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Measuring and Validating Consumer Style Inventory for Selected Non-durable Products

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Consumer decision-making styles; Consumer buying behavior; Consumer style inventory; Factor analysis; Marketing

JEL Classification
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Abstract: Knowledge of consumers' decision-making styles which are relatively consistent general orientation towards shopping can serve as basis for understanding how consumers behave when making product or service choices. The primary objective of the present study is to test the generalizability of the consumer style inventory (CSI), an instrument developed to determine consumers' decision-making styles. The CSI was administered to a sample of 224 consumers aged 18 and above. Data collected was analyzed employing suitable statistical tools, namely, principal component analysis with varimax rotation and cronbach's alpha reliability coefficients. Results of exploratory factor analysis identified seven consumer decision-making traits: perfectionist/high-quality conscious consumer, novelty-fashion conscious consumer, confused by over choice consumer, brand conscious-"price equals quality" consumer, recreational-hedonistic consumer, impulsive-careless consumer, and habitual/brand-loyal consumer. Five traits were found to possess satisfactory reliability coefficients. Findings offer meaningful implications for various stakeholders, especially marketing practitioners and consumer research specialists. Limitations and scope for future research are also discussed.

1. Introduction

Globalization has resulted in virtually borderless economies facilitating the unrestricted flow of variety of products across nations. This has exposed the consumers to a wide range of offerings, both domestic as well as foreign, thereby increasing consumer product choices at an overwhelming level. Not to mention the increase in number of retail outlets, department stores, and shopping malls. Technological advancements in various spheres, advent and increased usage of internet has contributed to the growing intricacy of consumer choices. In addition to the traditional brick and mortar stores, consumers are now being offered the choice to shop from the comfort of their homes through electronic or online medium. With the click of a button, consumers can get access to a sea of product information. Consumers are also bombarded with various types of promotional messages through tradition medium such as T.V., newspapers, radio, magazines, billboards, etc. Marketers also employ electronic media to deliver their messages including emails, SMS, social media, etc. Such abundance in terms of product choices, quantity of information, places of availability, promotional activity, and various other stimuli have added layers to the expanding complexity of decision-making among consumers (Hafstrom et al., 1992; Lysonski et al., 1996). This necessitates research to provide business organizations with meaningful insights and knowledge.

Lysonski & Durvasula (2013) opined that determination of consumer profiles by studying their decision making behaviour can facilitate businesses in dividing their target market into "viable and profitable clusters". Market segmentation is essential for developing tailor-made strategies aimed to cater to the specific needs of each group of consumers who constitute the firm's target market. For example, while formulating marketing strategies for consumers who belong to quality conscious segment, marketers should ensure that their advertising and promotional campaigns effectively highlight the superior quality of their products. One way to do so is by mentioning the certifications granted to the firm's products by concerned authorities approving the quality of their products.

A substantial amount of empirical research studies determining consumer buying styles have been carried out across various countries. Sproles & Kendall, (1986) recommended testing of the instrument on the general population. However, a major issue with several past studies is that they have repeatedly used students as their sample (e.g., Bakewell & Mitchell, 2004; Fan & Xiao, 1998; Hafstrom et al., 1992; Lysonski et al., 1996; Mehta, 2020; Mitchell & Bates, 1998; Mokhlis, 2009; Sproles & Kendall, 1986; Srivastava, 2015). Further, previous research has predominantly concentrated on evaluating consumer traits without linking them to specific product categories or industry. Thus, the main goal of the present paper is to examine if the same characteristics identified by Sproles & Kendall (1986) utilizing students as sample can be confirmed on a sample taken from a cross-section of the general population belonging to the state of Manipur, India in the context of selected non-durable product category.

2. Review of Literature

Consumer decision-making style has been defined as, "a mental orientation characterizing a consumer's approach to making choices" (Sproles & Kendall 1986). With the objective of developing and validating a scale for measuring consumer decision-making styles, data was gathered from 501 students based in Tucson, US. Through factor analysis, eight styles was identified in their study which included, "perfectionist, high-quality conscious consumer; brand conscious, price equals quality consumer; novelty-fashion conscious consumer; recreational, hedonistic consumer; price conscious, value for money consumer; impulsive, careless consumer; confused by over choice consumer; habitual, brand-loyal consumer". This measurement scale is popularly known as Consumer Style Inventory (CSI).

Hafstrom et al., (1992) conducted research to determine young Korean consumers' styles of making purchase-related choices and contrasted the identified traits with those from the original study in the United States. Analysis of data collected from 310 college students confirmed eight styles in the Korean sample, namely, brand conscious consumers, seekers of perfection, those who considered shopping as a recreational activity, buyers confused by excessive choices, impulsive shoppers, individuals who desired to conserve time and energy while shopping, brand-loyal consumers, and those who were motivated by price and value. Out of the eight styles, seven were found to be comparable to the US sample with the exception of Seven of the 'time-energy conserving' trait.

Lysonski et al., (1996) investigated the relevance of the inventory in four distinct countries using samples comprising of undergraduate college students. Analysis revealed that the inventory seemed to be more appropriate for measuring shopping styles in samples from more developed economies compared to those from developing economies including India.

Fan & Xiao (1998) introduced a revised model for assessing consumer decision-making dimensions. They examined its applicability by gathering data from 271 college students in China. Two out of the seven factors had to be dropped as the results of their reliability tests indicated that they were unreliable. A five-factor model was found to be most suitable for the employed data set.

Bakewell & Mitchell (2006) proposed that shopping behaviour varies according to gender. To test this hypothesis, data was gathered from 245 respondents from each gender category aged between 18-22 years. In addition to the original eight CSI styles, four new traits could be identified from the female sample. The authors attributed this to probable inter-cultural variations between the sample employed for the study and that of the original US study. With regard to male consumers, three new factors were discovered which related to store promiscuity, loyalty to favoured stores, desire for low prices, confusion stemming from time constraints while shopping.

Zhou et al., (2010) broadly divided the eight consumer traits into hedonic and utilitarian shopping styles. Hedonic individuals appeared conscious of brands, desired novel and stylish products, considered shopping as pleasant, and preferred frequenting favorite stores or brands. Utilitarian styles, on the other hand, encompassed shoppers who prioritized quality, price and value sensitive consumers, those confused by excessive choices, and individuals driven by impulsive behavior. Results revealed that consumers from both coastal and inland areas of China exhibit similarity with regard to utilitarian styles. It was also proven, as hypothesized, that they differed in relation to hedonic shopping styles.

Tanksale et al., (2014) examined the CSI on Indian shoppers, specifically those aged between 18-21 years old. Results of the research validated only six out of the eight styles. Shopping avoidance-time saver, a new attribute was also identified. Authors suggested validation and modification of the scale before employing it in a cross cultural setting.

Bandara (2014) found seven decision-making characteristics amongst consumers in Czech Republic. They are: brand conscious shoppers, those who emphasized perfection and high quality, consumers driven by recreation and hedonism, impulsive buyers, consumers who prioritized price and value, those who were confused by abundance of choices, and consumers conscious of novel fashion trends. However, habitual and brand loyal characteristics from the initial study conducted in the United States could not be confirmed among Czech consumers.

Mehta & Dixit (2016) explored whether the CSI could be applied in two different countries with vast cultural differences by gathering data from a student sample of 558 and 185 belonging to India and Germany respectively. The original 8-factor solution could not be confirmed in both countries. However, the styles that emerged in both the Indian and German groups included perfection seeking buyers, brand conscious shoppers, those who were overwhelmed due to excessive choices, brand loyal consumers, and those who related high price to superior quality and vice-versa. In India, new dimensions of price and time conscious consumers were found, while variety-seeking consciousness was a trait discovered in Germany.

Mittal (2017) collected data from 163 student sample and found four consumer segments, namely, "OPEX (optimizing-extenders), BALAD (balanced diligent), CUFD (confused, uncertain, foot-draggers, and SNAP (snap deciders)". Decision-making styles of each segment differed from one to the other. These four consumer segments also showed differences in terms of their demographic profiles, personality traits, and buying behavior.

Thangavel et al., (2019) highlighted the purchasing styles of consumers belonging to Gen Z. Principal component analysis of data gathered from 244 subjects aged between 16 and 23 which mainly comprised of school and college-going students revealed nine key factors: loyalty to brands, brand conscious, focus on quality, confusion due to innumerable options, sensitivity to price, convenience-seeking behavior, loyalty to online stores, confidence in online shopping, and a tendency for socially accepted shopping behavior.

Nayeem & Marie-IpSooching, (2022) reported variations in the employability of the CSI when dealing with high and low-involvement product classes. Although CSI proved to be valid for purchases requiring low-involvement, findings implied that it required further modification concerning high-involvement products. As such, it was suggested that new factors be examined and incorporated.

Siraj et al., (2024) found that individuals' consciousness toward brand, price, and fashion significantly influenced purchasing behavior of consumers in Pakistan. Confusion among the consumers due to vast choices also had an impact on their purchase decisions. Differences were also discovered in behavior of consumers on the basis of gender with respect to fashion and price awareness.

Literature suggests that majority of the studies employ student samples. According to Hiu et al., (2001), this limits the applicability of results to the general population of the real world which is comprised of different individuals with varying socio-economic backgrounds. In order to address this recognized gap, the current research has been undertaken with the subsequent aims: 1) to test the applicability of the CSI on cross sections of the general population, 2) to evaluate the reliability and validity of the inventory, and 3) to explore decision-making approaches of consumers in Manipur.

3. Research Methodology

3.1. Survey Instrument

Consumer decision-making styles were evaluated employing the 40-item CSI originally created by Sproles & Kendall in 1986. Participants were prompted to assess the statements using a five-point Likert scale, where 1 indicated 'strongly disagree' and 5 indicated 'strongly agree' with reference to select non-durable products, namely, food, beverages, clothing and accessories. For the purpose of reducing the possibility of order effects, the items were organized randomly. Additionally, items that were most likely to correlate with a single factor were distributed apart from each other.

3.2. Sample and Data Collection

Majority of previous studies testing applicability of the CSI utilized student populations. However, Gordon et al., (1986) argued that employing students limits sample representativeness. Additionally, results obtained from studies using student samples lacked generalizability (Kinnear & Taylor, 1983). Hence, the present study employed a sample that better reflects all segments of the general population, following the advice of Sproles & Kendall, (1986).

A combination of judgemental and convenience sampling techniques were employed. Individuals (students as well as non-students) who had consumed at least one of the selected product category, aged 18 and above, easily accessible by the researcher and deemed more apt of taking part in the study were recruited as respondents. Paper-and pencil questionnaire was initially used to gather responses from participants who were conveniently accessible to the researcher. Due to prevailing conflict in the state restricting the reach and mobility of the researcher, online survey was also carried out. For this purpose, Google form link was disseminated online, specifically through Whatsapp and Instagram, to collect more data in cases where face-to-face interaction was not possible. Data collection lasted for a period of two months, that is, January-February 2024.

Guilford, (1954) suggested using a sample size of at least 200 for performing factor analysis. Comrey & Lee (1992) rated the usage of 200 as sample size as fair. Cattell (1978) also opined that an acceptable minimum sample size would be between 200 and 250. Hair et al., (2010) indicated that sample size for factor analysis should be a minimum of five times the number of variables involved. The CSI scale consists of 40 items resulting in minimum sample size requirement of 200 (40 x 5 = 200). Consequently, data for this research was gathered from 224 participants. After thorough checking, all responses were confirmed to be valid and suitable for analysis. Several past studies were also found employing sample sizes of at least 200 or even less. For instance, Lysonski & Durvasula, (2013) used a sample of 120, Bauer et al., (2006) used 223, Thangavel et al., (2019) used 244, Howcroft et al., (2003) used 244, Srivastava, (2015) used 233.

3.3. Analysis

Data was analysed following the procedures employed by previous studies. Initially, principal component analysis (PCA) with Varimax rotation was executed on all 40 items leading to the extraction of 13 primary factors. Items that exhibited significantly low factor loadings or substantial cross-loadings were excluded from analysis. Remaining items were again subjected to factor analysis. The process was repeated until no items were required to be removed resulting in a seven-factor model. Then, Cronbach's alpha coefficients were derived for the identified factors in order to determine reliability of variables.

4. Results and Discussion

As seen in the table given below, sample used for the present study was considered to be appropriate for factor analysis as Kaiser-Meyer-Olkin and Bartlett's Test of Sphericity yielded values of .718 and 1122.217 (significant at $p < .001$) respectively.

Table 1: KMO and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin		.718
Bartlett's Test of Sphericity	Approx. Chi-Square	1122.217
	Df	276
	Sig.	.000

According to table no. 2, factor analysis of all 40 items of the CSI produced a solution with seven factors comprising of 24 of the original items. Eigen values of the seven-factor solution ranged from 3.806 to 1.099, which represented 56.47 % of the overall variance surpassing the findings from some previous studies (e.g., Kamaruddin & Kamaruddin, 2017; Canabal, 2002; Fan & Xiao, 1998; Mokhlis, 2009). Out of the eight styles identified in the CSI, only seven could be confirmed: (1) perfection and high-quality seeking consumers, (2) novelty-fashion focused consumers, (3) confused by overabundance of options, (4) brand conscious, "price equals quality" consumers, (5) recreational and pleasure-seeking consumers, (6) impulsive and careless shoppers, and (7) habitual and brand-loyal consumers. The price conscious decision-making trait, however, was not discernible in this study. All factors were named in accordance with (Sproles & Kendall, 1986)'s study and summarized hereunder.

Factor 1: Shopping style of consumers with this trait is characterized by their systematic and careful search for products that deliver superior overall quality (Sproles & Kendall, 1986).

Factor 2: Individuals who are intrigued to explore new experiences and motivated to stay informed about the latest styles and trends are termed as novelty and fashion focused consumers.

Factor 3: This group of consumers often struggle to select stores or brands while shopping as a result of confusion due to availability of one too many choices.

Factor 4: Individuals with this trait believe that high price is an indication of superior quality. They tend to gravitate towards the most advertised and the top-selling brands, assuming that these are among the good ones (Hafstrom et al., 1992).

Factor 5: A distinctive characteristic of consumers with this style is that they find shopping to be an enjoyable activity.

Factor 6: Consumers scoring high on this factor act impulsively while shopping. This implies that they often purchase products on an impulse, that is, without planning ahead. The item 'I enjoy shopping just for the fun of it' pertaining to 'recreational, hedonistic consumer' decision-making trait was found to load on to this factor with a factor loading of .532.

Factor 7: Buying behavior of consumers with this particular shopping trait has developed a habit of buying from their favourite brands or returning to their preferred stores repeatedly.

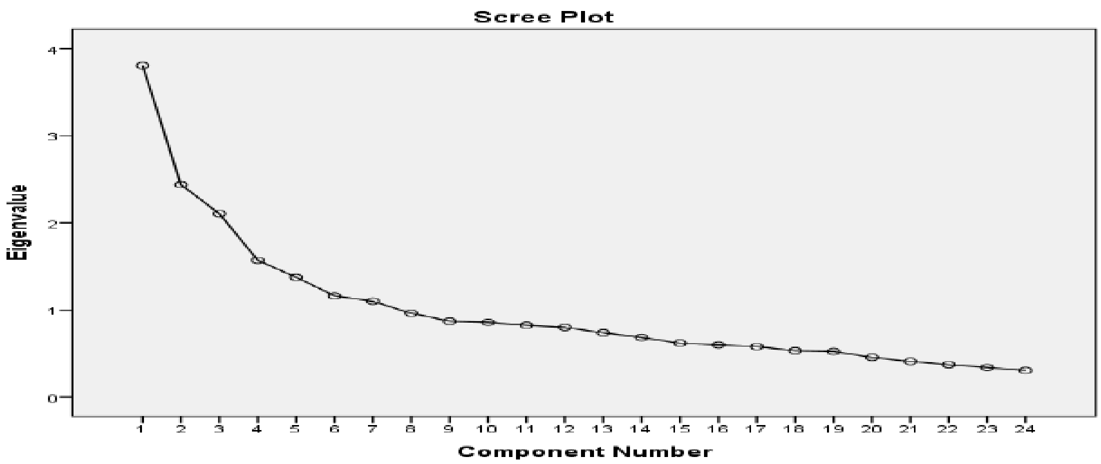
Table 2: Exploratory Factor analysis

Items	Eigen Values	Factor Loadings	% of Variance
Factor 1	3.806		15.857
Item1		.789	
Item2		.751	
Item3		.639	
Item4		.592	
Factor 2	2.438		10.157
Item5		.778	

Item6		.686	
Item7		.628	
Item8		.519	
Factor 3	2.106		8.775
Item9		.728	
Item10		.713	
Item11		.701	
Item12		.618	
Factor 4	1.644		6.539
Item13		.671	
Item14		.654	
Item15		.646	
Item16		.602	
Factor 5	1.375		5.729
Item17		.735	
Item18		.714	
Item19		.608	
Factor 6	1.159		4.829
Item20		-.768	
Item21		.602	
Item22		.532	
Factor 7	1.099		4.580
Item23		.836	
Item24		.626	

The scree plot obtained has been presented in Figure 1 as shown below. It can be seen clearly that seven factors have been identified with Eigen values greater than 1.

Figure 1: Scree Plot



Generally, cronbach alpha reliability coefficients of 0.5 and higher are considered to be acceptable (Kerlinger & Lee, 2000; Nunnally, 1967). As observed in the table given below, reliability coefficients for the first five factors are found to be satisfactory as they range from .590 to .756. The last two factors, however, are revealed to be unreliable. This may be an indication that the items do not measure their respective factors in an effective manner (Walsh et al., 2001).

Table 3: Reliability Coefficients

Factors	Cronbach's Alpha	No. of items
1	.700	4
2	.661	4
3	.673	4
4	.590	4
5	.756	2
6	.160	2
7	.458	2

The table below presents a comparison of Cronbach's alpha values obtained in this research alongside those from several previous studies.

Table 4: Comparison of Reliability Coefficients of the present study and some past studies

Factors	(Sproles & Kendall, 1986)	(Hafstrom et al., 1992)	(Mitchell & Bates, 1998)	(Srivastava, 2015)	(Kamaruddin & Kamaruddin, 2017)	Present study
1	.74	0.77	0.41	0.46	0.67	0.70
2	.74	NA	0.77	0.58	0.83	0.66
3	.55	0.54	0.67	0.49	0.59	0.67
4	.75	.84	NA	0.52	NA	0.59
5	.76	0.70	0.33	0.59	0.65	0.75
6	.48	0.54	0.24	0.25	0.65	0.16
7	.53	0.34	NA	0.39	0.52	0.45

5. Conclusion

The CSI was examined using a sample of 224 shoppers from the general public. Factor analysis identified seven styles. The 'price-value conscious' dimension could not be detected. Consistent with the outcomes of the present study, previous research also could not validate all eight consumer traits (Bauer et al., 2006; Fan & Xiao, 1998; Lysonski et al., 1996; Walsh et al., 2001). It is worth noting that the seven-factor solution obtained in the present study retained only 24 out of 40 items of the CSI as variables with significantly low factor scores or cross-loadings had to be removed before proceeding with subsequent analysis.

Additionally, it was determined that only five of the seven decision-making tendencies were deemed reliable. Cronbach's alpha values for the remaining two traits were abysmal. Results of previous studies have also revealed poor reliability coefficients for some factors (Canabal, 2002; Kamaruddin & Kamaruddin, 2017; Lysonski et al., 1996; Mitchell & Bates, 1998; Srivastava, 2015). This may be an indication that the CSI cannot be considered a robust tool to measure and determine consumer characteristics, regardless of the sample type used (students or general shoppers).

These shortcomings may be attributed to differences in population characteristics that vary significantly from one culture or country to another. For instance, as a result of linguistic differences, it is impossible to consider that all questionnaire items will be interpreted and understood in the same way by respondents from different locations or countries. Thus, findings from the present as well as past studies suggest that the CSI needs to be improved through further testing, validation, and modification.

The outcomes of this research have considerable effects on several groups, particularly the stakeholders in the non-durable goods market. The study shows that consumers can be segmented into meaningful groups based on their similarities in decision-making approaches. Each style can be associated with some characteristics that distinguish it from one another. Marketers should take these differences into consideration in order to develop products or marketing strategies that effectively caters to the needs and demands of consumers from each decision-making segment. For instance, consumers with 'perfectionist, high quality seeking' trait is strongly affected by the quality of products when making their purchase decisions. They tend to choose products that deliver superior quality in comparison to those with mediocre or poor quality. To appeal to this consumer segment, marketers need to emphasize offering products with better quality than its competitors. Quality Control or Assessment team may be set up and assigned with the task of checking and maintaining the quality of finished products of the manufacturer. On the other hand, consumers exhibiting 'novelty-fashion focused decision-making characteristic can be targeted through products that are innovative, fashionable, and trendy. This can be done through the establishment of a separate Research and Development department dedicated to scanning the market for the latest developments in terms of technological advancements and changes in consumers' tastes and preferences.

'Price conscious' could not be confirmed in the present study. This trait is used to describe consumers who seek lower prices or sale prices whenever they make a purchase. Non-confirmation of this trait may imply that consumers in the state are not concerned with the prices of products. This may be because they are more concerned with other attributes such as, quality of the product. Another reason may be because of the nature of sample used in the study. The CSI was developed based on a study conducted with student sample characterized by lower levels of disposable income thereby making them more price conscious (Walsh, et al., 2001). Conversely, the current research administered the questionnaire to a cross-section of the general population with varying levels of income and purchasing power.

This study is not without its limitations. Data was gathered from respondents residing in Imphal East and West districts of Manipur. Therefore, results of the study cannot be concluded as being representative of all consumers residing in different parts of India. A similar study on a large-scale basis may be carried out in the future using a sample comprising of shoppers from all over the country. Authors can also examine applicability of the CSI on non-student samples as majority of past studies utilized student samples to evaluate the instrument. Further studies can investigate the interaction between decision-making patterns of consumers with various factors across different product categories.

References

Bakewell, C., & Mitchell, V. W. (2004). Male Consumer Decision-Making Styles. *The International Review of Retail, Distribution and Consumer Research*, *14*(2), 223–240.

Bakewell, C., & Mitchell, V. W. (2006). Male versus female consumer decision making styles. *Journal of Business Research*, *59*(12), 1297–1300.

Bandara, W. W. (2014). Consumer Decision-Making Styles and Local Brand Biasness: Exploration in Czech Republic. *Journal of Competitiveness*, *6*(1).

Bauer, H. H., Sauer, N. E., & Becker, C. (2006). Investigating the relationship between product involvement and consumer decision-making styles. *Journal of Consumer Behaviour*, *5*, 342–354.

Canabal, M. E. (2002). Decision-Making Styles of Young South Indian Consumers: An Exploratory Study. *College Student Journal*, *36*(1), 12–19.

Cattell, R. B. (1978). *The scientific use of factor analysis*. Plenum.

Comrey, A. L., & Lee, H. B. (1992). *A first course in factor analysis* (2nd ed.). Erlbaum.

Fan, J. X., & Xiao, J. J. (1998). Consumer Decision-Making Styles of Young-Adult Chinese. *Journal of Consumer Affairs*, *32*(2), 275–294.

Gordon, M. E., Slade, L. A., & Schmitt, N. (1986). The 'science of the sophomore' revisited: From conjecture to empiricism. *Academy of Management Review*, *11*(1), 191–207.

Guilford, J. P. (1954). *Psychometric methods* (2nd ed.). McGraw-Hill.

Hafstrom, J. L., Chae, J. S., & Chung, Y. S. (1992). Consumer decision-making styles: Comparison between United States and Korean young consumers. *Journal of Consumer Affairs*, *26*(1), 146–158.

Hair, J. F., Black, B., Babin, B., Anderson, R. E., & Tatham, R. L. (2010). *Multivariate Data Analysis: A Global Perspective*. Pearson Education Inc.

Hiu, A. S., Siu, N. Y., Wang, C. C., & Chang, L. M. (2001). An Investigation of Decision-Making Styles of Consumers in China. *Journal of Consumer Affairs*, *35*(2), 326–345.

Howcroft, B., Hewer, P., & Hamilton, R. (2003). Consumer Decision-making Styles and the Purchase of Financial Services. *The Service Industries Journal*, *23*(3), 63–81.

Kamaruddin, A. R., & Kamaruddin, K. (2017). Malay culture and consumer decision-making styles: An investigation on religious and ethnic dimensions. *Journal of Kemanusiaan*, *7*(2).

Kerlinger, F. M., & Lee, H. B. (2000). *Foundations of Behavioral Research* (4th ed). Harcourt College Publishers.

Kinnear, T. C., & Taylor, J. R. (1983). *Marketing Research* (2ed ed). McGraw-Hill.

Lysonski, S., & Durvasula, S. (2013). Consumer decision making styles in retailing: Evolution of mindsets and psychological impacts. *Journal of Consumer Marketing*, *30*(1), 75–87.

Lysonski, S., Durvasula, S., & Zotos, Y. (1996). Consumer decision-making styles: A multi-country investigation. *European Journal of Marketing*, *30*(12), 10–21.

Mehta, R. (2020). Gender-based differences in consumer decision-making styles: Implications for marketers. *Decision*, *47*(3), 319–329.

Mehta, R., & Dixit, G. (2016). Consumer decision making styles in developed and developing markets: A cross-country comparison. *Journal of Retailing and Consumer Services*, *33*, 202–208.

Mitchell, & Bates, L. (1998). UK Consumer Decision-Making Styles. *Journal of Marketing Management*, *14*, 199–225.

Mittal, B. (2017). Facing the shelf: Four consumer decision-making styles. *Journal of International Consumer Marketing*, *29*(5), 303–318.

Mokhlis, S. (2009). An Investigation of Consumer Decision-Making Styles of Young-Adults in Malysia. *International Journal of Business and Management*, *4*(4), 140–148.

Nayeem, T., & Marie-IpSooching, J. (2022). Revisiting Sproles and Kendall's Consumer Style Inventory (CSI) in the 21st Century: A Case of Australian Consumers Decision-Making Styles in the context of High and Low-Involvement Purchases. *Journal of International Business Research and Marketing*, *7*(2), 7–17.

Nunnally, J. C. (1967). *Psychometric Theory* (1st ed). McGraw-Hill.

Siraj, A., Zhu, Y., Taneja, S., Ali, E., Guo, J., & Chen, X. (2024). Executing marketing through a gender lens: A consumer purchase decision-making study in an emerging economy. *Arab Gulf Journal of Scientific Research*, *42*(4), 1982–2000.

Sproles, G. B., & Kendall, E. L. (1986). A methodology for profiling consumers' decision-making styles. *Journal of Consumer Affairs*, *20*(2), 269–279.

Srivastava, A. (2015). Consumer Decision-Making Styles of Indian Adolescents. *Contemporary Management Research*, *11*(4), 385–408.

Tanksale, D., Neelam, N., & Venkatachalam, R. (2014). Consumer decision making styles of young adult consumers in India. *Procedia-Social and Behavioral Sciences*, *133*, 211–218.

Thangavel, P., Pathak, P., & Chandra, B. (2019). Consumer Decision-making style of Gen Z: A Generational Cohort Analysis. *Global Business Review*, 1–19.

Walsh, G., Wayne-Mitchell, V., & Hennig-Thurau, T. (2001). German Consumer Decision-Making Styles. *The Journal of Consumer Affairs*, *35*(1), 73–95.

Zhou, J. X., Arnold, M. J., Pereira, A., & Yu, J. (2010). Chinese consumer decision-making styles: A comparison between the coastal and inland regions. *Journal of Business Research*, *63*(1), 45–51.

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A Study on Feasibility of Rainfall Derivatives to Hedge Rainfall Risk in Coastal Districts of Odisha

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Abstract: India's monsoon vulnerability exposes its agriculture and industry to significant rainfall risk. The plethora of insurance schemes introduced by the Indian Government to reduce this risk have also failed to deliver. Rainfall derivatives offer a potential hedging solution, as successfully implemented in Western nations. This study investigates the potential of a Rainfall Index (RFI) for trading rainfall derivatives, utilizing daily rainfall data spanning over 15-year period (2008-2022), sourced from four coastal districts of Odisha: Balasore, Ganjam, Puri, and Jagatsinghpur. The analysis focuses on assessing the volatility inherent in the constructed RFI, derived from the observed rainfall patterns. Being a vital input for investment and financial market regulation, the RFI was compared with that of established asset classes – BSE SENSEX, NSE Nifty 50, and Nifty G-Sec, using Pearson's correlation analysis. The results validated that RFI has the potential for being classified as a distinct asset class. Furthermore, the study assesses the hedge effectiveness of rainfall derivatives through a literature-based review, demonstrating their feasibility as a low-cost, adaptable, and sustainable risk management strategy for the Indian economy. By offering a tool to control rainfall-related exposure, these derivatives can enhance planning, minimize volatility, and hedge against losses, thus making them a desirable choice for investors seeking to weather the storms with financial instruments.

1. Introduction

India's 7,500-km of coastline and reliance on the monsoon makes it extremely vulnerable to climate change (Gupta et al., 2022). The monsoon months from June to September bring 3/4th of India's annual rainfall (RBI, 2019). Odisha, one of the states of India (Government of Odisha), has a coastline comprising seven districts- Ganjam, Khordha, Puri, Jagatsinghpur, Kendrapara, Bhadrak and Balasore (Odisha Coastal Zone Management Authority). Coastal Odisha generally receive copious rainfall compared to the rest of the state (Gouda et al., 2017). In coastal regions, the rainfall is ordinarily backed by the low-pressure system during southwest monsoon season (June-September), tropical cyclone in pre-monsoon (March-May) and post-monsoon (October- November) period (Kankara et al., 2018). A large amount of monsoon rainfall over Odisha is mainly contributed by July and August months (Swain et al., 2018). The coastal part of the state is frequently affected by natural disaster like flood and cyclone almost every year (Patnaik et al., 2013). Weather conditions can be extreme and can cause natural disasters. However, the most frequent weather risk is linked to normal, non-catastrophic high-probability weather events (Bartkowiak, 2009). This rainfall risk can be hedged proportionately using rainfall derivatives.

Numerous instruments have been developed and used in the past, whenever risk of some type is to be hedged. For safeguarding against financial loss of some kind, several instruments have been used for hedging. One among them is derivatives. A derivative is defined as a product whose value rests on the risk factors of one or more assets. These instruments can be used for protection against likely adverse market movements through offsetting exposures or shifting risks. They are predominantly worthwhile during times of volatility. Indian monsoon offers a huge prospect for designing rainfall derivatives for hedging the risk of rainfall. However, hedgers and speculators can take part lawfully in monsoon rainfall trading only when definite amendments have been ratified in the Forward Contract Regulation Act (Kotreshwar, 2014).

The rainfall risk market ecosystem is half-done in the absence of rainfall derivatives markets that would enable hedging rainfall risk by wide-ranging stakeholders. The expansion of such markets necessitates intricate research and regulatory backing. Given the increasing variability in rainfall patterns and the systemic nature of rainfall-related risks, there is a need for innovative financial instruments to hedge such uncertainties. While rainfall derivatives have gained attention globally, their adoption in India remains limited due to challenges in designing effective indices and trading frameworks. This study is significant as it explores the feasibility of introducing rainfall derivatives by constructing a Rainfall Index (RFI) tailored to local rainfall patterns. By doing so, it contributes to the development of a localized risk management tool and provides a foundation for further research and policy formulation in weather-based financial instruments. Considering the great opportunity that these instruments represent, rainfall derivatives can be a pioneering product in the market with significant potential to generate a sustainable rainfall risk hedging market by reforming the widespread speculative tendencies linked to the monsoon.

2. Review of Literature

Bharath & Kotreshwar (2022) implemented a distinctive method of designing the RFI formed on a projected metrics that is Deficit Rainfall Days/Excess Rainfall Days (DRD/ERD) index, which can be exercised as a component for designing rainfall derivatives alike Cooling Degree Days/Heating Degree Days (CDDs/HDDs) implicit in temperature derivatives. DRD/ERD figures were calculated for thirty-six meteorological subdivisions (MSDs) of India. The simple rainfall futures contract structure was clearly described, and it was analyzed in what way they could be useful to hedge the rainfall risk.

Bharath and Kotreshwar (2020) recommended a fresh lot of indices for assessing excess rainfall risk profiles that are designated as ERDs. Empirical figures of ERDs for 50 years of carefully chosen MSDs of India were obtained, and such index values were evaluated in defining the degree of volatility and variability, accompanied by the investigation of the degree of interrelationship between indices of chosen MSDs. The study was formulated on the use of econometric models like the Augmented Dickey Fuller (ADF) test succeeded by the Generalized Auto Regressive Conditional Heteroskedasticity (GARCH) model. The outcomes showed that numerous statistical properties of ERD indices back the impression that these indices can be exercised as a component for designing rainfall derivatives.

Noven et al. (2015) proposed a parsimonious stochastic model for characterizing the temporal and distributional properties of rainfall. The model was centered on a unified Ornstein-Uhlenbeck method activated by Hougaard Levy method. The model was demonstrated by adjusting it to empirical rainfall data on both hourly and daily time span. It was revealed that the model was amply compliant to pick up significant characteristics of the rainfall practice across places and time span. The authors also studied an appeal to setting the price of rainfall derivatives that introduced the market price of risk by the means of Esscher transform.

Hong and Sohn (2013) conducted a study for introducing weather derivatives for Seoul, Korea. Peer group analysis was used by the authors to introduce the same. Additionally, they used historical weather data from Seoul and its peer cities to offer a straightforward pricing strategy for the weather derivative. They determined ‘Seoul’s Weather Index’. According to the findings, monthly CDD futures, Seasonal CDD strips, monthly HDD futures and Seasonal HDD strips are reasonable to be introduced to Seoul. However, since less than half of the five peer cities utilize them, Seoul shouldn't be exposed to CAT futures and seasonal strips, and Rainfall futures and seasonal strips.

Geyser (2004) evaluated the benefits of rainfall options and proposed an option strategy as a yield risk management tool in order to determine whether rainfall derivatives might be used to manage agricultural output risk in South Africa. The study concluded that farmers might gain significantly from the use of weather derivatives to control production risk in South African agricultural markets.

Paulson et al. (2010) addressed the issue of historical data availability in designing actuarially sound weather-based instruments. Using observed historical data, a Bayesian rainfall model was constructed that makes use of Markov chain Monte Carlo and spatial kriging techniques to estimate rainfall histories. A substantial data set from Iowa was used to verify the applicability of the estimation method. The results from the historical analysis showed that even in Iowa's very homogeneous region, the systemic character of weather risk can change significantly over time.

Goetzmann and Zhu (2005) used a databank of individual investor accounts to study the effects of weather on traders. Their investigation of the trading activity in five chief US cities over a 6-year period found almost no variance in individuals' susceptibility to sell or buy equities on cloudy days in contrast to sunny days. NYSE ranges expand on cloudy days. When this is controlled, the weather effect turns out to be less significant and smaller. The authors interpreted this as proof that the conduct of market makers, in lieu of individual investors, may be accountable for the relationship among returns and weather.

Lennep et al. (2004) found that non-standardized contracts work as a greater efficient risk transfer mechanism than standardized contracts do. The study also revealed that including weather derivatives in a conventional portfolio boosts the performance of the portfolio while maintaining a low standard deviation. It was concluded that, by identifying that incorporating weather derivatives will improve the performance of conventional portfolios, organizations can repackage those non-standardized contracts and offer them as a unique asset class to be contained within a conventional portfolio.

Chiang (2004) developed a model to price weather derivatives for ice wine producers in Ontario and assessed the economic feasibility of offering such a weather derivative product. The study found that weather derivatives are potentially very applicable for ice wine makers. In order to mitigate the risks that agricultural producers face, it can be a helpful financial tool.

Cao et al. (2003) presented a brief survey of the market, described the key products, and illustrated their treatment in risk management. They also discussed the important problems in modeling and valuation. As a final point, considering weather derivatives as a unique asset class, the authors demonstrated their potentiality in asset allocation and portfolio management. It was concluded that as a unique class of financial instrument, weather derivatives can increase the risk return trade off in asset allocation strategies.

From the literature above it is evident that rainfall derivatives are at a very starting stage in this world. Some trading has been started for these products in other parts of the world and some people are doing tedious research in this field, but the trading volume is very less as compared to other derivative products. Western countries like USA, Canada, Europe, Japan, and Australia have depended on rainfall derivatives to hedge rainfall risk (Ritter et al., 2012). There has been a lot of debate going on if rainfall derivative will work in Indian context. Rainfall derivatives can be a very useful tool in case of volatile monsoon conditions. This study can help to boost the market and give necessary recommendations to change the regulatory framework to introduce rainfall derivatives in India. A perception-based study conducted among stakeholders in Odisha reflected encouraging support (Mean = 3.71) on the need to explore the potential of rainfall derivatives as a distinct asset class (Mahapatra & Samal, 2024), underscoring the practical relevance and urgency of such an investigation. This support reflects a strong foundation for advancing discussions on the potential of rainfall derivatives, emphasizing the need for targeted interventions in Odisha to explore their feasibility, which could then be scaled across India.

3. Objectives and Hypothesis of the Study

3.1 Objectives of the Study

1. To discover the potential of the Rainfall Index as a distinct asset class.
2. To examine the effectiveness of using rainfall derivatives for hedging rainfall risk.

3.2 Hypotheses of the Study

These hypotheses are formulated to address the first objective of the study.
H_0: Rainfall Index is not potentially a distinct asset class.
H_1: Rainfall Index is potentially a distinct asset class.

4. Research Methodology

Based on the two objectives of the study, the methodology is also categorized into two parts: one focusing on the potential of the RFI as a distinct asset class, and the other examining the effectiveness of using rainfall derivatives for hedging rainfall risk.

4.1 To Discover the Potential of RFI As a Distinct Asset Class

Sampling frame: Rainfall data (in mm.) of coastal region of Odisha.

Sample Size: Historical daily data of rainfall of south-west monsoon season (June to September) is collected for 4 districts of coastal region of Odisha i.e., Balasore, Ganjam, Puri and Jagatsinghpur. These districts were selected as they are hotspots of rainfall in the coastal region of Odisha, experiencing significant variations in rainfall patterns during the southwest monsoon season.

Data collection Source: Daily rainfall data has been obtained for the past 15 years (2008-2022) from the website of Odisha Weather Monitoring System (OWMS). Existing literature and online resources served as the foundation for this paper. The study is based entirely on secondary data, including government reports, research publications, and credible online sources such as the official websites of NSE and BSE.

Research Tools: Rainfall volatility will be computed by using Standard Deviation (SD) and Coefficient of Variation (CV). Relative risk can be effectively measured using CV. CVs are only reported for complete datasets spanning 15 years or more. Currently, the CV measurements serve as the standard for risk reduction (Skees et al., 2001). This implies that efforts to mitigate risk are guided by an understanding of the variability in the data, as captured by the CV. While CV itself does not directly reduce risk, it plays a critical role in assessing the extent of variability, which is crucial for identifying areas of potential risk and guiding efforts to mitigate those risks effectively. Special care is taken in this study to develop RFI for Coastal Odisha that will reduce relative risk associated with rainfall variability in the region. The formula for calculation of RFI is adapted from a previous study (Singh & Vashisht, 2020). Further, Pearson's Correlation analysis will be carried out to determine the relationship with respect to movement of various indices and RFI figures. The descriptive statistics regarding volatility of indices of diverse asset classes are also calculated.

4.2 Literature-Based Review for the Hedge Effectiveness of Rainfall Derivatives

To address the second objective regarding the hedge effectiveness of rainfall derivatives, this section presents a literature-based conceptual review. The review synthesizes key insights from scholarly literature to assess how weather derivatives, particularly rainfall-based instruments, have been used or proposed for managing weather-related agricultural risks. It reviews and discusses the effectiveness of weather derivatives in hedging weather risks and introduces them as a novel tool for weather risk management. In order to accomplish this goal, relevant literature was primarily sourced from the Scopus database using targeted keyword searches. Citations are utilized to determine the field structure and the major trends in this field (Niñerola et al., 2019). Our search for an integrated review took into account pertinent research articles that were available in the field because we relaxed the publication year restrictions (Gairola & Dey, 2023). The following primary keywords were used to choose the publications: “weather derivatives,” “rainfall derivatives,” “climate derivatives,” “precipitation derivatives,” “hedging effectiveness,” and “hedging efficiency.” These keywords were combined to extract the papers from the SCOPUS database of Elsevier. The search was limited to English-language journal articles, and excluded other types of documents such as conference proceedings or editorials.

In addition, Google Scholar was used as a supplementary tool to explore broader academic contributions on the topic. However, its use was limited due to the lack of field-specific filtering and quality assurance (Giustini & Maged Boulos, 2013). It searches the full text by default and offers limited control over refining search results by specific metadata fields (Wageningen University & Research). Because of the greater coverage it offers, some of the items are not comparable to those found in other similar databases (Aguillo, 2011). Therefore, to maintain the relevance and quality of the literature reviewed, Scopus was the principal database used for identifying scholarly work related to weather and rainfall derivatives. However, Google Scholar is an effective resource for academic literature (Halevi et al., 2017). Despite its inadequacies, Google Scholar should still be employed in systematic reviews (Mastrangelo et al., 2010). Therefore, this study also cites papers from the same.

This review will help conceptualize rainfall derivatives as a tool for rainfall risk management and provide evidence supporting their feasibility. A summary of the literature on weather derivatives is also given in the paper, but the most significant contribution is the identification of development trends and avenues that can be used to guide future research efforts. The objective is to synthesize the body of written research findings into a user-friendly style so that interested parties may easily comprehend weather derivatives and their effectiveness in mitigating rainfall risk.

5. Data Analysis, Results & Discussion

Although the presence of a RFI is important to support the development of hedging contracts, a key limitation in the Indian context is that RFI-based contracts are not actively traded, despite the existence of commodity trading platforms. Pilot initiatives by the National Commodity & Derivatives Exchange (NCDEX) and the Multi Commodity Exchange (MCX) explored the use of RFIs, but these were not designed for open market trading. Instead, the RFIs functioned primarily as reference indices to determine deviations from normal rainfall and to trigger payouts under weather-based insurance schemes (Shivkumar & Kotreshwar , 2013).

Here an effort is made to advance an overall structure for visualizing RFI-based risk transfer product estimated from the rainfall data of coastal region of Odisha. A standardized approach to rainfall indexation has not yet been developed. To address this gap, the present study employs a methodology for calculating a RFI that has been previously utilized in earlier research (Singh & Vashisht, 2020). The rainfall indexation considered in the study is diverse in outlook of expansion of risk transfer products designed for capital market. It is suggested to identify the index by means of ticker symbol, RFI that will lay the foundation of rainfall derivatives. RFI for a definite location is ascertained as:

$$RFI = \frac{\sum r_{it}}{\sum R_{it}} \times Scale\ Value$$

Where,
r_{it} denotes actual rainfall of ith day of the tth season;
R_{it} denotes cumulative average of daily rainfall of ith day of the tth season;
Scale or multiplier value was assumed 1000 (rainfall is stated equivalent to 1/1000th of a meter, i.e., in millimeter).
RFI specifies how much % of cumulative normal anticipated rainfall is realized. A higher RFI value means that the actual rainfall has exceeded the cumulative average rainfall up to that point (Bharath &

Kotreshwar, 2022). According to Equation (1), RFI values have been calculated for the four coastal districts of Odisha for each of the four monsoon months, as shown in Table 1.

Table 1. RFI for the coastal districts for 15 years (2008-2022) using historical daily rainfall data

Year	June	July	August	September
2008	1296.71	1362.17	903.06	1243.33
2009	1133.40	995.62	1300.00	928.40
2010	2494.46	958.05	779.03	1147.72
2011	1536.03	901.88	1038.17	627.74
2012	1729.03	1016.43	1124.86	709.70
2013	1620.01	1645.02	1147.70	1113.44
2014	1716.76	1144.00	896.36	564.43
2015	1590.02	1597.68	1392.20	953.40
2016	1476.35	972.61	710.10	1052.11
2017	1509.66	1097.75	1056.23	898.99
2018	1706.59	1319.74	996.09	809.15
2019	1324.81	959.67	1009.42	1083.67
2020	1104.99	924.24	1108.77	1317.00
2021	1215.17	1269.46	1530.87	1103.57
2022	1791.39	954.84	973.73	1215.65

Source: Calculated based on secondary data collected from OWMS

Statistical properties of RFI for the 4 coastal districts of Odisha are available in Table 2.

Table 2. Statistics of RFI values for June-Sep for 15 years rainfall data

	June	July	August	September
Mean	1549.69	1141.28	1064.44	984.55
SD	342.99	243.78	218.93	227.45
CV	22.13%	21.36%	20.57%	23.10%

Source: Calculated based on secondary data collected from OWMS

Table 2 shows descriptive statistics such as mean, standard deviation (SD) and coefficient of variance (CV) for RFI values individually for the 4 monsoon months starting 2008 till 2022 of rainfall data intended for the 4 districts of coastal Odisha.

The CV of RFI for all the 4 monsoon months i.e., June, July, August, and September ranges between 20 to 25%. While the CV for September RFI is the highest at 23.10%. It is also clear from the table that volatility decreases from the month June to August but increases in September. A moderate CV suggests that RFI exhibits variability that is sufficient to reflect changes in rainfall patterns without being excessively volatile. This is significant for rainfall derivatives, as extreme fluctuations in variability might deter risk managers and investors who are seeking reliable products to hedge against weather risks. Conversely, low variability might not adequately capture the risk involved, making such a product less useful for weather-based risk management. The moderate CV observed in the data for the coastal region of Odisha strikes a balance, offering predictability while still capturing enough variability to be useful for hedging purposes. This level of variability suggests that RFI could be attractive for rainfall-based financial products, as it offers a stable but sufficiently responsive indicator of rainfall changes. Thus, the moderate CV is considered a pragmatic indicator of RFI's potential as a weather-related financial instrument.

5.1 Potential of RFI As an Asset Class

Volatility is the base for index trading. It is one way of measuring an index's risk (Theron & Vuuren, 2018). Maximum index trades depend greatly on volatility statistics. Volatility plays a crucial role in asset pricing as it leads to alterations in the financial assets risk (Sharma, 2021). Therefore, this study tries to discover the potential of RFI as an asset class as compared to other tradable indices. An investigation of statistical properties of RFI indicates that RFI could be a prospective instrument for speculation as well as hedging. RFI would be an exceptional speculation tool as well. To gain some idea about the statistical properties of diverse asset class indices – equity, fixed income and proposed RFI, an investigation is conducted. For this study, popular equity indices—BSE SENSEX and NSE Nifty 50, and the fixed income security index, Nifty Government Security Index (Nifty G-Sec), have been considered. The analysis for the period of 2008-2022 is carried out taking these indices. Table 3 shows the index values for June, July, August, and September month for 2008-2022.

Table 3. Indices of various asset classes for 15 years (2008-2022)

Year	Nifty GS	Nifty 50	Sensex	RFI
2008	848.89	4303.05	14344.6	1201.31
2009	981.40	4552.47	15292.70	1089.36
2010	979.83	5454.06	18169.33	1344.81
2011	1013.33	5290.39	17606.91	1025.96
2012	1097.85	5277.80	17414.13	1145.00
2013	1177.11	5749.81	19276.91	1381.55
2014	1202.10	7765.12	25979.69	1080.39
2015	1348.07	8199.99	27061.43	1383.32
2016	1496.14	8530.14	27735.15	1052.79
2017	1652.97	9834.04	31670.91	1140.66
2018	1598.19	11132.41	36817.64	1207.89
2019	1831.21	11365.73	38220.69	1094.39
2020	1988.54	10917.36	37004.77	1113.75
2021	2054.00	16373.96	54778.10	1279.76
2022	2010.72	16839.03	56499.41	1233.90

Source: Calculated based on secondary data collected from NSE, BSE and OWMS

Table 4. Statistics of indices of various asset classes for the period (2008-2022)

	Nifty GS	Nifty 50	Sensex	RFI
Mean	1418.69	8772.36	29191.49	1184.99
SD	416.46	4004.86	13444.47	118.13
CV	29.36%	45.65%	46.06%	9.97%

Source: Calculated based on secondary data collected from NSE, BSE and OWMS

In Table 4, the mean, standard deviation, and CV (%) of all the indices has been calculated for June, July, August, and September month for the period 2008-2022. As compared to other indices, the CV (%) of RFI is lower and indicates lower volatility of this index. Low volatility is when an asset does not fluctuate dramatically, but changes at a steady pace over a period (Jones). One of the significant parameters to estimate an index is volatility. Volatility mechanism works both ways. When volatility is low, it marks an index safer and lower on risk scale. But it also proportionally shrinks the chances for creating profits. The past achievements of diverse asset classes in the long run are certainly stable with the criterion that higher risk generates higher rewards. On the other hand, many academic studies along with historic back tests of low volatility indices specify that portfolios contained entirely of low volatility indices have a habit to outdo portfolios of high volatility indices in the long run (Joshipura & Joshipura, 2019). This circumstance is generally inferred to indicate that low volatility stocks have higher returns, on average (Banner, 2012). Hence, though RFI has comparatively low volatility, it does have the potential to be traded.

The variation in volatility of these indices gives chances to portfolio diversification to reduce this volatility. To check the chances of portfolio diversification, the correlation analysis among these indices is conducted.

5.1.1. Pearson's Correlation Analysis

Table 5. Pearson's Correlation analysis of various asset classes with RFI for years 2008-2022

		Nifty GS	Nifty 50	Sensex	RFI
Nifty GS	Pearson Correlation	1	.939**	.938**	-.007
	Sig. (2-tailed)		.000	.000	.982
	N	15	15	15	15
Nifty 50	Pearson Correlation	.939**	1	.999**	.099
	Sig. (2-tailed)	.000		.000	.725
	N	15	15	15	15
Sensex	Pearson Correlation	.938**	.999**	1	.101
	Sig. (2-tailed)	.000	.000		.720
	N	15	15	15	15
RFI	Pearson Correlation	-.007	.099	.101	1
	Sig. (2-tailed)	.982	.725	.720	
	N	15	15	15	15
**. Correlation is significant at the 0.01 level (2-tailed).					

