies the price fluctuation of a bond that is not covered by duration. It is known as the bond's price's second derivative with respect to interest rates; the first derivative is duration. Therefore, convexity measures the curvature of the bond price-yield relationship and shows how a bond's duration changes with changes in rate of interest.

Table-1 : Sensitivity Analysis through the Convexity Model

Sl. No.	Name of the Security	Coupon Rate	Bond Price	YTM	Duration	Mduration	V+	V-	Convexity	Price due to increase in yield by 100 bps	Price due to decrease in yield by 100 bps	Price Variation
1	9.15% GS 2024	9.15%	101.25	7.03%	0.60	0.58	100.65	101.85	0.64	100.65	101.85	1.20
2	5.15% GS 2025	5.15%	97.09	7.09%	1.53	1.48	95.65	98.57	3.03	95.65	98.57	2.92
3	8.15% G S 2026	8.15%	102.50	7.09%	2.37	2.29	100.12	104.95	6.94	100.12	104.95	4.83
4	8.28% GS 2027	8.28%	103.57	7.10%	3.09	2.98	100.53	106.72	11.02	100.53	106.72	6.20
5	7.25% GS 2028	7.25%	100.59	7.09%	3.90	3.77	96.79	104.58	18.18	96.79	104.58	7.79
6	6.79% GS 2029	6.79%	98.66	7.08%	4.75	4.59	94.18	103.40	26.49	94.18	103.40	9.23
7	8.97% GS 2030	8.97%	109.79	7.10%	5.11	4.94	104.40	115.53	32.11	104.40	115.53	11.13
8	6.68% GS 2031	6.68%	97.72	7.08%	5.96	5.76	92.27	103.57	40.99	92.27	103.57	11.29
9	8.33% GS 2032	8.33%	107.97	7.06%	6.32	6.11	101.61	114.85	47.61	101.61	114.85	13.23
10	7.24% GS 2033	7.24%	101.23	7.06%	7.00	6.76	94.54	108.54	60.72	94.54	108.54	14.00
11	7.73% GS 2034	7.73%	104.75	7.09%	7.41	7.15	97.46	112.78	69.31	97.46	112.78	15.32
12	6.67% GS 2035	6.67%	96.55	7.11%	8.08	7.80	89.25	104.64	82.23	89.25	104.64	15.39
13	7.41% GS 2036	7.41%	102.54	7.10%	8.34	8.05	94.56	111.44	89.86	94.56	111.44	16.89
14	7.18% GS 2037	7.18%	100.78	7.09%	8.69	8.40	92.67	109.86	96.86	92.67	109.86	17.19
15	7.62% GS 2039	7.62%	104.85	7.10%	9.46	9.13	95.83	115.10	116.36	95.83	115.10	19.27
16	8.30% GS 2040	8.30%	111.46	7.10%	9.41	9.09	101.78	122.49	120.90	101.78	122.49	20.70
17	8.83% GS 2041	8.83%	117.29	7.10%	9.68	9.35	106.81	129.32	131.98	106.81	129.32	22.51
18	8.30% GS 2042	8.30%	112.10	7.12%	10.12	9.77	101.71	124.11	144.27	101.71	124.11	22.41
19	9.23% GS 2043	9.23%	122.40	7.10%	10.15	9.80	111.01	135.60	148.40	111.01	135.60	24.59
20	8.17% GS 2044	8.17%	111.38	7.11%	10.57	10.21	100.58	123.98	162.72	100.58	123.98	23.40
21	8.13% GS 2045	8.13%	110.97	7.12%	10.75	10.38	100.09	123.71	167.89	100.09	123.71	23.61
22	7.06% GS 2046	7.06%	99.47	7.11%	11.19	10.80	89.24	111.57	187.89	89.24	111.57	22.34
23	7.72% GS 2049	7.72%	107.20	7.10%	11.64	11.24	95.91	120.69	205.55	95.91	120.69	24.77
24	6.67% GS 2050	6.67%	94.65	7.12%	12.20	11.79	84.26	107.18	227.59	84.26	107.18	22.92
25	6.99% GS 2051	6.99%	98.50	7.11%	12.25	11.83	87.67	111.62	232.18	87.67	111.62	23.96
26	7.36% GS 2052	7.36%	103.06	7.11%	12.45	12.02	91.74	116.80	234.27	91.74	116.80	25.07
27	7.30% GS 2053	7.30%	102.26	7.11%	12.37	11.94	90.93	116.05	240.41	90.93	116.05	25.11
28	7.37% GS 2054	7.37%	103.16	7.11%	12.51	12.08	91.69	117.14	244.08	91.69	117.14	25.46
29	7.72% GS 2055	7.72%	107.53	7.12%	12.41	11.98	95.49	122.28	252.71	95.49	122.28	26.79
30	7.63% GS 2059	7.63%	106.36	7.13%	12.90	12.46	94.17	121.49	275.89	94.17	121.49	27.32
31	6.80% GS 2060	6.80%	95.67	7.13%	13.23	12.77	84.47	109.68	293.06	84.47	109.68	25.21
32	6.95% GS 2061	6.95%	97.86	7.11%	13.29	12.83	86.36	112.27	297.62	86.36	112.27	25.90
33	7.40% GS 2062	7.40%	103.56	7.13%	13.45	12.99	91.46	118.72	296.13	91.46	118.72	27.26
34	7.25% GS 2063	7.25%	101.54	7.13%	13.28	12.82	89.62	116.51	301.13	89.62	116.51	26.90
35	7.46% GS 2073	7.46%	104.75	7.11%	13.67	13.20	92.12	120.95	341.81	92.12	120.95	28.83

Source : Authors' computation.

It is evident from the above Table-1 that the prices move more in response to changes in yields when the convexity measure is higher which is shown as a positive number. The bond that will mature in 2073 has a larger convexity and a higher price sensitivity of 341.81. Thus, it can be said that price sensitivity increases with duration. In a similar vein, the security that matures in 2024 has an extremely low convexity of 0.64. This indicates that the price sensitivity is lower for shorter security durations. Therefore, investors can learn more about the possible risk and return profiles of fixed income instruments by examining convexity. Similar result also been found in the study of (Aoun, Viard, & Marquer, 2021) that convexity is the driving force behind long-term bonds.

Table-2 : Regression Analysis

Analysis	SoS	df	MS	F	Sig.
Regression	206023.874	2	103011.937	19.868	.000[a]
Residual	165917.258	32	5184.914		
Total	371941.132	34			
a. Predictors: (Constant), YTM, Bond Price					
b. Dependent Variable: Convexity					

(Ozili, 2023) in his study states that R-square values between should lies between 0.50 and 0.99 in social science study, especially when the majority of the explanatory factors are statistically significant. The aforementioned analysis of R^2 values (0.554) shows a significant impact on the dependent variable. It is evident from the regression analysis that the Price and Yield have impact on convexity measurement. Since $F_{calculated} > F_{tabulated}$, with significant at the 0.01 level established the same. Therefore, it can be concluded that there is a significant association between price and yield with convexity.

Table-3 : Correlations Analysis

Analysis		Convexity	Price Variation
Convexity	Pearson-Correlation	1	.924[**]
	Sig. (2-tailed)		.000
	N	35	35
Price Variation	Pearson-Correlation	.924[**]	1
	Sig. (2-tailed)	.000	
	N	35	35
**. Correlation is significant at the 0.01 level (2-tailed).			

The bond maturing in 2024 has a price variation of 1.20, while the bond maturing in 2073 has a price variation of 28.83. Table-2 indicates that the price variation increases as the maturity increases. Table-3 clearly illustrates the positive correlation between convexity and price variations. It is evident from the correlation analysis that the convexity and price variation have a positive relation and increasing with the increase in maturity period. Since $F_{calculated} > F_{tabulated}$, with significant at the 0.01 level established the same. Therefore, it can be concluded that there is a significant difference in the sensitivity of price if there is a 100 bps change in the yield.

Conclusions

The convexity is arbitrage-free priced over longer time frames, which can produce excess returns during aberrant volatility periods. Therefore, using convexity as a tool to take advantage of volatility expectations that are higher than the market average may be beneficial in the longer period of time. A bond with higher convexity will provide less downside in the event that rates rise and more upside in the event that they fall. Bonds with lower coupons are more convex for the same maturity and yield.

Longer duration bond have largest risk and volatility. Only convexity can estimate the variability on longer duration bonds which typically exhibit greater volatile and susceptible to changes in interest rates. However, for modest rate changes duration alone is merely a reliable indicator of price changes. Convexity is required to account for the change in price that duration does not for greater or longer changes in rates. Bonds with higher convexity will yield higher income if the drop inrates of interest is anticipated. Similarly, the loss brought on by unanticipated. A higher convexity bond results in a smaller interest rate increase. Therefore, it makes no difference if interest rates rise or fall; convexity still improves the portfolio's performance. Consequently, the portfolio's convexity ought to be increased if higher interest rate volatility is anticipated.

Finally, sovereign bonds (G-Sec) can be a wise choice for those seeking low-risk investment approach to create a stable and trading income. Interest income can provide steady revenue, and the convexity model can guarantee trading income.

Bibliography

Acharya, V. V., & Steffen, S. (2015). The Greatest Carry Trade Ever? Understanding Eurozone Bank Risks. Journal of Financial Economics, 215-236.

Beatty, A., Chamberlain, S., & Magliolo, J. (1995). Managing financial reports of commercial-banks - the influence of taxes, regulatory capital, and earnings . Journal of Accounting Research, 231-261.

Christensen, P. O., & Sorensen, B. G. (1994). Duration, convexity and time value. Journal of Portfolio Management , 51-60.

Eaton, J., & Gersovitz, M. (1981). Debt with potential repudiation: Theoretical and empirical analysis. Review of Economic Studies, 289-309.

Flesaker, B. (1993). Arbitrage free pricing of interest rate futures and forward contracts. Journal of Futures Markets, 77-91.

Hagan, P. (2003). Convexity conundrums: Pricing cms swaps, caps and floors. Wilmott, 38-45.

IMF. (2013). Sovereign Debt Restructuring. Recent Developments and Implications for the Fund's Legal and Policy Framework. Washington D.C: International Monetary Fund.

Jorion, P. (2007). Value at risk: The new benchmark for managing financial risk. New York: McGraw-Hill.

KLivingston, M., & Zhou, L. (2005). Exponential duration : A more accurate estimation of interest rate risk. Journal of Financial Research, 343-361.

Macaulay, F. R. (1938). : Some Theoretical Problems Suggested by the Movements of Interest Rates, Bond Yields and Stock Prices in the United States since 1856. National Bureau of Economic Research, 24-53.

Ozili, P. K. (2023). The acceptable R-square in empirical modelling for social science research. Germany: Munich Personal RePEc Archive.

Panizza, U., Sturzenegger, F., & Zettelmeyer, J. (2009). The Economics and Law of Sovereign Debt and Default. Journal of Economic Literature, 651-698.

Ritchken, P., & Sankarasubramanian, L. (1993). Averaging and deferred payment yield agreements. The Journal of Futures Markets, 23-41.

Shirvani, H., & Wilbratte, B. (2005). Duration and Bond Price Volatility : Some Further Results . Journal of Economics and Finance Education, 1-6.

Tomz, M., & Wright, M. L. (2009). Sovereign Theft: Theory and Evidence About Sovereign Default and Expropriation, Stanford Political Science. United States: Stanford King Center on Global Development.

Xu, Z. (2020). Risk analysis and suggestions on bond investment transaction of financial institutions. Finance and Market, 1-4.

Yusuf, A., & Prasetyo, A. D. (2019). The effect of inflation, US bond yield, and exchange rate on Indonesia bond yield. Jurnal Perspektif Pembiayaan dan Pembangunan Daerah, 649-656.

Zhang, Z. (2022). The Basic Macaulay Duration Theories and Limitations that are Necessary for Investors to Know. Advances in Economics, Business and Management Research, 1146-1151.

Differential Impacts of Macroeconomic Factors on Outward Foreign Direct Investment : An Analytical Study Across Development Levels of Countries

Manoj Kumar Sinha and Shalini Rawal

Abstract : *This study explores the key macroeconomic factors that drive Outward Foreign Direct Investment (OFDI) in both developed and developing countries. Using data from 52 countries, including 23 developed and 29 developing nations, we analyze how market size, trade policies, infrastructure, governance, and technological capabilities influence OFDI decisions. The period of study is 2000-2022. Our methodology involves Principal Component Analysis (PCA) and panel data regression to create composite indices and assess their impact on OFDI flows. The findings highlight significant differences in the determinants of OFDI between developed and developing countries, providing insights into the strategic considerations firms must navigate to succeed internationally. The results suggest that while market size and trade openness are crucial for both groups, factors such as infrastructure and natural resources have varying impacts depending on the country's development level. These insights can help policymakers and businesses understand the complexities of global investment flows and enhance their strategies for international expansion.*

1. Introduction

Decisions regarding Outward Foreign Direct Investment (OFDI) are influenced by many macroeconomic factors, each playing a crucial role in shaping the investment for multinational companies. As global markets become more

Prof. Manoj Kumar Sinha, Professor, Commerce Department PGDAV College, University of Delhi New Delhi - 110065, Email id: mksinha@pgdav.du.ac.in Mobile No.: 9818622017, ICA Life Membership No.: D325

Ms. Shalini Rawal (Corresponding Author), Assistant Professor, Commerce Department Ram Lal Anand College, University of Delhi New Delhi - 110021, Email Id: shalini.commerce@rla.du.ac.in Mobile No.: 8506861872, ICA Life Membership No.: D725.

connected, understanding these factors is essential for firms looking to expand their operations internationally. This paper explores the key macroeconomic variables that drive OFDI, examining how market size, trade policies, infrastructure, governance, and technological capabilities impact investment decisions. By exploring these elements, we aim to provide a thorough analysis of the conditions that encourage OFDI and how they vary across different country groups. Our study categorizes these influences into three distinct groups, including both developed and developing nations, to offer clear insights into the dynamics of global investment flows. This examination not only highlights the complexity of OFDI decision-making but also underscores the strategic considerations that firms must navigate to succeed internationally. These macroeconomic variables are significant for a country's FDI outflows. However, their impact varies across countries due to other influencing factors.

2. Literature Review

The evolution of Foreign Direct Investment (FDI) theories spans from early concepts like MacDougall's Capital Theory (1958) and Kemp's hypothesis (1964) to more nuanced frameworks. Initially, differences in rates of return between countries were seen as the primary driver of FDI. Hymer (1960) challenged this by highlighting that FDI involved not just capital flows but also firm-specific advantages in imperfect markets, leading to theories such as Industrial Organization Theory. Hymer's model shifted focus from country-level to firm-level, suggesting that firms invest abroad to exploit specific advantages like superior technology or managerial skills, competing with local firms despite inherent disadvantages such as cultural unfamiliarity and foreign exchange risks. This theory was further developed by scholars like Kindleberger (1969), Knickerbocker (1973), and Caves (1974), emphasizing the strategic advantages firms hold over local competitors. Vernon (1966) 's Product Life Cycle Theory added a temporal dimension, explaining how US firms initially produce domestically, then export to advanced nations, and eventually shift production to developing countries to reduce costs. Knickerbocker (1973) Oligopolistic Theory described how firms in oligopolistic industries follow each other's moves to maintain competitive parity, while Buckley and Casson (1976) Internalization Theory focused on firms internalizing operations to avoid high transaction costs associated with transferring technology. The Eclectic Paradigm by Dunning (1979) remains one of the most comprehensive FDI theories, combining ownership, location, and internalization advantages. However, it was found less suitable for explaining FDI from developing countries, leading to the development of the LLL framework (Linkages, Leverage, Learning) by Mathews

(2002). This framework accounts for the strategic resource acquisition and utilization by emerging market multinational enterprises (EMNEs).

The Outward Foreign Direct Investment (OFDI) from developing countries reflects these theoretical foundations. Dunning's IDP framework categorized countries based on their FDI development stages. Studies by Cazurra and Genc (2008) and Al-sadig (2013) highlighted the unique challenges and characteristics of EMNEs, such as governance and regulatory quality impacts. Mathews (2002) proposed the Resource-Based View (RBV) for EMNEs, emphasizing the strategic targeting of resources through linkages, leverage, and learning. Recent research has explored the determinants and impacts of OFDI from developing nations, considering macroeconomic factors, home government policies, and the economic effects on host countries. Notable works include those by Bhasin and Paul (2016), Behera et al. (2021), and Wang (2022), which examine the directional patterns and institutional environments shaping OFDI. This body of literature underscores the distinct nature of OFDI from developing countries, suggesting that traditional models may need adaptation to fully capture the unique contexts of these markets.

Transitioning from the historical development and theoretical foundations of FDI to the specific macro-economic determinants influencing OFDI, it becomes clear that various factors at the national level significantly shape a country's outward investment behaviour. Understanding these determinants provides a deeper insight into how firms from developing nations navigate the global market landscape. Strong home country infrastructure, including efficient technology, communication, and financial systems, significantly enhances OFDI by fostering innovation and reducing costs (Porter, 1990; Narula & Dunning, 2000; Wheeler & Mody, 1992; Asiedu, 2002; Kinda, 2010). Larger domestic markets provide resources and drive firms to seek international opportunities, although they also present challenges like intense competition (Dunning, 1980; Hymer, 1976; Barrell & Pain, 1999; Buckley & Casson, 1998). Economic instability, such as higher inflation, can drive firms to invest abroad but may also increase costs due to currency devaluation (Cushman, 1985; Campa, 1993; Blonigen, 1997; Chakrabarti & Scholnick, 2002). Higher corporate tax rates at home encourage OFDI to lower-tax countries, with policies like foreign tax credits and tax treaties playing significant roles (Hines & Rice, 1994; Desai et al., 2006; Grubert & Mutti, 2000; Becker & Fuest, 2011).

Technological advancement drives OFDI by providing competitive advantages, enabling firms to access new technologies and enhance innovation capabilities

(Buckley & Casson, 1976; Dunning, 1981; Patel & Pavitt, 1991; Cantwell, 1989). Developing countries use OFDI to improve their technology and competitiveness (Lall, 1980; Dunning, 1988). Open trade policies expose firms to global markets and competitive forces, aiding technology transfer and knowledge spill overs, but increased domestic competition can constrain resources for OFDI (Dunning, 1980; Kojima, 1978; Braunerhjelm & Oxelheim, 2000; Helpman et al., 2004; Aizenman & Noy, 2006). Rising labour costs and stringent labour regulations drive firms to invest in lower-cost and more flexible labour markets (Akamatsu, 1962; Caves, 1996; Dunning, 1993; Noorbakhsh et al., 2001; Dewenter & Malatesta, 2001). Human Resource Development (HRD) enhances global competitiveness and facilitates OFDI by improving firms' ability to absorb advanced technologies and maintain a skilled workforce (Dunning, 1993; Becker et al., 2001; Borensztein et al., 1998; Laursen & Foss, 2003; Görg & Greenaway, 2004).

In conclusion, while the literature provides a robust understanding of the macroeconomic factors influencing Outward Foreign Direct Investment (OFDI), significant gaps remain, particularly in understanding the differential impacts across developed and developing countries. These gaps underscore the need for further research that delves into these nuanced dynamics. Therefore, this study aims to bridge these gaps by exploring how various macroeconomic determinants impact OFDI in distinct country contexts, providing valuable insights for policymakers and businesses alike.

3. Objective and Hypothesis of the Study

Objective

To estimate and assess the impact of developmental variables on outward FDI of developed and developing countries.

Hypotheses

H01 : Developmental variables do not affect the outward FDI of developing countries.

H02 : Determinants of outward FDI do not differ from developing countries and the rest of the world.

These hypotheses are tested with the help of an elaborated methodology in the latter part of the paper.

4. Data and Methodology

This section outlines the approach taken to analyse the determinants of Outward Foreign Direct Investment (OFDI) in developing countries. The data for this study were sourced from the United Nations Conference on Trade and Development (UNCTAD) and the World Bank. IBM SPSS Statistics (Version 24) was used to analyse the data. The methodology involves using Principal Component Analysis (PCA) to create a composite index for the various independent variables. This approach helps in managing the potential multicollinearity among these variables. After constructing the composite index, the study employs fixed-effect panel data regression. This regression model is used to analyse the impact of the identified macroeconomic and firm-specific factors on OFDI, considering different groupings of countries, including a subset 52 countries that include both developed and developing countries and a subset of 29 developing countries. The period of study is 2000-2022. This methodology allows for a nuanced understanding of how various factors influence OFDI in different country contexts.

Panel Data Regression

A general panel data regression given by Chamberlain (1982) looks like:

$$Y_{it} = a + b_{it} + e_{it}$$

This chapter is based on some set of panel data regression equations that have been used to find out the impact of developmental variables on various country groups and inter-group differences using difference dummy in the equations. There are two sets of two fixed effect panel data models using different country groups in terms of Outward FDI stock and outward FDI flows as given below.

Outward FDI Flows : World and Developing Countries

$(FDI_{OF})_{it} = e^{\{[\alpha 0]+[\beta 1]^*(t)+D2+[\beta 2]^*D2(t)\}}$. $(IINFRA)_{it}^{\beta 3}$. $(IMKT)_{it}^{\beta 4}$. $(IINFL)_{it}^{\beta 5}$. $(ITAX)_{it}^{\beta 6}$. $(ITECH)_{it}^{\beta 7}$. $(ITOPN)_{it}^{\beta 8}$. $(ILAB)_{it}^{\beta 9}$. $(INR)_{it}^{\beta 10}$. $(IHR)_{it}^{\beta 10}$. $D2(IINFRA)_{it}^{\beta 9}$. $D2(IMKT)_{it}^{\beta 10}$. $D2(IINFL)_{it}^{\beta 11}$. $D2(ITAX)_{it}^{\beta 12}$. $D2(ITECH)_{it}^{\beta 13}$. $D2$. $(ITOPN)_{it}^{\beta 14}$. $D2(ILAB)_{it}^{\beta 15}$. $D2(INR)_{it}^{\beta 16}$. $D2(IHR)_{it}^{\beta 17}$

Here :

FDI_{OF} = Outward Foreign Direct Investment flows

α_0 = Intercept

β_1 = Growth Rate of Outward FDI from world

D_2 = Difference Dummy for Developing Countries

β_2 = Growth Rate of Outward FDI from Developing Countries

β_3, β_4, β_5, β_6, β_7, β_8, β_9, β_{10}, β_{11} = Elasticities of Developmental Variables of All Countries

β_{12}, β_{13}, β_{14}, β_{15}, β_{16}, β_{17}, β_{18}, β_{19}, β_{20} = Elasticities of Developmental Variables of Developing Countries

> IINFRA = Index of Infrastructure
>
> IMKT   = Index of Market
>
> IINFLA = Index of Inflation
>
> ITAX   = Index of Taxation
>
> ITECH   = Index of Technology
>
> ITOPN   = Index of Trade openness
>
> ILAB   = Index of Labour
>
> INR   = Index of Natural Resources
>
> IHR   = Index of Human Resources

5. Results and Discussion

Building upon the established framework, this section delves into the application of the methodologies - primarily the Principal Component Analysis (PCA) and the panel data regression model. It presents a detailed examination of how the composite index derived from PCA is integrated into the regression analysis. The focus is on interpreting these methods in the context of understanding OFDI from different country groups, setting the stage for the subsequent presentation of findings and their implications in the broader research context.

Principal Component Analysis

This section methodically details how Principal Component Analysis (PCA) is applied to aggregate individual indicators such as infrastructure, market size, inflation, taxation, technology, trade openness, labour, natural resources, and human resources. The aim is to distil these multifaceted variables into a

comprehensive index, facilitating a more streamlined and effective analysis in the subsequent regression model. This approach allows for a nuanced assessment of the impact of these combined factors on OFDI patterns across the different country groupings.

World (Developed and Developing Countries)

Infrastructure

Infrastructure development plays a crucial role for outward foreign direct investment (OFDI) and promoting sustained economic growth. This is achieved through the provision of a robust foundation for business expansion, facilitation of market access, enhancement of competitiveness, mitigation of risks, fostering of collaboration, and signalling of a favourable investment climate.

The value of the KMO test ought to be on the upper side, which indicates that things are going well. In case of Infrastructure, the value is 0.75, which is a good score. Bartlett's Test is used to measure sphericity which determines whether PCA is suitable to be applied. Bartlett test is highly significant (Table-1)

Table-1 : KMO and Bartlett's Test of Infrastructure

Sampling Adequacy (KMO)	0.75
Bartlett's Test of Sphericity	
Approx. Chi-Square	7828.99
Degrees of Freedom (df)	55
Significance (Sig.)	0.00

The next step is to determine the number of retained principal component. We decided to retain three variables. Therefore, 70 percent of the variation in the data can be accounted for by these three factors. You can see the total explained variance represented by the three retained variables in Table-1

Next, we used the Varimax rotation method to get a rotated component score. It aids in producing the composite index by providing a source for the value weights derived from the factor loading.

PCA found PRODCAP, TELPSUB and MOBCELL as principal variables having rotated component scores are 0.834, 0.874 and 0.782 respectively, which are used for composite index of infrastructure.

Composite Index of Infrastructure

IINFRA = 0.834 PRODCAP + 0.874 TELPSUB + 0.782 MOBCELL

Market

A home country's GDP indicates market size, with larger GDP suggesting greater market size, economies of scale, and specialization benefits (Lall, 1980; Caves, 1974; Kyrkilis & Pantelidis, 2003). Firms from large markets gain capabilities useful for overseas investments (Buckley et al., 2006). The KMO test value of 0.77 confirms sample adequacy for PCA. Bartlett's test shows statistical significance. Three principal components were retained, explaining 69.61% of the total variance. Varimax rotation yielded rotated component scores of 0.97 for GDP, 0.704 for POP, and 0.687 for MFGGDP (Table-2).

Table-2 : KMO and Bartlett's Test of Market

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.771
Bartlett's Test of Sphericity	Approx. Chi-Square	34893.18
	df	105
	Sig.	.000

Composite Index of Market:

IMKT = 0.976 GDP + 0.704 POP + 0.687 MFGGDP

Inflation

Inflation indicates a country's economic health. Stable economies attract inward FDI, while high inflation may drive OFDI due to home country instability (Buckley et al., 2007). A KMO test result of 0.78 confirms sample adequacy for PCA. Bartlett's test indicates statistical significance. The retained principal components explained 99.89% of the total variation. Varimax rotation was used to compute rotated component scores and value weights for the composite index (Table-3).

Table-3 : KMO and Bartlett's Test of Inflation

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.782
Bartlett's Test of Sphericity	Approx. Chi-Square	7616.927
	Df	6
	Sig.	.000

Composite Index of Inflation:

IINFLATION = 0.872 INF + 0.927 CPI + 0.780 CONSP

Taxation

Taxation impacts economic well-being through tax regulations, rates, administration efficiency, and the broader economic environment. Policymakers must balance revenue generation with minimizing economic disincentives. The KMO test score of 0.667 indicates adequate sampling for PCA, and Bartlett's test confirms statistical significance. Three retained principal components retained - TRIFRMFN, TAXREV and TARIFRSM explained 69.28%. and their respectively rotated component scores are 0.918, 0.966, and 0.786 (Table-4).

Table-4: KMO and Bartlett's Test of Taxation

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.667
	Approx. Chi-Square	4183.89
Bartlett's Test of Sphericity	df	28
	Sig.	.000

Composite Index of Taxation

$$ITAX = 0.918\ TRIFRMFN + 0.966\ TAXREV + 0.786\ TARIFRSM$$

Technology

Advanced technology enables cost-effective production by combining resources efficiently. The KMO test result of 0.697 indicates sample adequacy for PCA, and Bartlett's test confirms statistical significance. Three principal components explained 95.55% of the variance. The retained variables are PATENT, ICT and TECHIND having rotated component scores 0.955, 0.998, and 0.998, respectively (Table-5).

Table-5 : KMO and Bartlett's Test of Technology

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.697
	Approx. Chi-Square	1297.84
Bartlett's Test of Sphericity	Df	6
	Sig.	.000

Composite Index of Technology:

$$ITECH = 0.955\ PATENT + 0.998\ ICT + 0.998\ TECHIND$$

Trade Openness

Trade openness facilitates collaboration among individuals, businesses, and resources from various nations. The KMO test result of 0.667 indicates sample adequacy for PCA, and Bartlett's test confirms statistical significance. Three principal components explain 74.9% of the variance. Using the Varimax rotation method, the component scores of retained variables - IMPGS, MFGEXP, and EXRATE are 0.984, 0.909, and 0.816, respectively. These scores are used to generate the composite trade openness index (Table-6).

Table-6 : KMO and Bartlett's Test of Trade Openness

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.667
Bartlett's Test of Sphericity	Approx. Chi-Square	30105.25
	df	91
	Sig.	.000

Composite Index of Trade openness

ITOPN = 0.984 IMPGS + 0.909 MFGEXP + 0.816 EXRATE

Labour

The labour force includes all employed individuals. The KMO test result of 0.712 indicates sample adequacy, and Bartlett's test confirms statistical significance. Three principal components explain 66.37% of the variance. The component scores of retained variables - EMPPOP, EMPAG, and LFP24 are 0.932, 0.931, and 0.569, respectively. These scores are used to construct the composite labour index (Table-7).

Table-7 : KMO and Bartlett's Test of Labour

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.712
Bartlett's Test of Sphericity	Approx. Chi-Square	6662.917
	Df	36
	Sig.	.000

Composite Index of Labour

ILAB = 0.932 EMPL_POL% + 0.931 EMPL_AGR% + 0.579 LABR_15-24%

Natural Resources

The KMO test result of 0.77 indicates sample adequacy, and Bartlett's test confirms statistical significance. Three principal components explain 77.35% of the variance. The component scores of retained variables - ENGPC, EPRODOGC and ENGDEP are 0.838, 0.884, and 0.734, respectively. These scores are used to build the composite natural resource index (Table-8).

Table-8 : KMO and Bartlett's Test of Natural Resources

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.768
Bartlett's Test of Sphericity	Approx. Chi-Square	14911.09
	Df	136
	Sig.	.000

Composite Index of Natural Resources

INRES = 0.838 ENGPC + 0.884 EPRODOGC + 0.734 ENGDEP

Human Resources

HRD enhances workforce skills and competencies, contributing to global competitiveness and innovation, which supports domestic companies in expanding internationally. The KMO test result of 0.732 indicates good sample adequacy, and Bartlett's test confirms statistical significance. The rotated component scores for retained variables - EDUI, HCAP, and INCOMI are 0.932, 0.931, and 0.569, respectively.

Table-9 : KMO and Bartlett's Test Human Resource

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.732
Bartlett's Test of Sphericity	Approx. Chi-Square	7177.676
	df	6
	Sig.	.000

Composite Index of Human Resources

IHR = 0.828 EDUI + 0.866 HCAP + 0.770 INCOMI

Outward FDI Flows - (World and Developing Countries)

The adjusted R^2 value of 76.4% indicates that our model explains a significant portion of the variation in OFDI flows (Table 5.29). Our analysis shows a 0.05% decline in OFDI flow, which is statistically significant. This decline could be due to factors such as the 2008-09 global financial crisis, periods of economic uncertainty, and the maturation of rapidly developing economies that saw high growth in the early 2000s. As these economies mature, the demand for new overseas investments may diminish. For Group 1 countries, infrastructure has a negative impact on OFDI flows, with a 1% increase in infrastructure leading to a 0.47% decrease in FDI outflows. This relationship may be due to countries with superior infrastructure attracting more investment, reducing the need for firms to invest abroad. Nations with well-developed infrastructure typically offer better logistics, connectivity, and market accessibility, making them more attractive to businesses. Consequently, countries with less developed infrastructure may experience a decrease in OFDI outflows. For Group 2 countries, the relationship between infrastructure and OFDI flows is statistically insignificant.

Market size has a positive impact on OFDI outflows for Group 1 countries. A 1% increase in market size leads to a 0.95% increase in OFDI flows. Larger domestic markets provide abundant resources, intense competition, and a higher number of multinational corporations, motivating firms to invest abroad. However, the regression results for Group 2 countries are statistically insignificant.

Higher taxation in the home country is positively associated with OFDI flows. In Group 1 countries, a 1% increase in taxation leads to a 0.11% increase in OFDI flows. Similarly, for Group 2 countries, a 1% increase in tax burden results in a 0.24% increase in OFDI flows. Despite high domestic tax rates, firms may opt for OFDI to access new markets, acquire resources, or leverage cost efficiencies in foreign markets, as the potential for higher returns and growth opportunities abroad outweighs the tax burden at home. Inflation affects OFDI differently across groups. In Group 1 countries, a 1% increase in inflation leads to a 0.42% increase in OFDI stock. Inflation can make the domestic market less attractive for investment due to reduced purchasing power, higher production costs, and economic instability. For Group 2 countries, a 1% increase in inflation results in

a 0.23% reduction in OFDI flow. High costs, decreased buying capacity, currency devaluation, and economic volatility deter firms from expanding internationally and drive them to invest in more stable and economically favorable environments. Technological advancement and OFDI flows are statistically insignificant for both Group 1 and Group 2 countries. This indicates that the impact of technological capabilities on OFDI may vary depending on other factors not captured in this analysis.

Trade openness positively influences OFDI outflows. In Group 1 countries, a 1% increase in trade openness results in a 0.76% increase in FDI outflows. Similarly, in Group 2 countries, a 1% increase in trade openness leads to a 0.11% increase in FDI outflows. Open trade policies expose firms to global markets and competitive forces, encouraging them to invest abroad to enhance their capabilities and access new opportunities. The domestic labour force also impacts OFDI differently across groups. For Group 1 countries, a 1% increase in the labour force results in a 1.76% increase in OFDI flows. A highly skilled workforce in advanced nations drives firms to invest abroad to capitalize on their expertise in new markets. However, for Group 2 countries, a 1% increase in the labour force reduces OFDI outflows by 0.67%. A large unskilled labour force may indicate a lack of technical expertise, reducing global competitiveness and the inclination to invest abroad.

Natural resources negatively affect OFDI flows. In Group 1 countries, a 1% increase in natural resources decreases OFDI flows by 0.15%. Similarly, in Group 2 countries, a 1% increase in natural resources results in a 0.03% decrease in FDI outflows. The influence of natural resources on OFDI is subject to various factors such as geopolitical considerations, market accessibility, regulatory frameworks, infrastructure, and political stability. Human resource endowment positively influences OFDI flows. A 1% rise in the human resource index is linked to a 1.53% increase in OFDI stock. For Group 2 countries, a 1% increase in human resources results in a 4.64% rise in OFDI stock. Skilled labour, technological expertise, management skills, and organizational capabilities enhance a nation's global competitiveness and support outward investment strategies.

Table-10: Regression Results for Developed and Developing Countries Outward FDI Flows and Macro-economic Variables

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.877[a]	.768	.764	1.436907325342679	.910

a. Predictors: (Constant), Human Resources*D, Year, NATURAL RESOURCES, LABOUR, INFLATION, TAXATION, TECHNOLOGY, TRADE OPENNESS, HUMAN RESOURCE, INFRASTRUCTURE, Technology*D, Inflation*D, Market, Natural Resources*D, Taxation*D, Infrastructure*D, Labour*D, Trade openness*D, Dummy, Market*D

b. Dependent Variable: OFDI FLOWS

ANOVA[a]						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7694.395	20	384.720	186.332	.000[b]
	Residual	2318.661	1123	2.065		
	Total	10013.056	1143			

a. Dependent Variable: OFDI FLOWS

b. Predictors: (Constant), Human Resources*D, Year, NATURAL RESOURCES, LABOUR, INFLATION, TAXATION, TECHNOLOGY, TRADE OPENNESS, HUMAN RESOURCE, INFRASTRUCTURE, Technology*D, Inflation*D, Market, Natural Resources*D, Taxation*D, Infrastructure*D, Labour*D, Trade openness*D, Dummy, Market*D

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1.00	(Constant)	65.13	18.00		3.62	0.00
	Year	-0.05	0.01	-0.12	-6.12	0.00
	INFRASTRUCTURE	-0.47	0.14	-0.25	-3.44	0.00
	MARKET	0.95	0.27	0.57	3.54	0.00
	INFLATION	0.42	0.08	0.14	5.46	0.00
	TAXATION	0.11	0.04	0.09	2.50	0.01
	TECHNOLOGY	-0.03	0.02	-0.04	-1.55	0.12
	TRADE OPENNESS	0.76	0.24	0.51	3.17	0.00
	LABOUR	1.76	0.52	0.15	3.38	0.00
	NATURAL RESOURCES	-0.15	0.02	-0.28	-8.93	0.00
	HUMAN RESOURCE	1.53	0.75	0.10	2.05	0.04
	Dummy	-0.67	3.85	-0.11	-0.17	0.86
	Infrastructure*D	0.36	0.16	0.91	2.29	0.02
	Market*D	0.22	0.29	0.96	0.78	0.44
	Inflation*D	-0.69	0.10	-0.33	-6.77	0.00
	Taxation*D	0.13	0.05	0.61	2.61	0.01

Coefficients[a]					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
Technology*D	0.03	0.04	0.04	0.68	0.50
Trade openness*D	-0.66	0.24	-2.72	-2.70	0.01
Labour*D	-2.43	0.56	-1.86	-4.37	0.00
Natural Resources*D	0.12	0.02	0.39	5.60	0.00
Human Resources*D	3.11	0.87	2.00	3.59	0.00
a. Dependent Variable: OFDI FLOWS					

6. Conclusion

This study provides a comprehensive analysis of the macroeconomic determinants influencing Outward Foreign Direct Investment (OFDI) across both developed and developing countries. Utilizing Principal Component Analysis (PCA) and panel data regression, we identified key factors such as market size, infrastructure, inflation, taxation, technological advancement, trade openness, labor force, natural resources, and human resources that significantly affect OFDI flows.

The novelty of this research lies in its dual analysis of developed and developing countries, highlighting the nuanced differences in how these macroeconomic factors impact OFDI. Our findings indicate that while market size and trade openness are universally important for OFDI, other factors like infrastructure and natural resources have different levels of significance depending on the country's development status. For example, infrastructure positively influences OFDI in developed countries, while it has an insignificant effect in developing countries. Conversely, natural resources have a negative impact on OFDI in both country groups, but the effect is more pronounced in developed nations.

This study also reveals that higher inflation and taxation levels can drive OFDI, particularly in developed countries, as firms seek to mitigate domestic economic instability and high tax burdens by investing abroad. In developing countries, the labor force and human resource development are critical for enhancing global competitiveness and supporting OFDI.

References

Aizenman, J., & Noy, I. (2006). FDI and trade—Two-way linkages? *The quarterly review of economics and finance*, *46*(3), 317-337.

Becker, J., & Fuest, C. (2011). Source versus residence based taxation with international mergers and acquisitions. *Journal of Public Economics*, *95*(1-2), 28-40.

Caves, R. E. (1996). *Multinational enterprise and economic analysis*. Cambridge university press.

Chakrabarti, R., & Scholnick, B. (2002). Exchange rate expectations and foreign direct investment flows. *Weltwirtschaftliches Archiv*, *138*(1), 1-21.

Desai, M. A., Foley, C. F., & Hines Jr, J. R. (2006). The demand for tax haven operations. *Journal of Public economics*, *90*(3), 513-531.

Dewenter, K. L., & Malatesta, P. H. (2001). State-owned and privately owned firms: An empirical analysis of profitability, leverage, and labor intensity. *American Economic Review*, *91*(1), 320-334.

Dunning, J. H. (1979). Explaining changing patterns of international production: in defence of the eclectic theory. *Oxford bulletin of economics and statistics*, *41*(4), 269-295.

George, N., Wei, C., & Nneka, U. O. (2021). The impact of mergers and acquisitions on the financial performance of Ecobank Ghana Limited.

Grubert, H., & Mutti, J. (2000). Do taxes influence where US corporations invest?. *National Tax Journal*, *53*(4), 825-839.

Helpman, E., Melitz, M. J., & Yeaple, S. R. (2004). Export versus FDI with heterogeneous firms. *American economic review*, *94*(1), 300-316.

Hymer, S. H. (1960). *The international operations of national firms, a study of direct foreign investment* (Doctoral dissertation, Massachusetts Institute of Technology).

Kemp, M.C. (1964). The theory of international trade. Prentice Hall. London.

Kinda, T. (2010). Increasing private capital flows to developing countries: The role of physical and financial infrastructure in 58 countries, 1970-2003. *Applied Econometrics and International Development*, *10*(2), 57-72.

Kindleberger, C.P. (1969). American business abroad. United States: Yale University Press.

Knickerbocker, F. T. (1973). Oligopolistic reaction and multinational enterprise. *The International Executive*, *15*(2), 7-9

Kojima, K. (2010). *Direct foreign investment: a Japanese model of multi-national business operations* (Vol. 10). Routledge.

Laursen, K., & Foss, N. J. (2003). New human resource management practices, complementarities and the impact on innovation performance. *Cambridge Journal of economics*, *27*(2), 243-263.

Mathews, J. A. (2002). Competitive advantages of the latecomer firm: A resource-based account of industrial catch-up strategies. *Asia Pacific journal of management*, *19*, 467-488.

Narula, R., & Dunning, J. H. (2000). Industrial development, globalization and multinational enterprises: new realities for developing countries. *Oxford development studies*, *28*(2), 141-167.

Patel, P., & Pavitt, K. (1991). Large firms in the production of the world's technology: an important case of "non-globalisation". *Journal of international business studies*, *22*, 1-21.

Vernon, R. (1992). International investment and international trade in the product cycle. In *International economic policies and their theoretical foundations* (pp. 415-435). Academic Press.

Wang, X. (2022). Contribution of China's OFDI to Economic Growth of Developed Host Countries and Its Mechanism. *Mathematical Problems in Engineering*, *2022*.

Wheeler, D., & Mody, A. (1992). International investment location decisions: The case of US firms. *Journal of international economics*, *33*(1-2), 57-76.

Appendix - I

List of Variables

Infrastructure	
ELCTY	Access to electricity (% of population)
AIRTRSNS	Air transport, passengers carried
EPCONSP	Electric power consumption (kWh per capita)
TELPSUB	Fixed telephone subscriptions
TELPH	Fixed telephone subscriptions (per 100 people)
FUEL	Fossil fuel energy consumption (% of total)
ITRNET	Individuals using the Internet (% of population)
MOBCELL	Mobile cellular subscriptions (MOB_CEL_SUB),
PRODCAP	Production Capacity Index (PROD_CAP_IND)
TRANS	Tranport
Market	
GDP	GDP (current US$)
GDPDEF	GDP deflator
GDPG	GDP growth (annual %)
GNI	GNI (current US$)
GNIPPP	GNI, PPP (current international $)
INDGDP	Industry value added (% of GDP)
INDVA	Industry value added (current US$)
MFGGDP	Manufacturing value added (% of GDP)
MFGVA	Manufacturing value added (current US$)
POP	Population ages 15-64
POPD	Population density
TPOP	Total population
SERGDP	Services value added (% of GDP)
SERVA	Services value added (current US$)
MKT	Market size (MAR_kt).
Inflation	
CONSP	Consumer prices (annual %)
INF	Inflation, GDP deflator (annual %)
INFGDPD	Inflation, GDP deflator: linked series (annual %)
CPI	Consumer Price Index (CPI_Annual).
Taxation	
CSTMD	Customs and import duties (% of tax revenue)
CSTMDC	Customs and import duties (current LCU)
TAXRGDP	Tax revenue (% of GDP)
TAXREV	Tax revenue (current LCU)
TRIFRAT	Tariff rates for all products, manufactured products, and primary products
TRIFRMFN	Tariff Rate Most Favoured Nations MP (%)
TARIFRSM	Tariff Rate SM AP
Technology	
PATENT	Patent applications, residents
TRADEMARK	Trademark applications, direct resident
TECHIND	Medium and high-tech industry (% manufacturing value added)
ICT	Information and Communication Technology (ICT).
Trade Openness	
SEREXP	Commercial service exports (current US$)

SERIMP	Commercial service imports (current US$)
COMEXP	Communications, computer, etc. (% of service exports, BoP)
COMIMP	Communications, computer, etc. (% of service imports, BoP)
CPTREXP	Computer, communications and other services (% of commercial service exports)
CPTRIMP	Computer, communications and other services (% of commercial service imports)
EXPGS	Exports of goods and services (current US$)
FDIGDP	Foreign direct investment, net inflows (% of GDP)
IMPGS	Imports of goods and services (current US$)
MFGEXP	Manufactures exports (% of merchandise exports)
MFGIMP	Manufactures imports (% of merchandise imports)
MEXP	Merchandise exports (current US$)
MIMP	Merchandise imports (current US$)
EXRATE	Official exchange rate (LCU per US$, period average)
TOPN	Trade Openness
BIT	Bilateral Investment Treaty (BIT)
PVTSEC	Private Sector and Structural Changes
Labour	
EMPAG	Employment in agriculture (% of total employment)
EMPIND	Employment in industry (% of total employment)
EMPSER	Employment in services (% of total employment)
EMPPOP	Employment to population ratio, 15+, total (%)
EMP24	Employment to population ratio, ages 15-24, total (%)
LFP24	Labor force participation rate for ages 15-24, total (%)
LFP	Labor force participation rate, total (% of total population ages 15-64)
LFPTOT	Labor force participation rate, total (% of total population ages 15+)
LFTOT	Labor force, total
Natural Resource	
ENGDEP	Energy depletion
MINDEP	Adjusted savings: Adjusted savings: mineral depletion
FRSTDEP	Net forest depletion
EPOWC	Electric power consumption per capita
EPRODC	Electricity production from coal sources
ETYPRODH	Electricity production from hydroelectric sources
EPRODNG	Electricity production from natural gas sources
EPRODNU	Electricity production from nuclear sources
EPRODOIL	Electricity production from oil sources
EPRODOGC	Electricity production from oil, gas, and coal sources
EPRODRNW	Electricity production from renewable sources, excluding hydroelectric
ENGPC	Energy use per capita
ENGGDP	Energy use per $1,000 GDP
TNRES	Total natural resources rents (% of GDP)
Human Resource	
HDI	Human Development Index
EDUI	Education Index

Steering Decisions : Unveiling Consumer Perceptions and Preferences in Indian Automotive Market with a Spotlight on Tamil Nadu

A. KHALEELUR RAHMAN AND S. JAFAR SATHIK

Abstract : *This study employs a quantitative approach to examine car ownership trends and consumer preferences among different socioeconomic classes in Tiruchirappalli, Madurai, and Dindigul, Tamil Nadu. The increase in car ownership is linked to the easy availability of auto loans, rising salaries, and higher purchasing power of the middle-income class. India's expanding middle class, rising cost of living, and rapid urbanization contribute to its prominence as a major vehicle market. Analyzing these factors can help businesses refine their products, marketing strategies, and distribution methods to effectively target this growing market. The study involved 300 respondents, evenly distributed across the three cities, using a simple random sampling technique and collecting data via a structured questionnaire, both online and in print. Data analysis was conducted using Microsoft Excel and SPSS 26, including reliability testing via Cronbach's alpha, Exploratory Factor Analysis (EFA), and Pearson's chi-square tests. Ethical considerations, such as informed consent and data confidentiality, were adhered to. Despite existing research on factors influencing car ownership, a gap remains in understanding how these factors vary across socioeconomic classes. Addressing this gap could offer valuable insights into car ownership trends in India and inform policymakers on sustainability and regulatory impacts.*

Dr.A.Khaleelur Rahman, Associate Professor, PG & Research Department of Commerce, Jamal Mohamed College (Autonomous) (Affiliated to Bharathidasan University), Tiruchirappalli-620020, Tamilnadu, India. E-mail : akrakr65@gmail.com

Mr.S.Jafar Sathik, Ph.D Research Scholar, PG & Research Department of Commerce, Jamal Mohamed College (Autonomous) (Affiliated to Bharathidasan University), Tiruchirappalli-620020, Tamilnadu, India. E-mail : jafarsathik20@gmail.com

Introduction

Understanding consumer behavior involves studying how people make choices among various products and how they see themselves about those choices. Analyzing consumer attitudes is essential for understanding their motivations and decision-making processes. A customer's reaction to a product or service is influenced by their beliefs, attitudes, and past experiences. Marketers use this mix of information to create persuasive messages that can shape consumer behavior.