Source: Secondary data collected from NSE, BSE and OWMS

The Pearson's Correlation analysis in Table 5 reveals a strong positive co-movement between Nifty GS, Nifty 50, and Sensex, all statistically significant at the 0.01 level. However, RFI exhibits a very weak and statistically insignificant correlation with these three indices. This distinct behavior implies that RFI could indeed represent a distinct and unique asset class, potentially driven by its own specific underlying factors and market dynamics. As a result of this, RFI can be introduced on an exchange as it has the potential to be a tradable asset class. Furthermore, in line with earlier research, our work has shown potential for introducing RFI-based weather derivatives. The outcomes further validate the potential of RFI as a new asset class to be included in a portfolio for risk hedging (Shivkumar & Kotreshwar , 2013). This suggests that RFI will be an innovative and useful tool for risk hedging. It will appeal to both hedgers and speculators to trade RFI futures and options.

Therefore, the null hypothesis (H_0) i.e., *Rainfall Index is not potentially a distinct asset class* is rejected and the alternative hypothesis (H_1) i.e., *Rainfall Index is potentially a distinct asset class* is accepted.

5.2 Hedge Effectiveness of Rainfall Derivatives: A Literature-Based Review

This section addresses the second objective of the study. The review draws upon published research to understand how weather derivatives—particularly rainfall-based ones, perform as risk-hedging instruments. A comprehensive analysis of the literatures on hedge effectiveness of weather derivatives indicates that there is still a dearth of information, especially in this field. Another name for a financial weather derivative contract is a weather contingent contract, with a cash payout reliant on future weather events. A weather index, which is represented as values of a weather variable measured at a specific location, is used to calculate the settlement value of various weather events (Dischel & Barrieu, 2002). Weather derivatives are regarded as a more effective, affordable, and long-term alternative risk management approach. Because of its many benefits, weather derivative contracts are used in several developing nations in addition to industrialized ones. There are several different levels of initiatives underway on the state of weather derivative contracts in India. On March 1, 2024, the Department of Economic Affairs through Union Ministry of Finance published a notification to add weather to the list of commodities (Securities and Exchange Board of India (SEBI), 2024). This inclusion was noted in the Union Budget 2024–25 speech by Finance Minister Nirmala Sitharaman. The recognition of weather as a commodity is seen as a significant step towards enabling such financial instruments. While NCDEX has already finalized plans for such instruments, their launch awaits final government clearance. Since present restrictions prohibit trading in instruments that cannot be delivered in physical form, certain revisions to the Securities Contract Regulation Act and the Forward Contract Regulation Act are necessary (Sharma & Vashishtha, 2007). Remarking on the efficacy of these items as a risk-hedging strategy would be premature, given they are still in the early stages of development and adoption. Nevertheless, there is ample empirical proof that weather derivatives are successfully used across the world.

Weather derivatives are more advantageous than regular insurances, although the market for these products is still quite small. A growing body of literature explores the potential benefits of weather derivatives as a tool for risk management. Hedge effectiveness may increase if the hedger is able to use temperature and rainfall derivatives together (Woodard & Garcia, 2008). The hedging effectiveness of weather index-based insurance can be improved by combining various weather factors (Vedenov & Barnett, 2004). When minimizing variance is the goal, there is no discernible difference in the hedge effectiveness of call, put, and futures. On the other hand, put options perform significantly better when the hedger's goal is to minimize semi-variance because the hedger receives a risk premium when it sells the put option for hedging. (Zhou et al., 2016). Conventional risk-hedging methods and instruments have not only proven expensive and ineffective in India, but they have also become a burden on the nation's finances. They primarily provide a hedge against price risk alone. Being more severe and heavily dependent on the weather, the volume-related risk is still essentially uninsured. Within an economy such as India, controlling the volume-related weather risk may be more flexible, cost-effective, and long-term if a suitable weather-based derivative contract structure is in place. A versatile management approach for the non-catastrophic weather risk is offered by weather derivatives (Stulec et al., 2016).

Hedging against income fluctuations caused by weather-related events is the goal of employing weather derivatives. The degree of income stabilization is also known as risk reduction potential or hedging effectiveness (Pelka & Musshoff, 2013). The contract design which includes the tick size, strike level, and index controls the hedging effectiveness (Musshoff et al., 2011). The benefits to costs ratio determine the prospective demand for a weather derivative. Simple index-based derivatives with poor efficacy resulted in a decreased willingness to pay. Nevertheless, they can also be offered at a lesser cost due to their reduced transaction costs. Therefore, we cannot automatically draw the conclusion that weather derivatives with a low hedging effectiveness are ‘inapplicable’ or that they lack trading potential (Musshoff et al., 2011). Hence, weather derivatives have a lot of potential to develop into a new asset class that allows investors to diversify their portfolios, much like other contracts with exotic underlying (Brockett et al., 2005).

Table 6. Summary of Literature Review on Hedging Effectiveness of Weather Derivatives

Author (Year of study)	Market under study	Symbols	Sample Period	Methodology	Hedging effectiveness
Stoppa & Hess (2003)	Morocco	Rainfall index derivative	1978- 2001	Optimization process	Risk associated with agricultural production can be effectively managed with weather derivatives.
Brockett, Wang & Yang (2005)	U.S.	HDDs and CDD	1979-2002	Simulation	When it comes to achieving the goal of risk minimization, linear basis hedging outperforms nonlinear basis hedging by a wide margin. Additionally, basis hedging typically works better in the winter than in the summer.
Woodard & Garcia (2008)	U.S.	Temperature & precipitation derivatives	1971-2005	Sensitivity analysis	Temperature contracts are more effective than precipitation derivatives. Higher levels of spatial aggregation proved to be more

					successful for weather hedges, suggesting that re/insurers rather than individual producers will be the most likely end-users.
Yang & Brockett & Wen (2009)	U.S.	HDD & CDD indexed standardized weather derivatives	1.1.1979-30.4.2002	Regression models	The standardized weather derivatives written on the Risk Management Solutions (RMS), or Chicago Mercantile Exchange (CME) indexes provide a very effective hedge.
Musshoff, Odening, & Xu (2011)	North-east Germany	Rainfall options	1993-2006	Stochastic simulation	The hedging effectiveness of rainfall options as a hedge is highly influenced by the basis risk.
Pelka & Musshoff (2013)	Central Germany	Temperature & precipitation-based weather derivatives	1995 - 2009	Bootstrapping method, t-test	In comparison to a mixed index, where the weather variables are measured at different weather stations, the hedging effectiveness of using several weather derivatives at the same time based on a basic index of only one weather variable is substantially higher.
Pelka & Musshoff (2014)	China	Precipitation index-based insurance	1980-2009	Burn Analysis, Regression Analysis, Standard Deviation (SD) Value at Risk	In certain provinces in China, precipitation index-based insurances can make a significant contribution to the stabilization of agricultural income.
Zhou, Li & Pai (2016)	U.S.	Temperature derivatives	1.1.1970-31.12.2007	Stochastic temperature model, Crop yield model, Risk-neutral pricing method, profit optimization procedure	Higher hedging effectiveness is achieved by reducing idiosyncratic risk through the large-scale spatial aggregation of corn yields.
Salgueiro & Tarrazon-Rodon (2019)	Spain	Temperature and rainfall-based options	1971-2011	Index value Simulation & Daily Simulation Techniques, Root mean square error	As a way to reduce basis risk exposure, the results obtained highlight the significant hedging potential and the appropriateness of taking into account a mix of options targeted to adjacent stations.
Raucci, Lanna, Silveira & Capitani (2019)	Brazil	European put options with rainfall index	1992-2016	Index modeling method, Monte Carlo simulations	The producers' income volatility was significantly decreased by the adoption of weather-based derivatives.

Source: Authors' compilation

According to the review, rainfall-based indices were most commonly used in the context of weather derivatives, and could be found in four different forms: average, cumulative, surplus, and deficit. Amongst this cumulative rainfall was the most common (Abdi et al., 2022). RFI-based derivatives must be launched to complete the rainfall risk market and properly hedge rainfall risk (Dileep, 2022). The evidence from multiple empirical studies demonstrating the effectiveness of weather derivatives only serves to support their implementation in any nation, especially one where the weather is extremely irregular and unpredictable (Sharma & Vashishtha, 2007). It is possible that not all nations have the same prerequisites for the weather derivative market to succeed. Regarding the Indian economy, however, it seems to be a generally quite good fit for the implementation of weather derivatives. Furthermore, it is reasonable to anticipate that the current trend of the Indian financial sector's integration with the international market will help the derivatives market succeed in terms of attracting foreign players and boosting competition. Due to their affordability, adaptability, and sustainability, weather derivatives are drawing more and more attention from risk managers worldwide (Choksi, 2012). It is worthy of being tried in India as well.

However, having understood how hedge effectiveness measures the reduction in risk, it is crucial to examine the factors that can limit this effectiveness. One of the most significant factors is basis risk.

5.1.2. Basis Risk

Under these kinds of contracts, one significant constraint relates to what is called as basis risk. This is dependent upon the degree of positive correlation between the insured's losses and the index. If the insured suffers a loss and is not compensated by the insurer for the loss or if a payment larger than the loss is made available, basis risk may arise. This is the result of the contract's indemnities being triggered by the weather event rather than by actual producer yields (Spaulding et al., 2010). The moral hazard and adverse selection issues underlying traditional insurance are intended to be resolved with rainfall derivatives. However, one problem with a rainfall derivative is that it has basis risk. When there is a discrepancy between the spot price and the futures price in financial derivatives, basis risk typically appears. However, three situations lead to basis risk in rainfall derivatives.

1. It happens when the recorded rainfall and the actual rainfall in a particular location do not perfectly correlate.
2. The absence of rain gauge places registered in the exchange gives rise to basis risk in over-the-counter trading.
3. It happens where recorded rainfall in a particular location differs slightly from the underlying rainfall value used as the basis for the RFI-based futures contract.

A higher level of basis risk emerges if there is a significant difference between the actual and recorded rainfall. Therefore, when hedging the rainfall risk, the hedger needs to be mindful of basis risk. To reduce the basis risk, more and more rain gauge stations can be constructed to collect rainfall data. The effectiveness of rainfall derivatives as a hedge is increased by lower basis risk (Dileep & Kotreshwar, 2023).

When employing standardized contracts for hedging, basis risk is a significant consideration. Hedgers that use standardized weather derivatives for hedging are exposed to basis risk as well as the risk arising from a weather contract drafted in a location other than the area they want to cover. Participants who want to control their weather exposures in places not listed by exchanges are exposed to basis risk (Considine, 2000). The existence of risk premiums can considerably reduce the hedging effectiveness of weather hedges. Furthermore, geographic basis risk becomes less of a barrier to effective hedging as the level of spatial aggregation rises. It has been discovered that precipitation hedges increase product basis risk. Hedgers must assume both the basis risk and the credit risk when trading over the counter in standardized weather contracts (Brockett et al., 2005). The creation of weather derivatives based on rainfall indices requires careful consideration of the basis risk. This is because the area under consideration has a variety of edaphoclimatic formations (Raucci et al., 2019).

Thus far, basis risk in weather derivatives has been overlooked a lot. Nonetheless, the argument made in this research is that the market for weather derivatives accepts weather derivatives more widely when basis risk is considered. In this regard, it is crucial for all market participants to accurately evaluate the basis risk for a weather hedge. When using exchange-traded instruments as a hedge for a local business risk, basis risk might escalate to a critical point. Conversely, reinsurance treaties may be replaced with exchange-based instruments (Rohrer, 2004). Therefore, a transparent information policy regarding the basis risk of weather derivatives is critical to the continued viability of these products.

6. Conclusion

Rainfall derivatives are financial instruments which an investor uses to hedge risks associated with rainfall fluctuation (Berhane et al., 2020). The use of rainfall derivatives in the Indian setting has been the subject of a protracted discussion. The design of RFI-based derivatives and other essential concerns for trading rainfall derivatives were not the main focus in previous studies. Thus, this work fills this research gap. This study computed the RFI based on rainfall data collected and maintained by the OWMS. The index mirrors the amount of rainfall received in comparison to the long-term average for a definite area and timespan. The study takes into consideration the four aforementioned coastal districts of Odisha due to the different rainfall patterns prevailing there. To bring up rainfall derivatives in the Indian market we require an appropriate RFI that can be categorized as a distinct asset class. Hence, in this study RFI was calculated at the state level for coastal districts of Odisha using the formula from earlier researches, and the results have proved that RFI can be a distinct asset class and it can be considered as a useful index for trading rainfall derivatives. This is consistent with earlier research that claims rainfall derivatives have the potential to be a separate asset class and, as such, provide investors with an added arsenal to enhance their portfolios (Bharath & Kotreshwar, 2022). Numerous studies have looked into the feasibility of creating insurance based on weather indexes, despite the fact that weather risk is primarily systemic in nature. (Skees et al., 2001) investigated the creation of drought insurance based on a RFI in Morocco and it was discovered that the product would be feasible and Moroccan farmers would greatly benefit from the product. Weather derivatives can effectively manage weather-related risks in Sri Lankan paddy farming by providing risk-protection against yield shortfalls (Dayasekara, 2015). Therefore, prior research indicates that rainfall derivatives contracts are feasible hedging instruments for mitigating rainfall risk (Dileep, 2022). The study also assessed the hedging effectiveness of weather derivatives through a literature-based review. The results of the studies supported the notion that weather derivatives are a trustworthy and effective risk management tool that is required to protect stakeholders from the dangers of weather uncertainty (Musshoff et al., 2011). It lessens or eliminates the drawbacks of standard insurance by linking the payoffs to a fairly quantified weather index, such as temperature, rainfall, humidity, and sunshine (Gyamerah et al., 2019).

This study has implications for researchers and practitioners. First, scholars can possess a deep understanding of the parametric weather risk financial products' intricacies and nuances associated with these instruments. They will be able to design models that accurately capture the relationship between weather events and financial outcomes. Second, it can assist the exchanges in creating a strong weather index that is tailored to the season, geographic areas, and landscape, along with suitable actuarial risk premia and strike levels. This way, the loss resulting from systemic risk should be covered by the index-triggered pay-out (Gairola & Dey, 2023). Ultimately, rainfall derivatives could offer a promising solution to manage climate-related risks in India.

7. Scope for Further Research

Future research should concentrate on assessing the impact of three or more meteorological factors on the hedging effectiveness of weather derivatives. From an agronomic perspective, it could also be advisable to incorporate not only the rainfall but also the temperature, the wind etc. in the index. The valuation of weather derivatives is a further research task that was omitted in this study. To encourage the development of the weather derivatives market, more effort is required to create a consistent and widely accepted valuation model.

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References

Abdi, M. J., Raffar, N., Zulkafli, Z., Nurulhuda, K., Rehan, B. M., Muharam, F. M., Khosim, N. A., & Tangang, F. (2022). Index-based insurance and hydroclimatic risk management in agriculture: A systematic review of index selection and yield-index modelling methods. *International Journal of Disaster Risk Reduction*, *67*, 102653. https://doi.org/10.1016/j.ijdrr.2021.102653

Aguillo, I. F. (2011). Is Google Scholar useful for bibliometrics? A webometric analysis. *Scientometrics, 91*(2), 343-351. https://doi.org/10.1007/s11192-011-0582-8

Banner, A. (2012). *Enjoying the benefits of the low-volatility anomaly*. Institutional Investor. Retrieved from https://www.institutionalinvestor.com/article/2bsvoatvxvy8pwqwefjsw/portfolio/enjoying-the-benefits-of-the-low-volatility-anomaly

Bartkowiak, M. (2009). Weather derivatives. *Mathematics in Economics*, 5-17.

Berhane, T., Shibabaw, N., Awgichew, G., & Kebede, T. (2020). Option pricing of weather derivatives based on a stochastic daily rainfall model with Analogue Year component. *National Library of Medicine, 6*(1). https://doi.org/https://doi.org/10.1016%2Fj.heliyon.2020.e03212

Bharath V. (2022). Conceptual Study on Securitizing Weather-related Risk in India. *ymerdigital, 21* (7), 154-172. Retrieved from https://ymerdigital.com/uploads/YMER210708.pdf

Bharath, V., & Kotreshwar, G. (2020). Evaluating rainfall risk profile of Indian subcontinent based on index metrics. *Indian Journal of Finance and Banking*, *4*(2), 38-50.

Bharath, V.,, & Kotreshwar, G. (2022). Modeling and Designing of Rainfall Derivative Contract in India. *Parikalpana - KIIT Journal of Management, 18*(1), https://www.google.com/search?q=https://doi.org/10.23862/kiit-parikalpana/2022/v18/i1/212343

Brockett, P. L., Wang, M., & Yang, C. (2005). Weather Derivatives and Weather Risk Management. *Risk Management and Insurance Review, 8*(1), 127-140.

Cao, M., Li, A., & Wei, J. Z. (2003). Weather derivatives: A new class of financial instruments. *Available at SSRN 1016123*.

Care, R., & Weber, O. (2023). How much finance is in climate finance? A bibliometric review, critiques, and future research directions. *Research in International Business and Finance, 64*. https://doi.org/10.1016/j.ribaf.2023.101886

Chiang, S. H. C. (2004). *The feasibility of a weather derivative for Ontario ice wine producers* (Doctoral dissertation, University of Guelph).

Choksi, A. (2012, May). Emergence Of Weather Derivatives-Feasibility in Indian Context. *Zenith International Journal of Business Economics & Management Research, 2*(5).

Considine, G. (2000). Introduction to weather derivatives. *Weather derivatives group, Aquila energy*, 1-10.

Dayasekara. (2015). Feasibility of Weather Derivatives for Agriculture Risk Reduction. *Proceedings of 12th International Conference on Business Management.* Colombo, Sri Lanka.

Dileep, N. (2022). Comparison of Rainfall and GDP: A Feasibility Study on Introducing Rainfall Derivatives in the Indian Weather Risk Market. *Indian Journal of Economics and Finance (IJEF), 2*(2), 39-44. https://doi.org/http://doi.org/10.54105/ijef.B2530.112222

Dileep, N., & Kotreshwar, G. (2023). Rainfall Index Based Futures: A Tool for Absorbing Systemic Monsoon Risk. *International Journal of Finance, Insurance and Risk Management, XIII*(1), 79-87.

Dischel, R. S., & Barrieu, P. (2002). Financial weather contracts and their application in risk management. In *Climate Risk and the Weather Market: Financial Risk Management With Weather Hedges* (pp. 25-42). London, UK: Risk Waters Group Ltd. Retrieved from http://eprints.lse.ac.uk/id/eprint/10362

Gairola, G., & Dey, K. (2023). Moderators of pricing and willingness to pay for parametric weather risk mitigants in agriculture: An integrative review, conceptual framework, and research agenda. *Cogent Economics & Finance, 11*(2). https://doi.org/10.1080/23322039.2023.2254579

Geyser, J. M. (2004). Weather Derivatives: Concept and application for their use in South Africa. *Agrekon*, *43*(4), 444–464. https://doi.org/10.1080/03031853.2004.9523660

Giustini, D., & M. N. (2013). Google Scholar is not enough to be used alone for systematic reviews. *National Library of Medicine,* *5*(2), 214. https://doi.org/https://doi.org/10.5210%2Fojphi.v5i2.4623

Goetzmann, W. N., & Zhu, N. (2005). Rain or shine: where is the weather effect?. *European Financial Management*, *11*(5), 559-578.

Gouda, K., Sahoo, S. K., Samantray, P., & Shivappa, H. (2017). Comparative Study of Monsoon Rainfall Variability over India and the Odisha State. *Climate,* *5*(4), 79. https://doi.org/https://doi.org/10.3390/cli5040079

Government of Odisha. (n.d.). *Topography*. Retrieved April 23, 2025, from https://odisha.gov.in/odisha-profile/topography

Gupta, L., Maurya, S., & Saxena, A. (2022). Climate Change Risk and Climate Finance in India: A Critical Analysis and Policy Recommendations. *Orissa Journal of Commerce, 43*(3), 9-28. https://doi.org/https://doi.org/10.54063/ojc.2022.v43i03.02

Gyamerah, S. A., Ngare, P., & Ikpe, D. (2019). Hedging Crop Yields Against Weather Uncertainties—A Weather Derivative Perspective. *Mathematical and Computational Applications, 24*(3), 71. https://doi.org/https://doi.org/10.3390/mca24030071

Halevi, G., Moed, H. F., & Ilan, J. B. (2017). Suitability of Google Scholar as a source of scientific information and as a source of data for scientific evaluation—Review of the Literature. *Journal of Informetrics, 11*(3), 823-834. https://doi.org/http://dx.doi.org/10.1016/j.joi.2017.06.005

Hong, S. J., & Sohn, S. Y. (2013). Peer group analysis for introducing weather derivatives for a city. *Expert systems with applications*, *40*(14), 5680-5687.

Jones, E. (n.d.). *Are these the 8 best volatility indicators traders should know?* IG International Limited. Retrieved from IG International: https://www.ig.com/en/trading-strategies/are-these-the-8-best-volatility-indicators-traders-should-know--230124

Joshipura, N., & Joshipura, M. (2019, August). The Volatility Effect: Recent Evidence from Indian Markets. *Theoretical Economics Letters,* *9*(6). https://doi.org/https://doi.org/10.4236/tel.2019.96136

Kankara, R. S., Ramana Murthy, M. V., & Rajeevan, M. (2018). *National assessment of shoreline changes along Indian Coast - A status report for 26 years 1990-2016* (NCCR Publication, 2018). National Centre for Coastal Research. Retrieved from https://www.nccr.gov.in/sites/default/files/schangenew.pdf

Kotreshwar, G. (2014, July 17). *Why not hedge on the monsoon?* Retrieved from The hindu businessline: https://www.thehindubusinessline.com/opinion/why-not-hedge-on-the-monsoon/article64597714.ece

Mahapatra, A., & Samal, G. P. (2024). Harnessing Rainfall Derivatives for Agriculture Risk Hedging: A Study on Stakeholder Perceptions and Regulatory Framework in Odisha. *IUP Journal of Financial Risk Management, 21*(4), 5-32. Retrieved from https://iupindia.in/ViewArticleDetails.asp?ArticleID=7534

Martínez Salgueiro, A., & Tarrazon-Rodon, M.-A. (2019). Weather derivatives to mitigate meteorological risks in tourism management: An empirical application to celebrations of Comunidad Valenciana (Spain). *Tourism Economics*, *27*(4), 591-613. https://doi.org/10.1177/1354816619890751

Mastrangelo, G., Fadda, E., Rossi, C. R., Zamprogno, E., & Buja, A. (2010). Literature search on risk factors for sarcoma: PubMed and Google Scholar may be complementary sources. *BMC Res Notes, 3*(131). https://doi.org/https://doi.org/10.1186/1756-0500-3-131

Musshoff, O., Odening, M., & Xu, W. (2011). Management of climate risks in agriculture – will weather derivatives permeate? *Applied Economics, 43*, 1067–1077. https://doi.org/10.1080/00036840802600210

Niñerola, A., Sánchez-Rebull, M.-V., & Hernández-Lara, A. (2019). Tourism Research on Sustainability: A Bibliometric Analysis. *Sustainability , 11*(5). https://doi.org/https://doi.org/10.3390/su11051377

Noven, R. C., Veraart, A. E., & Gandy, A. (2015). A lévy-driven rainfall model with applications to futures pricing. *AStA Advances in Statistical Analysis*, *99*(4), 403-432.

Odisha Coastal Zone Management Authority. (n.d.). Retrieved from https://www.sczmaodisha.org/

Patnaik, U., Das, P. K., & Bahinipati, C. S. (2013). Analyzing Vulnerability to Climatic Variability and Extremes in the Coastal Districts of Odisha, India. *Review of Development & Change , XVIII*(2), 173-189. https://doi.org/https://doi.org/10.1177/0972266120130206

Paulson, N. D., Hart, C. E., & Hayes, D. (2010, May 11). A spatial Bayesian approach to weather derivatives. *Agricultural Finance Review, 70*(1), 79-96. https://doi.org/https://doi.org/10.1108/00021461011042657

Pelka, N., & Musshoff, O. (2013). Hedging effectiveness of weather derivatives in arable farming – is there a need for mixed indices? *Agricultural Finance Review, 73*(2), 358 - 372. https://doi.org/http://dx.doi.org/10.1108/AFR-10-2012-0055

Rainfall data. (n.d.). Retrieved from SRC Odisha: https://srcodisha.nic.in/rain_fall.php & Odisha Weather Monitoring System (OWMS).

Raucci, G. L., Lanna, R., Silveira, F. d., & Capitani, D. H. (2019). Development of weather derivatives: evidence from the Brazilian soybean market. *Italian Review of Agricultural Economics, 74*(2), 17-28. https://doi.org/10.13128/rea-10850

RBI. (2019). *Will the Weather Gods Smile or Frown? Evaluating Monsoon Forecasts*. Retrieved from Reserve Bank of India: https://rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=18289

Ritter, M., Mußhoff, O., & Odening, M. (2012). Minimizing geographical basis risk of weather derivatives using a multi-site rainfall model. *AgEcon Search.* Dublin: AgEcon Search.

Rohrer, M. B. (2004). The relevance of basis risk in the weather derivatives market . (M. Costantino, & C. A. Brebbia, Eds.) *Computational Finance and its Applications*. Retrieved from https://www.witpress.com/Secure/elibrary/papers/CF04/CF04007FU.pdf

Securities and Exchange Board of India (SEBI). (2024). *Notification for List of Commodities Under SCRA, 1956 dated March 01, 2024.* Retrieved from SEBI: https:// www.sebi.gov.in/legal/gazette-notification/mar-2024/notification-for-list-ofcommodities-under-scra-1956-dated-march-01-2024_82030.html

Sharma, A. K., & Vashishtha, A. (2007). Weather derivatives: risk-hedging prospects for agriculture and power sectors in India. *The Journal of Risk Finance, 8*(2), 112 - 132. https://doi.org/10.1108/15265940710732323

Sharma, P. C. (2021). Impact of Investors' Sentiments on Selected Sectoral Indices Return Volatility: Special Reference to NSE. *Orissa Journal of Commerce, 42*(1), 44-58. https://doi.org/https://doi.org/10.54063/ojc.2021.v42i01.04

Shivkumar , D., & Kotreshwar , G. (2013, November). Trading in weather risk transfer products – Reengineering rainfall indexation. *International Journal of Business and Management Invention, 2*(11), 33-41.

Singh, H., & Vashisht, A. (2020). Use of rainfall derivative to hedge rainfall risk in agriculture sector in India. *Journal of Xi'an University of Architecture & Technology,12*(5),2280-2289. https://xajzkjdx.cn/volume-xii-issue-5-may-2020/

Skees, J., Gober, S., Varangis, P., Lester, R., & Kalavakonda, V. (2001). *Developing Rainfall-Based Index Insurance in Morocco*. (Policy Research Working Paper No. 2577). World Bank. http://hdl.handle.net/10986/19674

Spaulding, A., Kanakasabai, M., Hao, J., & Skees, J. (2010). Can Weather Derivative Contracts Help Mitigating Agricultural Risk? Microeconomic Policy Implications for Romania. Retrieved from https://econpapers.repec.org/paper/ekd003307/330700139.htm

Stoppa , A., & Hess, U. (2003). *Design and Use of Weather Derivatives in Agricultural Policies:the Case of Rainfall Index Insurance in Morocco*. Paper presented at *"Agricultural Policy Reform and the WTO: Where are we heading"*. Capri, Italy.

Stulec, I., Petljak, K., & Bakovic, T. (2016). Effectiveness of weather derivatives as a hedge against the weather risk in agriculture. *Agric. Econ. – Czech, 62*(8), 356–362. https://doi.org/10.17221/188/2015-AGRICECON

Swain, M., Pattanayak, S., & Mohanty, U. (2018). Characteristics of occurrence of heavy rainfall events over Odisha during summer monsoon season. *Dynamics of Atmospheres and Oceans, 82*(17). https://doi.org/http://dx.doi.org/10.1016/j.dynatmoce.2018.05.004

Theron, L., & Vuuren, G. V. (2018). The maximum diversification investment strategy: A portfolio performance comparison. *Cogent Economics and Finance, 6*(1).

Vedenov, D. V., & Barnett, B. J. (2004). Efficiency of weather derivatives as primary crop insurance instruments. *Journal of Agricultural and Resource Economics, 29*(13), 387-403.

Wageningen University & Research. (n.d.). *How to use Google Scholar*. Retrieved from https://www.wur.nl/en/article/how-to-use-google-scholar.htm

Woodard, J. D., & Garcia, P. (2008). Basis risk and weather hedging effectiveness. *Agricultural Finance Review, 68*(1), 99 - 117. https://doi.org/10.1108/00214660880001221

Yang, C.C., Brockett, P.L. & Wen, M. (2009), Basis risk and hedging efficiency of weather derivatives, *Journal of Risk Finance*, Vol. 10 No. 5, pp. 517-536. https://doi.org/10.1108/15265940911001411

Zhou, R., Li, J. S.-H., & Pai, J. (2016). Hedging crop yield with exchange-traded weather derivatives. *Agricultural Finance Review, 76*(1).

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Factors Responsible for Financial Literacy with Reference to Jagatsinghpur Municipality of Odisha (India): A Logistic Regression Approach

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Abstract: The present paper attempts to study the factors which are responsible for financial behaviour-cum-literacy by considering demographic, socio-economic and financial factors. The current study uses primary data collected from the educated citizens of Jagatsinghpur Municipality in Odisha using a structured questionnaire survey. The sample consists of 125 individuals. Using Binary Logistic regression model and employing the marginal effect techniques, the study produces four major findings. First, factors like age, occupation, education and working profile are the variables which are responsible for financial literacy. Second, financial variable like monthly income of the respondent is also found to be significant in the model. All of these variables have positive marginal effects that are statistically significant at conventional levels, except for gender, which is not statistically significant. Third, from the descriptive analysis the study synthesizes that, respondents are poor in numeracy that means they are unable to calculate the financial portfolio properly. Fourth, majority of respondents have not any strategic future plan. It indicates their financial ignorance which leads them towards financial insecurity. Thus, results of the study are reliable for measuring financial literacy, and they support the need for quick action to reduce the problem of financial illiteracy. Hence, the study promotes certain policy recommendations, such that the state planning should identify the most vulnerable groups and should endeavour to raise their level of financial literacy. Major efforts should be taken into consideration through formal education, higher income, their working profile and future orientation of people can ameliorate the Indian financial literacy rate.

1. Introduction

In this cut-throat competitive world "Financial ignorance" is a great evil to manage personal finance. We can say financial illiteracy is a social evil that causes a financial crisis globally (Dinwoodie, 2011). Many people are ill-equipped to be in charge of their crucial personal and family financial matters. In other words, people lack in adequate knowledge and skills required to make sound financial decisions, which is stated as financial ignorance. In the 21st Century, financial ignorance is one of the dominant challenges that lead people to be the victims of financial abuse. The inadequate financial knowledge and absence of proper financial education create an imbalance between the consumption and savings patterns of an individual. Moreover, ignorance about the risk-return trade-off leads to the misallocation of funds into unprofitable investments (d'Ambrosio, 2003). People lacking knowledge regarding basic financial concepts and terms makes them vulnerable to solving financial issues (Alves et. al, 2012). Financial illiteracy is widespread among the general population and they are ignorant about basic financial concepts (Lusardi, 2008**)**. To make people financially aware, financial literacy is inevitable. Nowadays quality life requires making wise portfolio decisions and wealth accumulation which have a positive correlation with financial literacy (Jappelli & Padula, 2013). The rudimentary concept for devising prudent savings patterns, managing mortgages, planning for retirement, and undertaking other financial decisions is financial literacy (Lusardi and Mitchell, 2007).

2. Review of Literature

Socioeconomic characteristics like age, marital status, occupation, education, and gender have a big impact on financial literacy levels, according to recent studies. Gender-based disparities in confidence in financial decision-making are highlighted by Lind et al. (2020) and Tinghög et al., (2021). According to Tzora (2025) and Böhm et al., (2023), education and early financial exposure are essential for developing financial aptitude. Due to restricted access to financial education, youth and rural people continue to be at risk (Ben Belgacem et al., 2024). All things considered, these results highlight the necessity of focused, demographically aware financial literacy initiatives to encourage wise financial practices.

Financial illiteracy is influenced by a variety of elements, including socio-demographic factors, psychological traits, and other individual-specific conditions (Chen & Volpe, 2002). One of the primary factors that affects a person's financial decision-making is gender disparity. Research has shown that women are more likely to be financially illiterate (Al-Tamimi and Kalli, 2009), primarily because they tend to be less enthusiastic and confident about learning personal finance (Chen and Volpe, 2002). As a result, in many households, financial decision-making is predominantly carried out by the male members of the family. This disparity is further reinforced by the fact that women are generally more risk-averse and tend to prefer safe and low-risk investment options (Singh and Kumar, 2025), which is often cited as an example of financial illiteracy.

In addition to gender, age also plays a significant role, as several studies have indicated that financial literacy is particularly low among the younger population, which raises serious concerns. This deficiency can be attributed to various factors such as their socio-economic background, demographic profile, the financial sophistication of their families, and their limited exposure to personal financial dealings (Chen & Volpe, 1998; Agarwalla et al., 2012; Garg and Singh, 2018). The lack of financial knowledge can have adverse effects on individuals' daily lives, as their inability to make sound financial decisions often leads to the misallocation of funds, thereby increasing their vulnerability to financial exploitation (Nicolini et al., 2017).

A key component in mitigating this issue is numeracy, which plays a critical role in helping individuals manage their personal finances effectively. However, low numeracy levels are prevalent among certain demographic groups, particularly the elderly, women, and those with limited education, leading to poor financial decision-making (Lusardi, 2012; Kadoya and Khan, 2020). Consequently, inadequate financial planning among these groups hampers their ability to secure a stable post-retirement life (Lusardi, 2008).

People who are experienced and have an interest in acquiring personal financial knowledge from several sources, and people with higher academic attainment, are more aware of personal financial management (Hogarth and Hilgert, 2002). Since experience and education play a vital role, the training for the future should start from early childhood; so, to make a person financially literate and able to make wise financial decisions, his education matters. Thus, financial literacy must be emphasized as a continuous learning process and incorporated into school curricula (United States Financial Literacy and Education Commission, 2007), which lays the foundation for financial awareness. In this context, the personal finance management course in school positively affects their subsequent financial behaviour (Bamforth et al., 2018), showing that early exposure has long-term benefits. Reinforcing this, (Chen and Volpe, 2002) advocated that personal finance knowledge and college education are key factors in determining people's interest in personal finance concerns.

However, Chen and Volpe (1998), by surveying 924 college students from several institutes, found that college students lack adequate personal financial literacy as they are not availing the personal financial education in their curriculum. Hence, educational background is a key element in possessing financial literacy, and it increases with the level of education (Agrawal et al. 2010).

Married, male, high earners, non-minority, and middle-aged people are financially knowledgeable (Taft et al., 2013). However, Khuc et al. (2022) advocated that demographic elements such as income, age, and educational background have a significant impact on the level of financial literacy among the people. Furthermore, Sangeeta et al. (2022) have explored that as compared to other socio-demographic factors, work experience, education, and being techno-savvy are more closely associated with financial literacy. Another factor for Financial Literacy is high income and higher education (Fernandes et al, 2014). Some studies found people having high income are highly financially literate (Al-Tamimi and Kalli, 2009) and this is high among the people who are employed in banking, finance, or investment fields. Apart from that, the impact of personal finance management courses on school student's subsequent financial behaviour is quite positive. Bamforth et al. (2018), investigated the response of teenagers to social, economic, and psychological determinants of money management behaviour (Wagner, 2015).

In a nutshell, it can be summarized that financial literacy can be determined by various demographic and socio-economic factors, such as age, gender, marital status, income, occupation, knowledge of basic financial and economic terms and concepts, confusion over investing and saving, educational level, job nature, work cultur (Al-Tamimi and Kalli 2009; Xiao and Chatterjee 2014; Potrich et al. 2015; Kadoya and Khan 2020). Hence, there is an interdependency between people's financial literacy level and various demographic and socio-economic variables (Malhotra and Vijay, 2024). The concern over stock market fraud and scandals is an intriguing addition to this list. Many respondents acknowledged their inability to fully comprehend the financial crisis but acknowledged that it has negatively impacted their efforts to comprehend the financial market (Letamendia et al.,2017). Financial literacy has a positive influence on people's active participation in the financial market (Yoong 2010, Klapper et al. 2013, Mate and Dam 2017). Epaphra and Kiwia (2021), by applying a logistic regression model found that the degree of financial literacy and financial understanding creates a platform for financial market participation despite the level of educational qualification. Consequently, financially literate persons can deal with financial matters more cautiously and make wise financial investments (Bayar et al., 2020).

After a thorough analysis of previous literature, we found that numerous socioeconomic and demographic variables have an impact on peoples' financial literacy, but no such studies have been undertaken in the Odisha context, especially in a district with having high literacy rate. Thus, the present study attempts to examine the socio-economic determinants influencing financial literacy among residents of Jagatsinghpur Municipality in Odisha.

3. Theoretical Underpinning

Financial literacy has emerged to empower people, to make marginalized individuals able to manage their finances, mobilize their savings habits, and inculcate the attitude among people to invest money in proper avenues. Before the emergence of financial literacy, in schematic finance poor were always addressed from the supply side, but in today's era, the focus is on understanding the demand side, i.e., the financial status of the poor through financial inclusion. Thus, in a broader spectrum, it can be said that to make a proper hold on financial management, financial literacy is inevitable. The prime focus is to develop the financial literacy level and skills among individuals having limited financial resources, to deal with the complexity of finance.

Financial literacy is a crucial factor in building confidence among people to have control over their present and future financial matters. So, we can say financial intelligence is necessary for everyone. Ironically, financial literacy has nothing to do with one's level of formal education. There are questions about the long-term efficacy of teaching financial literacy in high school since the course seems not to have influenced students who took the personal financial management course (Mandell and Klein, 2009). Women have a high rate of financial ignorance, which hurts their investment choices (Al-Tamimi and Kalli, 2009). Financially ignorant individuals cannot make wise decisions regarding their finances, which negatively affects economic development. Thus, financial literacy is the path to prosperity. As per the recent study by the National Financial Educators Council (NFEC) although America is a developed country, 28.8 percent of those aged 65 or older said they lack knowledge about personal finance, which caused them to lose $30,000 or more in their lifetimes. According to the 2011 census report, out of 74.04 percent of literate, only a few are financially literate. Only 24% of Indian youths are financially literate, as per the report from the Global Financial Literacy Excellence Centre, which shows a low literacy rate as compared to other major growing economies. This is because of a lack of awareness and formal instruction.

4. Data and Methodology

The effect of socioeconomic and demographic factors on people's financial literacy levels was examined by using the data collected from the educated mass of Jagatsinghpur municipality of Odisha, India via Google Form. The impact of the independent variables has been analysed with the help of the Regression Logistic Model. Despite some limitations in sampling to generalize the population, this study attempts to show the interactions among the variables.

4.1 Data

The COVID-19 outbreak has disrupted normal operations everywhere. To avoid contamination, physical contact was strictly restricted and it was not feasible to visit the field to collect primary data. Given the constraints of the pandemic outbreak, resources, and accessibility, we adopted a snowball sampling method. It is considered a non-probabilistic sampling method where existing study participants pass the information to future participants from their social network, family friends and relatives by creating a chain-like structure. It is useful to reach the population where it is hard to access the population during the pandemic situation. Initially, some known people were contacted and discussed the purpose of the research. Then urged them to provide their known person contact numbers and further requested with them for other people's mobile numbers. By realizing the noteworthiness of our study, they have provided many people's contact details. Through this process, around 150 questionnaires were circulated, and out of these, only 125 were returned. The questionnaire was framed after extensive analysis of previous literature by Vyas (2021) and Gupta (2017), national and international toolkits to measure financial literacy, like OECD and NCFE reports. The segregation of questions into different parts is made as per the Global standard, i.e., financial knowledge, financial attitude, and financial behaviour (Potrich et. al, 2015).

The survey has been undertaken among the educated masses of two municipalities in Jagatsinghpur district, (i.e., Jagatsinghpur Municipality and Paradeep Municipality). Jagatsinghpur is considered as one of the highest literacy rates in the state of Odisha, as well as it ranks better than the national average in literacy and at the top of the list for the highest male literacy and second for female literacy. These two municipalities have been selected with consideration for accessibility, lodging, and the presence of some local contacts that supported us with the provision of crucial information about the sample area. Jagatsinghpur municipality consists of 21 wards of which 2 wards were chosen, i.e., ward-8 (Ohal) and ward-19 (Purohitpur), as most of the dwellers are educated in these 2 wards. These wards were selected carefully to represent diverse socio-economic backgrounds within the municipality, ensuring a reasonable degree of variation in the sample. From the entire 4,664 population of these two wards, 125 (2.68% approx.) representative samples have been collected. The male response rate is 56.80%, whereas the female response rate is 43.20%. The financial literacy of respondents has been measured by evaluating their basic financial knowledge regarding some financial concepts, day-to-day financial dealings, computational ability, stock market knowledge, and retirement planning. The data have been collected through a 5-point Likert scale and binary scaling techniques. The positive responses were coded as 1 and negative ones as 0, where questions, as per a 5 5-point Likert scale, are coded as 5 for highest weight and 1 for the lowest weight. The variables taken in the study have been explained in the table 7.

4.2 Methodology

Binary Logistic Regression Models

A binary logistic regression model is the statistical model used to predict the relationship between independent variables and dependent variables, where the dependent variable is binary. The present study employs a logistic regression model (Agresti, 1996) to examine the socioeconomic factors that are responsible for the financial literacy of Jagatsinghpur municipality of Odisha. Given the binary nature of the dependent variable, logistic regression is an appropriate methodological choice, as it allows for the estimation of the probability of a particular event occurring as a function of several explanatory variables (Long & Freese, 2006). This model effectively captures the relationship between the regressors and the binary outcome variable, accommodating various types of predictors, including categorical, continuous, and dummy variables. Prior studies have demonstrated the suitability of the logit model in analyzing dichotomous outcomes within social and behavioural research (Long & Freese, 2006). Thus, the logit model is particularly well-suited to the present study's objectives and the structure of the data.

Assumptions of Logistic Regression Model:

- The logistic regression model is used to model binary or categorical dependent variables. It has several key assumptions which vary from the linear regression model because of the nature of dependent variables. These assumptions are outlined below:
- **The dependent variable is Binary in Nature:** The dependent variable of the logistic regression model must be binary or dichotomous i.e. it captures the '0' and '1'. If Y=1, it indicates the occurrence of the event and if Y=0 indicates its non-occurrence
- **Linearity of the Logit model:** The model assumes that the relationship between the logit and the independent variables is linear. That is the logit value changes linearly with changes in the independent variables.
- **No perfect multicollinearity:** The independent variables must not be perfectly correlated. To avoid it we have run a correlation analysis and the coefficient of all variables indicates that there is no perfect multicollinearity among the independent variables. We have run a correlation to check multicollinearity in the model in Table 9 of the manuscript; all coefficients are below 0.5 which indicates there is no multicollinearity among independent variables.
- **Independent of Observations:** The observations should be independent of each other; there should be no repeated measurements or clustering unless accounted for.
- **Homoscedasticity is not assumed:** Logistic regression does not assume homoscedasticity, unlike Ordinary Least Squares (OLS) regression. Logistic regression is designed to handle situations where the variance of the error terms is not constant across all levels of the independent variables.

Considering the binary characteristics of "financial knowledge", the present paper has attempted to estimate a binary logistic regression model.

$$\text{logit } p = \ln\left(\frac{P_i}{1-P_i}\right) = Z_i = \beta_1 + \beta_2 X_i,\ 0<P<1$$

Where,

P_i = Probability of having financial knowledge

$1 - P_i$ = Probability of not having financial k knowledge

$\frac{P_i}{1-P_i}$ = The odds ratio in favour of having financial k knowledge Or the ratio of the probability that the respondent will have financial knowledge or literacy to the probability that he will not have financial knowledge or literacy. The logistic regression model assumes that the financial knowledge and literacy depend upon one or more explanatory variables such as gender, age, monthly income of the respondent, occupation, educational qualification, source of income (SOI), and work profile (WP).

Based on the above theoretical framework, we have developed the following models, which will be estimated to realize the objectives.

$$CA_i = \beta_1 + \beta_2\, GENDER_{it} + \beta_3\, AGE + \beta_4\, MIR + \beta_5\, OCCU + \beta_6\, EDR + \beta_7 WP + \gamma_t \quad (1)$$

$$EPLAT_i = \beta_1 + \beta_2\, GENDER_{it} + \beta_3\, AGE + \beta_4\, MIR + \beta_5\, OCCU + \beta_6\, EDR + \beta_7\, WP + +\gamma_t \quad (2)$$

$$SMK_i = \beta_1 + \beta_2\, GENDER_{it} + \beta_3\, AGE + \beta_4\, MIR + \beta_5\, OCCU + \beta_6\, EDR + \beta_7\, SOI + \beta_8 WP + \gamma_t \quad (3)$$

5. Results and Discussion

Demographic Profile

Demographic information of respondents includes both quantitative and qualitative aspects of the sample. Quantitative aspects include age, gender, and income, and qualitative aspects include factors like educational qualification, work profile, occupation, and sources of income.

5.1 Gender

As in the 21st Century, there is no gender disparity in any sector, still, the research revealed the existence of dissimilarity in financial decision-making patterns based on gender, which is a consequence of financial literacy. Gender differences are the key factor influencing personal finance literacy (Chen and Volpe, 2002). Study says that males are more risk-seekers and comparatively financially knowledgeable and aware than females (Taft et. al, 2013). Compared to young women, young males are more risk-averse, action-oriented, and interested in reading to increase their financial literacy. However, young women are more concerned with managing their finances and making sensible financial decisions (Cera and Tuzi, 2019). So, gender is an important variable in the present study.

Table 1: Gender

Gender	Frequency	Percentage
Male	71	56.80%
Female	54	43.20%

Note: Author's computation from primary data; N=125

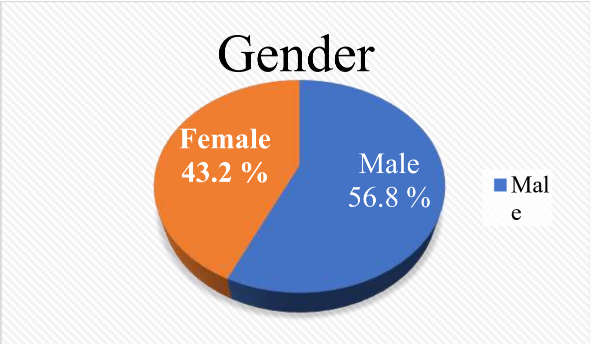

Figure 1: Percentage of the respondents' Gender

The above pie chart shows the gender of respondents taken into consideration. It demonstrates that out of 125 respondents, 43.2% were female i.e. 54 females have given their responses, whereas the number of male respondents is 71 which is 56.8%. Thus, there is majority of male respondents.

5.2 Age

Age is a major factor in financial literacy determination. As with age, experience, and exposure to financial matters increases. However, in the US and other countries, financial illiteracy is pervasive among both young and old individuals (Lusardi and Mitchell, 2007). Finke et. al (2017), as financial responsibility is limited for young adults, the financial literacy level is less, whereas, it declines in old age.

Table 2: Age

Age	Frequency	Percentage
20-30	51	40.80%
30-40	35	28%
40-50	17	13.60%
50-60	20	16%
Above 60	2	1.6%

Note: Author's computation from Primary data; N=125

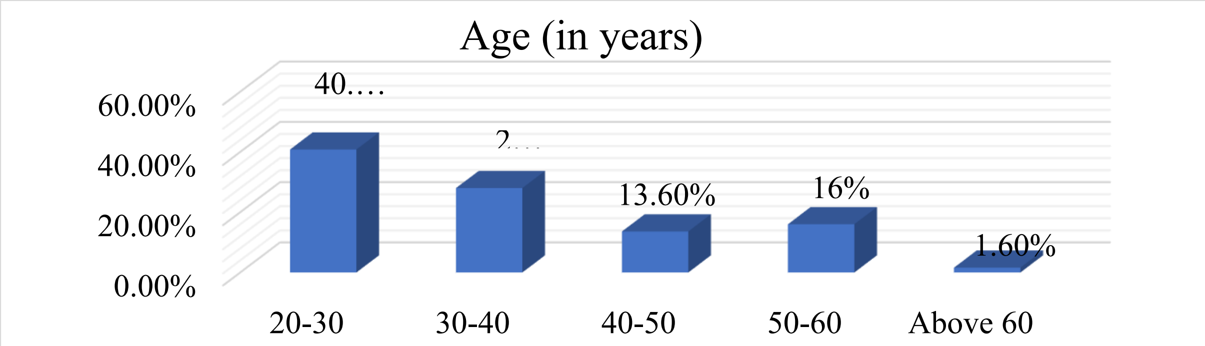

Figure 2: Percentage of respondents' age

Note: Author's computation from Primary data; N=125

The above bar graph demonstrates the percentage of the age of the respondents. It has been analysed that, the maximum number of respondents i.e. 40.8% are from the 20-30 age group, followed by the 30-40 age group with 28% and the 50-60 age group with 16% of total responses, whereas there are the least number of people of above 60 age group have been given their responses which is only 1.6 % of total responses and 40-50 age group followed with 13.6%. So, it shows that youngsters are more concerned about financial matters and are financially aware.

5.3 Educational Qualification:

The educational qualification of an individual plays a crucial role in being financially literate. Financial literacy and schooling attainment have a strong positive impact on household wealth accumulation (Behrman et. al, 2010). The level of education helps a person to make decisions wisely, which provides a shield to avoid exploitation.

Table 3: Educational Qualification

Qualification	Frequency	Percentage
10th Standard	1	0.80%
12th Standard	7	5.60%
Graduate	52	41.60%
Post-Graduate	58	46.40%
Any Other	7	5.60%

Note: Author's computation from Primary data; N=125

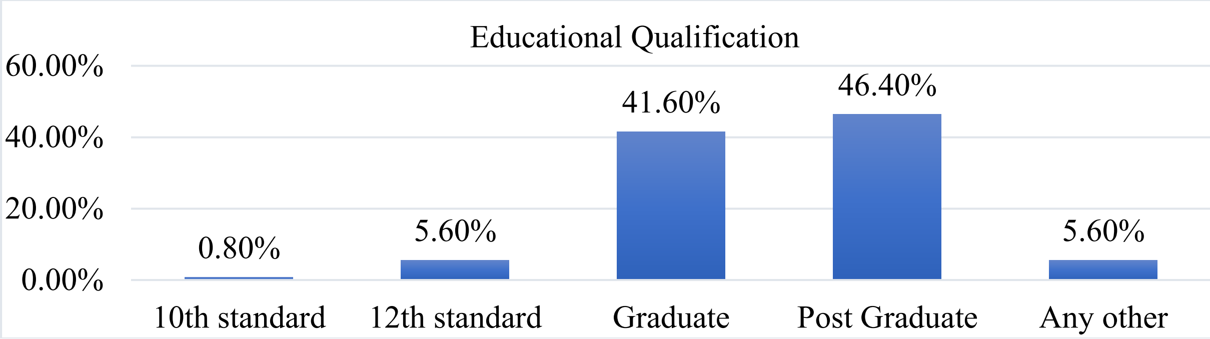

Figure 3: Percentage of respondents' Educational Qualification
Note: Author's computation from primary data; N=125

The diagram reveals the educational qualifications of the respondents. The majority of respondents are post-graduates, which is 46.40% of total respondents, i.e., 58 people, and 52 people out of 125 samples are graduates, i.e., 41.60%. However, a negligible portion of the sample size is below graduation, i.e., having educational qualifications of 10th and 12th standard, which are 0.80% and 5.6% respectively. Also, a small portion of respondents, i.e., 5.6% of total respondents, have other degrees or post-graduate degrees above. It evaluates that the maximum number of respondents are highly educated.

5.4 Occupation

The occupation of an individual is the principal work or job for earning his livelihood. Since students' and retirees' levels of financial knowledge differ, financial literacy is dependent on the occupation of a person.

Table 4: Occupation

Occupation	Frequency	Percentage
Government Sector	27	21.60%
Private Sector	51	40.80%
Business and Profession	8	6.40%
Student	20	16%
Retired	2	1.60%
Any Other	17	13.60%

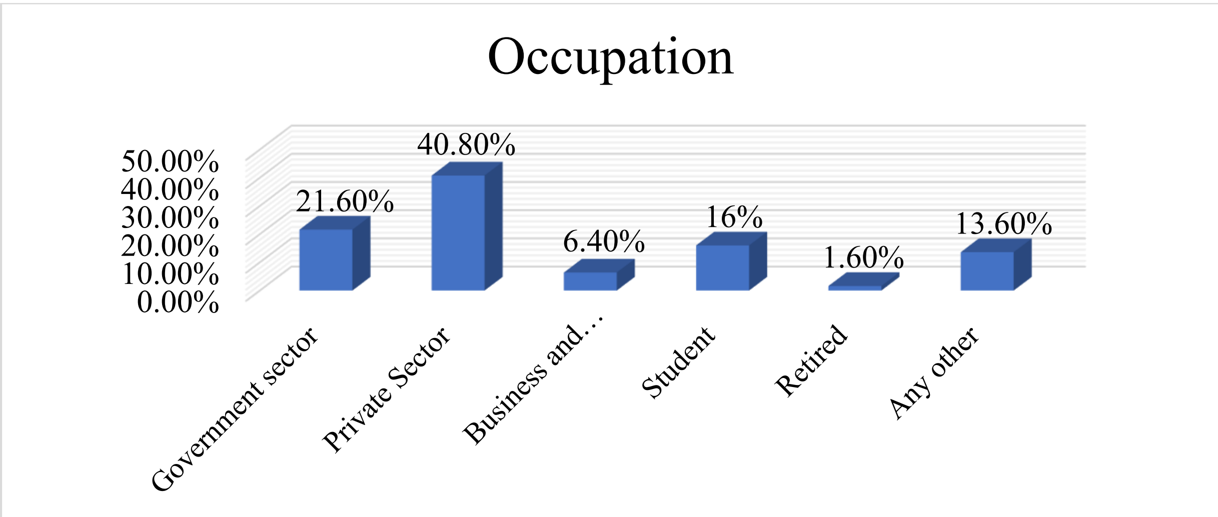

Figure 4: Percentage of respondents' Occupation

The above chart shows the occupation of the respondents, which demonstrates that the majority of respondents are private sector employees, i.e., 40.80% (51 respondents). The next highest number of respondents, i.e., 27 (21.60%) working in the Government sector. Whereas only 2 retired persons have given their responses, and 8 business people have responded. While 20 students have opined about their financial literacy, which is 16% of total responses, 13.60% of total responses were collected from people of different occupations.

5.5 Work Profile

Work Profile plays a vital role in making an individual financially literate. An individual working in the financial sector has greater exposure to deal with various financial instruments which helps him gain more financial knowledge as compared to an individual working in the non-financial sector. Financial sector employees are comparatively more able to understand and efficiently use financial knowledge including personal financial management. Thus, the work profile of respondents has significance in this current study.

Table 5: Work Profile

Work Profile	Frequency	Percentage
Financial	47	38%
Non-Financial	78	62%

Note: Author's computation from Primary data; N=125

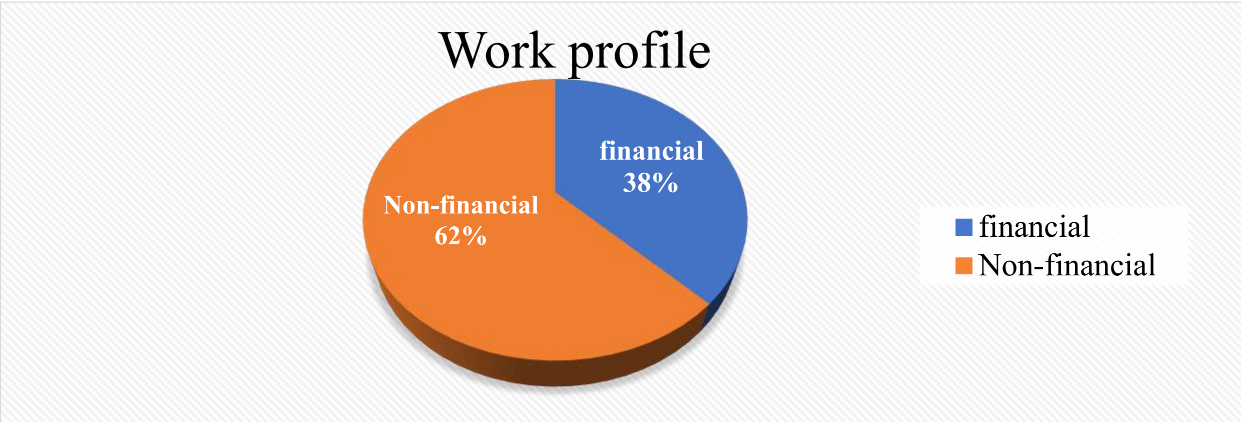

Figure 5: Percentage of respondents' Work Profile
Note: Author's computation from primary data; N=125

From the above chart, it is clear that the maximum number of respondents have a non-financial work profile, i.e., 78 respondents, which is 62% of the total responses. However, only 47 respondents belong to the financial sector, which is 38% of the total responses.

5.6 Monthly Income:

Monthly income plays a pivotal role in determining financial literacy. Because, as per income, an individual plans his amount of expenditure, savings pattern, and makes plans. The person who earns more has a different pattern of savings and investment than a person who earns a little just to manage his livelihood. So, personal financial management has an association with the quantum of earnings. Thus, the monthly income variable is significant for the present study.

Table 6: Monthly Income

Monthly Income (in rupees)	Frequency	Percentage
Below 10000	47	37.60%
10001-20000	25	20%
20001-30000	15	12%
30001-40000	12	9.60%

40001-50000	5	4%
Above 50000	21	16.80%

Note: Author's computation from Primary data; N=125

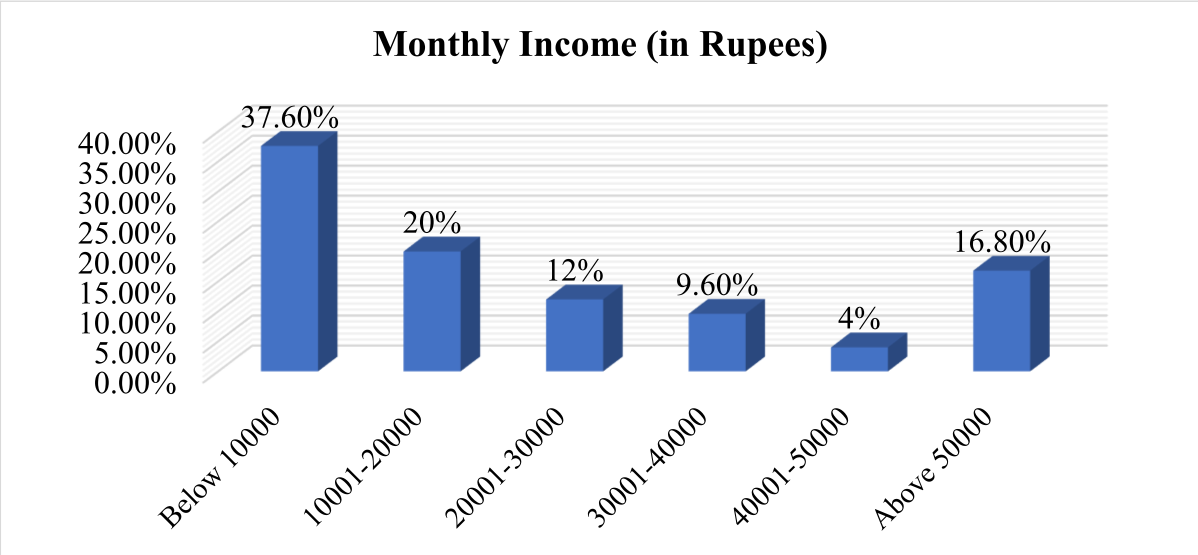

Figure 6: Percentage of income of the respondents
Note: Author's computation from primary data; N=125

Figure 6 demonstrates the income of the respondents and the maximum number of people belonging to the below Rs. 10000 categories, which is 37.60% of total responses. Then, 25 people having an income of Rs. 10001-20000 category and 21 people, i.e., 16.80% of the total sample, who are earning above Rs. 50000, have given their responses. Whereas, the least number of respondents, i.e., 4%, are falling under the Rs. 40001-50000 category, and 12 respondents have earnings of Rs. 30001-40000.

6. Discussion of the Econometric Results

Table 7: Socio-economic variable-cum-variable matrix of the study

Sl. No	Domain	Variables	Definition	Expected Impacts	Expected Sign
			Dependent Variables		
		E-PLAT	Use of internet banking/E-platform by the respondent	The use of the E-platform depends upon the following controlled variables	NA
1.	Financial Knowledge	CA	Computational Ability and Numeracy	The ability to do financial numeracy and computation leads to financial literacy.	NA
		SMK	Stock Market Knowledge	Stock market knowledge depends on the following independent variables.	NA
			Independent or Controlled Variables		
		GENDER	Gender of the respondent	Gender plays a vital role in financial literacy	+
2.	Demographic	AGE	Age of the respondent	Age is an important factor in financial literacy	+

3.	Economic	MIR	Monthly Income of the respondent	As income rises, there is an expected positive impact on financial literacy-cum-knowledge	+
4.	Occupational	OCCU	Occupation of the respondent	Better occupation leads to better financial understanding	+
		WP	Working profile of the respondent, whether Financial or non-financial	If the working profile of the respondent is financial, then it is expected to have a positive impact	+
5.	Educational	EDR	Education of the respondent	If the respondents' level of education is high, then there is a positive relationship with financial knowledge-cum-literacy	+

Note: Author's compilation from primary data; N=125

Table 8: Matrix of Basic Statistics of the selected variables

Variables	Minimum	Maximum	Mean	Std. Deviation
SMK	0	1	.61	.49
CA	0	1	.48	.50
GENDER	0	1	.43	.49
AGE	1	3	1.61	.52
MIR	1	3	1.83	.74
OCCU	1	4	2.47	1.14
EDR	1	3	1.58	.59
WP	0	1	.38	.48

Note: Author's estimation from primary data.
Note: Std. Dev, Standard Deviation; Min, Minimum; Max, Maximum, N=125

Table 8 is a clear picture of the matrix of basic statistics of the selected variable considered for the study. On average 0.61 percent population has stock market knowledge (SMK), while an average of 0.48 percent population possesses the computational ability to process financial data. The mean age of the respondents is 1.61 and the average educational qualification percentage is 1.58.

Table 9: Correlation Table

Sl. No.	Variables	1	2	3	4	5	6
1.	GENDER						
2.	AGE	-.119					
3.	MIR	$-.258^{**}$	$.284^{**}$				
4.	OCCU	$.177^{*}$	-.173	$-.442^{**}$			
5.	EDR	.105	-.149	.038	-.023		
6.	WP	.090	.077	$.197^{*}$	$-.480^{**}$	-.002	-.114

**. P< 0.01 (2-tailed); * P< 0.05; N=125
Note: Author's estimation from primary data; N=125

Table 9 demonstrates the correlation among the variables. The one-tailed test determines the difference between variables in a specific direction. A two-tailed correlation shows the possibility of positive and negative differences. The sign (two-tailed) p-value explains whether the correlation is significant or not at a chosen alpha level. If the p-value is less than 0.01, then the relationship is highly significant, and the negative sign indicates the inverse relationship between variables. If the p-value is less than 0.05, then there is a weak but significant relationship exists.

Table 10: Binary Logistic Regression

Variables	B	S.E.	Wald	df	Sig.	Interpretation
GENDER	-.297	.425	.490	1	.484	Not Significant
AGE	.904	.412	4.815	1	.028	Significant
MIR	.437	.311	1.976	1	.160	Not Significant
OCCU	.465	.242	3.692	1	.055	Significant
EDR	.609	.340	3.204	1	.073	Significant
WP	1.514	.487	9.641	1	.002	Significant
Constant	-5.353	1.548	11.951	1	.001	Significant

Note: Author's estimation from primary data; N=125
Dep. Variable=Computational Ability (CA)

Table 10 shows the impact of various independent variables such as age, gender, monthly income of respondents (MIR), occupation (OCCU), educational qualification of respondents (EDR), and work profile of respondents (WP) on the dependent variable i.e. Computational Ability (CA) which is the proxy variable for financial literacy. After regressing the dependent variable (CA) with the controlled variables, we found that the variables age and work profile of respondents (WP) are significant at the 5% level of significance and positive in the model. It indicates that as with the coming of age, the experience and exposure to financial dealings increase, so the financial literacy and financial knowledge also increase. Likewise, a better WP gives a handsome income, which is subject to more financial activities and ultimately better financial knowledge and computational ability. Furthermore, variables like occupation (OCCU) and educational qualification of the respondents (EDR) are significant to determine the computational ability at a 10% level of significance. As an occupation that provides exposure to dealing with financial matters, it improves the computational ability of the respondents. Similarly, computational ability improves with the level of education. Except for these variables, other variables are showing their expected signs but are non-significant.

Table 11: Binary Logistic Regression

Variables	B	S.E.	Wald	df	Sig.	Interpretation
GENDER	-1.567	.591	7.026	1	.008	Significant
AGE	-2.124	.613	11.990	1	.001	Significant
MIR	.794	.399	3.958	1	.047	Significant
OCCU	.107	.315	.116	1	.733	Not Significant
EDR	1.097	.502	4.768	1	.029	Significant
WP	1.129	.692	2.658	1	.103	Not Significant
Constant	1.115	1.823	.374	1	.541	Not Significant

Note: Authors' estimation from primary data; N=125
Dep. Variable (E-platform/Internet Banking/ATM)

Table 11 exhibits the significance of various explanatory variables on the dependent variable, viz., use of E- E-Platform/Internet Banking/ATM, which means the use of online banking services like transacting through UPI, BHIM, use of ATM cards, and other mobile banking portals by the respondents. The use of the e-platform asserts the level of financial knowledge of the respondents. By regressing the dependent variable (use of E-Platform) with the independent variables such as gender, age, monthly income of respondents (MIR), occupation (OCCU), educational qualification (EDR), work profile (WP) of the respondents, we found that GENDER, AGE, monthly income of the respondents (MIR) and educational qualification (EDR) are significant at 5% level of significance. Gender plays a vital role in the use of Internet banking. A study says males are more inclined to online banking as compared to females. While the use of e-payment portals also varies with age, because, comparatively, youngsters are more apt to use them than older people. Likewise, high-earners are relatively more financially aware and undertake online transactions. Lastly, since educated people have better financial understanding, they use e-platforms more. But taking e-platform as the dependent variable, controlled variables such as occupation (OCCU), and work profile (WP) are found to be non-significant in this model.

Table 12: Binary Logistic Regression

Variables	B	S.E.	Wald	df	Sig.	Interpretation
GENDER	-.916	.431	4.520	1	.034	Significant
AGE	-.935	.418	5.014	1	.025	Significant
MIR	.505	.320	2.495	1	.114	Not Significant
OCCU	.637	.263	5.854	1	.016	Significant
EDR	.346	.349	.982	1	.322	Not Significant
WP	.843	.481	3.068	1	.080	Significant
Constant	.557	1.417	.154	1	.694	Not Significant

Note: Author's estimation from primary data; N=125
Dep. Variable = Stock Market Knowledge (SMK)

Stock market knowledge (SMK) is the proxy variable to evaluate respondents' financial literacy, while gender, age, monthly income of respondents (MIR), occupation (OCCU), educational qualification (EDR), sources of income (SOI), and work profile of the respondents (WP) are independent variables. By regressing the dependent variable (SMK) with independent variables, we found that gender, age, and occupation (OCCU) are significant at a 5% level of significance. However, the work profile of the respondents (WP) is significant at a 10% level of significance. Since a person who belongs to the financial work profile has a better understanding of financial concepts as well as knowledge about the stock market, this signifies a level of financial literacy. (See Table 12)

7. Interpretation of Average Marginal Effect (AME)

Especially empirical economists usually pay attention to marginal effects rather than the parameters, as it measures a change of one unit in the explanatory variables, resulting in an average change in the dependent variable. The result of the average marginal effect (AME) is presented in Table 13. The AME explains the degree of elasticity of a one-unit change in the explanatory variable, the average change in the dependent variable.

Table 13: Marginal Effects of the entire Controlled variable

Variables	dy/dx	Std. Err.	Z	P>z	[95% Conf.	Interval]
GENDER	-0.06	0.09	-0.7	0.48	-0.23	0.11
AGE	0.19***	0.08	2.36	0.02	0.03	0.35
MIR	0.09	0.06	1.45	0.15	-0.03	0.21
OCCU	0.10***	0.05	2.03	0.04	0.00	0.19
EDR	0.13*	0.07	1.88	0.06	-0.01	0.26
WP	0.32***	0.09	3.66	0.00	0.15	0.49

*& *** denote significant at 10% & 1% level.
Source: Estimated from primary data by authors using STATA.

It is evident from Table 13 that the coefficient of the marginal effect of age (AGE) is positive and significant, which means there is a positive relationship between age and financial knowledge. That is, as the respondent's age increases, financial literacy also increases with age. In the same line, the coefficient of education of the respondent (EDR) is also positive and significant in the model. Better working profile (WP) and better occupation (OCCU) reduce financial ignorance, which in turn enhances financial literacy.

8. Findings

The present paper attempts to study the socio-economic and demographic factors that are responsible for financial literacy in the targeted group of Jagatsinghpur municipality of Odisha state. The study is based on the primary data set collected from the district. There is a plethora of empirical research papers that attempt to explain the determinants that induce financial literacy, but there is a dearth of studies that focus on cross-sectional level data sets in the context of a district-level empirical case study to find out the major factors for financial literacy. This study contributes to the financial inclusion and financial literacy literature in great ways. By considering three dependent variables, such as computational ability, use of E-payment platforms, and stock market knowledge as the proxy for financial literacy, we have developed three models. Using a binary logistic regression model, the study produces three major findings.

Firstly, considering the computational ability (CA) as the proxy variable for financial literacy, and regressing the same with the controlled variable, the study concludes that variables such as age, working profile of the respondent, occupation, and educational qualification of the respondent are the factors which enhance the financial literacy among the targeted group. It indicates that with increasing age, experience, and exposure to financial literacy increase. Likewise, when the respondent has a better working profile, he/she is financially more literate. Even the occupation and level of education play a vital role in enhancing financial literacy among the targeted group. (Lusardi, 2012; Klapper et. al, 2013), Stated that numeracy is one of the rudimentary skills that people should possess to make wise financial decisions, because computational ability plays a vital role in debt management asset building, and coping with manifold economic conditions as well. But it is low among women, old-aged people, and people having low educational qualifications. However, Klapper et. al (2013) revealed that people from a financial working profile have better financial skills as they have more financial dealings.

Secondly, by considering the E-platform i.e. the online banking service like transacting through UPI, BHIM, mobile banking, and other portals for financial transactions as the response variable and regressing the E-Platform with the independent variables such as gender, age, monthly income of respondents, occupation, educational qualification and work profile of the respondent, the study finds that gender, age, monthly income of the respondents and educational qualification are significant and are the factors which are responsible for use of more e-platform. Manifold socio-economic and demographic factors promote the use of digital banking services (Choudhury and Bhattacharjee, 2015). Andreou and Anyfantaki (2020) found that the financially knowledgeable mass uses Internet banking more frequently than the financially illiterate masses, as the latter group does not possess enough trust, self-confidence, and digital proficiency. Thus, financial literacy has a positive correlation with the use of e-banking. Furthermore, Teka and Sharma (2017), by surveying 600 people from Ethiopia, found that the involvement of women in e-banking practices is less, so digital literacy should be created among females.

Thirdly, regressing the stock market knowledge with the same controlled variables, we have found that the gender, age, occupation, and work profile of the respondent are significant and are the factors that are responsible for financial literacy. (Dwyer et. al, 2002; Almenberg and Dreber, 2015) Advocated that the gender gap plays a crucial role in the line of stock market participation, as women have less risk appetite, which their participation being minimal in stock investment. Nevertheless, investors' knowledge also has an impact to a greater extent. Van Rooji et. al (2011) stated that a lack of grasp on financial concepts led people to deviate from stock holding. However, (Vaarmets et. al, 2019) cognitive ability has a considerable significance for stock market participation, which is poor in the case of women, and financial education also helps to boost participation, along with occupation, socioeconomic status, economic pursuit, and religious aspect are other influencing factors.

Finally, we can conclude that various demographic and socio-economic factors like age, gender, education, income, occupation, and work profile are responsible for the level of financial literacy (Chen and Volpe, 2002; Al-Tamimi, 2009; Taft et. al, 2013). A better work profile and occupation lead to a better financial understanding and a higher educational qualification a better financial knowledge-cum-financial literacy. Furthermore, (Taft et. al, 2013) revealed that a high level of financial literacy contributes to better financial well-being and fewer financial concerns. With the increased level of income, more financial activities give better financial knowledge, and (Klapper, 2013) a high level of financial literacy helps to endure macroeconomic shocks as well as to make a finer savings, investment, and debt management strategy. Moreover, financial literacy aids in better savings, investment, and debt management strategies.

9. Contribution of the Study

We have clearly stated that this study contributes to the existing literature by:

- Providing empirical evidence on the determinants of financial literacy using binary logistic regression analysis in the context of a semi-urban municipality in Odisha.
- Identifying socio-economic and variables such as age, gender, education, income level, work profile, and occupation that significantly influence financial literacy.
- Offering policy-level insights that may guide government and local institutions in designing targeted financial literacy programs.

10. Conclusion with Policy Suggestion

The current study sought to assess the financial literacy of residents of Jagatsinghpur district. Financial literacy is essential for everyone's well-being, and financial knowledge is its fundamental component. But people are ignorant about it, which are exposing for financial exploitation. This ignorance is getting acute due to inadequate awareness, for which the government should plan for rigorous policy formulation. And in rural areas, this ignorance is widespread. So, there is a need to make society financially literate, not only educationally qualified. However, various regulatory authorities are conducting many programs to make people financially aware, but they should also expedite it to reach each household. However, (Chen and Volpe, 2002; Lusardi and Mitchell, 2008; Singh and Kumar, 2025) administered that financial literacy is low among women, hence the policy formulators should throw light on gender differences and as women have longer life expectancy than men, so more emphasis should be given on women to make them financially aware as well as induce them to make an earlier retirement planning. If everyone is financially aware, they will make proper financial decisions, so that their financial condition will also be better, and ultimately, the country will grow.

Thus, after all the discussions, it concludes that while designing programs that promote financial literacy, they should take into account a variety of socioeconomic and demographic aspects. The present study discovered that people are aware and literate enough in some areas, but poor in some specific areas. So, those areas should be emphasized during policy formulation and must be addressed through different awareness programs and campaigns as well. A high level of educational qualification brings better financial knowledge-cum-literacy, which has a positive association with financial decision-making. Thus, financial literacy empowers people to make wise financial decisions that significantly affect an individual's financial literacy, financial outlook, and financial conduct. That indicates financial knowledge, financial attitude, and financial behaviour change with the level of financial literacy.

11. Practical Implications of the Study

The findings of the study carry significant implications for policymakers, educators, financial institutions, and community development professionals, especially in the semi-urban and rural areas context. Firstly, the study highlights the key socio-economic and demographic determinants influencing an individual's financial literacy, which can be used as a guiding tool for formulating more focused and effective financial literacy initiatives. Policymakers and educational institutions can leverage this evidence to design awareness campaigns and training programs and include it in the teaching curriculum. Secondly, financial institutions and NGOs can customize their outreach and financial education strategies in terms of providing a mobile-based learning system with simplified digital tools and conducting community workshops. Thirdly, the application of the logistic regression model can help government agencies and development planners to use such a model as a diagnostic model. In summary, the study's findings offer a data-driven basis for policy formulation and community-level action, contributing toward the broader goal of financial inclusion and empowerment in underserved areas.

12. Limitations of the Study

The scope of this study is limited to the Jagatsinghpur municipality only. Only two wards, having most of the educated dwellers of the municipality, have been chosen for the study, which also limits the generalizability of the study. Due to the COVID outbreak, as no physical contact was possible, so number of samples was limited to just 125. However, these wards were selected carefully to represent diverse socio-economic backgrounds within the municipality, ensuring a reasonable degree of variation in the sample. Moreover, the primary objective of the study was to conduct an in-depth exploratory analysis rather than to make broad generalizations.

Another key limitation is the use of cross-sectional data, which limits the ability to establish a relationship between the variables and financial literacy. The logistic regression approach does not permit the construction of causal linkages, even though it finds statistically significant correlations between financial literacy and several socioeconomic and demographic characteristics.

The study relies upon the self-reported survey data, which may be subject to biases. Respondents may overstate or understate their financial knowledge and financial behaviour. There may be a situation where participants are unable to accurately recall their past financial decisions. These biases can affect the reliability and validity of the data, which leads to overestimation or underestimation of the financial literacy level.

13. Future Scope of the Study

Based on the above limitations, the present study recommends some valuable insights for future researchers:

- For a better understanding of regional differences in financial literacy, future research could include comparative analyses across several districts or states, particularly between rural, semi-urban, and urban populations.
- It is advised that future studies may use experimental or longitudinal approaches to more thoroughly examine causal pathways. Monitoring people over time would make it easier to determine how shifts in income, education, work profile, and digital access affect the results of financial literacy.
- Future studies could include the psychological and behavioural aspects, such as risk appetite, financial confidence, and decision-making capabilities of individuals.
- By considering both quantitative and qualitative methods, a combined form of research could be undertaken.
- To measure real-world effects, future research might use experimental or quasi-experimental methodologies to evaluate the efficacy of various financial literacy initiatives or government interventions (such as the PM Jan Dhan Yojana or financial inclusion campaigns).

By addressing these areas, future research can build a more holistic and dynamic understanding of financial literacy in the Indian context.

References

Agarwal, S. (2010). "Financial Literacy and Financial Planning: Evidence from India", *SSRN Electronic Journal,* 1-45. (DOI: 10.2139/ssrn.1728831)

Almenberg, J., & Dreber, A. (2015). Gender, stock market participation and financial literacy. *Economics Letters*, *137*, 140-142.

Al-Tamimi, H. A. H. (2009). "Financial literacy and investment decisions of UAE investors", *The Journal of Risk Finance*, 10(5), 500-516, (DOI: 10.1108/15265940911001402).

Alves et. al. (2012). "Financial Literacy vs. Financial Illiteracy: A case study for the region in the Northern of Portugal", International Conference The future of education 2nd Edition.

Andreou, P. C., & Anyfantaki, S. (2021). Financial literacy and its influence on internet banking behavior. *European Management Journal*, *39*(5), 658-674.

Bamforth et al. (2018). "Understanding undergraduates' money management behaviour: A study beyond financial literacy", *International Journal of Bank Marketing*, (DOI: 10.1108/IJBM-05-2017-0104)

Bayar et al. (2020). "Financial literacy and financial risk tolerance of individual investors: Multinomial logistic regression approach", *SAGE Open*, 1-11, (DOI: 10.1177/2158244020945717)

Behrman, J. R., Mitchell, O. S., Soo, C., & Bravo, D. (2010). Financial Literacy, Schooling, and Wealth Accumulation. NBER Working Paper No. 16452. *National Bureau of Economic Research*.

Ben Belgacem, S., Khatoon, G., Bala, H., & Alzuman, A. (2024). The Role of Financial Technology on the Nexus Between Demographic, Socio-economic, and Psychological Factors, and the Financial Literacy Gap. *Sage Open*, *14*(2), 21582440241255678.

Böhm, P., Böhmová, G., Gazdíková, J., & Šimková, V. (2023). Determinants of financial literacy: Analysis of the impact of family and socioeconomic variables on undergraduate students in the Slovak Republic. *Journal of Risk and Financial Management*, *16*(4), 252.

Çera, G., & Tuzi, B. (2019). Does gender matter in financial literacy? A case study of young people in Tirana. *Scientific papers of the University of Pardubice. Series D, Faculty of Economics and Administration. 45/2019*.

Chen, H. & Volpe, R. (2002). "Gender differences in personal financial literacy among college students", *Financial Services Review*, 11, 289-307.

Choudhury, D., & Dibyojyoti, B. (2015). Impact of socio economic factors on adoption of e-banking amongst salaried employee. *Int. J. Res. Manag*, 2321-3264.

Dinwoodie, T. J. (2010). "Ignorance is Not Bliss: Financial Illiteracy, the Mortgage Market Collapse, and the Global Economic Crisis*", University of Miami Business Law Review.* 18(2), 182-219.

Dwyer, P. D., Gilkeson, J. H., & List, J. A. (2002). Gender differences in revealed risk taking: evidence from mutual fund investors. *Economics Letters*, *76*(2), 151-158.

Epaphra, M. & Kiwia, B. P. (2021). "Financial literacy and participation in financial markets in Tanzania: An application of logit regression model", *Journal of Economic and Financial Science*, 14(1), 13, (DOI: 10.4102/jef.v14i1.545)

Fernandes et al. (2014). "Financial Literacy, Financial Education, and Downstream financial behaviour", Management Science, 60(8), 1861-1883, (DOI: 10.1287/mnsc.2013.1849)

Finke, M. S., Howe, J. S., & Huston, S. J. (2017). Old age and the decline in financial literacy. *Management Science*, *63*(1), 213-230.

Fonseca et al. (2012). "What Explains the Gender Gap in Financial Literacy? The Role of Household Decision Making", *Journal of Consumer Affairs*, 46(1), 90-106. (DOI: 10.1111/j.1745-6606.2011. 01221.x)

Garg, N., & Singh, S. (2018). Financial literacy among youth. *International journaL of sociaL economics*, *45*(1), 173-186.

Gupta, S. (2017). "A study of dimensions of financial literacy and its relationship with household savings and investment", Jagannath University.

Hirawati, H., Sijabat, Y. P., & Giovanni, A. (2021). Financial literacy, risk tolerance, and financial management of micro-enterprise actors. *Society*, *9*(1), 174-186

Hogarth, J. & Hilgerth, M. (2002). "Financial Knowledge, Experience and Learning Preferences: Preliminary Results from a New Survey on Financial Literacy", *Consumer Interest Annual,* 48, 1-7.

Jappelli, T., & Padula, M. (2013). Investment in financial literacy and saving decisions. *Journal of Banking & Finance*, *37*(8), 2779-2792.

Kadoya, Y. & Khan, M.S.R. (2020). "What determines financial literacy in Japan?", *Journal of Pension Economics and Finance*, 19, 353-371, (DOI: 10.1017/S1474747218000379).

Khuc et al. (2022). Factors influencing financial literacy of the poor in rural areas: Empirical research with the case of Vietnam. *Journal of Eastern European and Central Asian Research (JEECAR)*, *9*(4), 638-650.

Klapper, L. et al. (2013). "Financial literacy and its consequences: Evidence from Russia during the financial crisis", *Journal of Banking & Finance,* 37, 3904-3923

Letamendia et al. (2017). "Financial illiteracy, Motivation ad barrios to savings and investing by Spanish households", *FUNCAS Social and Economic Studies, 4,* 77-97.

Lind, T., Ahmed, A., Skagerlund, K., Strömbäck, C., Västfjäll, D., & Tinghög, G. (2020). Competence, confidence, and gender: The role of objective and subjective financial knowledge in household finance. *Journal of Family and Economic Issues*, *41*, 626- 638.

Longobardi, S., Pagliuca, M. M., & Regoli, A. (2017). Family background and financial literacy of Italian students: the mediating role of attitudes and motivations. *Economics Bulletin*, *37*(4), 2585-2594

Lusardi, A. & Mitchel S. (2008). "Planning and financial literacy: How do women fare?". *NBER Working paper No. 13750*

Lusardi, A. & Mitchell, S. (2007). "Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education Programs", *Wharton Pension Research Council Working Papers.*

Lusardi, A. (2008). "Household saving behaviour: the role of financial literacy, information and financial education programs", *NBER Working paper No. 13824.*

Lusardi, A. (2012). "Numeracy, Financial Literacy, and Financial Decision-Making", *NBER Working Paper No. 17821*.

Malhotra, K., & Vijay, P. (2024). The impact of demographics and socioeconomic factors on financial literacy: a study of India. *International Journal of Indian Culture and Business Management*, *33*(1), 22-46.

Mandell, L. & Klein, S. (2009). "The impact of financial literacy education on financial literacy behaviour", *Journal of financial counselling and planning,* 20 (1), 15-24.

Mate, R. & Dam, L. (2018). "Financial Literacy about Stock Market among the Participants of Bombay Stock Exchange" *International Journal of Emerging Research in Management &Technology,* 16 (7). *(*DOI: 10.23956/ijermt.v6i7.208).

Mishra, R. (2018). Financial literacy, risk tolerance and stock market participation. *Asian Economic and Financial Review*, *8*(12), 1457-1471.

Mulyana, E., & Dimyati, E. (2020). The role of socio-economic background, family economic education, and financial literacy on student decision making. In *Advances in Business, Management and Entrepreneurship* (pp. 668-671). CRC Press

Nicolini, G. et al. (2017).“Attitude Toward Risk and Financial Literacy in Investment Planning*”, Studies in Banking and Financial Institutions*, 307-320. (DOI: 10.1007/978-3-319-57592-6_14)

Potrich, A. C. G., Vieira, K. M., & Kirch, G. (2015). Determinants of financial literacy: Analysis of the influence of socioeconomic and demographic variables. *Revista Contabilidade & Finanças*, *26*, 362-377.

Sangeeta et al. (2022). Assessing the Association of Socio-Demographic Factors with Financial Literacy of Academic Employees in Haryana. *Industrial Engineering Journal*, *15*(10).

Singh, D. S., & Kumar, D. S. (2025). Gender Dynamics in Household Financial Decision-Making: A Socio-Economic Analysis of Urban and Rural Households in Hamirpur, Himachal Pradesh.

Taft, M. (2013). “The Relation between Financial Literacy, Financial Wellbeing and Financial Concerns”, *International Journal of Business and Management*, 8(11), 63-75. (DOI: 10.5539/ijbm.v8n11p63)

Teka, B. M., & Sharma, D. (2017). Influence of Demographic Factors on Users' Adoption of Electronic Banking in Ethiopia. *The Journal of Internet Banking and Commerce*, 1- 17.

Tinghög, G., Ahmed, A., Barrafrem, K., Lind, T., Skagerlund, K., & Västfjäll, D. (2021). Gender differences in financial literacy: The role of stereotype threat. *Journal of Economic Behavior & Organization*, *192*, 405-416.

Titko, et al. (2015). Financial Issues Perceived by Youth: Preliminary Survey for Financial Literacy Evaluation in the Baltics. *Oeconomia Copernicana*, 6(1), pp. 75-98, (DOI: http://dx.doi.org/10.12775/OeC.2015.004)

Tzora, V. A. (2025). Defining the Predictors of Financial Literacy for High-School Students. *Journal of Risk and Financial Management*, *18*(2), 45.

United States Financial Literacy and Education Commission (2007) Taking Ownership of the Future: The National Strategy for Financial Literacy. https://www.treasury.gov/about/organizational-structure/offices/Domestic-Finance/Documents/Strategyeng.pdf.

Vaarmets, T., Liivamägi, K., & Talpsepp, T. (2019). From academic abilities to occupation: What drives stock market participation?. *Emerging Markets Review*, *39*, 83-100.

Van Rooij, M., Lusardi, A., & Alessie, R. (2011). Financial literacy and stock market participation. *Journal of Financial economics*, *101*(2), 449-472.

Vieira, K. M., Potrich, A. C. G., & Mendes-Da-Silva, W. (2019). A financial literacy model for university students. In *Individual Behaviors and Technologies for Financial Innovations* (pp. 69-95). Springer, Cham.

Vyas, D. (2021). “Impact of financial literacy on post-retirement financial planning among salaried individuals”, IIS (Deemed to be University).

Wagner, J. (2015). “An analysis of the effects of financial education on financial literacy and financial behaviours”, *Dissertations, Theses, and Student Research from the College of Business*.50. http://digitalcommons.unl.edu/businessdiss/50

Xiao, J. & Chatterjee, S. (2014). “Factors associated with financial independence of young adults”, *International Journal of Consumer Studie*s, 38(4), 394-403. (DOI:10.1111/ijcs.12106)

Yong, H. N. A., & Tan, K. L. (2017). The influence of financial literacy towards risk tolerance. *International journal of business and society*, *18*(3), 469-484.

Yoong, J. (2010). “Financial illiteracy and stock market participation: Evidence from RAND American Life Panel”, *Wharton Pension Research Council Working Papers. 214.*

D’ Ambrosio, M. (2003, November). “Ignorance is not Bliss: The importance of financial education”, paper presented at the Contractual Savings Conference: Supervisory and Regulatory issues in Private Pensions and Life Insurance, November 3-7, 2003.

Agarwalla, S. K., Barua, S., Jacob, J., & Varma, J. R. (2012, June). *A survey of financial literacy among students, young employees and the retired in India*.

Šubic, R., Braje, I. N., & Žagi, K. (2019, June). Family background and financial literacy as a prerequisite for entrepreneurial intention of university students. In *Proceedings of FEB Zagreb International Odyssey Conference on Economics and Business* (Vol. 1, No. 1, pp. 678-689). University of Zagreb, Faculty of Economics and Business

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Students' Perception toward Digital Social Entrepreneurship: An Analysis with Reference to Public Universities of Odisha

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Abstract: Social entrepreneurship as a business model not only strives to address social issues but also aims to be economically viable. It uses innovative strategies to address different issues with the motive to bring a positive and sustainable impact to society. The purpose of this research is to study the perception of postgraduate students studying in Public Universities in Odisha towards digital social entrepreneurship. It also aims to analyze the impact of the students' demographic profile on their perceptions. The study used an online questionnaire to gather data from 278 university students, and it was analyzed using SPSS software. The impact of demographic profile on students' perception of digital social entrepreneurship is studied using chi-square. Factor analysis was done to identify the major factors influencing the perception of the students towards digital social entrepreneurship. Further, correlation was used to study the association among the identified factors. The study identified factors such as Attitude towards digital social entrepreneurship and Empathy that strongly impact the perceptions of students towards digital social entrepreneurship, and further correlation analysis revealed that these identified factors are related.

1. Introduction

In recent times, Entrepreneurship as a term has witnessed a notable transformation, marked by a substantial rise in the involvement of individuals(entrepreneurs) worldwide in contributing towards the growth of their economy. Entrepreneurship is a crucial concern not only in developed nations but also in underdeveloped ones, as it contributes to the enhancement of a nation's economic well-being (Yi, 2021). India has positioned itself as a significant developing and emerging economy on the global level due to the positive changes in the political and economic environment. Entrepreneurship is considered an important aspect of promoting economic and social advancement at a national level (Neneh, 2022).

The term "social entrepreneurship" was first used in the academic literature by Howard Bowen in his book in the year 1953. However, the concept gained widespread attention and formal recognition in the 1980s and 1990s through the work of Bill Drayton. While conventional entrepreneurial motives often prioritize profit-making and market dominance, there has been a parallel rise in a distinct movement, which is focused on social impact and sustainable development. This shift in perception among entrepreneurs has led to the beginning of a thriving field known as social entrepreneurship, where individuals utilize business principles to tackle pressing social and environmental issues. Digital social entrepreneurship, a subset of this broader concept, covers the efforts of individuals who use their digital knowledge and vision to bring about positive change in society by addressing their needs. Whether they are empowering marginalized communities, advocating for environmental sustainability, or promoting gender equality, these digital entrepreneurs are at the forefront of transformative action.

Odisha, with its growing infrastructure in the education sector and increasing focus on technology and innovation, presents an opportunity to explore the perception of students toward digital social entrepreneurship. These universities have a vital role in developing the entrepreneurial mindsets of these students by arming them with the knowledge and skills needed to navigate this field. With this context, this study attempts to carry out a study to find the major factors that have an impact on students' perception toward digital social entrepreneurship. Further, it also attempts to study the impact of demographic factors on students' perceptions.

2. Review of Literature

Soomro et al. (2021) carried out a study to investigate the entrepreneurial attitude of public-sector university students in Thailand by using a model based on the Entrepreneurial Attitude Orientation (EAO) scale. This scale includes components such as achievement, self-esteem, personal control, and innovation, which have been found to effectively measure entrepreneurial attitudes, whereas it is discovered that self-esteem did not have a major impact on entrepreneurial attitudes, suggesting that students may not have enough confidence in their business skills. Their study determined that students with a strong drive to reach goals, take charge of their actions, and think creatively are more attracted to building entrepreneurial ventures. Similarly, Belwal & Balushi (2015) conducted research that examines the perception of students at Sohar University in Oman regarding entrepreneurship and the contribution of universities toward enterprise education. A questionnaire-constructed survey was conducted, collecting data from a sample of 200 students. They found out that although a majority of students express enthusiasm and interest in launching their businesses, they lack the essential knowledge required for such. They also concluded that the factors that motivate them to pursue entrepreneurship include students' willingness, sociable nature, and connections with established entrepreneurs, while the major obstacles are fear of failure and risk avoidance.

Ajzen (1991) conducted a study to review the theory of planned behavior (TPB) and evaluate its effectiveness in predicting behavior based on attitudes, subjective norms, and perceived behavioral control. It was found that TPB is well-supported by empirical evidence, demonstrating high accuracy in predicting intentions and actual behavior. This TPB is used as a foundational model by Lopez et al. (2021) to carry out a study to describe the relationship between students' perceptions based on learning from programs done on entrepreneurship. By using the data available at the GUESS Project. They concluded that attitudes toward entrepreneurial perception and perceived behavior control have a positive influence on the entrepreneurial intentions of the students. Further, Urban & Kujinga's (2017) extended their study aimed to fully comprehend the concept of social entrepreneurship by exploring how institutional factors influence social entrepreneurship (SE) intentions, particularly by examining the regulatory environment's role in emerging markets like South Africa. They found out that the governing bodies have a noteworthy as well as positive effect on perceived feasibility and perceived desirability, which, moving ahead, also significantly influences SE intentions. Peterman & Kennedy (2003) attempted to study whether participation in an enterprise education program has any impact on the perceptions of students towards the desirability and feasibility of starting a business. They found that the program has significantly led to higher desirability and feasibility in students towards creating their own business, and also concluded that prior positive experience also plays a significant role in it. Giving it a new dimension, Ghatak, Chatterjee & Bhowmick (2020) have conducted a study in India to explore the factors influencing intentions toward digital social entrepreneurship (IDSE) using the Theory of Planned Behavior along with Expectancy theory. They concluded that prior social and digital experiences significantly impact IDSE through factors such as Perceived feasibility and Perceived desirability.

Nga & Shamuganathan 's (2010) research focused on studying the impact of personality behavior on social entrepreneurship dimensions; they considered the big five personality traits to judge it. Their study revealed that agreeableness positively impacts all dimensions of social entrepreneurship. Whereas openness has a positive impact on a few dimensions, i.e., social vision and innovation. In a related study, Escobedo et al. (2011) explored the impact of gender on the perceptions of university students toward entrepreneurship. He found out that gender plays an important role in determining how the personality of the entrepreneur is shaped and perceived. It also shows how they start their own business.

Kusio & Fiore's (2020) research aimed at studying the perceptions of students towards entrepreneurship education provided by the university. They concluded that the role of the university is still not prominently affecting students' perceptions, highlighting a clear disparity between students' expectations and the entrepreneurship education they receive.

In recent studies, Hossain et al. (2022) highlighted the importance of Social Entrepreneurial Orientation (SEO) by finding out that elements like social vision, innovativeness, and risk-taking significantly shape students' entrepreneurial behavior. Adding to it, Viswanath & Kumar (2023) developed a cognitive appraisal scale that identified relevance, resources, coping potential, and normative beliefs as core factors in influencing the decisions on social entrepreneurship. Further pro-sustainable orientation is being introduced by Gomes et al. (2024) as a key motivator, explaining that sustainability values may outweigh feasibility concerns. Same year, Viswanath et al. (2024) highlighted that life experience and community focus are vital in opportunity recognition.

3. Research Gap

Numerous studies have explored students' social entrepreneurial attitudes and intentions through different perception models. Much of this existing literature is limited to identifying personality traits, institutional influences, and other factors that influence the students' perception of social entrepreneurship or traditional entrepreneurship. Whereas, only a few studies are directed towards digital social entrepreneurship, which is an emerging subset of social entrepreneurship. After reviewing multiple articles, it was found that few or no studies on this area are being carried out among students of Odisha. Therefore, this study has attempted to analyse the factors that have an impact on the social entrepreneurial intentions of the students by taking into account the digital perspective.

4. Objectives of the Study

The study is undertaken with the following objectives:

- To assess the impact of students' demographic profile (Gender, Age, and Family Business Background) on their perception towards digital social entrepreneurship, and
- To identify the factors influencing the perceptions of public university students regarding digital social entrepreneurship.

5. Hypothesis of the Study

H_{01}: There is no impact of gender on students' awareness of digital social entrepreneurship.
H_{02}: There is no impact of age on students' awareness of digital social entrepreneurship.
H_{03}: There is no impact of the student's family business background on the student's awareness of digital social entrepreneurship.

6. Research Methodology

The study aimed to analyze the factors affecting the perception of Odisha University students towards digital social entrepreneurship. Along with studying the impact of students' demographic profile on the perception of students towards digital social entrepreneurship. The targeted population for this study consisted mainly of post-graduate commerce students from the state universities of Odisha. The sample consists of 278 students from both first and second-year postgraduate students. A random sampling technique is used to gather the data. The primary source method was used to collect the information from the respondents through a questionnaire method. Secondary sources, i.e., the internet, articles, and periodicals, were used to study the existing literature and gain a brief understanding of the conceptual context.

The questionnaire consisted of 30 questions divided into five sections. The first section comprises the demographic profile of the respondents. The second, third, fourth, and fifth sections consisted of the questions to judge the perception of students toward digital social entrepreneurship. A total of 5 factors were identified to judge the perceptions of students toward digital social entrepreneurship based on the existing literature. Multiple papers have been done already on how to judge perception although this study doesn't intend to dive deep into these already existing theories of perception rather it focuses on taking them as a base which will help in determining the factors that can be used in our study to judge the perception of students towards digital social entrepreneurship. The perception theories that were mainly used in our study to decide the factors were the Theory of planned behavior (Ajzen, 1991), Social entrepreneurship behavior (Mair & Noboa, 2006), the Entrepreneurial event model (Shapero & Sokol, 1982), and the social entrepreneurship intentions model (Schmit,2017). The five identified factors for our study were Attitude toward social entrepreneurship, Empathy, Perceived desirability, Perceived feasibility, and Personal factors affecting social entrepreneurship.

Table 1: Factors Explained

Sl. No.	Factors	Meaning
1	Attitude toward social entrepreneurship	It explains, based on its perception, how much an individual is attracted to social entrepreneurship as a career option.
2	Empathy	It explains how motivated social entrepreneurs were to address societal challenges by fostering a deep emotional connection with the problems faced by others.
3	Perceived desirability	It explains how attractive it is to an individual.
4	Perceived feasibility	It explains how confident an individual is in their performance or ability to do so.
5	Personal factors affecting social entrepreneurship	It explains how personal factors, i.e., Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism, have an impact on individuals' perceptions of social entrepreneurship.

Source: *Author's compilation*

Further, to analyze the collected data, different descriptive statistical tools, such as standard deviation and mean, are used to define the students' demographic profiles. Using SPSS software, the chi-square test is carried out to examine the impact of demographic factors on the perception of students toward digital social entrepreneurship. Factor analysis was used to find the major factors influencing the perceptions of students toward digital social entrepreneurship at different state universities in Odisha. Correlation analysis was also carried out to examine the associations between the identified factors.

7. Data Analysis

The purpose is to analyse how students' demographic profile impacts their perception of digital social entrepreneurship. The respondents' demographic profile is presented using descriptive statistics.