As of 2021, India ranked as the fourth-largest automobile market in the world. By 2022, the country's automotive sector had grown significantly, becoming the fourth-largest globally in terms of value. India surpassed Japan and Germany to become the third-largest vehicle market worldwide based on sales figures in 2022.

India's auto industry now generates over $100 billion in revenue, accounts for 8% of the nation's exports, and contributes 2.3% to the GDP. Prominent Indian automakers include Maruti Suzuki, Ashok Leyland, Tata Motors, Mahindra, Tractors and Farm Equipment Limited, Royal Enfield, Eicher Motors, Hindustan Motors, Kerala Automobiles Limited, Tara International, Vehicle Factory Jabalpur, and Reva.

The automotive sector has a significant environmental impact due to carbon emissions, air pollution, and resource consumption. Examining this sector is crucial for identifying sustainable practices, such as promoting electric transportation, improving fuel efficiency, adopting cleaner manufacturing methods, and addressing environmental concerns. The electric vehicle (EV) industry is expected to reach annual sales of 10 million by 2030, growing at a compound annual growth rate (CAGR) of 49% from 2022 to 2030. By 2030, the EV sector is anticipated to create 50 million direct and indirect jobs. The Indian automobile industry is projected to be worth over $222 billion by 2030, contribute 8% to the country's total exports, account for 7.1% of the GDP, and rank third globally.

Review of Literature

(Claudia & Enrico Ivaldi , Paolo Parra Saiani, 2019) Says there are two goals for the paper. The first goal of the paper is to advance our understanding of the factors that influence people's decision to use car sharing by putting forth a novel viewpoint based on how people feel about driving their cars. Second, by

analyzing the socio-demographic influences on car-sharing behavior, the research adds to our knowledge of the link between the pace of acceptance of car-sharing services and attitudes about using a private automobile.

(Gebhardt, 2021) based on his research, claims that in many nations around the world, automobiles remain the most popular form of transportation. However, reducing motorized transportation is essential to achieving sustainability. Therefore, it's essential to understand and consider the viewpoint of car users when creating alternative mobility ideas. (Ashath, 2014) believes that India's automobile industry is rapidly expanding. As their per capita income rises people are increasingly inclined to purchase luxury items like cars, diamonds, etc.

(Pawar, 2022) concludes his research by stating that the type and brand image of automobiles and their manufacturers have an impact on consumer purchasing decisions. thus they must preserve their brand identities. (Gheorghe & Dan, 2011) Price is one of the four traditional components of the marketing mix, and for durable goods like automobiles, price is a key factor in the decision to purchase.

(Doshi & Parmar, 2016) One of the sectors in our economy that are growing the fastest is the auto industry. It has now become a staple of our daily lives, which is why car manufacturers focus more on the common man market. The choice to purchase a car is not a personal one. (Sangeeta Gupta, 2013) Today's world is characterized by the consumer, and as a result, manufacturers and marketers not only consider how to satisfy customers but also go beyond what is necessary to delight them.

(Priya et al., 2019) The important factors taken into account when purchasing flavorful, delectable foods were product quality, brand recognition, product variety, and limited promotional strategy. Various studies show that the number of family members and the monthly family income has a significant impact on the number of tasty bites of sweets and savory foods consumed.

(Dr. R.Krishna Kumari1 & C.Saranya2, 2019) According to the research, most people prefer macro cars, which include Tata and Mahindra. Preference for Indian brand cars is influenced by the quality, after-sales service, and brand name.(Bhardwaj, 2019) The top automakers must create vehicles that guarantee comfort, safety, and a sense of freedom, even while taking into account environmental concerns and consumer perceptions of alternative modes of transportation.

(Akdoðan, 2021) In addition to being a key component of the marketing mix, a product's price has a significant impact on consumer preferences. Price can have an impact on a product's perceived value, quality, and consumer's ability to choose between different alternatives.

(Maharana & Acharya, 2023) Said in this study that the goal of this research is to investigate customer preferences. Through examination of the elements impacting purchasing choices, an effort has been made to gauge the loyalty of customers concerning these goods. Through random selection, information was gathered from 550 chosen respondents in the Odisha district of Sambalpur. According to the objective, the data have been analyzed using exploratory factor analysis, confirmatory factor analysis, structural equation modeling, the Garrett Ranking Technique, and ANOVA.

(Shetty & Khaladkar, 2023) said in this research that the frequency, mean, and one-way ANOVA were used as methods of analysis. The statistical research design was used here and the questionnaires were sent to respondents digitally. The questions were structured as statements that asked the responder to rate their impressions and give them a Likert scale score. There are two parts to the questionnaires. The demographic data is presented first, then the main body of the study or several assertions. Convenience sampling is used as a sample method. 219 investors make up the study's sample population.

(Abdul & Soundararajan, 2022) said in this study that the conceptual research project aims to develop a model that shows the connection between consumers' intent to make purchases via the Internet and the different levels of perceived risk. The model, which is based on the Theory of Planned Behavior (TPB), highlights the role of perceived behavioral control to modify the strength of the perceived risk and purchase intent and its connection. To investigate the connection between consumers' actual buying behavior and their purchase intentions, this model employs hierarchical regression. The findings help to clarify the complex relationships between various risk indicators and the desire to do an online transaction. The sense of interactive control as a relationship mediator, which has enormous consequences in both theory and practice, is what predominantly influences online purchases.

(Chawla & Singh, 2022) Said in this study that the automobile industry's success rests on offering exceptional after-sales services in addition to selling customers outstanding cars. To better comprehend how the beneficial after-sales services provided by the car sector may boost client satisfaction. For this study, non-

probabilistic snowball sampling, a quantitative analytical technique, was used to gather data from 336 automobile company customers. Both exploratory factor analysis and Cronbach's internal consistency have been used to look into the links between the variables.

(Roy, 2022) The study includes a variety of consumer behavior research studies that relate to both offline and online buying. It offers a thorough introduction to consumer behavior in addition to a range of other behaviorally associated topics. Variables were produced via an in-depth analysis of several research articles that affect the purchase options of consumers. The purpose of the research is to identify the factors that affect consumers' decision-making when they purchase both online and offline. The research observed several factors that affect consumers' purchasing decisions for both online and offline shopping.

(Cicila, 2021) This research focuses on how customers perceive the availability of grievance redressal procedures in the banking industry. The ANOVA test and multiple regression have both been used as statistical procedures to determine the outcomes. Through an interview schedule, data from 384 bank clients were gathered. The study's findings showed that customers are less aware of banks' external processes than of their internal ones when it comes to dispute resolution procedures and mechanisms.

(Kumar & Gulati, 2017) To better understand how consumers in rural Haryana, India, perceive organic goods a study has been undertaken. The goal of the research is to understand how consumers genuinely interact with organic goods. 110 respondents were selected as a sample for the study's purposes. (Chon, 1989) If the performance meets or surpasses the consumer's expectations, the consumer will have a positive disconfirmation, which might result in more purchases. On the other side, if the performance falls short of expectations, customers will experience negative disconfirmation. The customer will not be happy and will look for alternate possibilities.

Objectives of the Study

1. To assess the Tamil Nadu automobile industry.

2. To evaluate the consumer's decision-making process for purchases.

3. To classify the buying behavior of Indian consumers.

4. To determine consumer satisfaction with automobiles and their buying patterns.

Research Methodology

Research Design and Sampling : This study uses a quantitative approach to explore the factors influencing car ownership and consumer preferences among different socioeconomic classes in Tiruchirappalli, Madurai, and Dindigul, Tamil Nadu. As per statistician's recommendationa sample size of 273 was calculated using a sample size calculator based on a 90% confidence level and a ±5% margin of error, assuming a 50% population proportion. To enhance the robustness of our findings, we collected data from 300 respondents, equally split across the three cities. A simple random sampling technique was employed to ensure the sample accurately represents the population. For the digital distribution, we utilized random sampling tools to select respondents from platforms like Instagram, Facebook, Telegram, WhatsApp, and email. Physical surveys were conducted in public areas, and we took steps to prevent duplicate responses.

Data Collection : Data were collected through a structured questionnaire, available both online and in print, catering to those with limited digital access. The questionnaire featured a five-point Likert scale to gauge consumer decision-making regarding car purchases. Before full distribution, a pilot test helped refine the questions for clarity.

Data Analysis : We entered the collected data into Microsoft Excel and analyzed it using SPSS 26. To ensure the reliability of our questionnaire, we checked for Cronbach's alpha, achieving a satisfactory value above 0.7. Exploratory Factor Analysis (EFA) was used to uncover underlying factors, with the Kaiser-Meyer-Olkin (KMO) measure confirming the adequacy of our data for this analysis. We also used Pearson's chi-square test to explore the relationships between socioeconomic status and car ownership preferences.

Ethical Considerations and Limitations : We prioritized ethical considerations by obtaining informed consent from all participants and ensuring their data remained confidential and secure, with anonymization of responses. While we made every effort to reach a diverse group of participants, we recognize potential biases due to self-reporting and the limited generalizability of our findings to other urban and rural areas in Tamil Nadu.

Additional Considerations : We collected demographic details such as age, gender, income, and education level to provide deeper context and control variables in our analysis. We took care to design the questionnaire neutrally and trained physical data collectors to minimize potential biases.

Figure-1 : Neural Scheme of Consumer Buying Behavior (The Conceptual Model)

Source: Authors' own Compilation

Purchasing Decision Process

Selecting a product to purchase involves several steps for the consumer. Marketers need to understand how consumers make their final purchasing decisions. Four stages will be experienced by the consumer, according to Philip Kotler. A lot of social and psychological involvement is implied in the behavior of buying a car, making it a fairly complex one. As a consequence, the customer will progress through each step of the purchasing decision-making process, as depicted in Figure-2.

Figure-2 : The Purchase Decision Making Process (Philip Kotler)
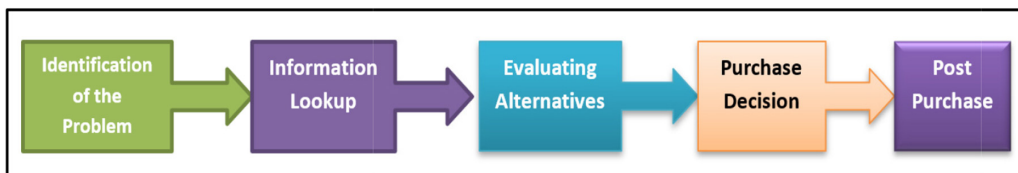
Source: Authors' own Compilation

Data Analysis

Table-1 : Demographic Profile

NAME OF THE VARIABLE.	DEMOGRAPHIC	FREQUENCY	PERCENTAGE
GENDER OF THE RESPONDENTS	MALE	159	53.0
	FEMALE	141	47.0
THE AGE OF THE RESPONDENTS (IN YEARS)	20-30	96	27.3
	30-40	82	32.0
	40-50	76	25.3
	ABOVE 50	46	15.3
OCCUPATION OF THE RESPONDENTS	EMPLOYEE OF GOVERNMENT SECTOR	43	14.3
	EMPLOYEE OF THE PRIVATE SECTOR	124	41.3
	RESPONDENTS WHO ARE SELF-EMPLOYED	103	34.3
	RESPONDENTS WHO ARE RETIRED	30	10.0
MONTHLY INCOME	UPTO 30000 Rupees	38	12.7
	30000-40000 Rupees	70	23.3
	40000-50000 Rupees	93	31.0
	ABOVE 50000 Rupees	99	33.0
AREA OF RESIDENCE	RURAL AREA	153	49.0
	URBAN AREA	147	51.0
CAR BRANDS (PREFERRED BY RESPONDENTS)	MARUTHI SUZUKI	36	12.0
	HYUNDAI	93	31.0
	MAHINDRA	22	7.3
	TATA	37	12.3
	OTHERS	112	37.3
CAR SEGMENTS (PREFERRED BY RESPONDENTS)	HATCHBACK	40	13.3
	SEDAN CAR	93	30.7
	SUV	92	31.0
	MUV	75	25.0
FUEL TYPES OF CARS (PREFERED BY RESPONDENTS)	Petrol	117	39.0
	LPG/CNG	53	17.7
	Diesel	91	30.3
	Electricity	39	13.0

Source: Authors' own Compilation

From the above table, it shows that. The majority (53%) of the total respondents were male and the remaining (47%) were female respondents. And (32%) of the Respondents belong to the 30 – 40 age categories. (41.3%) of the respondents were Government employees. (33%) of respondents are earning above 50,000 rupees of income per month. Most of the respondents (51%)are living in urban areas and (37.3%) of them prefer other foreign brands of cars. (31%) of respondents preferred SUV segment cars and Most of the (39%) of respondents preferred petrol engines.

Data trust is built on a solid foundation of data reliability, which is the accuracy and completeness of the data. As a measurement of internal consistency, Cronbach's alpha indicates how closely a set of things are linked to one another. It is widely accepted that this number has to be higher than 0.7. Cronbach's Alpha values of 0.90 or above indicate remarkable internal consistency, 0.80 or higher is good, 0.70 or higher is acceptable, 0.60 or higher is probable, 0.50 or more is poor, and 0.50 or below is unacceptable.

Table-2 : Reliability Analysis

Cronbach's Alpha's Result	Number of Items.,
.755	15

Source: Authors' own Compilation

From the reliability analysis test, it was found that to be acceptable at .755, the rule of alphas result must be (> or =) to .7, and the alpha's result is greater than .7 (alpha >.7).

Table-3 : KMO and Bartlett's Test

KMO measures Adequacy.,		.832
Bartlett's Test of Sphericity.	Approx. Chi-Square.	3272.944
	Degree of freedom	105
	Sigft,	< 0.001

Source: Authors' own Compilation

EFA is often used to assess a measure's internal reliability and determine its factor structure. Before evaluating the factors, it is customary to run the Kaiser-Meyer-Olkin (KMO) adequacy test and Bartlett's test of sphericity, commonalities, and variances. A value greater than 6 is considered acceptable. However, for the propinquity of variables, which is also supported by Snedecor and Cochran,

Bartlett's test statistics must be significant. The variances are homogenous because the p-value is less than 0.5. The usual acceptance standard for factor loading is more than 0.5. The greater an item's affinity with a certain component, the higher the loading factor.

The KMO index defines sampling adequacy. The KMO test has a valid and acceptable value of (.832), which is more than (0.5), and can be utilized to carry out the data reduction procedure. Bartlett's test of Sphericity assists in determining if more data analysis is warranted in light of the factor analysis results. The level of significance (< 0.001), it may be stated that there is a substantial degree of correlation between the variables, making factor analysis appropriate.

The extent to which something corresponds with all other things is known as the communality. Greater communalities are preferable. It may be difficult for a given variable to load considerably on any factor if its communalities are low.

Table-4 : The Communalities

S.No.	NAME OF THE VARIABLES.	INITIAL	EXTRACTION
1	Technological Advancements	1.000	.571
2	Fuel Economy	1.000	.812
3	Ground Clearance	1.000	.712
4	Resale Value	1.000	.674
5	Pricing	1.000	.671
6	Comfort in Driving	1.000	.865
7	Driving Style	1.000	.900
8	Symbol of Status in Society	1.000	.894
9	Availability of Loans	1.000	.806
10	Religious and Ethical Considerations	1.000	.865
11	Gender Roles and Expectations	1.000	.811
12	Advertising and Media Influence	1.000	.716
13	Family Requirement	1.000	.709
14	Dealership Experience	1.000	.652
15	Sales After Service	1.000	.347

Source: Authors' own Compilation

Initially, every variable in the communality is anticipated to share 100% variance. As a result, each item starts with a value of 1.00, indicating that each item shares 100% of the variation. The extraction values range from 0.347 to 0.900, suggesting that the extracted item has a minimum variance share of 34.7% and a maximum variance share of 90%.

Table-5 : Total Explained Variance

S.no.	The Eigen values			Extraction Squared Loadings			Rotated Squared Loadings		
	The values of Eigen	Variance percentage	The total percentage	The values of Eigen	Variance percentage	The total percentage	Total	Variance percentage	The total percentage
1	4.980	33.202	33.202	4.980	33.202	33.202	3.431	22.872	22.872
2	2.418	16.122	49.324	2.418	16.122	49.324	2.804	18.695	41.567
3	1.971	13.142	62.466	1.971	13.142	62.466	2.669	17.794	59.361
4	1.636	10.907	73.373	1.636	10.907	73.373	2.102	14.012	73.373
5	.740	4.934	78.307						
6	.569	3.791	82.098						
7	.507	3.379	85.476						
8	.446	2.976	88.453						
9	.379	2.529	90.982						
10	.352	2.345	93.327						
11	.273	1.820	95.147						
12	.238	1.587	96.734						
13	.200	1.335	98.069						
14	.168	1.120	99.189						
15	.122	.811	100.000						
Principal Component technique is used for the extraction									

Source: Authors' own Compilation

The first component's total variance contribution is (33.202), followed by the second component's (16.122), the third component's (13.142), and the fourth component (10.907). The Eigen value of a particular factor assesses the variance in all variables that the factor accounts for. It is also obvious that out of the given set of variables, there are a total of four components with Eigen values greater than 1 they are 1, 2, 3, and 4 and their Eigen values are (4.980), (2.418), (1.971), and (1.636) respectively.

Figure-3 : Scree Plot
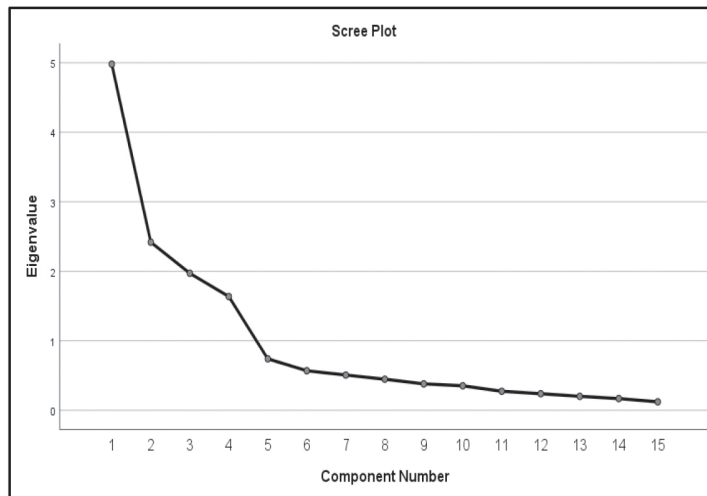
The components are displayed on the X-axis of the Scree plot along with the corresponding Eigenvalues on the Y-axis. These Eigenvalues are regarded as the first four components: (4.980), (2.418), (1.971), and (1.636). Since the highest Eigenvalue is 4.980, this factor is the most significant, followed by all others. These four components are important in this research since they all have Eigenvalues larger than 1 and share the largest variation.

Table-6 : Rotated Component Matrix

Factors	Variables	Component				Variance percentage	The values of Eigen
		1	2	3	4		
Personal Factors	Technological Advancements	.877				33.202	4.980
	Fuel Economy	.827					
	Ground Clearance	.792					
	Resale Value	.766					
	Pricing	.739					
Social Factors	Comfort in Driving		.911			16.122	2.418
	Driving Style		.892				
	Symbol of Status in Society		.886				
	Availability of Loans		.505				

(Contd...)

Cultural Factors	Religious and Ethical Considerations			.935		13.142	1.971
	Gender Roles and Expectations			.928			
	Advertising and Media Influence			.925			
Psychological Factors	Family Requirement				.832	10.907	1.636
	Dealership Experience				.813		
	Sales After Service				.785		
The principal Component technique is used for the extraction and the Varimax technique is used for the Rotation.							

Source : Authors' own Compilation.

The Eigen value of factor 1 is 4.980 with 33.202% of variance, for factor 2 is 2.418 with 16.122% of variance, factor 3 is 1.971 with 13.142% of variance and factor 4 is 1.636 with 10.907% of variance. The variables are related to Personal Factors which has very high significant loading on the variable Technological Advancements(0.877) and the least factor loading on price which is (0.739), same as the variables are related to social Factors which has a very high significant loading on the variable Comfort in Driving which is (0.911) and the least factor loaded on the availability of car loans which is (0.505), and for the third-factor variables which are related to culturalfactors which have very high significant loading on the Religious and Ethical Considerations(0.935) and the least factor loading on Advertising and Media Influencewhich is (0.925), and finally The variables are related to Psychological Factors which has very high significant loading on the variable Family Requirements (0.832) and moderate factor loading on Dealership Experience which is (0.813) and the least factor loading on sales after service which is (0.785)

Table-7 : Analysis of Purchasing Decision of Car

Overall purchasing decision towards the car		
Level of satisfaction	**Frequency**	**Valid Percent**
SATISFIED	111	37.0
NEUTRAL	81	27.0
DISSATISFIED	108	36.0
Total	300	100.0

Source: Authors' own Compilation

From the above Table no: 7, it shows that the majority of the respondents 111 were satisfied with their purchasing decision towards the car which is (37%)

and 108 respondents were dissatisfied which is (36%) and 81 respondents were neutral in their purchasing decision towards the car which is (27%) of the respondents.

Research Hypotheses

- H_{O1} : The Purchasing decision of the car was not dependent on the gender of the respondents

- H_{O2} : The Purchasing decision of the car was not dependent on the age of the respondents

- H_{O3} : The Purchasing decision of a car was not dependent on the occupation of the respondents

- H_{O4} : The Purchasing decision of a car was not dependent on monthly income of the respondents

Table-8 : Cross-tabulation of Gender and Overall Satisfaction for Purchasing Decision of Car

	The Value.	Degree of freedom	Asytc Sig
Pearson,s Chi-Square value	22.197^a	4	.000
Number of Valid Cases.	300		

Source: Authors' own Compilation

The above-mentioned Table no. 7 shows that the decision to purchase a car was influenced by gender; the value of P is lower than 0.001. As a result, the null hypothesis was declined.

Table-9 : Cross-tabulation of Age and Overall Satisfaction for Purchasing Decision of Car

	The Value.	Degree of freedom	Asytc Sig
Pearson,s Chi-Square value	59.487^a	12	.000
Number of Valid Cases.	300		

Source: Authors' own Compilation

In the preceding table, the alternative hypothesis was accepted at (< 0.001), showing that there is a substantial relation between age and overall satisfaction with a vehicle purchase decision.

Table-10 : Cross-tabulation of Occupation and Overall Satisfaction for Purchasing Decision of Car

	The Value.	Degree of freedom	Asytc Sig
Pearson,s Chi-Square value	110.575[a]	12	.000
Number of Valid Cases.	300		

Source: Authors' own Compilation

The table reveals that the P value is (< 0.001) thus it disproves the Null Hypothesis, indicating that there is a direct association between occupation and overall satisfaction with car purchasing decisions.

Table-11 : Cross-tabulation of Monthly Income and Overall Satisfaction for Purchasing Decision of Car

	The Value.	Degree of freedom	Asytc Sig
Pearson,s Chi-Square value	73.857[a]	12	.000
Number of Valid Cases.	300		

Source: Authors' own Compilation

The alternative hypothesis is valid since the P value is (< 0.001), demonstrating a clear relation between monthly income and overall satisfaction with the choice to purchase a car.

Limitations

The research does have some limitations. This study's limitations are brought on by several uncontrollable variables. The location of the research is the first limitation of the proposed study. Data collection for this study is concentrated on the cities of the Tamilnadu state, namely Tiruchirappalli, Madurai, and Dindigul. According to the convenience of the researcher. Future studies might include every state in India, with a focus on testing the quality component to see whether the findings are consistent with those of the current research.

Conclusion

India is one of the world's major vehicle markets due to its expanding middle class, rising cost of living, and rapidly increasing urbanization. Businesses can modify their goods, marketing plans, and distribution methods to successfully get into this huge market by analyzing the sector to acquire insights into customer behavior, preferences, and buying patterns. The vehicle industry in India is governed by several rules and regulations including emissions, safety requirements, fuel economy, taxes, and trade agreements. Policymakers and regulators may better protect the interests of consumers by promoting sustainability, innovation, and the expansion of the sector by evaluating the effects of current rules and developing new ones.Existing studies highlight many factors influencing car ownership and preferences in India, like car sharing attitudes, income growth, brand image, price sensitivity, and after-sales services. But there's a missing piece: how do these factors change across different socioeconomic classes? We don't fully understand how economic growth, marketing strategies, sustainability concerns, and online versus offline buying habits impact the upper, middle, and lower classes differently. Filling this gap could give us a clearer picture of car ownership trends in India.

References

Abdul, S. B., & Soundararajan, V. (2022). Perceived Risk and Online Purchase Intention of Online Buying and its Affinity/ : Perceived Behavioral Control as a Moderator. *Orissa Journal of Commerce*, *43*(3), 41–53.

Bhardwaj, R. (2019). Role of Consumers ' Perception and Attitude in Car Buying Behaviour/ : A Review. *International Journal of Management, IT & Engineering*, *9*(4), 244–259.

Chawla, B. K., & Singh, B. (2022). Impact of Supportive After-Sales Services on Customer Satisfaction in Automobile Industry. *Orissa Journal of Commerce*, *43*(4), 59–72.

Doshi, V. Y., & Parmar, C. T. (2016). A Study on Research Articles on Hatchback Cars/ : Customer Perception and Buying Behaviour. *Proceedings of RK University's First International Conference on Research & Entrepreneurship*, *7*(Icre), 1–7. https://doi.org/ 10.13140/RG.2.2.18798.10561

Dr. R.Krishna Kumari1 & C.Saranya2. (2019). A STUDY ON CONSUMER PREFERENCE TOWARDS INDIAN BRAND CARS. *E ISSN 2348 –1269, Print ISSN 2349-5138 Cosmos Impact Factor 4.236*, *6*(1), 635–640.

Gebhardt, L. (2021). Understanding different car users as starting point for future mobility concepts – A co-creation approach. *Transportation Research Interdisciplinary Perspectives*, *12*(November). https://doi.org/10.1016/j.trip.2021.100485

Kumar, P., & Gulati, H. (2017). Consumer s Perception Towards Organic Food Products in Rural Area of Haryana. *International Journal of New Technology and Research (IJNTR)*, *3*(5), 15–20.

Maharana, K. C., & Acharya, S. C. (2023). Exploring Consumer Loyalty towards Sambalpuri Handloom/ : A Structural Equation Modeling Approach. *Orissa Journal of Commerce*, *44*(1), 27–43.

Pawar, G. B. (2022). An Analysis of New Normal Consumer Behaviour for Buying Cars in Indian Automotive Industries in Mumbai. *Journal of Positive School Psychology*, *6*(3), 6258–6270.

Roy, P. (2022). Determinants of Consumer buying behaviour towards online and offline shopping. *International Journal for Research in Engineering Application & Management (IJREAM)*, *Vol-08*, *Is*(June). https://doi.org/10.35291/2454-9150.2022.0328

Shetty, A. V, & Khaladkar, M. (2023). A Study on the Investors ' Perception Related to M & A on Shareholders ' Wealth and Profitability of Banks in India. *Orissa Journal of Commerce*, *44*(1), 66–76.

Integrating Forensic Accounting with Conventional Financial Accounting : A Forward-Looking Approach

Rajani Gupta and Arvind Kumar

Abstract : Forensic accounting is a comparatively innovative field of career that has prolonged rapidly since its inception. The need for it is growing every day. Forensic accountants are extremely endowed individuals who possess meticulous knowledge in several areas such as general accounting principles, criminal behavior, the law, frauds and computerized systems. Due to increasing scenario of frauds in India, it is evident that now a day's criminals are becoming technology-savvy and developing new methods to perpetuate crimes. Hence, in the era of digitization, the necessity of forensic accounting is growing for their "niche" accounting, auditing, lawful and analytical skills. Therefore, the introduction of forensic accounting as a new area of accounting has been thrown in the "forefront of the crusade" against financial dishonesty and accounting scandals.

Since the start of the twenty-first century, several financial and online frauds occur that led to the downfall of many enterprises. To meet these kinds of scandals, there is drastic increase in the demand of forensic accounting for which the Committee on Information Technology (CIT) of the Since forensic audit, fraud detection, and prevention have been recognized by the Institute of Chartered Accountants (ICAI) as specialty areas, the ICAI has begun offering certificate programs in these areas. The present study aims at analyzing the futuristic approach towards integration of forensic accounting with conventional financial accounting in India. The researcher tried an attempt to describe the perceived benefits as well as obstacles regarding integration of forensic accounting with conventional accounting according to gathered information from 100 responders including student group, academicians and professionals.

Dr.Rajani Gupta, Assistant Professor, Department of Commerce, DDU Government Degree College, Sahjanwa, Gorakhpur.

Prof.Arvind Kumar, Senior Professor, Former Head & Dean, Faculty of Commerce, University of Lucknow, Lucknow.

Introduction

"True and Fair" view of financial state of affairs regarding financial statements must be depicted as per the fundamental objective of GAAP. But due to great financial frauds, there is a strong need for detailed investigation of irregularities in the segment of financial reporting. Forensic accounting as a new scope of accounting came into limelight due to white collar crimes, cyber crimes, financial frauds and the rising complexity of corporate environment. According to Arokiasamy & Cristal (2009), forensic accounting can be described as the application of financial skills and investigative mentality to unsettled issues, conducted within the context of rules of evidence. Adegbie and Fakile (2012) said that the Forensic accounting is generally described as the new scope of accounting which incorporates accounting and auditing skills with investigating techniques and professional skepticism. Forensic accounting is the practice of utilizing accounting, auditing and investigation skill to assist in legal matter and the application of specialized body of knowledge to the evidence of economic transaction and reporting suitable in the purpose of establishing accountability or valuation of administrative proceedings. .

The application of accounting principles and methods to legal issues is known as forensic accounting. When fraud, bribery, or embezzlement is proven, it requires reporting; the report is then used as evidence in administrative or legal actions. (Dhar and Sarkar, 2010). With the overview of integrating forensic accounting with regular accounting, The Treadway Commission (1987) recommended that accounting curricula provide greater consideration towards investigating the frauds in financial sector for which they suggested that the existing curriculum is lacking in this crucial area. Perhaps forensic accounting ought to take center stage in accounting curricula because of the wide range of expertise needed for forensic accounting to handle litigation support, provide expert evidence, and carry out fraud investigations.

Historical March of Forensic Accounting in India

The term "Forensic accountant" was coined for the very first time in 1946 by Maurica E. peloubet in his essay "Forensic Accounting: Its Place in Today's Economy." Archaeological findings reveled that during 3300-3500 BC, accountants in Egypt were involved in the activity of prevention and detection of fraud. During 18th century, there was a tight bond formed between accountancy and legal profession. Many amendments made in financial statement disclosure can be attributed to frauds occur in corporate sector. In 1930s, Frank Wilson was credited for the birth of forensic accounting when he

was working as a CPA for the US Internal Revenue Service. At that time, Wilson was tasked with looking into the transactions of the gangster AI Capone who was involved in illegal activities including violent crimes. In this case, Capone found guilty of tax evasion for which he got punishment of 10 years in Federal Prison. Hence, Wilson is considered as America's first high profile forensic accountant. After this case, the importance of accounting for crimes is increasing In Indian context, the history of investigative accounting is related with ancient times of Mauryan. In Indian history, the renowned forty forms of misappropriation were first addressed by Kautilya in his book "Kautilya Arthashastra." Since the commencement of 21st century, many financial and virtual frauds occur that led to the downfall or collapse of many enterprises. To meet these kinds of scandals, there is drastic increase in the demand of forensic accounting for which the Committee on Information Technology (CIT) of the Institute of Chartered Accountant (ICAI) has identified forensic audit, fraud detection and prevention as one of the niche area and has started to conduct forensic accounting and fraud detection certificate program. Hence, in present era, when it comes to identifying and preventing financial crime, chartered accountants have the monopoly because of the nature of skill required to examine such frauds.

Significance of Forensic Accounting in India

Within the accounting industry, forensic accounting is a rapidly expanding field. and has added new dimensions to accounting education and practices (Razaee et.al, 1992). Today many stakeholders expect from accountants to play a crucial part in providing reasonable assurance towards appropriate corporate governance, trustworthy financial reporting and checking financial fraudulent activities. Due to increase in demand for fraud investigation, the necessity and significance of professional forensic accounting was highlighted by a number of significant initiatives, including the Treadway Commission (1987), the Sponsoring Organization Committee's 1992 report, and the new Proposed Statement on Auditing Standards (SAS).

Beckoff and Schrader (2000) hypothesized in their paper that "adding forensic accounting course to the accounting curriculum can greatly benefit the three major stakeholders in accounting- academic institutions, students and the employers of accounting graduates." Although there is increasing the demand for forensic accountants, courses being offered at the level of university around the world have not reserved velocity with this demand.

Literature Review

Extensive study has been conducted in the field of forensic accounting worldwide. Nonetheless, academics' interest in this field is just beginning to grow in developing nations like India. The following are a few prominent forensic accounting studies:

Al-Tarawneh, M., & Haloush, H. A. (2023) in their study report entitled "The role of forensic accountants in online dispute resolution: Benefits and challenges" identified the theoretical and conceptual frameworks supporting the use of forensic accountants in online dispute resolution through a thorough literature review and expert interviews. It has also emphasized the significance of having a well-trained team of forensic accountants and a strong technological framework to ensure the smooth operation of the ODR process.

Shbeilat M.K. & Alqatamin R.M. (2022) in their research paper entitled "Challenges and Forward-looking Roles of Forensic Accounting in Combating Money laundering : Evidence from the Developing Market" suggests that to enhance the efficacy of forensic accountants (represented by the JACPA) as expert witnesses in the investigation of white-collar crimes and money laundering, this study helps to highlight the significance of coordination between forensic accountants and the judicial authorities (ACFE, n.d.). By bridging the knowledge gap regarding the function of forensic accounting techniques in combating money laundering and illuminating the primary challenges faced by forensic accountants, which demand collaboration between the JACPA and regulators, the study also adds to the body of literature.

Dr. Chaya R (2021) in her research paper entitled "An empirical study on the impact of Forensic Accounting in Corporate Sector and its exponential Growth" determined The practicality of forensic accounting as a means of minimizing corporate fraud, assessed its suitability for an efficient internal control system, and recommended the practice for producing high-quality financial reports and a practical way to reduce the number of fraud-related incidents.

Supriya. H (2019) in her research article "Forensic Accounting – Emerging Trend in Indian Accounting Field" described that a new development in the Indian accounting industry is forensic accounting. It is different from other accountant, as other accountant look at the number but forensic accounting look beyond the number. It involves integration of investigation, accounting and auditing abilities to continue with a legal situation. Forensic accounting came into limelight in India after corporate frauds and white collar crimes; however there is difficulty

in adopting it. In summary, the writer states that forensic accounting should not become the subject of a selected few specialized area. It ought to be included in undergraduate and post graduate curriculum across the country. This initiative will help both the corporate as well as government sector to initially maintain an eye on crime.

Kramer, B., Seda, M. and Bobashev, G. (2017), in their research paper "Current opinions on forensic accounting education", tried to ascertain the views of educators and practitioners regarding forensic accounting education. After analyzing data, they came to the conclusion that while both groups agreed that there will be a greater need for forensic accounting in the near future; they preferred that graduate and undergraduate students have access to a different course or degree. The investigation discovered that there are a number of noteworthy variations between the educators and practitioners opinion regarding forensic accounting content and preferred teaching techniques. Practitioners are with the opinion to consider topics which are exterior to traditional accounting as more important topics to include in forensic accounting education and should consider high value teaching techniques that add an experiential learning component.

Sorunke, Olukayode Abayomi (2016) in their research paper "Integrating Forensic Accounting into the Accounting Curriculum in Nigerian Universities: Challenges and Remedies" stated that the accounting profession has been witnessed to a rising demand for professional trained in forensic accounting. But their research showed that no Nigerian university is offering forensic accounting either as individual course and/or entire fraud accounting programme. Their study investigated the challenges militating against Nigerian university in their quest to integrate forensic accounting into accounting curriculum as been done in other parts of the world.

Basu S. (2014) in his research paper entitled "Forensic Accounting in the Cyber World: A New Challenge for Accountants" stated that today data storage has shifted from individual PCs to servers or multiple servers to cloud storage that make the job of forensic accountant, auditors and investigators much complex. Now days, the traditional accounting has failed in order to deal with the emerging complexity of management requirements. Further, it is not much capable in checking or controlling frauds in India. Irregularities related with corporate sector starting from Mundra case to the Satyam case has exposed that the traditional accounting system is unable to keep pace with the prospering and changing business scenario. To prevent economic frauds and to preserve national

wealth, the American Law and British Bribery Act has demanded for a new approach. Fraud irregularities and compliance lapses have necessitated the growing importance of Forensic Accounting.

The author continued on to state that forensic accounting has emerged as a useful instrument for stopping white collar crime. It is still in its infancy and needs ongoing technological support as well as international collaboration. It will grow into a specialist field of accountancy, and regulators and law enforcement will value it more and more every day.

Hidayat & Ali Al-Sadiq (2014) concluded in their research "A Survey on the Need to offer Forensic Accounting Education in the Kingdom of Bahrain" that there will be a rise in Bahrain's need for forensic accounting education. in near future. The majority of respondents to their survey believe that forensic accounting courses ought to be included in Bahraini universities' accounting curricula. In order to preserve a balance between the supply and demand for forensic accountants, they proposed in their study that institutions in Bahrain offer at least one forensic accounting course, mostly for senior students.

Research Gap

Numerous studies have been conducted on the topic of forensic accounting across the world. But in developing countries like India, very few studies have been done. The researchers have emphasized on the theoretical and conceptual framework of forensic accounting. The industrial revolution has resulted in a number of financial scandals and scams, which has raised the need for forensic accounting in India. Keeping this point of view, an attempt is made to analyze the relevance and method of integrating forensic accounting with conventional financial accounting in India.

Objectives of Study

1. To analyze the demand of integrating forensic accounting with conventional financial accounting in India.

2. To compare and contrast the views of students, academicians and professionals on the futuristic approach towards the methods of integrating forensic accounting with conventional financial accounting.

3. To examine the perceived benefits and obstacles regarding integration of forensic accounting with conventional financial accounting.

Hypotheses of the Study

1. H_0 : Nothing noticeably different exists between the level of conventional accounting education and demand for forensic accounting in India.

2. H_0 : There is no significant difference between the view point of students, academicians and professionals regarding integration method of forensic accounting with conventional financial accounting.

Research Methodology

Universe : The population regarding this research study consists of all accounting profession practitioners, academicians related with accounting stream, researchers and prospective users among students of forensic accounting.

Sample Size : A sample size of 100 respondents has been gathered for this research investigation. which includes responses of accounting academicians, practicing accountants, executive members and students who are potential users of forensic accounting.

Data Collection Method : This study relies on data collected via questionnaire (Google form) as primary source of data collection. The questionnaire's inquiries are broken down into two parts. The first section of questionnaire collects demographic profile of respondents while the Second section of questionnaire collects information about respondent's perception and their familiarity with forensic accounting and their opinion about the futuristic approach regarding integration of forensic accounting with conventional financial accounting. For this investigation, a convenient sampling strategy was employed.

Statistical tool for data analysis : To evaluate the data collected from questionnaire, SPSS software has been used to compute descriptive statistics for frequencies and percentage and to test the hypothesis, chi-square ($\chi2$) test has been used. Some charts and tables have been used to support this study.

Data Analysis and Interpretation

Demographic Profile of the Respondents

In first section of questionnaire, the demographic profile of respondents were asked which is depicted in the following chart-1.

Chart-1 : Demographic Profile of the Respondents
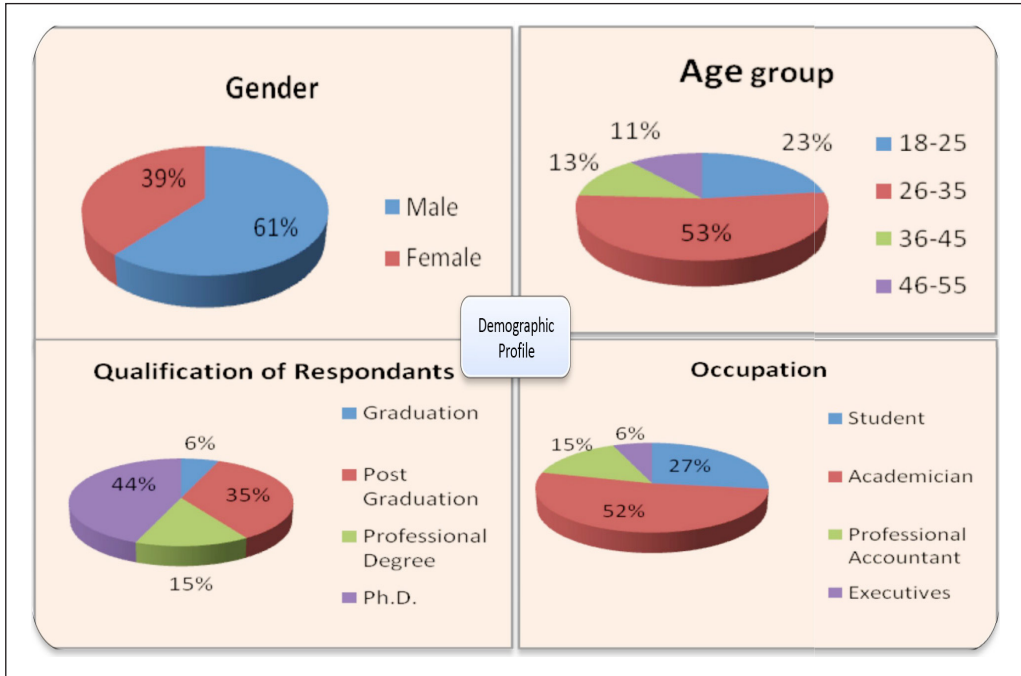
Source : Primary data.

The above chart 1 indicates the demographic profile of 100 respondents. Out of total respondents, 61% are male and 39% are female. In terms of age group, 23% respondents fall under the age group of 18-25, 53% are related with the age group of 26-35, 13% respondents come under the age group of 36-45 and 11% respondents are from the age group of 46-55. In terms of qualification of respondents, 6% are graduate, 35% are post graduate, 15% respondents have professional degree like CA, CMA, and CS etc. while 44% respondents are doctorate of philosophy.

Testing of Hypotheses

H0 : 1. Nothing noticeably different exists between the level of conventional accounting education and demand for forensic accounting in India.

Table-1 : Cross Tabulation Regarding Demand for Forensic Accounting and Qualification of Respondents

In India, white-collar crimes are rising. Corporate India has suffered a loss of financial resources and prestige as a result of this. As a result, hiring forensic accountants has become essential to stopping and dealing with financial crimes and fraud.	Qualification of respondents				Total
	Graduation	Post Graduation	Professional Degree (CA, CMA, CS etc.)	Ph.D.	
Strongly Agree	4	20	4	21	49
Agree	2	11	11	22	46
Neutral	0	2	0	0	2
Disagree	0	2	0	1	3
Total	6	35	15	44	100

Source : Primary data collection.

Based on the above table, it can be seen that 49% of respondents strongly agree and 46% agree that forensic accounting is the best way to investigate white-collar crimes in India.

Table-2 : Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.093[a]	9	.208
Likelihood Ratio	13.122	9	.157
Linear-by-Linear Association	.065	1	.798
N of Valid Cases	100		

a. 10 cells (62.5%) have expected count less than 5. The minimum expected count is .12.

In the above table, the value of chi-square statistic is 12.093 and the p-value appears in the same row in the asymptotic Significance column is 0.208 i.e., greater than the designated alpha value 0.05. Hence, the null hypothesis is accepted that nothing noticeably different exists between the level of education and demand for forensic accounting in India. At every level of qualification, respondents are agreeing that the services of forensic accounting have become necessary to prevent and resolve the financial crimes in India.

1. **H0 :** There is no significant difference between the view point of students, academicians and professionals regarding integration method of forensic accounting with conventional financial accounting.

Table-3 : Method of Integrating Forensic Accounting with Conventional Accounting as per Occupation of Respondents

Occupation	Forensic Accounting would best be incorporated into the accounting curriculum by-			Total
	Offering a separate forensic accounting courses	Integrating forensic accounting into current accounting system	Should not be integrated at all	
Student	3	22	2	27
Academician	19	32	1	52
Professional	1	14	0	15
Accountants	1	5	0	6
Executives **Total**	**24**	**73**	**3**	**100**

Source : Primary data computed through SPSS.

The opinions of respondents from a variety of professions about how to incorporate forensic accounting into traditional financial accounting curricula are shown in the above table. According to the data, 24% of respondents believe that students ought to have access to a distinct forensic accounting course. While 3% of respondents thought that forensic accounting should not be merged with financial accounting at all, 73% of respondents felt it would be preferable to integrate forensic accounting into the current accounting system. The majority of respondents support incorporating forensic accounting into the present accounting system, the study says.

Table-4 : Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.006[a]	6	.062
Likelihood Ratio	12.895	6	.045
Linear-by-Linear Association	.266	1	.606
N of Valid Cases	100		

a. 7 cells (58.3%) have expected count less than 5. The minimum expected count is .18.

In above table, the value of Pearson Chi-square test statistic is 12.006. The corresponding p-vale of the test statistic is 0.062. Since, the p-value is greater than the significance level i.e., 0.05, we do not reject the null hypothesis. Rather we conclude that there is no significant difference between the methods of integrating forensic accounting with traditional accounting as per the occupation of respondents. In other words, there is no association between the occupation of respondents and opinion regarding integrating forensic accounting with traditional accounting.

Perceived Benefits of Forensic Accounting

Forensic accounting has emerged as a famous and extensively demanded area of accounting. According to Aldridge, Corporations have three goals after discovering a fraud has been committed: "first, to identify the fraudster, secondly to secure the evidence to legally terminate their contract, and thirdly to make sure it cannot happen again." Forensic accountants were educated in every of these areas. They can become aware of and discover fraud and are educated to accumulate applicable proof. Forensic accountants are able to supply helpful hints for future fraud prevention. Their talents are unique and incredibly essential in the financial world. Respondents were asked about the perceived benefits of forensic accounting education. These benefits are presented in Chart-2.

Chart-2 : Benefits of Forensic Accounting Education
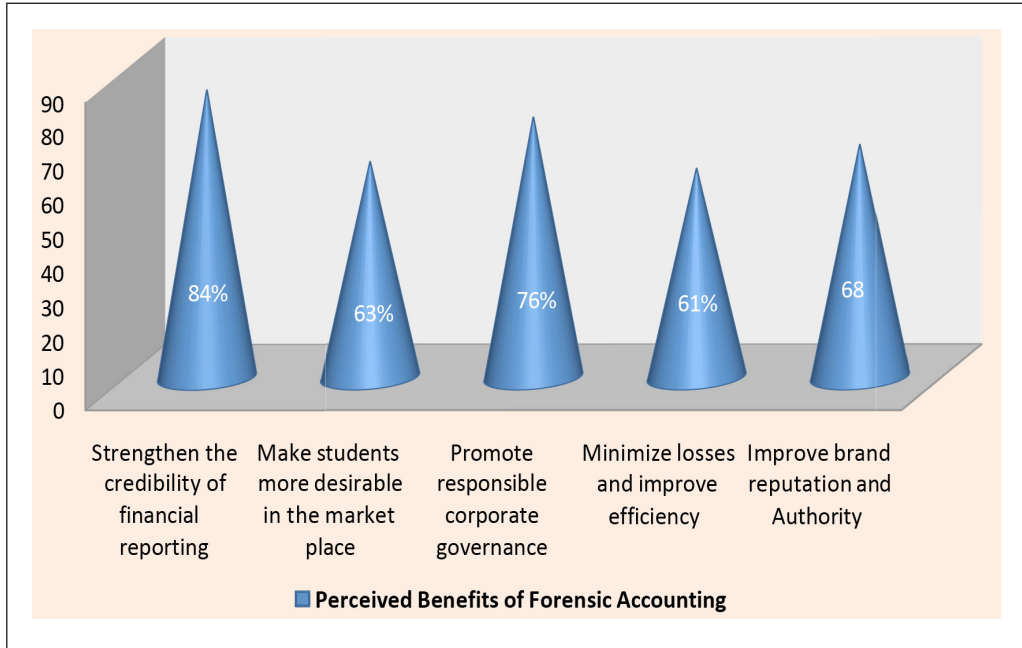
Source : Primary data.

The perceived advantages of forensic accounting education in India are shown in the above chart. The participants were requested to select multiple benefits through pre-structured questionnaire. The majority of respondents i.e., 84% think that the financial reporting's credibility will be enhanced via forensic accounting. followed by the view of 76% respondents that it will promote responsible corporate governance. 68% respondents think that it will improve brand reputation and authority, 63% are agree that the knowledge and skill of forensic accounting will make students more desirable at the market place. 61% respondents have the opinion that it will minimize losses and improve efficiency of organization.

Perceived Obstacles of Forensic Accounting

Respondents were asked regarding specific factors that may be obstacles in providing forensic accounting education in India. These responses are summarized in the following Chart-3.

Chart-3 : Obstacles of Forensic Accounting Education
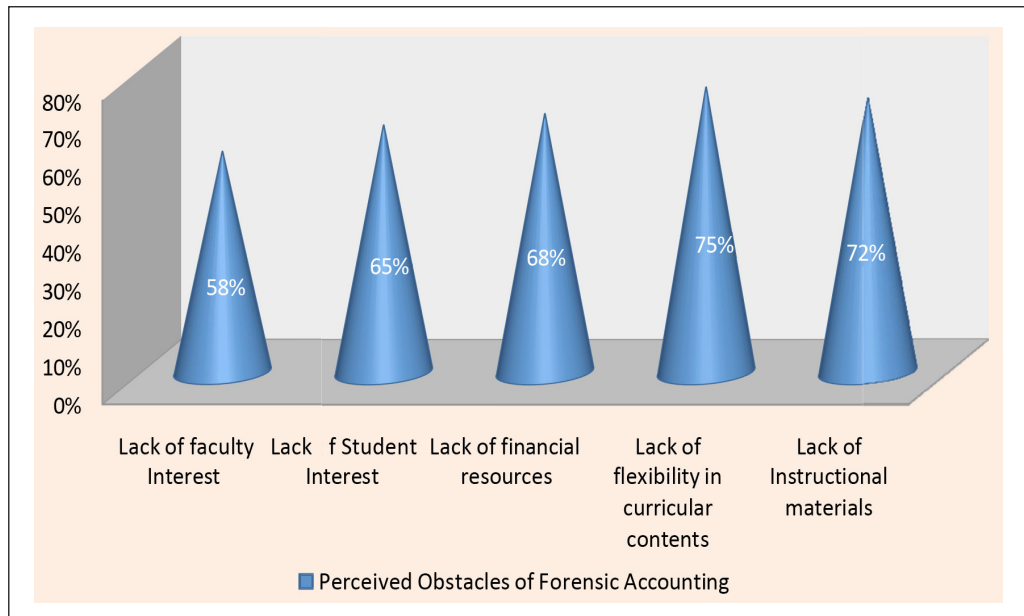
Source : Primary data.

The above chart describes the obstacles regarding implementation of forensic accounting education in India. 75% respondents think that there is lack of flexibility in curricular contents. 72% respondents believe that there is lack of instructional materials to proper implement the forensic accounting in India. 68% respondents feel that there would be lack of financial resources or support to implement this course in curriculum. 65% respondents reflect that there would be lack of interest among students to learn a new field of education who are not desirable to go in the field of accounting as their career. They have fear of over burden. 58% respondents think that there is lack of well qualified faculty to teach forensic accounting efficiently.

Conclusion and Suggestions

Due to growth in business sector and advancement of technology, there is a strong need of forensic accounting to control over the financial reporting. Now the people are becoming increasingly conscious of the financial misappropriation and frauds being occur in corporate sector and have fear of potential risk in investing these sectors. In India, people should be made aware about the Forensic Accounting as it¡¦s far genuinely useful in investigating financial frauds.

Based on the perceived benefits of forensic accounting education in India, many opportunities are there to the forensic accounting stakeholders such as students, academicians, practitioners and the customers. If we emphasize on students, they would be able to boost their knowledge and skill in the field of accounting by mixing up their acquaintance regarding accounting with the holistic knowledge about the forensic accounting. Hence, it needs to be made part of curriculum in undergraduate as well as in post graduate level. Universities who offer accounting course at their post graduate level should encourage specialization in forensic accounting among its students. Requisite amendments within the law ought to be undertaken to establish the importance of forensic accounting in India.

References

Al-Tarawneh, M., & Haloush, H. A. (2023). The role of forensic accountants in online dispute resolution : Benefits and challenges. Journal of Governance & Regulation, 12(3), 53-60. https://doi.org/10.22495/jgrv12i3art6

Basu S. (2014),"Forensic Accounting in the Cyber World: A New Challenge for Accountants"The Management Accountant, the journal of CMAs, Volume 49, Issue 9, September 2014.

Buckhoff, T. A & Schrader, R. W. (2000). The Teaching of Forensic Accounting. Journal of Forensic Accounting 1(1), 135-146.

Dhar, P and Sarkar, A (2010): Forensic Accounting: An Accountant's Vision. Vidyasagar university J. Commerce 15(3): 93-104.

Dr. Chaya R (2021), "An empirical study on the impact of Forensic Accounting in Corporate Sector and its exponential Growth" THE JOURNAL OF ORIENTAL RESEARCH MADRAS, ISSN : 0022-3301, August 2021, pp.52-58.

Hidayat & Ali Al-Sadiq (2014), "A Survey on the Need to offer Forensic Accounting Education in the Kingdom of Bahrain" International Journal of Pedagogical Innovations ISSN 2210-1543 Int. J. Ped. Inn. 2, No. 2 (July 2014).

Kramer, B., Seda, M. and Bobashev, G. (2017), "Current opinions on forensic accounting education", Accounting Research Journal, Vol.30, No.3, pp.249-264. https://doi.org/10.1108/ARJ-06-2015-0082

Rezaee, Z, Crumbley, D. L, & Elmore, R .C. (2003). Forensic Accounting Education : A Survey of Academicians and Practitioners. Advances in Accounting Education : SSRN (http://ssrn.com/abstract=518263).

Shbeilat M.K. & Alqatamin R.M. (2022), Challenges and Forward-looking Roles of Forensic Accounting in Combating Money laundering: Evidence from the Developing Market. Journal of Governance and Regulation 11(2), pp. 103-120. DOI:10.22495/jgrv11i3art10

Treadway, J.C. Jr (1987), Report on the National Commission on Fraudulent Financial Reporting,, National Commission Fraudulent Financial Reporting Washington, DC.

Examining the Impact of Employee Relations on Employee Retention in the Context of Higher Education Institutes (HEI)

AKANKSHA SAXENA AND MANISH DHINGRA

Abstract : *Employee relations are one of the critical essential components of hierarchical execution, success, and maintainability. Enviable employee relations result in profoundly dedicated, propelled, and steadfast workers in the associations. Keeping up with and encouraging great relations between employers and employees can make an amicable air. Invariability at work not only aids in protecting the interests of employers and employees but also advances the dynamic improvement of the association.*

This study aims to investigate and analyze a literature review on employee retention strategies of higher education institutions. It aims to determine the factors influencing and attempting to quantify employee retention. In this review, the sample was gathered from different employees of various higher education institutes situated in Lucknow, by a self-regulated questionnaire based on the random sampling method (RSM). The assessment was done by quantifiable assessments in SPSS. The study's findings confirm that higher education institutions (HEI) need to foster areas of strength between management and employees, establish a decent open climate, and urge representatives to fill in collectively without segregation. Additionally, this paper gives bits of knowledge into the difficulties faced by institutes in retaining their academic employees and the need to carry out methodologies to further improve retention. Besides, this study likewise gives different suggestions to the top administration of the colleges to give regard alongside worth and appreciation, give a sound workplace and occupation configuration, place employees as per their abilities, and give vocation valuable learning experiences to retain a quality workforce by making them committed and secured.

Akanksha Saxena, Research Scholar, Faculty of Commerce and Management, Rama University, Kanpur, Uttar Pradesh, India.

Prof. Dr. Manish Dhingr, Professor & Dean R&D, Faculty of Commerce and Management, Rama University, Kanpur, Uttar Pradesh, India.

1. Introduction

Academic employee turnover has transformed into a pertinent predicament all over the world. Retention of employees is a perplexity for Higher Education Institutions (HEI). The high turnover rate of academic staff can extensively affect understudies and remaining staff individuals when void positions exist considering a shortfall of accessible qualified faculty (Selesho and Naile, 2014).

Within the confines of the higher education environment, high employee turnover adversely influences understudies' accomplishment, and learning opens doors (Garibay, 2015). To surmount such sort of issues colleges and universities need to focus on their commitments to educating and learning, need to make the indispensable efforts to hold their skilled and talented labor force and such staff should be spurred to work effectively (Selesho et al., 2014). With such earnest endeavors, the purpose of colleges and universities to confer quality training in the public arena can be accomplished.

A consistent workforce will make more grounded educator-student associations and understudies can have the advantage of the educator insight because of the progression of their subject information, intensity of institution experience, and corroborated performance (Kreisman, 2002).

2. Employee Relations and Employee Retention

The term 'employee relations' alludes to an organization's endeavors to regulate associations between employers and employees. Employee relations are conventionally oriented with regulating dealing with the business relationship and fostering a positive mental understanding. Employee relations incorporate the assortment of work concerned with nurturing employer-employee relationships that add efficiency, inspiration, and confidence. Employee relations is mostly managing the inner connection between the employer and employee in an association, this inner relationship is centered around speculations of the human way of behaving (Liao et al., 2004).

According to Ng'ethe JM (2012), public universities operate in a highly competitive environment, necessitating employee retention to stay ahead of the competition. The exceptional idea of universities anticipates that they should be stores of the most specialized and skilled intelligent people. They hold knowledge that can be used to meet the nation's manpower requirements. The quality and quantity of faculty members influence university education. Accordingly, higher education institutions (HEI) are subject to the insightful and inventive capacities and responsibilities of the academic staff than most other associations. This makes

it fundamentally imperative to hold this framework of staff (Ng'ethe JM, 2012, Michael O et al., 2013). According to Sinniah et al. (2019), academic staff members at colleges and universities are more likely to forage for possible innovative employment alternatives than to linger to stay in their current positions. The reason is its conjunction with job satisfaction. According to Sinniah et al. (2019), several factors, including pay, advancement opportunities, the workplace, and recognition, influence faculty job satisfaction. Faculty members are more likely to leave their organization if they believe they are not receiving fair performance reviews, receive inadequate training, or are underpaid. The retention of high-performing staff is extremely significant for higher education institutions (HEI). However, industry competition makes it difficult for institutions to retain employees. According to Jointer (2012), many nations are now concerned with this situation.

3. Review of Literature

1. As per a review led by **Alshamrani et al., 2023,** it was exhibited that there exists a positive connection between employee retention and six key variables. These variables incorporate compensation and benefits, workplace environment, relationship with accomplices, corporate culture, employee encouragement and motivation, and leadership inside the association.

2. According to **Justice Solomon Kolantwi Barimah (2017)**, leadership and institutional culture, growth opportunities, valuable learning experiences, the institution's mission and vision, reasonable work, and collegiality influence the retention of the university's teaching employees. These formal retention strategies support the intrinsic needs of employees and furthermore leverage the qualities and strengths of their institutional culture.

3. In their article, **Mohammed Sahedur Rahman and Rabeya Khatun Taniya (2017)** emphasized that Employee Relationship Management (ERM) emphasizes novel means of communication. Both the employer and employee gain from maintaining positive employee relations. The purpose of the study was to determine how Employee Relationship Management (ERM) affects the performance of banking sector employees. The authors used HR Practices, Trust, Communication, Leadership Style, Shared Goals, and Values were used in the study by the authors. This study confirmed that Employee Relationship Management (ERM) components have a positive effect on performance. They argued that recognizing Employee Relationship Management (ERM) practices in all aspects of an organization's employees' lives would directly boost its performance.

4. **Pamuditha and Harshani Samarasinghe (2017)** in an article concentrated on three factors, including, correspondence, grievance handling, and guiding as the variables deceiving Employee Relationship Management (ERM), and figured out its effect on the inspiration of associate-level employees in a hotel in Columbo. They discovered that relations between employers and employees are poor, so they proposed some suggestions in their article to improve relations between employers and employees, focusing on the aforementioned factors.

5. As stated by **R. Anbu Ranjith Kumar (2016)** colleges employ inadequate retention policies to retain faculty members. There is a divergent workforce populace, whose solicitations effectual retention measures enhance work satisfaction, which subsequently augments work execution.

6. **Rowland Worlu et al.'s (2016)** research aims to determine whether employee relations strategies influence employee performance at a Nigerian educational institution. Factors such as versatile progressive techniques, affirmation, value, progress, and instruction influence definitive execution with the mediating elements of delegate affiliation and support. It was found that techniques for employee relations affected representatives' performance. They suggested to policymakers that a more supportive employee relations strategy would lead to increased job performance and employee retention. They called managers to focus on various versatile leveled procedures.

7. According to **Dr.Mita Mehta, Aarti Kurbetti, Ravneeta Dhankhar (2014),** employee retention and commitment are affected by career development opportunities, compellingtalent management methodologies, enrollment, onboarding and orientation, compensatory benefits, training & development, equilibrium in work and life, authoritative culture, direction, corporate altruism, independence and emancipation, audits, individual causes, business-related techniques and leisure time, valuating performance and career developmental opportunities show the magnitude and significance on exerting influence on retention and stimulate employee obligation in the association.

4. Objectives of the Study

1. To investigate the existing academic staff retention strategies of higher education institutions in Lucknow.

2. To concentrate on the significance of retaining talented and experienced academic staff members.

3. To determine the issues and difficulties that institutes face when implementing and maintaining employee relations.

4. To proffer admonishment to overcome various obstacles and implement employee relations in institutions.

5. Statement of the Problem

Employees are regarded as the company's assets because they contribute in numerous ways to the organization's success. As a result, positive employee relations must be maintained within the organization by management. Employee relations are vital and assume a significant part in this way today the association contributes both time and money for a decent relationship in the association. The company currently faces difficulties in long-term employee retention. In this way, examining employee relation management is significant.

Stemmed from the literature review, numerous studies on employee retention have been conducted from both the employee's and employer's perspectives. There is a lack of research on the association between the reasons employees want to stay with an organization and the employer's retention strategies. The majority of studies on staff retention in the IT sector, secondary and high schools, nursing, and other fields were conducted in established businesses. As a result, there is much room for research into employee retention strategies in higher education institutions. Few studies examined the relationship between employee relations factors and strategy and employee retention.

6. Significance of the Study

Employees are the quintessence of any association. Employee retention refers to an organization's strategies for maintaining employees on the staff for a long time. Employee retention strategies help employees perform their jobs well and stay with the company for a long time. To ensure that employees enjoy their work and gain knowledge, certain beneficial actions must be taken. Employee turnover is expensive for associations. It is difficult to find key employees suitable replacements. An organization's outstanding performance is correlated with low employee turnover. Thus, hiring is a challenging task. It is plausible that he will join the rivals after resigning. An employee who stays with the company for a long time is more likely to be honest with management and the organization.

The fact that employees and management play such a significant role in an organization makes this study unique. The study is expected to be beneficial to institute management, employees, staff, and future researcher management.

1. It will assist the institute in determining ways to improve employee relations. It gives useful information about employee relations that can be used in future scientific studies.

2. To the researcher, it can add to developing the researcher's information and comprehension of the part of employee relations by giving attention to the higher education institutes (HEI) about employee relations and how it exerts influence onemployee retention.

3. For the employees, it will help them learn how to communicate with one another within the institute, which will make their work less stressful and teach them how to complete it more effectively and efficiently.

7. Employee Turnover in Higher Education Institutes (HEI)

In higher education institutions (HEI), administrators, academic employees, and faculty are now considered social norms (Figueroa, 2015). According to Takawira, Coetzee, and Schreuder (2014), employee turnover also significantly affected their physical, mental, and emotional well-being. Employee turnover also had an impact on higher education institution (HEI) university presidents. University presidents are powerless against instinctive and intentional turnovers. Eckel and Kezar (2016) conjectured that university presidents assume critical roles in raising money, budget management, strategic premeditation, working with the local community, state, and administering sheets, and working with executives in a tight spot. According to Figueroa (2015), employee turnover in higher education institutions (HEI) can have a negative impact on staff, faculty, and institution operations. According to Abubakar et al., 7.7% of full-time faculty members from various colleges and universities are transferred to other institutions. More than 20,000 specialists, including medical personnel and academic employees from various universities and colleges, consistently pass on to the African central area to look for work in different countries (Abubakar et al., 2015).

8. Factors of Employee Relation to Embolden Employee Retention

In light of the preceding literature review, several factors have been identified that have the potential to encourage academic employee retention. Rewards and compensation, training, working conditions, recognition, promotion, job

security, support from supervisors, job autonomy, and job satisfaction are all examples of these factors.

8.1. Rewards and Remuneration

Remuneration of representatives is essential for compensation. The term "rewards" alludes to the monetary financial, nonfinancial, and mental rewards that an organization provides to its employees in exchange for the work they perform. Reward (or compensation) management is the epicenter of employment relationships. The retention rate is inversely proportional to pay, with lower pay resulting in a higher turnover rate. The impact of pay on employee retention has been the subject of previous research (Hinkin& Tracey, 2010). Remuneration and well-being have always been important factors for faculty retention. According to Huang and Kleiner (2005), organizations use rewards and recognition to reward employees for better job performance. According to Hsieh and Kleiner (2003), reward and recognition generally have three main constructs: reward predicated on compensation, reward predicated on indirect compensation, and reward predicated on incentives. According to Chiekezie, Emejulu, &Nwanneka (2017), retaining talented employees within an organization is engendered by putting good policies into place for reward and compensation. However, the requirements of each worker must not be verified. On this account, with the intent that businesses retain their employees, they need to understand what they want in terms of compensation and rewards. Dissatisfied lecturers are willing to relocate to universities with higher compensation packages, as the number of universities increases. According to Radhakrishnan et al. (2016), a deficiency of integrity and equity in compensation satisfaction can lead to an increase in turnover intention among academic employees. Academic employees typically experience dissatisfaction when they believe that their compensation is unfair.

8.2. Continuing Professional Development (CPD)

The human resources (HR) responsible for the institute's expansion should be developedfor the institution to grow. There is a lot to learn when teachers first start their careers. As a result, continuing professional development (CPD) is a prerequisite during the underlying years and educators have numerous opportunities to foster their knowledge, skills, and practices. Continuing professional development (CPD) opportunities that are beneficial to more experienced and accomplished educators are less common. Continuous professional development (CPD) training enables educators to succeed professionally, learn about cutting-edge new approaches, and remain up to date

on the latest trends. The best academic employees will be thrilled to stay at their current institution because they see this opportunity as a boost to their professional development. Career and professional development opportunities appear to have a strong positive correlation with employee retention, according to a previous study (Rahaman et al., 2023). Career opportunities have a significant impact on employee loyalty and retention within the organization because employees place a high value on long-term career development (Rahaman et al., 2023).

8.3. Transparency in Communication

Cultivating the relationship between employers and employees ameliorates open correspondence all through the association on a wide scale premise and at an individual level. Transparency in correspondence about the working environment rehearses accomplishes the ideal results for the worker and the association. Regular and transparent imparting of the right data to authoritative individuals on the work necessities empowers representatives to do the right things; this keeps up with trust, assembles, and attracts a workforce. This makes it easier for employees to understand expectations, objectives, and targets and how their commitments have an effect.

According to Chinomona and Sandada (2013), employees' job satisfaction is influenced by their communication transparency. Employees can work more effectively and grow as a result of improved communication, which also benefits the organization. As indicated by Debaawy (2011), correspondence and occupational fulfillment have a positive connection. Transparency in correspondence brings about the work fulfillment of representatives.

8.4. Gratifying a Healthy Work-life Balance

According to Bashir & Ramay (2008), work-life policies increase employee commitment, which in turn increases retention. People tend to be more productive when they believe their work-life balance is valued. A healthy work-life balance aids employees' mental and physical well-being. Healthier employees are more enticed, more likely to stay with the company, and less likely to take sick leave. A fundamental component of a generally successful workplace is a balance between personal life and work. It can lessen pressure and forestall burnout in the work environment, which can have adverse results on the physical and emotional well-being of their representatives. Improving employees' work-life balance can substantially reduce issues such as fatigue, low performance, mood swings, irritability, and a toxic work environment. A lot of work and

obligations influence the individual life adversely and affect retention adversely. Supplementary identified determinants that are not business concomitant like burnout, unscheduled working, and occupation stress inhibit Work-Life Balance and adversely influence retention (Mitchell et. al., 2011).

One of the main reasons teachers leave school, according to the Department of Education, is a heavy workload. For the teachers' mental, emotional, and physical well-being, it is essential to hire more teachers so that the load is distributed and the number of teaching sessions per teacher is balanced. Additionally, teachers should have small breaks to unwind and get ready for the next class.

8.5. Appealing Management and Leadership

To keep employees happy and satisfied, management and leadership need to be at their best. According to Goleman (2000), leaders who exhibit emotional intelligence, offer advice, and truly care about the well-being of their staff can foster a sense of loyalty and dedication. As per Bass and Riggio (2006), managers who effectively empower their colleagues, give them standard analysis, and give them dynamic power help to increment standards for dependability. According to Harris et al. (2016), there was a strong correlation between job satisfaction and leadership, which affected whether an employee stayed with the company or left.

Bateh and Heyliger (2014) inspected the effect that the three authority styles had on the work fulfillment of employees in a state university framework. Bateh and Heyliger (2014) deduced in their review the accompanying: (a) employees who distinguished transformational leadership as authoritative encountered an expansion in work fulfillment, (b) employees who distinguished transactional leadership as predominant likewise encountered an expansion in work fulfillment, and (c) employees who perceived detached or avoidant leadership as prevailing experience a decline in work fulfillment.

9. Research Methodology

9.1. Research Design

This study aimed to ascertain how employee relations influence employee retention in the academic sector of Lucknow. To empirically speculate on the research objective, a quantitative approach to a descriptive research design will be utilized for this study. Relevant data and information were gathered, evaluated, and analyzed using a variety of statistical tools. The study constructs—

salary, promotion, recognition, and working environment—were assessed using a five-point Likert scale, with 1 representing strongly disagree and 5 representing strongly agree. The validity and reliability of this scale are very high.

9.2. Sample and Sample Size

The study is descriptive owing to the fact that the review forages for the variables that impact employee retention in an institute. Additionally, it intends to investigate the implications of these variables for the academic staff to remain in the same foundation. The academic staff will be asked for their input through a synoptic and well-organized questionnaire. According to Wellman and Kruger (2004), a sample has the accompanying components:

● Representivity: The populace should be addressed by the sample.

● If the researcher can present their findings to that populace, the sample needs to be of a size that makes sense.

● The acceptable sample size should generally be 33% of the designated population, though sometimes 25% is sufficient. T

● The sample's randomness: Any member of the population can be part of the sample.

According to Blaikie (2018), researchers frequently choose their sample sizes by referring to sample sizes from previous research review evidence. Using a case study approach, Amena (2017) interviewed five banking managers to investigate strategies for reducing employee turnover.To ascertain how employee relationships affect employee retention in Lucknow's academic sector, 110 respondents were surveyed.

9.3. Participants

According to DeJonckheere and Vaughn (2019), participants in a review ought to have encountered or participated in the peculiarity. Therefore, to accomplish the objectives of a study, it is essential to establish selection criteria for participants (Saxena, 2017). To be eligible, participants had to be employed in higher education and have worked for more than five years. The researcher can get in touch with the institution gatekeeper at the research site to find out if participants are available and how to contact them (Fusch& Ness, 2015). To ascertain how employee relationships affect employee retention in Lucknow's academic sector, 110 respondents were surveyed.

9.4. Data Collection

A) **Primary Data** : A structured questionnaire-based survey has been adapted for data collection.

B) **Secondary Data** : Diversified national international journals on Staff support, maintenance and retention Frameworks, Human resource praxis to retain talented and experienced employees, retention of employees and staff in divergent areas such as the academic sector, IT areas, hospitals, enterprises, analyzing the effect of the workplace, incentives, and fringe benefits, positions of authority, research papers, proposal, and different auxiliary information sources has been utilized for the review.

Table 9.4.1 Factor measurement

Variables	No of items	Source
Rewards and Remuneration	6	Frye *et al.*, 2020
Professional development	5	Presbitero*et al.*, 2016
Communication	3	Kundu and Lata, 2017
Work-Life Balance	4	Fletcher *et al.*, 2018
Leadership	6	Kundu and Lata, 2017
Employee retention	6	Haldorai, *et al.*, 2019

9.5. Data Analysis Tool

First, the responses are placed into the Statistical Package for Social Sciences (SPSS) version 23 to analyze the data. Then, SPSS and Microsoft Excel were utilized to sort, dissect, and decipher the information. The reliability of data has been attempted through Cronbach Alpha. It has additionally been analyzed through descriptive statistics. Descriptive statistics like frequencies, percentages, cross tabs, and correlation were used in the adopted statistical methods.

10. Analysis and Discussion of Result

10.1. Demographic Profile of the Respondents

The study had targeted a sample of 110 respondents out of 165. The examination assembled data from 110 individuals, with a reaction pace of 66.7 percent. Table 1 summarizes the respondents' demographic profiles for the study.

Table 10.1.1 Demographical Profile of the respondents

Demographical Profile		Frequency	Percentage
Gender	Male	76	69.09
	Female	34	30.91
Age (In Years)	20-30	32	29.09
	30-40	41	37.27
	40-50	23	20.91
	Above 50	14	12.73
Academic Experience (In Years)	5-10	42	38.18
	10-20	31	28.18
	20-30	26	23.64
	Above 30	11	10.00
Highest Qualification	Ph.D.	45	40.91
	Post Graduate	39	35.45
	Graduate	26	23.64
Academic Position	Professor	14	12.73
	Associate Professor	41	37.27
	Assistant Professor	32	29.09
	Others	23	20.91

10.2. Reliability Analysis

The reliability test was applied to the collected data. Areliability analysis test is done with the stipulation that the variable is supposed to be reliable and can be considered for study if the value of Cronbach alpha (á) is greater than 0.60. The corollary of the reliability analysis testdemonstrated the way that all the questions of the questionnairecould be supposed to genuinely deserve being research instruments and in this manner appropriate to be utilized as measuring instruments.

Table-10.2.1 : Reliability Analysis

Variable	No of items	Cronbach alpha (α)	Information
Reward and remuneration	6	0.918	Reliable
Professional Development	5	0.938	Reliable
Communication	3	0.843	Reliable
Work-Life Balance	4	0.891	Reliable
Leadership	6	0.935	Reliable
Employee Retention	6	0.907	Reliable

The corollary of the reliability analysis testutilizing SPSS above shows that every one of these variables of thequestionnaireinstruments has areliability value that serves the purpose and is assertedreliable because Cronbach's Alpha sign is more than 0.60.

10.2.2. Correlation Analysis

If the coefficient of correlation between two variables is greater than 0.5, it is said that they arecorrelated. One of the independent predictor variables must be excluded from the analysis if there is a correlation. **Table 10.2.2** shows the mean scores based on the weighted average method.

Among all the factors, leadership behavior has got highest mean value of 4.0545 (S.D. =0.88656). This implies representatives are profoundly happy and satisfied with the factor practices by the college and all the employees acknowledge it. From the characteristics of the data, it is observed that the data of continuing professional development (Mean = 3.9000, S.D. = 1.01322) and open communication (Mean = 3.9182, S. D. = 0.97803) are highly deviated from the mean among all other factors. This statistical evidence implies that these two factors involved in the practice of the college are not appropriate for all employees of the institutions. As a result, the college should reevaluate its communication and practices for professional development. In contrast, the data of workload (Mean = 4.1182, S. D. = 0.82096) and reward and remuneration (Mean = 4.0455, S.D. = 0.88189) have been found less deviated fromthe mean. These statistics indicate that the college has been successfully distributing equivalent burdensand providing fairrewards and remuneration, whichare appreciated and valued by all levels of the employees.

Table-10.2.2 : Mean, Standard Deviation, and Correlation Coefficient

Correlations							
Variables	Mean	Std Dev.	ER	RR	CPP	C	WL	L
Employee Retention(ER)	4.0545	.87615	1	.911**	.823**	.883**	.897**	.894**
Reward and remuneration(RR)	4.0455	.88189	.911**	1	.796**	.866**	.880**	.877**
Continuous Professional Development(CPP)	3.9000	1.01322	.823**	.796**	1	.871**	.808**	.915**
Communication (C)	3.9182	.97803	.883**	.866**	.871**	1	.812**	.883**
Work-Life Balance (WL)	4.1182	.82096	.897**	.880**	.808**	.812**	1	.886**
Leadership (L)	4.0545	.88656	.894**	.877**	.915**	.883**	.886**	1
**. Correlation is significant at the 0.01 level (2-tailed).								

In the table, a significant positive and strong correlation was found for employee retention in relationship with reward and remuneration policy (r = 0.911, p <0.01), with continuous professional development (r = 0.823, p <0.01), with open and clear communication (r = 0.883, p <0.01), with Work-Life Balance (r = 0.897, p <0.01), and with leadership (r = 0.894, p <0.01). This significant correlation indicates thatthese factors have a strong influence on the employee retention policy of the college. Moreover, a positive andstrong correlation was found betweenreward and remunerationpolicy, continuous professional development, open and clear communication, Work-Life Balance, and leadership which implies the college should develop and adopt a policy that has completesynchronization among those factors.

This significant correlation demonstrates that these variables influence the college's employee retention strategy. In addition, a positive and strong correlation was found between the institute'sreward and remuneration policy, ongoing professional development, open and transparent communication, Work-Life Balance, and leadership. This indicates that the college ought to develop and implement a policy that synchronizes all of these aspects completely.

10.2.3. Regression Model

Multiple regression is a statistical approach used to obtain the value of a measure of various predictor variables on an explanatory variable. It is the instantaneous amalgamation of numerous factorsto evaluate how and to what level the dependent variable is affected by various predictor variables. Regression is used to determine the value of a dependent variable based on the value of two or more predictor variables. In this study, we checked the impact of selected variables on the dependent variable.

The statistical method known as multiple regression is used to determine the effect of various predictor variables on an explanatory variable. It is the instantaneous fusion of numerous factors to determine how and to what extent the dependent variable is affected by various predictor variables. Based on the value of two or more predictor variables, regression is used to calculate the value of a dependent variable. In this study, we checked the impact of selected variables (reward and remuneration policy, ongoing professional development, open and transparent communication, Work-Life Balance, and leadership on the dependent variable (employee retention).

Table 10.2.3.1Regression Analysis

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.946[a]	.895	.890	.29068	.895	177.251	5	104	.000

Model Summary

a. Predictors: (Constant), L, RR, C, WL, CPP

b. Dependent Variable: ER

Table 10.2.3.2 Anova Table

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	74.885	5	14.977	177.251	.000[b]
	Residual	8.788	104	.084		
	Total	83.673	109			

a. Dependent Variable: ER

b. Predictors: (Constant), L, RR, C, WL, CPP

Table 10.2.3.3 Coefficient

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.053	.145		.370	.712		
	RR	.304	.082	.306	3.710	.000	.149	6.717
	CPP	-.052	.074	-.061	-.710	.479	.139	7.198
	C	.247	.072	.276	3.438	.001	.156	6.394
	WL	.323	.083	.303	3.910	.000	.169	5.932
	L	.167	.106	.169	1.573	.119	.087	11.444

a. Dependent Variable: ER

Source : Author's Computation.

Table-10.2.3.1 shows that 89.0% of employee retention is explained by all independentvariables, such as reward and remuneration policy, ongoing professional development, open and transparent communication, work-life balance, and leadership.However, the model's significance is demonstrated in the ANOVA table. According to Table 10.2.3.3 regression equation of employee retention satisfaction is :

Employee Retention = 0.53 + 0.304 (Reward and remuneration) -0.052 (Continuous professional development) +0.247 (Open and transparent communication) + 0.323 (Work-Life Balance) + 0.167 (leadership).

The results from the analysis showed there is a positive relationship between all the Employee Relationship practices and employee retention of employees except one i.e. opportunity for Continuous professional development.

13. Conclusion

In conclusion, there is strong evidence that employee relationships positively impact employee retention and job satisfaction. Employee retention is correlated with the strength of interpersonal relationships. There are numerous approaches to improving the representatives' relationship in this review. The best method for further developing representative relations is open and transparent correspondence. In an association, there should be a correspondence between one another. Consequently, they can achieve the same objective. There will continuously be a contention between the colleagues or among managers and workers in the association. Because employers can better understand their employees' strengths and weaknesses, the work becomes easier after communication. Based on their knowledge and skills, employees can be assigned jobs that are right for them. Employees place a high value on top management because it is essential to promote human values and maintain positive relationships with them. An organization can benefit from the efforts of skilled leaders and professionals in human resources to foster and maintain a spirit of cooperation. At the point when the pioneers generally continue upholding and executing this soul in the whole association, then the whole association will systematically assimilate a similar soul. Subsequently, it will end up being the association's perspective.

When they are satisfied with their work, representatives are motivated to work. Large portions of the representatives are persuaded to work when their top administration has valued their work. Additionally, the institute offers excellent benefits or rewards to its employees. Institutes will soon use gainsharing to reward productive teams. To reap the rewards, employees will do their best to complete all tasks. Fortunately, this strategy has helped improve relationships with employees. Motivated employees will drive the institute's growth.

Assuming that an institute has positive employee relations, the battles will be less because the differentiations between the employer and employee have not increased any expansive openings. While employee relations have been improved, the way of life in the work environment will turn out to be better, and individuals need to work in a work environment that has a decent culture. Employees will naturally comply with the institute's guidelines and standards when there is a good relationship in the group.

References

Abubakar, R. A., Chauhan, A., & Kura, K. M. (2015). The relationship between human resource management practices and employee turnover intention among registered nurses in Nigerian public hospitals: The mediating role of organizational trust. SainsHumanika, 5(2), 95-98

Bajaj, R. (2013). Suggestions to Implement Human Relations and Its Determinants in Public Sectors.

Bashir, S., &Ramay, M. I. (2008). Determinants of Organizational Commitment A Study of Information Technology Professionals in Pakistan. Journal of Behavioral & Applied Management, 9(2).

Bateh, J., &Heyliger, W. (2014). Academic administrator leadership styles and the impact on faculty job satisfaction. Journal of Leadership Education, 13(3), 34-49.

Blaikie, N. (2018). Confounding issues related to determining sample size in qualitative research. International Journal of Social Research Methodology, 21, 635-641

Burns, A. (2012). Employee Relations. In Prescott RK, Roth well WJ (Eds.) Encyclopaedia of Human Resource Management, Key Topics and Issues, 1:186. John Wiley & Sons.

Chiekezie, O.M., Emejulu, G. and Nwanneka, A., 2017. Compensation Management and Employee Retention of Selected Commercial Banks In Anambra State, Nigeria. Archives of Business Research, 5(3).

Chinomona, R. &Sandada, M. (2013). A shared goal, communication, and absence of damaging conflicts as antecedents of employee relationship strength at institutions of higher learning in South Africa. Mediterranean Journal of Social Sciences, 4(3), 137-145.

DeJonckheere, M., & Vaughn, L. M. (2019). Semistructured interviewing in primary care research: A balance of relationship and rigor. Family Medicine and Community Health, 7, 1-8

Din, N. N. O., Zainal, N., &Balakrishna, S. (2023). Factors Influencing Job Satisfaction Of Employees In The Higher Education Institutions In Malaysia. International Journal Of Education And Pedagogy, 5(2), 112-125.

Eckel, P. D., &Kezar, A. J. (2016). The intersecting authority of boards, presidents, and faculty: Toward shared leadership. In M. N. Bastedo, P. G. Altbach, & P. J. Gumport (Eds.), American higher education in the 21st century: Social, political, and economic challenges (5th ed.). Baltimore, MD: John Hopkins University Press.

employee retention in BPOs: focus on employee-organization value fit. The International Journal of Human Resource Management, 27(6), 635-652.

Figueroa, O. (2015). The influences impacting staff turnover in higher education. Journal of Management and Sustainability, 5, 86-93

Fletcher, L., Alfes, K., Robinson, D. 2018. The relationship between perceived training and development and employee retention: the mediating role of work attitudes. The International Journal of Human Resource Management, 29(18), 2701-2728.

Frye, W., Kang, S., Huh, C., Lee, M. 2020. What factors influence Generation Y's employee retention in the hospitality industry: An internal marketing approach. International Journal of Hospitality Management, 85, 102352.

Fusch, P. I., & Ness, L. R. (2015). Are we there yet? Data saturation in qualitative research. The Qualitative Report, 20, 1408-1416. Retrieved from https://nsuworks.nova.edu/tqr/

Garibay, J. C. (2015). STEM students' social agency and views on working for social change: Are STEM disciplines developing socially and civically responsible students? Journal of Research in Science Teaching, 52, 610-632. doi:10.1002/tea.2013

Haldorai, K., Kim, W.G., Pillai, S.G., Park, T.E., Balasubramanian, K. 2019. Factors affecting hotel employees' attrition and turnover: Application of pull-push-mooring framework. International Journal of Hospitality Management, 83, 46-55.

Hinkin, T. R., & Tracey, J. B. (2010). What makes it so great? An analysis of human resources practices among Fortune's best companies to work for. Cornell Hospitality Quarterly, 51(2), 158-170.

Hsieh, C. and Kleiner, B.H. (2003). New developments in executive compensation. Management Research News, 26(7), pp.72–78.

Huang, C. and Kleiner, B.H. (2005). Managing compensation in the financial service industry. Management Research News, 28(11/12), pp.20–31.

Joarder, M. H. (2012). The role of HRM practices in predicting faculty turnover intention: empirical evidence from private universities in Bangladesh. The South East Asian Journal of Management.5(2), 159-179.

Justice Solomon Korantwi-Barimah, Factors Influencing the Retention of Academic Staff in a Ghanaian Technical University, Human Resource Management Research, Vol. 7 No. 3, 2017, pp. 111-119. doi 10.5923/j.hrmr.20170703.03.

Kundu, S.C., Lata, K. 2017. Effects of supportive work environment on employee retention: Mediating role of organizational engagement. International Journal of Organizational Analysis, 25(4), 703-722.

Liao, S.-h., Chang, J.-c., Cheng, S.-c., &Kuo, C.-m. (2004). Employee relationship and knowledge sharing: a case study of a Taiwanese finance and. Knowledge Management Research & Practice, 24-37.

Long, H. (2016). The new normal: 4 job changes by the time you're 32. https://money.cnn.com/2016/04/12/news/economy/millennials-change-jobs-frequently/

Mehta, DrMita&Kurbetti, Aarti&Dhankhar, Ravneeta. (2014). Review Paper -Study on Employee Retention and Commitment. International Journal of Advance Research in Computer Science and Management. 2. 154-164.

Michael O. Samuel &CrispenChipunza. (2013). Attrition and Retention of Senior Academics at Institutions of Higher Learning in South Africa: The Strategies, Complexities and Realities, 35(2), 97-109.

Mitchell, T. R., & Albright, D. (1971). Expectancy Theory Predictions of Job Satisfaction, Job Effort, Job Performance, and Retention of Naval Aviation Officers. Organisational Research University of Washington Seattle, Washington, TR 71-17, 1-25.

Mohammed Sahedur Rahman, RabeyaKhatun Taniya (2017), Effect of ERM on Employee Performance: A Study on private commercial banks in Bangladesh, Human Resource Management Research, 7(2): 90-96.

Ng'ethe JM. (2012). Influence of leadership style on academic staff retention in public universities in Kenya. International Journal of Business and Social Sciences, 3(21).

Pamuditha and HarshaniSamarasinghe (2017), Study on the effective factors on the employer-employee relationship for motivation of associate level of employees at ABC hotel, Columbo, International Journal of Scientific and Research Publication 7(11)

Pavithra, J. &Thirukumaran,. (2018). A study on employee retention with special reference at Philips Electronics, Chennai. International Journal of Pure and Applied Mathematics. 119. 1523-1543.

Presbitero, A., Roxas, B., Chadee, D. 2016. Looking beyond HRM practices in enhancing

Rahaman, M. A., Uddin, M. S., & Latif, W. B. (2023). Effects of Training and Development, Organizational Culture, Job Satisfaction, and Career Development on Employee Retention in Commercial Banks in Bangladesh. The Journal of Asian Finance, Economics and Business (JAFEB), 10(2), 91-97.

Raja, Dr V. Antony Joe, and R. AnbuRanjith Kumar. "A Study on Effectiveness of Training and Development in Ashok Leyland all over India." Journal of Management 3.1 (2016).

Rathakrishnan, T., Imm, N. S., &Kok, T. K. (2016). Turnover intentions of lecturers in private universities in Malaysia. Social Sciences & Humanities, 24, 129-146.

Rose, E.D. (2008). Employment Relations. (3rd Ed.). Pearson Education Ltd, London. The UK.

Rowland World, AdewaleOsibanjo, OlalekeOgunnaike, Odunyo P Salau, Ebegukiigbinoba (2016), Employee Relations Strategy, The Journal of Human Work 3(1):53-63

Sandhya, K., & Kumar, D. P. (2014). Employee retention: A strategic tool for organizational growth and sustaining competitiveness. Journal of Strategic Human Resource Management, 3(3), 42-45. Retrieved from http://www.pulishingindia.com

Saxena, R. (2017). Muddling through the passage of qualitative research: Experiences of a novice researcher. Vision, 2, 314-322

Selesho, J. B., &Naile, I. (2014). Academic staff retention as a human resource factor: University perspective. International Business & Economics Research Journal, 13, 295-304. doi:10.19030/iber.v13;2,8444

Selesho, J. M., Naile, I. (2014). Academic Staff Retention as a Human Resource Factor: University Perspective, International Business & Economics Research Journal, 13(2), 295-302.

Sepahvand, R., &Khodashahri, R. B. (2021). Strategic human resource management practices and employee retention: A study of the moderating role of job engagement. Iranian Journal of Management Studies (IJMS), 14(2), 437-468.

Sinniah, S., Mohamed, R. K. M. H., Mior, W. R., Harith, A., Izni, W. N., &Rawshdeh, Z. A. (2019). Talent retention in private universities of Malaysia. International Journal of Engineering and Advanced Technology (IJEAT), 8(6S3), 233-239.

Takawira, N., Coetzee, M., &Schreuder, D. (2014). Job embeddedness, work engagement and turnover intention of staff in a higher education institution: An exploratory study. SA Journal of Human Resource Management, 12(1), 1-10.

Umpierrez, A. (2021, March 2). Higher Ed Institutions Facing Increased Turnover Due to Burnout During Pandemic. Retrieved from Plan Sponsor: https://www.plansponsor.com/ higher-ed-institutions-facing-increased-turnover-due-burnout-pandemic.

Wellman JC, Kruger SJ 2004. Research Methodology for Business and Administrative Sciences. 3rd Edition. Cape Town: University Press.

Williams, M. L., &Dreher, G. F. (1992). Compensation system attributes and applicant pool characteristics. Academy of Management Journal, 35(3), 571-595.

Wulansari, P., Meilita, B., &Ganesan, Y. (2020). The effect of employee retention company to turnover intention employee – A case study on head office Lampung bank. Management, and Entrepreneurship, 117, 236-239.

Drivers of Cashless Payments in Emerging Markets

SAREESH K AND SHACHEENDRAN V

Abstract : *Cashless payments are gaining popularity around the world. Countries are competing to build digital payment ecosystems in order to accelerate the adoption of cashless payments. The purpose of this study is to find out what drives cashless payments in emerging markets. The panel data regression method was used to analyse a panel data collection of nine emerging market economies. The research demonstrates the significant impact of internet use on cashless payments. The amount of cards has a detrimental impact on the outcome. Internet based payments are becoming more popular which is easy and convenient method of cashless payments.*

Keywords : Cashless Payments, Electronic Payments, Digital Payments, Emerging Markets, Panel Data.

1. Introduction

The global growth of cashless payments shows an upward trend. Adoption of innovative technologies in the financial service sector accelerates the growth of cashless payment systems. Countries are largely promoting cashless payments by facilitating simplified and easily accessible digital payment ecosystems. Mobile payments, card payments, and NFC payments technologies provide convenience and help to reach every segment of the population. The outbreak of covid-19 also accelerates the growth of cashless and contactless payments. People depend on technology to find safe and efficient payment transactions, which enables social distancing. (Daqar et al., 2021;Anderson et al., 2020).Low- and lower-middle-income countries stepped up to fulfil the growing demand for digital payment needs during the outbreak (Mansour, 2021).

Sareesh K, Research Scholar, Department of Management Studies, Dr.Janaki Ammal Campus, Kannur University, Palayad, Kannur District, Kerala, India-670661. E-mail : sareeshkresearcher@gmail.com Mob: 9745241625.

Dr.Shacheendran V, Professor, GPM Govt. College, Manjeshwaram, Kasaragod Dt., Kerala, India - 671323. E-mail : drshacheendranv@gmail.com, Mob : 9497292772.

The global fintech lenders paved a new ways to provide financial services and it is going to shape the future of banking (Murinde et al., 2022). It helps to bring banking services to remote locations, thus providing financial inclusion. Global markets are moving towards a digital economy, and finTech promotes digital economy growth by encouraging technology innovations (Xiaohui et al., 2022).Apart from developed economies, emerging markets have great potential for cashless payment growth. They are adopting the latest fintech ecosystems and facilitating cashless payment growth by utilising the growth of GDP and large human resources.

The purpose of the present study is to identify the drivers of cashless payments in the emerging markets. In order to find this objective, the study used a panel data set of nine emerging economies. Selected macroeconomic variables were analysed using panel data regression method and fixed and random effect models. The rest of the paper is organised as follows. Section II summarised the literature related to the study. Data and methodology were discussed in section III. The result of the analysis is presented in Section IV, and Section V summarises the study.

2. Literature Review

Many studies conducted to identify the factors influencing the adoption of cashless payment systems. Users' readiness to go cashless is directly affected by ease of use, usefulness, innovativeness, optimism, and lack of awareness (Balakrishnan et al., 2021).Performance expectancy, facilitating condition, and perceived technology security was found to be the most significant influencing factors towards the adoption of cashless payments (Rahman et al., 2021). Most of the studies found the significance of security in the adoption of digital payment methods. If the risk is low then, people will trust the system which results in the increased adoption of cashless payment systems.

Researchers also used panel data set to identify the influence of different digital payment modes on various economic parameters. In the short period adoption of a cashless payment method will influence other cashless payment system, and cashless payment systems have an impact on the economic growth in the long run (Tee & Ong, 2016). The fixed effect analysis shows that increased volume of digital payments helps an economy to reduce corruption (Kwaku et al., 2021). Immordino & Russo(2017) also found similar result that, credit and debit card payments helps to reduce the VAT evasion.

The micro data analysis on the determinants of card payments reveals that availability, open mindedness and trust have a positive influence, but the macro

data analysis does not support the relevance of education, income, and age (Goczek & Witkowski, 2015).The mobile and internet usage and the level of financial inclusion influence the digital payments in passenger transport (Urbanek, 2021). The study of the relationship between cashless economy policy and financial inclusion discovered that awareness, user value proposition, and infrastructure all have a strong significant influence (Bayero, 2015).

3. Data and Methodology

The study used panel data set of various macroeconomic indicators from nine emerging economies. IMF Identified twenty countries as emerging markets during the period 2010-20, based on the sustained economic growth. These twenty countries actively participating in global trade and financial market integration and accounts for 34 percent of world's nominal GDP (Duttagupta & Pazarbasioglu, 2021). Among the twenty emerging market economies, nine economies having higher digital payment growth potential were selected for the study. They are; Argentina, Brazil, China, India, Indonesia, Russia, Saudi Arabia, South Africa and Turkey. India, china and Russia contributing to the major portion of global electronic payment transactions (Bruno et al., 2020).The CAGR of cashless payment volume for the selected economies during the period 2012-20 are shown in Figure-1. From the data it is clear that the growth of cashless payment for five emerging markets such as, China, India, Indonesia, Russia and Saudi Arabia is impressive.