Table 2: Descriptive Statistics

N=278	Min	Max	Mean	SD
Attitude toward digital social entrepreneurship	1	5	3.98	1.125
Empathy	1	5	2.86	1.297
Perceived desirability	1	5	3.41	1.090
Perceived feasibility	1	5	3.05	1.242
Personal factors affecting digital social entrepreneurship	1	5	3.09	1.008

Source: *Primary data*

Table 2 shows the descriptive statistics of the identified factors considered in the study. It shows that the attitude toward digital social entrepreneurship can be considered an important factor that impacts the students' perception toward digital social entrepreneurship, with the highest mean of 3.98. It is followed by other factors like personal factors affecting social entrepreneurship and perceived desirability. The standard deviations highlight the variations among the respondents' perceptions. Attitude towards digital social entrepreneurship (SD=1.125) shows relatively consistent agreement among the students. Perceived desirability (SD = 1.090) and personal factors affecting digital social entrepreneurship (SD = 1.008) reflect moderate variation. However, Empathy (SD = 1.297) and Perceived feasibility (SD = 1.242) exhibit higher variation, indicating diverse opinions on emotional connection and practicality in digital social entrepreneurship. The minimum response value for all the factors is said to be 1 (strongly disagree), and the maximum response value for all factors is said to be 5 (strongly agree), showcasing that opinions are diverse.

Test of hypothesis:

H_{01}: There is no impact of gender on students' awareness of digital social entrepreneurship.

Table 3: Gender and Students' Awareness of Digital Social Entrepreneurship

	Values	DF	Asymptotic Significance (2-sided)
Pearson Chi-square	31.171	2	.053
Likelihood Ratio	29.217	2	.090
Linear-by-linear association	1.106	1	.093
N of valid cases	278		

Source: *Primary data*

Table 3 indicates that there is no significant relationship between gender and students' awareness of digital social entrepreneurship. With a significance value, i.e., 0.053, which is more than 0.05. Hence, the null hypothesis is accepted. Thus, gender is not an important factor in students' awareness of digital social entrepreneurship.

H_{02}: There is no impact of age on students' awareness of digital social entrepreneurship

Table 4: Age and Students' Awareness of Digital Social Entrepreneurship

	Values	DF	Asymptotic Significance (2-sided)
Pearson Chi-square	31.748	3	.070
Likelihood Ratio	10.218	3	.068
Linear-by-linear association	2.620	1	.069
N of valid cases	278		

Source: *Primary Data*

Table 4 indicates that there is no significant relationship between age and students' awareness of digital social entrepreneurship. With a significance value, i.e., 0.070, which is more than 0.05. Hence, the null hypothesis is accepted. Thus, age is not an important factor in students' awareness of digital social entrepreneurship.

H_{03}: Students' family business background does not influence their awareness of digital social entrepreneurship.

Table 5: Students' Family Business Background and Students' Awareness of Digital Social Entrepreneurship

	Values	DF	Asymptotic Significance (2-sided)
Pearson Chi-square	28.255	4	.060
Likelihood Ratio	32.543	4	.078
Linear-by-linear association	2.820	1	.069
N of valid cases	278		

Source: *Primary data*

Table 5 indicates that there is no significant relationship between students' family business and students' awareness of digital social entrepreneurship. With a significance value, i.e., 0.060, which is more than 0.05. Hence, the null hypothesis is accepted. Thus, a student's family business background is not an important factor in students' awareness of social entrepreneurship.

Reliability test:

Table 6: KMO and Bartlett's Test

KMO Measure of Sampling Adequacy	0.812
Bartlett's Test of Sphericity	
Approx. Chi-Square	1523.476
DF	190
Sig.	0.000

Source: *Primary data*

The appropriateness of the adequacy of sample data was tested using the KMO test before going for factor analysis. The KMO value is 0.812, which is taken as "meritorious(good)" according to Kaiser's scale. A KMO value above 0.80 ensures that the data is suitable for factor analysis as the correlations among the variables are good enough for extracting reliable factors. Further, Bartlett's Test of Sphericity gives a Chi-Square value of 1523.476, with 190 DOF, and the associated p-value (Sig.) is 0.000. This indicates that the test is statistically significant as $p<0.05$, which means the null hypothesis (i.e., the correlation matrix is an identity matrix) is rejected. Hence, we conclude that there are significant correlations among variables, which makes the data appropriate for factor analysis.

Factor Analysis

The objective of this study is to identify the factors impacting the perceptions of public university students toward digital social entrepreneurship. Based on the analysis of the existing literature, 5 factors have been identified from the already proposed theories to study the students' perception toward digital social entrepreneurship. The discussion on each identified individual factor is as follows:

Factor 1: *Attitude toward digital social entrepreneurship* is constituted of five items, i.e., digital social entrepreneurship is beneficial for addressing social issues, it is a rewarding career path, an innovative approach to solving social issues, enjoy the process of creating digital social entrepreneurship, do risks outweigh the benefits of digital social entrepreneurship. "Enjoy the process of creating digital social entrepreneurship" exhibits the highest item load at 0.788. This factor has a total load of 3.783 and accounts for the highest coverage of variance, i.e., 21.254%. The item "enjoy the process of creating digital social entrepreneurship" has the highest factor loading of 0.788, indicating its significant impact in shaping an individual's attitude toward digital social entrepreneurship. Enjoyment derived from engaging in digital social entrepreneurship emerges as a crucial motivational factor, positively influencing perceptions. With a total factor load of 3.783 and explaining 21.254% of the variance, this factor explains the importance of attitude in attracting individuals to digital social entrepreneurship. The findings suggest that personal satisfaction, innovation, and perceived benefits strongly influence one's inclination to pursue digital social entrepreneurship as a rewarding career.

Factor 2: *Empathy* consists of five items i.e., digital solutions can significantly improve lives, drawn to projects that use technology to bring positive change, feel motivated to address root causes of social issues using digital tools, helping using digital tools gives you personal satisfaction, you believe digital platforms help people in need to amplify their voices. From the above items, "feel motivated to address root causes of social issues using digital tools" exhibits the highest item load of 0.810. This factor has a total load of 3.915 and accounts for 19.501% of the variance. The item "feel motivated to address root causes of social issues using digital tools" has the highest factor loading of 0.810, implying it is the most persuasive component in shaping empathetic attitudes. This advocates a strong desire among the respondents to tackle the fundamental causes of social problems through technology, which is a key driver of empathetic motivation in social entrepreneurship. With a total factor load of 3.915 and explaining 19.501% of the variance, this factor is considered the most significant factor in the dataset. This explains the role of empathy behind the motivation to address the root causes by fostering a deep emotional connection with societal issues. Such motivation inspires social entrepreneurs to use digital platforms effectively to bring positive change, amplify the voices of those in need, and find personal fulfilment in these efforts.

Factor 3: *Perceived Desirability* is constituted of 5 items i.e., digital social entrepreneurship is a meaningful way to make a difference, becoming a digital social entrepreneur is appealing, digital social entrepreneurship provides a unique way to combine innovation with purpose, following a career that benefits both society and myself, engaging in digital social entrepreneurship bring a sense of fulfillment. The item “following a career that benefits both society and myself” exhibits the highest factor load of 0.720. This factor has a total load of 3.382 and accounts for the highest coverage of 14.254% of the variance. In this set of items, the statement "following a career that benefits both society and myself" stands out with a factor load of 0.720, showing it has the biggest impact on the overall level of attractiveness. This indicates that people are particularly drawn to digital social entrepreneurship when they view it as a means to achieve personal objectives while also benefiting society. The factor loading for Perceived Desirability is 3.382, explaining 14.254% of the variance in the data. This signifies that although it is a crucial factor, it accounts for a lesser part of the total variance in comparison to other factors. To conclude, the main factor influencing perceived attractiveness is the idea that social entrepreneurship provides a career that combines personal rewards with contributions to society.

Factor 4: *Perceived feasibility* is constituted of 4 items, i.e., possible to start social digital entrepreneurship while still studying, access to guidance acts as a help to begin, believe adequate support is available to begin, can balance digital social entrepreneurship and personal commitments. The item “can balance digital social entrepreneurship and personal commitments” exhibits the highest item load of 0.829. This factor has a total load of 3.378 and accounts for the highest coverage of 12.253% of variance. It shows that it is the most vital factor in shaping how a person sees feasibility. This implies that successfully balancing personal and business responsibilities is crucial in determining an individual's confidence in participating in digital social entrepreneurship. People who think they can manage these requirements are more inclined to believe that establishing and operating a social enterprise is good. Perceived Feasibility has a factor load of 3.378, explaining 12.253% of the data variance; it accounts for only a small amount of the total variability. It explains that the strongest factor contributing to perceived feasibility is the skill to manage personal and entrepreneurial obligations effectively. People who believe in their ability to balance both personal and professional lives are more inclined to see digital social entrepreneurship as feasible and attainable.

Factor 5: *Personal factors affecting digital social entrepreneurship* are constituted of 5 items i.e., curiosity to explore new ideas motivates you to be a digital social entrepreneur, your strong organizational skill will help you to succeed, your outgoing personality will help you build your networking, your compassion helps you to motivate you to be digital social entrepreneur, do you think your stress can be a hindrance. The item “do you think your stress can be a hindrance” exhibits the highest item load of 0.739. This factor has a total load of 3.092 and accounts for the highest coverage of 10.745% of the variance. The item "do you think your stress can be a hindrance" has the highest factor load of 0.739, meaning it has the most influence on shaping how individuals view the impact of their traits on digital social entrepreneurship potential. This implies that people who see stress as a major challenge are more inclined to view it as something that hinders their success in becoming digital social entrepreneurs. Stress plays the biggest role in influencing how well they can handle the pressures of being a digital social entrepreneur. It has a factor load of 3.092, accounting for 10.745 percent of the data's variance. Even though this factor contributes less to the overall variance, it emphasizes how personal traits have a substantial role in determining an individual's inclination toward digital social entrepreneurship. We can say that stress is viewed as a possible obstacle that has the biggest impact on how someone sees social entrepreneurship based on personal factors. This emphasizes how neuroticism, a fundamental personality trait, affects their capacity to cope with the demands of entrepreneurship. Traits like curiosity, organizational skills, and an outgoing personality play a role, but stress perception has the biggest impact on how personality affects the possibility of becoming a digital social entrepreneur.

Correlation Matrix:

Table 7: Correlation Matrix of Factors

	ADSE	EM	PD	PF	PDSE
Attitude toward Digital Social Entrepreneurship	1				
Empathy	0.65	1			
Perceived desirability	0.61	0.62	1		
Perceived feasibility	0.58	0.59	0.56	1	
Personal Factors Affecting Digital Social Entrepreneurship	0.52	0.57	0.48	0.52	1

Source: *Primary data*

Table 7 shows a moderately strong positive correlation (0.65) between Attitude toward Digital Social Entrepreneurship (ADSE) and Empathy (EM), indicating that individuals with higher empathy tend to have a positive attitude toward digital social entrepreneurship. Likewise, there is a positive correlation (0.61) between Attitude toward Digital Social Entrepreneurship (ADSE) and Perceived Desirability (PD), indicating that those who find digital social entrepreneurship desirable are also likely to have a favourable attitude toward it. A correlation (0.56) exists between Perceived Desirability (PD) and Perceived Feasibility (PF), suggesting that those who perceive digital social entrepreneurship as feasible are also more likely to consider it desirable. A notable correlation of (0.62) is there between Empathy (EM) and Perceived Desirability (PD), showing that empathetic individuals pursue it as a more desirable option. Furthermore, Personal Factors Affecting Digital Social Entrepreneurship (PDSE) moderately correlate with Empathy (EM) with (0.57) and Perceived Feasibility (PF) with (0.52) indicating that personal traits like openness, conscientiousness, extraversion, agreeableness, and neuroticism influence both empathy towards digital social entrepreneurship and perceived ability to engage in digital social entrepreneurship. In general, we can see that every correlation is positive, indicating that rises in one variable are linked to rises in others, with the connections varying from moderate to rather solid.

8. Results and Discussion

Based on the analysis, attitude toward digital social entrepreneurship emerged as the most substantial factor; this result aligns with the findings of Lopez et al. (2021), but they carried out the study on social entrepreneurial intentions without taking the digital aspect into account. In our study with the mean of 3.98, and a comparatively low standard deviation of 1.125, indicating consistent responses among participants. This suggests that students generally hold a positive attitude towards digital social entrepreneurship, recognizing its potential benefits and innovative solutions for addressing social issues. Notably, the item "enjoy the process of creating digital social entrepreneurship" had the highest factor loading (0.788), highlighting enjoyment in the creation process as a critical motivational driver. Empathy, with a mean of 2.86 and a higher standard deviation (1.297), reflects more varied perceptions. The highest-loading item, "feel motivated to address root causes of social issues using digital tools" (0.810), emphasizes a deep emotional connection with societal challenges as a key motivator. This suggests that students who exhibit higher empathy are more inclined to engage in social entrepreneurship, driven by a desire to create meaningful social change through technology. Perceived desirability and perceived feasibility also contribute significantly toward students' perceptions. This finding also aligns with a previous study carried out by Peterman & Kennedy (2003), but they have not considered the digital perspective. Perceived desirability had an item "following a career that benefits both society and myself" (0.720), with the highest item load explaining that students are drawn to digital social entrepreneurship when they perceive it as a career that not only will benefit society but also will satisfy them. Meanwhile, perceived feasibility had an item “can balance digital social entrepreneurship and personal commitments” (0.829), with the highest item load indicating that students perceive it as desirable only when they believe that they can balance both personal and professional lives. Personal factors affecting digital social entrepreneurship had an item “do you think your stress can be a hindrance” (0.739) explains that students who see stress as a major challenge are more inclined to view it as something that hinders their success in becoming digital social entrepreneurs. Moreover, the correlation matrix reveals strong interrelationships among these 5 identified factors. It is found that there is a positive correlation (0.65) between attitude toward digital social entrepreneurship and empathy, suggesting that students with higher empathy have more favourable attitudes. Additionally, perceived desirability and perceived feasibility show moderate correlations with other factors, indicating that students who find digital social entrepreneurship desirable also view it as feasible. These correlations emphasize the interconnected nature of motivational, emotional, and practical factors in shaping students' perceptions.

9. Conclusion

In conclusion, the study highlights key insights into public university students' perceptions of digital social entrepreneurship. The findings reveal that attitude is the most influential factor, driven by the enjoyment and personal satisfaction derived from creating digital social ventures. This shows that encouraging a positive attitude through engaging and rewarding experiences can significantly enhance students' interest in building digital social entrepreneurship. Additionally, empathy emerged as a critical component, indicating that students out of empathetic behaviour are motivated to address the root causes of social issues and are more likely to go for digital social entrepreneurship. Educational institutions can use this to their advantage by incorporating empathy-driven programs and real-world problem-solving initiatives into their curriculum. The study also emphasizes the importance of perceived desirability and feasibility. Students are more expected to go for digital social entrepreneurship when they perceive it as personally fulfilling and practically manageable. Therefore, providing mentorship, resources, and support systems can enhance students' confidence and perceptions of feasibility. The correlation analysis further reveals the interconnectedness of these factors, suggesting that a holistic approach that addresses emotional, motivational, and practical aspects is essential for promoting digital social entrepreneurship.

10. Limitations of the Study

The research was limited to a sample of 278 university students taken from public universities in Odisha, which might affect the generalization of the findings to a broader population.

11. Future Scope of the Study

Future research scope can be to explore additional factors, such as the role of technological literacy and cultural influences, to provide a more comprehensive understanding. There is also a need to study the influence of institutional support and policy frameworks on shaping students' perceptions and motivations. By addressing these gaps, educators and policymakers can create a more supportive ecosystem that encourages the next generation of entrepreneurs to drive meaningful societal change by optimally utilising the digital resources.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211. https://doi.org/10.1016/0749-5978(91)90020-T

Belwal, R., Al Balushi, H., & Belwal, S. (2015). Students' perception of entrepreneurship and enterprise education in Oman. *Education+Training, 57*(8/9), 924-947. https://doi.org/10.1108/ET-12-2014-0149

Bowen, H. R. (1953). *Social responsibilities of the businessman*. Harper & Row.

Ghatak, A., Chatterjee, S., & Bhowmick, B. (2020). Intention towards digital social entrepreneurship: An integrated model. *Journal of Social Entrepreneurship*. 14(2), 131-151. https://doi.org/10.1080/19420676.2020.1826563

Gomes, S., Lopes, J. M., & Trancoso, T. (2024). The green seed: The influence of pro-sustainable orientation on social entrepreneurship in higher education students. *Industry and Higher Education*. https://doi.org/10.1177/09504222241297550

Hossain, M. U., Rahman, M. M., & Rahman, M. A. (2022). Graduate students' behavioral intention towards social entrepreneurship: Role of social vision, innovativeness, social proactiveness, and risk-taking. *Sustainability*, *13*(11). https://doi.org/10.3390/su13116386

Kusio, T., & Fiore, M. (2020). The perception of entrepreneurship culture by internal university stakeholders. *European Business Review, 32*(3), 443-457. https://doi.org/10.1108/EBR-05-2019-0087

Lopez, T., Alvarez, C., Martins, I., Perez, J. P., & Román-Calderón, J. P. (2021). Students' perception of learning from entrepreneurship education programs and entrepreneurial intention in Latin America. *Academia Revista Latinoamericana de Administración, 34*(3), 419-444. https://doi.org/10.1108/ARLA-07-2020-0169

Maity, S., & Sahu, T. N. (2021). Women entrepreneurs and determinants of their success: An empirical study. *Small Enterprise Development, Management & Extension Journal, 47*(2), 115-129. http://dx.doi.org/10.1177/09708464211032546

Neneh, B. N. (2022). Entrepreneurial passion and entrepreneurial intention: The role of social support and entrepreneurial self-efficacy. *Studies in Higher Education, 47*(3), 587–603. https://doi.org/10.1080/03075079.2020.1770716

Nga, J. K. H., & Shamuganathan, G. (2010). The influence of personality traits and demographic factors on social entrepreneurship start-up intentions. *Journal of Business Ethics, 95*(2), 259-282. https://doi.org/10.1007/s10551-009-0358-8

Peterman, N. E., & Kennedy, J. (2003). Enterprise education: Influencing students' perceptions of entrepreneurship. *Entrepreneurship Theory and Practice*, 28(2), 129-144. https://doi.org/10.1046/j.1540-6520.2003.00035.x

Sánchez-Escobedo, M. C., Díaz-Casero, J. C., Hernández-Mogollón, R., et al. (2011). Perceptions and attitudes towards entrepreneurship: An analysis of gender among university students. *International Entrepreneurship and Management Journal,* 7, 443–463. https://doi.org/10.1007/s11365-011-0200-5

San-Martín, P., Fernández-Laviada, A., Pérez, A., & Palazuelos, E. (2021). The teacher of entrepreneurship as a role model: Students' and teachers' perceptions. *The International Journal of Management Education, 19*(1). https://doi.org/10.1016/j.ijme.2019.100358

Segal, G., Borgia, D., & Schoenfeld, J. (2005). The motivation to become an entrepreneur. *International Journal of Entrepreneurial Behavior & Research, 11*(1), 42-57. https://doi.org/10.1108/13552550510580834

Shapero, A., & Sokol, L. (1982). The social dimensions of entrepreneurship. *Encyclopaedia of entrepreneurship*. Prentice-Hall.

Soomro, B. A., Memon, M., & Shah, N. (2021). Attitudes towards entrepreneurship among the students of Thailand: An entrepreneurial attitude orientation approach. *Education + Training, 63*(2), 239-255. https://doi.org/10.1108/ET-01-2020-0014

Tiwari, P., Bhat, A. K., & Tikoria, J. (2017). Predictors of social entrepreneurial intention: An empirical study. *South Asian Journal of Business Studies, 6*(1), 53-79. http://dx.doi.org/10.1108/SAJBS-04-2016-0032

Urban, B., & Kujinga, L. (2017). The institutional environment and social entrepreneurship intentions. *International Journal of Entrepreneurial Behavior & Research, 23*(4), 638-655. https://doi.org/10.1108/IJEBR-07-2016-0218

Veciana, J. M., Aponte, M., & Urbano, D. (2005). University students' attitudes towards entrepreneurship: A two countries comparison. *The International Entrepreneurship and Management Journal, 1*, 165–182. https://doi.org/10.1007/s11365-005-1127-5

Viswanath, P., & Kumar, A. (2023). Development and validation of social entrepreneurship career decisions scale among higher education students. *Asia Pacific Journal of Innovation and Entrepreneurship*, *18*(4), 375–400. https://doi.org/10.1108/APJIE-12-2023-0253

Viswanath, P., Annapally, S. R., & Kumar, A. (2024). Social entrepreneurial opportunity recognition among higher education students: Scale development and validation. *Social Enterprise Journal*, *20*(3), 339–363. https://doi.org/10.1108/SEJ-04-2023-0051

Yi, G. (2021). From green entrepreneurial intentions to green entrepreneurial behaviors: The role of university entrepreneurial support and external institutional support. *International Entrepreneurship and Management Journal, 17*(2), 963–979. https://doi.org/10.1007/s11365-020-00649-y

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Value Co-creation and Bank Image: Insights from Punjab's Banking Sector

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Abstract: With rise of service sector there is great revolution in banking sector. To survive in age of competition, banks need to be innovative. One of strategies employed by banks to be innovative is value co-creation between banks and customers where customers collaborate with banks by sharing their ideas, opinions and experiences with banks to bring forth mutual benefits. VCC (Value Co-Creation) builds positive bank image and results in customer loyalty. Favourable image of bank leads to better bank reputation and positive word of mouth about bank. Data was collected through questionnaire with sample of 512 bank customers in Punjab. CFA and SEM were applied to analyse the data. The R square of the endogenous construct *"Bank Image"* was found to be 36%. Banks providing good quality services to customers, offering innovative products and reliable services tend to yield positive results in the form of improved Bank image as well as reputation and customer satisfaction.

1. Introduction

In today's dynamic world, every business thrives to gain competitive advantage over the competitors and search innovative ideas to build strong relationships with the customers. One such approach that is currently adopted is the concept of VCC. Galvagno and Dalli, 2014 opined that the word value co-creation (VCC) is basically the collective efforts of bank and its clients to produce value for the company (bank) by the exchange of opinions, ideas and experiences. The process of VCC helps in building strong image and reputation of the bank, along with that it is also proved as a source of satisfaction to the customers (Mansilla et al., 2019). This study proposes measuring influence of co-created behaviour of bank's customers on bank's image.

In the banking industry also, participating and voluntary behaviour of customers have emerged to be powerful instrument enhancing the bank image. Earlier banks were only perceived as service providers but after introduction of co-creation behaviour, collaborative efforts between banks and the clients have impacted the banking sector as well (Caru and Cova, 2015). Banks surely deal with money and trust is the prominent factor here. Involvement of customers in product/service delivery by banks creates high amount of transparency and shared ownership. (Vargo and Lusch, 2004; Finne and Gronroos, 2017).

The advent of digital technology to engage consumers through various social media platforms, mobile apps, websites and the like has also led to drastic change in terms of resources being used by both the banks as well as the customers (Verhoef et al., 2009). Recent researches indicate, increased customer demand for superior quality products have forced banks to shift their approach from being product centric to customer centric (Mukherjee et al., 2013; Wang and Hajli, 2014; Zhao et al., 2015). Consequently, with an aim of meeting varied needs for both existing as well as potential clients, the banks are inclined towards the development of value co-creation.

Banking industry being based on SD logic and collaborative perspective, thus focuses on active engagement of customers to create value (Vargo, Maglio and Akaka, 2008). So firstly, involvement of banking customers in two innovative behaviours (CPB and CVB) provides an opportunity to the banks to determine the perceptions of their customers regarding service quality. In this way, they can develop solutions that deliver desirable service experiences. On the other hand, participation in co-production process allow banking customers to improve the anticipated advantages expected by them, by acquiring new abilities, as well as their participation in learning activities enhances their overall involvement in the banks (Prebensen et.al., 2016). Banking Services yielding significant benefits to the customers leads them in showing favorable behavioral intentions towards banks (Ghanbary et. al., 2022). They advocate favourable recommendations about the bank and express the satisfaction they have, towards the numerous services and financial products being offered by the banking firms. It further triggers customer loyalty (Cuong, 2020). In this context, value co-creation process not only involves identification of customer needs but also fosters customer loyalty and satisfaction (Moise et. al., 2021).

Customer co-creation behaviour being a practice, possesses mutual benefits both for the consumers as well as the banking organizations. Customers expect customized products, outstanding services, real time updates for their transactions (Kumar et al., 2009) to fulfill their personal needs and interests. Banks derives value through their customers who provide market insights, share new ideas, promote banking campaigns, provide feedback and build positive bank image (Hatch and Schultz, 2010; Ind and Coates, 2013; Thatcher et al., 2016). It can be said that whatever services a bank is providing, becomes source for building positive behaviour for creating value (Vargo and Lusch, 2008). Gronroos (2012) stated VCC as one of the best strategic models which helps firms to achieve success. Lorenzo (2021) also stressed that the banking firms that adopt the co-creation process are turned out to be more successful in generating new concepts of financial product development. Engaging customers actively in the value co-creation provides them a sense of reliability, belongingness and appreciation which ultimately brings about customer retention (Yang et.al, 2014). They show high repurchase patronage for the banks that allow them for collaborating with them, in creating value for each other. Fulfillment of banking customers’ expectations lead to client’s loyalty and affirmative referrals about the bank. Whereas, falling short about customers' perceptions results into complaining behaviour, high switching intentions and thereby bring hurdles in customer retention. For this, understanding as well as reacting proactively to the needs of the banking customers seems to be an important strategy to attain excellence.

In the service industry, specifically banking industry, noteworthy investment in learning about the consumer requirements and expectations is of paramount importance (Prahalad and Ramaswamy, 2000). It would help the banking entities to grow strongly and distinctively. Since consumer behaviour is quite complex and dynamic, involvement of bank’s clients in product/service development and delivery helps bank to develop new opportunities along with long-term relationships (Ibrahim & Najjar, 2008; Maciel and Camargo, 2016). The importance of VCC for banking sector has proved this fact that its application results in better Bank Image and the banks who do not consider the recommendations and opinions of the clients still starve for the success (Keshavarz and Jamshidi, 2018). The banking sector mainly faces a challenge of customer satisfaction and hence to satisfy banking customers, to retain them, is the only way out. Co-Creation not only proves to make significant influence on the customer satisfaction, but it also helps to gain the competitive advantage for bank, favourable image of bank, thus influences the loyalty of customer towards bank too (Bendapudi & Leone, 2003; Ibrahim & Najjar, 2008; Prahalad & Ramaswamy, 2004; Maciel & Camargo, 2016; Grott et al., 2019).

2. Dimensions of Customer Co-Creation

Based on the extensive literature, two factors of VCC (Value Co-Creation) have evolved; Customer Participation Behaviour (CPB) and Customer Voluntary Behaviour (CVB) as shown through figure 1 below. Customer Participation Behaviour scale was developed based on references as (Meuter et al., 2005; Yi and Gong, 2013; Mansilla, et al., 2019; Wong & Lai, 2019). Customer Vountary Behaviour construct scale is based on references as (Meuter et al., 2005; Yi and Gong 2013; Xie et al., 2019; Foroudi et al., 2019).

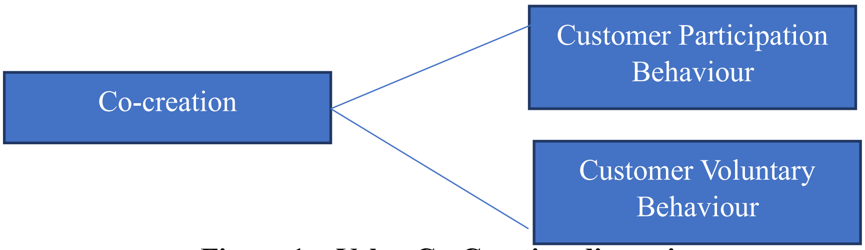

Figure 1: Value Co-Creation dimensions

Customer Participation Behaviour (CPB) is described by various authors as a compulsory role that a customer needs to perform if he is taking/availing any service (Meuter et al., 2005; Yi and Gong, 2013). As without active involvement, participation & engagement he/she cannot take benefit of the service and would not be capable enough of generating extra value for service providing bank (Yi et al., 2011). Customer Participation Behaviour has six sub-dimensions that form this behaviour such as, Information Seeking (INS), Information Sharing (IS), Responsible Behaviour (RB), Personal Interaction (PI) from (Foroudi et al., 2019); Motivation (M) and Ability (AB) scale from (Meuter et al., 2005; Tsai et.al, 2017)

Customer Voluntary Behaviour (CVB) is the extra role behaviour that helps the bank to generate extra value for bank and customers through its customers (Bove et al., 2009). The four dimensions taken for CVB are Feedback (FB), Advocacy (A), Helping (H) and Tolerance (T) (Yi and Gong, 2013; Foroudi et al., 2019).

Bank Image: It is the customer's impression about the bank in his/her mind based on bank's name, visual identity or logo, interaction and prior experiences with bank (Foroudi et al., 2019). Bank Image is the reflection of quality of bank's goods and services as perceived by clients and has a lot of significance in shaping the bank's marketing strategy (Phong and Anh, 2023). When customers engage in satisfactory experiences with a bank, they encourage friends and family members to avail services at their bank but at same time remain loyal towards bank in future. This enhances bank's image and reputation in the long run and leads to increase in profitability of banks. The construct Bank Image, has been taken from references, namely Williams and Mottiff (1997), Nguyen and Leblanc (2001), Foroudi et al., (2014), De Leaniz and Rodriguez (2016), Xie et al., (2019). In the present study, variable Company (Bank) Image is measured through five statements.

3. Review of Literature

Maria et al., (2014) investigated the role of marketing managers of Greek banks in establishing co-creation values with their customers regarding the electronic banking services they offer. For the investigation, DART model is used. Data collection was done by conducting personal interviews of managers so as to know their perspective. Interviews were conducted from five different branch managers of different banks in Greek. The results of the study revealed that four components, Dialogue, Access, Risk and Transparency were found to have profound significance in building co-creation values among customer and it was also supported from manager's perspective.

Mainardes et al., (2017) examined determinants that affect the VCC behaviour among banks and their clients. The contribution of these factors in building co-creation among customers was also judged. The elements of DART model were used in the study. Collection of data for present study was done through aid of online questionnaires sent to the random customers. Total 265 respondents fill the questionnaires shared on social networks. The respondents were selected from a major Brazilian bank and data was collected between December 2013 and January 2014. It was found, hypotheses framed using DART model represents that these variables make a significant influence on VCC. But, it was found that out of the four variables, that is Dialogue, access, risk assessment and transparency, the dialogue variable seems to have non-significant impact on customer VCC in the banking industry. The study revealed that banks must improve their technology for superior access to the customers.

Ida (2017) investigated the significance of involving customers in building behaviours to co-create value. Further the relationship between customerVCC and perceived value is also determined. For this study, the customer value co-creation behaviour is further segregated to CCB & CPB. Hypotheses developed for the study includes; H1, CPB and CCB is positively affected by involvement of customer and H2, Perceived value is directly influenced by CPB and CCB. A survey was worked out to test the hypotheses, in which 335 respondents were selected in two aspects, x and y generation. This segregation was made on the basis of age, family and income. The two hypotheses were tested separately by further considering the factors that comprise customer participation and customer voluntary behaviour such as information seeking, information sharing, personal interaction, helping, advocacy, tolerance and feedback. Analysis of data was carried out to reach conclusions. Findings revealed were that both the hypotheses were partly supported as there exists a difference between the respondents of both the generations.

Cambra Fierro et al., (2017) in their study analysed VCC influence on consumer satisfaction. Further an attempt was made to examine whether this satisfaction leads to the positive results through customers in the form of positive referrals and their loyalty specifically towards the banking industry. To incorporate cross cultural aspect, the customers were chosen from two different cultures to record their reviews. Spanish and British respondents who were customers in the retail banking industry were surveyed to collect data. Questionnaires were mailed to the respondents and 224 respondents filled up the questionnaires. Findings concluded VCC makes significant impact upon the satisfaction of the customers; this in turns results in the customer loyalty towards the business and their positive word of mouth. It was also seen that satisfaction acts as a mediator in creating loyalty and word of mouth through generating value to the customers. As far as cross cultural aspects were considered, it was found that British respondents were directly influenced through the VCC which resulted towards loyalty as well as positive word of mouth whereas Spanish respondents were more affected through satisfaction that further leads towards the loyalty and word of mouth.

Malar et al., (2019) investigated significance of IT enabled services in the contribution of customers to build the positive image of the company that could further prove to be of competitive advantage to company. In this paper, customers' experiences from services availed in an Indian banking system were considered. Data collection for present study was done by conducting semi-structured interviews from the active online customers of the bank. In total 22 interviews were held including face to face conversation as well as telephonic interviews. Official website, SBI was also used in order to collect some data. The study focused on three main questions that were; while delivering the online services, what type of risk is associated with the resources required by the banking system; what are the problems that customers face in contributing value to the firm and the difficulties related to the online banking system. Finding indicate though the co-creating value along with the help of clients have significant impacts for the company, but the negative experiences of the customers due to the hurdles faced by them may lead to value destruction too. The major difficulties that customers face include; rigidity of the online system and lack of information in a format customer expect. Complexity of the system was also considered as a major drawback. Thus, in order to be competitive, the online service system should be user friendly and not too complex.

Mansilla et al., (2019) analysed the relationship between co-creation and brand equity in the hotel industry. 604 visitors from two beachfront 4 star hotels belonging to Iberostar chain in Spain were personally surveyed using DART model to measure their degree of participation in VCC. Further PLS-SEM method using the smart PLS program was utilized. The findings state that level of visitor's participation in the service process is largely dependent on their perception of favour of VCC by hotel. Involvement of visitors in the service design process and delivery seems to have positive impact on both perceived value and brand equity. The study has important managerial implications in the sense that it allows hotel managers to apply differential brand strategies for attracting new customers and infuse loyalty among existing customers. Further, the findings also confirmed the positive relationship of brand equity and perceived value with customer satisfaction (CS).

Omar et al., (2020) examined the role of VCC in boosting brand equity with special reference to Small and medium enterprises in the service sector. The VCC behaviour was further divided into customer participation behaviour and customer citizenship behaviour. On the basis of which few hypotheses were generated; H1, Information seeking is positively associated with retailers brand equity, H2, Information sharing has a positive influence on retailers brand equity, H3, Responsible behaviour leads to establishing brand equity of retailers, H4, Personal interaction has a positive impact on retailers brand equity, H5, Feedback has a positive relationship with retailers brand equity, H6, Advocacy is positively associated with retailers brand equity, H7, Helping has a direct relationship with brand equity of retailers and H8, Tolerance is positively associated with Brand equity of retailers. Data collection was done through use of questionnaire method from the respondents of Malaysia in which owners of SMEs and consumers both were chosen. The administrated questionnaires were first distributed and then collected by the trained research assistants. 548 total valid questionnaires were selected for doing analysis. The data was analysed using PLS-SEM. The results revealed that out of 8, 5 hypotheses were supported. Thus Information seeking, Responsible Behaviour, Personal interaction, Advocacy and Tolerance are the factors that contribute towards creating brand equity of retailers. The other factors such as information sharing, helping and feedback do not act as a determinant in establishing retailers brand equity.

Garcia et al., (2021) explored the personal characteristics that lead to co-creating value and its impact on customer experience with reference to the banking industry. For this study, few hypothesis were formulated, H1, There is a positive impact of VCC on the customer experience, H2, consumer's level of connectivity directly influence the value co-creation, H3, consumer creativity positively influence the value co-creation, H4 knowledge also positively impacts the value co-creation process. For data collection, respondents were chosen from the major cities of Columbia. Data was collected with the help of structured questionnaire interviews from 406 customers.The analysis was done by using PLS-SEM technique. Results confirmed all the formulated hypotheses. It was found that connectivity, creativity and knowledge are the important antecedents in the co-creation process which ultimately leads toward the customer experience.

Gunawan and Rustiadi (2021) examined how value co-creation plays a part in the design of new digital banking products. Since in-depth interviews are face-to face, they are a qualitative method that was used to gather primary data from Indonesian Bank. Snowball sampling technique was applied. A sample of 12 respondents was selected for research. On basis of analysis, various co-creation initiatives were suggested as co-ideation, co-design, co-launching, co-testing and co-evaluation. Customer's involvement can be enhanced in banks through motivators like financial, personal, social, psychological and learning motives.

Galdolage and Rasanjalee (2022) investigated the activities that the customers need to undertake and they should be capable of for creating value co-creation while using self-service technologies in case of banking sector.A qualitative study was undertaken in Sri Lanka to investigate the various characteristics. Semi structured interviews were performed with 50 bank customers. The interviews were recorded for subsequent analysis. The findings revealed eight customers habits that bank customers engaged in, when using self-service technologies, along with five capabilities were also found through the results with special reference to Sri Lankan banking sector. Completing the necessary steps, acquiring information, collaborating with service providers, obeying directions, accepting mistakes, verifying transactions, completing formalities, and conducting the procedure were among the practices engaged. Language proficiency, computer proficiency, internet proficiency, gadget proficiency, and interface proficiency were the outcomes.

4. Research Methodology

A well designed and structured questionnaire was used to gather data from 512 bank customers.The responses have been collected using purposive sampling, from the customers of 5 public and 5 private banks from selected cities of Punjab, namely, Amritsar, Ludhiana, Jalandhar, representing three regions Majha, Malwa and Doaba respectively. The 10 selected banks were listed in Brand Finance Report of top 500 banking brands of the world, 2021. Bank customers belonging to different genders, age groups, occupations, qualifications and monthly incomes constituted a varied sample. A seven point Likert scale ranging from 'Very Strongly Agree (VSA) to Very Strongly Disagree (VSD)' was used to measure each of items under various constructs. Confirmatory factor analysis (CFA) and structural equation modelling (SEM) were used to analyze the collected data. Reliability of each factor was checked using Cronbach alpha, each value of Cronbach alpha being greater than 0.7.

(Bagozzi and Yi, 1988; Bonett and Wright, 2015).Convergent and discriminant validity were also found satisfactory using CFA, by calculating AVE and composite reliability (Anderson and Gerbing, 1988; Hair et al., 2006) and by using Fornell Larcker Criteria (1981) for each construct in present study. AVE being more than 0.5 and composite reliability more than 0.7 for all constructs in the study (Chin, 1998; Hair et al., 2021).

The following hypothesis was developed based on review of literature and objectives of the current investigation.

Hypothesis 1: "Value Co- Creation significantly influences the image of the bank"

In Figure 2 below, using SEM technique, the results of hypothesis testing are shown:

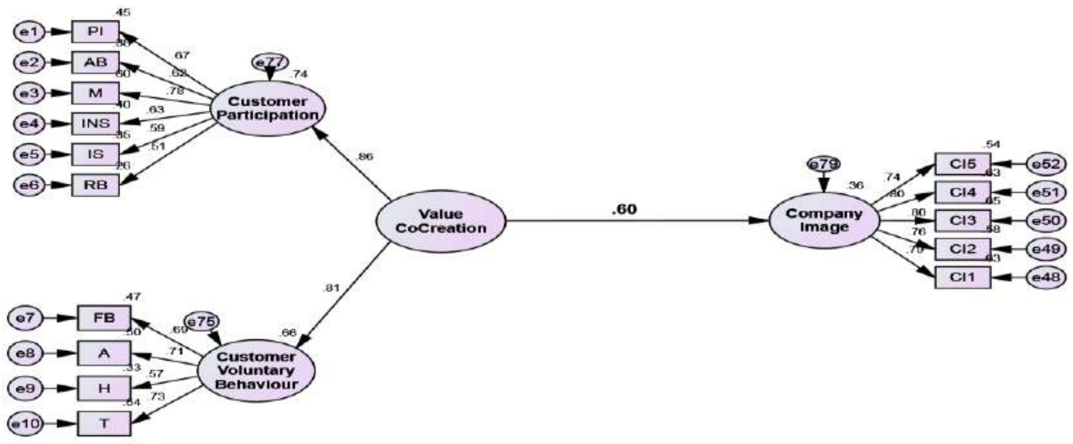

Figure 2: SEM Analysis through AMOS

Results of analysis using SEM, are reported in Table no.1

Table 1: Hypothesis testing using SEM

			Estimates[1]	S.E.[2]	C.R[3].	P value[4]	R Square
Customer Participation Behaviour	<---	Value Co-Creation	0.863				
Customer Voluntary Behaviour	<---	Value Co-Creation	0.811	.177	7.501	***	
Company(Bank) Image	**<---**	***Value Co-Creation***	***0.596***	***.170***	***7.440***	***	***36%***

Source: Author's calculation using AMOS

*(**1**= Path Coefficients, **2**= Standard Error, **3**= Critical Ratio, **4**= Significance Level)*

5. Findings and Discussion

The results as shown in Table 1 supported the hypothesis *"Value Co-Creation significantly influences the image of the bank"*. As shown in Figure 2, the path coefficient indicating the impact of Value Co-Creation on Bank Image was found to be 0.596, significant at 5 % level of significance. Thus, it can be concluded that the Value Co-Creation significantly influences the Bank Image. The results also reported that the path coefficients of the influence of Value Co-Creation is found to be positive representing that higher Value Co-Creation enhances the image of the bank. The R square of the endogenous construct *"Bank Image"* is found to be 36% indicating the explanatory power of the relationship. Thus, Company (Bank) Image was explained 36% by the value co-created in banks through in role and extra role behaviour of banks customers. The statistical fitness of the structural model in the study was estimated with the help of different fitness indices as shown in Table no.2.

Table 2: Statistical measure of Fitness

Statistical Measure of Fitness	Minimum Discrepancy of Confirmatory Factor Analysis /Degree of freedom (CMIN/Df)	Goodness of Fit Index (GFI)	Comparative Fit Index (CFI)	Tucker-Lewis Index (TLI)	Normed Fit Index (NFI)	Root mean square error of approximation (RMSEA)
Measured Value	3.435	0.928	.932	.918	.907	0.069
Required Value	Near to 3	More than 0.8	More than 0.9	More than 0.9	More than 0.8	0.08 or less

Source: Author's calculation using AMOS

The various model fit indices as GFI, CFI, TLI, NFI, RMSEA are as per the recommended values (Baumgartner and Homburg, 1996; Hu and Bentler, 1999; Schermelleh et al., 2003; Hair et al., 2010) indicating that above model is fit. Thus, the estimated indices as reported in Table no.2, indicate that the structural model representing the influence of VCC on Company (Bank) Image is estimated to be statistically fit.

Value Co-Creation is a two dimensional concept. Customer Participation Behaviour and Customer Voluntary Behaviour are its two dimensions. The results as given in above analysis indicate that Value co-creation has positive influence on Bank's Image. As indicated in Table no.1 that 36% of Bank's Image is influenced by value co-creation behaviour in banks which is possible through customer participation and customer voluntary behaviour. Involvement of customers through in role and extra role behaviour leads to co-creation which brings about innovations in services being offered by banks. By offering innovative products, personalized services, convenient digital banking solutions, and exceptional customer experiences, banks gain competitive advantage and have a better image and reputation in market. Based on positive feedback, word of mouth, suggestions about banking product or service, customers build a positive image of the bank which enhances bank's business, profitability and customer loyalty. When customers actively participate in VCC through customer participation and customer voluntary behaviour, it can enhance their perception of the bank's quality of products and services and lead to a stronger, more favourable bank image (Ozuem et al., 2021).Thus, a bank providing good quality services to customers, offering innovative products and reliable services tend to yield positive results in the form of improved bank image as well as reputation and customer satisfaction (Lu and Seock, 2008;Walsh and Beatty, 2007; Walsh et al., 2014; Narteh and Braimah, 2020).

6. Limitations and Scope for Future Research

The present study is a cross-sectional study to determine how value co-creation behaviour in banks affects banks' image. To more fully evaluate the effect of value co-creation on bank image, longitudinal research must be conducted. The present study has been carried across state of Punjab. A larger sample size may be used in future studies and research can be carried out in various regions of India. Future research can make a comparative study of various public and private banks across India with regard to influence of value co-creation The present research study has been undertaken by collecting data personally from bank customers. The same study can be undertaken through bank customers in online mode and a comparison can be made of the value co-created and its impact in both modes, between banks and its customers.

References

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modelling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*(3), pp. 411.

André Lorenzo, R. (2021). Value co-creation as key to customer satisfaction in digital services sales. In *Managing Industrial Services: From Basics to the Emergence of Smart and Remote Services* (pp. 195-201). Cham: Springer International Publishing.

Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, *16*, pp. 74-94.

Baumgartner, H., & Homburg, C. (1996). Applications of structural equation modeling in marketing and consumer research: A review. *International journal of Research in Marketing*, *13*(2), pp. 139-161.

Bendapudi, N., & Leone, R. P. (2003). Psychological implications of customer participation in co-production. *Journal of Marketing*, *67*(1), pp. 14-28.

Bentler, P. M., & Chou, C. P. (1987). Practical issues in structural modelling. *Sociological Methods & Research*, *16*(1), pp.78-117.

Bonett, D. G., & Wright, T. A. (2015). Cronbach's alpha reliability: Interval estimation, hypothesis testing, and sample size planning. *Journal of Organizational Behaviour*, *36*(1), pp. 3-15.

Bove, L. L., Pervan, S. J., Beatty, S. E., & Shiu, E. (2009). Service worker role in encouraging customer organizational citizenship behaviours. *Journal of Business Research*, *62*(7), pp. 698-705.

Brand Finance, 2021, Banking 500, https://brandirectory.com/reports/banking/2021

Cambra-Fierro, J., Grott, E., & Pérez, L. (2017). Towards a co-creation framework in the retail banking services industry: a cross-cultural analysis. In *XXIX Congreso de Marketing AEMARK (2017),* pp. 854-868. ESIC.

Carù, A., & Cova, B. (2015). Co-creating the collective service experience. *Journal of Service Management*, *26*(2), pp. 276-294.

Chin, W. W. (1998). The partial least squares approach to structural equation modelling. *Modern Methods for Business Research*, *295*(2), pp.295-336.

Cuong, D. T. (2020). The impact of brand experience dimensions on attitudinal loyalty and behavioral loyalty of motorcycle brands. *Journal of Advanced Research in Dynamical and Control Systems*, *12*(3), pp. 682-690.

Finne, Å. & Grönroos, C. (2017). Communication-in-use: customer-integrated marketing communication. *European Journal of Marketing*, *51*(3), pp. 445-463.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), pp.39-50.

Foroudi, P., Yu, Q., Gupta, S., & Foroudi, M. M. (2019). Enhancing university brand image and reputation through customer value co-creation behaviour. *Technological Forecasting and Social Change*, *138*, pp.218-227.

Galdolage, B. S., & Rasanjalee, R. M. K. S. (2022). Customer Capabilities and Value Co-Creation Practices in Self-service Technologies: Insights from Commercial Banks in Sri Lanka. *Asian Journal of Management Studies*, *2*(1).

Galvagno, M., & Dalli, D. (2014). Theory of value co-creation: a systematic literature review. *Managing Service Quality*, *24*(6), pp.643-683.

Ghanbary, S., Sharifi, S. M., & Momeni, S. (2022). OFD platform: consumers' persuasion based on economic, relational and enjoyment values. *Journal of Foodservice Business Research*, *25*(3), pp.329-352.

González-Mansilla, Ó. Berenguer-Contrí, G., & Serra-Cantallops, A. (2019). The impact of value co-creation on hotel brand equity and customer satisfaction. *Tourism Management*, *75*, pp.51-65.

Grönroos, C. (2012). Conceptualising value co-creation: A journey to the 1970s and back to the future. *Journal of Marketing Management*, *28*(13-14), pp.1520-1534.

Grott, E. M., Cambra-Fierro, J., Perez, L., & Yani-de-Soriano, M. (2019). How cross-culture affects the outcomes of co-creation. *European Business Review*, *31*(4), pp.544-566.

Gunawan, R., & Rustiadi, S. (2021). Banking digitally to micro-business: Exploring value co-creation strategy in new product development pdf. *ASEAN Marketing Journal*, *13*(1), pp.2.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). Multivariate Data Analysis, 7th Edition. NJ: Prentice Hall.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). Multivariate Data Analysis, 6th Edition. New Jersey: Pearson

Hatch, M. J., & Schultz, M. (2010). Toward a theory of brand co-creation with implications for brand governance. *Journal of Brand Management*, *17*, pp.590-604.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modelling: a Multidisciplinary Journal*, *6*(1), pp.1-55.

Ibrahim, H., & Najjar, F. (2008). Relationship Bonding Tactics, Personality Traits, Relationship Quality and Customer Loyalty: Behavioural Sequence in Retail Environment. *ICFAI Journal of Services Marketing*, *6*(4).

Ida, E. (2017). The role of customers' involvement in value co-creation behaviour is value co-creation the source of competitive advantage? *Journal of Competitiveness*, *9*(3), pp.51-66.

Ind, N., & Coates, N. (2013). The meanings of co-creation. *European Business Review*, *25*(1), pp.86-95.

Keshavarz, Y., & Jamshidi, D. (2018). Service quality evaluation and the mediating role of perceived value and customer satisfaction in customer loyalty. *International Journal of Tourism Cities*, *4*(2), pp. 220-244.

Kumar, M., Kee, F. T., & Manshor, A. T. (2009). Determining the relative importance of critical factors in delivering service quality of banks: an application of dominance analysis in SERVQUAL model. *Managing Service Quality: An International Journal*, *19*(2), pp. 211-228.

Lu, Y., & Seock, Y. K. (2008). The influence of grey consumers' service quality perception on satisfaction and store loyalty behavior. *International Journal of Retail & Distribution Management*, *36*(11), pp. 901-918.

Maciel, C. de O., & Camargo, C. (2016). Coproduction Factors in Strategic Networks. *Brazilian Business Review*, *13*(1), pp. 24–46.

Mainardes, E. W., Teixeira, A., & Romano, P. C. D. S. (2017). Determinants of co-creation in banking services. *International Journal of Bank Marketing*, *35*(2), pp.187-204.

Malar, D. A., Arvidsson, V., & Holmstrom, J. (2019). Digital Transformation in Banking: Exploring Value Co-Creation in Online Banking Services in India. *Journal of Global Information Technology Management*, *22*(1), pp. 7-24.

Maria T., Dimitris P. & Dafni N. (2014). Customer Value Co-Creation in Electronic Banking Services. ETAR, Vol 1, pp. 70-75.