Figure-1 : CAGR of Cashless Payments Volume (2012-20)
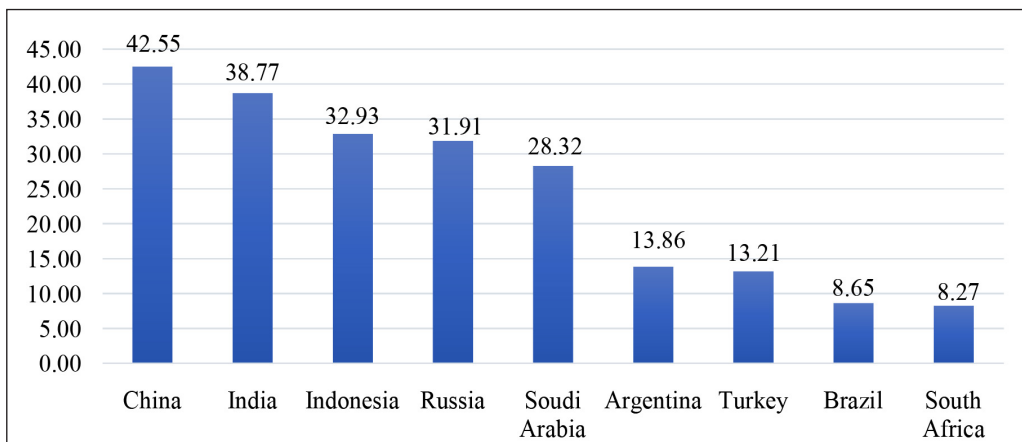
Source : Red Book Statistics-Bank of International Settlement.

The macro economic variables were analysed to identify the drivers of cashless payments. Volume of cashless payment per inhabitant was selected as the proxy for establishing relationship. Six macro economic variables have been selected for testing the relationship towards cashless payments. Data were collected from the Red book statistics of Bank of International Settlement and the World Bank database. The sample period for the study is 2012-2020, and 81 samples were collected. The detailed list of the macro economic variables adopted for the study is given in Table-1.

Table-1 : Summary of Variables Studied

Variables	Description	Source
Cashless payments per inhabitant (CLPV)	Annual cashless payment volume per inhabitant	BIS Statistics
GDP per Capita (GDPPC)	Annual GDP at Current US$	World bank data bank
Cards per hundred people (CARD)	Total number of payments cards issued per hundred people	BIS Statistics
POS per hundred people (POS)	Total number of pos terminals established per hundred people	BIS Statistics
Inflation (INFL)	Inflation, GDP deflator (annual %)	World bank data bank
Industry Value Added (IVA)	Industry (including construction), value added (% of GDP)	World bank data bank
Internet Usage (INTUSE)	Individuals using the internet (% of population)	World bank data bank

Source : Prepared by the researcher.

4. Data Analysis and Result

Panel data regression method was adopted to identify the relationship between digital payment volume and macro economic variables. Appropriate regression technique will be selected from among Pooled ordinary least square model, Fixed Effect Model (FEM), and Random Effect Model to establish the relationship between variables in the panel data. Breusch-Pagan test and Hausman test were applied to identify the suitable model.The analysis was carried out by importing panel data in E-Views version 12.

4.1. Model Specification

The determinants of cashless payments are analysed using six macro economic variables. They are; GDP per capita, Card per hundred people, POS per hundred people, inflation, Industry value added, and internet usage. The fixed effect model regression equation for panel data is as follows:

$$Y_{it} = a_i + bX_{it} + e_{it}$$

Where Y_{it} is the value of dependent variable (cashless payment volume per inhabitant) of country i at time t. X_{it} is the value of independent variables of country i at time t.

4.2. Descriptive Statistics

The summary of descriptive statistics of seven macro economic variables is given in table 2. Among the countries China and India are the two major fast developing countries and also the largest populated countries globally. They adopted latest mobile and communication technologies to strengthen the cashless payment ecosystems. As a result a rapid growth can be observed in the cashless payment transactions.

Table-2 : Descriptive Statistics

	CLPV	GDPPC	CARD	POS	INFL	IVA	INTUSE
Mean	144.301	9768.61	232.548	1.41787	7.8856	31.4489	56.2423
Maximum	1599.48	25243.6	634.648	6.32106	50.9215	62.6912	97.8600
Minimum	8.59317	1443.88	56.4732	0.06747	-16.909	17.6501	11.1000
S.D	268.998	5869.43	139.478	1.21348	11.0094	10.0678	21.7147

Source : Consolidated by the researcher.

The selected countries have an average of 144.301 cashless payment transactions per inhabitant per year. A higher average GDP per capita value indicates the economies' overall production strength. In these countries, more than 50% of the population uses the internet. However, there is a substantial difference between the maximum and minimum values of the study's parameters. Because emerging markets are fast-growing economies, rapid growth in both economic and non-economic activities has been observed over the last nine years.

4.3. Empirical Result

Pooled ordinary least square model (POLS) has been analysed using Panel least square method, to establish the relationship between Cashless payment Volume per inhabitant and selected macro economic variables. The result of the pooled regression model is presented in Table-3. The result shows that, card per inhabitant, inflation and internet usage were significant at 5% significant level.

Table-3 : Result of Pooled Regression Model (Panel Least Square)

Variable	Co-efficient	S.E	t-Statistics
Constant (C)	-257.7780*	120.9379	-2.131491
GDPPC	0.006316	0.006765	0.933633
CARD	-0.063436**	0.023767	-2.669040
POS	2.907975	3.007501	0.966907
INFL	-6.778680**	2.365754	-2.865336
IVA	5.715984	3.236173	1.766279
INTUSE	5.696003**	1.758682	3.238790
R-squared	0.492583	**F-statistic**	11.97276
Adjusted R-squared	0.451441	**Prob. (F-statistic)**	0.000000
SE of Regression	192.2331		

** $p < .01$,* $p < .05$

Source : Consolidated by the researcher.

Then we applied Breusch-Pagan (BP) test to identify the suitability of Pooled OLS model. The test result shows that there is cross section random effect in the panel data (Cross section- $p<.05$, Time- $p>.05$). Therefore, in the second stage, one sided random effect model using panel EGLS model has been analysed for the data.

The test result shows that (Table-4), the co-efficient of the model is significant at 5% level. Number of cards, inflation and internet usage were significantly influencing the cashless payment volumes. The suitability of random effect model was tested by conducting Hausman test. The purpose of the test is to

identify whether unique error are correlated with each explanatory variable. The test result reject the null hypothesis ($\chi = 83.939705$; df = 6; p < .05). Random effect model is not appropriate for the data; hence fixed effect model is used for analysis.

Table-4 : Result of Random Effect Model

Variable	Co-efficient	S.E	t-Statistics
Constant (C)	-255.8764**	95.12346	-2.689940
GDPPC	0.001987	0.004601	0.431764
CARD	-0.065860***	0.018285	-3.601822
POS	2.223789	2.176121	1.021905
INFL	-7.466939***	1.827881	-4.085025
IVA	3.150927	2.501316	1.259707
INTUSE	8.217734***	1.161968	7.072255
R-squared	0.410997	F-statistic	8.606014
Adjusted R-squared	0.363240	Prob. (F-statistic)	0.000000
SE of Regression	166.6994		

*** p <.001, ** p <.01

Source : Consolidated by the researcher.

The result of fixed effect model is shown in table 5.A cross section fixed effect can be observed across the selected countries. The Chow test reject the null hypothesis (p <0.05), which confirm the suitability of fixed effect model over common effect model. Among the six variables, three variables namely, number of cards, industrial value added, and internet usage have significant influence on cashless payments. The constant of the model is also significant at 5% level. Internet usage has a strong positive influence on cashless payment volume, whereas number of cards and industry value added has inverse influence. GDP per capita, number of POS terminals and inflation does not significantly contribute to cashless payment volume. The variables in the model together contribute 85 percent towards cashless payment volume.

Table-5 : Result of Fixed Effect Model

Variable	Co-efficient	S.E	t-Statistics
Constant (C)	552.9921*	261.2866	2.116420
GDPPC	0.018293	0.009601	1.905204
CARD	-0.072644*	0.031910	-2.276550
POS	4.543657	2.921340	1.555333
INFL	2.645832	3.176960	0.832819
IVA	-28.27714***	5.956420	-4.747338
INTUSE	6.855097**	2.036893	3.365467
R-squared	0.849652	**F-statistic**	26.64153
Adjusted R-squared	0.817760	**Prob. (F-statistic)**	0.000000
SE of Regression	114.8343		

*** $p < .001$, ** $p < .01$, * $p < .05$

Source : Consolidated by the researcher.

5. Summary and Conclusion

This paper seeks to identify the macroeconomic drivers of cashless payments. Panel data regression model has been analysed by collecting data from 9 emerging market economies. The test result shows that individuals using internet have strong positive influence on cashless payment volume. Most of the cashless payment methods are provided through digital payment modes. So growth in internet connectivity has positive impact on the cashless payment transactions. At the same time number of cards issued by the authority has negative impact on cashless payment transactions. The fast growing technology adoption in emerging markets lead to the development of mobile phone based payment technology. Countries like India, China and Indonesia, focused on mobile based payment system. It may reduce the demand for card payments. Inflation make the economy unstable and higher price of commodities will reduce the transaction volumes of payment transactions. Therefore, a negative influence of inflation can be observed on cashless payment volumes.

The study focused on emerging market to identify the possible influencing factors which facilitate the growth of cashless payments. The analysis revealed a strong positive influence of internet usage on cashless payment and at the same time a

negative influence of inflation, and number of payment cards also observed. The study has certain limitations in the following aspects. Firstly, it focused on the emerging markets and selected 9 economies to collect data. Future research can be conducted similar studies on other economies. Second, six factors have been analysed to identify the influence on cashless payment volume. More number of factors can be incorporated in the future studies. Studies on the factors affecting cashless payment value can also be conducted by the researchers.

References

Anderson, R. M., Heesterbeek, H., Klinkenberg, D., & Hollingsworth, T. D. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic? *The Lancet*, *395*(march), 931–934. https://doi.org/10.1016/S0140-6736(20)30567-5

Balakrishnan, V., Liyana, N., & Shuib, M. (2021). Drivers and inhibitors for digital payment adoption using the Cashless Society Readiness-Adoption model in Malaysia. *Technology in Society*, *65*(February), 1–9. https://doi.org/10.1016/j.techsoc.2021.101554

Daqar, M., Constantinovits, M., Arqawi, S., & Daragmeh, A. (2021). The role of Fintech in predicting the spread of COVID-19. *Banks and Bank Systems*, *16*(1), 1–16. https://doi.org/10.21511/bbs.16(1).2021.01

Duttagupta, R., & Pazarbasioglu, C. (2021). *Emerging markets must balance overcoming the pandemic, returning to more normal policies, and rebuilding their economies* (Issue June).

Goczek, Ł., & Witkowski, B. (2015). *Determinants of card payments*. *6846*(November). https://doi.org/10.1080/00036846.2015.1102846

Immordino, G., & Russo, F. F. (2017). Cashless Payments and Tax Evasion. *European Journal of Political Economy*, *October*. https://doi.org/10.1016/j.ejpoleco.2017.11.001

Kwaku, T., Senyo, P. K., & Addo, A. (2021). Do digital payment transactions reduce corruption/? Evidence from developing countries. *Telematics and Informatics*, *60*(November 2020), 101577. https://doi.org/10.1016/j.tele.2021.101577

Murinde, V., Rizopoulos, E., & Zachariadis, M. (2022). The impact of the FinTech revolution on the future of banking/: Opportunities and risks. *International Review of Financial Analysis*, *81*(March), 102103. https://doi.org/10.1016/j.irfa.2022.102103

Mansour, H. (2021). How successful countries are in promoting digital transactions during COVID-19. *Journal of Economic Studies*, https://doi.org/10.1108/JES-10-2020-0489

Rahman, M., Ismail, I., & Bahri, S. (2021). Analysing consumer adoption of cashless payment in Malaysia. *Digital Business*, *1*(1), 100004. https://doi.org/10.1016/j.digbus.2021.100004

Tee, H., & Ong, H. (2016). Cashless payment and economic growth. *Financial Innovation*, *2:4*, 1–9. https://doi.org/10.1186/s40854-016-0023-z

Urbanek, A. (2021). Financial inclusion as an important factor influencing digital payments in passenger transport/: A case study of EU countries. *Research in Transportation Business & Management*, 100691. https://doi.org/10.1016/j.rtbm.2021.100691

Xiaohui, C., Lei, T., & Wen, C. (2022). How does FinTech affect the development of the digital economy? evidence from China. *The North American Journal of Economics and Finance*, *61*. https://doi.org/https://doi.org/10.1016/j.najef.2022.101697.

Socio-Economic Conditions of Marine Fishermen in Ramanathapuram District, Tamil Nadu, India

S. SANKARESWARI

Abstract : *India is one of the top ten fish producing countries in the world in terms of production and export of sea food. Fishing is considered to be a strong source of income and employment. The sector has made a substantial contribution to foreign exchange. The present paper appraised the Socio-economic positions of marine fishermen of Rameswaram in Ramanathapuram District. In the present study, both quantifiable and categorical data were collected by virtue of interview schedule and analyzed by using statistical tools like; Chi-square test, Ranking scales and Factor analysis. The analysis signifies the socio-economic status of marine fishermen, problems faced and important factors which determines their standard of living, expectation of benefits from the Government. Chi-square test betrays income status, savings culture, duration of fishing, consumption habits of the respondents. Ranking scales patrons the expectation of benefits from the Government and the Factor analysis designate the problems on marketing of fishes & the factors influencing the level of satisfaction of marine fishermen towards their occupation. The study concludes that the fishermen are in generally poor, semiliterate, illiterate; poor family income, gargantuan associated with destitute financial inputs have left many of the fishermen in an impoverished economic status. Further the proper marketing and storage facilities for the yield is need of the hour. The suggestions of these findings and the significance of the study are discussed and the outcomes of the present research useful for the Policy Makers.*

Dr. S. Sankareswari, Assistant Professor of Commerce, Thiagarajar College, Madurai, Madurai Kamaraj University, Madurai, Tamil Nadu, India.

1. Personal Reflexive Statement

India is a country with people from various backgrounds and occupations. Several communities are based out of the occupations that people perform, and thereby their socio-economic conditions differ drastically from one another. For this reason, it is important to analyze and understand the lives and socio-economic conditions of people in communities to determine their standard of living and improve upon them. In this context, the present research paper is an strive to determine the socio-economic status of the marine fishermen in Ramanathapuram district, Tamil Nadu. It is well known that the fishermen community faces various challenges in meeting their basic needs due to various factors like changes in climatic conditions, environment protection standards, and declining sea life. Therefore, an effort has been taken to study the socio - economic condition of the fishermen in Rameswaram, Ramanathapuram District. It is one of the most popular coastal districts of Tamil Nadu – Ramanathapuram. The researcher believes that the findings of the study would not only help to derive an unbiased analysis of the livelihood of the people in the community, but also helps in developing the future course of actions to be undertaken to uplift them.

2. Introduction

India is considered as third largest fish producer in the world with 14.75 million tonnes of fish produced in the year 2023. The total value of marine product exports from India was $4.54 billion in the fiscal year 2021-2022.This sector has made a substantial contribution to foreign exchange earnings which stand at fiscal year 2022-2023, frozen shrimp alone earned $5.48 billion and 1.36 million metric tonnes of seafood in the year 2022-2023 and the earnings amount to 1.24 percent of the GDP. In India, around 4 million fishermen with approximately 61% living below the poverty line and depend on fisheries for their bread and butter. Those directly involved in fishing activities as well as engaged in allied activities such as fish processing, marketing, and net making. Besides, fisheries sector provides livelihood, employment and entrepreneurship to fishing folk. It is axiomatic that for enhancing food, security, alleviating poverty and generating further employment opportunities are a must. India has a long coastline of 8,118 Km with an Exclusive Economic Zone (EEZ), which is highly appropriate for capture and culture fisheries. India's marine fish marketing has changed quickly over the years. Fish and fisheries products are becoming more and more popular worldwide due to their high nutritional content. The intensity of fishing increased with the demand for fish, and target fishing in open access fisheries resulted

from an overabundance of some types. Tamil Nadu has emerged as a leading maritime fish producer, with an yearly production of 929.000 tons in 2023.Ramanathapuram district is the main producer of marine fish in the State, followed by Nagapattinam, Thiruvarur and Thanjavur, Tuticorin, Kanniyakumari, and Chennai put together reckoned for over 60% of the state's marine fish production. Despite this, fishermen tend to be low-income individuals with low literacy rates, low family incomes, and few opportunities for other employment. Numerous specialized programs and initiatives have been consistently introduced by the Central and State governments. Within this framework, the current study concentrated on issues that are now pertinent to the general improvement of fisherman in general and the Rameshwarm fishermen in Ramanathapuram District specifically.

3. Review of Literature

The following reviews have been used by the researcher to support the study problem that was chosen.

Selvaraj. N (2022) has stated in his research "Socio-Economic Conditions of the Fishermen in Tamil Nadu – India" that the market for marine products of the nation in Asia has not well organized. He proposed that the markets need to be reformed by bringing in new management approaches and updating the standard fish selling tactics.

S. Manimaran & Dr. K. Suriyan, (2021), conducted **"**A Study on Socio-Economic Condition on Fishermen in Cuddlore District" and concluded that, Their standard of living is going to get better. However, extremely low incomes increase the likelihood of starving, pose problems for their children's education, and result in a bad quality of living that inevitably leads to a terrible social life, all of which have a detrimental effect on the individual's life. Price increases for food, essential services, medical care, and education.

Emaldarani. S & Dr.A.Kanmani Joan (2019) have concluded in their research paper as "Socio-Economic Status of Fishermen Community (with special reference to Nagapattinam Town, Tamil Nadu)". The fishermen's economic situation was so dire that they weren't even entirely focused on fishing. The minimum requirements were not met by the maximum number of fisherman. The majority of fishermen showed little awareness of contemporary capture fishing methods.

Vivek Parashar, Satish Kumar Bara, Dinesh Damde, Ankit Kumar and Vipin Vyas (2016), in their research "Assessment of the socio-economic status of

fishermen communities: a case study from a selected reach of River Narmada, India" observed that, A Significant parts of the riverine capture fishery industry are the traditional fishing communities. The study suggested that, by raising capture rates, fisheries regulations can both protect the natural biodiversity and enhance the standard of living for fishermen. Daily fish marketing should be conducted in order to sustain the fundamental necessities of the current rural communities. In the off-season for fishing, ventures such as beekeeping, gardening, handicrafts, etc., should be launched to generate revenue.

Bijayalakshmi Devi and, Ajit Kumar (2014), in their study came to the conclusion, that a wide range of studies on the socioeconomic conditions in the area have been used to construct the general socioeconomic situation of fishermen in India. It is recommended that scientists and policy makers concentrate more on the establishment of backward and forward linkages on the overall socio-economic and cultural development of the fishermen.

Vhankade (2011), in his study revealed that the government provides financial support to cooperative societies through loans and subsidies to the fishing community.He suggested that, the fishermen cooperative society shall provide services and credit to the poor fishermen for working capital requirements also.

Durairaj (2009) in his study on "Marine Fishing Industry in Ramanathapuram district" focused on the distribution of revenue, debt, and the yearly average return per craft of both mechanized and non-mechanized industries, including fishery, in the Ramanathapuram district.

Ganesh Kumar et al., (2008) has conducted an in-depth study in all the major coastal states and selected inland states to understand the domestic marketing of fish in India. It has been discovered that the infrastructure at wholesale and retail markets, as well as fishing harbors, is woefully inadequate and badly maintained. The researcher strongly suggests that a unified market strategy be developed for the promotion of fish and fish products.

Ragupathy & Venkatachalam (2005) have presented a paper which looked at the threat to India's large fisheries, especially those around the Gulf of Mannarregion. It is widely quoted that, many people have stated that the introduction of trawler fishing methods, which scrape the sea floor and ultimately catch young fish, is to blame for the depletion. It was advised to assess this method's efficacy critically and offer a substitute for maintaining the resources.

Shiyani, R.L, (2002) has made an examination of Rameswaram's marine fisheries' growth and instability by species and district. While Rameswaram had a sharp fall in marine fish productivity, the state's overall marine fish production increased over time. To maintain socioeconomic equilibrium, the government should take the appropriate actions to enforce maritime rules that define distinct fishing grounds for various vessel gear combinations.

Balasubramaniyan (2001) in his study, the economic standing of fishermen in two coastal fishing communities in Thoothukudi District is compared in this study. The findings show that, in both villages, the fishermen had a positive view on the motorization of fishing vessels.

Dibakar Naik (2001) have conducted a research on the patterns of marine fish landings and marketing in various Thoothukudi marine areas. In Thoothukudi, the marketing of marine fish has been handled by a multitude of middlemen who have established an extensive network of market channels.

Islam, M.S (2000) conducted a research on "Socio-economic profile in Fisheries Development" and observed that a large number of women involved in fisheries activities (such as fish collection, fish drying and net making) earned a small amount of income. The study recommended that the government and NGOs should come forward to facilitate women to be employed in income generating activities.

Verduijin (2000) carried out a survey in the Kanyakumari district on behalf of the BOBP to ascertain the basic needs of 39 coastal fishing communities. The survey's findings indicated that the use of motorization and mechanization in fishing crafts, the rise in the population of active fishermen, and the absence of alternative income-generating opportunities have all contributed to the increased intensity of fishing. The report also emphasizes how the lack of amenities for sanitary conditions, health care, and safe drinking water exacerbates the worries of the fishermen.

4. Statement of the Problem

India is among the nations where a sizable portion of the land is submerged beneath the sea. Because of this, the majority of people living in these areas are exclusively involved in fish farming and fishing. The socio-economic status of these people largely depends on the income from this occupation only. The

amount of fish available varies seasonally; the mechanized boats have replaced the country boats for fishing activities. There is always a relationship between the quantity of fish caught and its price. In the rainy season, the fishermen rarely enter the sea for fishing and even if they go they catch only minimum quantity which fetches them low income from these operations and at times they face financial crises. In order to meet these crises, the fishermen mortgage their valuables including gold ornaments and sometimes they draw near money lenders for getting loans at exorbitant interest. Family size combined with limited financial inputs has created many issues for the fishermen, who have low literacy rates, low family incomes, and few opportunities to transition to other jobs. Even with their moderate incomes, the fishing community is economically weak They struggle to provide for their family in part due to their inconsistent income and in part to their alcohol addiction. So it is but natural they remain poor and always in need. Since fishing is their primary source of income, it is exceedingly difficult for them to increase their earnings and raise their family's standard of living. The current study intends to investigate the socio-economic circumstances of the fishermen in the Ramanathapuram District in this regard.

5. Objectives of the Study

The following are the major objectives of the study :

1. To examine the socio-economic conditions of marine fishermen of Rameswaram in Ramanathapuram District.

2. To investigate the problems faced and support provided by the Government of Tamil Nadu to boost the Socio-economic conditions of marine fishermen.

3. To present suitable suggestions based on findings.

6. Methodology of the Study

Sociological interest has always been piqued by studies of socioeconomic situations. The current study is focused on the socioeconomic conditions of marine fishermen.

The primary objective of the study is to comprehend the socio-economic status of marine fishermen because fisheries are the booming/flourishing sectors, which contributes considerable income on country's GDP. GDP can determine the economic development of the Country. The study has been conducted in

Rameswaram Taluk in Ramanathapuram District. The State of Tamil Nadu's Ramanathapuram District is the leading district for producing marine fish, followed by Nagapattinam, Thiruvaram, Tuticorin, Kanyakumari, and Chennai. There are nine taluks in the district: Mangadu, Akkalmadam, Anthoniatpattinam, Aiyankundu, China Palam, Mandapam, Pamban, and Thangachimadamas. A significant number of families who are fisherman live in these taluks. The researcher used a non-random sample technique (judgment sampling technique) to choose 150 marine fishermen as responders. Interview schedules were utilized to gather information about the profile of occupational activities and socioeconomic conditions. Secondary data are also collected and compiled from Books, Journals, Magazines, Publications, and Websites. The researcher used statistical methods, such as percentage analysis, weighted average ranking, Garret's ranking approach, factor analysis, and Chi-square test, to examine the data that was gathered.

7. Hypotheses of the Study

The researcher has established the following hypothesis in order to conduct the research :

1. The ownership of a fishing boat and monthly income are not significantly correlated.

2. The respondents' age and the amount of time they spend fishing in a year do not significantly correlate.

3. There is no discernible connection between their monthly income and their consumption patterns.

8. Analysis and Interpretation

8.1. Demographic Profile of the Respondents

When the respondents' demographic profile is examined, it becomes clear that 36% of them were primarily between the ages of 30 and 40.Most of the respondents (71.33 percent) are illiterate. A vast majority of 81.33 percent of the respondents got married, 56.67 percent live in nuclear families and 61.01 percent have more than four family members in their family belonging to the religion of Hindu followed by Christian and Muslim. Table-1 depicts the profile of demographics.

Table-1 : Demographic Profile

Demographic Factors		No. of Respondents	Percentage (%)
Gender	Male	150	100.00
Age	Below 20 years	17	11.33
	20-30 years	42	28.00
	30-40 years	54	36.00
	40 and above	37	24.67
Educational Qualification	No schooling	107	71.33
	Elementary	23	15.34
	Higher secondary	15	10.00
	Graduation	05	3.33
Marital Status	Single	28	18.67
	Married	122	81.33
Type of Family	Joint	65	43.33
	Nuclear	85	56.67
Size of Family	1-3	28	19.66
	4-6	92	61.01
	above 6	30	19.33
Religion	Hindu	101	67.33
	Muslim	20	13.33
	Christian	29	19.34
Occupation	Fishing	150	100.00

Source: Primary Data.

8.2. Occupational Profile

Occupation is the important source of income to the livelihood of an individual. The occupational profile of the respondents are analyzed which indicates that the majority 71.33 percent of the respondent have chosen fishing as their occupation by heredity at the age of 13-14 years. 41.33 percent of the respondents go to sea for fishing for200-250 days a year. The majority of 42.67 percent of the respondents used country boats for fishing and 42.67 percent of the respondents were actively involved in other activities like boat repairing, training to new learners and fish vending. Only 13.33 percent of the respondents' spouses are involved in fish vending and processing work to generate income for their families. The above fact presented in Table-2.

Table-2 : Occupational Profile

Occupational Profile		No. of Respondents	Percentage (%)
Occupation	Fishing	150	100.00
Reasons for choosing the occupation	Hereditary	107	71.33
	Profitability	18	12.00
	Lack of alternate employment	21	14.00
	Due to interest	04	2.67
Age at the time of entry into fishing (in a year)	10 - 12	36	24.00
	13 - 14	43	28.67
	15 - 17	32	21.33
	18 - 20	27	18.00
	20 and above	12	8.00
Duration of fishing in a year (days in a year)	Less than 100	04	2.67
	100 - 150	13	8.67
	150 - 200	22	14.67
	200 - 250	62	41.33
	250 - 300	37	24.66
	300 and above	12	8.00
Mode of Vessel for Fishing	Country boats	64	42.67
	Catamarans	09	6.00
	Motor boats	51	34.00
	Fiber boats	26	17.33
Occupational problems of fishermen	Yes	114	76.00
	No	36	24.00
Work other than fishing	Yes	64	42.67
	No	86	57.33
Nature of other work	Preparing new fishing net	09	14.07
	Sale of fishing net	10	15.62
	Fish vending	13	20.31
	Boat repairing	14	21.88
	Training activities for new learners	18	28.12
Employment of family members	Employed	20	13.33
	Not employed	130	86.67
Nature of employment	Organized private sector	06	30.00
	Un organized private sector	12	60.00
	Employed in other state	01	5.00
	Employed in gulf countries	01	5.00
Occupation of spouse	Home maker	80	64.52
	Fish Vendor	31	25.00
	Processing Worker	04	3.22
	Private Employee	03	2.42
	Self-Employed	06	4.84

Source : Primary Data.

8.3. Occupational Problems of Fishermen

The researcher used the weighted average ranking method to determine the occupational problems faced by the respondents in Ramanathapuram District. The points were assigned to each variable as 7,6,5,4,3,2,1 and the total score and mean score were calculated based on which the ranks are assigned. Out of the several variables, scarcity and high net cost are assigned the highest rank, followed by inaccessibility to credit and high boat maintenance costs. These are the major problems that marine fishermen face. Table-3 displays the occupational problems of the respondents.

Table-3 : Mean Score of Occupational Problems of Fishermen

S.No.	Problems	Total Score	Mean Score	Rank
1	Scarcity and high cost of Net	257	4.50	I
2	Inaccessibility to Credit	252	4.42	II
3	High cost of Maintenance of Boats	232	4.07	III
4	Non availability of spare parts for Boats	231	4.05	IV
5	High Cost of Equipment	217	3.80	V
6	Climate Conditions	216	3.78	VI
7	Inadequate Technology	191	3.35	VII

Source : Primary Data.

8.4. Profile of Economic Status

Earnings determine the respondents' socio-economic empowerment. Income is the primary factor that allows people to live happy lives. The study shows that 54% of respondents have an income between Rs. 5,000 and Rs. 10,000. It also determines the family's spending and saving patterns. The majority of 56.67 percent of the respondents spent their whole income on food only because of the larger size of the family and 51.33 percent of the respondents save meager amounts for their future contingencies in the Post office, Commercial banks and Chit funds. The results are shown in Table-4.

Table-4 : Economic Status of the Respondents

Economic Status		No. of Respondents	Percentage (%)
Monthly Income (in Rs.)	Less than 5000	27	18.00
	5000- 10000	81	54.00
	10000- 15000	35	23.33
	15000 and above	07	4.67
Allocation of Income	Food only	85	56.67
	Food and Savings	39	26.00
	Fulfill all needs	26	17.33
Savings	Yes	77	51.33
	No	73	48.67
Financial Institution for Savings	Commercial Banks	08	10.38
	Co-operative Banks	06	7.80
	Post Office	30	38.96
	Private Banks	26	33.76
	Chit Fund	07	9.10

Source : Primary Data.

8.5. Expenditure Pattern

Income is an important aspect that dictates the expenditure habits of the respondents. It also determines the socio-economic situations of fishermen. The current research illustrates that the majority of 62 percent of the respondents spent above Rs.15,000 for food and clothes, followed by medical expenses 45 percent of them spent below Rs.5000, 63.33 percent of them allocate less than Rs.5,000 for their children's education. The study indicates that the expenditure on fishing, 48.67 percent of them spent in the range of Rs.50,000-75,000 towards diesel & oil for boats in a year, followed by labour charges as 36.67 percent of them spent Rs.75,000-1, 00,000 and 32 percent of the respondents spent Rs.50,000-75,000 for maintenance of boats. Table-5 discloses the fact.

The Chi-Square test was used to test the following hypotheses at a 5% level of significance in order to determine the degree of agreement between respondents' satisfaction and socioeconomic characteristics.

Table-5 : Expenditure Pattern of the Respondents

Expenditure Pattern (Rs. in a year)		No. of Respondents	Percentage (%)
Food and Clothing	5000-10,000	06	4.00
	10,000-15,000	51	34.00
	15,000 and above	93	62.00
Medical Expenses	Less than 5000	68	45.33
	5000-10,000	44	29.33
	10,000-15,000	35	23.33
	15,000 and above	02	1.33
Expenditure on Children's Education	Less than 5000	95	63.33
	5000-10,000	46	30.67
	10,000-15,000	09	6.00
Expenditure for festival	Less than 5000	02	1.33
	5000-10,000	48	32.00
	10,000-15,000	100	66.67
Expenses on Electricity	Less than 500	110	73.33
	500-10,00	30	20.00
	1000-1500	10	6.67
Communication Expenditure	Less than 5000	118	78.67
	5000-10,000	28	18.67
	10,000-15,000	04	2.67
Expenditure on fishing: (Rs. in a year)			
Diesel and Oil Expenditure	Less than 50,000	58	38.67
	50,000 -75,000	73	48.67
	75,000 - 1,00,000	12	8.00
	1,00,000 and above	07	4.66
Labour Charges	Less than 50,000	19	12.67
	50,000 -75,000	46	30.67
	75,000- 1,00,000	55	36.66
	1,00,000 and above	30	20.00
Maintenance Expenditure	Less than 50,000	41	27.33
	50,000- 75,000	48	32.00
	75,000- 1,00,000	39	26.00
	1,00,000 and above	22	14.67

Source : Primary Data.

H_1 : The ownership of a fishing boat and monthly income are not significantly correlated.

H_2 : The respondents' age and the amount of time they spend for fishing in a year do not significantly correlate.

H_3 : There is no discernible connection between their monthly income and their consumption patterns.

At the 5% level of significance, the calculated values for each of the aforementioned hypotheses are greater than the table value. The null hypothesis is thus disproved. As a result, there is a strong correlation between the respondents' degree of satisfaction and socioeconomic characteristics. Table-6 reveals this information.

Table-6 : Results of Chi-square Test

Between	X^2	Table Value @5% level	Inference
Ownership of boat and monthly income.	11.447	7.815	Significant
Age and duration of fishing in a year.	12.772	24.996	Insignificant
Consumption habits and monthly income.	7.866	16.919	Significant

Source : Computed Data.

8.6. (Life Style) Cultural Factors

Socioeconomic conditions spokes about lifestyle also. This study analyzed the lifestyle of fishermen in Ramanathapuram District, which indicates that most of the respondents (80 percent) owned houses like huts, concrete and tiled houses. More than 60 percent of the respondents use water from their own pumps for drinking and other purposes. The majority of 73.33 percent of them eat stable food such as rice, fish, vegetables & milk and 58 percent of the respondents spent their leisure time on watching Television. The outcomes are shown in Table-7.

8.7. Channel of Distribution in Marketing of Fish

Depending on the situation, the respondents sell their fish directly to the Consumers, Wholesaler, Retailer, and Exporter. When they sell directly it is possible for them to get a reasonable price but it is not possible always. The present study indicates that the majority of the respondents (80 percent) are forced to sell their fish to wholesalers to get immediate money and wholesalers are more benefited than fishermen. Table-8 discloses the fact.

Table-7 : (Life Style) Cultural Factors of the Respondents

Particulars		No. of Respondents	Percentage (%)
Ownership of House	Own	120	80.00
	Rented	30	20.00
Type of House	Hut	28	23.33
	Concrete house	33	27.50
	Tiled house	59	49.17
Source of drinking water	Own pump	92	61.33
	Public pump	34	22.67
	Bought from out side	12	8.00
	From neighbor	12	8.00
Source of water for cooking & other purposes	Own pump	98	65.33
	Public pump	32	21.33
	Bought from out side	12	8.00
	From neighbor	08	5.33

Particulars		Cooking	Lighting	Percentage (%)
Source of Energy	Fire wood	83	-	27.67
	Kerosene	28	16	14.67
	Gas	34	2	12.00
	Electricity	5	132	45.66

Particulars		No. of Respondents	Percentage (%)
Food habits	Stable food + Fish + vegetables + milk	110	73.33
	Stable food- milk- meals+ Fish + fruits + vegetables	19	12.67
	Stable food + Fish + meat + milk + vegetables	21	14.00
Consumption Habits	Smoking	103	68.67
	Liquor	20	13.33
	Betel leaves	12	8.00
	Pan masala	15	10.00
Toilet facilities	Owned old type	54	36.00
	Common toilet	26	17.33
	Open place	70	46.67
Spending leisure time	Reading Newspaper & Magazine	25	16.67
	Watching TV	87	58.00
	Listening to Radio	04	2.67
	Playing Cricket	05	3.33
	Playing Cards	24	16.00
	Playing Dice	03	2.00
	Playing Carom	02	1.33

Source : Primary Data.

Table-8 : Profile of Marketing of Fishes

Profile of Marketing		No. of Respondents	Percentage (%)
Marketing Channel	To Consumers	06	04.00
	To Wholesellers	120	80.00
	To Retailers	21	14.00
	To Exporters	03	02.00
Beneficiaries on Marketing	Local Agents	06	04.00
	Exporters	03	02.00
	Whole Sellers	124	82.67
	Retailers	15	10.00
	Money Lenders	02	01.33

Source : Primary Data.

8.8. Problems on Marketing of Fishes

All kinds of business activities are not free from problems; the fishermen also faced different kinds of problems in the marketing of fish. To examine the problems of marketing, factor analysis has been utilized by the researcher. The study clearly reveals the lack of marketing knowledge of fishermen which is an important factor. The factor analysis reveals the high factor loading, indicating the major problems in the marketing of fish followed by natural calamities, lack of Government support, competition, and exploitation of fishermen by middlemen. Table-9 discloses the fact.

Table-9 : Problems on Marketing of Fishes

S.No.	Marketing Problems	Rotated Factor Loading Value			
		Factor 1	Factor 2	Factor 3	Factor 4
1.	Lack of marketing knowledge of fishermen	**.832**	-.033	-.040	-.048
2.	Inadequate storage facility	**.622**	-.243	.447	.173
3.	Insufficient expertise in fish grading and processing	**.607**	-.078	.187	-.224
4.	Lack of organized market activities	**.422**	.257	.321	-.375
5.	Natural calamities	-.216	**.761**	-.071	.051
6.	Lack of government support	.571	**.547**	.255	.083
7.	Raining problems	-.480	**.505**	.271	.063
8.	Competition	-.353	.120	**.722**	-.068
9.	Wide price variations	.184	-.068	**.691**	.402
10.	Insufficient facilities for cleaning at the market premises	-.229	.089	**.604**	-.010
11.	Exploitation of fishermen by middlemen	.531	.184	**.336**	-.553

Source : Computed data.

8.9. Borrowing Capacity

Every business or trade thrives on borrowing money. In the present study, the investigator has endeavored to examine the borrowing capability of the respondents. The analysis indicates that a notable portion (82 percent) of the respondents have borrowed money from Money lenders, banks, and Cooperative societies to meet their fishing expenses like buying craft, engines and settling an old debt. The results are shown in Table-10.

Table-10 : Borrowings of the Respondents

Borrowings of the Respondents		No. of Respondents	Percentage (%)
Capacity of Borrowing	Yes	123	82.00
	No	27	18.00
Source of Borrowings	Commercial Banks	06	4.88
	Co-operative Societies	07	5.70
	Private Banks	29	23.58
	Money Lenders	56	45.52
	Friends and Relatives	25	20.32
Purpose of Borrowings	To buy a craft	20	13.33
	To buy a gear	10	6.67
	To buy an engine	20	13.33
	To meet the fishing expenses	55	36.67
	To meet personal expenses	08	5.33
	To settle old debts	10	6.67
Mode of Repayment	By single payment	23	18.70
	Daily	18	14.64
	Weekly	16	13.00
	Monthly installment	61	49.60
	Once in six months	03	2.44
	Once a year	02	1.62

Source : Computed data.

8.10. Awareness of Welfare Schemes Offered by the Government

Both the Central and State Government offers welfare schemes for the upliftment of fishermen in India particularly in Tamil Nadu. To examine the awareness of welfare schemes among the respondents, it indicates that only 22.67 percent of them are aware of welfare schemes of the Government. Both the vacation period

(54.12 percent) and storm period (45.88 percent), and the fishermen have received compensation from the Government as Rs. 2,000-5,000 and 93.75 percent of the respondents were availed of tsunami relief homes. Table-11 discloses the fact.

Table-11 : Awareness of Welfare Schemes

Awareness of Welfare Schemes		No. of Respondents	Percentage (%)
Awareness of welfare schemes	Yes	34	22.67
	No	116	77.33
Compensation received	Vacation period	59	54.12
	Storm period	50	45.88
Amount of compensation	Below Rs. 2000	60	55.05
	Rs.2000 - Rs.5000	40	36.70
	Above Rs.5000	09	8.25
Tsunami relief homes availed	Yes	90	93.75
	No	06	6.25

Source : Computed data.

8.11. Expectation of Benefits from the Government

To examine the expectation of benefits from the Government, the researcher has applied Garret's ranking method. It clearly reveals that Storage facilities, Educational facilities, Transport facilities and protection from other nation's guards are the major benefits expected by the respondents. Table-12 discloses the fact.

Table-12 : Mean Score for Expectation of Benefits from the Government

S.No.	Benefits	Total Score	Mean Score	Rank
1	Storage facilities	829	5.52	I
2	Educational facilities	773	5.15	II
3	Transport facilities	746	4.97	III
4	Protection from other nation's guards	692	4.61	IV
5	Medical facilities	671	4.47	V
6	Housing facilities	662	4.41	VI
7	Credit facilities	513	3.42	VII
8	Insurance facilities	507	3.38	VIII

Source : Computed data.

8.12. Factors Influencing the Level of Satisfaction Towards Occupation

To understand the overall satisfaction of the respondents towards their occupation, Factor analysis has been used by the researcher. The study

unequivocally shows that among the several attitude scales, availability of bank loans and advances and Government regulations are the important factors that influence the level of satisfaction of the fishermen, followed by a second factor as maintenance of boats for fishing, third-factor high factor loading is the marketing of fishes, insurance coverage to the equipment and to the fishermen influence the level of satisfaction of the fishermen. The results are shown in Table-13.

Table-13 : Factors Influencing the Level of Satisfaction

S.No.	Variables	Rotated Factor Loading Value			
		Factor 1	Factor 2	Factor 3	Factor 4
1.	Availability of bank loans and advances	1.129	.211	.057	.044
2.	Government regulations	1.026	.104	.192	.086
3.	Fishing activities	.455	1.287	-.010	-.151
4.	Maintenance boats for fishing	-.012	1.023	.169	.143
5.	Marketing of fishes	.072	-.082	1.024	-.078
6.	Insurance coverage to the equipment	.095	.124	.735	-.324
7.	Insurance coverage to the fishermen	.106	.451	.619	.165
8.	Improvement in the standard of living	-.164	.180	-.102	1.165
9.	Political intervention in fishing societies	.377	-.082	-.141	.797

Source : Computed data.

9. Findings

● Most of the 30-40 year-old marine fishermen (71.33 percent) are illiterate and remaining are only completed elementary school, married into a nuclear family with more than four membersbelonging to the religion of Hindu, Muslim and Christian have actively involved in fishing.

● According to the survey's occupation, out of 150 respondents, 70% had started fishing when they were 13 to 17 years old, going out to sea 200–250 days a year in used country boats. They actively participated in boat repairs, fish vending, and training new aspirants. The respondents' spouses also engaged in fish vending and fish processing to provide income for the family, but they also faced challenges with fish scarcity and high boat maintenance costs.

● Economic conditions reveal that income of respondents falls between Rs.10000- 15000, which is sufficient only for their basic needs and they are able to save meagre amount of savings for future contingencies.

- The lifestyle of fishermen indicates that most of the respondents (80 percent) have owned house as hut, concrete and tiled and able to get stable food with consumption habits of smoking, liquoring and pan masala.

- Majority of the respondents are forced to sell their products to wholesalers at cheaper rate and the factor analysis on problems on marketing of fishes reveals that lack of marketing knowledge, natural calamities etc., and they expect the storage facilities from the Government.

- Availability of bank loans& advances, government regulations on fishing activities, maintenance of boats and marketing are the important factors which influences the level of satisfaction of the respondents towards their occupation.

10. Suggestions

In order to enhance the present level of socio-economic conditions of marine fishermen of Rameswaram in Ramanathapuram District, the researcher suggests the following based on the findings;

- The literacy level of the fishermen is very low. Further, they do not have adequate technical knowledge to operate and carrying out repair works of the mechanised boats. Hence, the Government can encourage the nearby government and private engineering college to provide hands on training to the fishermen on the working and service of mechanised boats during their vacation period, as part of their extension programme at free of cost.

- The study reveals that the major problem faced by the fishermen in marketing of fish is lack of marketing knowledge. Hence, the government through its social welfare department can organize programmes to give them adequate marketing knowledge.

- Fish is a perishable commodity; the fishermen are forced to sell fishes to the middlemen at cheaper rate. Hence, it is suggested that the government can construct cold storage facilities and provide the facility to the fishermen at nominal rent.

- The lead bank of Ramanthapuram District may provide loan to the fishermen to construct their own cold storage warehouses.

11. Conclusion

Even yet, India ranks in the top ten nations in the world for fish production. In many regions of India, the markets for marine items are disorganized. The

markets must be reformed by using new management strategies and updating the conventional fish marketing strategies. The majority of fisherman live in poverty and face numerous challenges, such as low family income, low literacy, large families combined with limited financial resources, lack of other off-season work opportunities, inadequate storage facilities, etc. The fishing community lives according to the national culture. They work in a seasonal capacity. They are not capable of doing other jobs. Because of this, they are not paid during the off-season, which presents further financial challenges.

Since this coastline is unique by nature, the majority of the fishermen use country boats (Vallam). Since they do not engage in deep sea fishing, they depend on money lenders for loans and are taken advantage of by middlemen and agents when selling their products in the Ramnad market. The central and state governments have been introducing a number of specialized schemes and projects to improve the socioeconomic conditions of the fishermen. In this context, the present study focused on those which are currently relevant to the overall upliftment of the fishermen in general and fishermen of Rameshwarm in Ramanathapuram District in particular.

12. References

Journals

N Selvaraj, (2022),"Socio-Economic Conditions of the Fishermen in Tamil Nadu" - India DOI: 10.21917/ijms.2022.0226, ICTACT Journal on Management Studies, May 2022, Volume: 08, Issue: 02.

S. Manimaran & Dr. K. Suriyan, (2021) "A Study on Socio-Economic Condition on Fishermen in Cuddlore District", Kala : The Journal of Indian Arts History Congress ISSN : 0975-7945, Volume-26, No.2(IV) : 2020-2021, pp-78-83.

Emaldarani. S & Dr.A.Kanmani Joan (2019) Socio-Economic Status of Fishermen Community (with special reference to Nagapattinam Town, Tamil Nadu), Journal of Emerging Technologies and Innovative Research (JETIR), May 2019, Volume 6, Issue 5 www.jetir.org (ISSN-2349-5162),pp-446-449.

Vivek Parashar, Satish Kumar Bara, Dinesh Damde, Ankit Kumar and Vipin Vyas, (2016),"Assessment of the Socioeconomic Status of Fishermen Communities: a case study from a selected reach of River Narmada, India" International Journal of Research in Fisheries and Aquaculture, ISSN 2277-7729, Sep 2016; 6(2): 47-59.

Bijayalakshmi Devi Nongmaithem, **Ajit Kumar Ngangbam**, (2014) "Socio-economic conditions and cultural profile of the fishers in India- a review", IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS) e-ISSN: 2319-2380, p-ISSN: 2319-2372. Volume 7, Issue 9, Ver. I (Sep. 2014), PP 42-48.

Vhankade, P.G., (2011), "Critical Assessment of Devgad Fishermen Cooperative society", Indian Streams Research Journal; Vol:1, pp.101-108.

Durairaj, N., (2009), "A study of Marine Fishing Industry in Ramanadhapuram District", published Ph.D Thesis, Madurai Kamaraj University, 2009, p.230.

Ragupathy and Venkatachalam, (**2005)**, "Sustainable Fisheries and Community Management System", paper presented in "Environment and growth of 2ⁿᵈ South Asian Economic students meet 2005" at Lahore, Pakistan, Jan 28-30, 2005 being organized by the Lahore university of management sciences (LUMS).

Balasubramanian. S, (2001), "Socio-economic Status of Marine Fishermen in Tow Fishing Village of Rameshwaram", Fishing Technology, 38(1), 2001 : pp.51-55.

Islam, M.S. (2000), "Socio economic Profile in Fisheries Development" Research Report No.25, BSERT, BAU, Mymensingh.

Verduijin, J.C, (2000), (BOBP/MM/1), Basic Needs of Coastal Fishing Communities in Kanyakumari District, Tamil Nadu, India, 2000, pp.1-24.

Websites

www.thoothu.nic.in

https://*www.fao.org*

www.en.wikipedia.org/wiki/fishery

www.fisheries.up.nic.in/

www.tn.gov.in/citizen/tnfdc.html

www.tn.gov.in/fisheries/marine.html

www.ramnad.tn.nic.in/fisheries.html

www.ramanathapuram.nic.in

https://www.scholarshipsinindia.com/articles/career_opportunities_in_fisheries

www.languageinindia.com/may2013/marinefishingilavarasanfinal.pdf

https://www.researchgate.net/publication

https://www.shanlaxjournals.in/pdf/MGT/V1N1/MGT_V1_N1_003.pdf

Fisheries & Aquaculture | Invest India

https://www.thebusinessrankers.com

Marine Fisheries | Department of Fisheries, GoI (dof.gov.in)

https://www.ceicdata.com

https://nfdb.gov.in/welcome/ce_message

An Empirical Study of NEP 2020 among Selected Students and Teachers in the State of Gujarat

DHARTI RAMI, KAMINI SHAH, VISHAL ACHARYA AND DEEP VAGHELA

Abstract : *The National Education Policy 2020 aims to reform the existing education system from elementary to higher education vocational and teacher training in India, to provide industry-ready manpower and holistic development.*

Purpose :

The study was conducted to examine the awareness and perception among teachers and students from Gujarat to apprehend the opinion of two major stakeholders of the NEP 2020.

Methodology :

The study examines the level of awareness and perception among selected teachers and students from Gujarat with the help of a structured questionnaire from more than 500 respondents including 324 students and 204 teachers using a convenience purposive sampling method. The study is empirical in nature. The awareness and the perception of students and teachers of Gujarat are measured with 5-point Likert scale.

Outcome :

The research findings indicate a noteworthy distinction in the degree of NEP 2020 awareness between male and female teachers and students. Teachers who have worked for more than 15 years are more knowledgeable about and supportive of NEP 2020. Students pursuing postgraduate degrees and other advanced degrees are also more cognizant of and supportive of NEP 2020.

Keywords : National Education Policy, Awareness, Perception.

Dr.Dharti Rami, Assistant Professor, V. M. Patel College of Management Studies, Ganpat University-Kherva, dpr01@ganpatuniversity.ac.in, Contact: 8866622353

Prof. (Dr.) Kamini Shah, Dean, Faculty of Business Studies, Sardar Patel University-Vallabh Vidyanagar, kamini_shah@spuvvn.edu, Contact: 9825271629

Dr.Vishal Acharya, Assistant Professor, V.M. Patel College of Management Studies, Ganpat University-Kherva, vishal.acharya@ganpatuniversity.ac.in

Dr. Deep Vaghela, Assistant Professor, Shri V. Z. Patel college of Commerce, Sardar Patel University-Vallabh Vidyanagar, vagheladeep123@gmail.com

1. Introduction

The National Education Policy, was approved on July 29, 2020, aims to reform India's education system, incorporating vocational training and industry-ready manpower, and fostering holistic development in both academic and non-academic spheres. (Panditrao & Panditrao, 2020) Looking back, India has implemented three education policy reforms: the first in 1968, the second in 1986 (updated in 1992), and the third in 2020. (Devi & Cheluvaraju, 2020) The new education policy aims to develop logical thinkers, compassionate, resilient, and ethically minded individuals, fostering an egalitarian, inclusive, and plural society as per the Constitution. (Ministry of Human Resource Development, 2020)

The policy also aims to overhaul core programs, simplify board exams, and focus on experiential learning and critical thinking as per (Pawar et al., 2022) The NEP-2020 policy shifts from a 10+2 structure to a "5+3+3+4" approach, focusing on age groups 3-8 years, 8-11 years, 11-14 years, and 14-18 years, including babyhood education and pre-school education for children aged 3-5 under formal schooling. (Khan & Bhatnagar, 2019) (Pawar et al., 2022) But this aim cannot be fulfilled if the stakeholders of the policy are not aware of it or have a negative perception towards it.

The National Education Policy 2020 aims for comprehensive, quality education in natural or regional languages for students until category five. It recommends phasing out single-stream organizations and aiming for multidisciplinary universities and faculties by 2040. The policy addresses India's growing biological process needs and emphasizes the importance of learning skills alongside learning. (Pawar et al., 2022)(Ministry of Human Resource Development, 2020) Education reforms aim to ensure quality, integrity, and equity in learning outcomes from schooling to educational activity. Theoretical understanding is emphasized through pedagogies that focus on communication, discussion, debate, research, and cross-disciplinary thinking. Commerce and Management education needs continuous revision to develop students' creative potential and meet evolving industrial and social demands. Programs should be periodically revisited through stakeholder involvement to meet their expectations and meet education policy needs. (Akareem & Hossain, 2016)

The education in Commerce and Management should be outcome-based, with a selection-based system (CBCS) for undergraduate and postgraduate stages. Outcome-based education defines program objectives, program objectives, and course objectives, with student progression assessed based on achievement

status. Core subjects should combine theory and practical application, while open elective courses provide knowledge and skills across various areas, allowing for holistic education and specialization in practical areas. (Panditrao & Panditrao, 2020)

2. Review of Literature

(Choi, 2017) explores teachers' resistance to pedagogical changes in South Korea, focusing on the subtle, low-profile opposition to teaching English in English reform. Drawing on Foucault and Scott's writings, the study provides a comprehensive understanding of teachers' resistance to educational changes. (Peck, 2017) observed Urban School Reform in the US highlighting the challenges faced in implementing transformation initiatives, such as conflicts arising from foreign policies and local opposition. Despite these challenges, trust in urban school reform has remained strong due to outstanding city schools and programs that have helped children excel academically. (Maruthavanan, 2020) in his study of secondary school teachers in Madurai district revealed significant differences in their knowledge of the National Education Policy 2020 based on gender, years of service, family type, location, and school management type. The study also found a significant difference in NEP 2020 awareness based on years of service and family type. Limited awareness was found in (Devi & Cheluvaraju, 2020)'s survey on stakeholders' perceptions of the 2020 National Education Policy's impact on Bengaluru's trade and management sector. Stakeholders are advised to assess the operational parameters of NEP 2020 in order to ascertain its functionality. (Khan & Bhatnagar, 2019) examined the impact of education reform in Patna on higher education. The survey revealed significant differences in students' perceptions of teaching practices and learning environments based on gender, family income, school type, and school board, but no significant differences were found based on family type. (Muskan S. 2020) focused on all the segments of the education sector and their effects on the economy. The study majorly represented the national education policy from the time of announcement by the prime minister until the varied challenges to be faced by the tutorial establishments in adopting the changes in their work surroundings supported by the National Education Policy 2020. (Kumar, A. 2021) predicts that NEP 2020 will revolutionize higher education in India, enhancing leadership quality and addressing future challenges. If implemented effectively, it could make India a global hub in education by 2030.

3. Research Gap

Many research papers and articles emphasise on new education policy by exploring the mechanism or the road map it provided to complete its targets and objectives. However, very few researchers have attempted to explore the perception of students and stakeholders of Gujarat state towards NEP. However, there are some research papers exploring NEP with the perspective of quality-of-life employment opportunities and technology driven education systems. Hence, the researchers have tried to gauge the awareness and perception of two main stakeholders of NEP 2020 i.e., Teachers and Students.

4. Research Methodology

4.1. Research Objectives

- To know whether awareness level and perception of NEP 2020 differs due to gender, level of education, year of study and age group among students in Gujarat.

- To know whether awareness level and perception of NEP 2020 differs due to gender, stream and area of teaching, educational qualification and experience among teachers in Gujarat.

4.2. Hypotheses

H_{01} : The awareness of NEP 2020 and Perception of NEP 2020 do not differ due to demographic variables such as gender, level of education, year of study and age group among students.

H_{02} : The awareness of NEP 2020 and Perception of NEP 2020 do not differ due to demographic variables such as gender, stream of teaching, area of teaching, educational qualification and experience among teachers (educators).

4.3. Methodology

This study has been conducted using a structured questionnaire that comprises demographic information of respondents and 28 statements linked to 10 variables of NEP 2020 on awareness on fundamental principles, multidimensional assessment, key changes in school education, key changes in higher education and perception on changes in education policy, requirement of training in staff, practical implications, the implications of NEP 2020 in the rural area, the way of teaching and learning environment. The study is conducted using non-probability convenience sampling, with teachers from the commerce, science, and arts

faculties as well as students from the UG, PG, and other higher education degree holders in commerce and management as samples. The structured questionnaire prepared for the purpose was sent to approximately 1100 respondents. We have received 528 valid responses, therefore, a total of 324 students and 204 teachers have been considered for the final data analysis. To know the difference in the awareness level and perception among teachers and students, independent two-sample t-test and one-way ANOVA was employed. Post-hoc analysis was also carried out for the rejected hypotheses from ANOVA using SPSS.

Table-1 : Test of Reliability

Reliability Statistics	
Cronbach's Alpha	N of Items
0.897	10

For the reliability test, we used SPSS to run Cronbach's Alpha on the average of all ten variables, which yielded a co-efficient of 0.897, suggesting strong consistency with the statements in table 1.

5. Results and Discussion

The Indian government aimed to create a national education policy to equal global standards for students. However, the success of this policy depends on the awareness of teachers and students about NEP 2020. University educators were more aware of the principles, multidimensional assessment, and key changes in higher education, while school teachers had moderate awareness. Teachers found it difficult to understand all aspects of NEP 2020 due to its lack of regional language. Most respondents had positive perceptions, except for rural areas where some teachers were skeptical about it looking to altogether different dynamics of education.

H_{01a}: The awareness of NEP 2020 and Perception on NEP 2020 does not differ due to Gender of students.

Table-2 : Independent Samples T-Test						
Variables	**t**	**df**	**Sig. (2-tailed)**	**Mean Diff.**	**Std. Error Difference**	**Results**
Awareness on fundamental principles in NEP 2020	-5.731	322	0.000	-0.533	0.093	**Significant difference**
Awareness on multidimensional assessment	-5.641	322	0.000	-0.494	0.088	**Significant difference**
Awareness on key changes in school education	1.318	322	0.188	0.136	0.103	Insignificant difference

(Contd...)

Awareness on key changes in higher education	0.697	322	0.486	0.067	0.096	Insignificant difference
Perception on changes in education policy	-3.045	322	0.003	-0.285	0.094	**Significant difference**
Perception on the requirement of training in staff	-0.329	322	0.742	-0.034	0.104	Insignificant difference
Perception on practical implications	-2.957	322	0.003	-0.285	0.096	**Significant difference**
Perception on implication of NEP 2020 in the rural area	2.342	322	0.020	0.280	0.119	**Significant difference**
Perception on the way of teaching	-2.038	322	0.042	-0.228	0.112	**Significant difference**
Perception on learning environment	0.637	322	0.524	0.070	0.110	Insignificant difference

Source : Author's Computation.

Table-2 shows the independent two-sample t-test on the awareness and perception of NEP 2020 among male and female students. The results show that male students are more aware of NEP 2020's key changes in school education and higher education, but not significantly different in their perception of training and learning environment requirements, suggesting a positive perception of policy changes, practical implications, and teaching methods.

H_{01b} : The awareness of NEP 2020 and Perception of NEP 2020 does not differ due to the level of education among students.

Table-3 : ANOVA							
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**	**Results**
Awareness on fundamental principles in NEP 2020	Between Groups	49.583	2	24.792	40.111	0.000	**Significant difference**
	Within Groups	198.404	321	.618			
	Total	247.988	323				
Awareness on multidimensional assessment	Between Groups	24.491	2	12.246	20.203	0.000	**Significant difference**
	Within Groups	194.570	321	.606			
	Total	219.062	323				
Awareness on key changes in school education	Between Groups	65.492	2	32.746	49.832	0.000	**Significant difference**
	Within Groups	210.940	321	.657			
	Total	276.432	323				

(Contd...)

Awareness on key changes in higher education	Between Groups	123.360	2	61.680	171.950	0.000	**Significant difference**
	Within Groups	115.146	321	.359			
	Total	238.506	323				
Perception on changes in education policy	Between Groups	10.012	2	5.006	7.174	0.001	**Significant difference**
	Within Groups	223.988	321	.698			
	Total	234.000	323				
Perception on requirement of training in staff	Between Groups	12.520	2	6.260	7.548	0.001	**Significant difference**
	Within Groups	266.230	321	.829			
	Total	278.750	323				
Perception on practical implications	Between Groups	61.957	2	30.979	53.356	0.000	**Significant difference**
	Within Groups	186.373	321	.581			
	Total	248.330	323				
Perception on implication of NEP 2020 in the rural area	Between Groups	41.411	2	20.705	19.807	0.000	**Significant difference**
	Within Groups	335.562	321	1.045			
	Total	376.972	323				
Perception on the way of teaching	Between Groups	5.465	2	2.733	2.712	0.068	Insignificant difference
	Within Groups	323.486	321	1.008			
	Total	328.951	323				
Perception on learning environment	Between Groups	26.804	2	13.402	15.047	0.000	**Significant difference**
	Within Groups	285.897	321	.891			
	Total	312.701	323				

Source : Author's Computation.

Above Table 3 shows the one-way ANOVA on the awareness and perception of NEP 2020 among the students pursuing UG, PG and other higher degree. The results shows that the awareness and perception of NEP 2020 both significantly differs as the students with PG and higher degree are more aware and positive toward the NEP 2020 and the changes it will bring to the education compared to the students pursuing UG degree except for the way of teaching as it has p-value more than 0.05.

H$_{01c}$: The awareness of NEP 2020 and Perception on NEP 2020 does not differ due to years of study of students.

Table-4 : ANOVA							
		Sum of Squares	df	Mean Square	F	Sig.	Results
Awareness on fundamental principles in NEP 2020	Between Groups	40.365	2	20.183	31.204	.000	**Significant difference**
	Within Groups	207.622	321	.647			
	Total	247.988	323				
Awareness on multidimensional assessment	Between Groups	35.456	2	17.728	30.994	.000	**Significant difference**
	Within Groups	183.606	321	.572			
	Total	219.062	323				
Awareness on key changes in school education	Between Groups	107.020	2	53.510	101.389	.000	**Significant difference**
	Within Groups	169.413	321	.528			
	Total	276.432	323				
Awareness on key changes in higher education	Between Groups	59.824	2	29.912	53.737	.000	**Significant difference**
	Within Groups	178.682	321	.557			
	Total	238.506	323				
Perception on changes in education policy	Between Groups	19.927	2	9.964	14.940	.000	**Significant difference**
	Within Groups	214.073	321	.667			
	Total	234.000	323				
Perception on requirement of training in staff	Between Groups	89.693	2	44.846	76.144	.000	**Significant difference**
	Within Groups	189.057	321	.589			
	Total	278.750	323				
Perception on practical implications	Between Groups	42.799	2	21.400	33.422	.000	**Significant difference**
	Within Groups	205.531	321	.640			
	Total	248.330	323				
Perception on implication of NEP 2020 in the rural area	Between Groups	56.108	2	28.054	28.066	.000	**Significant difference**
	Within Groups	320.864	321	1.000			
	Total	376.972	323				
Perception on the way of teaching	Between Groups	14.918	2	7.459	7.624	.001	**Significant difference**
	Within Groups	314.033	321	.978			
	Total	328.951	323				
Perception on learning environment	Between Groups	68.668	2	34.334	45.163	.000	**Significant difference**
	Within Groups	244.033	321	.760			
	Total	312.701	323				

Above Table 4 shows the one-way ANOVA on the awareness and perception of NEP 2020 among the students in their 1st, 2nd and 3rd year of their study. The results shows that the awareness and perception of NEP 2020 both significantly differs as the students with 2nd and 3rd years are more aware and positive toward the NEP 2020 and the changes it will bring to the education compared to the students.

H_{01d} : The awareness of NEP 2020 and Perception on NEP 2020 does not differ due to Age group of students.

		Sum of Squares	df	Mean Square	F	Sig.	Results
Awareness on fundamental principles in NEP 2020	Between Groups	43.677	2	21.838	34.311	.000	**Significant difference**
	Within Groups	204.311	321	.636			
	Total	247.988	323				
Awareness on multidimensional assessment	Between Groups	2.905	2	1.452	2.157	.117	Insignificant difference
	Within Groups	216.157	321	.673			
	Total	219.062	323				
Awareness on key changes in school education	Between Groups	23.372	2	11.686	14.823	.000	**Significant difference**
	Within Groups	253.060	321	.788			
	Total	276.432	323				
Awareness on key changes in higher education	Between Groups	61.879	2	30.940	56.229	.000	**Significant difference**
	Within Groups	176.627	321	.550			
	Total	238.506	323				
Perception on changes in education policy	Between Groups	.000	2	.000	.000	1.000	Insignificant difference
	Within Groups	234.000	321	.729			
	Total	234.000	323				
Perception on requirement of training in staff	Between Groups	21.777	2	10.888	13.601	.000	**Significant difference**
	Within Groups	256.973	321	.801			
	Total	278.750	323				
Perception on practical implications	Between Groups	9.442	2	4.721	6.344	.002	**Significant difference**
	Within Groups	238.888	321	.744			
	Total	248.330	323				
Perception on implication of NEP 2020 in the rural area	Between Groups	31.362	2	15.681	14.564	.000	**Significant difference**
	Within Groups	345.611	321	1.077			
	Total	376.972	323				
Perception on the way of teaching	Between Groups	21.567	2	10.783	11.261	.000	**Significant difference**
	Within Groups	307.384	321	.958			
	Total	328.951	323				
Perception on learning environment	Between Groups	15.106	2	7.553	8.147	.000	**Significant difference**
	Within Groups	297.594	321	.927			
	Total	312.701	323				

Table-5 : ANOVA

Above Table-5 shows the one-way ANOVA on the awareness and perception of NEP 2020 among students with various age groups. The results shows significant differences in student awareness and perception, except for multidimensional assessment, among different age groups, with students being more skeptical about policy changes' effectiveness.

H$_{02a}$: The awareness of NEP 2020 and Perception of NEP 2020 does not differ due to Gender among teachers (educators).

Variables	t	df	Sig. (2-tailed)	Mean Diff.	Std. Error Difference	Results
Awareness on fundamental principles in NEP 2020	-.633	201	.528	-.087	.137	Insignificant difference
Awareness on multidimensional assessment	1.477	201	.141	.207	.140	Insignificant difference
Awareness on key changes in school education	2.952	201	.004	.409	.138	**Significant difference**
Awareness on key changes in higher education	-1.347	201	.179	-.183	.136	Insignificant difference
Perception on changes in education policy	-.356	201	.722	-.029	.081	Insignificant difference
Perception on requirement of training in staff	.729	201	.467	.120	.165	Insignificant difference
Perception on practical implications	-2.170	201	.031	-.231	.106	**Significant difference**
Perception on implication of NEP 2020 in the rural area	-2.172	201	.031	-.264	.122	**Significant difference**
Perception on the way of teaching	2.424	201	.016	.303	.125	**Significant difference**
Perception on learning environment	-.095	201	.925	-.010	.101	Insignificant difference

Table title: Table-6 : Independent Samples Test

Above Table-6 shows the independent two-sample t-test on the awareness and perception of NEP 2020 among the male and female teachers. The results shows that awareness of key changes in school education among male and female teachers is similar, but perceptions of practical implications, rural area implications, and teaching methods differ significantly, with p-values greater than 0.05.

H$_{02b}$: The awareness of NEP 2020 and Perception of NEP 2020 does not differ due to the stream of teaching among teachers (educators).

		Sum of Squares	df	Mean Square	F	Sig.	Results
Awareness on fundamental principles in NEP 2020	Between Groups	7.616	2	3.808	4.193	.016	**Significant difference**
	Within Groups	181.625	200	.908			
	Total	189.241	202				

Table title: Table-7 : ANOVA

Awareness on multidimensional assessment	Between Groups	16.862	2	8.431	9.214	.000	**Significant difference**
	Within Groups	183.000	200	.915			
	Total	199.862	202				
Awareness on key changes in school education	Between Groups	28.668	2	14.334	16.559	.000	**Significant difference**
	Within Groups	173.125	200	.866			
	Total	201.793	202				
Awareness on key changes in higher education	Between Groups	24.185	2	12.093	14.826	.000	**Significant difference**
	Within Groups	163.125	200	.816			
	Total	187.310	202				
Perception on changes in education policy	Between Groups	3.638	2	1.819	5.821	.003	**Significant difference**
	Within Groups	62.500	200	.313			
	Total	66.138	202				
Perception on requirement of training in staff	Between Groups	1.047	2	.524	.382	.683	Insignificant difference
	Within Groups	274.125	200	1.371			
	Total	275.172	202				
Perception on practical implications	Between Groups	12.328	2	6.164	11.797	.000	**Significant difference**
	Within Groups	104.500	200	.523			
	Total	116.828	202				
Perception on implication of NEP 2020 in the rural area	Between Groups	.909	2	.455	.598	.551	Insignificant difference
	Within Groups	152.125	200	.761			
	Total	153.034	202				
Perception on the way of teaching	Between Groups	8.082	2	4.041	5.244	.006	**Significant difference**
	Within Groups	154.125	200	.771			
	Total	162.207	202				
Perception on learning environment	Between Groups	11.293	2	5.647	12.209	.000	**Significant difference**
	Within Groups	92.500	200	.463			
	Total	103.793	202				

Above Table-7 shows the one-way ANOVA on the awareness and perception of NEP 2020 among teachers with different stream of teaching. The results shows significant differences in teachers' awareness and perceptions, except for the perception of staff training requirements and the effectiveness of NEP 2020 in rural areas.

H$_{02c}$: The awareness of NEP 2020 and Perception of NEP 2020 does not differ due to the area of teaching among teachers (educators).

		Sum of Squares	df	Mean Square	F	Sig.	Results
Table-8 : ANOVA							
Awareness on fundamental principles in NEP 2020	Between Groups	15.641	1	15.641	18.110	.000	**Significant difference**
	Within Groups	173.600	201	.864			
	Total	189.241	202				
Awareness on multidimensional assessment	Between Groups	1.373	1	1.373	1.391	.240	Insignificant difference
	Within Groups	198.489	201	.988			
	Total	199.862	202				
Awareness on key changes in school education	Between Groups	.193	1	.193	.193	.661	Insignificant difference
	Within Groups	201.600	201	1.003			
	Total	201.793	202				
Awareness on key changes in higher education	Between Groups	9.238	1	9.238	10.428	.001	**Significant difference**
	Within Groups	178.072	201	.886			
	Total	187.310	202				
Perception on changes in education policy	Between Groups	5.666	1	5.666	18.832	.000	**Significant difference**
	Within Groups	60.472	201	.301			
	Total	66.138	202				
Perception on requirement of training in staff	Between Groups	1.550	1	1.550	1.139	.287	Insignificant difference
	Within Groups	273.622	201	1.361			
	Total	275.172	202				

		Sum of Squares	df	Mean Square	F	Sig.	Results
Perception on practical implications	Between Groups	4.205	1	4.205	7.505	.007	**Significant difference**
	Within Groups	112.622	201	.560			
	Total	116.828	202				
Perception on implication of NEP 2020 in the rural area	Between Groups	.434	1	.434	.572	.450	Insignificant difference
	Within Groups	152.600	201	.759			
	Total	153.034	202				
Perception on the way of teaching	Between Groups	1.051	1	1.051	1.311	.254	Insignificant difference
	Within Groups	161.156	201	.802			
	Total	162.207	202				
Perception on learning environment	Between Groups	.388	1	.388	.753	.386	Insignificant difference
	Within Groups	103.406	201	.514			
	Total	103.793	202				

Above Table-8 shows the one-way ANOVA on the awareness and perception of NEP 2020 among teachers with different area of teaching (school teachers, professors and departmental faculties). The results shows that teachers' awareness of fundamental principles and key changes in schools and higher education varies, while their perception of educational policy changes and they are skeptical about implication and implementation of NEP 2020.

H_{02d} : The awareness of NEP 2020 and Perception of NEP 2020 does not differ due to educational qualification among teachers (educators).

Table-9 : ANOVA							
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**	**Results**
Awareness on fundamental principles in NEP 2020	Between Groups	15.116	5	3.023	3.420	.005	**Significant difference**
	Within Groups	174.125	197	.884			
	Total	189.241	202				
Awareness on multidimensional assessment	Between Groups	42.945	5	8.589	10.783	.000	**Significant difference**
	Within Groups	156.917	197	.797			
	Total	199.862	202				

(Contd...)

Awareness on key changes in school education	Between Groups	73.751	5	14.750	22.694	.000	**Significant difference**
	Within Groups	128.042	197	.650			
	Total	201.793	202				
Awareness on key changes in higher education	Between Groups	9.977	5	1.995	2.217	.054	**Significant difference**
	Within Groups	177.333	197	.900			
	Total	187.310	202				
Perception on changes in education policy	Between Groups	8.680	5	1.736	5.952	.000	**Significant difference**
	Within Groups	57.458	197	.292			
	Total	66.138	202				
Perception on requirement of training in staff	Between Groups	69.547	5	13.909	13.326	.000	**Significant difference**
	Within Groups	205.625	197	1.044			
	Total	275.172	202				
Perception on practical implications	Between Groups	10.078	5	2.016	3.720	.003	**Significant difference**
	Within Groups	106.750	197	.542			
	Total	116.828	202				
Perception on implication of NEP 2020 in the rural area	Between Groups	7.784	5	1.557	2.112	.066	Insignificant difference
	Within Groups	145.250	197	.737			
	Total	153.034	202				
Perception on the way of teaching	Between Groups	7.040	5	1.408	1.788	.117	Insignificant difference
	Within Groups	155.167	197	.788			
	Total	162.207	202				
Perception on learning environment	Between Groups	7.251	5	1.450	2.959	.013	**Significant difference**
	Within Groups	96.542	197	.490			
	Total	103.793	202				

Above Table-9 shows the one-way ANOVA on the awareness and perception of NEP 2020 among teachers with different educational qualifications. The results shows that teachers' awareness and perception vary significantly based on their educational qualifications, with differences in perception only observed in rural areas and teaching methods/pedagogy.

H$_{02e}$: The awareness of NEP 2020 and Perception of NEP 2020 does not differ due to experience among teachers (educators).

		Sum of Squares	df	Mean Square	F	Sig.	Results
Table-10 : ANOVA							
Awareness on fundamental principles in NEP 2020	Between Groups	13.241	2	6.621	7.524	.001	**Significant difference**
	Within Groups	176.000	200	.880			
	Total	189.241	202				
Awareness on multidimensional assessment	Between Groups	.129	2	.064	.064	.938	Insignificant difference
	Within Groups	199.733	200	.999			
	Total	199.862	202				
Awareness on key changes in school education	Between Groups	.060	2	.030	.030	.971	Insignificant difference
	Within Groups	201.733	200	1.009			
	Total	201.793	202				
Awareness on key changes in higher education	Between Groups	3.310	2	1.655	1.799	.168	**Insignificant difference**
	Within Groups	184.000	200	.920			
	Total	187.310	202				
Perception on changes in education policy	Between Groups	6.805	2	3.402	11.468	.000	**Significant difference**
	Within Groups	59.333	200	.297			
	Total	66.138	202				
Perception on requirement of training in staff	Between Groups	22.106	2	11.053	8.735	.000	**Significant difference**
	Within Groups	253.067	200	1.265			
	Total	275.172	202				
Perception on practical implications	Between Groups	4.561	2	2.280	4.063	.019	**Significant difference**
	Within Groups	112.267	200	.561			
	Total	116.828	202				
Perception on implication of NEP 2020 in the rural area	Between Groups	13.701	2	6.851	9.833	.000	**Significant difference**
	Within Groups	139.333	200	.697			
	Total	153.034	202				

(Contd...)

Perception on the way of teaching	Between Groups	29.140	2	14.570	21.899	.000	**Significant difference**
	Within Groups	133.067	200	.665			
	Total	162.207	202				
Perception on learning environment	Between Groups	13.126	2	6.563	14.478	.000	**Significant difference**
	Within Groups	90.667	200	.453			
	Total	103.793	202				

Above Table-10 shows the one-way ANOVA on the awareness and perception of NEP 2020 among teachers with difference experience level. The results shows that there are no significant difference in teachers' awareness of the fundamental principles of NEP 2020, but significant differences in their perceptions of the policy.

6. Post-Hoc Analysis

The hypotheses H01a to H01d, H02b, H02d and H02e were all rejected, as indicated in table 11. Thus, post-hoc tests were performed for the hypotheses H01b, H01c, H01d, H02b, H02d, and H02e because the ANOVA results indicated p-values less than 0.05 for these hypotheses. A detailed post-hoc analysis was performed to determine which factors had a significant difference. The results of the summarised Post-hoc Analysis are given below.

Table-11 : Summarised Post-Hoc Results		
Hypothesis	**Hypothesis Results**	**Post-Hoc Difference**
H01b: The awareness of NEP 2020 and Perception on NEP 2020 does not differ due to level of education in students.	Rejected	• Students pursuing PG and Higher degrees are more aware of fundamental principles, multidimensional assessment, key changes in school education and key changes in higher education in NEP 2020. • Students with higher degrees are more positive toward changes in education policy and ways of teaching • Students with higher degrees are more positive toward changes in education policy and ways of teaching
H01c: The awareness of NEP 2020 and Perception on NEP 2020 does not differ due to years of study in students.	Rejected	• Students studying in their 1st and 3rd year are more aware about the fundamental principles in NEP 2020, multidimensional assessment, key changes in school education and key changes in higher education and more positive toward learning environment. • Student in their 1st year of study are more positive toward changes in education policy while 1st and 3rd year students are more positive toward requirement of training in staff, practical implications, and implication of NEP 2020 in the rural area.

(Contd...)

H01d: The awareness of NEP 2020 and Perception on NEP 2020 does not differ due to age group in students.	Rejected	• Students with the age group of 18 to 21 years are positive toward requirement of training in staff and way of teaching while the student with age group of 22 to 25 years are more aware of fundamental principles in NEP 2020, key changes in school education and higher education and have positive perception on requirement of training in staff, implication of NEP 2020 in rural area and learning environment. • The students above the 25 age are more aware about fundamental principles in NEP 2020, key changes in school education and have positive perception of practical implication of NEP 2020.
H02b: The awareness of NEP 2020 and Perception of NEP 2020 does not differ due to the stream of teaching among teachers (educators).	Rejected	• The educators with arts streams are more aware about the fundamental principles of NEP 2020, key changes in school education and higher education and have more positive perception on changes in education police and way of teaching. • The educators with commerce stream are more aware about the multidimensional assessment while they have positive perception toward way of teaching and learning environment.
H02d: The awareness of NEP 2020 and Perception of NEP 2020 does not differ due to educational qualification among teachers (educators).	Rejected	• From post-hoc analysis, it was observed that educators having masters' degree and above were more aware about the fundament principles in NEP 2020., multidimensional assessments, key changes in school and higher education • Also the educators having masters' degree and above were more positive toward overall perception on NEP 2020.
H02e: The awareness of NEP 2020 and Perception of NEP 2020 does not differ due to experience among teachers (educators).	Rejected	• From post-hoc analysis, it was observed that educators having 10 years' experience and more were more aware about the fundament principles in NEP 2020., multidimensional assessments, key changes in school and higher education • Also the educators having 10 years' experience and more were more positive toward overall perception on NEP 2020.

7. Major Findings

- The awareness of fundamental principles, multidimensional assessment, and Perception of changes in educational policy, practical implication, the implications in rural areas and the way of teaching differed as male students were more aware and had a positive perception of NEP 2020 in Gujarat.

- The level of education and years of study significantly differs in the awareness and perception of NEP 2020 as the higher degree holder students and student in their final years were more aware and positive for NEP 2020.

- Awareness and perception of NEP 2020 also significantly differ due to the students' age group as the students above 21 years were more aware of the fundamental principles, key changes in school and higher education and had positive perception of requirements in training in staff, implication in rural area, way of teaching and learning environment.

- Awareness and perception of NEP 2020 do not significantly differ due to the Gender of educators as only awareness of key changes in school education and perception of practical implications, implication of NEP 2020 in rural areas and way of teaching had p-value less than 0.05.

- Awareness and perception of NEP 2020 do significantly differ due to the stream of educators as the educators belonging to the commerce and management stream were more aware and had positive perception of NEP 2020 compared to Science and Arts stream.

- Awareness and perception of NEP 2020 do not significantly differ due to the area of teaching (Schools and Colleges) of educators as ANOVA showed insignificant differences in the majority of variables.

- Awareness and perception of NEP 2020 do not significantly differ due to the Gender of educators as only awareness of key changes in school education and perception of practical implications, implication of NEP 2020 in rural areas and way of teaching had p-value less than 0.05.

- Awareness and perception of NEP 2020 do significantly differ due to the stream of educators as the educators belonging to the commerce and management stream were more aware and had positive perception of NEP 2020 compared to Science and Arts stream.

- Awareness and perception of NEP 2020 do not significantly differ due to the area of teaching (Schools and Colleges) of educators as ANOVA showed insignificant differences in the majority of variables.

8. Major Suggestions

- There is still a need for more sensitization programs on NEP 2020, as many students are still unaware of several benefits NEP 2020 would bring to their development.

- Similarly for educators, they are required to go through various development programs which can lead to a better understanding of what NEP 2020 changes and how they can absorb it in their teaching.

9. Limitations of the Study

1. The study is confined to only Gujarat state.

2. The study observes the awareness level and perception of respondents only.

3. The awareness level and perception of other stakeholders are not studied.

10. Future Scope of the Study

1. Researchers can study the awareness and perception of NEP 2020 in others states of India.

2. Researchers can also study other aspects or salient features of NEP.

3. The other stakeholders such as parents, employers etc. can also be studied for their opinion on various features and effective implementation of NEP 2020.

11. Usefulness of the Study

The study is helpful to understand the point of view of the students and teachers who are directly related to the changes in New Education Policy 2020. This will enable the policy makers to know the thoughts and point of view they have upon understanding how the NEP will bring changes to the education system in true sense and measures required to be taken for producing employment ready youth focusing on skill building instead of rote learning. This study will become a guiding path for it.

12. Conclusion

Previous studies in India show moderate awareness among stakeholders about the National Education Policy 2020, which is alarming as successful implementation relies on positive awareness and understanding of the policy. (Saraswathy & Nagavalli) (Maruthavanan, 2020) The present study observed that the educators were more aware of the various aspects of NEP 2020 and had more positive perceptions toward implementing NEP 2020. Similarly, the students also have moderate awareness about NEP 2020 but their perception is also somewhat positive as they expect the NEP 2020 will help them become industry-ready. However, simply having a positive perception will not ensure successful implementation. Rather, continual evaluation and monitoring are required to achieve the desirable outcomes of NEP 2020.

References

1.   Akareem, H. S., & Hossain, S. S. (2016). Determinants of education quality: what makes students' perception different? Open Review of Educational Research, 3(1), 52–67. https://doi.org/10.1080/23265507.2016.1155167

2.   Choi, T. H. (2017). Educational reform and teacher resistance: A case from South Korea. Comparative Education Society of Hong Kong Spring Annual Conference 2017 (CESHK 2017).

3.   Devi, L., & Cheluvaraju, . (2020). A Study on Awareness about the Impact of National Education Policy-2020 Among the Stakeholder of Commerce and Management Disciplinary. European Journal of Business and Management Research, 5(6). https://doi.org/10.24018/ejbmr.2020.5.6.640

4.   Khan, A., & Bhatnagar, V. (2019). A Critical Study of Educational Reforms and Its Implications in Higher Secondary School Education in Patna. Issue, 164, 1. www.ijspr.com

5.   Maruthavanan, M. (2020). A Study on the Awareness on New Education Policy (2019) among the Secondary School Teachers in Madurai District. Shanlax International Journal of Education, 8(3), 67–71. https://doi.org/10.34293/education.v8i3.2438

6.   Ministry of Human Resource Development, G. of I. (2020). National Education Policy 2020 Ministry of Human Resource Development Government of India. https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf

7.   Panditrao, M. M., & Panditrao, M. M. (2020). National Education Policy 2020: What is in it for a student, a parent, a teacher, or us, as a Higher Education Institution/University? Adesh University Journal of Medical Sciences & Research, 2, 70–79. https://doi.org/10.25259/aujmsr_32_2020

8.   Pawar, A., Phulari, S., Thakur, N., Joshi, V., Professor, A., & Shyamnarayan, T. (2022). A Study on Awareness about the Impact of National Education Policy-2020 among the Stakeholder of Commerce and Management Disciplinary. International Journal of Advanced Research in Science, Communication and Technology (IJARSCT, 2(5). https://doi.org/10.48175/IJARSCT-3575

9.   Peck, C. (2017). Urban School Reform in the United States. Oxford University Press. https://doi.org/10.1093/acrefore/9780190264093.013.27

10.   Saraswathy, R., & Nagavalli, t. (n.d.). Awareness of Teachers and College Students on National Education Policy 2020.

Impact of Microfinance on Women's Economic Empowerment in Rural Areas of Kancheepuram District

M. JAYASEELY AND C. SAFFINA

Abstract : *This study looks into how microfinance in Kancheepuram district, India, affects rural women's economic empowerment. Using a five-point Likert scale in a structured questionnaire, the study employs a quantitative survey-based research approach to evaluate important markers of economic empowerment. Increases in family income and savings, crisis management skills, less reliance on borrowing money from lenders, carefulness in spending, control over credit and loans, own housing, and appropriate rights in property are some of these signs. The sample is made up of women who were chosen at random from microfinance schemes. Regression analysis, confirmatory factor analysis, reliability analysis, and descriptive statistics are examples of data analysis approaches. According to the research, women's economic standing has benefited from microfinance, especially in terms of increased income, savings, financial independence, and asset ownership. The study emphasises the value of microfinance as a tool for rural women's economic empowerment and stresses the necessity of state support for these kinds of programmes. The study does, however, admit certain shortcomings, such as possible response biases. Prospective study avenues encompass longitudinal investigations and qualitative techniques to enhance comprehension of microfinance's enduring influence and efficaciousness in many socio-cultural settings.*

Keywords : Microfinance, Economic Empowerment, Rural Women, Kancheepuram District, Financial Autonomy, Women's Empowerment, Quantitative Analysis.

M.Jayaseely, Corresponding Author, Research Scholar, Department of Commerce, Holy Cross College (Autonomous), Affiliated to Bharathidasan University, Madurai Rd, Tiruchirappalli, Tamil Nadu 620002. E-mail : jayaseely79@gmail.com, Mob : 9884773586.

Dr.C.Saffina, Assistant Professor, Department of Commerce, Holy Cross College (Autonomous), Affiliated to Bharathidasan University, Madurai Road, Tiruchirappalli, Tamil Nadu - 620002. E-mail : saffinac79@gmail.com, Mob : 9442408291.

1. Introduction

Since its introduction in the 1970s, microfinance has grown to be a vital instrument for reducing poverty and promoting economic independence, particularly in rural regions (Sondhi, 2023). It entails giving low-income people or groups—who typically require access to banking and related services—financial services like loans, savings, insurance, and classes. Because it is more difficult to access traditional financial institutions in rural areas, microfinance is especially important and is a crucial resource for economic activity (Singel, 2018). When we look into women empowerment economically, microfinance is essential. Socioeconomic hurdles frequently hinder access to financial assets, possibilities for economic progress, particularly in rural areas (Memon & Seaman, 2021). In addition to providing financial goods, microfinance institutions (MFIs) give these women a way to advance their standing in their communities, increase their economic engagement, and have more influence over decisions (Asha & Senapathy, 2022).

2. Problem Statement

In Kancheepuram district, like many other rural areas, women encounter numerous economic challenges. These include limited access to capital, a lack of property rights, lower levels of education and financial literacy, and cultural norms that restrict their economic activities (Fofana, 2023). Such challenges exacerbate their vulnerability to poverty and limit their capacity for economic self-sufficiency. Microfinance could potentially address these issues by providing rural women with the necessary financial resources to engage in entrepreneurial activities, thereby improving their income and economic status (Singel, 2018). However, the effectiveness of microfinance in truly empowering women economically in these contexts remains a subject of debate and requires further investigation.

3. Purpose of the Study

The main objective of this research is to find out how microfinance affects rural women in Kancheepuram district's economic empowerment. This entails investigating the ways in which women's economic life are impacted by their access to microfinance, including income levels, savings, asset ownership, and financial decision-making authority. The study intends to advance knowledge of the function of microfinance in economic empowerment of women in a

particular cultural including economic environment by concentrating on Kancheepuram district.

The study will examine a number of important topics, including how much microfinance has helped women participants' families earn more money and save more money; how independent they are financially, including how well-equipped they are to handle financial difficulties; and how much less dependent they are on unofficial financial sources like private money lenders (Sondhi, 2023). It will also evaluate how much more control women have over loans and credit, how much they own of household assets, and how much property they have over male family members (Asha & Senapathy, 2022). By doing this, the study will add to the larger conversation on women's empowerment supported by microfinance as a resource and development in economic status by providing insights that may influence practice and policy in related situations. The results may also be used to improve microfinance models so that they better meet the needs of rural women, improving their general well-being and economic standing (Fofana, 2023; Memon & Seaman, 2021).

4. The Rationale of the Paper

It is impossible to overestimate the importance of researching the effect of microfinance in empowering women economically. Particularly for in underdeveloped nations, microfinance is becoming regarded as a powerful economic instrument for development eradication of poverty of women (Hamsaveni, 2023). Microfinance enables women to participate in entrepreneurship by giving them access to capital, improving their economic standing and advancing the general well-being of their communities (Çetin & Keser, 2018).

In addition to promoting financial independence, women's economic empowerment also acts as a catalyst for more significant social and economic transformations. Empowered women are more likely to make investments in their families' health, education, and well-being, which benefits subsequent generations (Mengstie, 2022). More gender equality and balanced power dynamics in homes and communities can result from women's economic empowerment (Nawawi et al., 2022). Because of the particular difficulties that women in rural areas like Kancheepuram district experience, research on the effects of microfinance in these places is very important. In addition to facing social and cultural constraints that limit their ability to participate in the economy,

rural women frequently have restricted access to traditional banking services (Cooke & Amuakwa-Mensah, 2022). By acting as a bridge, microfinance can help these women get past these obstacles and become financially independent.

5. Expected Contributions

5.a. Academic Contributions

1. **Enhancing Understanding of Microfinance's Role :** This research will contribute to the academic discourse on microfinance by providing empirical evidence on how economic empowerment of women is impacted in a specific geographical area (Adera & Abdisa, 2023).

2. **Filling Knowledge Gaps :** The study will address gaps in the literature, particularly regarding the long-term effects of microfinance on women's economic status in rural areas (Abdo Alaghbari et al., 2021).

3. **Theoretical Advancements :** By exploring the connection between microfinance and empowerment of women economically, the research may offer insights that could provide means to develop new theories or refine existing ones (Khalaf & Saqfalhait, 2020).

5.b. Practical Contributions

1. **Informing Policy and Practice :** The findings of this study could inform policymakers and practitioners about the effectiveness of microfinance programmes in rural areas, leading to improved strategies for women's economic empowerment (Hamsaveni, 2023).

2. **Guiding Microfinance Institutions (MFIs) :** Insights from this research could help MFIs tailor their products to fulfil the requirements of rural women better, thereby enhancing the impact of their programmes (Çetin & Keser, 2018).

3. **Empowering Women Entrepreneurs :** By identifying the key factors that contribute to successful economic empowerment through microfinance, the study could provide valuable guidance to women entrepreneurs in rural areas (Mengstie, 2022).

In short, it is anticipated that this research will significantly advance both theory and practise. It seeks to increase knowledge of microfinance as an instrument for empowering women economically and offer practical advice on how to

improve the efficacy of microlending initiatives in outlying areas like Kancheepuram district.

6. Review of Literature

The theoretical underpinnings of microfinance and women's empowerment are diverse and multidisciplinary. One prominent theory is the Social Capital Theory, which posits that microfinance helps build networks of relationships among women, leading to increased social capital and empowerment (Kaur et al., 2021). Another key framework is the Sustainable Livelihood Approach, which views microfinance as a tool to enhance the assets and capabilities of women to improve their livelihoods sustainably (Bedaduri & Pradhan, 2023). The Feminist Economic Theory also plays a crucial role in understanding microfinance's impact on women. This theory argues that traditional economic models often overlook women's contributions and challenges, and microfinance can be a means to address these gaps and promote gender equality (Mengesha & Mishra, 2023). Additionally, the empowerment theory, which focuses on increasing individuals' control over their own lives, is often used to assess how microfinance enables women to gain financial independence and decision-making power (Hegde, 2023).

Several research have been done to investigate the impact that microfinance has in economically stabilizing women. Microfinance seemed to have a positive impact on women's household, economic, and social accreditation, according to a conceptual review; however, the level of this benefit differs depending on the setting in which the microfinance programmes are implemented (Haque et al., 2022). The authors Efthymiadou and Farmaki (2023) explored women's empowerment in the tourism industry through the use of microfinance. They also indicated the sector-specific implications that microfinance solutions have. The sustainability of microfinance institutions was linked to the empowerment of women borrowers in a study that focused on Malaysia. This suggests that there is a positive association between the stability of institutions and the outcomes of women's empowerment (Arshad et al., 2021).

The study conducted by Mengstie (2022) investigated the influence that microfinance had in economically empowering women in Ethiopia. Findings pointed towards microfinance having a considerable and favourable impact on the empowering women economically. It was achieved through the enhancement of self-reliant income of women, the enhancement of rights on assets, and the enhancement of savings amounts. Khursheed (2022) conducted research to study the function that microfinance plays in empowering women and the expansion

of entrepreneurialism in Pakistan. According to the findings of the study, microfinance institutions have emerged as essential instruments not only for combating the problem of poverty but also, in particular, for extending the agency of women. The authors Kivalya and Caballero-Montes (2023) carried out a comprehensive analysis of the microfinance literature, highlighting the need of comprehending the various aspects of women entrepreneurs' empowerment. The findings of these research collectively shed light on the myriad ways in which microfinance influences the economic standing of women and their level of empowerment.

7. Gap Identification

Despite the significant study that has been conducted on microfinance and the empowerment of women, there are still several gaps. To begin, there is a requirement for an increased number of empirical studies that concentrate explicitly on the impact of microfinance in rural areas such as Kancheepuram district, where the cultural and socio-economic dynamics may be markedly different from those in other regions. Second, although previous research has investigated the effects of microfinance on a broad scale, there is a dearth of studies that investigate the long-term viability of these effects on the economic standing of women. Third, the intersectionality of gender with other social characteristics, such as caste, religion, and age, which can considerably influence the success of microfinance efforts, is not well addressed in a considerable number of studies. In order to fill these gaps, the study provides a comprehensive examination of the impact that microfinance has had on rural women in Kancheepuram district. The study will take into consideration the long-term viability of economic empowerment as well as the intersectional factors that may have an effect on the outcomes.

8. Research Methodology

This study used a quantitative, survey-based research strategy. The efficacy of this approach in measuring the influence of microfinance empowering rural women economically in Kancheepuram district led to its selection. It made it possible to gather quantitative information that could be statistically analysed to determine the connection between using microfinance and other measures of economic empowerment (Mengstie, 2022). To choose participants, the study used random sampling with a sampling frame. This technique improved the representativeness of the findings by guaranteeing that the individual member of the targeted population had a fair chance of being included in the sample.

The sampling frame, which targeted women who were presently enrolled in or had previously engaged in microfinance programmes, was created using data from neighbourhood microfinance institutions in rural Kancheepuram district. The sample consisted of 400 women in total. A structured questionnaire with a five-point Likert scale and an emphasis on economic empowerment measures served as the main instrument for gathering data (Singel, 2018). In addition to sections pertaining to personal data, the questionnaire had explicit statements about measures of economic empowerment such asset ownership, savings, income growth, and financial independence. In order to provide a quantitative assessment of their perceived economic empowerment, respondents were asked to score their degree of agreement with each statement. Depending on accessibility and convenience, the questionnaire was given to the chosen participants either in person or online. Participants were ensured of the anonymity of their answers and made aware of the goal of the study prior to the questionnaire being administered. Over a predefined length of time, the data was collected, giving participants enough opportunity to react (Khursheed, 2022)

9. Objectives of the Study

● **Primary Objective :** To examine microfinance's impact on economically empowering rural women in the District of Kancheepuram.

● **Secondary Objectives :**

   o To identify the key economic empowerment indicators affected by microfinance.

   o To evaluate the extent of change in these indicators among the participants.

10. Confirmatory Factor Analysis (CFA) and Reliability and Validity Analysis

Confirmatory factor analysis (CFA) was done to verify the credibility of the questionnaire and also to justify the use of scale. CFA will assist in validating the questionnaire's component structure and guarantee that the items precisely measure the targeted constructs of economic empowerment. In addition, a reliability analysis will be carried out to evaluate the questionnaire's internal consistency. In order to make sure that every scale's components consistently measure the same construct, Cronbach's alpha for each scale had to be determined.