Meuter, M. L., Bitner, M. J., Ostrom, A. L., & Brown, S. W. (2005). Choosing among alternative service delivery modes: An investigation of customer trial of self-service technologies. *Journal of Marketing*, *69*(2), pp. 61-83.

Moise, M. S., Gil-Saura, I., & Ruiz-Molina, M. E. (2021). "Green" practices as antecedents of functional value, guest satisfaction and loyalty. *Journal of Hospitality and Tourism Insights*, *4*(5), pp. 722-738.

Mukherjee, D., Gaur, A. S., & Datta, A. (2013). Creating value through offshore outsourcing: An integrative framework. *Journal of International Management*, *19*(4), pp. 377-389.

Narteh, B., & Braimah, M. (2020). Corporate reputation and retail bank selection: the moderating role of brand image. *International Journal of Retail & Distribution Management*, *48*(2), pp. 109-127.

Omar, N. A., Kassim, A. S., Shah, N. U., Shah Alam, S., & Che Wel, C. A. (2020). The influence of customer value co-creation behaviour on SME brand equity: An empirical analysis. *Iranian Journal of Management Studies*, *13*(2), pp. 165-196.

Ozuem, W., Willis, M., Howell, K., Helal, G., Ranfagni, S., & Lancaster, G. (2021). Effects of online brand communities on millennials' brand loyalty in the fashion industry. *Psychology & Marketing*, *38*(5), pp. 774-793.

Pena-Garcia, N., Losada-Otálora, M., Juliao-Rossi, J., & Rodríguez-Orejuela, A. (2021). Co-creation of value and customer experience: an application in online banking. *Sustainability*, *13*(18), pp. 10486.

Phong, V. T., & Anh, V. M. D. (2023). Impact of the Bank's Image and Reputation on Customer's Loyalty through Customer's Trust: A Case of Commercial Banks in Ho Chi Minh City. *Open Journal of Business and Management*, *11*(5), pp. 2652-2685.

Prahalad, C. K., & Ramaswamy, V. (2000). Co-opting customer competence. *Harvard Business Review*, *78*(1), pp. 79-90.

Prahalad, C. K., & Ramaswamy, V. (2004). Co-creation experiences: The next practice in value creation. *Journal of Interactive Marketing*, *18*(3), pp. 5-14.

Prahalad, C. K., & Ramaswamy, V. (2004). *The future of competition: Co-creating unique value with customers*. Harvard Business Press.

Prebensen, N. K., Kim, H., & Uysal, M. (2016). Co-Creation as moderator between the experience value and satisfaction relationship. *Journal of Travel Research*, *55*(7), pp. 934-945.

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2021). Partial least squares structural equation modeling. In *Handbook of Market Research* (pp. 587-632). Cham: Springer International Publishing.

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online*, *8*(2), pp. 23-74.

Thatcher, J., Alao, H., Brown, C. J., & Choudhary, S. (2016). Enriching the values of micro and small business research projects: co-creation service provision as perceived by academic, business and student. *Studies in Higher Education*, *41*(3), pp. 560-581.

Tsai, C. Y. D., Wu, S. H., & Huang, S. C. T. (2017). From mandatory to voluntary: consumer cooperation and citizenship behaviour. *The Service Industries Journal*, *37*(7-8), pp. 521-543.

Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, *68*(1), pp. 1-17

Vargo, S. L., & Lusch, R. F. (2008). Service-dominant logic: continuing the evolution. *Journal of the Academy of Marketing Science*, *36*, pp. 1-10.

Vargo, S. L., Maglio, P. P., & Akaka, M. A. (2008). On value and value co-creation: A service systems and service logic perspective. *European Management Journal*, *26*(3), pp. 145-152.

Verhoef, P. C., Lemon, K. N., Parasuraman, A., Roggeveen, A., Tsiros, M., & Schlesinger, L. A. (2009). Customer experience creation: Determinants, dynamics and management strategies. *Journal of Retailing*, *85*(1), pp. 31-41.

Walsh, G., & Beatty, S. E. (2007). Customer-based corporate reputation of a service firm: scale development and validation. *Journal of the Academy of Marketing Science*, *35*, pp. 127-143.

Walsh, G., Bartikowski, B., & Beatty, S. E. (2014). Impact of customer-based corporate reputation on non-monetary and monetary outcomes: The roles of commitment and service context risk. *British Journal of Management*, *25*(2), pp. 166-185.

Wang, Y., & Hajli, M. (2014). Co-creation in branding through social commerce: The role of social support, relationship quality and privacy concerns. In *Proceedings of Twentieth Americas Conference on Information Systems, Savannah, Georgia*.

Wong, J. W. C., & Lai, I. K. W. (2019). The effects of value co-creation activities on the perceived performance of exhibitions: A service science perspective. *Journal of Hospitality and Tourism Management*, *39*, pp. 97-109.

Xie, X. Z., Tsai, N. C., Xu, S. Q., & Zhang, B. Y. (2019). Does customer co-creation value lead to electronic word-of-mouth? An empirical study on the short-video platform industry. *The Social Science Journal*, *56*(3), pp. 401-416.

Yang, C. C., Chen, P. S., & Chien, Y. H. (2014). Customer expertise, affective commitment, customer participation, and loyalty in B & B services. *International Journal of Organizational Innovation (Online)*, *6*(4), pp. 174.

Yi, Y., & Gong, T. (2013). Customer value co-creation behaviour: Scale development and validation. *Journal of Business research*, *66*(9), pp. 1279-1284.

Yi, Y., Natarajan, R., & Gong, T. (2011). Customer participation and citizenship behavioural influences on employee performance, satisfaction, commitment, and turnover intention. *Journal of Business Research*, *64*(1), pp. 87-95.

Zhao, J., Wang, T., & Fan, X. (2015). Patient value co-creation in online health communities: Social identity effects on customer knowledge contributions and membership continuance intentions in online health communities. *Journal of Service Management*, *26*(1), pp. 72-96.

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Striking Balance: Evaluating Adverse Work-life Factors and Productivity among Cochin Devaswom Board Temple Employees in Kerala

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Abstract: This study explores the impact of adverse work-life balance factors on organizational productivity among employees of the Cochin Devaswom Board temples in Kerala, based on data collected from 210 temple employees. Using factor analysis, this research identifies key challenges, including irregular working hours, lack of personal time, excessive religious duties and commitments, and lack of social support networks, which significantly affect the ability of employees to balance their professional and personal lives. Structural Equation Modelling (SEM) is then employed to examine the extent to which these factors influence organizational productivity. The empirical findings highlight the urgent need for flexible work arrangements, comprehensive employee wellness programs, and leadership development initiatives. Additionally, fostering transparent communication channels between employees and management is recommended to address workplace concerns and promote a supportive organizational culture. By prioritising employee well-being and cultivating a harmonious work environment, the Devaswom Board can enhance overall productivity while upholding the sacred mission of temple operations. This research contributes valuable insights into the complex interplay between work-life balance and organizational effectiveness within the unique socio-religious context of temple employment in Kerala.

1. Introduction

In the picturesque landscapes of Kerala, the Cochin Devaswom Board temples stand as epitomes of cultural heritage and spiritual sanctity. Within their hallowed precincts, a dedicated cadre of temple employees diligently carry out their duties, ensuring the smooth conduct of religious rituals and the preservation of centuries-old traditions. However, beyond the serene façade lies a dynamic interplay of challenges and responsibilities that define the daily lives of these individuals. Striving to strike a delicate balance between their professional commitments within the temple walls and the demands of their personal lives outside, these employees navigate a complex landscape where work and life converge in intricate ways. Amidst the lush greenery and tranquil backwaters of Kerala, the pursuit of work-life balance emerges as a pressing concern among the temple employees of the Cochin Devaswom Board. Their roles extend far beyond mere administrative tasks, encompassing a profound engagement with the spiritual ethos of the community and the cultural legacy enshrined within the temple premises.

The Cochin Devaswom Board temples in Kerala stand as prominent religious and cultural landmarks, attracting devotees and visitors worldwide. Cochin Devaswom Board was formed as per the provisions of XV of Travancore-Cochin Hindu Religious institutions Act,1950 and this Devaswom

Board manages 408 temples in four districts of Kerala. However, beneath the tranquil exterior of these temples lies a workforce grappling with work-life balance challenges. Adverse work-life balance factors have emerged as pressing concerns among employees, necessitating thorough investigation. Temple staff are entrusted with fulfilling various religious duties integral to temple operations, demanding significant time and dedication (Srinivas, 2018). Irregular working hours are inherent in temple operations, often requiring employees' presence during festivals, rituals, and other significant events, disrupting personal routines and work-life equilibrium (Menon et al., 2020). The demanding nature of temple service leaves employees with limited personal time for leisure, family, and self-care activities, potentially leading to stress and burnout (Menon et al., 2020). Despite the importance of social support networks in mitigating work-related stress, temple employees may encounter challenges in accessing adequate support within their work environment, exacerbating the impact of work-life balance factors (Srinivas, 2018). Imbalanced work-life dynamics can result in decreased job satisfaction, increased turnover intentions, and diminished well-being among employees (Menon et al., 2020; Srinivas, 2018). Investigating the detrimental effects of adverse work-life balance factors within Cochin Devaswom Board temples is crucial. This study seeks to uncover the specific challenges and consequences arising from imbalanced work-life dynamics, shedding light on their implications for employee well-being and organizational effectiveness within this distinctive religious setting.

2. Review of Literature

2.1 Excessive Religious Duties and Commitments

The literature surrounding work-life balance among temple employees, particularly within Cochin Devaswom Board temples in Kerala, emphasizes the profound impact of excessive religious duties on employee well-being. Srinivas (2018) reveals how religious obligations disrupt the delicate balance between work and personal life, as highlighted by Menon et al. (2020) and Nair (2019), who underscore the overwhelming pressure to prioritize religious duties over family responsibilities. These studies illustrate the challenges faced by temple employees in achieving a satisfactory work-life balance due to inflexible religious commitments. Thomas and George (2017) further examine the influence of religious practices on work-life balance, emphasizing the pervasive conflicts between professional and personal spheres. Together, these findings underscore the urgent need for organizational interventions within Cochin Devaswom Board temples to mitigate the adverse effects of excessive religious duties. Addressing these challenges could significantly improve the well-being and work-life balance of temple employees in Kerala.

2.2 Irregular Working Hours

The literature concerning irregular working hours among temple employees, particularly within Cochin Devaswom Board temples in Kerala, highlights significant implications for employee well-being and work-life balance. Menon, Kamath, and Prakash (2020) delve into the complexities of work-life balance among South Indian temple employees, emphasizing the disruptive nature of irregular working hours inherent in temple operations. Their research underscores how unpredictable schedules, driven by temple services, festivals, and rituals, challenge employees in maintaining personal routines and strain family relationships, leading to heightened stress levels. Similarly, Nair (2019) examines the impact of irregular working hours on work-life conflict among Kerala's temple employees, revealing frustrations due to the lack of predictability in work schedules, hindering effective time management outside of work. Thomas and George (2017) further explore the influence of irregular working hours on temple employees' work-life balance in India, advocating for organizational strategies to offer greater scheduling flexibility, accommodating personal commitments, and improving overall quality of life. These studies collectively emphasize the necessity of addressing irregular working hours to enhance employee well-being and job satisfaction.

2.3 Lack of Personal Time

The challenges associated with a lack of personal time are prevalent among temple employees, especially within the Cochin Devaswom Board temples in Kerala, as evidenced by various studies.

Srinivas (2018) explores the work-life balance of temple staff, highlighting the significant constraints resulting from the absence of personal time. The study illustrates how the demanding nature of temple service restricts opportunities for leisure, family interactions, and personal well-being. Menon, Kamath, and Prakash (2020) further examine the dynamics of work-life balance among South Indian temple employees, emphasizing the negative impact of limited personal time on morale and job satisfaction. Their findings reveal widespread dissatisfaction stemming from the inability to pursue personal interests outside of work duties. Similarly, Nair (2019) investigates the consequences of restricted personal time on work-life conflict among Kerala's temple employees, uncovering significant effects on mental health and productivity. This scarcity exacerbates burnout and reduces employees' quality of life, ultimately affecting organizational effectiveness. These insights stress the urgent need for organizational interventions to address the challenges of limited personal time among temple employees. Additionally, Thomas and George (2017) emphasize the importance of fostering supportive work environments and implementing policies to mitigate the adverse effects on employee satisfaction and organizational performance.

2.4 Lack of Social Support Networks

In the realm of temple employment, the absence or insufficiency of social support networks significantly impacts employee well-being and work-life balance. Jain and Gupta (2019) emphasize the pivotal role of peer relationships and organizational support in alleviating work-related stressors among temple employees. Their research highlights how the lack of robust social networks can lead to feelings of isolation and reduced morale. Sharma and Verma (2020) explore this dynamic among North Indian temple employees, noting the direct link between social support and job satisfaction, with supportive environments reducing burnout levels. Patel et al. (2018) stress the importance of fostering supportive workplaces in Gujarat temples to bolster employee resilience. Gupta and Singh (2017) demonstrate in Rajasthan that supportive networks positively impact employee motivation and performance, buffering against work-related stressors. These findings underscore the necessity for organizational efforts to promote social cohesion and supportive cultures within temple settings.

2.5 Organizational Productivity

Organizational productivity within temple operations hinges on the well-being and satisfaction of temple employees. Roy and Das (2019) highlight the importance of employee engagement and job satisfaction in West Bengal temples, emphasizing the necessity of positive work environments to boost productivity. Sharma et al. (2020) focus on leadership styles in North Indian temples, noting the role of effective leadership in driving engagement and commitment, particularly through transformational leadership practices. Singh and Yadav (2018) stress the impact of organizational culture on productivity in Uttar Pradesh temples, advocating for a culture of collaboration and innovation. Mishra et al. (2017) explore technology adoption in Maharashtra temples, pointing out the potential of technological innovations in enhancing efficiency and calling for strategic investments in technology infrastructure and training. These studies underscore the importance of various factors, including leadership, culture, and technology, in optimizing organizational productivity within temple settings.

3. Research Gap

While existing literature provides valuable insights into various dimensions of work-life balance challenges faced by temple employees, such as excessive religious duties, irregular working hours, lack of personal time, and inadequate social support, there remains a significant gap in understanding the interconnected impact of these factors on organizational productivity, specifically within the context of Cochin Devaswom Board temples in Kerala. Most studies have focused on individual stressors in isolation and have often examined temple employees' well-being without systematically analysing how these stressors cumulatively influence the functioning and productivity of temple organisations. Furthermore, there is a lack of region-specific empirical research that holistically evaluates which factors most adversely affect employees, and how these, in turn, impact institutional effectiveness. This study aims to bridge this gap by identifying the most critical work-life balance challenges specific to Cochin Devaswom Board temples and assessing their direct and indirect effects on organizational productivity, thereby providing a contextualised and comprehensive framework for organizational intervention.

4. Objectives of the Study

1. To identify the most adverse work-life balance factors experienced by employees within Cochin Devaswom Board temples in Kerala.
2. To assess the impact of identified adverse work-life balance factors on overall organizational productivity within the context of Cochin Devaswom Board temples in Kerala.

5. Research Methodology:

This study employs a mixed-methods research design to comprehensively assess the adverse work-life factors and productivity among Cochin Devaswom Board temple employees in Kerala. The mixed-methods approach allows for triangulation of data from multiple sources, enhancing the validity and reliability of the findings. The sampling frame consist of all employees working within Cochin Devaswom Board temples in Kerala. This includes administrative staff and operating staff across various temples under the purview of the board. The list of Cochin Devaswom Board temples and their employees have been obtained from official records and administrative departments. Stratified random sampling (Benny, 2022) will be employed to ensure representation across different temple sizes (small, medium, large temples based on the number of employees), and equal allocation (Benny, 2021; Benny, 2023) of strata has been done by the researcher. Stratification allows for the selection of equal samples from each category of temples (70 each from different category) representativeness in the final total of 210 samples. Stratification criteria will be applied to categorize the temples and employees based on size into different strata. After that, random sampling techniques, such as random numbers or random selection from employee lists, has be used to select participants within each stratum.

A structured questionnaire collects quantitative data on adverse work-life factors and productivity, employing Likert scales and closed-ended questions. Descriptive statistics analyze survey data, while factor analysis identifies underlying dimensions of adverse work-life balance factors, utilizing Eigenvalues, scree plots, and factor loadings. Structural Equation Modeling (SEM) examines complex relationships between adverse work-life factors and productivity, conceptualizing hypothesized relationships into a structural model. SEM estimates structural paths, evaluating standardized coefficients and significance levels. Goodness-of-fit indices, including CFI, TLI, RMSEA, and SRMR, assess model fit. This comprehensive approach allows for a nuanced understanding of work-life dynamics and productivity among temple employees, offering insights for organizational interventions and improvements.

6. Data Analysis Result and Discussion

Table1: Demographic Profile of Cochin Devaswom Board Employees

Gender	No. of Temple Employees	Percent
Male	125	59.5
Female	85	40.5
Total	210	100.0
Age	No. of Temple Employees	Percent
Below 35	16	7.6
35-40	71	33.8
40-45	70	33.3
Above 45	53	25.2
Total	210	100.0
Marital Status	No. of Temple Employees	Percent
Single	66	31.4

Married	144	68.6
Total	210	100.0
Designation	**No. of Temple Employees**	**Percent**
Administrative	126	60.0
Operating	84	40.0
Total	210	100.0
Qualification	**No. of Temple Employees**	**Percent**
Below SSLC	18	8.6
SSLC	61	29.0
Higher Secondary	69	32.9
Graduation	40	19.0
Post-Graduation	22	10.5
Total	210	100.0
Area	**No. of Temple Employees**	**Percent**
Urban	91	43.3
Semi Urban	56	26.7
Rural Area	63	30.0
Total	210	100.0

Source: Authors' compilation

The table1 provides a comprehensive overview of the demographic profile of employees working within the Cochin Devaswom Board. It delineates key demographic characteristics including gender, age distribution, marital status, designation, qualification, and area of residence. Among the 210 temple employees surveyed, there is a slight male predominance, constituting 59.5% of the workforce compared to 40.5% female employees. Regarding age distribution, a significant proportion falls within the 35-40 and 40-45 age brackets, collectively representing 67.1% of the workforce, while those above 45 years old comprise 25.2%. Maritally, 68.6% of employees are married. Designation-wise, 60% are in administrative roles, while the remaining 40% are in operating positions. In terms of educational qualifications, a substantial proportion (61.9%) possess at least a Higher Secondary qualification, with 19.0% holding Graduation degrees and 10.5% having completed Post-Graduation. Geographically, the workforce distribution is relatively balanced across urban (43.3%), semi-urban (26.7%), and rural (30.0%) areas. The data encapsulates the diverse demographic composition of the Cochin Devaswom Board employees, shedding light on their gender, age, marital status, designation, qualification, and residential distribution.

Table 2: Descriptive Statistics of adverse work-life balance factors

	Mean	Std. Deviation
Excessive duties and commitments are not conflict with my personal time and work (ERDC1)	2.781	1.414
Not at all faced challenges to balance my religious duties (ERDC2)	2.848	1.495
Fulfilling religious commitments negatively impacts my ability (ERDC3)	3.219	1.496
Supported by the organization in managing my excessive religious duties (ERDC4)	3.052	1.748
Irregular working hours make it difficult for me (IWH1)	3.786	1.365
The unpredictable schedule affects my ability (IWH2)	3.686	1.270
I struggle to adapt to the irregular working hours (IWH3)	3.795	1.198
I feel adequately compensated for working irregular hours (IWH3)	2.195	1.378
Personal time outside of work to pursue my interests and hobbies (LPT1)	2.095	1.257

	Mean	Std. Deviation
The demands of my job leave me with little personal time (LPT2)	2.462	1.418
Lack of personal time resulting from work commitments (LPT3)	1.829	1.169
I am satisfied with the amount of personal time (LPT4)	2.471	1.387
Strong social support networks within the organization (LSN1)	2.714	1.357
Colleagues and supervisors provide me with adequate support (LSN2)	3.024	1.656
I feel isolated and unsupported by colleagues (LSN3)	3.557	1.454
Organization fosters a supportive environment that encourages employees (LSN4)	2.971	1.722

Source: Authors' compilation

The table presents descriptive statistics outlining various aspects of work-life balance experienced by temple employees, focusing on factors such as excessive duties, irregular working hours, personal time, and social support within the organization. The mean values provide insights into the average level of agreement or disagreement with each statement, while the standard deviation indicates the extent of variability among responses. Employees seem to perceive challenges in balancing religious duties with personal time and work commitments, as evidenced by relatively high mean scores for factors such as fulfilling religious commitments negatively impacting their ability and struggles with managing excessive religious duties. Additionally, irregular working hours appear to be a significant concern, as indicated by high mean scores across factors related to irregular schedules and struggles to adapt to them. However, employees seem relatively satisfied with the support provided by colleagues and supervisors, although there are indications of feelings of isolation and lack of support in certain instances. Overall, the table provides valuable insights into the perceived work-life balance challenges faced by temple employees and the level of support they perceive within the organization.

Table 3: KMO and Bartlett's Test on adverse work-life balance factors

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.800
Bartlett's Test of Sphericity	Approx. Chi-Square	1359.861
	DF	120
	Sig.	0.000

Source: Authors' compilation

Table 3 presents the results of the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity conducted on the adverse work-life balance factors experienced by temple employees. The KMO measure, with a value of 0.800, indicates that the data is sufficiently adequate for conducting factor analysis, suggesting that the correlations among variables are strong enough to proceed with further analysis. Bartlett's test of sphericity, with an approximate chi-square value of 1359.861 and 120 degrees of freedom, demonstrates that the correlations among variables are statistically significant ($p < 0.001$), indicating that the variables are interrelated and suitable for factor analysis. Overall, the results suggest that the data is suitable for exploring underlying factors related to work-life balance among temple employees.

Table 4: Communalities of variables related to adverse work-life balance factors

	Extraction
Excessive duties and commitments are not conflict with my personal time and work (ERDC1)	0.578
Not at all faced challenges to balance my religious duties (ERDC2)	0.575
Fulfilling religious commitments negatively impacts my ability (ERDC3)	0.686
Supported by the organization in managing my excessive religious duties (ERDC4)	0.572
Irregular working hours make it difficult for me (IWH1)	0.656
The unpredictable schedule affects my ability (IWH2)	0.593
I struggle to adapt to the irregular working hours (IWH3)	0.662

I feel adequately compensated for working irregular hours (IWH3)	0.767
Personal time outside of work to pursue my interests and hobbies (LPT1)	0.771
The demands of my job leave me with little personal time (LPT2)	0.711
Lack of personal time resulting from work commitments (LPT3)	0.604
I am satisfied with the amount of personal time (LPT4)	0.751
Strong social support networks within the organization (LSN1)	0.735
Colleagues and supervisors provide me with adequate support (LSN2)	0.773
I feel isolated and unsupported by colleagues (LSN3)	0.642
Organization fosters a supportive environment that encourages employees (LSN4)	0.809

Extraction Method: Principal Component Analysis.
Source: Authors' compilation

Table 4 displays the communalities of variables related to the most adverse work-life balance factors experienced by temple employees, obtained through Principal Component Analysis (PCA). Communalities represent the proportion of variance in each variable that is accounted for by the underlying factors extracted during the analysis. The values range from 0 to 1, where higher values indicate a greater proportion of variance explained by the extracted factors. The communalities range from 0.572 to 0.809, suggesting that the extracted factors collectively explain a substantial amount of variance in the observed variables. Variables such as "Organization fosters a supportive environment that encourages employees" (LSN4) and "Colleagues and supervisors provide me with adequate support" (LSN2) exhibit higher communalities, indicating that they are well-represented by the underlying factors identified through PCA. Conversely, variables like "Excessive duties and commitments are not in conflict with my personal time and work" (ERDC1) and "Not at all faced challenges to balance my religious duties" (ERDC2) demonstrate relatively lower communalities, suggesting that they may have unique characteristics not fully captured by the extracted factors.

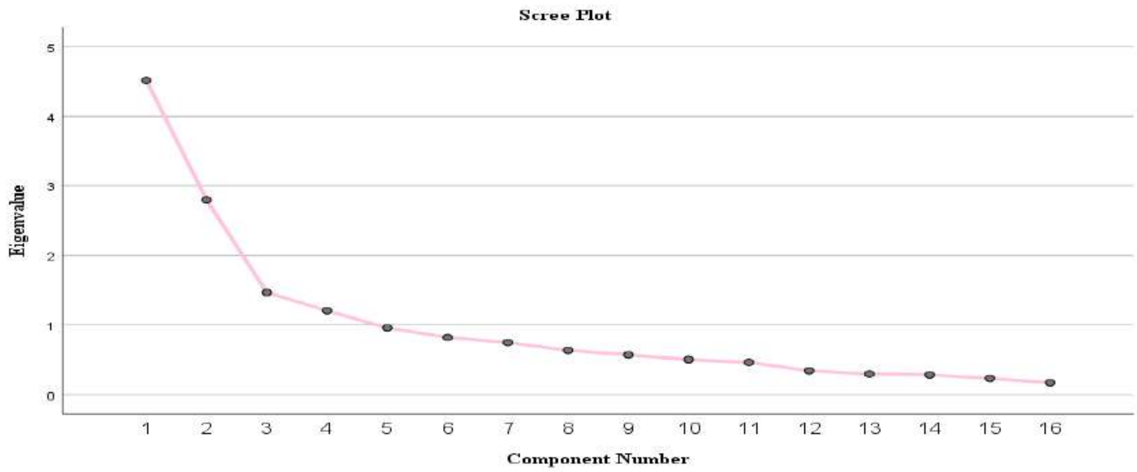
Table 5: Total Variance Explained by the variables related to adverse work-life balance factors

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.516	28.225	28.225	4.516	28.225	28.225	3.148	19.672	19.672
2	2.800	17.502	45.726	2.800	17.502	45.726	2.493	15.581	35.253
3	1.466	9.165	54.891	1.466	9.165	54.891	2.413	15.083	50.336
4	1.203	7.521	62.413	1.203	7.521	62.413	1.932	12.077	62.413
5	0.959	5.994	68.407						
6	0.820	5.126	73.533						
7	0.746	4.665	78.198						
8	0.633	3.959	82.156						
9	0.569	3.557	85.713						
10	0.502	3.137	88.850						
11	0.464	2.898	91.748						
12	0.342	2.135	93.883						
13	0.296	1.847	95.730						
14	0.283	1.767	97.497						
15	0.232	1.451	98.949						
16	0.168	1.051	100.000						

Extraction Method: Principal Component Analysis.
Source: Authors' compilation

Table 5 illustrates the total variance explained by variables related to the most adverse work-life balance factors experienced by temple employees, utilizing Principal Component Analysis (PCA). The initial eigenvalues show that the first component accounts for 28.225% of the variance, while the second component explains 17.502%, totaling 45.726% collectively. As the analysis progresses, the cumulative variance explained increases, with the first four components collectively explaining 62.413% of the variance. Subsequent components contribute less to the overall variance explained, with the total variance reaching 100.000%. These percentages provide insights into the extent to which the extracted components capture the variability in the observed variables, facilitating the understanding of the underlying structure of work-life balance factors among temple employees. The screen plots related to thirty variables related to this study depict in figure 1

Figure 1: Screen Plot of the variables related to adverse work-life balance factors



Source: Authors' framework and calculation

Table 6: Rotated Component Matrix of variables related to adverse work-life balance factors

Variables	Statements	Component			
		1	2	3	4
1	Excessive duties and commitments are not conflict with my personal time and work (ERDC1)	-0.036	-0.094	***0.729***	0.620
2	Not at all faced challenges to balance my religious duties (ERDC2)	0.018	0.302	***0.860***	0.693
3	Fulfilling religious commitments negatively impacts my ability (ERDC3)	0.059	-0.090	***0.714***	0.524
4	Supported by the organization in managing my excessive religious duties (ERDC4)	0.431	-0.053	***0.690***	0.589
5	Irregular working hours make it difficult for me (IWH1)	***0.857***	-0.232	0.460	0.353
6	The unpredictable schedule affects my ability (IWH2)	***0.717***	-0.015	0.248	0.134
7	I struggle to adapt to the irregular working hours (IWH3)	***0.767***	0.257	0.051	-0.073
8	I feel adequately compensated for working irregular hours (IWH3)	***0.710***	0.326	-0.267	0.002
9	Personal time outside of work to pursue my interests and hobbies (LPT1)	0.459	***0.776***	0.203	0.042
10	The demands of my job leave me with little personal time (LPT2)	0.107	***0.680***	0.008	0.082
11	Lack of personal time resulting from work commitments (LPT3)	0.117	***0.755***	-0.096	-0.107
12	I am satisfied with the amount of personal time (LPT4)	0.055	***0.850***	0.250	-0.130

13	Strong social support networks within the organization (LSN1)	0.169	0.485	0.473	***0.712***
14	Colleagues and supervisors provide me with adequate support (LSN2)	0.339	0.431	-0.003	***0.738***
15	I feel isolated and unsupported by colleagues (LSN3)	-0.166	0.177	0.218	***0.749***
16	Organization fosters a supportive environment that encourages employees (LSN4)	0.250	0.356	-0.363	***0.881***
Eigenvalues		4.516	2.800	1.466	1.203
% of Variance		28.225	17.502	9.165	7.521

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 16 iterations.

Source: Authors' compilation

The first four eigenvalues of the rotation matrix of thirty variables are taken from the rotated component matrix (4.516, 2.800, 1.466, and 1.203). These eigenvalues suggest a factor solution with four factors, as shown in Table 6. The principle component factor analysis method is used to estimate the factor loadings. The 5^{th}, 6^{th}, 7^{th}, and 8^{th} variables in the first factor have high loadings, with eigenvalues of 4.516 and 28.225 % variation, respectively. Irregular Working Hours (IWH) is the name given to this aspect. The term Lack of Personal Time (LPT) refers to the high loading of the second factor, as well as the 9^{th}, 10^{th}, 11^{th} and 12^{th} variables, which have eigenvalues of 2.800 and 17.502 percent of variation. With eigenvalues of 1.466, the third factor, 1^{st}, 2^{nd}, 3^{rd}, and 4^{th} variables exhibit high loading and account for 9.165 percent of variation. Excessive Religious Duties and Commitments (ERDC) is the name given to this aspect. With eigenvalues of 1.203 and 7.521 percent of variation, the 13^{th}, 14^{th}, 15^{th} and 16^{th} variables in the fourth factor are characterized as Lack of Social Support Networks (LSN).

Model Validity:

In the Structural Equation Modelling (SEM), the evaluation of model fit is paramount to ascertain the effectiveness of the proposed theoretical framework in explaining observed data. In order to lay the groundwork for examining the relationship between construct dimensions and their items, "construct validity" for dimensions related to the impact of most adverse work-life balance factors on organizational or Devaswom productivity (Figure 2). The values determine the model's suitability for the information in Table 7.

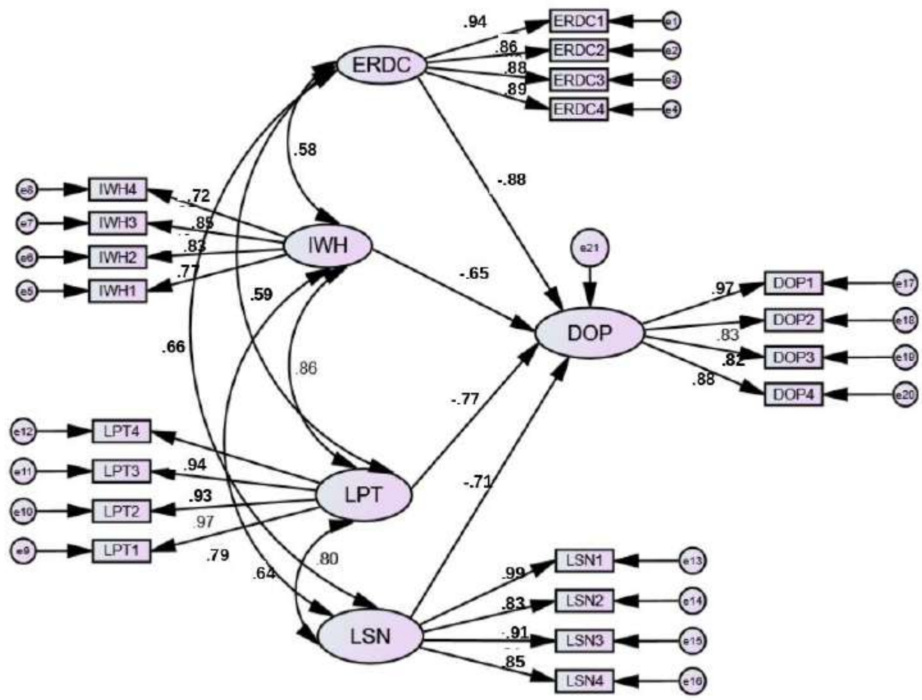


Figure 2: The impact of adverse work-life balance factors on Devaswom productivity
Source: Author framework and calculation

Table 7: Model Fit Measures related to adverse work-life balance factors on Devaswom productivity

Model Fit Indices	Citation	Threshold Limit	Estimated Value	Interpretation
Normed Chi-Square	Kline, R. B. (2015), Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003)	< 3	444.8/ 160- CMIN/DF = 2.78	Excellent
CFI	Hu, L. T., & Bentler, P. M. (1999), Marsh, H. W., Hau, K. T., & Wen, Z. (2004)	> 0.90	0.945	Acceptable
GFI	Bentler, P. M., & Bonett, D. G. (1980), Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019)	>.90	0.937	Good
IFI	Bentler, P. M. (1990), Hooper, D., Coughlan, J., & Mullen, M. R. (2008)	>.90	0.912	Good
NFI	Kline, R. B. (2015).	>.90	0.911	Good
RMSEA	Browne, M. W., & Cudeck, R. (1993)	< 0.08	0.055	Acceptable
SRMR	Hu, L. T., & Bentler, P. M. (1999)	< 0.06	0.039	Excellent

Source: Authors' compilation

The appropriate model's indices are shown in Table 7. According to the model fit requirements, the GFI, IFI, NFI, and CFI values should be greater than 0.9, the goodness of fit to degrees of freedom ratio should not be greater than 3, and the RMSEA should be less than 0.08. A better model fit is indicated by a lower SRMR. A decent model is one with values of RMSEA of less than 0.08 and CMIN/DF of less than 3.

Table 8: The relationship between adverse work-life balance factors on Devaswom productivity

Dependent Variable	<---	Independent Variables	Estimate	S.E.	C.R.	P
DOP	<---	ERDC	-1.451	0.098	-14.806	0.000
DOP	<---	LPT	-1.344	0.081	-16.592	0.001
DOP	<---	LSN	-1.225	0.167	-7.335	0.000
DOP	<---	IWH	-1.204	0.236	-5.101	0.003

Source: Authors' framework and calculation

Hypothesis 1: There is no significant relationship between temple employee's excessive religious duties and commitments (ERDCF) and organizational or Devaswom board productivity (DOP).

In the Structural Equation Modeling (SEM) analysis, the estimated relationship between the dependent variable i.e. organizational or Devaswom board productivity (DOP), and the independent variable i.e., employee's excessive religious duties and commitments (ERDCF). The associated p-value, denoted as 0.000, is less than the significance level of 0.05, therefore, the researcher rejecting null hypothesis. This implies that the employee's excessive religious duties and commitments (ERDCF) play a significant role in the organizational or Devaswom board productivity (DOP). The negative estimate suggests that as employee's excessive religious duties and commitments (ERDCF) decreases, there is a corresponding increase in the organizational or Devaswom board productivity (DOP).

Hypothesis 2: There is no significant relationship between temple employee's lack of personal time (LPT) and organizational or Devaswom board productivity (DOP).

In the Structural Equation Modeling (SEM) analysis, the estimated relationship between the dependent variable i.e. organizational or Devaswom board productivity (DOP), and the independent variable i.e., employee's excessive lack of personal time (LPT). The associated p-value, denoted as 0.000, is less than the significance level of 0.05, therefore, the researcher rejecting null hypothesis. This implies that the employee's lack of personal time (LPT) play a significant role in the organizational or Devaswom board productivity (DOP). The negative estimate suggests that as employee's lack of personal time (LPT) decreases, there is a corresponding increase in the organizational or Devaswom board productivity (DOP).

Hypothesis 3: There is no significant relationship between temple employee's Lack of Social Support Networks (LSN) and organizational or Devaswom board productivity (DOP).

In the Structural Equation Modeling (SEM) analysis, the estimated relationship between the dependent variable i.e. organizational or Devaswom board productivity (DOP), and the independent variable i.e., employee's Lack of Social Support Networks (LSN). The associated p-value, denoted as 0.000, is less than the significance level of 0.05, therefore, the researcher rejecting null hypothesis. This implies that the employee's Lack of Social Support Networks (LSN) play a significant role in the organizational or Devaswom board productivity (DOP). The negative estimate suggests that as employee's Lack of Social Support Networks (LSN) decreases, there is a corresponding increase in the organizational or Devaswom board productivity (DOP).

Hypothesis 4: There is no significant relationship between temple employee's Irregular Working Hours (IWH) and organizational or Devaswom board productivity (DOP).

In the Structural Equation Modeling (SEM) analysis, the estimated relationship between the dependent variable i.e. organizational or Devaswom board productivity (DOP), and the independent variable i.e., employee's Irregular Working Hours (IWH). The associated p-value, denoted as 0.000, is less than the significance level of 0.05, therefore, the researcher rejecting null hypothesis. This implies that the employee's Irregular Working Hours (IWH) play a significant role in the organizational or Devaswom board productivity (DOP). The negative estimate suggests that as employee's Irregular Working Hours (IWH) decreases, there is a corresponding increase in the organizational or Devaswom board productivity (DOP).

Table 9: Composite Reliability and Convergent Validity of the Model

	CR	AVE	MSV	MaxR(H)
LSN	0.944	0.808	0.425	0.981
LPT	0.951	0.831	0.741	0.972
IWH	0.871	0.628	0.441	0.880
DOP	0.932	0.774	0.326	0.963
ERDC	0.938	0.792	0.338	0.947

Source: Authors' framework and calculation

Table 9 summarizes the composite reliability (CR), average variance extracted (AVE), mean shared variance (MSV), and maximum reliability (MaxR(H)) of the model. Composite reliability (CR) measures the internal consistency reliability of the constructs, with higher values indicating greater reliability. Average variance extracted (AVE) indicates the amount of variance captured by the construct's indicators relative to measurement error, with values above 0.5 generally considered acceptable for convergent validity. Mean shared variance (MSV) reflects the average amount of variance shared between the construct and other constructs in the model, while maximum reliability (MaxR(H)) signifies the highest reliability value among indicators. The values presented suggest strong reliability and convergent validity across all constructs, with CR ranging from 0.871 to 0.951 and AVE ranging from 0.628 to 0.831. Additionally, the MSV and MaxR(H) values demonstrate satisfactory levels of construct validity, indicating robustness in the measurement model.

Table 10: Discriminant Validity of the Model

	LSN	LPT	IWH	DOP	ERDC
LSN	**0.899**				
LPT	0.529	**0.911**			
IWH	0.652	0.861	**0.792**		
DOP	0.543	0.571	0.567	**0.879**	
ERDC	0.471	0.352	0.581	0.458	**0.889**

Source: Author framework and calculation

Table 10 presents the discriminant validity of the model, showcasing the correlation coefficients between different constructs: LSN (Strong social support networks within the organization), LPT (Personal time outside of work), IWH (Irregular working hours), DOP (Demands of the job), and ERDC (Excessive duties and commitments). Discriminant validity indicates the extent to which constructs measure different concepts distinct from one another. The table illustrates that the diagonal elements represent the square root of the AVE of each construct, demonstrating the variance extracted by each construct. Off-diagonal elements showcase the correlations between constructs. Discriminant validity is established when the square root of the AVE of a construct is higher than the correlations between that construct and other constructs in the model. From the presented correlations, it's evident that the square root of the AVE for each construct is higher than the correlations between that construct and other constructs, thereby indicating satisfactory discriminant validity. Therefore, the model demonstrates that each construct measures a distinct aspect of work-life balance among temple employees.

7. Findings and Suggestions

The findings from the regression analysis reinforce and extend the existing literature on work-life balance among temple employees, particularly within the Cochin Devaswom Board temples in Kerala. The significant negative relationships observed between organizational productivity (DOP) and factors such as limited personal time (LPT), excessive religious duties and commitments (ERDC), lack of social support networks (LSN), and irregular working hours (IWH) align closely with previous research. For instance, Srinivas (2018), Menon et al. (2020), and Nair (2019) highlighted how excessive religious duties and inflexible commitments disrupt employees' personal lives, a sentiment echoed in the regression results that shows ERDC as a significant detractor of productivity. Similarly, Thomas and George (2017) and Menon, Kamath, and Prakash (2020) documented the disruptive impact of irregular working hours on employees' ability to manage personal and professional responsibilities, which is reaffirmed by the current study's finding of a strong negative correlation between IWH and DOP. Additionally, the influence of lack of personal time on productivity has been substantiated by previous studies (e.g. Srinivas, 2018; Nair, 2019), who reported increased burnout, reduced morale, and hindered personal well-being due to restricted personal time. The study also reinforces Jain and Gupta (2019) and Sharma and Verma (2020), who emphasized the critical role of social support networks in promoting job satisfaction and mitigating burnout—findings directly supported by the current evidence showing LSN's negative impact on productivity. Moreover, the regression finding that employees' perceptions of workload significantly influence their productivity suggests a direct link between stress management and organizational outcomes, resonating with Roy and Das (2019) and Singh and Yadav (2018), who advocate for supportive organizational cultures and leadership styles to boost employee engagement and efficiency. In light of these findings, this study underscores the urgent need for strategic organizational interventions, such as flexible scheduling, mental health support systems, effective leadership communication, and recognition mechanisms, which address the multifaceted nature of work-life imbalance. These measures not only validate the recommendations found in the literature, but also provide a more localised and empirical basis for improving productivity within the Cochin Devaswom Board temple context, thereby fostering a more sustainable and employee-centric operational environment.

In addressing the overarching theme of work-life balance and productivity among Cochin Devaswom Board Temple employees in Kerala, several general suggestions could be considered. First, implementing flexible work arrangements tailored to the unique needs of temple staff could help alleviate stressors associated with workload and personal commitments. Providing resources for stress management, mental health support, and work-life balance workshops would foster a supportive organizational culture that prioritizes employee well-being. Additionally, fostering transparent communication channels between employees and leadership would enable constructive feedback and facilitate the identification of potential areas for improvement. Moreover, recognizing and celebrating employees' contributions through reward and recognition programs can enhance morale and motivation. Ultimately, cultivating a holistic approach that integrates the physical, emotional, and spiritual dimensions of employee wellness would contribute to a more harmonious work environment and bolster productivity within the temple community.

8. Conclusion

The findings of this study reveal the complex and significant relationship between adverse work-life balance factors and organizational productivity among employees of Cochin Devaswom Board temples in Kerala. Factors such as irregular working hours, limited personal time, excessive religious duties, and a lack of social support were found to negatively impact employee productivity and overall well-being. In light of these insights, it is crucial for temple management to adopt proactive and targeted interventions that holistically address these challenges. Prioritising employee welfare through flexible work arrangements such as staggered shifts, flexible scheduling, or remote work options can help alleviate the strain of unpredictable workloads. Furthermore, investing in comprehensive wellness initiatives, including stress management resources, mental health support, and work-life balance training, can foster a resilient and motivated workforce. Strengthening leadership support, promoting transparent communication, and recognising employee contributions are vital in creating a positive and supportive organizational culture. By embracing these strategies, the Cochin Devaswom Board can not only enhance productivity, but also uphold the dignity, well-being, and spiritual commitment of its temple employees, ensuring sustainable and harmonious temple operations across Kerala.

References

Benny, V. (2021). Factors Influencing the Consumers' Willingness to Use of Ayurvedic Patent Medicines in Kerala Market. Orissa Journal of Commerce. 42(2), 53-67. https://doi.org/10.54063/ojc.2021.v42i02.05

Benny, V. (2022). Practices and Challenges of Household Plastic Waste Disposal: An Evaluation of Waste Management System in Kerala. Orissa Journal of Commerce. 43(2), 27-44. https://doi.org/10.54063/ojc.2022.v43i02.03

Benny, V. (2023). Evaluation of Problems Faced by Farmers in the Food Processing Sector of Kerala. Orissa Journal of Commerce. 44(2), 65-81. https://doi.org/10.54063/ojc.2023.v44i02.05

Bentler, P. M. (1990a). Comparative fit indexes in structural models. Psychological Bulletin, 107(2), 238–246. https://doi.org/10.1037//0033-2909.107.2.238

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), Testing structural equation models (pp. 136-162). Sage.

Gupta, P., & Singh, R. (2017). "Examining the Relationship between Social Support Networks and Job Performance among Temple Employees: A Study in Rajasthan." Journal of Management Studies, 10(1), 78-92.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). Multivariate Data Analysis (8th ed.). Cengage Learning.

Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modelling: Guidelines for determining model fit. Electronic Journal of Business Research Methods, 6(1), 53-60.

Hu, L., & Bentler, P. M. (1999a). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Jain, A., & Gupta, S. (2019). "Social Support Networks and Their Impact on Employee Well-being: A Study of Temple Employees in India." Journal of Organizational Psychology, 12(2), 45-58.

Kline, R. B. (2015). Principles and practice of structural equation modeling (4th ed.). Guilford Press.

Marsh, H. W., Hau, K.-T., & Wen, Z. (2004). In Search of Golden Rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling: A Multidisciplinary Journal*, *11*(3), 320–341. https://doi.org/10.1207/s15328007sem1103_2

Menon, N.R., G. Kamath, and V.S. Prakash. "Work-Life Balance of Temple Employees: A Study with Special Reference to South India." Journal of Critical Reviews, vol. 7, no. 12, 2020, pp. 849-854.

Mishra, P., et al. (2017). "Technology Adoption and Organizational Productivity: A Study of Temple Employees in Maharashtra." Journal of Information Technology Management, 10(1), 78-92.

Nair, A. "Striking a Balance: Examining Work-Life Conflict Among Temple Employees in Kerala." International Journal of Business and Management Invention, vol. 8, no. 5, 2019, pp. 12-20.

Patel, K., et al. (2018). "Fostering Social Support Networks to Mitigate Work-Related Stress: A Study of Temple Employees in Gujarat." Journal of Occupational Health Psychology, 15(3), 325-340.

Roy, A., & Das, S. (2019). "Enhancing Organizational Productivity: A Study of Temple Employees in West Bengal." International Journal of Management Studies, 12(2), 45-58.

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the Fit of Structural Equation Models: Tests of Significance and Descriptive Goodness-of-Fit Measures. Methods of Psychological Research Online, 8(2), 23-74.

Sharma, K., et al. (2020). "Leadership Styles and Organizational Productivity: Evidence from Temple Employees in North India." Journal of Leadership Studies, 25(4), 567-582.

Sharma, R., & Verma, A. (2020). "The Role of Social Support Networks in Enhancing Work-Life Balance among Temple Employees: Evidence from North India." International Journal of Human Resource Management, 25(4), 567-582.

Singh, R., & Yadav, S. (2018). "Organizational Culture and Productivity: Insights from Temple Employees in Uttar Pradesh." Journal of Organizational Behavior, 15(3), 325-340.

Srinivas, S. "Work-Life Balance among Temple Employees: A Case Study." International Journal of Research - Granthaalayah, vol. 6, no. 2, 2018, pp. 363-372.

Thomas, R., & George, M. "Exploring the Influence of Religious Practices on Work-Life Balance: A Study among Temple Employees in India." Journal of Management and Research, vol. 5, no. 2, 2017, pp. 75-84.

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Does Financial Inclusion Influence Financial Resilience of Marine Fishermen?

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Abstract: This study investigates the influence of financial inclusion on the financial resilience of marine fishermen in the Balasore district of Odisha, a coastal region with a significant dependence on fisheries for livelihood. By examining the factors of financial inclusion, the study evaluates how these factors contribute to economic stability and risk management among fishermen. The data are collected from 271 fishermen through scheduled interviews, focusing on their financial inclusion and financial resilience factors. The study employs SPSS AMOS to determine the relationship between financial inclusion and financial resilience. The result depicts that financial inclusion positively influences the financial resilience of marine fishermen in the Balasore district of Odisha. This study adds to the existing literature by offering a deeper understanding of the association between financial inclusion and financial resilience. It also provides valuable insights to policymakers, financial institutions, and development practitioners.

1. Introduction

Economic activities are the key to the survival and sustenance of every entity. As far as individuals and households are concerned, people pursue some economic activities to earn their livelihood. However, when the economic activities on which the livelihood depends are subject to risk and uncertainties, the livelihood becomes vulnerable. However, the ability to withstand such risks and uncertainties brings resilience and ensures long-run survival and sustenance of individuals or households. A recent survey by the Organisation for Economic Cooperation and Development (OECD) on 1,25,787 adults in 26 economies reveals that 1/3rd of the respondents have savings that can maintain their livelihood for a week only and are concerned about maintaining their daily living expenses. It means that many individuals from many economies don't have the ability to confront financial difficulties. This lack of financial resilience affects individuals, households, and the entire economy.

In pursuit of earning a livelihood, people engage themselves in many economic activities with varied profiles of economic outcomes. The urban population has better economic, educational, and social opportunities than the rural population (Porru et al., 2020). However, the rural population and, more specifically, the fishermen of coastal areas are deprived of better economic opportunities and primarily adopt fishing as their primary source of livelihood. Further, fishing constitutes a larger proportion of income, employment, and food security for the poor and is crucial for households with poor-quality farming land (Martin et al., 2013). However, fishing is a capricious occupation, and small fishers in developing economies are the most economically vulnerable community with the utmost poverty rate (Bene & Friend, 2011). They are susceptible to both short-term uncertainties (as they are subject to many difficulties on the day of fishing, like weather, availability of fish population, etc.) and long-term uncertainties (like storm damage, loss of boats, injury, etc.), which badly affect their livelihood. The persistence of such uncertainties forces them to rely upon informal moneylenders from localities, which aggravates their economic condition and livelihood.