Table-1 : Confirmatory Factor Analysis (CFA) : Hypothetical Data

Factor	Item (Question)	Factor Loading
Increase in Family Income	My family income has increased due to my involvement in microfinance activities.	0.75
Increase in Family Saving	My family's savings have increased as a result of microfinance.	0.72
Ability to Deal with Financial Crisis	Microfinance has helped me to effectively deal with financial crises.	0.78
Reduced Dependency on Money Lenders	My dependency on private money lenders has decreased because of microfinance.	0.70
Discretion in Spending	I have more discretion over how to spend my portion of the family income.	0.77
Control Over Credit/Loans	I have control over the credit/loans obtained through microfinance.	0.74
Independent Savings Account	I have an independent savings bank account in my name.	0.69
Ownership of Household Assets	I have ownership or co-ownership of household assets.	0.76
Equal Property Rights	I have equal rights to property as compared to male members of my family.	0.68

Source : Author's Compilation.

The factor loadings in this table represent the strength of the relationship between each item and its underlying factor. Loadings above 0.7 are generally considered strong, indicating that the items are good indicators of the respective factors.

Table-2 : Reliability Analysis : Hypothetical Data

Scale	Cronbach's Alpha
Economic Empowerment Indicators	0.85

Cronbach's alpha is used to assess the internal consistency of the questionnaire. An alpha value of 0.85 indicates a high level of reliability, meaning the items within the economic empowerment indicators scale consistently measure the same underlying construct. This high reliability suggests that the questionnaire is a dependable tool for assessing the empowerment of rural women economically through microfinance.

The results are interpreted in the context of the study's objectives, which are to examine microfinance's impact on the empowering rural women economically in Kancheepuram district and to evaluate the extent of change in economic empowerment indicators among the participants. The analysis also takes into consideration any potential limitations or biases in the data collection process, such as sample size and selection, as well as the potential influence of external factors on the participants' economic empowerment. Additionally, the study may also explore any variations in economic empowerment outcomes based on factors such as age, education level, and household income.

Table-3 : Descriptive Statistics : Hypothetical Data

Indicator	Mean	Median	Standard Deviation
Increase in Family Income	3.8	4	0.9
Increase in Family Saving	3.6	4	1.0
Ability to Deal with Financial Crisis	3.7	4	0.8
Reduced Dependency on Money Lenders	3.5	3	1.1
Discretion in Spending	3.9	4	0.7
Control Over Credit/Loans	3.8	4	0.6
Independent Savings Account	3.4	3	1.2
Ownership of Household Assets	3.7	4	0.9
Equal Property Rights	3.6	4	1.0

Source : Author's Compilation.

The mean scores near or above 4 indicate a general agreement with the statements, suggesting positive impacts of microfinance on these indicators. Standard deviations provide insights into the variability of responses.

Table-4 : Regression Analysis

Dependent Variable	Independent Variable	Beta Coefficient	p-value
Economic Empowerment Indicators Score	Participation in Microfinance Activities	0.65	<0.01

A positive beta coefficient (0.65) suggests a strong positive relation between participation in microfinance activities and overall score of economic empowerment indicators. A p-value less than 0.01 shows that this relationship is significant statistically.

The tables and interpretations provide a framework for how the actual data is analysed and interpreted. The quantitative analysis focused on measuring the extent of economic empowerment provided deeper insights into the personal experiences and perceptions of the participants regarding their economic empowerment.

11. Summary of Findings

The examination of the impact of microfinance on women's economic empowerment in rural Kancheepuram district has yielded several key findings:

1. **Positive Impact on Economic Indicators :** The data suggests a general increase in family income, savings, and the ability to deal with financial crises among women participating in microfinance programmes. This indicates that microfinance is playing an important role in enhancing the economic status of rural women.

2. **Increased Financial Autonomy :** There is evidence of increased discretion in spending and control over credit and loans, suggesting that microfinance contributes to greater financial autonomy for women.

3. **Asset Ownership and Property Rights :** The findings show a positive trend in equal property rights and ownership of women, highlighting the role of microfinance in advancing property rights and ownership of women.

4. **Statistical Significance :** The regression analysis indicates a strong and statistically significant relationship between participation in microfinance activities and overall economic empowerment.

12. Conclusion

In conclusion, while the analysis indicates a positive impact of microfinance on the economic empowerment of rural women in Kancheepuram district, more studies are necessary to validate these findings and guide effective policy and practice in this field.

References

Abdo Alaghbari, L. M., Abdullah Othman, A. H., & Mohd. Noor, A. B. (2021). Challenges and difficulties facing Islamic financial inclusion in women's economic empowerment in Yemen: a qualitative approach. *International Journal of Business Ethics and Governance*, 91-114.

Bedaduri, R., & Pradhan, S. K. (2023). Post COVID-19: Eco-friendly Women Entrepreneurs Sustainability Development on TBL Components *International Journal of Professional Business Review*, *8*(6), e02257.

Çetin, I., & Keser, H. Y. (2018). Women entrepreneurs in MENA and Europe. In *Microfinance and Its Impact on Entrepreneurial Development, Sustainability, and Inclusive Growth* (pp. 30–51), IGI Global.

Efthymiadou, F., & Farmaki, A. (2023). Women's empowerment in tourism through microfinance: A case study of Greece. Tourism Management, 84, 104281.

Fofana, N. B. (2023). *Efficacy of microfinancing women's activities in Côte d'Ivoire*. Brill Wageningen Academic.

Hamsaveni, M. (2023). Effect of microfinance on women's empowerment in India: A review. *International Journal for Research in Applied Science and Engineering Technology*, *11*(12), 1584-1589.

Kaur, S., Srivastav, S., & Tyagi, A. (2021, September 3). Impact of using RoSCA on Women Empowerment (with reference to Delhi NCR). *2021 9th International Conference on Reliability, Infocom Technologies, and Optimisation (Trends and Future Directions) (ICRITO), Noida, India.

Khalaf, L. S., & Saqfalhait, N. I. (2020). Microfinance is an emerging tool for women's economic empowerment. In *Entrepreneurial Opportunities* (pp. 37–52), Emerald Publishing Limited.

Khursheed, A. (2022). Exploring the role of microfinance in women's empowerment and entrepreneurial development: a qualitative study. Future Business Journal, 8, Article number: 57

Kivalya, N. Y., & Caballero-Montes, T. (2023). Understanding the dimensions of women entrepreneurs' empowerment: a systematic review of the microfinance literature and avenues for research. *International Journal of Gender and Entrepreneurship*.

Memon, S. B., & Seaman, C. (2021). Empowering women through microfinance banks in rural areas of Pakistan. In The *Emerald Handbook of Women and Entrepreneurship in Developing* Economies (pp. 391-408), Emerald Publishing Limited.

Mengstie, B. (2022). Impact of microfinance on women's economic empowerment. *Journal of Innovation and Entrepreneurship*, *11*(1).

Nawawi, Z. M., Soemitra, A., & Dalimunthe, M. (2022). Women's economic empowerment through sharia micro-finance institutions in Indonesia: qualitative research. *IQTISHADIA Jurnal Kajian Ekonomi Dan Bisnis Islam*, *15*(2), 255.

Singel, R. (2018). Impact of Microfinance on the Economic Empowerment of Rural Women in India: An Empirical Study. *Ramanujan International Journal of Business and Research*, *3*(1), 17–39.

Sondhi, M. S. (2023). Impact of microfinance on women's empowerment. *EPRA International Journal of Multidisciplinary Research (IJMR)*, 41-43.

Shakti Act : A Beacon of Hope for Maharashtra's Women

Kanchan S. Fulmali and Samrat Ashok Gangurde

Abstract : *The efficacy of Maharashtra, India's Shakti Act of 2020, a legislative measure aimed at reducing violence against women and children, depends on public knowledge. The purpose of this study is to find out how much the people of Maharashtra currently know about the provisions of the Act. The study uses focused approaches, such as surveys and questionnaires, in addition to media depictions. It seeks to determine the degree of comprehension among various demographic groups, paying special attention to those who might be at risk. Any disparities in awareness depending on social background, location, or information access will be clarified by this investigation. This research can help shape targeted outreach programs and educational initiatives by detecting awareness gaps. For the Act's intended beneficiaries to be able to take advantage of the legal protections it provides, there has to be a greater awareness among the public of its provisions. By reducing ignorance about the Shakti Act, this study seeks to make Maharashtra a safer place for women to live.*

Keywords : Shakti Act, Awareness, Women, Maharashtra.

1. Introduction

Rape is an abhorrent aspect of human existence; both men and women who are victims of it suffer greatly locally. Several Indian states have taken extremely serious measures against this horrible deed. As an illustration, consider the Andhra Pradesh and Disha Act 2019, which has been proposed in numerous states and established a standard for aiding female victims. Anil Deshmukh, the home minister, introduced the Shakti Bill in the Legislative Assembly in order to address this. The prevention of violence against women and children will be

Prof. Dr. Kanchan S. Fulmali, Professor, Department of Commerce, M.L. Dahanukar College of Commerce, Mumbai, India. E-mail : kfulmali@gmail.com.

Dr. Samrat Ashok Gangurde, Assistant Professor, Department of Accountancy, M. L. Dahanukar College of Commerce, Mumbai, India. E-mail : samashgang@gmail.com.

aided by this law. This law stipulates that the prosecution of the accused must be finished in 21 days.

Within fifteen days, the police had to wrap up their investigation. The Andhra Pradesh Disha Act is being considered as this Act is being written. Globally, violence against women is still widespread and severe, with a high proportion of documented cases occurring in India. As a result, the Indian government passed number of laws to defend women's rights and stop gender-based violence. Among these, the state of Maharashtra's Shakti Act (Protection of Women from Domestic Violence Act, 2005) and Disha Act (The Criminal Law (Amendment) Act, 2013) from Andra Pradesh are prominent.

2. Shakti Act :

In the Indian state of Maharashtra, the Shakti Act, 2020 is a comprehensive law designed to improve the protection and security of women. In response to the mounting worries about sexual harassment, violence against women, and other related offenses, it was put into law. Maharashtra's Shakti Act is a big step in the right direction for women's protection and welfare. The goal of the Act is to make women feel safer and discourage future perpetrators by offering harsher punishments, quicker trials, and support programs.

Enacted in 2005, the Shakti Act is a landmark legislation that provides a comprehensive legal framework for protecting women from domestic violence. It recognizes domestic violence as a cognizable and non-bailable offense, empowering women to seek legal remedies and obtain various forms of protection, including residence orders, custody orders, and monetary relief.

3. Review of Literature

Pam Rajput, Usha Thakkar (2023) : The writers talked about the Maharashtra Shakti Criminal Law, the (Maharashtra Amendment) Act 2020, the Special Court, and the Mechanism for implementing the Maharashtra Shakti Criminal Law, 2020 in order to lessen crimes against women and children. The death sentence is one of the legal punishments for serious crimes like rape.

Sadaf Modak (Dec; 2021) : It has been focused on the Shakti Criminal Laws (Maharashtra Amendment) Act, which was passed by the Maharashtra Assembly on Thursday, December 23, with unanimous votes. Once the Bill was approved,

it became the second state in India, after Andhra Pradesh, to adopt the death penalty for heinous rape and gang rape offenses. The relevant parts of the Criminal Procedure Code and the Acts protecting children from sexual offenses (POCSO) and the Indian Penal Code against rape, gangrape, acid attacks, and sexual harassment have been changed by the Assembly.

Rajendra Prasad (2022) : According to Rajendra Prasad's article in his current affairs yearbook 2022, the Maharashtra Assembly unanimously enacted the Shakti Criminal Laws (Maharashtra Amendment) Act. Context After Andhra Pradesh gave its consent, Maharashtra was proclaimed the second state in India.

4. Research Gap

There are many articles available in newspapers and some descriptions in books on various current affairs. So far, there is no reference to the scrutiny of this Act. Therefore, this is an honest attempt of the researcher to know the public awareness of this law in Maharashtra itself and its effect on women's crimes in the future.

5. Objectives of the Paper

1.   To determine the historical context of the Maharashtra State Shakti Act

2.   To examine awareness of the Shakti Act concerning incidents of violence against women in Maharashtra.

3.   To assess the Shakti Act's effects on various involved people

4.   To make recommendations for enhancing the Act's efficacy

With these few objectives, the following hypothesis is formulated to explore the awareness of Shakti Act in the State of Maharashtra.

6. Hypotheses

H_0 : The Shakti Act has not had a significant impact on the incidence of crimes against women in Maharashtra.

H_1 : The Shakti Act has had a significant impact on the incidence of crimes against women in Maharashtra.

7. Research Methodology

Data Collection : Primary data was collected trough questionnaire. Secondary data was collected through various current affairs books, articles in the newspapers, blogs and e-sources.

Sample size : 117 sample have been collected through simple random sampling method

Statistical tools : Mann-Whitney U Test used for justification of hypothesis.

Limitations of the study : The number of responses was small; the responses are taken only from Mumbai division and these responses are influenced by newspaper articles or hearsay incidents.

8. Testing of Hypotheses

H_0 : The Shakti Act has not had a significant impact on the incidence of crimes against women in Maharashtra.

H_1 : The Shakti Act has had a significant impact on the incidence of crimes against women in Maharashtra.

To evaluate the difference in incidence of crimes with the increase in implementation of the Shakti Act, Mann-Whitney U Test was utilized. This test points towards the impact that Shakti Act has had on incidence of crimes against women in Maharashtra.

Table No. 1 : Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Implementation of Shakti Act	109	2.04	.732	1	4
Incidence of Crimes	109	1.93	.754	1	3

Table No. 2 : Descriptive Statistics - Ranks

	Incidence of Crimes	N	Mean Rank	Sum of Ranks
Implementation of Shakti Act	Decreased	35	27.51	963.00
	Increased	27	36.67	990.00
	Total	62		

Table No. 3 : Results of Mann Whitney U test – Test Statistics[a]

	Implementation of Shakti Act
Mann-Whitney U	333.000
Wilcoxon W	963.000
Z	-2.283
Asymp. Sig. (2-tailed)	0.022

Grouping Variable: Incidence of Crimes

We shall reject the null hypothesis based on the aforementioned results, where the Z-value is -2.283 and the p-value is 0.022, both of which are less than 0.05. The incidence of crimes varies significantly with the growth of the Shakti Act's implementation. Given that the significant value is 0.022, it may be inferred that, notwithstanding the implementation of the Shakti Act, there is a slight effect on the variance in the occurrence of crimes. It follows that the Shakti Act has significantly reduced the number of crimes against women that occur in Maharashtra.

9. Data Analysis & Interpretation

Figure-1 : Gender Classification
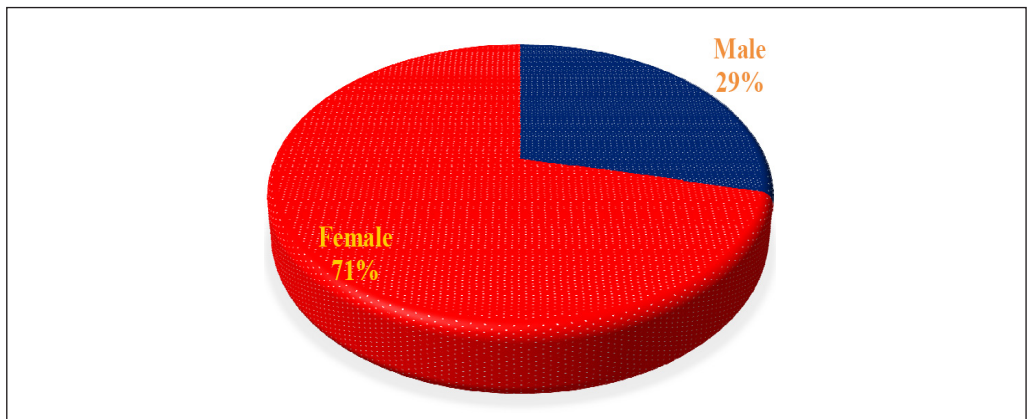
Source : Primary data.

Of the respondents in the research study, 29% were men and 71% were women. Thus, the proper sex ratio was used for this research.

Awareness about Shakti Act 2020

Figure-2 : Awareness of Shakti Act 2020
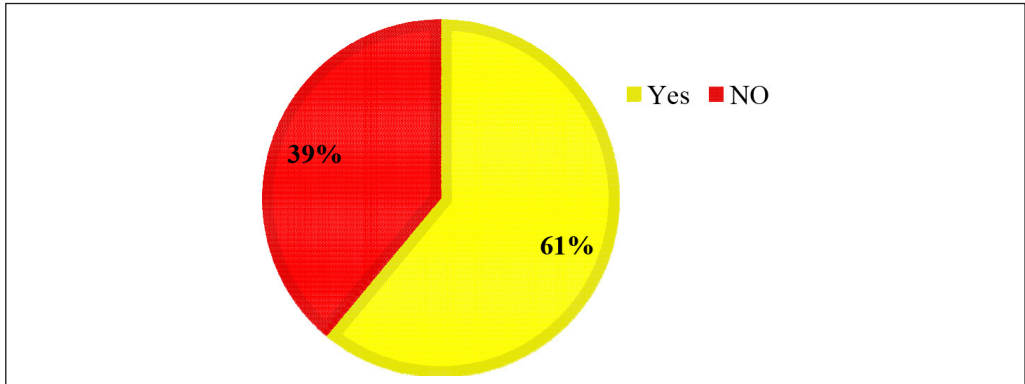
Source : Primary data.

According to Figure 3.61% of respondents are aware of this law, whereas 39% are not.

Familiar with the Provisions of the Shakti Act

Figure-3 : Familiar of the Shakti Act
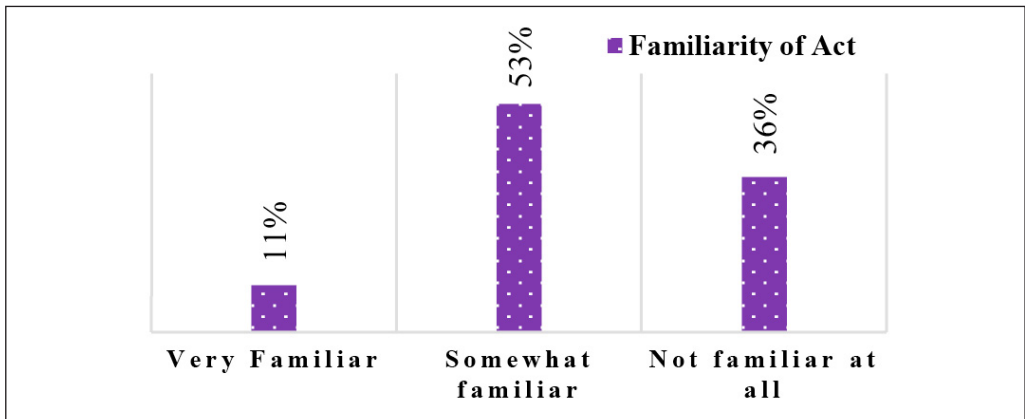
Source : Primary data.

Of those surveyed, 36% claimed to be ignorant of this law. Nonetheless, 53% of those surveyed claimed to only have a passing familiarity with the act—that is, to have heard about it but not in considerable detail.

Public Awareness of the Shakti Act would Deter Potential Abuse of Women

Figure-4 : Public Awareness about Shakti Act
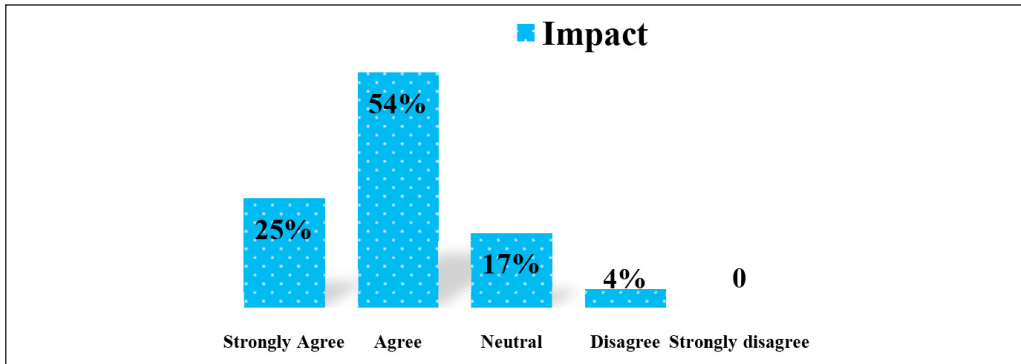
Source : Primary data.

Figure-5, which displays 54% of respondents who agree and 25% who strongly agree, illustrates how awareness discourages violence against women. This indicates that the Maharashtra people has to be made aware of the Shakti Act.

Confidence to Report Violent Crimes

Figure-5 : Confidence to Report Violent Crimes
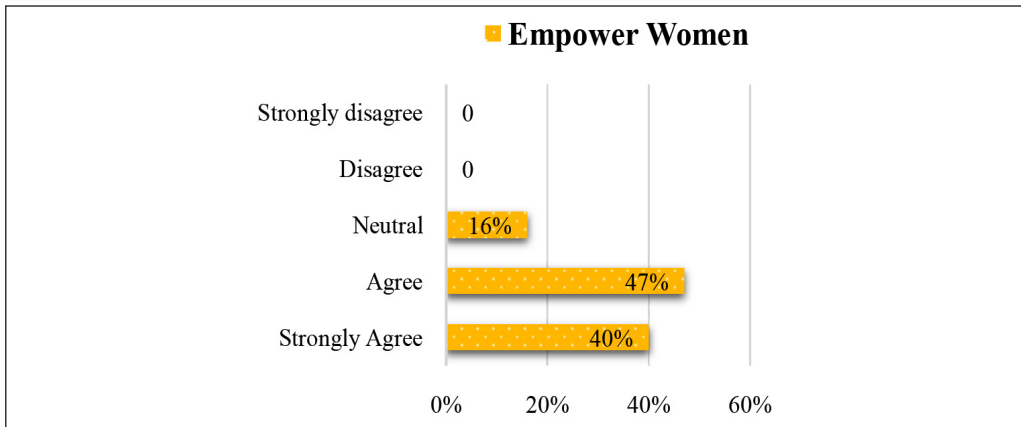
Source : Primary data.

Figure-6 depicts women's empowerment and awareness. Of the respondents, 47% agreed and 40% strongly agreed with women's empowerment. This implies that women's empowerment may result from knowledge of the Shakti Act.

The Most Effective Ways to Increase Awareness of the Shakti Act in Maharashtra

Figure-7 : Effective ways to Awareness
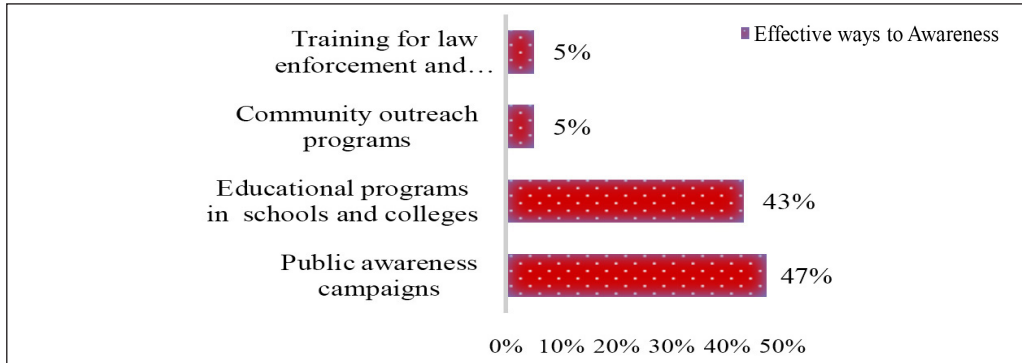
Source : Primary data.

The pathways of consciousness growth are depicted (in Figure-7). 5% of respondents were in favor of training for law enforcement and judicial officials. While 43% of respondents supported educational programs at schools and colleges, an additional 5% supported community outreach initiatives and 47% concurred with public awareness initiatives.

The incidence of crimes against women in Maharashtra increased, decreased, or remained the same since the implementation of the Shakti Act

Figure-8 : Impact of Shakti Act
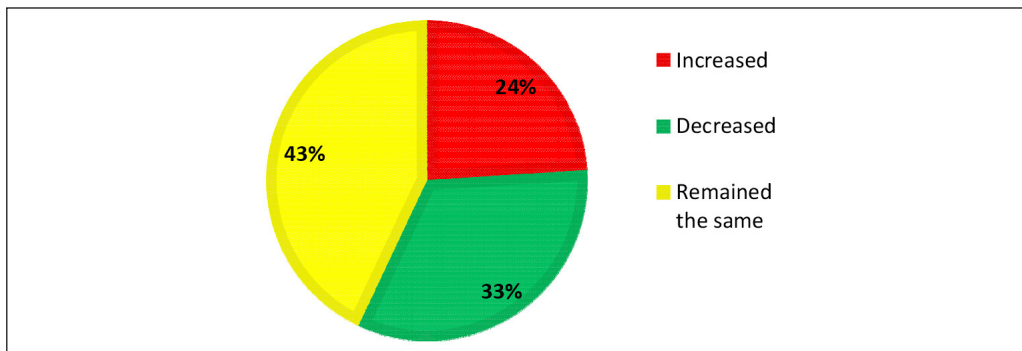
Source : Primary data.

People are not very aware of the facts, which has resulted in diverse opinions to the survey mentioned above. Of those surveyed, 24% predicted an increase. Of those who responded, 33% predicted a drop in crime and 43% said it would stay the same. In their view, there is therefore a great deal of confusion.

Reasons for Increasing the Crime

Figure-9 : If Reasons
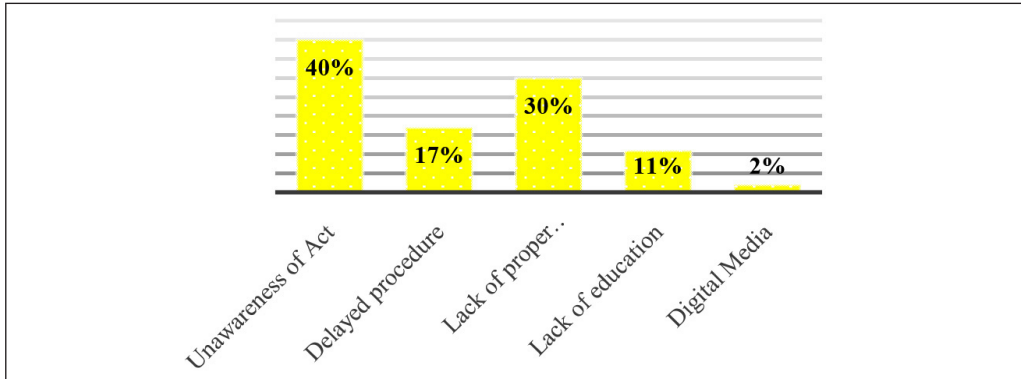
Source : Primary data.

The several causes of the rise in crimes against women following the Shakti Act's introduction are depicted in Figure-9. According to 40% of the respondents, it is because they are unaware of this Act. 30% concurred since there was insufficient punishment. While 11% and 17%, respectively, agreed that there was a lack of education and a delayed procedure. Remarkably, just 2 percent attributed crime against women to digital media.

Reasons for Decreasing the Crime

Figure-10 : Reasons for Decreasing
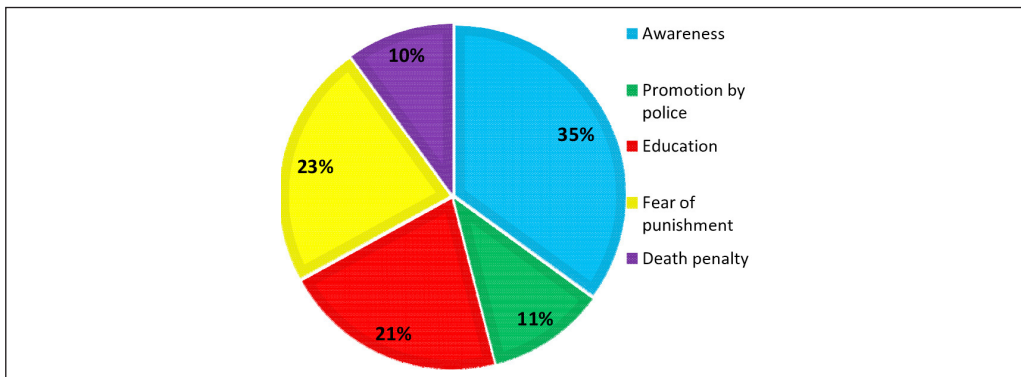
Source : Primary data.

Figure-10 focuses on the various reasons for the decline in crimes against women after the implementation of the Shakti Act. 35% of respondents say more awareness is needed. 23% and 21% agree for fear of punishment and more

education respectively. While 10% and 11% people agree to promote death penalty and promotion of Act by police respectively.

Safer as a woman in Maharashtra since the implementation of the Shakti Act?

Figure-11 : Safety of Women
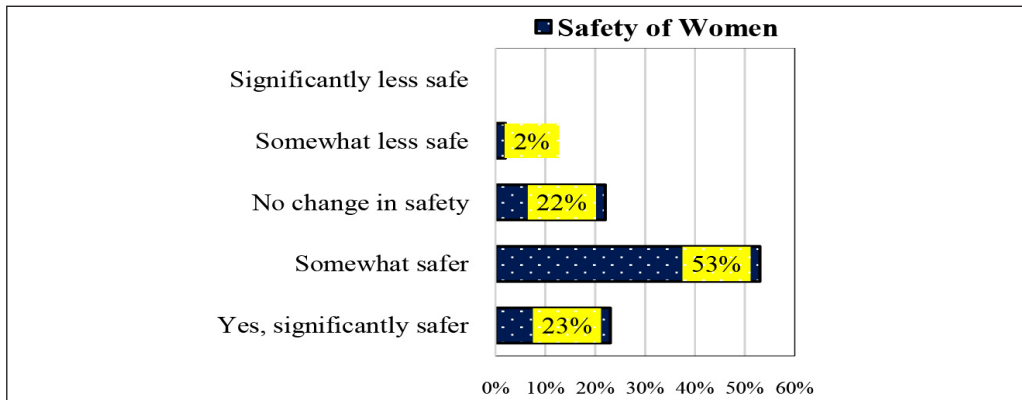
Source : Primary data.

Figure-11 shows the safety of women since the introduction of the Shakti Act. 53% and 23% of respondents agreed that women are somewhat safe and significantly safe respectively. 22% respondents agreed about no change in security. But 2% respondents said women are also somewhat less safe.

Recommendations for strengthening of Act

Figure-13 : Recommendations
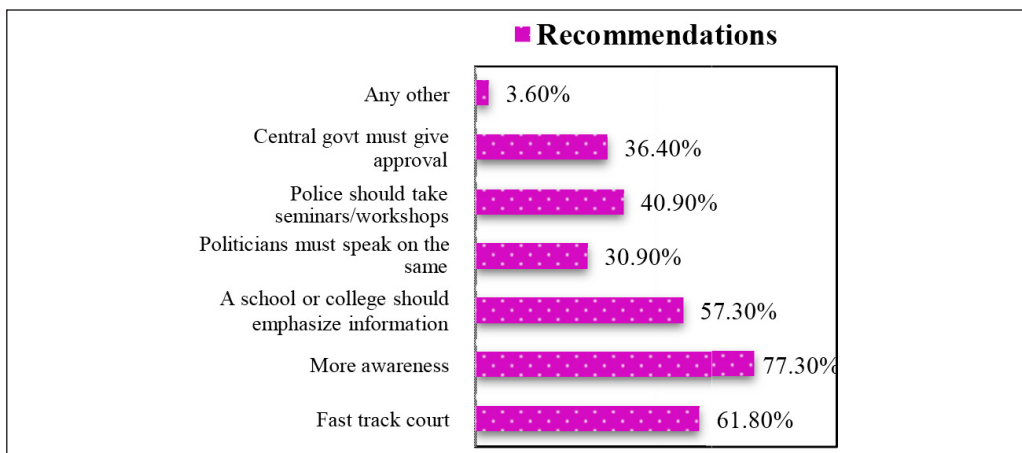
Source : Primary data.

From all the above research some recommendations are given by the respondents like about 62% of the respondents suggested speedy court for punishment of criminals. 78% suggested more awareness. 57% of the respondents suggested that schools and colleges should emphasize Shakti Act knowledge.41% of the respondents suggested that police should conduct seminars and workshops related to Shakti Act and create public awareness. 36% suggested that it should be approved by the central government quickly. 31% also suggested that politicians should speak at each of their public meetings.

10. Conclusion

In order to lessen horrible crimes against women in Maharashtra, the Shakti Act is crucial. Yet, greater awareness is required, raising red flags for criminals. Hence the alternate hypothesis in the research opposing theory that "the Shakti Act has had a significant impact on the incidence of crimes against women in Maharashtra" is accepted. The difference in crime rates with increases in law enforcement authority was assessed using the Mann-Whitney U test. This test shows how the Shakti Act has affected the number of crimes against women in Maharashtra.

The current status of decline in incidents among Maharashtrians in relation to the Shakti Act's provisions has been brought to light by this research. It will be advantageous for victims' rights advocacy and women's safety. This will give Maharashtrian women more influence. This is the researcher's ultimate objective.

References

Pam Rajput, Usha Thakkar. (2023). Women in State Politics in India: Missing in the Corridors of Power. Taylor & Francis Publication

Rajendra Prasad. (2022). Current Affairs Year Book 2022: Indian Polity & Governance. MYUPSC publication

Sadaf Modak. (December 30, 2021). Explained: Maharashtra's Shakti Act that approved death penalty for rape. indianexpress.com

Surendra P Gangan (December 17, 2023) State's 2021 Shakti Act for crimes against women still to get central nod. Hindustan Times.

Bhavika Jain. (December 24, 2021). Maharashtra assembly unanimously OKs Shakti bill seeking death for rape. The Times of India.

Disha Expert. (2023). Quarterly Current Affairs Vol.4- October to December 2020. Disha Publication

https://thewire.in/women/maharashtra-bill-proposes-death-penalty-for-heinous-crimes-against-women-children

https://prsindia.org/bills/states/the-shakti-criminal-laws-maharashtra-amendment-bill-2020

https://www.nextias.com/ca/current-affairs/28-12-2021/shakti-criminal-laws-maharashtra-amendment-act

https://vajiramias.com/current-affairs/shakti-criminal-laws-maharashtra-amendment-act/61cd3a9b1d5def706162cefb/

A Bibliometric Analysis of Financial Technologies in the Indian Banking Sector

ANURAG .A.S, JOHNPAUL .M AND RAVI ALUVALA

Abstract : *The banking industry in India has experienced notable technological progress that has revolutionized its operations and consumer experiences. Using data from 217 publications gathered from the Web of Science (WoS) and Scopus databases, this bibliometric review research investigates how Indian banks are using technology including digital banking, blockchain, artificial intelligence, and fintech advances. Through a thorough analysis of several academic and commercial publications, the report pinpoints important research topics, trends, and the effects of these technologies on productivity, security, and customer satisfaction. The study underscores the significance of technology in propelling financial inclusion and transforming the Indian financial scene, and it also indicates forthcoming avenues for research and innovation in the banking sector.*

Keywords : Bibliometric Analysis, Blockchain, Finance, Fintech, Indian Banking.

1. Introduction

The introduction of modern technology has led to a transformational shift in the Indian banking sector. Global companies have been impacted by the significant interruptions caused by the COVID-19 epidemic and the Russian-Ukrainian war. There has been significant disruption to a number of vital corporate operations, including the global supply chain and financial services (Guo et al., 2024). Through some of the major inventions of the contemporary world, both of these have made a comeback. Following the disruptions, artificial

Anurag .A.S, Research Scholar, Department of Management Studies, Central University of Kerala. Email : anurag.a.sunitha@gmail.com

Dr.Johnpaul .M, Assistant Professor, Department of Management Studies, Central University of Kerala, India, Email : johnpaul@cukerala.ac.in

Prof.Ravi Aluvala, Professor, Department of Business Management, Mahatma Gandhi University, Nalgonda, Email : aravi13371@gmail.com

intelligence (AI) technologies such as blockchain technology have been essential in revitalizing the banking industry. By enabling traditional financial services to realize their full potential, the implementation of block chain technology has played a pivotal role in propelling the revolutionary expansion of financial technologies, or fintech (Xie et al., 2023). Unfathomable potential has been unlocked in the banking sector through the integration of these digital technologies and the internet.

Fintech is where innovation, information technology (IT), and finance come together (Giglio, 2021). Although there isn't a clear definition for fintech, it often refers to any financial services that have been combined with digital technology. Fintech, according to Mention (2019), includes any innovation aimed at improving financial services delivery, use, and business operations. Fintech uses specialized software and algorithms available on computers and, increasingly, smart phones to help businesses, entrepreneurs, and people manage their finances more efficiently. (Kagan, 2020). New business models can be enabled, automation increased, customer experience improved, financial processes transformed, and decision-making improved through the integration of emerging technology in FinTech.

 Financial organizations are better positioned for success in a competitive market because to this integration, which also improves efficiency, security, happiness, innovation, and development (Leong & Sung, 2018). Fintech's future will be shaped by technologies including artificial intelligence (AI), cloud computing, blockchain, Internet of Things (IoT), low- or no-code programming, open source, robots, and machine learning (ML) (Patadiya, 2023). Two significant participants in the fintech industry are emerging markets like China and India (Mention, 2019).

According to the latest report by (Mint, 2023), the US is the country with the most fintech start-ups, followed by the UK. India holds the third position in terms of fintech unicorns. India's fintech market, poised for rapid expansion, surged from $50 billion in 2021 to an anticipated $150 billion by 2025, with crucial segments like Payments, Digital Lending, InsurTech, and WealthTech projected to achieve a transaction volume of $100 trillion and revenue of $50 billion by 2030 (Invest India, 2024). These reports show India's critical role in the development of fintech. India has a long history with the fintech. Saxena et al. (2022) have highlighted the history of fintech in India. According to the authors, fintech 1.0 started just after independence in 1950, with the nationalization of several Indian banks and increased users of financial services. With the arrival

of the internet and online digital technologies, fintech evolved into fintech 2.0. Online banking, ATMs, and credit cards characterized Fintech 2.0. The emergence of crypto currencies and online wallets, alongside the demonetization movement in 2016, propelled the growth of India's fintech 3.0. With over 2000 fintech firms operating in India, traditional banks were compelled to adapt, incorporating fintech elements into their strategies to cater to tech-savvy customers. Fintech technologies, ranging from crowd funding platforms to mobile payments and robotic investment advisors, have revolutionized the financial industry, driving innovation and reshaping consumer behaviour (Saxena et al., 2022).

There are typically four different types of fintech according to their functions. These are capable of revolutionizing the banking sector. Payment processing and money transfers, investment management, loan origination, and wealth management are the four types that aim to enhance customer experiences and streamline financial processes for banks and individuals alike (Shnaider, 2023). These technologies help improve the loan market, payment services, wealth management, remittance transfers, insurance services, and equity funding (Painoli et al., 2021). New fintech companies bring numerous opportunities to the financial sector, yet some traditional banks are affected by the rapid development of fintech. Fintech companies can make transactions more accessible, reliable, and efficient, and this can disrupt traditional banking methods (Shnaider, 2023).

There are multiple approaches to comprehending a specific scientific domain's evolution and fundamental principles. Various methods, such as quotation analysis for recognizing significant papers and authors, bibliographic coupling for unveiling emerging trends, keyword co-occurrence analysis for charting research domains, and science mapping/network analysis for offering a panoramic view of scientific terrains, along with bibliometric analysis for scrutinizing data associated with scientific literature, contribute to understanding the development and core concepts within a particular field of science (Borregan-Alvarado et al., 2020). One of the most commonly used methods is bibliometric analysis, a rigorous approach to analyzing extensive scientific data (Donthu et al., 2021). With the help of software assistance, a bibliometric analysis can be used to identify relevant research areas, authors, and their relationships by analyzing all published works in a field (Han et al., 2020). Bibliometric analysis depends on recognizing the entire literature, encompassing publications in their most comprehensive scope within a particular subject domain (Ellegaard & Wallin, 2015). The widespread adoption of bibliometric analysis owes to

advancements, accessibility, and the availability of software tools like Gephi, Leximancer, and VOSviewer, in addition to scientific databases like Scopus and Web of Science (WoS) (Donthu et al., 2021). Furthermore, its cross-disciplinary dissemination from information science to business research has contributed to its popularity.

When seeking to comprehend the current status and evolution of a specific topic, bibliometric analysis emerges as one of the most effective options in research. Hence, we conducted a bibliometric analysis to study the state of research on fintech within the Indian banking sector. Before conducting the bibliometric analysis, an extensive literature review revealed that an analysis on this topic is not available in the context of the Indian banking sector. Several bibliometric studies have already been done on fintech and related fields, but none on the Indian banking sector. Pandey et al. (2024) is a bibliometric review of fintech in banking and finance. The authors used the bibliometric and content analysis method on 366 Scopus-indexed publications. This study reveals the existence of a significant opportunity for theoretical and contextual exploration alongside methodological advancements within the fintech literature (Pandey et al., 2024). A bibliometric analysis of fintech trends was conducted by (Garg et al., 2023) by analyzing 665 publications from the Scopus database by evaluating the citation connections among the most influential articles. The research concentrated on examining FinTech's roles and research limitations in digital finance. In the '2023 3rd International Conference on Innovative Practices in Technology and Management (ICIPTM)', a paper on bibliometric and visual analysis of fintech applications is published (Revulagadda et al., 2023). The authors claimed that the leading fintech publishers are in the USA and UK, followed by China. India holds fourth place in terms of fintech-related publications. (Patel et al., 2022) went more specific with their analysis. They specifically studied block chain in banking and finance. As mentioned earlier, block chain is only one of the several technologies used in fintech. On the other hand, our study focuses on fintech as a whole. Rabbani et al. (2022) conducted a bibliometric analysis of crowd funding and P2P lending. These are two of the most critical and innovative financial services of the modern time (Rabbani et al., 2022). Both can be associated with fintech since they represent innovative financial services technology enables. This study focused on fintech and its functions in India's banking sector.

By conducting a bibliometric analysis on this topic, we identified areas within fintech in Indian banking that have received less attention or remain unexplored. This can guide future research efforts, enabling researchers to focus on filling

these gaps and contributing meaningfully to the field. By examining citation counts, publication trends, and research collaboration patterns, we could map these studies' relevance to the field. Insights from this study can inform policymakers and industry stakeholders about the prevailing research landscape in fintech and its implications for the Indian banking sector. This knowledge can guide the formulation of policies, strategic decisions, and investments to foster innovation and competitiveness in the industry. Lastly, a bibliometric analysis can contribute to the academic discourse by adding to the body of scholarly literature and laying the groundwork for future research endeavours in fintech and banking in the Indian context.

The remainder of the paper is structured as follows: Section 2 offers a detailed overview of the methods and data employed in the study. Section 3, the results section, will analyze and interpret the findings derived from the software. This section will include visual representations and thorough descriptions of the results. Section 4 will delve into discussions surrounding the interpreted results and outline potential avenues for future research. The concluding remarks on the study will be presented in the final section.

2. Methodology

This study was conducted through a meticulously structured three-phase process. In the study's first phase, we collected data for the relevant articles. WoS, named the Web of Science initially and established by Eugene Garfield in the 1960s, is the pioneering bibliographic database (Pranckutë, 2021). Several comparative studies of these two databases are available (Martín-Martín et al., 2018; Mongeon & Paul-Hus, 2016; Pranckutë, 2021; Zhu & Liu, 2020). Our research incorporates Scopus and WoS databases, recognizing that each possesses distinct advantages and drawbacks, ensuring comprehensive coverage of high-quality works in the field. After the search, we identified 173 and 54 documents from Scopus and WoS, respectively. After combining and removing the ten duplicate articles, we ended up with 217 relevant articles to our study.

The second step involved an analysis of the 217 papers that had been nominated. The analysis was undertaken to better understand the topic's publication frequency, effect in academic disciplines, and change over time. Biblioshiny and VoS Viewer's multiple presentation choices enable deep investigation of bibliometric maps, allowing users to precisely expose many elements of the data (van Eck & Waltman, 2010). These technologies work together to allow for more in-depth study and interpretation of bibliometric data.

Figure-1 : Flowchart of Data Collection Process
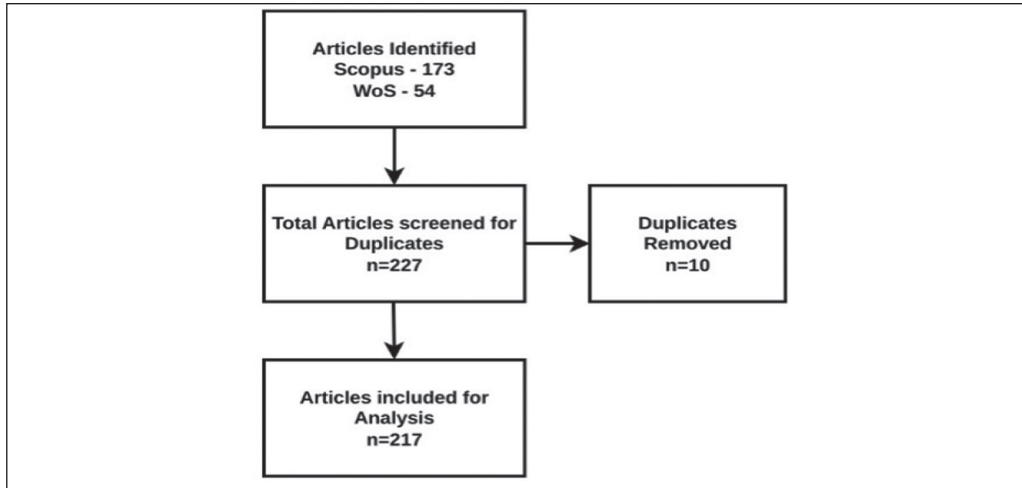
The third and final step is the reporting of bibliometric analysis. Reporting any research is very critical. Through reporting, the quality and validity of the analysis can be assessed, contributing to the advancement of knowledge in the field. Additionally, it provides researchers with recognition and facilitates informed decision-making for policy, practice, and further research directions.

3. Results

3.1. Publication Analysis

At first, we focus on assessing the quantity and impact of scientific publications; including citation metrics, core sources, authors' productivity, and affiliations' contributions over time. By focusing on these key metrics, we can effectively evaluate scientific research's quantity, impact, and dissemination channels and recognize influential authors, affiliations, and documents within the research landscape. This approach ensures a comprehensive yet focused analysis of publication dynamics.

3.1.1. Annual Scientific Production

As illustrated in Table-1, there has been a substantial increase in the volume of publications on this topic in India. After analyzing the data acquired from Scopus and WoS, we noticed a steady increase in the production volume since 2020. The most noticeable change occurred during the 2021-22 period. There is an increase of more than 60% in the annual production in 2022 compared to 2021.

Table-1 : Annual Production of the Last 10 Years

Year	Articles
2014	8
2015	7
2016	15
2017	6
2018	10
2019	17
2020	13
2021	15
2022	39
2023	46
2024	11

Figure-2 shows the average citations over the years. The graph also has a very prominent peak during the year 2020. This is the year with the most production; hence, it is evident that it will also mark the most citations. When we analyze the trend of citations over the years, a general upward movement can be seen despite the ups and downs in the graph. With India's new technology adoption measures, we can expect more studies on Fintech and associated technologies coming from India in the latter part of 2024 and the coming years.

Figure-2 : Average Citations over the Years
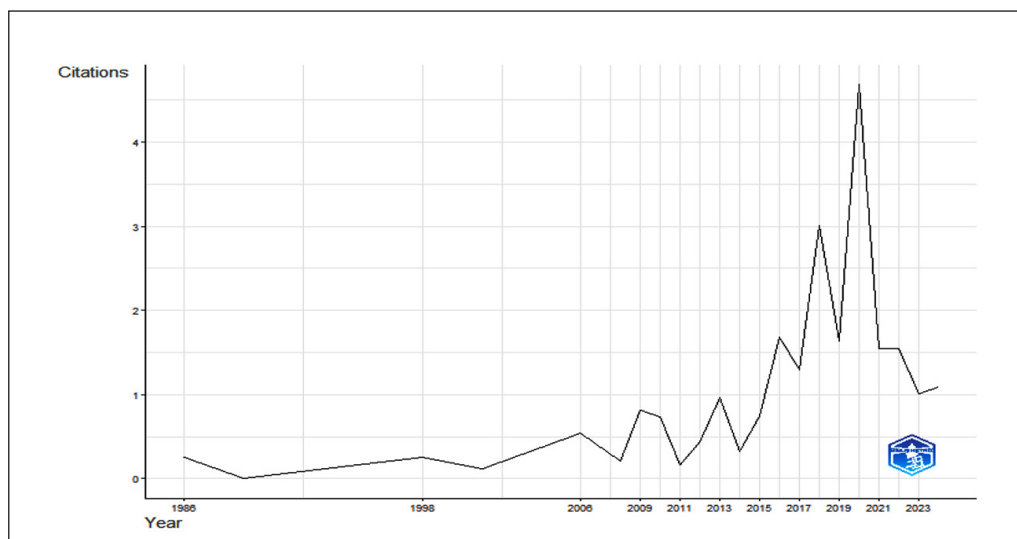
3.1.2. Most Relevant Sources

It is not unexpected that a financial journal leads the pack regarding article count. The Indian Journal of Finance shares the top spot with the International Journal of Applied Engineering Research, each boasting six articles. Communications in Computer and Information Science, Smart Innovation Systems and Technologies, and Sustainability have four articles each. Table-2 outlines the top 10 journals and their respective publication totals.