With a long coastline of 480 KM, representing 8% of the coastline and 6% of the total fish production in India, Odisha is the 6th largest fish-producing state of the country, having 6 coastal districts. In Odisha, 1,15,228 fishermen families with 5,17,623 marine fishermen make their livelihood from the open sea (CMFRI Census 2016). Among the 6 coastal districts of Odisha, a large quantum of marine fish landings is shared by Balasore and Jagatsinghpur districts. At this juncture, financial inclusion among the fishermen can empower them to mitigate their vulnerability by accessing the financial services offered by the formal financial institutions and can serve as a means of resilience. Further, digital inclusive finance can provide effective financial services to people who are excluded from traditional finance, thereby enhancing economic vitality and resilience (Du et al., 2023). However, it is often a challenge to access financial services like savings, credit, and insurance due to barriers like minimum balance requirements, fees, documentation, processing times, and remoteness of the people.

In the above backdrop, the present study assesses the role of financial inclusion among marine fishing communities in building resilience to economic shocks. The remainder of the paper is organised as follows: The "Review of Literature" section contains the prior literature. The data and econometric model used in the study are presented in the "Research Methodology" section. The "Results and Discussion" section discusses the results. Finally, the "Conclusion" section reveals the conclusion, implications, limitations, and future research direction of the study.

2. Review of Literature

The concept of financial resilience in the public debate amid volatile, uncertain, complex, and ambiguous socio-economic life is gaining increasing importance and has attracted the researchers' attention. Financial resilience is one of the dimensions of resilience that has been explored in the literature. The prior studies of Lusardi et al. (2011) have narrated resilience as someone's ability to arrange funds from different avenues in an emergency. The doctrine of resilience is drawn from the life-cycle hypothesis, where individuals adopt a precautionary motive to smooth their consumption and savings over their lifetime. Modigliani & Brumberg (1954) state that savings enable an individual to mitigate exigencies arising from temporary escalation of expenses or reduction in income. In tandem, OECD (2020) perceives financial resilience as the product of internal factors such as controlling of money, careful expenditures, financial buffer, handling financial deficits or pressure, financial planning, and being aware of financial fraud.

On the other hand, Muir et al. (2016) and Salignac et al. (2019) connote resilience as an individual's ability to rely on internal (savings and reduction of expenditure) as well as external sources of funds (funds from friends, family, and other social connections) at the time of financial crunch. Further, Salignac et al. (2019) argue that an individual's resilience not only depends upon the ability to access funds from the above-mentioned sources but also upon access to formal financial sources, which is referred to as financial inclusion. So, the framework of resilience by Salignac et al. (2019) comprises of four interrelated forces: economic resources, financial products and services, financial knowledge and behaviour, and social capital. Kass-Hanna et al. (2022) and Lusardi et al. (2021) demonstrate the effect of financial literacy on financial resilience. Hamid et al. (2023) document a positive influence of financial literacy and financial inclusion on financial resilience. Kass-Hanna et al. (2022) reveal that financial literacy leads to higher savings, higher borrowings, superior risk management through life and health insurance, and improved crisis preparedness. Lusardi et al. (2021) document that high financial literacy encourages better crisis management, lesser debt constraints, superior planning for the future, and greater propensity to save and plan for the future.

Studies have also assessed the importance of financial inclusion in promoting financial resilience. Though there is no consensus on the definition of financial inclusion, the majority of the studies consider financial inclusion in terms of holding financial products and services. In line with this, Salignac et al. (2022) postulate that financial inclusion leads to individuals' access to financial products or services, and financially excluded individuals rely upon costly informal sources of funds

(Lamb, 2019). The economy with more savings-related financial products, credit, and insurance experiences the economic well-being of individuals against financial turbulence. In line with this, a low financial inclusion rate is associated with higher poverty, more income inequality, and sluggish economic growth (Hussain et al., 2019). Higher financial inclusion reduces poverty (Saha & Qin, 2023). Hussain et al. (2019) demonstrate a better resilience of bank account holders than non-account holders, and Lyons et al. (2020) document superior financial inclusion results in lesser financial vulnerability. The above section clarifies that financial inclusion plays a significant role in ensuring individuals' financial resilience. However, financial innovation and financial technology have changed the realm of financial inclusion. The massive penetration of technology into the financial system has urged access to financial products and services through digital devices to garner the full benefits of financial inclusion, which is referred to as digital financial inclusion. So, digital financial inclusion has a greater role in bringing financial resilience. In this regard, Davis & Braunholtz-Speight (2016) reveal that financial innovation leads to economic resilience. Hao & Qu (2023) document that information technology drives economic resilience. Zhu et al. (2023) and Yu et al. (2024) find a positive effect of digital financial agglomeration on economic resilience.

In recent years, the resilience talk has gained plausible academic success among regional scientists and beyond (Martin et al., 2013), and much literature concerning resilience phenomena has been published. Economic resilience has been empirically investigated in different localities (Bergeijk et al., 2017). Further, resilience papers have emphasised different levels of analysis, such as country, region, province, city, local labour market, neighbourhood, etc. (Modica & Reggiani, 2015). Also, methodologically, the papers are fairly diverse, from case studies (Evans & Karecha, 2014; Simmie & Martin, 2010) to studies involving indicators, to studies applying models (Capello et al., 2015), and to studies involving long-run time series (Di Caro, 2017; Fingleton et al., 2012). From a policy viewpoint, the concept is also notable across the world. However, in the context of assessing the role of financial inclusion in bringing economic resilience among the people dependent on fishing is very scant. From review studies, Pomeroy et al. (2020) document the barriers to financial inclusion and the importance of financial inclusion in building financial resilience. However, the existing literature lacks empirical evidence. Though the contribution of the fishermen of Odisha to national fish production is highly significant, and they contribute about 2.19% to the state's GDP, they live with many economic plights. The prior works have unheeded these phenomena. Hence, this proposed work attempts to investigate this missing evidence from among the marine fishermen of the Balasore district of Odisha.

3. Research Methodology

3.1 Research Design

This study employs a quantitative research approach to examine the influence of financial inclusion on financial resilience among marine fishermen in the Balasore district of Odisha. The research framework incorporates an interview schedule to collect primary data, and statistical tools are applied to analyse the relationships between the key variables.

3.2 Target Respondents

The target respondents consist of marine fishermen in the Balasore district of Odisha. To maintain ethical research standards, participants are informed that their involvement in the study is entirely voluntary. Additionally, measures are taken to ensure that all responses remain anonymous and confidential, fostering a sense of trust and openness during data collection.

3.3 Questionnaire Design

A customised questionnaire is designed and administered for the collection of data. The questionnaire comprises of items measured on a 5-point Likert scale to capture nuanced responses. To ensure its validity and comprehensiveness, rigorous validation techniques, including expert reviews and pilot testing, have been conducted before deployment.

3.4 Tools Used

Data analysis has been performed using SPSS and SPSS AMOS, leveraging their complementary capabilities. SPSS is utilised for descriptive and preliminary data analysis, offering a clear overview of the dataset's characteristics. Further, SPSS AMOS is employed for advanced structural equation modelling (SEM), enabling a robust evaluation of complex relationships between constructs. Specifically, SPSS facilitates descriptive analyses, while SPSS AMOS is instrumental in testing the structural relationship between financial inclusion and financial resilience. The measurement model is assessed for validity, and the structural model is analysed using path coefficients to determine the significance of the relationships.

3.5 Survey Process

The survey involves scheduling and conducting interviews with 282 fishermen in the Balasore district of Odisha. These interviews are guided by a structured questionnaire designed to capture relevant data. Each response is carefully reviewed to ensure the representativeness and quality of the data. Upon examination**,** 7 responses are excluded due to incomplete information. Additionally, 4 responses are removed because of inconsistent answer patterns. Ultimately, 271 valid responses are included in the final analysis, ensuring a robust dataset for the study.

Table 1: Measurement of financial inclusion and financial resilience

Observed Variables	Constructs
Financial Inclusion (FI)	(1) Access (ACC) (2) Usage (USG) (3) Quality (QUA)
Financial Resilience (FR)	(1) Keeping Control of Money (KCM) (2) Taking Care of Expenditure (TCE) (3) Having Financial Cushion (HFC) (4) Having Financial Shortfall/Stress (HFS) (5) Having Financial Planning (HFP)

Source: Authors' compilation

4. Results and Discussion

A significant majority of the respondents, 78.2%, are aged 30 years and above. A smaller proportion, 0.7%, and 21.1%, are between 18-25 years and 26-30 years, respectively. In terms of education, 68.2% of the respondents are illiterate. A substantial portion, 30%, have primary education, while only 1.8% have secondary education. Regarding family size, 8.2% of the fishermen have more than four dependents. A smaller proportion of 0.3% has one dependent, while 8.2%, 45.1%, and 38.2% have two, three, and four dependents, respectively. Most respondents, 92.6%, are professional fishermen, while 7.4% are occasional fishermen. In terms of income distribution, a significant proportion, 57.4%, have a monthly income ranging from ₹10,000 to ₹15,000. A smaller proportion, 20.4% and 22.2%, have a monthly income between ₹5,000 to ₹10,000 and above ₹15,000, respectively. These results are provided in Table 2.

Table 2: Demographic characteristics of marine fishermen

Demographics	Frequency	%	Cumulative %
Age			
>30	212	78.2	78.2
18-25	2	0.7	78.9
26-30	57	21.1	100.0
Total	271	100	
Education			
Illiterate	185	68.2	68.2
Primary	81	30.0	98.2

Secondary	5	1.8	100.0
Total	271	100	
Dependent Members			
>4	22	8.2	8.2
1	1	0.3	8.5
2	22	8.2	16.7
3	123	45.1	61.8
4	103	38.2	100.0
Total	271	100	
Types of Fishermen			
Occasional	20	7.4	7.4
Professional	251	92.6	100.0
Total	271	100	
Monthly Income			
>15000	60	22.2	22.2
10000-15000	156	57.4	79.6
5000-10000	55	20.4	100.0
Total	271	100	

Source: Authors' calculation

To reduce the dimensionality of the data and identify underlying constructs, Principal Component Analysis (PCA) has been employed. Following Kaiser's criterion (Kaiser, 1960), components with eigen values greater than 1 are retained. This analysis yields three factors for financial inclusion and five factors for financial resilience, capturing a significant proportion of the total variance.

To further validate the factor structure and assess the measurement model, Confirmatory Factor Analysis (CFA) is conducted (Hair et al., 2010). CFA aims to examine the extent to which the observed variables are associated with their latent constructs. The analysis assessed convergent and discriminant validity, composite reliability (CR), and average variance extracted (AVE), which are described in Table 4 and Table 5.

Convergent validity evaluates how well items within the same construct correlate and represent the underlying concept they are designed to measure. It is deemed achieved when item loadings surpass the 0.70 threshold, demonstrating that the items effectively capture their construct and account for at least 50% of the variance (indicated by an AVE exceeding 50%) (Blunch, 2012). Table 3 outlines the factor loadings for various constructs. Generally, a factor loading greater than 0.70 signifies a strong relationship between the observed variable and the intended construct.

Following the guidelines outlined by Lee (2009), an additional validation step has been conducted to ensure the convergent validity of the constructs. As per Hu & Bentler (1999), this validation requires an AVE value of at least 0.50, signifying that latent variables account for at least 50% of the variance in their corresponding indicator variables. Table 4 provides an assessment of the model constructs' reliability, evaluated through Cronbach's alpha, CR, and AVE. Each construct achieves and exceeds the minimum AVE value of 0.50, further substantiating the validity of the constructs under investigation (Hair et al., 1992; Nunnally & Bernstein, 1994; Wang et al., 2009).

The reliability of the scale is thoroughly assessed for each of the eight primary components in the study using Cronbach's alpha and CR measures. The findings indicate satisfactory convergent validity across all components, with factor loadings exceeding 0.70 in Table 3. CR values are above the acceptable benchmark of 0.60, and all AVEs are greater than 0.50. As Yu et al. (2011) suggested, these results confirm that the items met the required criteria, which is further validated by the composite reliability scores. Additionally, Cronbach's alpha values for all components surpassed 0.50, aligning with the recommendations of Sarstedt et al. (2021).

Table 3: Factor loadings

Constructs	Items	Factor Loadings
Access (Five Items)	FI_ACC1	0.868
	FI_ACC2	0.789
	FI_ACC3	0.768
	FI_ACC4	0.895
	FI_ACC5	0.795
Usage (Nine Items)	FI_USG1	0.786
	FI_USG2	0.832
	FI_USG3	0.812
	FI_USG4	0.793
	FI_USG5	0.739
	FI_USG6	0.819
	FI_USG7	0.898
	FI_USG8	0.712
	FI_USG9	0.773
Quality (Six Items)	FI_QUA1	0.819
	FI_QUA2	0.827
	FI_QUA3	0.704
	FI_QUA4	0.721
	FI_QUA5	0.732
	FI_QUA6	0.812
Keeping Control of Money (Three Items)	FR_KCM1	0.758
	FR_KCM2	0.831
	FR_KCM3	0.796
Taking Care of Expenditure (Three Items)	FR_TCE1	0.914
	FR_TCE2	0.883
	FR_TCE3	0.730
Having Financial Cushion (Three Items)	FR_HFC1	0.807
	FR_HFC2	0.888
	FR_HFC3	0.839
Having Financial Shortfall/Stress (Three Items)	FR_HFS1	0.828
	FR_HFS2	0.879
	FR_HFS3	0.732
Having Financial Planning (Three Items)	FR_HFP1	0.726
	FR_HFP2	0.856
	FR_HFP3	0.791

Source: Authors' calculation

Table 4: Reliability of constructs

Constructs	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Financial Inclusion	0.732		
FI_ACC		0.914	0.680
FI_USG		0.940	0.636
FI_QUA		0.894	0.586
Financial Resilience	0.865		
FR_KCM		0.808	0.586
FR_TCE		0.882	0.716
FR_HFC		0.882	0.715
FR_HFS		0.855	0.665
FR_HFP		0.804	0.579

Source: Authors' calculation

Discriminant validity is evaluated by comparing the square root of the AVE for each construct with the correlation values between that construct and others in the model, following the method outlined by Henseler et al. (2015). This approach ensures that the constructs exhibit acceptable discriminant validity. Table 5 illustrates the results, calculated using the Fornell-Larcker criterion, to verify that the constructs are distinct and represent different concepts. The analysis reveals that all items satisfied the criterion, indicating robust discriminant validity. Both the Fornell-Larcker criterion and cross-loadings are employed to analyse discriminant validity. The assessment confirmed that each item loaded more strongly on its intended construct than any other construct in the model, which is consistent with Fornell and Larcker (1981). In Table 5, the diagonal elements represent the square root of the AVE, while the off-diagonal elements reflect the correlations between constructs. Each diagonal value exceeds the off-diagonal values in the corresponding rows and columns, supporting the validity of the constructs (Fatayah et al., 2022).

Table 5: Discriminant validity

Constructs	FI_ACC	FI_USG	FI_QUA	FR_KCM	FR_TCE	FR_HFC	FR_HFS	FR_HFP
FI_ACC	**0.825**							
FI_USG	0.746	**0.797**						
FI_QUA	0.526	0.595	**0.766**					
FR_KCM	0.689	0.718	0.525	**0.766**				
FR_TCE	0.661	0.522	0.592	0.556	**0.846**			
FR_HFC	0.569	0.560	0.569	0.542	0.621	**0.846**		
FR_HFS	0.718	0.688	0.621	0.653	0.756	0.674	**0.815**	
FR_HFP	0.758	0.636	0.599	0.509	0.724	0.625	0.684	**0.761**

Source: Authors' calculation

Table 6 depicts the SEM results. The CFA results for financial inclusion indicate that the model is fit. The chi-square (χ^2) statistic is non-significant (P>0.05), and the fit indices exceed the recommended thresholds: IFI>0.95, TLI>0.95, CFI>0.90, and RMSEA<0.08. These findings suggest that the measurement model for financial inclusion is robust and adequately represents the underlying constructs. The findings confirm the convergent validity of the manifest and latent for financial resilience, with excellent model fit statistics between the model and the observed data. The normed chi-square (x^2), i.e., (CMIN/DF)=1.089 (degree of freedom=67, probability level=0.118), and the incremental fit index (IFI)=0.961, where the recommended value is 0.95. Further, the Tucker-Lewis index (TLI)=0.963 is above the recommended value of 0.95. Furthermore, the comparative fit index (CFI)=0.971 is above the recommended value of 0.90, with the Root Mean Square Error of Approximation (RMSEA) of 0.056, which is within the recommended value.

Table 6: SEM results

Statistics	Value
Financial Inclusion (FI) $\longrightarrow$ Financial Resilience (FR)	0.298***
Chi-square Minimum (CMIN)	72.935
Degree of Freedom (DF)	67
Probability (P)	0.118
Goodness of Fit Index (GFI)	0.938
Incremental Fit Index (IFI)	0.961
Tucker-Lewis Index (TLI)	0.963
Comparative Fit Index (CFI)	0.971
Normed Fit Index (NFI)	0.925
Root Mean Square Error of Approximation (RMSEA)	0.056
Squared Multiple Correlations (R^2)	0.217

Source: Authors' calculation

Note: N-271, ***P<0.001, **P<0.01, *P<0.05

The result depicts that financial inclusion positively influences the financial resilience of marine fishermen (β=0.298, $P<0.001$) in the Balasore district of Odisha. So, it is inferred that financial inclusion explains a 29.8% variation in financial resilience.

5. Conclusion

This study examines the influence of financial inclusion on the financial resilience of marine fishermen in the Balasore district of Odisha. A quantitative research methodology has been employed using data collected from 271 fishermen. SEM has been conducted to analyse the data. The findings of the study provide empirical evidence that financial inclusion positively influences the financial resilience of marine fishermen. The analysis reveals a positive relationship between dimensions of financial inclusion, such as access, usage, and quality of financial services, and dimensions of financial resilience, such as keeping control of money, taking care of expenditure, having financial cushion, having financial shortfall/stress, and having financial planning. These results imply that enhancing access, usage, and quality of financial services broadens the scope of financial inclusion and empowers marine fishermen to manage financial risks better. This helps the marine fishermen to cope with shocks and build financial resilience, and thereby improve the economic well-being.

This study holds significant implications for policymakers, financial institutions, and development practitioners. Financial inclusion is critical in enhancing the financial resilience of marine fishermen who face precarious livelihoods due to natural calamities and fluctuating incomes. The research underscores that inclusive financial systems enable marine fishermen to improve savings, access emergency funds, and recover more effectively from economic shocks. The policymakers can leverage these findings to design targeted financial inclusion programs and promote accessible banking services tailored to the unique needs of marine fishing communities. Introducing microinsurance schemes and affordable asset-acquisition credit facilities can mitigate income uncertainties and foster long-term resilience. For financial institutions, this study emphasises the business potential in extending services to underserved segments, ensuring mutual benefits. The study advocates integrating financial inclusion initiatives with broader developmental programs. This holistic approach can sustainably uplift marine fishermen’s socio-economic conditions and financial resilience, ensuring their inclusive growth.

While the study provides valuable insights into how financial inclusion influences the financial resilience of marine fishermen, there are certain drawbacks to consider. Firstly, the research primarily focuses on marine fishermen of a specific geographical area, which may limit the generalisability of the findings to other coastal areas with different socio-economic dynamics. Secondly, the study relies on cross-sectional data, which restricts the ability to observe long-term trends and causal relationships between financial inclusion and financial resilience. Thirdly, the sample size, though representative, may not capture the full diversity of experiences within the marine fishing community, such as gender-specific challenges or varying levels of access to financial services. Fourthly, external factors like climate change, policy shifts, and market volatility significantly affect marine fishermen’s financial resilience and have not been thoroughly explored.

Future research can address these limitations by employing longitudinal data to better understand the long-term effects of financial inclusion on financial resilience, and expanding the study to include other coastal areas or states can provide comparative insights and enhance generalisability. Further, incorporating qualitative methods can shed light on nuanced aspects of financial resilience, such as social capital and community support. Furthermore, analysing the role of digital financial inclusion and innovative financial tools can offer an added perspective, especially given the growing penetration of technology in coastal areas.

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References

Bene, C., & Friend, R. M. (2011). Poverty in small-scale fisheries. *Progress in Development Studies*, *11*(2), 119–144. https://doi.org/10.1177/146499341001100203

Bergeijk, P. Van, Brakman, S., & Marrewijk, C. Van. (2017). Heterogeneous economic resilience and the great recession's world trade collapse. Papers in regional science, 96(1), 3-13. https://doi.org10.1111/pirs.12279

Blunch, N. J. (2012). Introduction to structural equation modeling using IBM SPSS statistics and AMOS.

Capello, R., Caragliu, A., & Fratesi, U. (2015). Spatial heterogeneity in the costs of the economic crisis in Europe: are cities sources of regional resilience? *Journal of Economic Geography*, *15*(5), 951–972. https://doi.org/10.1093/jeg/lbu053

Davis, M. & Braunholtz-Speight, T. (2016). *Financial Innovation Today: Towards Economic Resilience.* Report. Bauman Institute, University of Leeds, Leeds, UK.

Di Caro, P. (2017). Testing and explaining economic resilience with an application to Italian regions. *Papers in Regional Science*, *96*(1), 93–114. https://doi.org/10.1111/pirs.12168

Du, Y., Wang, Q., & Zhou, J. (2023). How does digital inclusive finance affect economic resilience: Evidence from 285 cities in China. *International Review of Financial Analysis*, *88*, 102709. https://doi.org/10.1016/j.irfa.2023.102709

Evans, R., & Karecha, J. (2014). Staying on Top: Why is Munich so Resilient and Successful? *European Planning Studies*, *22*(6), 1259–1279. https://doi.org/10.1080/09654313.2013.778958

Fatayah, F., Yuliana, I. F., & Mufidah, L. (2022). Validity and Reliability Analysis in Supporting Mastery Learning STEM Model. *Buana Pendidikan: Jurnal Fakultas Keguruan dan Ilmu Pendidikan Unipa Surabaya*, *18*(1), 49-60.

Fingleton, B., Garretsen, H., & Martin, R. (2012). Recessionary Shocks and Regional Employment: Evidence on the Resilience of U.K. Regions. *Journal of Regional Science*, *52*(1), 109–133. https://doi.org/10.1111/j.1467-9787.2011.00755.x

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39-50.

Hair, J. F., Anderson, R. E., Tatham, R. L. and Black, W. C. (2010), Multivariate Data Analysis, Prentice Hall, Englewood Cliffs, NJ. 7th Edition.

Hair, J. T., Anderson, R. E., Tatham, R. L. and Black, W. C. (1992) Multivariate Data Analysis with Readings, 3rd ed., Macmillan, New York.

Hamid, F. S., Loke, Y. J., & Chin, P. N. (2023). Determinants of financial resilience: insights from an emerging economy. *Journal of Social and Economic Development*, *25*(2), 479–499. https://doi.org/10.1007/s40847-023-00239-y

Hao, X., & Qu, J. (2023). The role of financial drivers on regional economic resilience: Does information technology level matter? *Journal of Information Economics*, 1–25. https://doi.org/10.58567/jie01020001

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science*, *43*, 115-135.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, *6*(1), 1-55.

Hussain, A. H. M. B., Endut, N., Das, S., Chowdhury, M. T. A., Haque, N., Sultana, S., & Ahmed, K. J. (2019). Does financial inclusion increase financial resilience? Evidence from Bangladesh. *Development in Practice*, *29*(6), 798–807. https://doi.org/10.1080/09614524.2019.1607256

Kaiser, H. F. (1960). The application of electronic computers to factor analysis. Educational and Psychological Measurement, 20, 141-151.

Kass-Hanna, J., Lyons, A. C., & Liu, F. (2022). Building financial resilience through financial and digital literacy in South Asia and Sub-Saharan Africa. *Emerging Markets Review*, *51*, 100846. https://doi.org/10.1016/j.ememar.2021.100846

Lamb, S. (2019). *Successful Aging as a Contemporary Obsession* (S. Lamb, Ed.). Rutgers University Press. https://doi.org/10.36019/9780813585369

Lee, M. (2009), "Understanding the behavioural intention to play online games: An extension of the theory of planned behaviour", Online Information Review, Vol. 33 No. 5, pp. 849-872. http://dx.doi.org/10.1108/14684520911001873

Lusardi, A., Hasler, A., & Yakoboski, P. J. (2021). Building up financial literacy and financial resilience. *Mind & Society*, *20*(2), 181–187. https://doi.org/10.1007/s11299-020-00246-0

Lusardi, A., Schneider, D., & Tufano, P. (2011). *Financially Fragile Households: Evidence and Implications*. https://doi.org/10.3386/w17072

Lyons, A. C., Kass-Hanna, J., Liu, F., Greenlee, A. J., & Zeng. (2020). Building financial resilience through financial and digital literacy in South Asia and Sub-Saharan Africa. In *Asian Development Bank Institute (ADBI* 1098). https://www.adb.org/publications/building-financial-resilience-through-financial-digital-

Martin, B. C., McNally, J. J., & Kay, M. J. (2013). Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing*, *28*(2), 211–224. https://doi.org/10.1016/j.jbusvent.2012.03.002

Modica, M., & Reggiani, A. (2015). Spatial Economic Resilience: Overview and Perspectives. *Networks and Spatial Economics*, *15*(2), 211–233. https://doi.org/10.1007/s11067-014-9261-7

Modigliani, F., & Brumberg, R. (1954). *The Collected Papers of Franco Modigliani*. The MIT Press. https://doi.org/10.7551/mitpress/1923.001.0001

Muir, K., Reeve, R., Connolly, C., Marjolin, A., Salignac, F., & Ho, K. (2016). Financial Resilience in Australia 2015. *Centre for Social Impact (CSI) – University of New South Wales, for National Australia Bank.*

Nunnally, J. C. and Bernstein, I. H. (1994). Psychometric Theory, 3rd ed., McGraw-Hill, New York.

Organisation for Economic Co-operation and Development (OECD). (2020). *OECD/INFE 2020 international survey of adult financial literacy*. OECD.

Pomeroy, R., Arango, C., Lomboy, C. G., & Box, S. (2020). Financial inclusion to build economic resilience in small-scale fisheries. Marine policy, 118, 1-9.

Porru, S., Misso, F. E., Pani, F. E., & Repetto, C. (2020). Smart mobility and public transport: Opportunities and challenges in rural and urban areas. *Journal of Traffic and Transportation Engineering (English Edition)*, *7*(1), 88–97. https://doi.org/10.1016/j.jtte.2019.10.002

Saha, S. K., & Qin, J. (2023). Financial inclusion and poverty alleviation: an empirical examination. *Economic Change and Restructuring*, *56*(1), 409–440. https://doi.org/10.1007/s10644-022-09428-x

Salignac, F., Hanoteau, J., & Ramia, I. (2022). Financial Resilience: A Way Forward Towards Economic Development in Developing Countries. *Social Indicators Research*, *160*(1), 1–33. https://doi.org/10.1007/s11205-021-02793-6ï

Salignac, F., Marjolin, A., Reeve, R., & Muir, K. (2019). Conceptualizing and Measuring Financial Resilience: A Multidimensional Framework. *Social Indicators Research*, *145*(1), 17–38. https://doi.org/10.1007/s11205-019-02100-4

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2021). Partial least squares structural equation modeling. In *Handbook of* market *research* (pp. 587-632). Cham: Springer International Publishing.

Simmie, J., & Martin, R. (2010). The economic resilience of regions: towards an evolutionary approach. *Cambridge Journal of Regions, Economy and Society*, *3*(1), 27–43. https://doi.org/10.1093/cjres/rsp029

Wang, Y.-S., Wu, M.-C.. and Wang, H.-Y. (2009) 'Investigating the determinants and age and gender differences in the acceptance of mobile learning', British Journal of Educational Technology, Vol. 40, pp.92–118.

Yu, C. H., Jannasch-Pennell, A., & DiGangi, S. (2011). Compatibility between text mining and qualitative research in the perspectives of grounded theory, content analysis, and reliability. *Qualitative Report*, *16*(3), 730-744.

Yu, J., Hu, W., & Deng, T. (2024). Towards more resilient economy—analyzing the impact of new-type urbanization on urban economic resilience: mechanisms and spatial spillover boundaries. *Economic Change and Restructuring*, *57*(5), 158. https://doi.org/10.1007/s10644-024-09742-6

Zhu, Z., Yang, Y., & Li, H. (2023). A study of the spillover effects of digital financial agglomeration on economic resilience. *Frontiers in Applied Mathematics and Statistics*, *8*, 1–13. https://doi.org/10.3389/fams.2022.1085563

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Mapping the Dynamics of Non-interest Income in Banking Sector: A Systematic Literature Review and Bibliometric Analysis Using Scopus Database

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G21, M11, P24, E02

Abstract: In recent years, the Indian banking sector has experienced major changes with a significant shift of generating revenue from non-interest income over interest income. The non-interest incomes are mostly from fees, commissions, sale of fixed assets, Bank guarantees and Letters of Credit have a strong impact on the financial performance of banks. By analyzing 735 Scopus-indexed articles published in English between 2005 and 2024, this paper attempts to present a blend of Bibliometric analysis along with a Systematic Literature Review (SLR) on the currently available literature on the topic "Non-interest income of Commercial Banks" using VOS viewer software. This study is likely the first to present a holistic view of current banking literature on non-interest income which has rarely been investigated by using Bibliometric and SLR methods. This analysis depicts leading and influential authors, most cited papers, country-wise highest publications, International author's collaborations, and key research topics. By Network analysis, co-citation analysis, etc. the thematic clusters have been identified with the results that Dang, V.D., and Sufian, F. are the most influential authors, and the Journal of Banking and Finance is the leading journal. The USA, UK, China, and Russia are the countries that have major research excellence in this field. This study provides significant insights to academia, policymakers, and Banking professionals interested in future research on Bank Revenue diversification, lending activities, and Off-balance sheet exposures.

1. Introduction

As financial intermediaries, banks are essential to the growth and development of a strong economy. To increase access to banking services, governments, central banks, and international organizations formulate and implement policies that benefit the people (Stiroh, 2006). Commercial banks are generally based on doing two basic activities, Taking deposits and advancing loans. In the latter, they get interest as their primary source of revenue. However, this focus has now been changed to the intermediation and shifting of revenue generation (Kohler, 2015). Similarly, over time, the US banks have also expanded their scope of operations towards generating revenue from several fee-based sources (Maxwell, 2006). A large portion of this data has originated from financial institutions especially the banking sectors in Europe and the US since banks have been vehemently moving towards new business lines and providing fee-based services to cater to their need to generate revenue with a lesser risk portfolio. Similarly, over the past decade, financial institutions have experienced a decline in profits due to the process of financial disintermediation and heightened competition within the traditional banking sector (Park et al 2019). Their study utilizes panel data from individual banks to investigate the connection between non-interest income and the risk-return profile of holding companies in American banks during the financial crisis. A study by Baek et al., 2018 demonstrates that Korean banks do not benefit from diversifying their operating income. As a result, Korean bank managers prioritize interest income. The findings also explain that the expansion in non-interest-related revenue fosters the growth in expenses, suppressing the impact of diversification on Korean banks' profitability. Consequently, Korean banks promote non-interest income revenues and discourage banking diversification According to this study; low returns and bank instability during the financial crisis are not caused by non-interest revenue. Therefore, it is crucial to examine evolving sources of bank revenue. Due to changes in their business models over time, banks are diversifying their sources of income. The bank's profits must be assessed since they are crucial to the models of supervision: foreign banks are earning more profits than PSBs which earn far less than private domestic banks. Higher state ownership of PSBs considerably reduces their propensity to seek non-interest revenue streams. For public sector banks, fee-based income drastically reduces risk as indicated by profitability statistics. These banks also have a lower default risk. Diversification seems to help PSBs of India from a regulatory standpoint (Pennathur et al., 2012). The unique aspect of this study is to include the application of a bibliometric and systematic literature methodology, which gives it a concise overview of the growing body of research on commercial banks' non-interest income.

The paper's primary contributions use the VOS viewer program, a widely used application for bibliometric research in any field, to discuss the important findings of 735 papers on the subject. Additionally, this approach differs from other approaches that provide high-contributing journals, influential papers, yearly publications, well-known authors, and networks for author collaboration. Furthermore, it identifies the main themes and keyword co-occurrences in previous research, which helps all scholars, identify current and upcoming hotspot issues in this particular field.

2. Literature Review

A literature review is a summary overview of previously published papers to determine the research gap, and scope of study that will be relevant to the topic under study (USC Libraries, 2010). To gain a thorough grasp of the numerous research papers on the non-interest income of commercial banking institutions, this present work has combined bibliometric analysis and SLR. SLR aims to provide the most comprehensive list of all published and unpublished research related to a certain topic of study. SLR adopts transparent, scientific, and reproducible producers, which differentiates it from traditional description reviews. To solve a particular research question, it is necessary to accumulate all related and important research articles and other publications that help us to match our predetermined criteria of inclusion (Mengist et al. 2020). A popular and detailed method for examining and evaluating vast amounts of bibliographic data is bibliometric analysis (Donthu 2021). Many researchers use bibliometrics for several reasons, which include catching the emerging patterns in the impact of articles and journals, identifying common patterns of association, identifying research segments, and examining the cognitive framework of a given field in the context of existing literature (Verma & Gustafsson,2020). Regarding the area of research, several papers have been examined to extract an in-depth understanding inculcated with various dimensions of this topic. Park et.al (2019) in their study discovered that Non-Interest Income facilitates improving the stock return and decreasing bank risk during the crisis period and bank risk and return were unaffected by non-interest income from investment banking operations. Trivedi (2015) finds an insignificant relationship between Increasing share of Non-Interest Income with Risk-adjusted performance but between Income diversification and Profitability found to be positive and significant. Non-interest income is also correlated with macroeconomic instability and the concentration of the banking sector (Dvorak and Hanousek 2009). Efficient banks typically make the most money from non-interest income, according to research by Tennant and Sutherland (2018). Mehzabin et. al (2023) found a positive nexus among operating efficiency, capital structure, and banks' financial performance when moderated by Non-Interest Income. Previous studies indicate in comparison to Interest income, non-interest income is more volatile (Williams & Prather, 2010; Stiroh, 2004; Stiroh & Rumble, 2006). This suggests that a bank's profitability may be more variable when non-interest income is included. Non-interest revenue provides retail-oriented banks with a substantial diversification advantage, according to (Köhler 2015). Research on the impact of fee-based income on the risks of the banking sector has yielded mixed results. Some studies have found that non-interest income is linked to increased revenue volatility. However, Williams (2016) suggests that it doesn't elevate the risks of insolvency in banks. Interestingly, Saunders et al. (2016) challenge Stiroh's (2004) earlier findings, which indicated that a larger proportion of non-interest income in a bank's revenue structure leads to decreased risk-adjusted returns. Regarding stock market performance, Stiroh (2006) found no significant relationship between stock returns and Non-interest income of commercial banks. Sissy et. al (2016) suggest that risk exploration offsets the bank revenue diversification of cross-border transactions. So, these literatures provide good insight into non-interest incomes in commercial banks along with understanding the framework of bibliometric analysis and systematic literature review.

3. Research Gap

All of the above studies focus on various empirical and conceptual studies that provide numerous insights for policymakers, institutions, Depositors, and financial intermediaries to make informed decisions in this particular field. The purpose of the research is to investigate the connection between non-interest income and other facets of financial performance. In particular, they examine the effects of variables including revenue volatility, capital structure, risk-return trade-offs, stock returns, off-balance sheet exposures, profitability, stability, and net interest margins.

Hence as far as the literature review is concerned, it is interesting to reveal that absolutely no research of bibliometric analysis on this particular field has been done yet. So this study can be considered the first research on this topic and is a humble attempt to identification of patterns and trends in these previous studies. This study uses a hybrid research design incorporating a blend of Bibliometric analysis along with Systematic Literature Review (SLR) to provide greater insights into a comprehensive knowledge landscape in the study of Non-Interest incomes. In light of this, the following research questions have been developed to guide the study: RQ.1- Which journals contribute the most to the field of "Non-interest income in Commercial banking"?. RQ.2- Which authors are the most prominent in this area, and how many citations they have received? RQ.3- Which countries have made the most contributions to the study of Non-interest income? RQ.4- Which are the top Papers having the most citations? RQ.5- Who are the authors having collaborations in this field of study? RQ.6- Which articles are inter-connected and what are the various clusters generated?

4. Objectives of the Study

In light of the research questions formulate above, the several objectives of this study include;

i. To find out the leading academic journals contributing significantly to the area of research on non-interest income in commercial banking.
ii. To identify the most influential authors in this field of research and their citation impact.
iii. To highlight the countries with the highest contributions and their patterns of collaboration.
iv. To determine the highly cited research papers in the area of non-interest income in banking.
v. To analyse the co-authorship networks and relationships among top researchers in this particular field and to investigate the inter-connected of articles and various clusters to be formulated.

5. Research Methodology

By summarizing earlier research, Bibliometric analysis which is employed in this study aims to expand the scope of research knowledge. (Zupic & Ater,2015). In this parlance, Bibliometric analysis refers to a quantitative evaluation of written publications that measures the advancement of scientific studies to determine the effect they have. (Broadus,1987). A bibliographic study has been used to find out the most influential authors, most cited journals, Contribution of top countries, Network analysis of top authors, Keyword and Citation analysis, Co-citation, Bibliographic Coupling, etc. for visualization by analyzing the metadata. Similarly, SLR is used to provide qualitative and thematic insights to gauge the research potential, and related areas and facilitate future researchers researching this area.

It offers a science mapping and a performance analysis that help in determining the thematic evolution of a study area. The topic is appropriate for this method since non-interest income in banking research is vast and multidisciplinary but still unstructured, as was previously discussed. In line with Fahimnia (2015), we followed a three-step technique including, (Assembling, Arranging, and Assessing) to measure the highly rated journals, and the prolific authors and to give a direction for further research in this area. Similarly, the Systematic Literature Review (SLR) depicts a structured process of review of literature to identify the gaps, and methods and synthesize the findings. VOS Viewer software has been used for the analysis and mapping of collected data.

5.1 Data Source

This study uses Scopus database to conduct an empirical analysis of journals and articles published between 2005 to 2024. The primary crux of this research is to visualize the research potentials, Network analysis, Citations and Co-Citation analysis, an insight about Authors and Articles, Keywords etc.

The reasons for using the Scopus database for this study mainly due to its accessibility, Another reason for the selection of Scopus over other databases like Web of Science etc. for its broad and multidisciplinary coverage, robust analytical tools, Scopus is indexed with high quality, reputable journals in banking and finance, making it best suited for bibliometric and systematic literature review analyses.

The period of study covers a period of 20 years ranging from 2005 to 2024 to have a better grasp on the evolutionary patterns of studies on non-interest income in banking. The time frame is important owing to the growth momentum of scholarly interest in these areas post-2005. Followed by the deregulation and earlier shifting in banking strategies due to Globalisation and deregulation in the 1990s and 2000s. The 2008 financial crisis has compelled banks to diversify their revenue. Besides, the surge of digital banking and innovations has spurred extensive research in this area, particularly in Scopus-indexed Journals.

5.2 Criteria for Selection of Study Framework

Assembling
Search query: (Title-Abs-Key ("Non-Interest And Income And of And Banks") or Title-Abs-Key ("Fee And Based And Income And of And Banks") or Title-Abs-Key ("Income And Diversification And of And Banks") or Title-Abs-Key ("Revenue And Diversification And Of And Banks")) To (Language, "English")) **Search database:** Scopus **Total articles retrieved**= 827

Arranging

Filtered by Subject area:
Finance, Economics and Econometrics= 538, Accounting & Management =316, Multidisciplinary = 9, Decision Sciences = 55, Engineering = 45, Mathematics = 33, Computer Science = 57, Arts and Humanities = 25, Social Sciences = 176,
Year: 2005-2024
Types of document: "articles".
Stages of Publication: "Final"
Type of source: "Article,
Language "English"
Final articles: 735 articles

Assessing

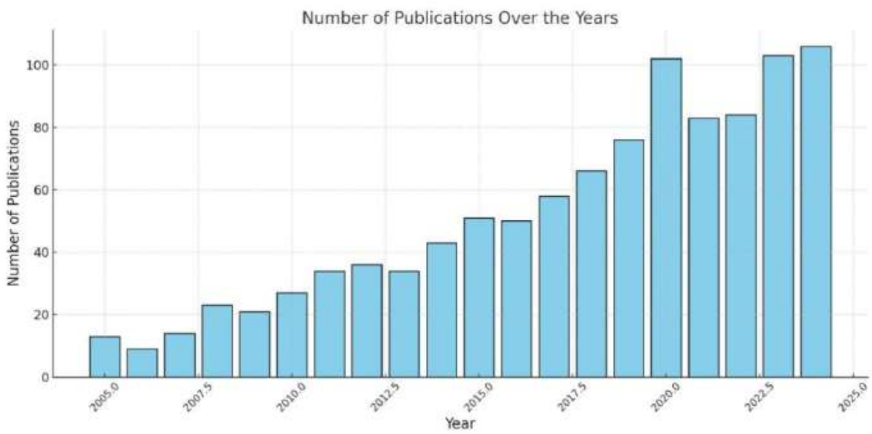
Analysis method: (SLR) Descriptive analysis- Most Prominent Journals, Top authors, Publication trends year by year,
Bibliometric analysis- Bibliographic Coupling, Citations & Co-citations analysis, Co-authorship, Network analysis.
Limitations: Completeness and accuracy of information obtained from the Scopus database

6. Scope of the Study

Published empirical papers from 2005 to 2024 retrieved from the Scopus database were rigorously examined for this study. A total of 735 papers have been selected for bibliometric and SLR analysis using VOS-Viewer software through visualization and interpretation of factual findings. The selected papers include themes connected to Non-interest income, Diversification of Revenue and Bank performance. The timeframe of this study captures two decades of banking spreading over Pre and post global financial crisis. The identification of the research gaps, and the significance of the factual data have also been thoroughly analyzed.

7. Descriptive Analysis:

Chart 1: Year-wise Publication Trend



Source: Authors' compilation

This chart shows the trends of publications year-wise from 2005 to 2024. Although articles have been published since 2005, Chart 1 shows that the majority of the articles are released starting in 2024. The graph demonstrates a trend of fluctuations, indicating that the quantum of articles publications in 2015 decreased while in 2020 it increased. In 2024, a significant number of articles were published. A thorough investigation of this chart reflects the growing importance of Non-interest income as an emerging topic in banking. It is assumed that this upward trend will continue due to the shifting of banking strategy owing to internet penetration, Digital banking products, Financial inclusion and literacy, Reforms in banking regulations and models, etc that usher banks to generate fee-based incomes more and more.

7.1 Top Contributing Journals

Table 1: Volume of Journal Articles Published

Journals	Count of Papers
Journal of Banking & Finance	31
Banks & Bank Systems	19
International Business Research	14
Cogent Business and Management	13
Finance Research Letters	12
Global Business Review	10
Pacific Basin Finance Journal	10
European Journal of Finance	09
International Economics Review	09
Journal of Financial Regulation	09

Source: *Authors' compilation*

Table 1 highlights the distribution of publications across 10 academic journals, with the Journal of Banking & Finance leading with 31 publications, followed by Banks and Bank Systems with 19. Other notable journals, including International Business Research (14) and Cogent Business and Management (13), reflect strong engagement with global finance and business topics. Several journals, such as *Global Business Review* and *Pacific Basin Finance Journal*, each have 10 publications, indicating balanced contributions to regional and thematic financial studies. Overall, the data showcases a diverse and targeted dissemination of research in finance, banking, and business domains.

Journals of Banking and Finance, bank systems, and Cogent Business and Management focus on innovations in banking, financial performance, and income streams which attracts the researchers to go for publishing in these quality journals. Pacific Basin Finance Journal and Global Business Review cater to the need of regional research like India where non-interest income is gaining much interest due to overhaul in banking models, Fintech, and affordability of digital banking products. These journals are indexed in the Scopus database attracting the researchers to publish their works.

7.2 Most Prolific and Influential Author

Table: 2 Number of documents per author

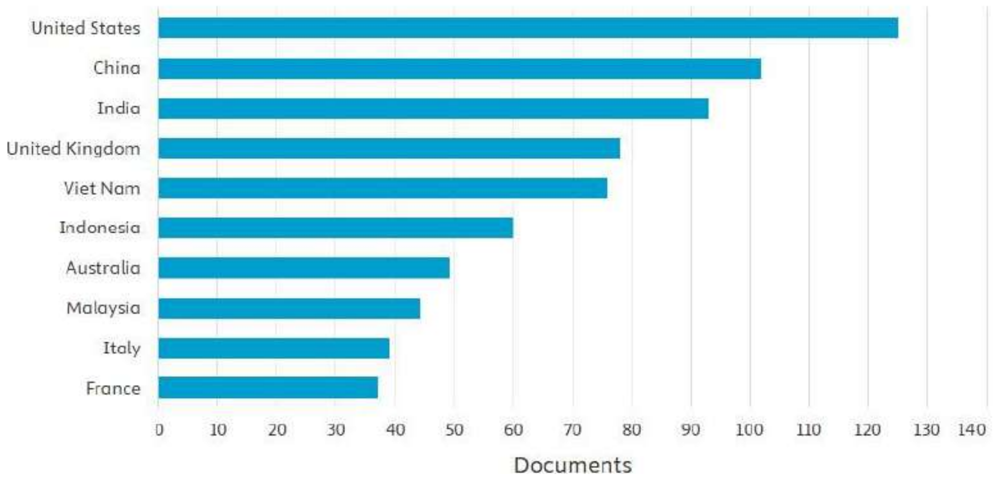
Authors	Number of Documents	H-Index
Dang, V.D	11	10
Sufian, F.	11	10
Amidu, M.	08	07
Lee, C.C	07	05
Tarazi, A	07	06
Calmès, C	06	03
Huynh, J	06	05
Tan, Y.	06	05
Williams, B.	06	05
Gambacorta, L.	05	09

Source: Authors' compilation

Dang, V.D. and Sufian, F. are the most frequently published authors, each contributing to 11 publications, highlighting their prominence in the research domain by having an H-index of 10 each. Authors like Amidu, M. (8 publications) and Lee, C.C., and Tarazi, A. (7 each) also play significant roles in the literature. They also have a good H-index ranging from 06-07. The remaining authors, including Calmès, C., Huynh, J., Tan, Y., and Williams, B., have consistent contributions (6 each), while Gambacorta, L. has 5 publications. The data reflects a mix of leading contributors and collaborative efforts in the field of banking, finance, and related studies. These leading authors focused specifically on banking incomes and their impact on financial performance and various through a critical analysis by using advanced empirical and econometric models that have been cited by other researchers due to their quality, peer review, and scholarly value.

7.3 Top Countries in Terms of Publication

Chart: 2: Country-wise Publications Trends



Source: Authors' compilation

The United States of America is the world leader in this field with 125 articles demonstrating its dominance in research output. With 102 articles, China comes in second, demonstrating its increasing sway over academic research. India makes a substantial contribution as well (93 publications), demonstrating its active participation in the scholarly community. With 78 and 76 articles, respectively, the United Kingdom and Vietnam come in second and third, demonstrating their significance in global research initiatives. With modest contributions to the field, Indonesia (60), Australia (49), Malaysia (44), Italy (39), and France (37) complete the list. Countries like China, USA, India, and UK have demonstrated their dominance in the publications in this field over Latin American, African, and other Asian nations. Though this study is a rigorous reflection of research on NII, other tools such as Meta-analysis, cross-country analysis, etc can be more helpful in deriving other aspects. There are also gaps in collaboration of authors. Besides all the odds, the trends of rising publications indicate that Non-interest income is not an uncovered and niche topic. It has gained momentum to a greater extent after 2015 with the advent of fintech services, and Internet penetration in populated countries like India and China.

8. Bibliometric Analysis

According to (Garfield, 1964), Bibliometric study refers to a visualization method to measure and monitor the current status of research on a particular topic under study. This study has an advantage over traditional methods when compared to SLR and Bibliometric. The Scopus database has been chosen for selecting the papers. Citation analysis in VOS viewer is used to obtain citations.

8.1 Citation Analysis

Citation analysis assesses the impact of research by looking at how frequently an author's work is cited by others, with citations signifying an article's impact and importance. Out of 735 papers on non-interest income, only 14 fulfilled the 25-citation criteria. Calmes and Christian's paper had the most citations (240), followed by Williams, Barry (184) and Gambacorta, Leonardo (27). Table 3 highlights these key contributions to the field. The citation analysis identifies various research gaps and opportunities for future investigation. Key limitations include insufficient geographical coverage—particularly in Latin America and smaller Asian countries—and insufficient emphasis on new topics such as fintech banking. While some studies look at commercial banks' risk-return dynamics, there isn't much study on the long-term relationship between non-interest income (NII) and bank stability. Integrating innovative banking approaches and linking NII with broader economic data may yield new insights. Furthermore, the influence of income diversification during systemic disruptions such as the COVID-19 pandemic is underexplored, necessitating further research.

Table 3: Bibliometric Data of Authors

Title of Articles	Journals	Authors	Citations
"Financial Structure change and Banking Income: A Canada–U.S. Comparison"	Journal of International Financial Markets, Institutions and Money	Calmes, Christian	240
"Non-Interest Income and Bank Risk: The Role of Financial Structure"	Pacific-Basin Finance Journal	Williams, Barry	184
"Bank Diversification Strategies Under Market Competition"	Sage Open	Huynh, Japan	178
"Income Structure and Performance: An Empirical Analysis of Islamic and Conventional Banks in Indonesia"	Bulletin of Monetary Economics and Banking	Ali, Mohsin	137
"The Effects of Business Models on Bank Risk Before, During and After Financial Crisis: Evidence from China"	Applied Economics	Cheng, Maoyong	131
"Noninterest Income Generating Activities and The Future of Banking"	Journal of Stock & Forex Trading	Theoret, Raymond	97
"How Does Bank Diversification Affect Efficiency? Insights of The Central Europe"	Global Business Review	Moudud-Ul-Huq, Syed	79
"Non-Interest Income and Bank Lending"	Journal of Banking & Finance	Tarazi, Amine	117
"The Interrelationship Between Net Interest Margin and Non-Interest Income: Evidence from Vietnam	International Journal Of Managerial Finance	Le, Tu D. Q.	37
Bank Profitability and The Business Cycle"	Journal of Financial Stability	Gambacorta, Leonardo	27

Source: Authors' compilation

8.2 Co-Citation Analysis

Co-citation analysis shows the strength of citations between publications (Small, 1973). Co-citation analysis aims to gauge the relationships between keywords, publications, themes, and researchers (Pilkington, 1999 Co-citation is the frequency with which two texts are cited together in other articles, showing a common thematic or conceptual link within a research stream. Cited authors and cited references form the analytical unit of co-citation analysis. Out of the total 30359 cited references in Figure 1, 165 items have at least 20 citations, meeting the requirement. Every single one of the 165 things has a network connection. This indicates strong thematic linkages and the figure indicates dense clusters of related research areas based on frequently co-cited research.

The co-citation study reveals that much of the existing research remains focused on traditional banking, with less linkages to developing areas such as behavioural finance, digital innovation, and regulatory reforms influencing modern banking. Surprisingly, research from powerful economies—frequently in the forefront of banking innovation—are underrepresented. However, highly cited works by researchers such as Williams and Calmes provide solid conceptual foundations. These studies can provide useful foundations for developing new theories in rapidly growing fields such as fintech and digital finance.

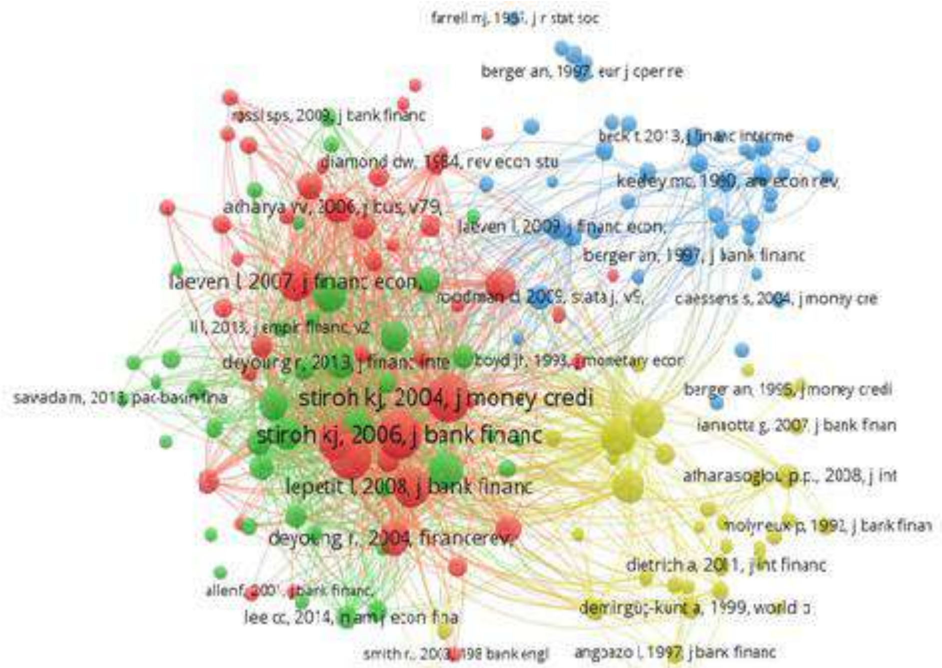


Figure 1: Cited references & Co-Citation analysis
Source: Retrieved through ‘VOS Viewer

8.3 Cited Authors and Co-citation Analysis

Through cited authors, co-citation appears in Figure 2. 276 authors out of the 19136 pass the threshold when an author's minimum number of citations is 20. This refers to the minimum number of citations of each author shown in the above map is 20. A map of 276 authors sub-divided into four groups has been created for co-citation analysis. The highest number of citations goes to Berger, A.N. i.e. 819. Stiroh, K.J. and Ghosh, S. have been cited with 692 and 20 respectively.

High co-cited authors like Bergers and Stiroh retain dominance in the particular literature available worldwide. Their research can be server as a device of direction for future research. Authors like Ghosh shows a very low citations but is having higher potential for future enquiry and gaining popularity gradually. The co-citation map shows a geographic bias in scholarly influence, with few scholars from India or underdeveloped countries. This indicates a research gap: incorporating regional and context-specific insights into global frameworks.

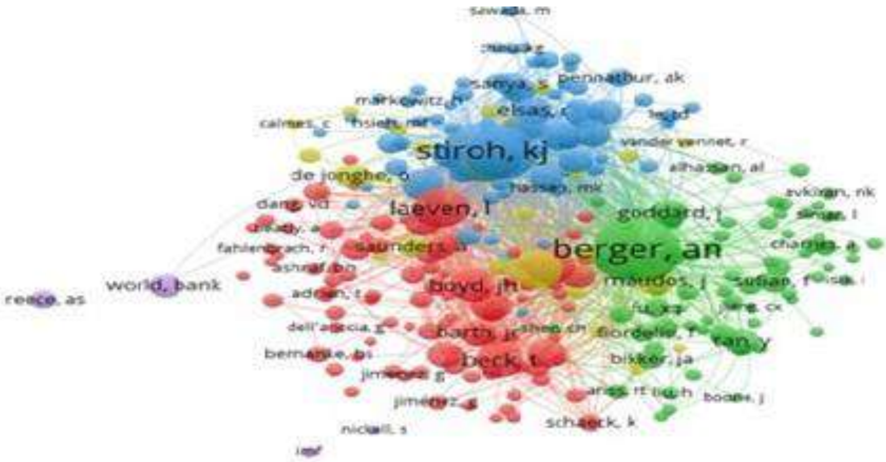


Figure 2: Cited Authors and Co- Citation analysis
Source: Retrieved through VOS Viewer

8.4 Bibliographic Coupling (Data Clustering)

Kessler introduced the idea of bibliographic coupling in 1963. When two articles cite a third work in common in their reference list, they are said to be bibliographically coupled. The intensity of bibliographic coupling is increased when two articles have more references that they frequently cite in their reference lists. Bibliographic coupling groups documents that share a common theme into clusters. 735 studies were categorized into six clusters using VOS Viewer. The bibliographic relationship of documents is shown in Figure 3.

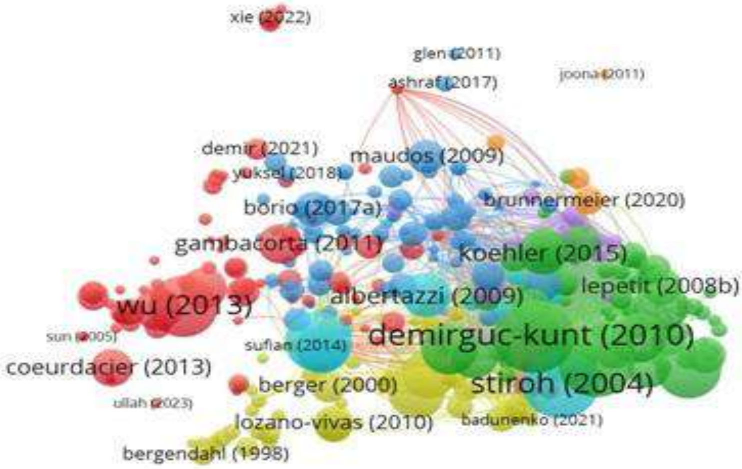


Figure 3: Clusters of Documents
Source: VOS Viewer

8.6 Analysis of Clusters

Cluster 1: One of the largest clusters is, Cluster 1 which is shown in red. There are 442 citations and 93 articles in it. Diversification and profits management strategies employed by African banks are the main topics of the first cluster. Ayenew and Wiese (2019) consist of 40 Citations and 04 link strengths followed by Altavilla (2018) having 165 Citations and 98 link strengths. Similarly, in the case of Asonku (2017), the Citations are 222 and the total link strength is 55.
Cluster 2: The color green is used to represent this. It is cited 666 times and has 75 articles. The second cluster's theme is bank risk-taking with stability and diversification dynamics. The two most cited papers in this cluster are De Jonghe (2010), having 287 citations and a link strength of 832, and 318 citations and 598 link strength goes to Baele (2007)

Cluster 3: Blue colour shows Cluster 3. It is cited 141 times and has 71 articles. The cluster's theme is bank competition and diversification. The two most cited papers in this cluster are by Amidu (2013), with 185 citations and 254 link strength, and 78 Citations by Fang (2020),
Cluster 4: The yellow color demonstrates this Cluster. It is cited 128 times and has 53 articles. This cluster's theme is banking concentration in the European region. The two most cited papers in this cluster are Berth (2013), with 145 citations and 300 link strength, and Lojano (2023), with 58 citations and 25 link strength.
Cluster 5: It is shown by Sky blue colour and is cited 37 times and has 53 articles within. This cluster's theme is banking risks and earnings volatility. The two most cited papers in this are adesina (2014), with 147 citations and 145 link strength, and hou (2023), with 42 citations and a 54 link strength.
Cluster 6: Cluster 6 is colored in light blue color. It is cited 20 times and consists of 12 articles. This cluster's theme is bank profitability and the business cycle. Two prominent authors in this section are Chen (2014) and Juna (2011) having 154 and 289 citations respectively.

8.7 Mapping of Contributions of Countries to Research in Non-interest Income

Six clusters of international research on non-interest income are depicted in Figure 4. With 74 and 72 documents, respectively, England and India lead the first cluster, which is highlighted in red. The United States, Canada, and Belgium make up the second cluster, which is shown in green. Ghana leads the third cluster (shown in blue), which is followed by Finland, Greece, and Nigeria. Australia, Russia, and Poland are all included in the fourth cluster, which is dominated by China with 127 documents. Spain contributed 28 documents to the fifth cluster, which is represented in violet and includes Bangladesh, Romania, Chile, and Spain. Portugal, France, and Turkey make up the sixth cluster, which is shown in sky blue. France has the most documents (47). According to the map, research collaboration on non-interest income is influenced by area, with the United States, China, England, and Russia working with the most nations worldwide.

There are significant research gaps that these clusters have shown. The lack of numerous developing countries in the collaborative network, especially those from Africa, Latin America, and the Middle East. These areas are underrepresented even though non-interest revenue is becoming more and more crucial for maintaining financial stability. Global banking narratives are generally molded by their financial systems, which may not represent the realities of other regions, leading to an imbalance in banking theories, as evidenced by the dominance of nations like the USA, China, and England in research output.

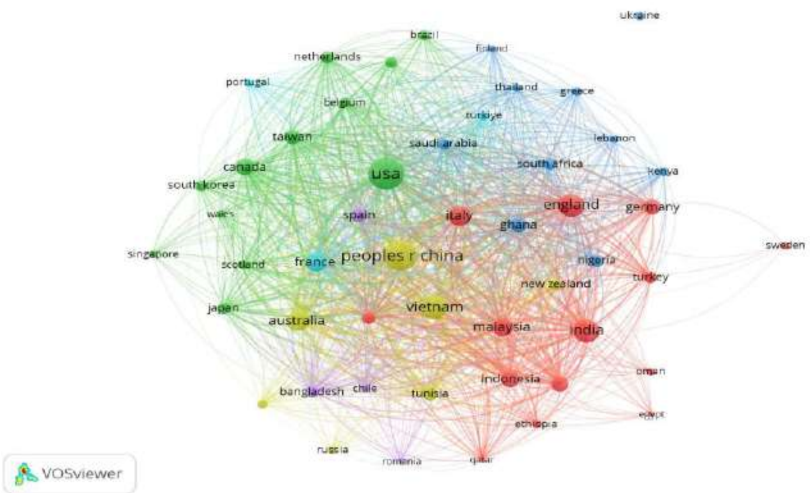


Figure 4: Clusters of Countries
Source: VOS Viewer

8.6 Analysis of Co-occurrences Map

VOS viewer is used to construct a co-occurrence map to find out the most often happening keywords that have occurred the most times in the articles. A map based on specific bibliographic information has been created using VOS Viewer. The way of counting that was chosen is the full counting method. Of the 3430 keywords, 302 reach the limit when five is set as the minimum number of occurrences.

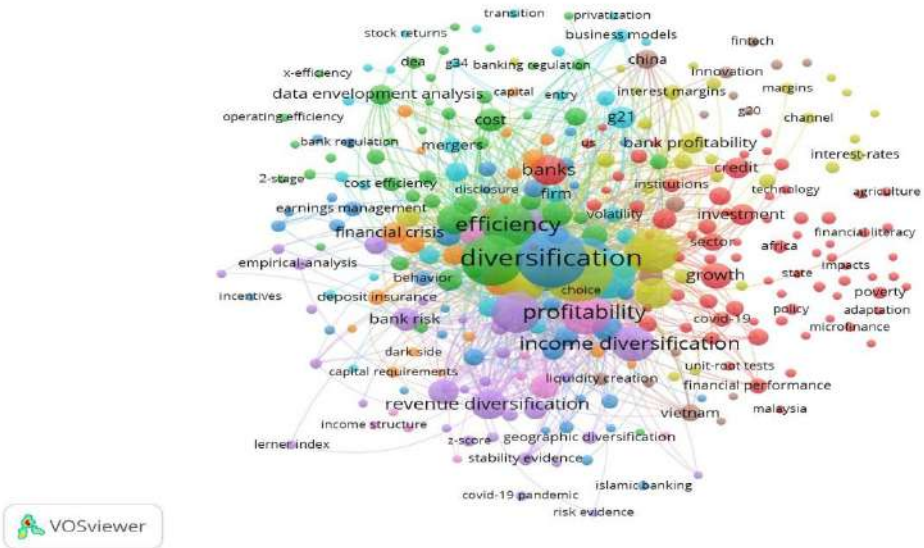


Figure 5: Keyword Occurrences through Network Visualization Map

Source: VOS Viewer

This map in Figure 5 provides a thorough overview of research gaps and trends in examining the effect of income diversification on bank performance. Strong connections between terms such as profitability, efficiency, and diversity imply that they are the main topics of current research. The Green Cluster emphasizes data envelopment analysis (DEA), diversification tactics, and operating efficiency. Blue Cluster uses words like bank risk, z-score, and stability evidence to describe risk, stability, and financial crises, Red Cluster emphasizes growth, investment, and development components. Orange/Yellow Cluster focuses on financial success, geographic diversification, and profitability. Current issues and advancements in the banking industry are reflected in terms like microfinance, fintech, and the COVID-19 pandemic.

The patterns of clusters formed reflect a segmented yet interconnected stream of research in the study of non-interest income. Many research gaps like not participation of small banks, RRBs of emerging economies, Non-inclsuion of behavioural and digital finance, lack of studying the role of ESG and sustainability, impact of pandemic etc. have been found and future directions of research can be better understood if these gaps can be identified and studied.

9. Findings and Recommendations

This study demonstrates by using SLR and Bibliometric analysis to find out about the Prolific authors in the field, Most Prominent Journals having large numbers of citations, citations & co-citations analysis, forms of clusters, etc. The six research questions have been addressed by the authors. Through various analyses conducted during the study, the results of each research topic are highlighted and presented appropriately.

9.1 Major Findings

- RQ (1) depicts the most leading and popular journals on the subject of Non-interest Income research. Results show that the Journal of Banking and Finance, Banks & Bank Systems, as well as International Business Research are the leading authors with 31, 19, and 14 publications, in that order.

- RQ (2) deals with the most Prolific and influential authors having large number of citations. According to our research, Dang, V.D. and Sufian, F. are the top authors in the field of Non-interest Income, each having 11 papers and a H-index of 10. These authors have emerged as the most important researchers having numerous scientific contributions to this field.
- RQ (3), shows that the United States leads the world with 125 research papers, followed by China with 102 and India with 93.
- Regarding top articles and their citations under RQ (4) in the field of Non-Interest income research. Among the most cited articles in that subject area are Christian's Change of Financial Structure and Banking Income: A Canada–U.S. Comparison, which has 240 citations followed by Non-Interest Income and Bank Risk. The Role of Financial Structure by Williams, Barry has 184 citations.
- RQ(5) demonstrates authors who have collaborated among themselves towards Non-interest Income research. An article co-authored by Berger A. N., Stiroh K. J., and Fukuyarna H. constitutes one cluster.
- Based on the similarity of the papers RQ(6) identified three clusters. The highly cited papers from all Six clusters include Ayenew and Wiese (2019), Altavilla (2018), De Jonghe (2010), Baele (2007), Amidu (2013), fang (2019), Lojano (2023), hou (2023), Chen (2014) and Juna (2011)

After addressing the research questions, there is a need to go beyond the factual data and analyze the research gaps, contributions, and implications that need to be highlighted.

9.2 Identification of Research Gaps

i. Most of the studies are related to traditional banking concepts and there is a huge gap of integration with emerging topics like behavioural finance, technology, Digital innovations and regulatory overhauls in modern banking.
ii. There are also underrepresentations of developed economies like Southeast Asia and African countries towards these emerging areas which are the powerhouse of innovating banking products.
iii. Non-inclusion of crisis centric studies like impact of Non-interest income on performances of banks during global financial crisis and COVID-19 Crisis.
iv. In-depth research on Long-term empirical impact studies with modern banking concepts as mediating factors has been found absent.

9.3 Contributions

The research posits a lot of contributions for future studies.

i. By knowing the top influential authors, Top contributing journals, cocitation networks, etc. this study offers a mapping of the evolution and concentration of this area as well as facilitates the future researchers to navigate inside the literature conveniently and to get the collaboration easily for working and publishing the research.
ii. With the help of keyword and co-word analysis, this paper highlights the important themes of research like digital finance, fintech, behavioural finance, risk, income diversification as the conceptual frame work for further study.

9.4 Recommendations

From the above analysis following recommendations can be found out.

i. Future researchers should focus on Non-intrerst income strategies evoving rapidly in emerging markets.
ii. More number of comaparative studies acroos countries and banking systems should be undertaken to find out the impact of NII and financial performance.
iii. Under-researched themes like ESG related income sources, fintech, Pandemic crisis impact on non-interest incomes should be studied.

iv. To increase revenue stability, banks should intentionally expand their non-interest revenue streams, particularly during times of unstable interest rates or recessions.
v. The risk-return trade-offs of non-interest income activities, particularly those associated with fee-based services and off-balance sheet operations, should be carefully considered.
vi. Regulatory bodies should consider frameworks that encourage healthy diversification of income streams in commercial banks while monitoring associated risks,
vii. More funding should be allocated to data-driven studies that use advanced bibliometric and econometric techniques to uncover insights in banking performance.

9.4 Policy Implications

The findings of the study can have several policy and practical implications;
i. Banking sectors in developing countries can be benefitted by knowing how non-interest income affects the stability profitability as a part of the banking performance.
ii. The extent of exposure to risky transactions such as bank guarantees, LOCs. Etc can be effectively calculated to take decisions.
iii. Banks can go for developing innovative and sustainable fintech products that will serve as an alternative to traditional interest generating products.

10. Conclusion

This study on non-interest income and Commercial banks and the contributions of various authors in this area are the main objectives of this study. For a comprehensive understanding, it combines bibliometric analysis with Systematic Literature Reviews (SLR) with the studies conducted between 2005 and 2024, paying particular attention to the expanding field of non-interest income. It shows that more authors are working together to publish in reputable journals, indicating an upward trend. Leading authors and their influence based on citation data are highlighted in the analysis. Bibliometric mapping is used to visualize author networks and clusters of linked studies. It provides an invaluable basis for upcoming studies, assisting researchers in carrying out thorough literature reviews and locating possible gaps in the field. This effort encourages more research into non-interest income and its function in commercial banking by highlighting trends and collaboration. Most of the studies are related to traditional banking concepts and there is a huge gap in integration with emerging topics like behavioral finance, Digital innovations, and regulatory overhauls in modern banking. A lot of research gaps like the underrepresentation of developed economies in this area of research, Non-inclusion of crisis-centric studies like the impact of Non-interest income on performances of banks during COVID-19, absence of In-depth research on Long-term empirical impact have been found. This study is a valuable tool for scholars, providing a summary of earlier research and directing further studies in this emerging field. Based on the relevance and findings of the study, actionable recommendations and implications can be suggested. Empirical models should be designed to study the impact of Non-interest income and performance of Indian banks with a segmentation of Public, Private, and Foreign banks. The study of under-researched areas such as fintech-led NII, ESG and its role in generating fee-based services of banks, the impact of post-COVID income diversification, etc. can be undertaken. Reserve Bank of India should develop a strategy where banks can leverage their fee-based services by developing non-interest income practices. Banks should disclose detailed components of non-interest income in line with BASEL norms. Without compromising customer satisfaction, banks should bank upon digital banking, e-payments, etc. as new income sources.

Declaration of Conflicting Interests

The authors have no conflicting interests regarding the Contents and publication of this article.

References

Aggarwal, R.K., Samwick, A.A.,(2003). Why do managers diversify their firms? Agency reconsidered. *Journal of Finance* 58 (1), 71118.

Bailey, A. A., Pentina, I., Mishra, A. S., & Mimoun, M. S. B. (2017). Mobile payments adoption by US consumers: an extended TAM. *International Journal of Retail & Distribution Management, 45*(6), 626–640. https://doi.org/10.1108/ IJRDM-08-2016-0144

Bokyung Park, Jungsoo Park & Joon Chae (2019): Non-interest income and bank performance during the financial crisis, Applied Economics Letters, DOI: 10.1080/13504851.2019.1591592

Bezovski, Z. (2016). The future of the mobile payment as electronic payment system. *European Journal of Business and Management*, *8*(8), 127–132. https://core.ac.uk/download/pdf/234627158.pdf

Craigwell, R., & Maxwell, C. (2006). *Non-Interest Income And Financial Performance At Commercial Banks In Barbados* (Vol. 30, Issue 3, Pp. 309–328).

De Albuquerque, J. P., Diniz, E. H., & Cernev, A. K. (2014). Mobile payments: A scoping study of the literature and issues for future research. *Information Development*, *32*(3), 527–553. doi:10.1177/ 0266666914557338.

Di Pietro, L., Guglielmetti Mugion, R., Mattia, G., Renzi, M., & Toni, M. (2015). The Integrated Model on Mobile Payment Acceptance (IMMPA): An empirical application to public transport. Transportation Research Part C: *Emerging Technologies*, 56, 463–479. https://doi.org/10.1016/j.trc.2015.05.001

Donthu, N, Kumar, S, Mukherjee, M, Pandey, N, Lim, (2021)W, 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.

Fahlenbrach, R., R. Prilmeier, and R. M. Stulz. (2012). "This Time Is the Same: Using Bank Performance in 1998 to Explain Bank Performance during the Recent Financial Crisis." *The Journal of Finance* 67: 2139–2185. doi:10.1111/j.1540-6261.2012.01783.x.

Gambacorta, L. and van Rixtel, A. (2013) Structural bank regulation initiatives: approaches and implications, Working Paper No. 412, *Bank for International Settlements, Basel.*

Gizyeki Marianne (2001): 'The Effect of Macroeconomic Conditions on Banks' Risk and Profitability', Discussion Paper, Reserve Bank of Australia.

Houston, J.F., James, C.M., Ryngaert, M.D., (2001). Where do merger gains come from? Bank mergers from the perspective of insiders and outsiders. *Journal of Financial Economics* 60, 285–331.

Iskandar-Datta, M. and McLaughlin, R. (2007) Global diversification: new evidence from corporate operating performance, Corporate Ownership and Control, 4, 228–50.

Kohli (2014), Does Non-Interest Income Make Banks More Risky? Retail-versus Investment Oriented Banks, Review of Financial Economics 23(4), 110-129

Nisha K. Kumar and Anitha S. Yadav (2022). A Systematic Literature Review and Bibliometric Analysis on Mobile Payments. Vision, A Sage Publication *8*(1), 1–16 DOI: https;//10.1177/09722629221104190

Saima Mehzabin and Ahanaf Shahriar (2023) The effect of capital structure, operating efficiency and non-interest income on bank profitability: new evidence from Asia, Asian Journal of Economics and Banking Vol. 7 No. 1, 2023 pp. 25-44

Saunders, Anthony & Schmid, Markus & Walter, Ingo. (2014). Non-Interest Income and Bank Performance: Is Bankss Increased Reliance on Non-Interest Income Bad?. *SSRN Electronic Journal.* 10.2139/ssrn.2504675.

Sissy, Aisha Mohammed, Amidu, Mohammed, Abor, Joshua Yindenaba, The effects of revenue diversification and cross border banking on risk and return of banks in Africa.Research in International Business and Finance http://dx.doi.org/10.1016/j.ribaf.2016.09.017

Stiroh, K. J. (2004). "Diversification in Banking: Is Noninterest Income the Answer?" Journal of Money, Credit and Banking 36: 853–882. doi:10.1353/mcb.2004.0076.

Stiroh, K. J. (2006). "A Portfolio View of Banking with Interest and Noninterest Activities." Journal of Money, Credit and Banking 38: 1351–1361. doi:10.1353/mcb.2006.0075.

Trivedi, R. S. (2015). Banking Innovations and New Income Streams: Impact on Banks' Performance. Vikalpa 40, 28-41.

Umakrishnan, U. K. and Bandyopadhyay, (2024) A. Changing Income Structure, Ownership and Performance: An Empirical Analysis of Indian Banking Sector. MPRA, Paper No. 5779.

Yueshu Zhou, Yuanyuan Peng & Rashid Latief (2020): The Impact of NonInterest Business Development on the Performance of Chinese Rural Commercial Banks, Emerging Markets Finance and Trade, 1–19. DOI: 10.1080/1540496X.2019.1711369

Zupic, Ivan & Čater, Tomaž. (2015). Bibliometric Methods in Management and Organization. Organizational Research Methods. 18. 429-472. 10.1177/1094428114562629

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Promoting Research

A Review of Perspectives on Women Managers: A Three Country Analysis

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Women managers, Gender diversity, Challenges, Leadership

JEL Classification
J16, M 10, M14

Abstract: Women's issues have been at the forefront of various movements, discussions, discourses, policy decisions and strategies from the last century onwards. In the 21st century, as we celebrate women's achievements, it is imperative to acknowledge and overcome the challenges, for women that still persist. Gender discriminatory practices hamper women's personal lives as well as professional growth. Women, across the globe, negotiate to overcome gender prejudices, stereotyping, condescending attitudes along with the pressures of performing in the competitive work environment. In this context, this paper explores the contextual challenges of women managers in three countries in Asia – India, Japan and China. Further, the focus of the paper would be to examine the factors that create impediments for women managers which consequently lead to lesser number of women at the top-level management positions. The paper uses existing literature and relevant secondary dataset from the three-country context, to depict, document and expose the prejudices and bias that women managers face in these countries. In the end, the paper provides the futuristic agenda to support women managers, and women led operations in corporate setups so as to enhance their representation and proficiency that will ultimately transform the work culture across the globe.

1. Introduction

Social discourses and movements around women's issues have initiated debates and deliberations highlighting varied issues such as gender differences, gender discrimination, oppression, missed opportunities and more. The present century is marked by the aim and vision to frame outcome-based goals, strategies and themes to achieve gender equality. With the quarter of the 21st century already over, it is imperative, on the one hand, to celebrate the achievements and milestones in women empowerment along with a stock taking of the still persisting challenges in achieving complete gender equality in all spheres of life. Countries, the world over, have undertaken huge measures to abolish gender discriminatory laws and practices, to establish and implement remedial and corrective measures. Yet, it becomes more difficult in the corporate and business world wherein women face opportunity crunch, and various challenges as they climb up the professional ladder. These challenges become overwhelming due to the quintessential stereotyping leading to vertical segregation placing men above women in the same professional bracket and management positions (Anker, 1997).

Management, conventionally, has been considered men's forte and thus, has been dominated by them (Adler and Izraeli, 1994; Marshall, 1995; Arttachariya, 1997). This is a global phenomenon that becomes more precarious in countries of the global south wherein promoting female talent is not a strategic focus in the professional setup. Thus, it becomes a critical challenge for women professionals and managers to negotiate around gender prejudices, stereotyping, condescending attitudes alongside performing in the competitive work environment. In this context, this paper uses a qualitative approach of 3 country context analysis by using content analysis on review of perspectives on women managers. The paper provides a contextual analysis of the challenges that women professionals and managers face in three countries in Asia – India, Japan and China due to gender barriers and tactical response or the lack of it. These countries have been chosen due to their geographical proximity (same continent) giving rise to similar cultural underpinnings and social value system. Also, equally important is the economic status of these countries as well-established or fast developing economies of the world. The paper further explores the factors creating impediments that women face in corporate and professional setup which consequently contributes to lesser number of women breaking the glass ceiling to reach the top-level managerial positions. Using both the extant literature (though miniscule) and relevant secondary dataset from the three-country context, the paper aims to depict, document and expose the prejudices and bias that women managers face in these countries. In the end, the paper provides the futuristic agenda to support women managers and women led operations in corporate setups so as to enhance their representation and proficiency that will ultimately transform the work culture across the globe.

This paper has been organized in six sections including introduction. The second section presents a review of literature on women manager's issues plaguing 21st century corporate sector. The third section outlines the methodological aspects followed towards exploration of the objectives. The fourth section presents case analysis of how women professionals and managers are faring in India, Japan and China. The fifth section discusses findings and the futuristic roadmap. The sixth section offers concluding remarks.

2. Women Managers in the 21st Century: Theoretical Underpinnings

For a very long time, women's movements have been centred on achieving gender equality in social, political, cultural and economic spheres. The difference in the role and responsibilities according to gender have been hierarchized and overtly valued more for men than women. Thus, men and women are the "intended or unintended product(s) of a social practice" (Haslanger, 1995, p. 97) whereby women's contributions and voices are devalued, and their status is neglected. So, achieving gender equality has enormous socio-economic ramifications with women realizing their dreams, and breaking the glass ceilings to overcome organized systems of vertical segregation in the professional setup. In order to ensure prompt and effective action, most countries have ratified women and child related international conventions. At the same time, most constitutions in the world also guarantee measures to ensure girls' right to education and protect women's political rights, protections from discrimination at work, the right to equal pay for equal work, prohibition of sexual harassment in the workplace etc. Yet, regressive laws like the anti-abortion law in the USA have made a comeback in 2024; women in countries like Afghanistan cannot work, attend school or even be heard in public; 30% women the world over face physical or sexual violence at least once in their lifetime which is one in every three women in the world; 500 million women lack access to menstrual products globally; 650 million women and girls have been married before they are 18 year old; 71% of all human trafficking victims worldwide are women and girls; gender health gap equates to 75 million years of life lost globally[1]. Corporate sector, the world over, is equally marred by the gender discriminatory practices such as the gender pay gap which stands at 20% globally indicating that women managers earn less than their male counterparts for the same work; and women may climb up the professional ladder but they still own less than a fifth of the business globally and hold less than one-fourth of the senior corporate roles worldwide. In USA alone, only 10% of the top 500 companies have female CEOs and in India the figure stands at 5%. This may not look good but there are

[1] https://news.un.org/en/story/2024/08/1153151
https://www.unwomen.org/en/articles/facts-and-figures/facts-and-figures-ending-violence-against-women#:~:text=Global%20scale%20of%20violence%20against,does%20not%20include%20sexual%20harassment.
https://cdn.who.int/media/docs/default-source/bulletin/online-first/blt.24.291421.pdf
https://www.unicef.org/eca/press-releases/fast-facts-10-facts-illustrating-why-we-must-endchildmarriage
https://www.un.org/sustainabledevelopment/blog/2016/12/report-majority-of-trafficking-victims-are-women-and-girls-one-third-children/#
https://www.mckinsey.com/mhi/focus-areas/equity-and-health/womens-health

countries such as Ireland and Luxembourg which have zero female CEO in top companies[2]. The path to achieving equality for women is set, it is the negotiations and strategies that are yet to be worked out.

It is to be acknowledged that women, in modern times, have managed to find sizeable representation in the academic, political, business and finance fields. Even women entrepreneurs are recognized as a potential force to reckon. These achievements do not subside the challenges that the 'new' age woman faces both personally and professionally. Statistics on women employment, pay parity and political representation show that their participation and leadership roles are still negligible. Despite legislative progress around gender equality, in many countries, providing equal rights and opportunities to women, they are still cloistered mainly in female dominated fields (childcare, nursing, education etc.), and lower levels in management with low remuneration. Women managers are as proficient as their male counterparts at delivering results, yet their outcome driven efforts are less likely to be appreciated. The scenario in countries like India, Japan and China becomes further complicated due to complex social, economic and cultural factors. India is a curious case study, where centuries of invasions and the British colonial domination have contributed to a narrow mind-set that continues to grip the social imagination in the country. Even in economically advanced country like Japan, women are traditionally expected to take the responsibility of household work and child rearing (Cho et al., 2015) as is explicit in *ryosaikenbo* – the Japanese 'ideology of good wife, wise mother' (Welsh et al., 2014). While in China, studies show that women managers are ill positioned than their male counterparts to deal with market threats, shifting technologies and financial insecurity in gender stereotyped scenario (Cooke, 2022). In terms of broader economic scenario worldwide, women continue to experience lack of financial autonomy and remuneration for unpaid household tasks. As for the corporate sector, management companies, in general, facilitate gender imbalances at different levels of managerial positions, and imperceptibly but sometimes overtly also, promote gender discriminatory policies. Studies reveal that when employed in managerial positions, women receive lower salaries, and restricted career advancements than male employees (Carter and Silva, 2010). Disparity in perks, due to gender differences, grows with organizational hierarchy reaching up to 30% in senior positions (Kulich et al 2011).

A very disturbing trend globally shows that mid-career women, who are highly educated and are early achievers, encounter much higher levels of bias and discrimination at workplace. Harvard Business Review conducted a study in 2021 to highlight how mid-career women across sectors like education, corporate, PSUs, services, have to pull through subtle barriers comprising 'unfair assumptions' which arise out of the belief that since mid-career women are actively parenting, they would be less dedicated to their careers. This 'motherhood penalty' is less explicit, and is masked as concern for the woman employee[3]. Even the organizational networks become highly exclusionary and gendered at mid-career limiting opportunities for women further. Senior male leadership and male managers may socialize beyond office an hour which significantly enhances scope of promotion and upgrade for them. Since, stakes are very high for mid-career employees, competitiveness takes new dimensions with gender-based insecurities taking centre stage, women managers' inaccessibility/accessibility becoming an office conversation and their administrative decisions getting over scrutinized. Policy statements do not translate into actions, and idealized notions of meritocracy are "difficult to operationalize in the face of corridor politics and informal communication systems" (Piterman, 2008, pp. 10). A commonly felt cultural prejudice, globally but most perceptibly in the countries of the global south, is reflected in the male attitude that sees it not appropriate for men to be subordinated by women in public life (Caplow, 1954, Kar et al 2015). Such an attitude creates barriers to bring about changes in the occupational choices for men and women (Burton, 1987). Organizational theorists highlight several factors such as organizational culture and structure responsible for lower representation of women in management positions (Mintzberg, 1973). Psychological theories

[2]https://www.ilo.org/resource/other/gender-pay-gap#:~:text=Gender%20pay%20gaps%20represent%20one,are%20wide%20variations%20across%20countries. https://www.bloomberg.com/news/articles/2024-04-30/ireland-now-has-zero-female-listed-ceos

[3] https://hbr.org/2022/09/3-workplace-biases-that-derail-mid-career-women

postulate that men and women are socialized to accept different roles even in professional setup which consequently is reflected in organizational preferences for engaging women and men for different work profiles (Eagly, 1987, Eagly et al, 2000). It is true that the representation of women managers has considerably enhanced, the world over, in lower and middle level positions especially in non-tech sectors such as HR, administrative and personnel areas. But the barriers and glass ceilings at higher management positions still persist, and can only be overcome with changes from within the rubrics of society and its institutions. Slogans of universal human rights, including gender equality, need to be supplemented with localized discussions of adaptation and application (Ortenblad et.al, 2017). Strategies as actions need to be deployed to address and resolve expectations of gender role categorization; to gain manoeuvrability, to negotiate structural limitations and challenges of intersectionality. In this context, this paper aims at addressing the lack of research on this very critical issue. Hence the specific objective of this paper is to explore the challenges and impediments of women managers in the selected three country contexts of India, Japan and China. The paper further explores the factors creating impediments that women face in corporate and professional setup which consequently contributes to lesser number of women breaking the glass ceiling to reach the top-level managerial positions. Furthermore, the paper aims at providing futuristic agenda to support women managers and women led operations in corporate setups so as to enhance their representation and proficiency that will ultimately transform the work culture across the globe.

3. Country Context Construct: Methodological Aspects

Globally, gender equality, in the professional world in general and the corporate sector in particular, has made some progress in the first quarter of the 21st century given the policy initiatives and statistical evidence showing efforts towards equal treatment (if not representation), inclusion, expectations and benefits for women managers. Yet, the situation on the ground is much more complex than the commitment of compliance, to global directives such as SDG 5 and CEDAW, would indicate. The social norms, values and cultural prejudices along with lacunae in policy and regulatory consequences for noncompliance, in different country contexts, become the bases to understand why gender equality has not progressed as expected and predicted. This exploration requires a framework of qualitative research methods to analyse the three countries in question. For that matter, we have employed a qualitative approach of analysing the three country contexts through a content analysis of wide body of extant secondary sources as described in theoretical underpinnings. Qualitative methods generally used to analyse "country constructs" by exploring the lived experiences, perspectives, and narratives of individuals within a country. This can involve methods like ethnography, interviews, focus groups, and case study narratives to gather rich, descriptive data about the social, cultural, political and other realities of a country. Such qualitative method is necessary for scientific inquiry that emphasizes the depth and richness of context and voice in understanding social phenomena. This methodology is constructive or interpretive, aiming to unveil the “what,” “why,” “when,” “where,” “who,” and “how” behind social behaviours and interactions, rather than merely quantifying occurrences (Lim, 2023). Further, researchers (Stake, 1994; Yin, 1994) tested a case study method to provide insight into the relevant issues pertaining to a research topic involving what, how and why queries. Furthermore, Dyer and Wilkins (1991, p. 615) argued that the ultimate goal of case study is to provide a rich description of the social scene, to describe the context in which events occur, and to reveal a deep structure of social behaviour. Therefore, firstly an extant content analysis has been carried out focusing on examining the political, economic, social, and environmental factors within three specific countries of India, Japan and China to understand their unique characteristics, and how the research questions pertaining to women managers have been addressed. Accordingly, the researchers have developed the following three country cases constructs of India, Japan and China. These three countries have been chosen due to their geographical proximity, similar cultural and social value systems. Secondly, the economic status of these countries definitely helped us selecting these countries for the case analysis. These case studies have helped us analyse the country contexts to document challenges, prejudices and bias towards women managers in these countries, and consequently understand how they are dealing with this. Further, it helped us to give an impetus to futuristic agenda for women managers in the corporate set up.

3.1 Three Country Analysis

In the countries of analysis – India, Japan and China, organizational cultures facilitate gendered interactions which not only curtail women managers' promotional prospects but also debilitate their skills and experience at the workplace. For further exploration, the country wise analysis is conducted so as to understand the social setup, organizational value system, competitive trends, challenges and impediments to women managers' advancement in the professional world.

3.1.1 India

In India, gender dynamics are shaped by complex historical and societal impacts of centuries of violent invasions, and colonial onslaught on the subcontinent. India had been an advanced civilization for centuries where "there is no dearth of legendary narratives of women empowerment, extraordinary women leaders" (Kar, 2019, p. 97). There is a continuous and long tradition of legendary women beginning with Gargi, known for her intellectual contributions; Rudrama Devi, known for exceptional leadership; Ahilya Bai Holkar known for her perseverance and protection of *dharma*; Chinnnamma, known for good governance and wisdom; freedom fighters like Sarojini Naidu, Savitribai Phule and many more. Along with these exemplary women from history, there are many successful Indian women business leaders such as Kiran Majumdar-Shaw (Chairperson and MD of Asia's largest insulin producer company Biocon Ltd) and Indra Nooyi (former CEO of Pepsi Co.) who have overcome gender barriers, and have contributed to India's growth trajectory in the 21st century. These success stories, all the more, highlight that women's leadership is a crucial yet under-utilized asset for India's progress. Data shows that organizations with greater representation of women, both at the managerial and executive positions, show better financial performance and continued sustainable growth (KPMG, 2024). Thus, the focus, in companies, should not just be on engaging women in leadership positions but also to create such organizational culture where their immense capabilities are harnessed, and unique insights are valued in boardrooms. The Indian corporate landscape is rapidly evolving despite the challenges that persist in achieving gender parity at senior level management. A positive trend shows that 23% organizations have 30-50% women in leadership roles and 12% companies have even crossed that mark. A very concerning career advancement trend shows that less than 30% of women hired at the entry level ever occupy leadership positions as compared to men (KPMG, 2024). As the Indian corporate scenario celebrates extraordinary women who have shattered glass ceilings, the not so encouraging figures highlight missed opportunities and multifaceted challenges for women managers. There are deep rooted social prejudices that obstruct women's aspirations to leadership roles, work-life balance is a continuing struggle, societal expectations of childcare and domestic responsibilities are overwhelming, concealed biases at workplace and inadequate mentoring hamper their progress. It is true that, over the past few decades, women, in India, have made their mark as leaders in fields like politics, academia, business, IT, research and science. But there remain glass ceilings in spheres like higher judiciary, which women have not been able to break. The percentage of women judges in the High Courts is only 14.27% (109 out of 764). Women judges do not reach senior positions as indicative from the fact that out of 25 High Courts in the country, only one (Gujarat) has a woman Chief Justice. The scenario is much worse in Supreme Court which has only two women judges serving at present[4]. However, there are better results in education sector where there are 75 women Vice Chancellors in India, which is just over 20% of total number of Vice Chancellors in India as per Association of Indian Universities (AIU) data. Thus, it is crucial to acknowledge that there is a significant gender gap in leadership positions across the sectors in India that highlight persisting systemic challenges that need to be addressed with urgency.

3.1.2 Japan

The social dynamics in Japan significantly inform gender interactions in the country. Femininity is strongly associated with the idea of 'good wife and wise mother '(*ryosaikenbo*) which is traditionally

[4] https://www.thehindu.com/opinion/op-ed/closing-the-gender-gap-in-the-higher-judiciary/article69310095.ece#:~:text=However%2C%20there%20remains%20a%20glass,Tripura%20have%20no%20woman%20judge.

an East Asian ideal in countries like Japan, China and South Korea (Boiling, 2008). Though the aftermath of WWII brought about considerable social and political reforms in Japan, with women getting equal rights as men (Article 14), Japanese women did not actively enter the workforce till the 1990s due to the rapid economic growth. The "breadwinner-housewife model…referred to as the salaryman model" (Kehrwieder, 2024) had been very popular in Japanese society till it became no longer sustainable after the bubble economy burst in 1992 when Japanese families felt the need for dual income to combat inflation. Prior to the 90s, women participation in the workforce was low due to various factors like forced marriage retirement, sexual harassment and unequal pay. There is an old practice of shoulder tap (*kata-tataki*) in the country wherein tapping the shoulder of an employee is an indication that they must leave or they will be sacked. It was women who were often tapped to coerce them into marriage retirement. Japan, being a patrilineal society, has long-established gender ideology that makes it problematic for men to welcome women in the workplace. Even when women do join the workforce, they are, in most cases, given the position of the office lady (OL) who performs administrative or clerical tasks. This position exists in nearly every office in Japan, and was created to "keep women in menial roles and maintain as much of the traditional system as possible" (Kehrwieder, 2024). If we are to talk about the female representation in senior management roles then Japan features among the lowest the world over. While there has been noticeable improvement in achieving higher female employment in the last decade yet 54% of the working women are engaged in irregular jobs and are acutely underrepresented in managerial roles. The proportion of women managers in private sector is 13% which is much below the OECD average of 34% (Asao et al, 2024). Among the G20 countries, Japan features in the lowest position for smallest proportion of women in senior roles with 5.3%, just above Saudi Arabia[5]. Organizational systems in Japan profoundly impact women's access to leadership positions which is why women make up only 8.3% of managerial positions as of 2016 (Nakamura & Horimoto, 2017). One such system comprises a promotion track (*sogoshoku)* and a non-promotion track (*ippanshoku*). Most of the women hires, in the country, are non-promotion which significantly curtails career advancement opportunities for them from the beginning itself. The other is seniority (*nenko*) system in which employees are rewarded based on long service that apply to regular male workers only (Nakata & Takehiro, 2002; Wakisaka, 2011). There are cultural barriers also to women taking up leadership positions in the country where a traditional division of labour ideology persists till date. Women, customarily, bear the burden of childcare, elderly-care and household work due to which 60% of Japanese women exit the labour force after child birth (National Institute of Population and Social Security Research, 2011). More importantly, Japanese workplace do not have women leadership role models that women managers can look up to and aspire to follow. All in all, women managers' aspirations, in Japan, are thwarted by multi layered factors ranging from social norms, cultural outlook and organizational systems.

3.1.3 China

Chinese culture perceives women as the weaker sex who need protection, and are expected to actively take up housekeeping and family care role as their primary function (Gao, 2003; Zhu et al., 2021). Women have been dependent on their fathers, husbands and children in different phases of life defining the social and cultural discourse around gender inequality in the country. Lives of women substantially changed after 1949 with the founding of PRC (People's Republic of China) that brought about social and economic reforms towards achieving gender equality. It is not as if there was an overnight shift in the social and cultural outlook towards gender roles in China after 1949 rather the Chinese state mobilized feminist movement to advance the country's economic development through women's participation (Hu, 2016). Luo and Hao's study (2007) reveals: the image of Chinese women presented by the mass media [which is heavily sanctioned by the state] is to a large extent influenced by the socio-economic and political-ideological changes in China. Rather than a literal portrayal of the 'reality', it is a symbolic representation of the Chinese women created through the interaction of party ideology, editorial policy, and readers' taste as well as the changing reality of Chinese women's life

[5] https://womenleadersindex.com/report/

and work. The interlocking of party control and societal influences has determined the typical images of 'Chinese Women' suited to particular periods of time in the contemporary Chinese history. (281)

Such a view clearly highlights that the Chinese state dominates the feminist discourse in the country making it rather difficult for any independent women's movement to materialize. As for the women managers in China, there is advancement for them due to legal and policy interventions but the barriers such as traditional gender norms, discriminatory practices in organizations, work-life challenges and others, remain formidable (Liu, 2013; Liu et al., 2020; Yang, 2020). Though the national policy in China advocates gender equality, the barriers to women managers' career progression are, foremost, to be attributed to institutional structures created by men who are responsible for maintaining the status quo of masculine power (Cooke, 2023). Women managers, in China, are poorly positioned than their male counterparts due to perceived weaknesses among them including "biased social perceptions, role changes at work and home, and innate obstacles, such as being timid/gentle, risk-averse, and having insufficient confidence and competence" (Cooke, 2023, p. 378). Due to all these factors, China is among such countries that have the smallest proportion of women (9.3%) in senior management and is the only G20 member nation where this percentage slipped down 3.3 points in 2022 as compared to previous years [6]. It is also interesting to note the impact of Confucianism, even in present day China, that prescribes a structural gender inequality in which Chinese women occupy lower social status than men. (Liu, H. et al., 2022). Further, Liu (2022) highlights that companies, with headquarters in Confucianism influenced regions of China, are less likely to appoint a woman as the CEO. These institutional and cultural barriers to women managers' career advancement in China, highlight the need to develop a fair and inclusive work place that must accommodate women managers' voices, and facilitate their capacities.

4. Discussion and Futuristic Agenda

As per the civilizational history of India, women were at par with men in various spheres; they were highly respected in society, and had access to education, and freedom to participate in religious and intellectual pursuits during *Vedic* times. However, their status deteriorated gradually afterwards. Still, India has a glorified list of remarkable women leaders, philosophers and rulers. In the last thousand years, we have had the examples of Rani Rudrama Devi (born in 1259 CE), the queen of the Kakatiya dynasty; she was trained in statecraft, military tactics, and administration from a young age. Her education equipped her to rule effectively and expand her kingdom. Rani Durgavati (born in 1524), the queen of Gondwana, was known for her bravery and intellect. She was well-versed in Sanskrit, Persian and the local dialects, and very effectively managed her kingdom, and lead her army against the Mughal invasion. Maharani Tarabai, (born in 1675), was a key figure in the Maratha Empire and was well-educated in politics, military strategy and administration. Rani Chennamma of Kittur (born in 1778), was a warrior queen known for her resistance against British empire, and was very well trained in statecraft, military tactics and local governance. Ahilyabai Holkar (born in 1725), the queen of the Malwa kingdom, was renowned for her administrative skills and deep knowledge of scriptures and philosophy. Rani Lakshmi Bai or Rani of Jhansi is one the most well-known women rulers of India, and played a crucial role in the Revolt of 1857.

However, in modern times, cultural prejudices and challenges inhibit women's path to progress and growth in the corporate world of India. These challenges and limitations can only be eliminated through strategies and policy initiatives that address such cultural nuances and organizational workings. Instances of empowered women, as quoted above, highlight the impact of path breaking policies which, when adopted, make way for great women leaders and entrepreneurs who redefine the workplace dynamics, and also inspire millions of women to follow their aspirations and ambitions. Thus, women managers, wherever the possibility arises, overcome the trappings of male controlled workplaces, and breach the senior management positions to reach the top. Though, women's representation in the leadership roles have considerably risen, such inspiring stories are still rare.

[6] https://womenleadersindex.com/report/

Majority of the country are yet to achieve complete gender equality within and beyond institutions. Gender stereotyping of managerial positions, is an ugly reality that needs to be spoken about, and brought to change. Thus, accelerating progress on women's rights, and addressing women's issues would require more women in decision making positions and in policy making initiatives. Organizations should be backing calls for action against gender discriminatory company policies. Empowering and promoting women managers are intrinsic to achieving full institutional growth along with addressing the bottlenecks that deter women in their advancement. Organizations, in order to ensure women empowered workplaces, must regularly measure and assess policies and strategies to promote talented women at senior management positions.