Table-2 : **Journals and their Share of Articles**

Sources	Articles
Indian Journal of Finance	6
International Journal of Applied Engineering Research	6
Communications in Computer and Information Science	4
Smart Innovation Systems and Technologies	4
Sustainability	4
AIP Conference Proceedings	3
Global Business Review	3
International Journal of Advanced Science and Technology	3
International Journal of Applied Business and Economic Research	3
International Journal of Bank Marketing	3

3.1.3. Most Relevant Authors

Figure-3 displays the top 10 authors based on the number of publications. Singh S, Gupta S, and Sharma S are leading the list, with eight, six, and five publications, respectively. Notably, with a publication dating back to 2016, Kumar A is the longest-active author among the top ten. The graph focuses solely on currently active authors and does not assess their impact on the research community.

Chitkara University is the most relevant institution in the analyzed dataset, contributing eight articles. Following closely behind, four universities share the second position, each contributing five articles. Figure-4 depicts the top 10 affiliations based on their total number of publications.

Figure-3 : Most Relevant Authors by Publications
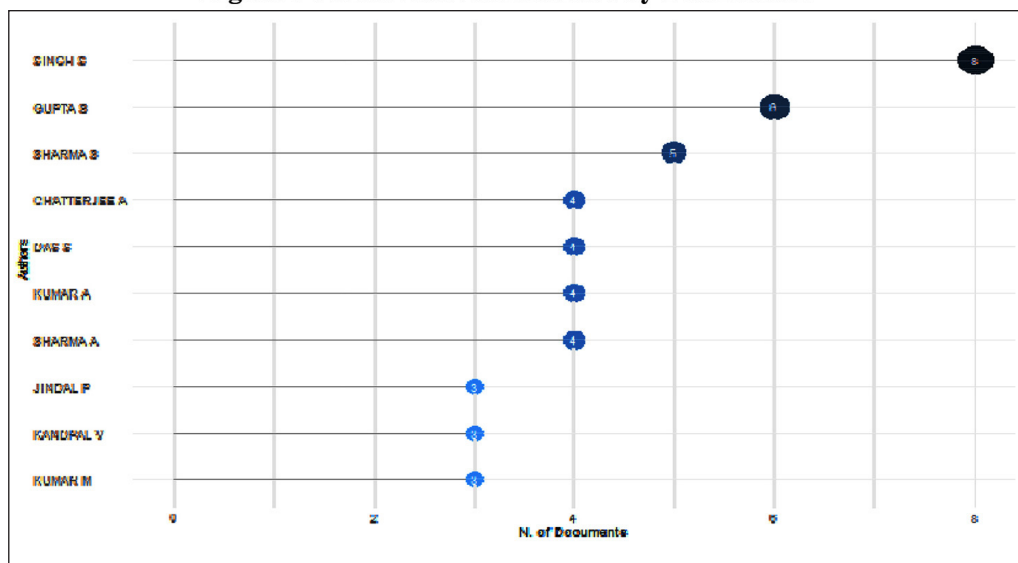
3.2. Keywords Analysis

In this section, we analyzed the textual content of publications, examining the frequency and trends of specific words, co-occurrence networks, and thematic mapping to identify prevalent topics and their evolution over time. Pesta et al. (2018) emphasized the significance of studying keywords. Keywords play a vital role in grasping the popularity of a particular research topic (Pesta et al., 2018). Since all the articles we used for this study focused on the Indian Banking sector, India became the most common keyword in the analysis. However, we should focus on the rest of the keywords in the table to understand the characteristics of the research topic. Block chain, e-banking, and mobile banking are some of the vital keywords to be noted.

Figures-4 present visual representations of the keywords. Figure-4 is a tree map illustrating the relevant keywords. According to Long et al. (2017), tree maps are practical tools for visually representing hierarchical data. They portray each node as a rectangle, further subdivided for child nodes, ensuring efficient use of space and aiding pattern identification, especially when colour and size variations align with the tree structure. Tree maps facilitate the clear display of thousands of items on a screen simultaneously, making them valuable for data visualization tasks (Long et al., 2017). Figure-5, the Keyword co-occurrence

network, as explained by Su and Lee (2010), is crucial for understanding the topic's theme and evolution and the keywords' interconnectedness. This network analysis provides insights into how keywords are linked and their mutual relationships (Su & Lee, 2010).

Figure-4 : **Keyword Treemap**

Figure-5 : Keyword Co-occurrence Network
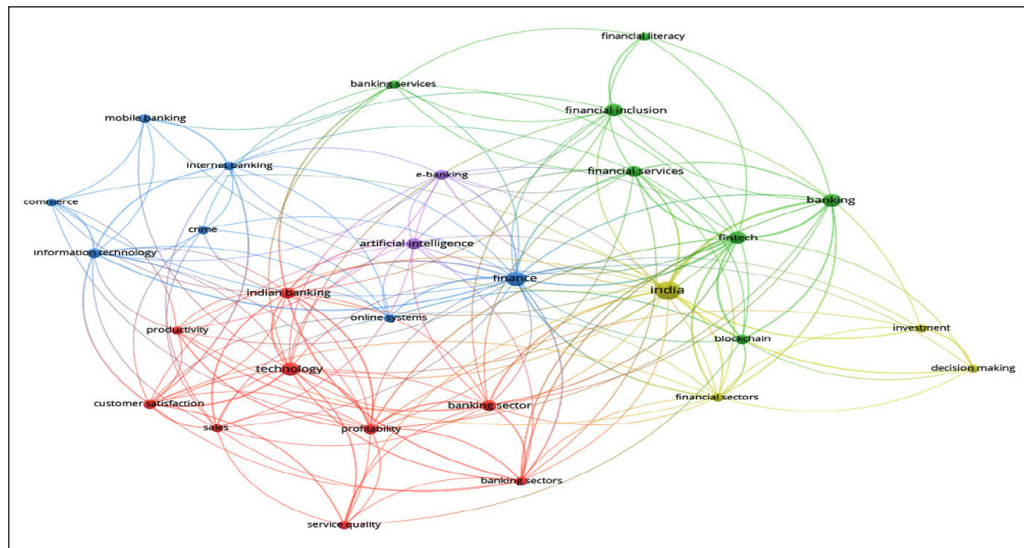
3.3. Thematic Analysis

A thematic map aids in comprehending the evolution of the research field. Figure-6 depicts the thematic map of our analysis, providing insights into the interconnectedness and evolution of various themes within the research domain. It is a two-dimensional map divided into four quadrants (Thangavel & Chandra, 2023). As illustrated in the graph, we observe distinct thematic categories: niche themes, motor themes, basic themes, and emerging or declining themes. According to Muñoz-Leiva et al. (2012), keywords within niche themes hold only marginal significance. Conversely, the motor themes section comprises the most relevant and well-developed keywords within the research field. These keywords represent established and clearly defined aspects of the domain. Meanwhile, themes in the basic themes quadrant indicate a developmental stage but hold significant importance for the research field's progress. Lastly, the quadrant representing emerging or declining themes contains keywords with limited developmental potential.(Muñoz-Leiva et al., 2012).

Figure-6 : **Thematic Evolution**
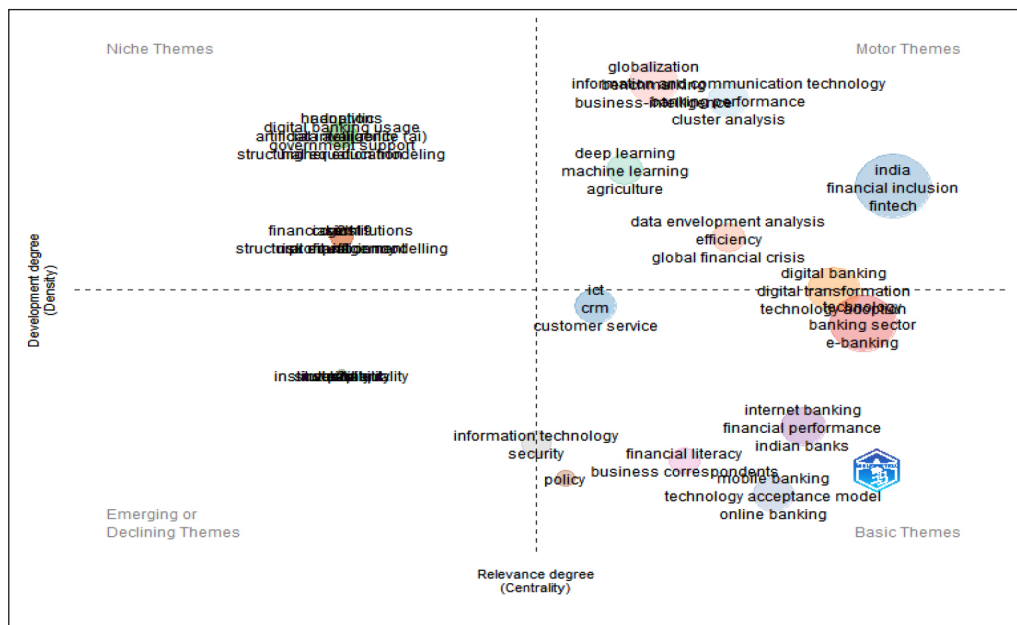
Figure-7 : A Conceptual Map of Factorial Analysis
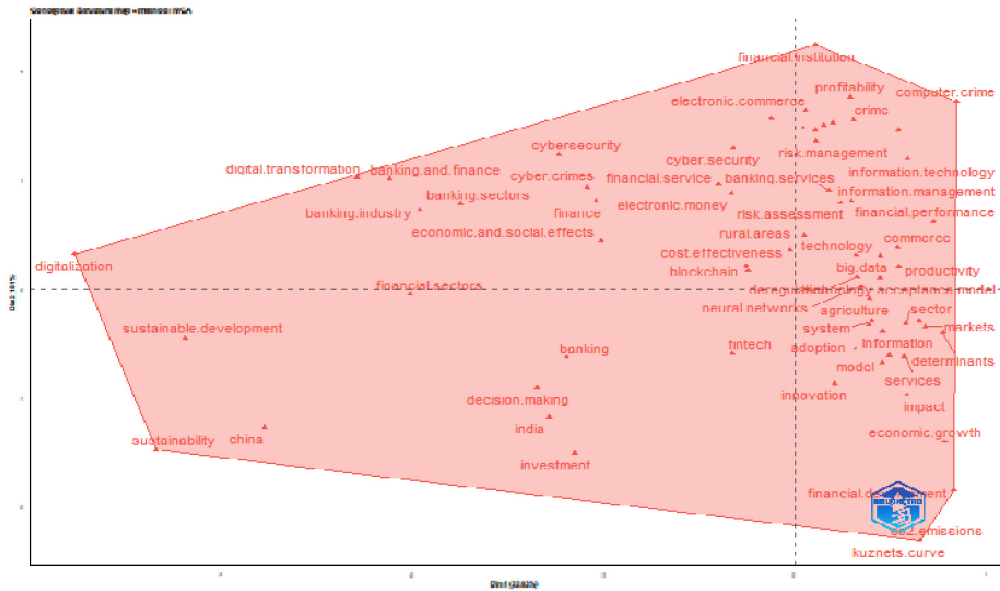
4. Discussions

This bibliometric analysis aimed to assess the current state of research on fintech in the Indian banking sector. In total, 217 papers authored by 511 individuals were examined. The subject demonstrated an annual growth rate of 6.51%, with a notable increase in researcher interest over the past seven years. Despite this growth, publications have remained relatively steady since 2016. These 217 studies were dispersed across 165 sources, indicating a lack of concentrated focus on the subject within a single publication outlet. With a contribution of 8 articles each, the Indian Journal of Finance and the International Journal of Applied Engineering Research emerged as the top two journals regarding publication volume. However, it is worth noting that only the former exhibited a high impact score, whereas the latter had a comparatively low h-index score.

When analyzing the number of publications per author, it was found that the highest contribution from a single author amounted to 8 out of the 217 articles studied. This suggests a lack of sustained interest from many authors, with only a few, such as Singh S and Kumar A, demonstrating consistent engagement over time. This indicates that many authors may not be continuously involved in studying the subject. Additionally, over 95% of the articles analyzed were single-

country publications. While these studies focus solely on India, collaboration with foreign authors could enhance research outcomes by facilitating comparisons of technologies across different countries. Similarly, the analysis of affiliations revealed the participation of several organizations, with the most productive affiliation contributing eight articles. This underscores the broad reach of the field under discussion but also suggests that studies have only scratched the surface, emphasizing the need for more focused research to understand the subject area truly.

Throughout the analysis, several keywords were identified that provide insight into the field's evolution over time. Notably, "India" emerged as the most frequently occurring keyword, which aligns with the focus on the Indian banking sector in our study. Interestingly, only "block chain" appeared in the top ten keywords, which can be considered a technology used in fintech. This suggests that research on other technologies like IoT, ML, cloud computing, and robotics is still in its early stages and presents opportunities for exploration for new researchers. Additionally, keywords such as "e-banking" and "mobile banking" were among the top ten, highlighting their significance as fintech applications. However, ample room remains for further investigation into practical fintech applications, including credit score computing, fraud detection, and wealth management. Researchers are encouraged to delve into these areas to enhance understanding and knowledge in the field.

The thematic map revealed several influential and emerging themes in the analysis. Among the most significant themes were deep learning, machine learning, digital banking, financial inclusion, and fintech. Additionally, themes such as financial literacy, mobile banking, online banking, financial performance, and technology acceptance models emerged as new focus areas, showing potential for future growth. Over time, specific themes have evolved. While banking has become less prominent, finance has grown more than in previous years. On the other hand, the evolution of electronic money appears to have been less significant over time. These observations underscore the dynamic nature of research themes within the fintech domain and highlight areas ripe for further exploration and development.

The bibliometric analysis provides a comprehensive overview of the current state of fintech research in the Indian banking sector. While the findings indicate a growing interest and investment in the subject, there remain opportunities for further exploration and collaboration to deepen understanding and drive meaningful impact. There is a need for sustained research efforts to deepen

understanding and address gaps in knowledge, particularly in underexplored areas. Fostering interdisciplinary collaboration and international partnerships can enrich research outcomes and facilitate knowledge transfer across borders. By leveraging diverse expertise and resources, researchers can generate more comprehensive insights into the complexities of fintech adoption and its impact on the Indian banking ecosystem. Lastly, as the field continues to evolve, it is essential to remain vigilant of emerging trends and technological advancements. Future research should strive to stay abreast of developments in artificial intelligence, data analytics, and cyber security, as these factors will increasingly shape the trajectory of fintech innovation in India. By leveraging insights from this analysis, researchers can chart a course for future investigations to advance knowledge and promote innovation in fintech within the Indian context.

5. Conclusions

In conclusion, the bibliometric analysis of fintech research within the Indian banking sector offers valuable insights into its growth trends, publication landscape, author contributions, thematic evolution, and potential future directions. The analysis revealed a steady annual growth rate, indicating increasing interest in fintech research over the past years. Comparatively, more journals have contributed to this area, but the dominance of a single source cannot be found. This analysis also helped us to reveal the prominent themes under development in this field. Understanding the evolution of these themes provides valuable insights into the shifting focus of fintech research over time.

In light of these findings, future research efforts should prioritize interdisciplinary collaboration, international partnerships, and exploration of emerging themes to advance understanding and drive innovation in fintech within the Indian banking sector. By addressing gaps in knowledge and leveraging insights from thematic analysis, researchers can contribute to the continued growth and development of fintech research, ultimately benefiting the broader banking ecosystem and society.

References

Borregan-Alvarado, J., Alvarez-Meaza, I., Cilleruelo-Carrasco, E., &Garechana-Anacabe, G. (2020). A Bibliometric Analysis in Industry 4.0 and Advanced Manufacturing: What about the Sustainable Supply Chain? *Sustainability*, *12*(19), 7840. https://doi.org/10.3390/su12197840

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, *133*, 285–296. https://doi.org/10.1016/j.jbusres.2021.04.070

Ellegaard, O., & Wallin, J. A. (2015). The bibliometric analysis of scholarly production: How great is the impact? *Scientometrics*, *105*(3), 1809–1831. https://doi.org/10.1007/s11192-015-1645-z

Garg, G., Shamshad, M., Gauhar, N., Tabash, M. I., Hamouri, B., & Daniel, L. N. (2023). A Bibliometric Analysis of Fintech Trends: An Empirical Investigation. *International Journal of Financial Studies*, *11*(2), 79. https://doi.org/10.3390/ijfs11020079

Giglio, F. (2021). Fintech: A Literature Review. *European Research Studies Journal*, *24*(2B), 600–627.

Guo, P., Cheng, M., & Shen, Y. (2024). FinTech adoption and bank risk-taking: evidence from China. *Applied Economics Letters*, *31*(7), 594–602. https://doi.org/10.1080/13504851.2022.2140755

Han, J., Kang, H.-J., Kim, M., & Kwon, G. H. (2020). Mapping the intellectual structure of research on surgery with mixed reality: Bibliometric network analysis (2000–2019). *Journal of Biomedical Informatics*, *109*, 103516. https://doi.org/10.1016/j.jbi.2020.103516

Invest India. (2024). *India - A Global FinTech Superpower*. Invest India.

Kagan, J. (2020, August 28). Financial Technology – Fintech. *Investopedia*.

Leong, K., & Sung, A. (2018). FinTech (Financial Technology): What is It and How to Use Technologies to Create Business Value in Fintech Way? *International Journal of Innovation, Management and Technology*, *9*(2), 74–78.

Long, L. K., Hui, L. C., Fook, G. Y., & Wan Zainon, W. M. N. (2017). A Study on the Effectiveness of Tree-Maps as Tree Visualization Techniques. *Procedia Computer Science*, *124*, 108–115. https://doi.org/10.1016/j.procs.2017.12.136

Martín-Martín, A., Orduna-Malea, E., Thelwall, M., & Delgado López-Cózar, E. (2018). Google Scholar, Web of Science, and Scopus: A systematic comparison of citations in 252 subject categories. *Journal of Informetrics*, *12*(4), 1160–1177. https://doi.org/10.1016/j.joi.2018.09.002

Mention, A.-L. (2019). The Future of Fintech. *Research-Technology Management*, *62*(4), 59–63. https://doi.org/10.1080/08956308.2019.1613123

Mint. (2023). *India ranks third among countries with most fintech unicorns in 2023; US retains the crown globally: Report*. Mint. https://www.livemint.com/companies/news/india-ranks-third-among-countries-with-most-fintech-unicorns-in-2023-us-retains-the-crown-globally-report-11698318290212.html

Mongeon, P., & Paul-Hus, A. (2016). The journal coverage of Web of Science and Scopus: a comparative analysis. *Scientometrics*, *106*(1), 213–228. https://doi.org/10.1007/s11192-015-1765-5

Muñoz-Leiva, F., Viedma-del-Jesús, M. I., Sánchez-Fernández, J., & López-Herrera, A. G. (2012). An application of co-word analysis and bibliometric maps for detecting the most highlighting themes in the consumer behaviour research from a longitudinal perspective. *Quality & Quantity*, *46*(4), 1077–1095. https://doi.org/10.1007/s11135-011-9565-3

Painoli, G. K., Dhinakaran, D. P., & Vijai, C. (2021). Impact of Fintech on the Profitability of Public and Private Banks in India. *Annals of R.S.C.B.*, *25*(6), 5419–5431.

Pandey, D. K., Hassan, M. K., Kumari, V., Zaied, Y. Ben, & Rai, V. K. (2024). Mapping the landscape of FinTech in banking and finance: A bibliometric review. *Research in International Business and Finance*, *67*, 102116. https://doi.org/10.1016/j.ribaf.2023.102116

Patadiya, J. (2023, December 18). *Technologies that Shaping the Future of FinTech Industry*. Radix. https://radixweb.com/blog/technologies-shaping-the-future-of-fintech#Future

Patel, R., Migliavacca, M., & Oriani, M. E. (2022). Blockchain in banking and finance: A bibliometric review. *Research in International Business and Finance*, *62*, 101718. https://doi.org/10.1016/j.ribaf.2022.101718

Pesta, B., Fuerst, J., & Kirkegaard, E. (2018). Bibliometric Keyword Analysis across Seventeen Years (2000–2016) of Intelligence Articles. *Journal of Intelligence*, *6*(4), 46. https://doi.org/10.3390/jintelligence6040046

Pranckutë, R. (2021). Web of Science (WoS) and Scopus: The Titans of Bibliographic Information in Today's Academic World. *Publications*, *9*(1), 12. https://doi.org/10.3390/publications9010012

Rabbani, M. R., Bashar, A., Hawaldar, I. T., Shaik, M., & Selim, M. (2022). What Do We Know about Crowdfunding and P2P Lending Research? A Bibliometric Review and Meta-Analysis. *Journal of Risk and Financial Management*, *15*(10), 451. https://doi.org/10.3390/jrfm15100451

Revulagadda, R. K., Kumar, S., Olasiuk, H., Singh, S., Vihari, N. S., & Vats, S. (2023). A Bibliometric and Visual Analysis of Financial Technology Applications. *2023 3rd International Conference on Innovative Practices in Technology and Management (ICIPTM)*, 1–5. https://doi.org/10.1109/ICIPTM57143.2023.10118147

Saxena, A., Jain, R., & Mandal, A. (2022). Fintech in India : Current Status,Trends& Prospects. *Journal of Business Management and Information Systems*, *9*(2), 21–28. https://doi.org/10.48001/jbmis.2022.0902004

Shnaider, H. (2023). *Impact of Fintech on the Banking Industry*. FortySeven. https:// fortyseven47.com/blog/impact-of-fintech-on-the-banking-industry/#:~:text= Fintech%20solutions%20have%20revolutionized%20the,%2C%20faster%20payments %2C%20and%20more.

Su, H.-N., & Lee, P.-C. (2010). Mapping knowledge structure by keyword co-occurrence: a first look at journal papers in Technology Foresight. *Scientometrics*, *85*(1), 65–79. https://doi.org/10.1007/s11192-010-0259-8

Thangavel, P., & Chandra, B. (2023). Two Decades of M-Commerce Consumer Research: A Bibliometric Analysis Using R Biblioshiny. *Sustainability*, *15*(15), 11835. https:// doi.org/10.3390/su151511835

van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, *84*(2), 523–538. https://doi.org/10.1007/ s11192-009-0146-3

Xie, P., Md Kassim, A. A., Wei, M., & Helmi, R. A. A. (2023). Comprehensive Review of Blockchain Applications in Fintech Companies. *Journal of System and Management Sciences*, *14*(1). https://doi.org/10.33168/JSMS.2024.0107

Zhu, J., & Liu, W. (2020). A tale of two databases: the use of Web of Science and Scopus in academic papers. *Scientometrics*, *123*(1), 321–335. https://doi.org/10.1007/s11192-020-03387-8

Women and the Realities of the Glass Ceiling : Investors' Perspective

REKHA HANDA

Abstract : *In the present times when issues pertaining to women, their societal and corporate roles and talks inclusion have hogged the limelight, a reality check of the roles and challenges of women is an absolute necessity. The study draws its distinctive character from being a perceptual study of the investors, who put their money into a company and ultimately translate corporate inclusion, if at all, into their investment decisions. The investors' perceptions with regards to women were analysed to conclude that advances were being made in mental and societal inclusion of women, yet a lot still remains unaccomplished. The clichéd roles pertaining to rearing children and family responsibilities still are perceived to be women's restricted area, though women have been recorded to break the societal and self-imposed barriers to take the fight to success and corporate excellence. The glass ceiling still remain though has noticeable cracks in it.*

Keywords : Gender Challenges, Glass Ceiling, Investment Decision, Social Inclusion, Resource Based Theory.

Introduction

Economic growth and development remain the ultimate objective for which every economy aspires and toils. Creation of a balanced society offering equal opportunities for all irrespective of the gender, caste, religion remains a natural consequence of growth and development. In an economy like India which is touted to be next superpower, balance and equality assume all the more importance as skewed flight is neither sustainable nor just. In the pursuit of social and financial inclusiveness, equality of opportunities and decision making is imperative. This equality in participation not only lends credibility and sustainability to the growth model but also creates a healthy prosperous society.

Dr. Rekha Handa, Assistant Professor, University Business School, Guru Nanak Dev University, Amritsar. Email : drrekha.ubs@gndu.ac.in

One of the major impediments in this growth spree remains the age-old and clichéd glass ceiling. The fairer sex has always strived hard to garner its share or opportunities in the male dominated society in in various walks of life. Unfortunately, this gender biasedness is not only all pervasive but also ubiquitous. Women since times immemorial have had to either stifle their professional aspirations or fall prey to the vicious traps weaved in the society which has also found it hard to accept women at equal footing.

Discrimination and exclusion have been pervasive in varying dimensions, in diverse fields and almost at all levels. Be it in the pretext of caste system, financial well being, haves and have-nots or skin color, administrations have not been able to level the play field completely. Discriminatory practices have known the Indian lands from the times immemorial which have been brought to record in the epic writings as well. Amongst those excluded, women have continued to be victimized by exclusionary practices in almost all fields. Glass ceiling, gender biasness, gender divide or call it by whatever name, women are still struggling to get their due. In the Indian lands with rich heritage and high reverence for women and female power, where females are worshipped as Goddesses, revered as source of life, it is indeed painful to realize the women continue to struggle in the cobwebs created by the male dominated society. Instances of discrimination against women, implicit and explicit impediments in social, religious, political and corporate life continue to keep these ladies to the margins denying them the center stage. This all, in the face of huge strides of progress, glory and global dominance taken by India whereby world acknowledges the clout of the developing economy.

Initiatives have been taken in India to put women at par with men in various fields. Be it quotas in political institutions, panchayati raj institutions, the fight for entry of women in traditional places of worship, merit based long due entry in armed forces and flying of fighter planes, the mandatory quotas on boards of companies as prescribed by the Companies Act, 2013 to name a few.

In Indian context, the indisputable glory and status call for more responsibility to grow and sustain on the strong pillars of equality, inclusion and fairness. With social inclusion being the buzzword in growing times and India hoarding the strong potential to grow, can the avoidable and manageable biases not be avoided? The study is motivated by the growth trajectory of the Indian economy juxtaposed against the evident imbalances especially against women and their potential to restrict the benefits due to a robust economy like India. In the backdrop of growing awareness on indispensability of inclusionary practices

and policies, the study intends to capture the perceptions of investors regarding the role of men and women in Indian society, challenges faced by Indian women and their influence on investment decisions. With an intent to gauge the perceptions of investors with regards to women and their challenges, the study is an attempt to paint a realistic picture of Indian women amidst the tall claims of gender equality: social and financial.

2. Theoretical Basis

The theoretical underpinnings which highlight the role of women in carrying out governance functions provide a basis for study of association between performance and gender diversity. These include the agency theory and resource dependency. Agency theory suggests that a more diverse team of principals may ensure better monitoring of mangers (agents), as diversity increases board independence (Randoy, Thomsen and Oxelheim, 2006). The proponents of agency theory intend to reduce agency costs through alignment of interests of managers and shareholders by effective monitoring through an efficient and effective board. Gender diversity on the corporate boards can help enhance effectiveness which in turn can lead to good performance, as a result of wider perspectives and more exhaustive decision-making process. The positive influence of diversity as a result of more effective monitoring function has been analysed in prior research studies in different contexts: measuring the impact through various accounting measures (Krishnan and Park, 2005, Jurkus, Park and Woodard, 2007), through audit function (Carter et al, 2007) and the similar kinds.

The resource dependence theory views women (diversity) as one of the important instruments in the hands of management to access the various resources critical to firm's success available in the external environment (Johnson, Daily and Ellstrand, 1996). More diverse board will help draw the essential strategic fit with the dynamic and complex business culture. A gender diverse board could benefit from a greater understanding of its customers (Carter, Simkins and Simpson, 2003) and from a wider and in depth knowledge of the industry or choice of access to finance, also will help tap more information sources though sometimes at the expense of less decisiveness (Randoy, Thomsen and Oxelheim, 2006).

There is an additional view to support the gender diversity on corporate boards i.e. the resource based view. It propagates that corporate performance is strongly influenced by physical, organizational and human resources that are available to management (Barney, 1991) and undoubtedly these must be valuable, rare, have imperfect imitability and no strategically equivalent substitutes. Gender

diversity and balance between both genders can become a source of competitive advantage (Watson, Kumar and Michaelson, 1993; Farewell and Hersch, 2001), provided that each gender contributes to management in a different and complementary way.

Corporate sector contributes profusely to the economic development of the country and in building up a healthy and equitable society. The businesses do not operate in vacuum rather share a relationship of interdependency and mutual exchange with the society. They strongly affect and are affected by developments, notions and ideas of the society. Through business activities and initiatives, the larger objective of a socially inclusive and healthy society can be hastened and smoothened.

Inclusion: societal and corporate, has been acknowledged as the stepping stone to sustainable growth and development world over. Countries in their pursuit of excelling and growing in the competitive times have been trying all tricks in the book to achieve that competitive edge and also sustain it to qualify as world leaders. Exclusionary practices where on one side are regarded as discriminatory, also throw a spanner in the wheels of economic and social development. When talks of equality are abound, are revered as indispensable and supported by evidence to lead to numero uno position, global economies are getting prepared to adopt inclusion till the last mile. With international agencies like World Bank, OECD, UNESCO and UN explicitly chartering the roads to inclusivity and embarking on a regime of making all a part of growth journey at micro and macro levels, nations do not have much to choose from in terms of policies. Hence, the case for comprehending the role of women and their challenges becomes pertinent.

3. Methodology

The primary objective of the study is to comprehend the perceptions of the common investor with respect to the women and their roles and challenges in Indian context. To gauge the perception of investors, data has been collected in a span of about five months (November, 2022 to March 2023) from a well-balanced sample in terms of gender, age, income and investment experience of the respondent.

The population for the study was the investing community across India spanning across different demographic categories. Adopting purposive and judgement

sampling, responses to questionnaire-based survey have been gathered from 400 respondents. Of these 60 questionnaires were found to be unfit for analysis on account of incomplete questions (29), multiple options where one was needed (23) and bias of neutrality (8). The final analysis has been done with respect to 340 respondents where responses were complete in all respects.

For analysis of the data appropriate statistical techniques have been used to justify the objective of the study and draw meaningful conclusions from the analysis. Calculation of simple frequencies and percentages, rankings and chi-square test for association have been used for different aspects of the survey. The Chi-Squared Test of Association allows the comparison of two attributes (i.e. qualitative variables) in a sample of data to determine if there is any relationship between them. The idea behind this test is to compare the observed frequencies with the frequencies that would be expected if the null hypothesis of no association / statistical independence were true.

3.1. Sample Profile

An attempt was made to include diverse investors in the survey: diversity on account of gender, educational qualification, monthly income and experience in investing. These were identified as important attributes of the investor profile which can impact their perceptions and considerations while making investment and their beliefs about role and contribution of women towards society in general and corporate boards specifically.

a) Qualification : Across gender, the sample for study was distributed as 192 males (56.5%) and 148 females (46.5%) who also were diverse with respect to qualifications and monthly income. In the sample, post graduates constituted the highest percentage accounting for 42.1% (143) of the total sample followed by graduates who were 73 of the totals of 340. Amongst the undergraduate respondents (17), females were larger in number as is case for the highest qualification of doctorate. Females, as revealed by the sample, did not lag behind on account of qualifications and this, hence, does not hold ground as a reason for denial of equal opportunities to them. Doctorate females accounted for almost 20% of the female sample size while this percentage was mere11% for males. Post graduate female investors were 40% of all females and the proportion of professional investors was a good 15% affirming stance of no dearth of qualified females.

Table-1 : Qualifications of Respondents Across Gender

HIGHEST QUALIFICATION	GENDER		
	Male	**Female**	**Total**
Under graduate	5	12	17
Graduate	46	27	73
Post Graduate	85	58	143
Professional	34	22	56
Doctorate	22	29	51
Total	192	148	340

This association of gender with qualification of the respondents was also checked with the help of chi-square statistic (χ^2= 10.9; p value 0.027) which was found to be significant at 5% level of significance establishing that highest qualification of investor was statistically significantly different across gender.

b) Monthly income : Income, undoubtedly, is an important determinant and influencer of investment decision by investors. An effort was made to gauge the monthly income of the respondent across five income categories to correlate it with basis of decision making of the investors. Distribution of respondents across different income categories was balanced in the sample with 25% of investors earning more than Rs. 1,00,000 per month, 27% in the category of 50,000-1,00,000, 23% earning less than 25,000 and 24% in the income bracket of 25,000-50,000. These income classifications however, were found to differ across gender groups wherein clearly women were found to lie in the lower income brackets.

Women in the higher income bracket (more than Rs. 75,000 per month) constituted mere 21% of the total female sample which stood in stark contrast to 44% of all males in this high-income group. On the outset, this seems to be loosely pointing towards the widely talked about ubiquitous pay-gaps and denial of equal financial and professional status to women.

The differences across male and female respondents with respect to monthly income were also found to be statistically significant when examined through chi-square test (χ^2= 23.0; p value <0.001). Sample statistics confirm the differences across gender groups with respect to income earned by them establishing that there lies a significant difference in monthly income across gender.

Table-2 : Monthly Income of Respondents Across Gender

Monthly income	GENDER		Total
	Male	Female	
Less than Rs. 25,000	35	42	77
Rs 25,000 to Rs. 50,000	39	43	82
Rs. 50,000 to Rs. 75000	31	32	63
Rs. 75,000 to Rs. 1,00,000	22	11	33
More than Rs. 1,00,000	65	20	85
Total	192	148	340

c) Investment experience : Investors' experience in terms of number of years they have been investing in corporate securities was examined to understand their perspective vis-à-vis their investment decisions and considerations involved therein.

A large percentage of the sample (68% approx.) was new investors with experience in the corporate investment less than 5 years. Government driven policy initiatives to make capital markets an attractive investment option for the investing community have resulted in attracting investors' money and attention towards these investment options. Female investors were in low numbers in higher experience categories highlighting the hitherto restrictive and conservative approach of females while making investments in corporate securities. These differences, however, were found to be significant at only 10% level of significance (χ^2= 8.24; p value 0.083) which establishes the association across gender and investment experience as loosely significant.

Table-3 : Investment Experience of Respondents Across Gender

How long you have been investing in corporate securities?	GENDER		Total
	Male	Female	
Less than a year	60	65	125
1-5 years	66	44	110
5-10 years	26	21	47
10- 15 years	19	7	26
More than 15 years	21	11	32
Total	192	148	340

4. Results and Findings

4.1. Perceived Roles of Men and Women in Society

Role of men and women in society seem to be divided more so in Indian society. These role differences emerge more from Indian mindsets, where women and their prime responsibilities were acknowledged to be centered around household, kitchen and child rearing jobs. The professional responsibilities and those relating to management of funds remain undoubtedly a man's area. If it related to kitchen and household chores or nurturing children or any of their needs, women were expected to assume it as their prime duty and undiluted priority. However, with changing times and mindset, tall claims of women empowerment and efforts towards breaking the glass ceiling, it is expected that societal expectations with respect to role of men and women in different walks of life would also change.

Investors' responses with regard to their thinking relating to which of the specified roles could be performed better by men or women or both were recorded. Nine different roles were identified which were attempted to cover prime areas in routine life. The responses were classified according to gender of investor to understand the male and female orientations with respect to different roles and their perceptions regarding ability of men and women to perform them. For further statistical emphasis, chi-square test of association was performed to determine if there is any association between the responses of males and females with respect to each of the identified roles.

Kitchen and household jobs, as the clichéd mind set goes, were found to be still regarded as the prime responsibility of females and surprisingly amongst both genders of investors – males as well as females. These responsibilities were perceived to lie far beyond the work area of males as confirmed by the low frequencies (3.6% for males and 2.7% for females). With more and more women stepping out of their homes for career driven aspirations, need of sharing such responsibilities is becoming inevitable. It was found that with respect to domestic chores, response to the option "both" (as to who can perform the role better) was respectable (29% for males and 33% for females) indicating the inevitability of participation of men given the professional commitments of today's women.

Table-4 : Frequencies (and Percentages) According to Gender for Role of Men and Women and Chi square (p-values) Values

ROLE	MALE			FEMALE			TOTAL			Chi value (p-value)
	Men	Women	Both	Men	Women	Both	Men	Women	Both	
Kitchen and household jobs	7 (3.6)	129 (67.2)	56 (29.2)	4 (2.7)	95 (64.2)	49 (33.1)	11 (3.3)	224 (65.8)	105 (30.9)	0.76 (0.68)
Taking care of children	5 (2.5)	118 (61.6)	69 (35.9)	5 (3.4)	87 (58.8)	56 (37.8)	10 (2.9)	205 (60.3)	125 (36.8)	0.35 (0.84)
Management of funds	72 (37.5)	32 (16.7)	88 (45.8)	34 (23)	31 (20.9)	83 (56.1)	106 (31.2)	63 (18.5)	171 (50.3)	**8.23 (0.02)**
Business decision making	89 (46.4)	11 (5.7)	92 (47.9)	39 (26.4)	16 (10.8)	93 (62.8)	128 (37.6)	27 (7.9)	185 (54.4)	**15.02 (0.00)**
Maintaining social relations and interactions	13 (6.8)	66 (34.4)	113 (58.8)	11 (7.4)	51 (34.5)	86 (58.1)	24 (7.1)	117 (34.4)	199 (58.5)	0.06 (0.97)
Leading work teams	57 (29.7)	24 (12.5)	111 (57.8)	31 (20.9)	31 (20.9)	86 (58.2)	88 (25.9)	55 (16.2)	197 (57.9)	**6.15 (0.04)**
Social work	33 (17.2)	50 (26.0)	109 (56.8)	15 (10.1)	51 (34.5)	82 (55.4)	48 (14.1)	101 (29.7)	191 (56.2)	**4.97 (0.08)**
Political activities	100 (52.1)	11 (5.7)	81 (42.2)	77 (52)	9 (6.1)	62 (41.9)	177 (52.1)	20 (5.9)	143 (42)	0.02 (0.99)
Stress management	38 (19.8)	63 (32.8)	91 (47.4)	26 (17.6)	60 (40.5)	62 (41.9)	64 (18.8)	123 (36.2)	153 (45)	2.162 (0.34)

Note: Figures in parenthesis in columns of male, female and both indicate gender wise percentages and in chi-square column indicate the p-values to highlight statistical significance

The association of male and female perceptions gender for kitchen and household jobs lack statistical significance indicating no significant association with respect to these roles (chi-square value of 0.76). Kitchen jobs still are regarded as the primary duty of women in Indian society even in today's transformed times. Another primary role of women lies with respect to motherhood and associated responsibilities of raising children and meeting their different needs. The results again highlighted that it is etched in all mindsets that children should remain a priority of women and what men do as fathers is far above essential. Built upon the Indian value system and image of ideal women, this role is perceived unanimously as better performed by women appearing more like their core competence. Women seem to acknowledge their prime responsibilities as domestic work driven by their upbringing in a patriarchal culture. Maintaining social relations and interactions exhibit similarity of opinion of males and females

as well. No significant differences across gender have been observed for the role pertaining to social interactions where in higher frequency lies for "both" (58%) indicating that this has not been recognized as a domain area for either males or females and both can do it successfully. On probing further, higher percentage of responses were noted for females (34% approximately) leading to conclude that females vis-à-vis males are better at social relations and interactions.

Consistency in responses of male and female respondents was also noted for political activities which are acknowledged as the forte of men. Investors were found to be of the opinion that men have the finer sensibilities to handle and contribute to political activities (52%). Though males were acknowledged to be deft in handling political affairs yet the option that both men and women can handle political matters also garnered support of more than 40% of investors. Homogeneity in responses of males and females is confirmed by the insignificance of results of chi-squared test of association. Similarly, no association was observed for the role pertaining to stress management where the options of women and both men and women have responses of 40% of respondents each. Stress management is perceived more as a situational trait emanating from experiences and preferences rather than from gender based biological characteristics. Males and females seemed to have similar stance, which failed the test of statistical association and hence responses of males and females with respect to better stress management were homogeneous (associated).

Relationships through chi-square test of association were recorded for roles relating to management of funds and business decision making. 37.5% of male respondents believed that men could manage funds better while only 23% of females acknowledged men as better fund managers. Females according to 16.7% of males could effectively manage funds but larger numbers of females (21%) regarded their fairer sex as better managers of funds and finances. 45% of males and 56% of females believe that sound financial management can be ensured by both. Results clarified that males did hold reservations with respect to female ability to manage financial issues while women reposed faith in financial abilities of females. These differences in mindset, indicative of male dominance especially in financial and critical matters was confirmed of its statistical significance through the values for chi-square test.

Very similar results were noted for the role of business decision making where again men seemed to believe that critical business decisions could be better arrived at and implemented by males (46%). Women, on the other hand,

underrated men on this and casted their vote for "both" (almost 63%) defying the male notion that women are less capable to make business decisions. Women seemed to no longer support the age-old belief of restricted capabilities of women rather believe that empowered women of today are capable to compete with men and make sustainable decisions relating to business issues. Responses culled from the survey emphasized that women differed significantly from men in context of the role relating to leading work teams and social work as well. For these roles also, men regarded people of their gender (males) as better suited than females while females held different opinion as lower percentage of them believed that men are better suited for the role (20% for leading work teams and 10% for social work). "Both" as a response option was chosen by larger number of females in comparison to males emphasizing that women of today, do not just believe in women power but also have faith in their abilities to perform better in areas which were hitherto regarded as male dominated domains.

Various roles in the society pertaining to household, children, fund management, business decision making, political activities, social welfare etc were put together and responses of sampled investors were sought. When compared on the basis of gender, it was found that men and women respondents did differ with respect to the suitability of the two for these roles. Males and females were found to hold similar opinions on roles like kitchen and household and taking care of children. With respect to roles relating to business decision making, leading work teams and social work significant associations, statistically confirmed through application of chi-square test of association, were recorded. These indicated the changing mindsets especially of women, who seemed to be defying and denying the traditional restrictions on roles which women can assume in society. Women investors and their responses advocated their ability and intention to participate equally with men in all jobs unshackling the traditional mindsets. It seemed that with changing times, women were moving beyond the clichéd role and starting to take on all responsibilities head on with a winning attitude.

4.2. Perceived Challenges of Inequality Combatted by Indian Women

For this, first the respondents were asked about the ubiquitous challenges which women in India are known to be facing. It meant to understand the extent and spread of these challenges in different walks of life like legal rights, occupational choices, property rights, pay gap, opportunities for leadership positions, board directorships and the like. Respondents were asked about these different areas and their feelings regarding the extent of inequality prevalent in society which

posed challenges for women. This was expected to provide input for better insights into the real position of women and gravity of situation vis-à-vis age-old challenges which seem to hinder their growth and empowerment.

Respondents were required to express their perceptions about women facing challenges pertaining to different aspects of routine life. Their thinking was captured through a 5 point scale ranging from "not at all" on one extreme to "very much" on the other. Total scores for each issue relating to women were calculated by taking the product of frequency of each source and assigned weight (-2: no/not at all; -1: I don't think so/not really; 0: Perhaps/undecided; 1: I think so/Somewhat; 2: Yes/very much). On the basis of total scores then, ranks were assigned: 1 for the component having highest score, 2 for second highest and so on with the lowest score getting the lowest rank, 12 in this case.

Table-5 : Total Score and Ranks for Perception about Women Combating Challenges of Inequality

ISSUE	Total Score	Rank
Provision of legal rights	99	11
Educational opportunities	126	8
Economic benefits	138	4
Occupational choices	223	1
Promotions and incentives in job	134	5
Access to credit	64	12
Corporate directorships	132	7
Senior leadership positions	159	3
Property rights	181	2
Health and survival provisions	105	10
Political opportunities	121	9
Gender pay gap	133	6

For the total sample of 340 respondents, the overall score and rankings demonstrated the feelings of investors that women faced most severe challenges of inequality in occupational choices. It was with respect to occupational choices that society and its members were perceived to be headstrong as to what jobs fall exclusively in the ambit of men where women cannot penetrate owing to their physical, biological, physiological and emotional characteristics. The issue of property rights was found as next issue where women in India had to fight odds against them. Senior leadership positions and economic benefits had next highest score conveying that women experienced restricted entry to the senior leadership positions and had to forego professional and economic benefits because of gender differences prevalent in the Indian society.

Table-6 : Gender Wise Total Score and Ranks for Perception about Women Combating Challenges of Inequality

ISSUE	Male Score	Rank	Female Score	Rank
Provision of legal rights	8	11	91	8
Educational opportunities	42	5	84	9
Economic benefits	36	7	102	5
Occupational choices	92	1	131	1
Promotions and incentives in job	22	9	112	3
Access to credit	0	12	64	12
Corporate directorships	37	6	95	7
Senior leadership positions	50	3	109	4
Property rights	69	2	112	2
Health and survival provisions	22	10	83	10
Political opportunities	44	4	77	11
Gender pay gap	34	8	99	6

Access to credit and provisions of legal rights were lowest in the rung which could be attributed to the growing emphasis on women laws and protection and an effort to empower women. However, the real benefit of these empowerment initiatives in letter and spirit cannot be fathomed in the real sense as the fruits they bear are yet to be tasted. Overall scores and relative ranks of different issues highlight that efforts taken by regulators, policy holders and activists, seemed to have worked in education sector, health provisions, financial facilities, legal protection but failed to trickle down to issue of property rights, economic benefits, senior positions in work environment and occupational preferences.

Being a gender sensitive and gender related issue; the segregation and comparison of scores across gender was considered very pertinent. Responses for male and female investors were same for the first and second highest scores and related ranks. Both male and female respondents were of the belief that women face challenges primarily with respect to choice of occupation and property rights. Female investors felt that promotions and incentives in job were the next area where biases against women were common while this factor for males was 9th in importance. The perspectives are undeniably based on experiences and hence were found to differ according to the situations faced and as it is rightly said that only the bearer knows where the shoe pinches. Women, from times immemorial, combating the differential treatment have been waging losing battles to command equality for work done. The issue related to

political activities as an area of inequality have taken rank 4 for the male investors while for women it has a low rank of 11 (from a total of 12 ranks). Political activities were not regarded as an area where gender biases were prevalent while males regard it as an important area where inequalities existed. This difference in ranks for political activities emerged due to differences in choices of males and females and low number of women in active politics.

The growing emphasis in Indian lands on boosting women participation and the reverberating slogans of women equality were found in areas like grant of credit, health provisions and protection of legal rights and hence these lie low on total score for both males and females.

For the issues where women combat challenges, in spite of slight differences across gender, qualification and income of respondents, occupational choices, property rights and senior leadership positions emerge as the areas where serious challenges of inequality are perceived to be faced by women. However, access to credit and provision of legal rights were identified as areas where minimal inequalities against women were perceived to exist.

4.3. Influence of Presence of Women at Different Levels in Company on Investment Decision

Next, the respondents were requested to record their thoughts with respect to influence of women presence at different levels in corporate hierarchy from CEO level to the shop floor level. Intention was to understand if the level in the corporate hierarchy makes a difference to kind of contributions (positive, negative or no influence) women bring with their presence. Purpose was also to check that if women as team members affect decision in a certain way, does that affect differ with position they occupy in a company.

Results highlighted that contribution of women in different positions across the organizational hierarchy was not perceived to contribute negatively as supported by low frequency of responses. Overall response to the women contribution is positively concentrated, more so in the senior and higher levels where percentage of positive response was more than 50%. It was observed that at the shop floor and floor levels, a large majority of investors feel that women presence had no influence making these as gender neutral positions. Women and their finer sensibilities and capabilities were found to add to the performance and overall influence of an organization when they assumed senior, decision making and strategic positions like that of a CEO and board member.

Table-7 : Frequencies of Effect of Presence of Women at Different Levels in Company and Chi Square Values According to Gender

Level	Positively	Negatively	No influence	Chi square value (p-value) (gender)
CEO	170 (50%)	21 (6.2%)	149 (43.8%)	3.222 (0.2)
Board Member	186 (54.7%)	18 (5.3%)	136 (40%)	1.953 (0.377)
Senior Level	182 (53.5%0	16 (4.7%)	142 (41.8%)	3.849 (0.146)
Middle Manager	153 (45%)	30 (8.8%)	157 (46.2%)	3.403 (0.182)
Supervisor level	145 (42.6%)	28 (8.2%)	167 (49.1%)	1.690 (0.43)
Shop floor level	116 (34.1%)	41 (12.1%)	183 (53.8%)	1.163 (0.393)

Attempt was made to explore the differences of these responses to women contribution at different organizational levels across gender. The chi-square values together with their p-values were compiled to arrive at conclusions in the table. Results clarified that differences in responses of the investors across gender with respect to contribution of women were insignificant for all levels, right from the shop floor level to the CEO. This emphasized that males and females do not statistically differ in their perception about that women presence, and they believe that women largely contribute positively to organizational performance.

Responses lead to the interpretation that influence of women as negative is a very limiting case among the sampled investors. Contribution is believed to be positive or no effect which is found to differ not just with respect to different operating levels within the organization but also across qualification and income of the investors.

5. Conclusion

The present study is motivated by the growing chatter about the progression of women in society and corporate settings with their contributions and positions being regarded as pertinent for corporate growth and investment decisions. The investors' perceptions are attempted to be recorded to see how the investors evaluate the role of women in society, their roles vis-a-vis men and challenges women face in Indian set up. The hackneyed "glass ceiling" and its realities over the years as comprehended by common investors is intended to be recorded

and analysed to understand the true positions of women. In this context, with the help of representative and demographically distributed sample, perceptions of investors with respect to role of men and women in society and challenges of women were culled.

Various roles in the society pertaining to household, children, fund management, business decision making, political activities, social welfare etc were put together and responses of sampled investors were sought. When compared on the basis of gender, it was found that men and women respondents did differ with respect to the suitability of the two for these roles. Males and females were found to hold similar opinions on roles like kitchen and household and taking care of children. With respect to roles relating to business decision making, leading work teams and social work significant associations in responses of males and females, statistically confirmed through application of chi-square test of association, were recorded. These indicated the changing mindsets especially of women, who seemed to be defying and denying the traditional restrictions on roles which women can assume in society. Women investors and their responses advocated their ability and intention to participate equally with men in all jobs unshackling the traditional mindsets. It seemed that with changing times, women were moving beyond the clichéd role and starting to take on all responsibilities head on with a winning attitude. For the issues where women combat challenges, in spite of slight differences across gender, property rights and senior leadership positions emerge as the areas where serious challenges of inequality are perceived to be faced by women. However, access to credit and provision of legal rights were identified as areas where minimal inequalities against women were perceived to exist.

Respondents were requested to record their thoughts with respect to influence of women presence at different levels in corporate hierarchy from CEO level to the shop floor level. Intention was to understand if the level in the corporate hierarchy makes a difference to kind of contributions (positive, negative or no influence) women bring with their presence. Responses lead to the interpretation that influence of women as negative is a very limiting case among the sampled investors. Contribution is believed to be positive or no effect which is found to differ not just with respect to different operating levels within the organization but also across qualification and income of the investors.

It is concluded certain societal roles, like kitchen and household chores and taking care of children are still regarded as women's citadel while participation of women in hitherto male dominated areas is also increasing. Also, women's

presence in different rungs of the corporate ladder is looked at positively and is perceived to be progressive yet there still remains a large tract of road which is untravelled. The glass ceiling still seems to be exhibit Teflon like ability in Indian settings yet deep incisions and cracks are evident. The road to equality has started to be traversed but still there are miles to go.

References

Barney, J.B. (1991) 'Firm resources and sustained competitive advantage', Journal of Management, Vol. 17, pp. 99-120.

Carter, D. A., Simkins, B. J., and Simpson, W. G. (2003) 'Corporate governance, board diversity, and firm value', Financial Review, Vol.38, No.1, pp. 33–53.

Carter, D.A., Simkins, B.J., D'Souza, F. and Simpson, W.G. (2007) 'The diversity of corporate board committees and financial performance', SSRN, September 20, pp. 1-30.

Farrell, K.A. and Hersch, P.L. (2001) 'Additions to corporate boards: does gender matter?', SSRN, November 28, pp. 1-30.

Johnson, J.L., Daily, C.M., Ellstrand, A.E. (1996) 'Boards of directors: a review and research agenda', Journal of Management, Vol. 22, No.3, pp. 409–38.

Jurkus, A.F., Park, J.C. and Woodard, L.S. (2007) 'Gender diversity and firm performance: environmentally reliant?', SSRN, pp. 1-31

Krishnan HA, Park D. (2005) 'A few good women—on top management teams", Journal of Business Research, Vol. 58, No.12, pp.1712–20.

Randøy, T., Thomsen, S. and Oxelheim, L. (2006) 'A Nordic perspective on board diversity", NICe-Report, Oslo.

Watson, W.E.; Kumar, K. and Michaelsen, L.K. (1993) 'Cultural diversity's impact on interaction process and performance: comparing homogeneous and diverse task groups', Academy of Management Journal, Vol. 36, pp. 590-602.

An Empirical Study of Barriers to Digital Financial Inclusion with the Mediating Effect of Awareness Among People

ELINA KANUNGO, DEVIKA, SARAT KUMAR SAMANTARAY AND ASHOK AGRAWAL

Abstract : There are various factors responsible for restraining the growth of digital financial inclusion in India. The present paper examines the mediating effects of awareness of people on the relationship between Digital Financial Inclusion (DFI) and the barriers affecting it. For achieving the objectives of this study, a research model was developed to test the mediating effect of awareness on the relationship between different factors acting as barriers to DFI and DFI. The data for the study is collected from 776 respondents residing in the district of Puri, Odisha, India by framing a structured questionnaire, and structural equation modeling in partial least square (PLS) combined with bootstrap was applied to analyze and test the hypotheses of this study. Awareness as a mediator affects the relationship between the barrier and the DFI significantly. Awareness of operations of the digital platform, control, and redressal mechanism is of paramount importance as people are using financial services digitally. Moreover, the restraining barriers affect the DFI more in case of a lack of awareness among the users of digital services.

Keywords : Awareness, Barriers, Bootstrap, Digital Financial Inclusion, Mediator, PLS-SEM

Dr.Elina Kanungo, Assistant Professor, P.G. Dept. of Commerce, SCS Autonomous College, Puri, Odisha, India. Mail id : elinakanungo83@yahoo.co.in, Mob : 9937161766.

Prof.Devika, Professor, Poornima University, Jaipur, Rajasthan, India. Mail id: professoreafm@gmail.com, Mob : 7073528084.

Sarat Kumar Samantaray, Ph.D. Research Scholar, Mittal School of Business, Lovely Professional University, Punjab, India. Mail id : sarat9124@gmail.com, Mob : 9124592496.

Prof.Ashok Agrawal, Professor, Head and Dean of Commerce (Retd.), University of Rajasthan, Jaipur, India. Mail id: ashokuor@gmail.com, Mob : 9928366240.

1. Introduction

The usage of digital technology has been proven to be an effective means for the attainment of the objective of financial inclusion. In the present digital age, people are encouraged to avail of financial services and perform other financial transactions by using the digital platform. **Zetzsche et al. (2019)** highlighted that according to the Global Partnership for Financial Inclusion (GPFI), Digital Financial Inclusion (DFI) consists of the use of the digital medium to reach the underserved population with a wide array of financial services at an affordable cost. They further stated that mobile money (Use of e-money on a mobile phone) and M-Pesa in Kenya has signified how innovations are facilitating financial inclusion. For using the virtual platform, it is essential that the user is digitally and financially literate. **Shen et al. (2020)** have identified four elements of DFI namely the Availability or access to digital financial products, Affordability, Financial literacy, and Ability to use digital products. **Svitlana et al. (2019)** concluded that the low level of public awareness of using innovative products and services is one of the reasons behind the low inclusion of financial services. To attain digital financial inclusiveness, there needs to have financial inclusion digitally that is people must be able to avail of financial services through digital platforms. But not all are able to use this platform. There are certain conditions or factors which restrain people to use digital platforms.

2. Review of Literature

The development of Digital Financial Inclusion (DFI) leads to improvement in the coverage of financial services, **Yang & Zhang (2020). Dahlman et al. (2016)** believed that the digitalization of the economy fosters growth and productivity and paves the way for inclusive development. A study by **Mahmood et al. (2021)** in China revealed that DFI increases regional economic growth as it facilitates ease of access to financial services with affordability. **Ozili (2018)** in his study concluded that digital finance through Fintech providers has positively affected financial inclusion in emerging and advanced economies. **Shen, Hueng & Hu (2020)** stated in their research that digital technology has emerged as an ideal medium to reach many customers across a wide territory. They further concluded that financial literacy and usage of digital financial products are highly important for increasing financial inclusion in China. **Bathula & Gupta (2021)** have defined the DFI in terms of the use of DFS namely debit cards, credit cards, etc in the past 1 year and ownership of these instruments along with owning a mobile phone.

Morgan et al. (2019) stated that financial technology (fintech), i.e., using software, applications, and digital platforms to deliver financial services to consumers and businesses through digital devices such as smartphones, has emerged as an eminent tool for promoting access to financial services by underserved populations. **Morgan & Trinh (2019)** stated categories of financial services like e-commerce, mobile banking, mobile wallets, digital currency, etc., offered through digital platforms by fintech firms. The use of Debit and credit cards society by providing the option of digital payment is contributing to the growth of a cashless economy, **Kijkasiwat & Chancharat (2022). Mhlanga (2020)** revealed the impact of Artificial Intelligence (AI) is transforming financial inclusion which enables vulnerable groups of women, youth, and small businesses to avail the financial services digitally. **Alameda (2020); Bill & Melinda (2019)** identified that mobile phone is not the only instrument for facilitating the DFI but instruments like payment cards can also be linked to a device like a Point of Sale (PoS) for making a financial transaction. For the purpose of taking proper financial decisions and attaining individual financial well-being, an individual must possess the financial awareness, knowledge, skills, attitude, and behaviors required **(OECD 2018).** In the present study, DFI is measured by using constructs like ownership and DFS.

Pazarbasioglu et al. (2020), stated "In developing economies, about two-thirds of adults without financial services cite having too little money as a barrier to account ownership, and roughly one-quarter say accounts are too expensive. In Latin America and the Caribbean, roughly half of the adults without financial services say accounts are too expensive. With lower marginal and fixed costs, DFS can be more cheaply delivered. This also allows for transaction-based pricing, which can be more suitable for the poor." They further came up with one of the findings that successful use of the DFS needs that people must have awareness and knowledge of the digital financial products and services, financial risks, financial control mechanism, and consumer redressal mechanism.

Liew et al. (2020) observed in their research that knowledge about digital financial risks and the knowledge of consumer rights and procedures of redressal have the lowest mean score. This indicates that there is a low level of awareness of FinTech products and services among people.

Azeez & Akhtar (2021) has highlighted Digital Financial Awareness (DFA) as one of the important elements of Digital Financial Literacy (DFL). **Lyons & Hanna (2021), and** Kass et al (2022) highlighted that awareness of positive financial attitudes and behavior is equally important for digital financial inclusion. They

emphasized the importance of a positive financial attitude on the part of digital users. The government of India has taken a foot forward to make the economy not only financially inclusive but digitally financially inclusive through its 'Digital India' initiatives. The government is encouraging its people to adopt digital tools for availing of financial services. In India, a broader Digital India revolution catalyzed by PMJDY, India Stack, e-KYC, and UPI brought a paradigm shift in the way financial services are availed by consumers**, NITI Aayog Report (2022)**. The Reserve Bank of India (RBI) with the intention of building a Fintech ecosystem in India has promoted a Unified Payment Interface (UPI), digital payments, P2P, etc. It has also granted licenses to 11 Fintech entities for the establishment of payment banks **Kandpal & Mehrotra, (2019). Lontchi et al. (2022)** stated that the significance can be assessed using p-value, t-statistics, and beta value (â).

Barik & Sharma (2019) concluded that despite the high growth of digital transactions, digital usage is not the same in people of different groups. Digital usage among women, rural people, elderly people, and less educated people is much less than among other groups of people. **Tiwari et al. (2019)** identified illiteracy, innumeracy, and unfamiliarity with technology as barriers to the use of digital products. **Bagla & Sancheti, (2018)** stated that the satisfaction level of customers using the digital platform is affected by factors like security, user-friendly interface, transaction cost, etc, to name a few. These factors pose challenges to the sustainability of digital products and hence need attention for their removal or proper solution.

3. Methodology

3.1. Sample and Collection of Data

The present study has made a valuable effort in highlighting the barriers affecting the DFI. The sample has been selected using a convenient sampling method based on literacy rates from 3 urban and 4 rural places in the district of Puri, Odisha, India. The data for the study has been collected from primary as well as secondary sources. Secondary sources include publications in different journals, magazines, websites, etc. Primary data has been collected using a structured questionnaire. The data is coded in binary (0-No, 1- Yes). Questions pertaining to barriers are collected using 5 point Likert scale where 5 denoted strongly agree and 1 as Strongly disagree.

3.2. Tools for Data Analysis

The statistical tool used to examine the hypothetical model developed in the study is Structural Equation Modeling (SEM) using Smart-PLS, **Ringle (2022).** Structural Equation Modeling (SEM) in partial least square (PLS) combined with bootstrap was applied to analyze the data collected from 776 respondents residing in the district of Puri, Odisha, India.

3.3. Measurement of Variables

The constructs in the study namely DFS, Ownership, Awareness, and Barriers are represented by 4, 3, 4, and 12 items each respectively. DFS, purpose, and awareness are reflective in nature and Ownership is a formative construct. Table 1 gives a vivid view of the items of each construct. The theoretical and empirical evidence given in the study has led to hypothesize the following :

H1 : Awareness has a significant relationship with DFS.

H2 : Awareness has a significant relationship with ownership.

H3 : Barriers to using the digital platform have a significant and negative relationship with DFS.

H4 : Barriers to using the digital platform have a significant and negative relationship with ownership.

H5 : Awareness mediates significantly the relationship between DFI and Barriers to using digital products.

H6 : Awareness mediates significantly the relationship between ownership and Barriers to using digital products.

4. Results and Discussion

Chin (2010) and Hair et al. (2017) presented a two-step process for the analysis of data using PLS-SEM. The two-way process includes the assessment of the measurement model representing the relationship between latent constructs and observed indicators and the assessment of the structural model which shows the relationship between latent constructs. The former is called the outer model and the latter is the inner model **Ringle et al. (2022).**

4.1. Constructing Measurement Model

The measurement model is constructed and composite reliability, convergent and discriminant validities of the latent variables are tested by taking the factor loadings into account. Cronbach's alpha is used to measure the composite reliability. Table 2 reflects the values that are greater than the recommended value of 0.70 **(Nunnally (1978), Bagozzi and Yi (1988), Cronbach (1971)).**

Table-1 : Constructs' Indicators

CONSTRUCT	MEASUREMENT	INDICATORS
Barriers	Reflective	B1: While using digital payment systems, there is anxiousness about the loss of connection
		B2: Minor mistakes lead to financial losses while using a digital payment system.
		B3: There is doubt about wrongly tapping the bill information while using digital payment systems
		B4: There is insecurity while using digital payment systems regarding the loss of PIN codes which might reach the wrong hands
		B5: There is fear while using digital payment systems, as the third party might get access to my account information
		B6: The procedure of using a digital platform is complex
		B7: There are difficulties in managing and remembering passwords while using digital payment systems
		B8: There is a lack of relevant knowledge to use digital products while using digital payment systems
		B9: Digital payment systems cannot be used for every purpose.
		B10: The redressal mechanism is not effective while using digital payment systems.
		B11: The redressal mechanism is too complex to understand while using digital payment systems.
		B12: There is a lack of adequate information about consumer rights and laws related to digital payment systems.

Awareness	Reflective	Awareness of digital risks like Phishing, hacking, etc - AW-1
		Knowledge of financial products and services offered digitally- AW 2
		Knowledge of consumer rights- AW 3
		Knowledge of consumer redressal mechanism- AW 4
Ownership	Formative	Ownership of Debit card- Own 1
		Ownership of Credit card- Own 2
		Ownership of digital money account- Own 3
DFS	Reflective	Usage of a Debit card in the past 12 months- DFS 1
		Usage of Credit card in the past 12 months- DFS 2
		Usage of UPI/PPI/e-wallets in the past 12 months- DFS 3
		Usage of electronic payment systems like IMPS/ECS/NEFT in the past 12 months- DFS 4

Source : Compilation from the survey.

TABLE-2 : Reliability and Validity

Construct Reliability and Validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
AWARENESS	0.776	0.778	0.857	0.601
BARRIERS	0.979	0.980	0.981	0.814
DFS	0.837	0.845	0.891	0.672

Source : Smart PLS Output.

The outer loadings of the items indicating constructs access, barriers, DFI, DMP, and FL are statistically significant (at p-value = 0 .000). The research instrument establishes acceptable indicator reliability. Internal consistency reliability is also established through the alpha values of Cronbach alpha, **Straub, (1989),** and Composite reliability tests **Gefen et al. (2000).** The convergent validity is measured through the values of Average variance extracted (AVE). In the present study, the AVE of each construct exceeded 0.5 thereby indicating the establishment of the convergent validity for the constructs**, Kim, Gupta, & Koh (2011).** The

construct of Ownership is formative in nature, so the reliability and validity are assured by the VIF values **(**Reflected in Table 4**).** All the indicators of constructs have factor loadings above the threshold of 0.70. **Hair et al. (2019)**. Though Ownership 2 has a loading of 0.460, it is explaining the construct significantly**.** The measurement of discriminant validity is done by using the Heterotrait-Monotrait ratio of correlations (HTMT) **Sinkovics (2009), Hair et al. (2012), Hanafiah (2020).** The results of the measurement model indicate that the internal consistency reliability and convergent validity of the constructs are satisfactory.

4.2. Construction of Structural Model

The predictive relevance and effect size is determined after constructing the structural model **(Hair et al., 2016)**. Consequently, a structural model through PLS-SEM bootstrap was constructed to study the impact of barriers to using the digital platform on DFS and ownership. The bootstrapping result indicates that barriers have a negative and significant impact on DFS and Ownership. Awareness as a construct mediates the relationship between ownership and barriers, and DFS and barriers. It is observed from the result that there are direct as well as specific indirect effects of awareness on both ownership and DFS. So, complementary mediation is observed in the model, **Lontchi et al. (2022).**

TABLE-2 : Reliability and Validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
AWARENESS	0.776	0.778	0.857	0.601
BARRIERS	0.979	0.980	0.981	0.814
DFS	0.837	0.845	0.891	0.672

Source : Smart PLS Output.

Table-4 : VIF Values

	VIF
OWN_1	1.293
OWN_2	1.055
OWN_3	1.331

Source: Smart PLS Output.

Table-5 : Factor Loadings of the Kndicators

Indicators	AWARENESS	BARRIERS	DFS	OWN
AWARE1	0.721			
AWARE2	0.826			
AWARE3	0.842			
AWARE4	0.702			
B1		0.902		
B10		0.946		
B11		0.952		
B12		0.944		
B2		0.923		
B3		0.924		
B4		0.955		
B5		0.802		
B6		0.797		
B7		0.758		
B8		0.946		
B9		0.949		
DFS_1			0.815	
DFS_2			0.785	
DFS_3			0.872	
DFS_4			0.805	
OWN_1				0.780
OWN_2				0.460
OWN_3				0.874

Source : Smart PLS Output.

A 43.2% variance in the DFS is explained by Awareness, Ownership, and the barriers to using the digital platform variance. A 48.9% in Ownership is explained by Awareness, DFS, and the barriers to using the digital platform. **Chin (2010) concluded that** the R^2 value of 0.67 is substantial, 0.33 is moderate and 0.19 is considered weak. The result of the research shows an R^2 value above 0.33 and

hence the model suggested is moderate. **Hair et al., (2017) and Kijkasiwat & Chancharat (2022) highlighted t**hat the predictive relevance of the model can be measured through Stone-Geisser's Q Square reflecting a value greater than zero to have predictive relevance, The Q Square values obtained after cross-validated redundancy for the endogenous construct are greater than zero (0.267, 0.229, and 0.214 for awareness, DFS, and ownership respectively).

Table-6 : Results of Outer Weights

Indicators	Weights
B1 <- BARRIERS	0.094
B2 <- BARRIERS	0.108
B3 <- BARRIERS	0.082
B4 <- BARRIERS	0.103
B5<- BARRIERS	0.096
B6 <- BARRIERS	0.092
B7 <- BARRIERS	0.090
B8 <- BARRIERS	0.090
B9 <- BARRIERS	0.090
B10 <- BARRIERS	0.089
B11<- BARRIERS	0.087
B12<- BARRIERS	0.090

Table-7 : Results of Hypotheses Testing

	Relationship	β Value	S.D	T-Stats	*p values	Decision Supported
AWARENESS->DFS	Direct	0.388	0.032	12.290	0.000	Yes H1
AWARENESS->OWN	Direct	0.398	0.028	14.220	0.000	Yes H2
BARRIER->AWARENESS->OWN	Indirect	-0.115	0.009	12.130	0.000	Yes H5
BARRIER->AWARENESS->DFS	Indirect	-0.112	0.010	11.134	0.000	Yes H6
BARRIERS->DFS->	Direct	-0.147	0.016	9.478	0.000	Yes H3
BARRIERS->OWN	Direct	-0.111	0.013	8.274	0.000	Yes H4

*Source: Smart PLS Output, *Significant at 0.05 level based on 5000 bootstraps.*

Figure-1 : Proposed Structural Model
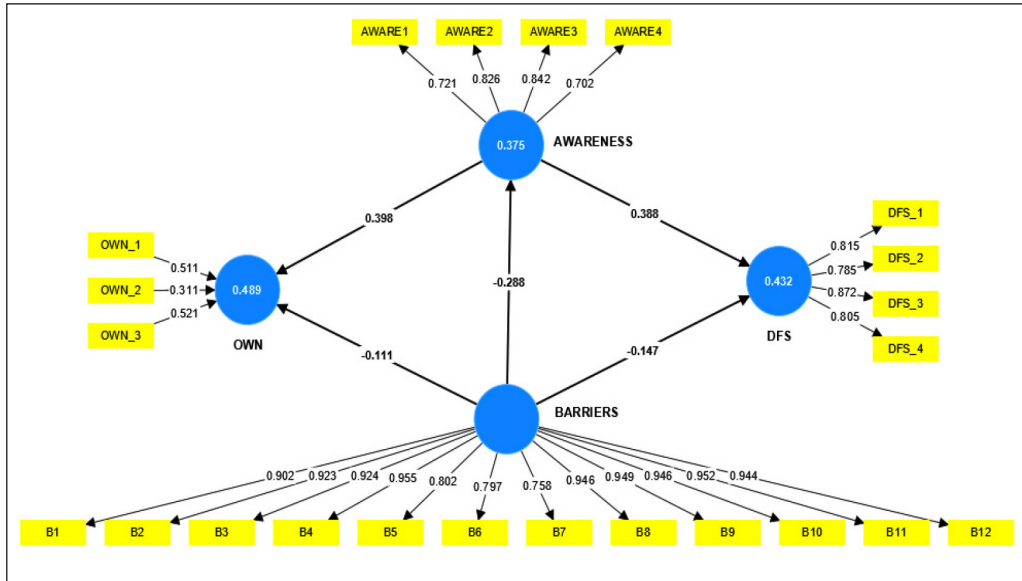
5. Major Findings

1. Attainment of the goal of digital financial inclusion is affected by digital financial literacy and barriers that come up in the way of people using the digital platform. The relationships between the constructs are assessed using 5000 bootstraps. The bootstrap result in Table 7 highlights the relationship between different constructs. It is observed that awareness has a significant, positive, and direct impact on DFS and ownership. Awareness of people is essential for owning a financial instrument and using different DFS. This leads to acceptance of H1 and H2 and leads to a finding that when people are aware of various financial services offered digitally, the consumer rights as a consumer of a digital platform, the risk associated with virtual and digital transactions, and the mechanism of redressal, they would use more digital financial products and services and would have ownership of various digital instruments like bank cards and with digital money providers like e-wallets, etc.

2. Barriers to using the digital platform also have a significant, negative, and direct impact on DFS and ownership respectively. This leads us to acceptance of H3 and H4 and to another finding that a well-aware person might have

restricted use of the digital platform if he faces certain challenges or difficulties in using the platform. There are certain factors identified as barriers to use the of digital products. Table 1 reflects the factors that act as barriers and Table 6 indicated the weights.

3. Minor mistakes lead to huge financial losses while using a digital payment system (B2) has a higher weight (0.108) of all the indicators and doubt about wrongly tapping the bill information while using digital payment systems (B3) has the least weight (0.082). People who are not adequately aware of the Digital Platform are quite skeptical while using it. It was observed during the study that people of different educational backgrounds and varied occupation uses digital products by taking the help of their friends and family members. They do so because they fear losing a huge sum of money due to a minor or negligible loss.

4. The direct and positive impact of these factors on DFS and ownership states that when people are affected by the mentioned factors, their ownership and usage of DFS are affected. The more the barriers the less they prefer to own and use the digital financial products.

5. It is observed from the result of Bootstrap that awareness mediates the relationship between barriers, DFS, and ownership. The mediation found is complementary in nature, **Lontchi et al. (2022).** A low level of awareness leads to barriers affecting the DFS and ownership negatively and significantly. Awareness affects DFI both directly and indirectly and H5 and H6 are accepted.

6. Conclusion

The study set out to investigate the factors affecting DFI in the district of Puri, Odisha, India**.** The identified factors constituting the barriers will help to improve the level of digital usage and penetration in the place of research. Awareness among the users is found to be a factor of paramount importance. The level of awareness affects the DFS and ownership of digital financial products. A positive and significant relationship is observed between DFI (DFS and ownership) and awareness among the people. Some factors are identified as barriers that have a negative and significant impact on DFS and Ownership. These identified barriers are to be removed or handled properly to minimize their negative impact on digital inclusion. It is the responsibility of the policymakers to ensure that awareness programs can be conducted for making people aware of various digital

financial products, and their methods of operation, redressal, control mechanism, etc, so that the difficulties faced by them can be reduced. The present study is going to give insight into the current scenario of digital inclusion to the advocates of DFI and promoters of digital financial products. People must be encouraged for using digital products by removing the constraints that restrain them from adopting the digital platform. The authorities need to give importance to increasing the awareness levels of people to facilitate their use of the DFS. Conducting more numbers of financial awareness programs by either banks or different other authorities can reduce ignorance among people related to digital financial transactions. A person who is well- aware can handle his digital transactions with confidence. The research findings can throw light on framing strategies for eradicating the barriers and improving awareness among people for facilitating more digital financial inclusion.

Acknowledgment

References

1.   Alameda, Teresa. 2020. Data, AI and Financial Inclusion: The Future of Global Banking—Responsible Finance Forum, *Responsible Finance Forum BBVA* 2020. Available online: https: //responsiblefinanceforum.org/data-ai-financial-inclusion-future-global-banking/ (accessed on 12 May 2020)

2.   Chin, W. W. (2010). How to write up and report PLS analyses. In V. Vinzi, W. Chin, J. Henseler & H. Wang (Eds.), Handbook of partial least squares: concepts, methods, and applications (pp. 655–690). Heidelberg, Germany: Springer-Verlag Berlin Heidelberg.

3.   Cronbach, L.J. (1971), "Test validation", in Thorndike R.L. (Ed*.), Educational Measurement*, IGI Publishing, American Council on Education, Washington, DC.

4.   Dahlman C., Mealy S., and Wermelinger M. (2016) "Harnessing the digital economy for developing countries." *OECD Development Centre Working Papers*.No.334

5.   Eshet, Y. (2002). Digital literacy: A new terminology framework and its application to the design of meaningful technology-based learning environments (pp. 493-498). *Association for the Advancement of Computing in Education (AACE).*

6.   Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39-50.

7.   Gautam, R. S., Rastogi, S., Rawal, A., Bhimavarapu, V. M., Kanoujiya, J., & Rastogi, S. (2022). Financial Technology and Its Impact on Digital Literacy in India: Using Poverty as a Moderating Variable. *Journal of Risk and Financial Management*, *15*(7), 311.

8.   Hair, J.F., Hult, G.T.M., Ringle, C.M., and Sarstedt, M. (2016), A Primer on Partial. Least Squares Structural Equation Modelling (PLS-SEM), 2nd ed., Sage, Thousand Oaks, CA.

9.   Kandpal, V., & Mehrotra, R. (2019). Financial inclusion: The role of fintech and digital financial services in India. *Indian Journal of Economics & Business*, *19*(1), 85-93.

10.   Kijkasiwat, P., & Chancharat, N. (2022). Financial inclusion in the industry 4.0: the effects of financial inclusion on electronic payments in Thailand. *International Journal of Trade and Global Markets*, *15*(1), 70-78.

11.   Lontchi, C.B.; Yang, B.; Su, Y, (2022), The Mediating Effect of Financial Literacy and the Moderating Role of Social Capital in the Relationship between Financial Inclusion and Sustainable Development in Cameroon. Sustainability, 14, 15093. https://doi.org/10.3390/su142215093

12.   Lyons, A.C., and J. KassHanna, A methodological overview to defining and measuring "digital" financial literacy. *Financial Planning Review,* 2021: p. e1113.DOI: https://doi.org/10.1002/cfp2.1113.

13.   Mahmood Ahmad; Abdul Majeed; Muhammad Asif Khan; Muhammad Sohaib; Khurram Shehzad; (2021). *Digital financial inclusion and economic growth: provincial data analysis of China. China Economic Journal –.* doi:10.1080/17538963.2021.1882064

14.   NITI Aayog Report, July 2022, Digital Banks- A proposal for Licensing & Regulatory Regime for India https://www.niti.gov.in/sites/default/files/2022-07/DigitalBanking07202022_compressed.pdf

15.   OECD. 2018. *G20/OECD INFE Policy Guidance on Digitalisation and Financial Literacy*. The Secretary-General of the OECD, Australi. Paris: OECD. [**Google Scholar**]

16.   Pakojwar, S. and N.J. Uke, (2014). Security in online banking services—A comparative study. International. *Journal of Innovation Res. Science Engineering and Technology*, 3: p. 16850-16857.DOI: https://doi.org/10.15680/IJIRSET.2014.0310079.

17. Prasad, H., Meghwal, D., & Dayama, V. (2018). Digital financial literacy: a study of households of Udaipur. *Journal of Business and Management*, *5*, 23-32.

18. Ringle, C. M., Wende, S., and Becker, J.-M. 2022. "SmartPLS 4." Oststeinbek: SmartPLS GmbH, http://www.smartpls.com.

19. Sinkovics, R.R., (2009), New challenges to international marketing, Emarald, London.

20. Yan Shen; Wenxiu Hu; C. James Hueng; (2021). Digital Financial Inclusion and Economic Growth: A Cross-country Study. *Procedia Computer Science*, (), –. Doi: 10.1016/j.procs.2021.04.054

21. Yang, L., & Zhang, Y. (2020). *Digital Financial Inclusion and Sustainable Growth of Small and Micro Enterprises—Evidence Based on China's New Third Board Market Listed Companies. Sustainability, 12(9), 3733.* doi:10.3390/su12093733.

22. Zetzsche, D. A., Buckley, R. P., & Arner, D. W. (2019). FinTech for financial inclusion: driving sustainable growth. *Sustainable Development Goals: Harnessing Business to Achieve the SDGs through Finance, Technology, and Law Reform*, 177-203.

Navigating Investment Choices : Understanding the Decision-Making Patterns of Young Investors in Chennai City

S. GAYATHRI AND C. SANKAR

Abstract : *This study investigates the decision-making patterns of young investors in Chennai city, focusing on factors such as investment habits, risk perception, information sources, and preferences for financial instruments. Adopting a descriptive research design, data was collected from 513 respondents below the age of 40 in the Chennai district, utilizing a structured questionnaire and employing a Simple Random Sampling technique. The findings reveal a pronounced gender disparity, with 76.6% male respondents, emphasizing the need for targeted strategies for female investors. The majority of respondents, falling within the 25-35 age range, depict a youthful investor demographic with diverse educational backgrounds. The study unveils a predominantly employed demographic, constituting 85.8% of respondents.Investment preferences highlight a significant inclination towards mutual funds (28.3%) and fixed deposits (26.9%), reflecting a preference for diversified and traditional low-risk vehicles. Emerging trends include cryptocurrency (8.2%) and real estate investments (7.4%), indicating a growing interest in alternative assets. Key influencers in investment decisions are expected returns (39.4%) and advice from financial experts (29.6%). Financial advisors (38.6%) and personal networks, primarily family and friends (38.2%), are crucial information sources. Confidence levels vary, with 28.5% highly confident, 25.3% moderately confident, and 17.0% uncertain. Risk tolerance is predominantly moderate (47.4%), with contributors to risk perception*

S. Gayathri, Research Scholar, PG and Research Department of Commerce, Vivekanandha College of Arts and Science for Women (Autonomous), Elayampalayam, Tiruchengode, Namakkal District, Tamilnadu, India - 637202

Dr. C. SANKAR, Ph.D, Assistant Professor, PG and Research Department of Commerce, Vivekanandha College of Arts and Science for Women (Autonomous), Elayampalayam, Tiruchengode, Namakkal District, Tamilnadu, India - 637202

encompassing future goals (38.8%), challenges and concerns (36.1%), decision-making processes (14.0%), and awareness of financial instruments (11.1%). This study provides insights into the nuanced landscape of young investors, offering valuable implications for financial institutions and policymakers.

Introduction

In the dynamic landscape of the financial world, the involvement of young investors in the stock market has become increasingly prominent. Chennai, a bustling metropolis in India, is witnessing a surge in the number of young individuals navigating the complex terrain of investment. Understanding the decision-making patterns of these young investors is crucial for both financial analysts and policymakers alike (Sapiri, M., & AWALUDDIN, M., 2023). One of the primary motivations for young investors in Chennai is the desire for financial independence and wealth accumulation. With aspirations of achieving long-term financial goals such as buying a house, starting a business, or securing a comfortable retirement, young investors see the stock market as a vehicle for wealth creation (Kumawat, A., & Parkar, A., 2020).

The increased accessibility of financial education through online platforms, workshops, and seminars has empowered young investors in Chennai. A growing awareness of investment strategies, risk management, and market dynamics has contributed to more informed decision-making among the youth (Yang, A. S., 2013).The digital revolution has played a pivotal role in shaping the investment landscape for young individuals. Smartphone apps, online trading platforms, and real-time market information have made it easier for them to participate in the stock market. The convenience offered by technology has democratized access to financial markets (Dar, B. I., & Kumar, J., 2023).

Review of Literature

While the desire for wealth creation is a powerful motivator, many young investors in Chennai grapple with finding the right balance between risk aversion and risk appetite. The fear of losing money can hinder investment decisions,

leading to missed opportunities for growth.Inexperience often poses a significant challenge for young investors. The complex nature of financial markets and the volatility of stock prices can be intimidating for those who are new to the investment landscape. Learning to navigate these challenges is a key aspect of their journey (Davar, Y. P., & Gill, S., 2007).

Emotional decision-making is a common pitfall for young investors. The influence of market trends, social media hype, and peer pressure can lead to impulsive decisions. Developing emotional resilience and adopting a disciplined approach to investment are crucial skills for long-term success.Technology has democratized access to information, enabling young investors to make more informed decisions (Jamal, A.A.A., Ramlan, W.K., Pazim, K.H., & Budin, D.S.A., 2014). Real-time market data, expert analyses, and educational resources are readily available at their fingertips, empowering them to stay abreast of market trends (Hoegen, A., Steininger, D. M., & Veit, D., 2018).

The ease of trading through online platforms has revolutionized the investment landscape. Young investors in Chennai can buy and sell securities with a few taps on their smartphones, eliminating the barriers of physical presence and time constraints. The emergence of robo-advisors has provided a tech-driven solution to investment management (Quang, L. T., Linh, N. D., Van Nguyen, D., & Khoa, D.D., 2023). These automated platforms use algorithms to analyze market trends and recommend investment strategies. For young investors with limited experience, robo-advisors offer a guided approach to building a diversified portfolio (Awaluddin, M., Molina, M., Nurlia, N., & Isra, W., 2023).

Objectives of the Study

The objective of this study is to analyse and comprehend the decision-making patterns of young investors in Chennai city, exploring factors such as investment habits, risk perception, information sources, and preferences for various financial instruments.

Methodology

For the study descriptive research design was adopted. The data was collected from young investors in Chennai district belonging to age category below 40 years. The data was collected from 513 respondents using structured questionnaire. Herein for the study Simple random sampling technique was used.

Analysis and Interpretation

The provided table presents a percentage analysis of the demographic profile of young investors in the Chennai district. The data, based on a sample of 513 respondents, is categorized by gender, age, educational background, and employment status.

Table-1 : Percentage Analysis - Demographic Profile of the Young investor in Chennai District

		Frequency	Percent
Gender	Male	393	76.6
	Female	120	23.4
	Total	513	100.0
Age	18-24 Years	56	10.9
	25-30 Years	195	38.0
	31-35 Years	214	41.7
	36-40 Years	48	9.4
	Total	513	100.0
Educational Background	U.G.	389	75.8
	P.G.	105	20.5
	Others	19	3.7
	Total	513	100.0
Employment Status	Employed	440	85.8
	Students	24	4.7
	Unemployed	24	4.7
	Others	25	4.9
	Total	513	100.0

Source : Primary Data.

- **Gender Distribution :**

o The majority of respondents are male, constituting 76.6% of the sample, while females account for 23.4%. This gender distribution indicates a notable gender disparity among young investors in the region.

- **Age Distribution:**

o The age distribution reveals that the majority of young investors fall within the 25-30 years (38.0%) and 31-35 years (41.7%) age brackets. A relatively smaller proportion is observed in the 18-24 years (10.9%) and 36-40 years (9.4%) age groups.

- ## Educational Background:

o   Regarding educational background, the majority of respondents have completed undergraduate (U.G.) education, representing 75.8% of the sample. Postgraduate (P.G.) qualifications are held by 20.5% of respondents, while 3.7% fall under the category of 'Others,' signifying diverse educational backgrounds within the surveyed population.

- ## Employment Status:

o   In terms of employment status, a significant portion of the respondents (85.8%) are employed. A smaller percentage comprises students (4.7%), unemployed individuals (4.7%), and others (4.9%). This distribution suggests a predominantly employed demographic among young investors in the Chennai district.

The presented table outlines the distribution of young investors in the Chennai district across various types of investments, based on a sample size of 513 respondents.

Table-2 : Percentage Analysis – Investment Decision

		Frequency	Percent
In which of the following types of investments are you currently involved?	Stocks	86	16.8
	Mutual Funds	145	28.3
	Real Estate	38	7.4
	Cryptocurrency	42	8.2
	Fixed Deposits	138	26.9
	Government Bonds	33	6.4
	Gold or Precious Metals	31	6.0
	Total	513	100.0

Source : Primary Data.

- ## Stocks:

o   A discernible 16.8% of respondents are currently involved in stock investments. This indicates a noteworthy but relatively moderate participation in equity markets among the surveyed population.

- **Mutual Funds:**

o   The majority of respondents, constituting 28.3%, are engaged in mutual funds. This demonstrates a prevalent inclination towards diversified investment vehicles, possibly driven by risk-sharing and professional fund management aspects associated with mutual funds.

- **Real Estate:**

o   Real estate investments are observed among 7.4% of respondents. This relatively lower percentage suggests a comparatively lesser proclivity for direct property investments within the surveyed young investor cohort.

- **Cryptocurrency:**

o   Cryptocurrency investments are represented by 8.2% of respondents, reflecting a notable but still a relatively niche involvement in digital assets. This finding indicates an emerging trend in embracing alternative investment avenues.

- **Fixed Deposits:**

o   A substantial 26.9% of respondents are involved in fixed deposits, underscoring a prevalent affinity for traditional, low-risk investment instruments. This could be indicative of risk-averse behavior among a significant portion of young investors.

- **Government Bonds:**

o   Government bonds attract 6.4% of respondents, signifying a measured interest in relatively secure and government-backed financial instruments.

- **Gold or Precious Metals:**

o   Investments in gold or precious metals are noted among 6.0% of respondents, reflecting a moderate but discernible inclination towards commodity-based investments.

The provided tables offer a comprehensive exploration of factors influencing investment decisions, information sources, confidence levels in decision-making, risk tolerance, and contributors to risk perception among young investors in the Chennai district. The analysis is based on a sample size of 513 respondents.

Table-3 : Decision Making Pattern

		Frequency	Percent
What factors influence your decision to invest?	Expected returns	202	39.4
	Risk tolerance	44	8.6
	Market trends	46	9.0
	Advice from financial experts	152	29.6
	Peer recommendations	30	5.8
	Social media influence	39	7.6
	Total	513	100.0
Where do you usually get information about investment opportunities?	Financial news websites	34	6.6
	Social media	85	16.6
	Financial advisors	198	38.6
	Family and friends	196	38.2
	Total	513	100.0
How confident do you feel about your ability to make investment decisions?	Very confident	146	28.5
	Somewhat confident	130	25.3
	Neutral	150	29.2
	Not very confident	47	9.2
	Not confident at all	40	7.8
	Total	513	100.0
How would you describe your risk tolerance when it comes to investments?	High risk tolerance	41	8.0
	Moderate risk tolerance	243	47.4
	Low risk tolerance	229	44.6
	Total	513	100.0
What factors contribute to your perception of risk in investments?	Decision-Making Process	72	14.0
	Awareness of Financial Instruments	57	11.1
	Future Goals	199	38.8
	Challenges and Concerns	185	36.1
	Total	513	100.0

Source : Primary Data.

• **Factors Influencing Investment Decisions:**

o   Expected returns emerge as the predominant factor influencing investment decisions, cited by 39.4% of respondents. This underscores the significance of financial gains in shaping investment choices. Other noteworthy influences include advice from financial experts (29.6%) and market trends (9.0%).

- **Information Sources for Investment:**

o   Financial advisors are the primary source of information for investment opportunities, indicated by 38.6% of respondents. Family and friends also play a substantial role, with 38.2%, emphasizing the influence of personal networks in shaping investment decisions.

- **Confidence in Investment Decision-Making:**

o   A diverse range of confidence levels is observed among respondents. Notably, 28.5% express being very confident, while 25.3% are somewhat confident. Neutral sentiments are prevalent at 29.2%, indicating a balance in confidence levels. A proportion of respondents (17.0%) expresses varying degrees of uncertainty, with 9.2% not feeling very confident and 7.8% not confident at all.

- **Risk Tolerance:**

o   The majority of respondents exhibit a moderate risk tolerance (47.4%), while 44.6% have a low risk tolerance. High risk tolerance is observed in 8.0% of respondents. This distribution suggests a varied risk appetite among young investors in the region.

- **Contributors to Risk Perception:**

o   Various factors contribute to the perception of risk in investments. Future goals significantly impact risk perception (38.8%), followed by challenges and concerns (36.1%). Decision-making processes (14.0%) and awareness of financial instruments (11.1%) also play discernible roles in shaping risk perceptions.

Findings and Conclusion

The study on young investors in the Chennai district reveals distinct patterns in demographic characteristics, investment preferences, and decision-making factors. Gender distribution indicates a substantial gender disparity, with 76.6% of respondents being male, highlighting a potential need for targeted outreach and engagement strategies for female investors. In terms of age, a significant proportion falls within the 25-35 years range, indicating a youthful investor demographic. Educational backgrounds vary, with a majority having completed undergraduate education, emphasizing the diverse educational landscape within the surveyed population. Employment status unveils a predominantly employed demographic, constituting 85.8% of respondents.

Investment preferences among young investors showcase a noteworthy inclination towards mutual funds (28.3%) and fixed deposits (26.9%), reflecting a preference for diversified and traditional low-risk investment vehicles. Cryptocurrency investments (8.2%) and real estate investments (7.4%) indicate a growing interest in alternative assets. Factors influencing investment decisions highlight the paramount importance of expected returns (39.4%) and advice from financial experts (29.6%), underscoring the significance of financial gains and professional guidance in shaping investment choices.

Information sources for investment reveal that financial advisors play a central role, being the primary source for 38.6% of respondents. Personal networks, represented by family and friends (38.2%), also significantly influence investment decisions. Confidence levels in investment decision-making vary among respondents, with 28.5% expressing high confidence, 25.3% moderate confidence, and 17.0% indicating uncertainty. Risk tolerance is predominantly moderate (47.4%), indicating a balanced approach to risk among young investors. Contributors to risk perception encompass future goals (38.8%), challenges and concerns (36.1%), decision-making processes (14.0%), and awareness of financial instruments (11.1%), highlighting the multifaceted nature of risk evaluation in investment decisions.

References

Awaluddin, M., Molina, M., Nurlia, N., & Isra, W. (2023). Determining Factors for Young Investors to Invest in the Capital Market. *International Journal of Professional Business Review: Int. J. Prof. Bus. Rev.*, *8*(5), 92.

Davar, Y. P., & Gill, S. (2007). Investment Decision Making : An empirical study of perceptual view of Investors. *Metamorphosis*, *6*(2), 115-135.

Dar, B. I., & Kumar, J. (2023). The Behavioural Pattern of Investment in the Financial Market : A Study of the Individual Investors. *Global Business Review*, 09721509231192229.

Hoegen, A., Steininger, D. M., & Veit, D. (2018). How do investors decide? An interdisciplinary review of decision-making in crowdfunding. *Electronic Markets*, *28*(3), 339-365.

Jamal, A.A.A., Ramlan, W. K., Pazim, K. H., &Budin, D. S. A. (2014). Decision-making style and investment success of retail investors in Malaysia. *International Journal of Business and Social Science*, *5*(9).

Quang, L.T., Linh, N.D., Van Nguyen, D., & Khoa, D.D. (2023). Behavioral factors influencing individual investors' decision making in Vietnam market. *Journal of Eastern European and Central Asian Research (JEECAR)*, *10*(2), 264-280.

Kumawat, A., & Parkar, A. (2020). Study on Investment Pattern and the Factors Influencing Investment Decisions of an Individual. *ShodhSarita*, *7*(25), 237-244.

Sapiri, M., & AWALUDDIN, M. (2023). Distribution of Financial Attitude, Financial Behavior, Financial Knowledge and Financial Literacy on the Investment Decision Behavior of Young Investors.

Yang, A. S. (2013). Decision making for individual investors : A measurement of latent difficulties. *Journal of Financial Services Research*, *44*, 303-329.

Office Bearers of ICA 2024

Prof. Ajay Kumar Singh
President – ICA, Senior Professor, Head & Dean
Department of Commerce, Faculty of Commerce
and Business, Delhi School of Economics
University of Delhi, Delhi

Prof. W. K. Sarwade
Immediate Past President – ICA
Pro Vice Chancellor
Dr. BAM University, Aurangabad

Prof. M. Jayappa
Executive Vice President – ICA
Former Principal, RBANMS First Grade College
Usloor, Banglore

Dr. Kuldeep Sharma
Secretary – ICA
Chairman Board of Studies in Trade,
Transport and Industry, University of Mumbai

Prof. N. K. Jha
Joint Secretary – ICA
Dean, Faculty of Commerce
Head & Director
Department of Applied Economics & Commerce
Patna University

Prof. D. Chennappa
Managing Editor, Indian Journal of Commerce
Treasurer – ICA
Head, Department of Commerce
Osmania University, Hyderabad

Conference Secretary

Prof. K. S. Thakur
Hon'ble Vice-Chancellor
Govind Guru Tribal University,
Banswara

Joint Conference Secretary

Prof. K. K. Dave
Hon'ble Vice-Chancellor
PAHER University, Udaipur

Regd. No.4973/60