5. Conclusion

Gender issues, in South Asia, have been evolved and shaped by the cultural, socio-economic, political factors and social movements in the region. In early societies, in the subcontinent, gender stratification existed but men and women had collective contributions to work and rights to resources. The cultural interventions and distortions due to centuries of invasions and the colonial past have also contributed to developing a parochial mind-set much in contrast with progressive Indian philosophical traditions (Kar & Tiwari, 2020). In India, 'starting from ancient times to modern management stories, there is no dearth of legendary narratives of women empowerment, extraordinary women leaders and philosophers' (Kar, 2019, p. 97) and administrators who overcame popular prejudices and barriers to bring qualitative changes in Indian social structures. The findings in the three country case analysis highlight how women managers are overcoming gender challenges and biases to access leadership positions in several fields including business, politics, academia and other areas. However, this dispersed progress does not undermine the challenges that women managers face both personally and professionally in these three countries. Further, accession of women managers to higher leadership roles is limited though Indian context is much better than other two countries. Even in Indian context, higher leadership role for women is much better in academics than other fields. Further, now-a-days media reports point towards women entrepreneurship which is also being recognised as a latent force to contribute towards economic growth of our country. However, there is still much to be achieved to bring about gender equality in the workplaces in all the country contexts studied.

References

Adler, N., and D. Izraeli (eds.). (1994). *Competitive Frontiers: Women Managers in a Global Economy*. Oxford: Blackwell Business.

Anker, R. (1997). 'Theories of Occupational Segregation by Sex: An Overview." *International Labor Review* 136, no. 3: 315–440.

Arttachariya, P. (1997). "Women Managers in Thailand: Cultural, Organizational and Domestic Issues." Unpublished PhD thesis, Warwick Business School, University of Warwick.

Asao, Kohei et al, (2024). "Why Such Few Women in Leadership Positions in Japan?". *International Monetary Fund*. April. PDF.

Boling, P. (2008). State Feminism in Japan? *U.S.-Japan Women's Journal*, 34, 68–89.

Burton, C. (1987). *Gender Bias in Job Evaluation*. Canberra: AGPS.

Caplow, T. (1954). *The Sociology of Work*. Minneapolis, MN: University of Minnesota Press.

Carter, N. M., and C. Silva. (2010). "Women in Management: Delusions of Progress." *Harvard Business Review* (March): 19–20.

Cho et al., (2015). "Asian women in top management: Eight country cases". *Human Resource Development International*. 18(4): 407-428

Cooke, Fang Lee, (2022). "Changing Lens: Broadening the Research Agenda of Women in Management in China". *Journal of Business Ethics*

Dyer, W.G., & Wilkins, A.L. (1991). Better stories, not better constructs, to generate better theory: A rejoinder to Eisen-hardt. *Academy of Management Review*, 16, 613–619. doi:10.2307/258920

Eagly, A. H. (1987). *Sex Differences in Social Behavior: Social Role Interpretations*, Hillsdale, NJ: Lawrence Erlbaum.

Eagly, A. H., W. Wood, and A. B. Dickman. (2000). "Social Role Theory of Sex Differences and Similarities: a Current Appraisal." In *The Developmental Social Psychology of Gender*, edited by T. Eckes and H. M. Trautner, 123–74. Mahawah, NJ: Lawrence Erlbaum.

Gao, X. (2003). Women existing for men: Confucianism and social injustice against women in China. *Race, Gender & Class, 10*(3), 114–125.

Haslanger, Sally (1995). "Ontology and Social Construction". *Philosophical Topics*. (23)2: 95-125

Hu, A. (2016). Half the sky, but not yet equal: China's feminist movement. *Harvard International Review, 37*(3), 15–18.

Kar, R. N., and Tiwari, K. (2020). Realms of Gender Interactions: South Asian Perspectives. *South Asian Survey*, *27*(2), 91-97. https://doi.org/10.1177/0971523120951575

Kar, R. N., S. Varma, and G. Suder. (2015). "Managers in Developing Countries." In *Handbook of Research on Managing Managers*, edited by Adrian Wilkinson, Keith Townsend, and Gabriele Suder, 351–68. Cheltenham: Edward Elgar.

Kar, R.N, (2019). "Women Managers in Developing Countries: Challenges and Strategic Responses". *Gender and Popular Culture: Identity, Constructions and Representations*. Cambridge Scholars Publishing: London.

Kehrwieder, Sierra (2024). "Japanese Women in the Workforce: Tradition Versus Equality". Seattle University.

KPMG (2024). *Women leadership in corporate India 2024 report*.

Kulich, C., G. Trojanowski, M. K. Ryan, S. A. Haslam, and L. D. R. Reeneboog. (2011). "Who Gets the Carrot and Who Gets the Stick? Evidence of Gender Disparities in Executive Remuneration." *Strategic Management Journal* 32: 301–21.

Lim W. M. (2023). Philosophy of science and research paradigm for business research in the transformative age of automation, digitalization, hyperconnectivity, obligations, globalization and sustainability. *Journal of Trade Science*, 11(2/3), 3–30. https://doi.org/10.1108/JTS-07-2023-0015

Liu, H. et al. (2022). Underrepresentation of female CEOs in China: The role of culture, market forces, and foreign experience of directors. *Research in International Business and Finance*. 63.

Liu, S. (2013). A few good women at the top: The China case. *Business Horizons, 56*(4), 483–490.

Liu, T., Shen, H., & Gao, J. (2020). Women's career advancement in hotels: The mediating role of organizational commitment. *International Journal of Contemporary Hospitality Management,* 32(8), 2543–2561.

Luo, Y. J., & Hao, X. M. (2007). Media portrayal of women and social change. *Feminist Media Studies*, 7(3), 281–298.

Marshall, J. (1995). "Gender and Management: a Critical Review of Research." *British Journal of Management* 6(1): 53–S62.

Mintzberg, H. (1973). The Nature of Managerial Work. New York: Harper & Row.

Nakamura, Y.T & Horimoto, M. (2017). "Women's Leadership in Japan", *Current Perspectives on Asian Women in Leadership*. Springer: Delhi

Nakata, Y.F., & Takehiro, R. (2002). "Employment and wages of Female Japanese workers: Past, present, and future". *Industrial Relations: A Journey of Economy and Society*, 41(4), 521-547

National Institute of Population and Social Security Research (2011). *14th National Fertility Survey of Japan*. Tokyo, Japan: National Institute of Population and Social Security Research Team

Ortenblad, Anders et.al, (2017). *Gender Equality in a Global Perspective*. Routledge: New York.

Piterman, H. (2008). *The Leadership Challenge: Women in Management*.

Stake, R.E. (1994). Case studies. Thousand Oaks, CA: Sage Publication, Inc

Wakisaka, A. (2011). "Changes of HRM for women after Equal Employment Law 1985". *The Japanese Journal of Labour Studies*, 38-51.

Welsh et al., (2014). "Japanese women entrepreneurs: Implications for family firms". *Journal of Small Business Management*, 52(2): 286-305.

Yang, J. (2020). Women in China moving forward: Progress, challenges and reflections. *Social Inclusion, 8*(2), 23–35.

Yin, R.K. (1994). Case study research – design and methods. Thousand Oaks: Sage Publications.

Zhu et al., (2021). "How inclusive is workplace gender equality research in the Chinese context? Taking Stock and Looking Ahead". *The International Journal of Human Resource Management*. https://doi.org/10.1080/09585192. 2021.1988680

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Fund Management and Decision-making in Financial Institutions: A Case Study of ICICI Bank

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Cost of deposits, Cost of borrowings, Cost of funds, Return on funds, Funds management, Profitability, ICICI Bank.

JEL Classification
G20, G21 G32, M41, P47, Z23

Abstract: This research examines the critical role of funds management in influencing the profitability and sustainability of ICICI Bank over the period 2011–2024. The analysis highlights significant trends in deposit growth, borrowing efficiency, cost of funds, and returns on funds. ICICI Bank has demonstrated consistent deposit growth, declining costs of deposits, and effective borrowing strategies, underscoring its ability to adapt to dynamic market conditions. Despite recent increases in borrowing costs, the bank's long-term financial management strategies have contributed to a significant reduction in the overall cost of funds and a strong rebound in returns on funds in 2023 and 2024. The findings emphasize the strategic importance of optimizing funding sources and leveraging advances and investments to maximize profitability. Implications extend to the banking industry, academia, and policy-making, emphasizing efficient cost management practices, offering a foundation for further research, and advocating for policies that support financial literacy and sustainable growth in the banking sector.

1. Introduction

The main function of banks is to receive deposits and use these funds for lending. Deposits, as resources, come with a cost, whereas lending represents the banks' assets and generates income. Since banks are businesses, they are expected to be profitable. To achieve this, lending activities should be managed to ensure that the income from loans exceeds the interest paid on deposits by a healthy margin. Bank profitability is significantly influenced by the efficient use of resources and the effectiveness of operations. Since money lending is a risky endeavour, it is likely that some of the loans and advances made by banks to their clients will become bad and unlikely to be recovered. Such bad and dubious assets do not generate income for banks and need loan loss provisions, thereby reducing the bank's profit and profitability. Banks make money when their interest and operating costs are less than their interest and non-interest income from services and investments. Profits are essential for the survival of any business. Banking is no exception. Although banking is regarded as a nation's bloodline, in order to offer a decent return on the aforesaid huge capital expenditures and to continue supporting any economy, bank profitability is required. To be profitable, the banking sector must practice 'efficient and effective funds management' across all of its operations.

Effective fund management and strategic decision-making are cornerstones of financial stability and profitability in banking institutions. In a dynamic and competitive financial environment, the ability to optimize funding costs while maximizing returns is critical for sustainable growth. This research paper focuses on ICICI Bank, one of India's leading private sector banks, as a case study to analyse the intricate relationship between fund management and financial performance over the period 2011–2024. Key parameters such as the cost of deposits, cost of borrowings, cost of funds, and return on funds serve as the focal points of this analysis, offering valuable insights into the bank's financial strategies and adaptability.

Cost of Deposits: Cost of Deposits has a pertinent bearing upon the bank's profitability. The components of deposits such as savings deposits, fixed deposits, and current deposits, have varying risk-return profiles that impact a bank's profitability. The cost of deposits turns out to be an indicator of deposit efficiency, as lower-cost funds enable banks to lend profitably. The higher cost of deposits of bank reflects the inefficiency in deposits management on the part of bank and vice versa. Thus, low cost of deposits can be the key for bank's profitability in the long-run though its sustainability would depend on factors like return on assets, credit growth, etc.

Cost of Borrowings: The cost of borrowings reflects the interest expenses incurred by banks to raise funds from financial markets, including inter-bank loans, institutional liabilities, and certificates of deposit. These funds, while crucial for addressing short-term liquidity needs, are often more volatile than deposits, exposing banks to liquidity risks. Recently, borrowing costs have declined to decade-low levels due to ample liquidity in the market, driven by the Reserve Bank of India's (RBI) measures, such as reducing the cash reserve ratio (CRR) and increasing the marginal standing facility (MSF) ceiling. This enhanced liquidity has enabled banks to manage short-term funding efficiently and prioritize lending activities to generate additional revenue. However, the surplus liquidity provided during the pandemic requires careful monitoring, as the RBI may reduce excess liquidity to prevent financial imbalances. Consequently, banks must strategically manage borrowing costs to balance liquidity needs and profitability amidst evolving market conditions. Thus, the cost of borrowings reveals the efficiency of cost of borrowed funds and hence, it is feasible on the part of the bank to maintain lower cost of borrowings which is an indicator of higher productivity of funds management.

Cost of Funds: The Cost of Funds represents the interest rate financial institutions incur for the funds they utilize in their operations. This cost is critical for a bank since lower funding costs lead to higher returns when these funds are lent out for short-term and long-term loans. The spread between the cost of funds and the interest rate charged to borrowers is a key source of profit for banks. The cost of funds indicates the significant interest rate banks and financial institutions must pay to acquire funds. If the cost of funds rises, banks may need to increase lending rates to maintain profitability. Higher lending rates might discourage borrowers, potentially reducing loan demand and consequently, the bank's income.

A downward trend in the overall cost of funds positively impacts a bank's profitability. This decrease is attributed to lower costs of deposits and borrowings, stemming from a low-interest rate environment and improved bank liquidity. Hence, a lower cost of funds enhances the efficiency of fund management.

Return on Funds: The Return on Funds is the interest income that the financial institutions earn on funds used in their investing and lending operations. A major share of bank's revenue emanates from return on funds. Return on funds is a metric that indicates the bank's revenue in relation to the average advances and investment made by bank. Return on funds comprises both advances and investments, with the return on advances reflecting a bank's ability to generate income from its lending activities. This includes interest and discounts on various loans and advances such as bills purchased, bill discounted, cash credits, overdrafts, and term loans. On the contrary, return on investments reveals the influence of movements of market interest rates on the portfolio value. Employment of bank funds in investments is intended to meet the requirements of statutory liquidity ratio (SLR). This serves two-fold purposes: maintaining liquidity needs and yielding a fair return with limited risk. Thus, return on funds is a fundamental factor in determining bank' profitability. A lower return on funds signifies poor return on advances and investments or higher losses in loans and vice-versa.

An increasing trend in overall return of funds favourably influence the bank's profitability. The increase in overall return of funds is attributable to an increase in the return on advances and investments as result of comparatively high-interest rate scenario and the bank's improved liquidity position. Thus, the higher the return on funds, the higher will be the productivity of funds management.

This study aims to provide a comprehensive analysis of these parameters to understand the interplay between fund management and profitability in financial institutions. By exploring the trends and underlying factors that influence these metrics, the research sheds light on ICICI Bank's ability to navigate economic cycles, manage funding costs, and sustainable growth. The findings hold implications for industry practitioners, academic researchers, and policymakers, offering actionable insights to enhance financial decision-making and ensure the long-term stability of financial institutions.

1.1. Brief Profile of ICICI Bank

ICICI Bank Limited, headquartered in Vadodara, is an Indian multinational bank and financial services provider. It offers a wide array of banking products and financial services to both corporate and retail clients through numerous delivery channels and specialized subsidiaries, including those focused on investment banking, life and non-life insurance, venture capital, and asset management. The bank operates 5,418 branches and 13,463 ATMs throughout India and has a presence in 17 countries. ICICI Bank has subsidiaries in the UK and Canada, and branches in the US, Singapore, Bahrain, Hong Kong, Qatar, Oman, the Dubai International Finance Centre, China, and South Africa. Additionally, it has representative offices in the UAE, Bangladesh, Malaysia, and Indonesia. As a leading private sector bank in India, ICICI Bank caters to retail, SME, and corporate customers with a broad spectrum of financial products and services, emphasizing technology-driven solutions through digital banking on mobile and internet platforms. As on 31st March 2024, the financial highlights of ICICI Bank are as below:

Key Financial Highlights of ICICI Bank (31st March, 2024)

Consolidated Total Assets	Rs. 18,715.15 billion
Core Operating Profit	Rs. 581.22 billion
Profit after Tax	Rs. 408.88 billion
Net Worth	Rs. 2,383.99 billion
Total deposits	Rs. 14,128.25 billion
Total Capital Adequacy Ratio	16.33%
Net Interest Margin	4.53%

Source: Compiled from the annual report 2024 of ICICI bank

2. Literature Review

Aguilar Omar and Balaji Sam (2019) the article titled "Cost Management in the Banking Industry" documented that banks today face significant challenges from every direction. The ongoing environment of low, or even negative, interest rate continues to create intense margin pressure and barriers to growth. At the same time, increased competition from neo-banks and fin-techs continue to nibble away at the edges of the traditional banking business, posing a constant threat of disruption. In this challenging environment, cost management remains a strong imperative for the entire global banking industry. Reaching the next level will require greater focus on strategic cost actions, as well as increased adoption of breakthrough technologies such as automation, cognitive/AI, and business intelligence. These digital innovations have the potential to generate substantial cost savings necessary to fund and implement business improvement that are not only for growth but transformational for the existing business model.

Oracle White Paper (2017) published an article titled "A Strategic Approach to Cost Efficiency in the Banking Industry." The article concluded that in a dynamic market, banks must identify areas of opportunity where they excel and leverage their existing strengths. Simply focusing on products and markets is insufficient for achieving rapid growth. In addition to exploring new market and product opportunities, banks need to modernize their business models and capabilities to better adapt to the current banking environment. Challenges such as rising costs, narrowing margins, heightened competition, and stringent regulations should be viewed as catalysts, not obstacles, for growth. However, sustainable growth requires profitability. To sustain competitiveness and profitability, banks should prioritize efficient cost management. Conducting a thorough cost-benefit analysis of processes, products, personnel, and infrastructure can enable banks to strategically manage costs and enhance profitability.

Earnest & Young (2015) in an article "Effective Cost Management and Profitability Analysis for the Financial Services Sector" contemplated that the financial sector is encountering growing challenges, compelling managers to focus on cost reduction and profit growth to generate value. To achieve this, they depend on business intelligence for decision-making aimed at value creation. Adapting to global changes necessitates that cost and profitability information be reliable, relevant, and timely. This requires robust and well-executed cost management and profitability analysis, enabling management to make informed decisions to sustain and enhance organizational performance.

The Institute of Cost Accountants of India (2014) in an article "Relevance and Applicability of Cost Management in Banking Sector" set forth that Banking is considered as a bloodline of economy of a nation; to provide a reasonable return for the huge capital expenditures and to remain servicing any economy, profitability of the banks is a must. In order to maintain profitability, the banking sector must prioritize efficient and effective management of costs across its operations. Increasing competition and the evolving complexity of banking require banks to innovate by developing intricate products, adopting new delivery channels for these innovations, and implementing new business processes, often involving significant capital investments. Cost control in banks should involve strategic planning, while cost reduction efforts should encompass both strategic and tactical aspects. Financial institutions should adopt a strategic perspective, viewing cost-cutting as part of a broader efficiency drive. Balancing short-term tactical cost reductions with longer-term strategic cost initiatives will position banks more effectively for sustained high performance in the future.

Shollapur and Balligati (2010) in their work "Funds Management in Banks: A Cost-Benefit Perspective" opined that the success of a bank relies heavily on how it manages the acquisition and deployment of funds. Efficient fund management involves acquiring funds and using them in a way that generates sufficient revenue to cover operational and financial costs while also yielding a reasonable return on investment. The Indian banking sector underwent significant changes in its operations following financial sector reforms in 1991. These reforms ushered in new banks, financial instruments, business methodologies, and increased competition within the banking industry. Given this environment, it is crucial for the Indian banking sector to bolster its financial foundation, enhance overall efficiency, and boost profitability through well-designed fund management policies and practices. Therefore, achieving profit objectives hinges on implementing sound and commercially viable fund management strategies.

2.1. Research Gap

After reviewing several articles related to the topic, it has been determined that there is significant potential for the current study. The focal point of earlier studies was fund management policies, cost management practices and its influence on the banking sector as a whole. It seems that no effort had been made to apprehend the effectiveness of fund management for decision making in financial institutions. Thus, present case study is an important venture for studying, measuring and analysing the effectiveness of efficient fund management and its implications on the overall profitability and sustainable growth of the bank.

3. Objectives and Hypothesis of the Study

The stated objectives and hypothesis provide a roadmap for exploring the core aspects of the research and achieving meaningful conclusions.

3.1. Objectives

The following are the specific objectives of this study:

i. Assessing the costs associated with acquiring funds and analysing the returns generated from distributing these funds.
ii. Examining how fund management practices influence the productivity, and profitability of the selected bank.
iii. Identifying the challenges encountered by the bank in managing its funds.

iv. Proposing cost-effective solutions to facilitate improved decision-making for effective fund management.

3.2. Hypothesis

Hypothesis for the present study is:

i. H_0: There is no significant relationship between funds management indicators and profitability of bank.
ii. H_1: There is a significant relationship between funds management indicators and profitability of bank.

4. Research Methodology

This section outlines the systematic approach adopted to collect, analyse, and interpret data, ensuring the credibility and reliability of the findings.

4.1. Research Design

This study is purely based upon empirical research design. Empirical research is a research approach that relies on verifiable evidence to draw conclusions. This methodology uses scientific data collection methods and analysis to obtain and interpret evidence for research outcomes.

4.2. Sample Profile

The sample size is the case study of ICICI Bank. The sampling technique used is non-probabilistic sampling more specifically the judgmental sampling.

4.3. Period of Study

For the purpose of study data for 14 years commencing from the year 2011 till 2024 has been taken into consideration.

4.4. Sources of Data Collection

The study radically relies only on Secondary sources of information viz; annual reports of ICICI bank, RBI Bulletin, published journals, websites, etc.

4.5. Statistical Tools and Techniques

The collected data has been analysed by using MS-Excel.

5. Data Analysis and Interpretation

The primary cost components of the ICICI Bank in relation to the problem under consideration are Cost of Deposits, Cost of Borrowings, Cost of Funds and Return on Funds. The requisite tables and figures have been used to present the detailed study of these components.

Table 1: Cost of Deposits

(INR in billions)

Year	Current Year Deposits	Previous Year Deposits	Average(D)*	Interest paid on Deposits	Cost of Deposit**
2011	2,256.02	2,020.16	2,138.09	100.71	4.71%
2012	2,555.00	2,256.02	2,405.51	143.04	5.95%
2013	2,926.14	2,555.00	2,740.56	168.89	6.16%
2014	3,319.14	2,926.14	3,122.63	178.68	5.72%
2015	3,615.63	3,319.14	3,467.38	202.94	5.85%
2016	4,214.26	3,615.63	3,914.94	215.49	5.50%
2017	4,900.39	4,214.26	4,557.32	228.72	5.02%
2018	5,609.75	4,900.39	5,255.07	234.29	4.46%

2019	6,529.20	5,609.75	6,069.47	265.25	4.37%
2020	7,709.69	6,529.20	7,119.44	326.88	4.59%
2021	9,325.22	7,709.69	8,517.45	332.56	3.90%
2022	10,645.72	9,325.22	9,985.47	333.00	3.33%
2023	11,808.41	10,645.72	11,227.07	389.68	3.47%
2024	14,128.25	11,808.41	12,968.33	578.57	4.46%

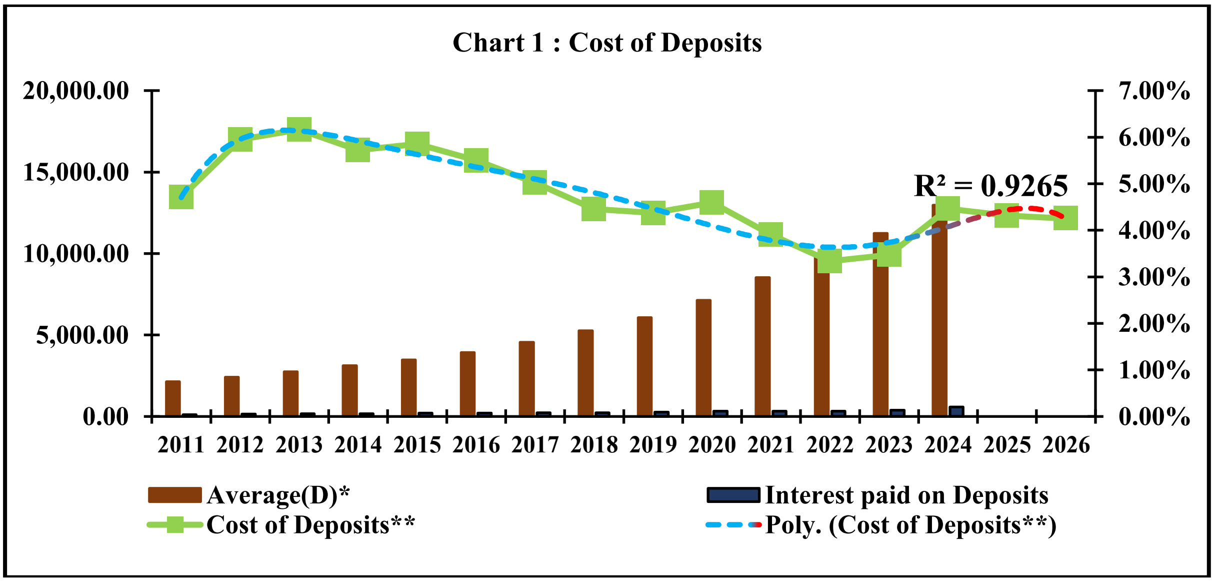
Source: Compiled from the various Annual Reports of ICICI Bank

*Average(D)= (Current Year Deposits + Previous Year Deposits)/2
** Cost of Deposit = Interest paid on Deposits/ Average (D)

The table no. 1 provides an overview of the cost of deposits for ICICI Bank from 2011 to 2024, revealing significant trends in deposit growth, interest expenses, and cost efficiency. Over the 14-year period, the bank's deposits have shown a consistent upward trend, increasing from INR 2,256.02 billion in 2011 to INR 14,128.25 billion in 2024. This growth reflects the bank's expanding depositor base and its ability to attract substantial financial resources.

The cost of deposits, calculated as the percentage of interest paid on deposits relative to the average deposit balance, illustrates the bank's efficiency in managing deposit-related expenses. Initially, the cost of deposits was 4.71% in 2011, with notable fluctuations over the years. While the cost peaked at 6.16% in 2013, it generally declined thereafter, reaching a low of 3.33% in 2022. This decline indicates the bank's efforts to optimize interest rates and reduce funding costs despite a growing deposit base. However, a slight increase in the cost of deposits to 4.46% in 2024 suggests adjustments in the bank's financial strategy, potentially influenced by market dynamics or economic conditions.

The interest paid on deposits has grown alongside the increase in deposits, reflecting the bank's ability to honour its financial commitments to depositors. Despite this rise in absolute interest payments, the declining trend in the cost of deposits highlights improved financial management and strategic decision-making by the bank. The data from Table 1 is also presented graphically in Chart 1.



Graphical Representation of Table 1

The Brown and Blue coloured bars depict the average of deposits and interest paid on deposits respectively. The Green line depicts the cost of deposits whereas the multi-coloured line is the trend line wherein the sky-blue colour illustrates the changes in cost of deposits over the period under study and the red colour forecasts the trend of cost of deposits for the year 2025 and 2026. The trend line initially increased in the year 2011 and 2012, reached its maximum in the year 2013 and then from the year 2014 onwards it started to diminish. The estimated value of $R^2 = 0.9265$ which brings into view that the line is a best fit for the data under study.

On the grounds of above discussion, the value of cost of deposits for the year 2025 and 2026 has been forecasted and presented in Table 1.1.

Table 1.1: Forecasted Cost of Deposits

(INR in billions)

Year	Current Year Deposits*	Previous Year Deposits	Average(D)	Interest paid on Deposits*	Cost of Deposits
2025	16,240.26	14,128.25	15,184.25	655.24	**4.32%**
2026	18,667.98	16,240.26	17,454.12	742.07	**4.25%**

Source: Computed with the help of MS-Excel

*Forecasted Value$_{t+1}$=Current Year Deposits$_t$ × (1+Average Growth Rate)

The forecasted value of the cost of deposits for the year 2025 and 2026 is 4.32% and 4.25% respectively. Thus, it indicates that ICICI bank is decisively managing the deposits.

Table 2: Cost of Borrowings

(INR in billions)

Year	Current Year's Borrowings	Previous Year's Borrowings	Average Borrowings	Interest on Borrowings*	Cost of Borrowings**
2011	1,095.54	942.63	1,019.08	68.86	6.76%
2012	1,401.64	1,095.54	1,248.59	85.04	6.81%
2013	1,453.41	1,401.64	1,427.53	93.20	6.53%
2014	1,547.59	1,453.41	1,500.50	98.34	6.55%
2015	1,724.17	1,547.59	1,635.88	97.57	5.96%
2016	1,748.07	1,724.17	1,736.12	99.66	5.74%
2017	1,475.56	1,748.07	1,611.81	95.47	5.92%
2018	1,828.58	1,475.56	1,652.07	85.11	5.15%
2019	1,653.19	1,828.58	1,740.89	98.61	5.66%
2020	1,628.96	1,653.19	1,641.08	88.43	5.39%
2021	916.30	1,628.96	1,272.63	68.72	5.40%
2022	1072.31	916.30	994.31	56.07	5.64%
2023	1193.25	1072.31	1,132.78	81.34	7.18%
2024	1249.68	1193.25	1,221.47	107.27	8.78%

Source: Compiled from the various Annual Reports of ICICI Bank

*Interest on Borrowings includes Interest on RBI/inter-bank borrowings and others (including interest on borrowings of erstwhile ICICI Limited)

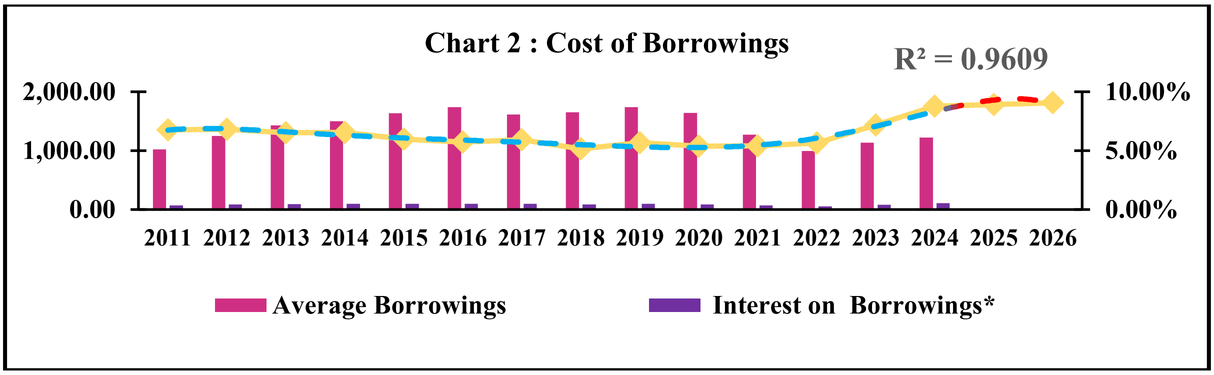
Average Borrowings = (Current Year Borrowings + Previous Year Borrowings)/2

** Cost of Borrowings = Interest paid on Borrowings/ Average Borrowings

The table no. 2 outlines the cost of borrowings for ICICI Bank from 2011 to 2024, showcasing trends in borrowing amounts, interest expenses, and borrowing efficiency. Over the period, the bank's current year borrowings display fluctuations, starting at INR 1,095.54 billion in 2011 and rising to INR 1,249.68 billion in 2024. This variability reflects the bank's changing reliance on borrowings as a source of funding across different economic cycles.

The cost of borrowings, which measures the percentage of interest paid relative to the average borrowings, shows notable trends. In 2011, the cost stood at 6.76%, with moderate fluctuations over the years. A decline is observed in certain years, reaching a low of 5.15% in 2018, highlighting periods of cost-efficiency in managing borrowed funds. However, the cost of borrowings rises sharply in 2023 and 2024, peaking at 8.78% in 2024. This increase might be attributed to rising interest rates or a shift in borrowing strategies due to economic or market conditions.

Interest paid on borrowings generally aligns with the changes in average borrowings, reflecting the bank's financial commitments to lenders. Despite a reduction in absolute borrowing amounts in some years, the cost of borrowings demonstrates variability, indicating the influence of external factors such as interest rate trends and internal strategies for managing borrowed funds. The data in table 2 has been graphically plotted in chart no. 2.



Graphical Representation of Table 2

The average borrowings and the interest paid on borrowings has been depicted by pink- and purple-coloured bars. The Yellow line depicts the cost of borrowings whereas the multi-coloured line is the trend line which clearly illustrates the fluctuations in the cost by blue colour and the point where the line changes to colour red is a projection of cost for the year 2025 and 2026, signalling potential challenges due to rising interest rates or increased reliance on borrowings. The estimated value of R^2 = 0.9609 which exhibits that the line is a best fit for sample data. In line with the above discussion, the value of cost of borrowings for the year 2025 and 2026 has been forecasted in Table 2.1.

Table 2.1: Forecasted Cost of Borrowings				**(INR in billions)**	
Year	**Current Year's Borrowings***	**Previous Year's Borrowings**	**Average Borrowings**	**Interest on Borrowings***	**Cost of Borrowings**
2022	1297.61	1249.68	1273.64	113.40	**8.90%**
2023	1347.38	1297.61	1322.49	119.88	**9.06%**

Source: Computed with the help of MS-Excel

*Forecasted Value_{t+1}=Current Year Deposits_t × (1+Average Growth Rate)
The projected cost of borrowings for 2025 and 2026 is estimated at 8.90% and 9.06% respectively. The rise in borrowing costs is theoretically attributed to an uptick in the expenses associated with foreign currency call and term borrowings, as well as interest costs on funding swaps, partially mitigated by a decline in refinance borrowing expenses.

Table 3: Cost of Funds					**(INR in billions)**		
Year	**Average (D)**	**Average (B)**	**Average (D+B)**	**Interest on Deposits**	**Interest on Borrowings***	**Interest (D+B)**	**Cost of Funds*** *
2011	2,138.09	1,019.08	3,157.17	100.71	68.86	169.57	5.37 %
2012	2,405.51	1,248.59	3,654.10	143.04	85.04	228.08	6.24%
2013	2,740.56	1,427.53	4,168.09	168.89	93.20	262.09	6.29%
2014	3,122.63	1,500.50	4,623.13	178.68	98.34	277.02	5.99%
2015	3,467.38	1,635.88	5,103.26	202.94	97.57	300.51	5.89%
2016	3,914.94	1,736.12	5,651.06	215.49	99.66	315.15	5.58%
2017	4,557.32	1,611.81	6,169.13	228.72	95.47	324.19	5.26%

2018	5,255.07	1,652.07	6,907.14	234.29	85.11	319.4	4.62%
2019	6,069.47	1,740.89	7,810.36	265.25	98.61	363.86	4.66%
2020	7,119.44	1,641.08	8,760.52	326.88	88.43	415.31	4.74%
2021	8,517.45	1,272.63	9,790.08	332.56	68.72	401.28	4.10%
2022	9,985.47	994.31	10,979.78	333.00	56.07	389.07	3.54%
2023	11,227.07	1,132.78	12,359.85	389.68	81.34	471.02	3.81%
2024	12,968.33	1,221.47	14,189.80	578.57	107.27	685.84	4.83%

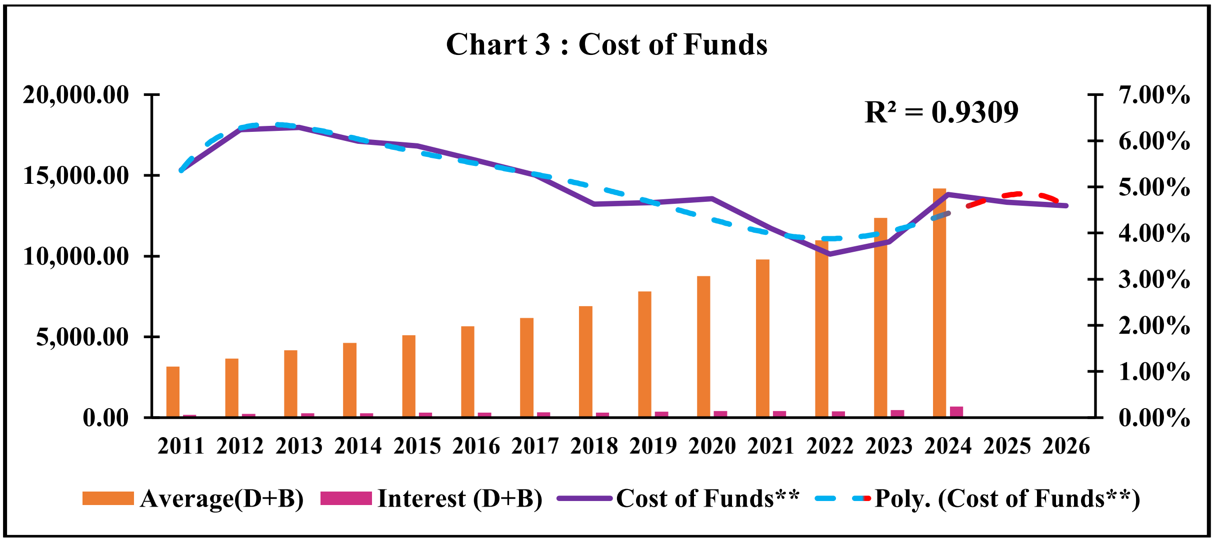
Source: Compiled from the various Annual Reports of ICICI Bank

*Interest on Borrowings includes Interest on RBI/inter-bank borrowings and others (including interest on borrowings of erstwhile ICICI Limited)
Interest (D+B) = Interest on Deposits + Interest on Borrowings
Average(D)= (Current Year Deposits + Previous Year Deposits)/2
Average (B) = (Current Year Borrowings + Previous Year Borrowings)/2
Average (D+B) = Sum of Average of Deposits and Borrowings

$$\text{** Cost of Funds} = \frac{\text{(Interest paid on Deposits + Interest paid on Borrowings)}}{\text{(Average of Current and Previous Years' Deposits + Borrowings)}}$$

The table no. 3 presents the cost of funds for ICICI Bank from 2011 to 2024, detailing the dynamics between deposits, borrowings, and their combined impact on interest expenses and efficiency. The average funds (deposits and borrowings combined) increased significantly over the years, rising from INR 3,157.17 billion in 2011 to INR 14,189.80 billion in 2024, reflecting the bank's growing resource base.

Interest paid on deposits and borrowings follows a similar upward trajectory, with total interest (on both deposits and borrowings) increasing from INR 169.57 billion in 2011 to INR 685.84 billion in 2024. The cost of funds, which measures the percentage of interest paid relative to the total average funds, exhibits fluctuations. It starts at 5.37% in 2011, peaks at 6.29% in 2013, and then declines steadily to 3.54% in 2022, reflecting improved cost management. However, it rises again to 4.83% in 2024, possibly due to increased interest rates or changes in funding structures. Despite the recent increase, the overall reduction in the cost of funds over the long term showcases the bank's effective financial management and adaptability to changing economic conditions. The data from Table 3 is illustrated in Chart 3.



Graphical Representation of Table no. 3

The average funds (deposits + borrowings) and the total interest paid on funds has been depicted by Orange and Pink coloured bars. The Purple line depicts the cost of funds. Besides, the multi-coloured line is the trend line which clearly illustrates the declining trend in the cost from 2014 onwards by blue colour for the period under study and a projection of cost for the year 2025 and 2026 has been depicted where the line changes to colour red. The estimated value of $R^2 = 0.9309$ which brings to view that the line is a best fit for sample data.

On the grounds of above discussion, the value of cost of funds for the year 2025 and 2026 has been forecasted in table 3.1.

Table 3.1: Forecasted Cost of Funds **(INR in billions)**

Year	Average (D)	Average (B)	Average (D+B)	Interest on Deposits	Interest on Borrowings	Interest (D+B)	Cost of Funds
2025	15,184.25	1273.64	16,457.90	655.24	113.40	768.64	4.67%
2026	17,454.12	1322.49	18,776.61	742.07	119.88	861.95	4.59%

Source: Computed with the help of data in Table 1.1 and Table 2.1

The forecasted value of the cost of funds for the year 2025 and 2026 is 4.67% and 4.59% respectively. Thus, it reflects the bank's anticipated ability to manage interest expenses on deposits and borrowings efficiently, ensuring lower funding costs while maintaining growth in its funding base.

Table 4: Return On Funds **(INR in billions)**

Year	Average (Advances)	Average (Investment)	Average(A+I)	Total Interest*	Return on funds**
2011	1,987.85	1,277.89	3,265.74	259.74	7.95%
2012	2,350.46	1,471.23	3,821.69	335.42	8.78%
2013	2,719.88	1,654.76	4,374.64	400.75	9.16%
2014	3,144.76	1,742.07	4,886.83	441.78	9.04%
2015	3,631.12	1,818.00	5,449.12	490.91	9.01%
2016	4,113.93	1,734.95	5,848.88	527.39	9.02%
2017	4,497.48	1,609.59	6,107.07	541.56	8.87%
2018	4,883.13	1,822.50	6,705.63	549.65	8.20%
2019	5,495.20	2,053.63	7,548.83	634.01	8.40%
2020	6,159.68	2,286.32	8,446.00	747.98	8.86%
2021	6,895.09	2,654.09	9,549.18	791.18	8.29%
2022	7,963.75	2,957.64	10,921.38	863.74	7.91%
2023	9,393.29	3,362.85	12,756.14	1092.31	8.56%
2024	11,020.22	4,121.36	15,141.58	1428.90	9.44%

Source: Compiled from the various Annual Reports of ICICI Bank

*Total Interest includes Interest / Discount on Advances, Income on Investment, Interest on balances with RBI and other inter- bank funds and other interest

Average (Advances) = (Current Year Advances + Previous Year Advances)/2

Average (Investment) = (Current Year Investment + Previous Year Investment) /2

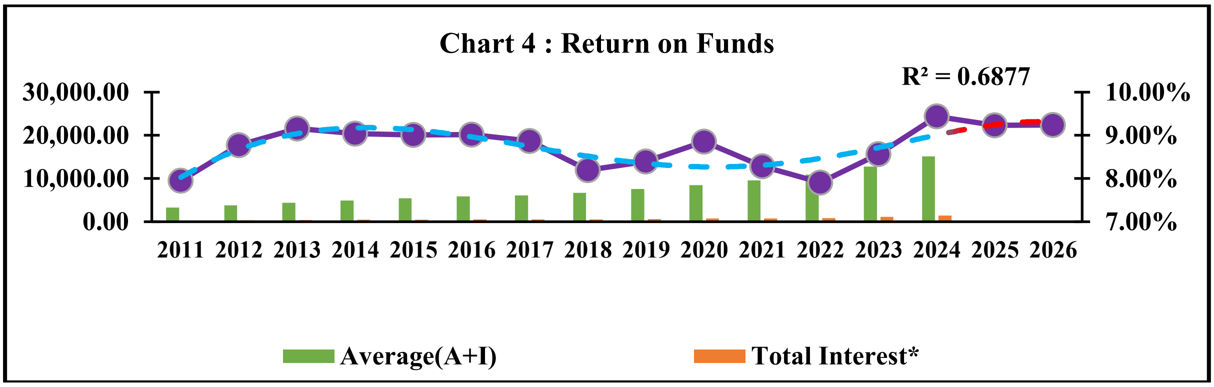
Average(A+I) = Sum of Average Advances and Average Investment

$$** \text{ Return on Funds} = \frac{\text{(Interest earned on Advances + Interest earned on Investments)}}{\text{(Average of Current and Previous Years' Advances + Investment)}}$$

The table no. 4 highlights ICICI Bank's return on funds by analysing its advances, investments, and the resulting total interest earned over time. From 2011 to 2024, there is a consistent growth in the average funds, which are the combined values of advances and investments. These averages increased from INR 3,265.74 billion in 2011 to INR 15,141.58 billion in 2024, showcasing the bank's expanding scale of operations.

The total interest earned, a critical indicator of the bank's performance, rose substantially from INR259.74 billion in 2011 to INR1,428.90 billion in 2024, driven by an increase in both advances and investment activities. The return on funds fluctuated slightly over the years, reflecting varying market conditions and operational efficiencies.

Initially, the return on funds increased from 7.95% in 2011 to a peak of 9.16% in 2013, indicating strong fund utilization during that period. However, it stabilized around 9.0% until 2016 before experiencing a gradual decline to 7.91% in 2022, likely due to lower interest rate environments or changes in the bank's portfolio structure. In 2023 and 2024, the return rebounded to 8.56% and 9.44%, respectively, marking a significant improvement, which may be attributed to favourable interest rates and effective management of advances and investments. The data from Table 4 is illustrated in Chart 4



Graphical Representation of Table No. 4

The average funds (advances+investments) and the total interest received on funds has been depicted by green- and orange-coloured bars. The Purple line depicts the return on funds. Besides, the multi-coloured line is the trend line which clearly illustrates the slight fluctuating trend in the returns from 2011 to 2024 by blue colour and a projection of return for the year 2025 and 2026 has been depicted where the line changes to colour red. The estimated value of $R^2 = 0.9877$ which brings to view that the line is a best fit for sample data.

Based on above discussion, the return on funds for the year 2025 and 2026 has been forecasted in table 4.1.

Table 4.1: Forecasted Return on Funds **(INR in billions)**

Year	Average (Advances)*	Average (Investment)*	Average(A+I)	Total Interest*	Return on funds
2025	12,697.04	4,863.72	17,560.76	1620.96	**9.23%**
2026	14,525.86	5,378.16	19,904.02	1838.83	**9.24%**

Source: Computed with the help of data in Table No.4

*Forecasted Value_{t+1}=Current Year Deposits_t × (1+Average Growth Rate)

The forecasted value of the return on funds for the year 2025 and 2026 is 9.23% and 9.24% respectively, highlighting ICICI Bank's ability to maintain strong financial performance. The marginal increase in return on funds suggests that the bank is effectively managing its advances and investments to generate higher interest income.

6. Result and Discussion

On the basis of analysis and interpretation of data, this section provides meaningful insights, validating or rejecting the hypothesis while uncovering key findings related to the study's objectives.

6.1. Hypothesis Testing

The Cost of Funds and Return on Funds for ICICI Bank stands out to be 5.07% (average) and 8.68% (average), resulting in a bank spread of 3.61% (average). This reflects the bank's proficient fund management, showcasing how the strategic and efficient utilization of resources significantly

enhances its profitability. The trends in the cost of deposits, borrowings, funds, and returns on funds clearly illustrate a significant relationship between ICICI Bank's funds management and its profitability. The bank's ability to reduce funding costs over time, optimize interest rates, and efficiently utilize funds to maximize returns demonstrates the critical role of effective funds management in enhancing financial performance. The recovery in returns on funds in recent years and the projected improvements further underline this connection.
Thus, based on the data analysis, the null hypothesis- no significant relationship between funds management indicators and profitability of bank has been rejected.

6.2.Findings

The analysis of ICICI Bank's financial data over the study period reveals several key trends in the domain of fund management, offering insights into its strategic financial operations. One of the most prominent observations is the bank's consistent expansion in its deposit base. This upward trajectory not only signifies strong depositor confidence but also points to the bank's growing market presence and its effective mobilization of financial resources. A noteworthy trend is the steady decline in the cost of deposits over the years, with the bank achieving its most favourable rate in 2022. This downward movement highlights enhanced operational efficiency and a strategic shift toward low-cost deposit mobilization. However, the marginal increase observed in 2024 suggests a recalibration in financial strategies, possibly driven by evolving market interest rates, regulatory shifts, or efforts to maintain liquidity buffers. In contrast, cost of borrowings has exhibited greater volatility. The recent escalation in borrowing costs can be attributed to broader macroeconomic pressures, including tightening monetary policy and higher benchmark interest rates. This trend underscores the sensitivity of market-based funding sources to external economic factors, emphasizing the need for a diversified and balanced funding mix.

Despite these individual movements, the overall cost of funds has followed a generally downward trajectory across the study period. This long-term reduction serves as evidence of ICICI Bank's comprehensive and effective financial management practices, even though there was a slight reversal in the most recent year, indicating ongoing responsiveness to short-term funding dynamics. The analysis of return on funds reveals intermittent fluctuations, reflective of both internal strategic decisions and external economic influences. Importantly, the return on funds witnessed a marked improvement in 2023 and sustained momentum in 2024. This resurgence demonstrates the bank's strengthened capability to deploy its funds in avenues that yield higher returns, even amid changing economic conditions. The overall findings suggest that ICICI Bank has adeptly navigated complex financial environments, achieving cost efficiency while steadily enhancing returns. These patterns not only affirm the bank's resilience but also establish a foundation for expected gains in profitability and competitiveness in the years ahead.

7. Conclusion

ICICI Bank's financial trajectory over the past decade reaffirms the pivotal role of strategic funds management in driving sustainable profitability. The empirical findings of the study highlight the bank's prudent approach in managing its key cost components—specifically, the cost of deposits, cost of borrowings, and overall cost of funds. Through meticulous financial planning and resource allocation, ICICI Bank has successfully maintained a delicate balance between minimizing funding costs and optimizing the return on funds deployed. The bank's performance reflects not only effective cost control mechanisms but also a proactive investment strategy that maximizes returns on advances and investments, contributing positively to its net interest margins and overall financial health. Notably, ICICI Bank has demonstrated an exceptional capacity to adapt to evolving macroeconomic conditions and regulatory frameworks, thereby strengthening its risk management practices and reinforcing financial resilience.

The recent uptrend in return on funds, observed during the latter part of the study period, signals a promising recovery and affirms the bank's capacity to align its fund deployment strategies with profitability goals. This resurgence, coupled with optimistic forward-looking indicators, positions

ICICI Bank as a model for effective fund management among Indian commercial banks. In conclusion, the case of ICICI Bank underscores that efficient funds management is not merely a support function but a core driver of profitability and long-term value creation. Its strategic financial governance serves as a benchmark for both public and private sector banks aiming to enhance operational efficiency, withstand economic volatilities, and achieve sustainable growth in a highly competitive banking environment.

7.1. Suggestions

In light of the analytical insights derived from the study, several strategic recommendations are proposed to further enhance ICICI Bank's financial performance through optimized funds management. Firstly, greater cost efficiency can be achieved by actively diversifying the bank's funding sources beyond traditional deposits and borrowings. Exploring alternative instruments such as long-term infrastructure bonds, green finance options, or international debt markets may provide access to funds at competitive rates while improving funding stability. In parallel, the bank could benefit from negotiating more favourable terms with institutional lenders and capital markets, particularly during periods of lower interest rate volatility. Secondly, portfolio diversification should be emphasized as a risk-mitigation strategy. By allocating funds across a broader range of sectors—such as infrastructure, renewable energy, MSMEs, and digital financial services—ICICI Bank can reduce its exposure to sector-specific downturns and maintain stable returns across economic cycles. Such diversification will also enhance resilience against credit concentration risks. Another key recommendation is the institutionalization of a dynamic market intelligence framework to facilitate regular monitoring of interest rate movements, liquidity patterns, and regulatory changes. This proactive approach will allow the bank to adapt its fund allocation strategies promptly and ensure optimal timing in pricing deposits and loans. Furthermore, product innovation tailored to evolving customer preferences can significantly strengthen the bank's competitive edge. By developing customized deposit schemes, flexible loan structures, and value-added financial products, the bank can attract a more diversified clientele while improving its cost-benefit ratio. Leveraging digital platforms to enhance outreach and delivery efficiency will further support these efforts.

Finally, investments in financial technology and data analytics should be prioritized to enable precision-based decision-making in fund management. A tech-enabled infrastructure can streamline operations, reduce overhead costs, and enhance the accuracy of profitability forecasts. These suggestions, if implemented effectively, will not only reinforce ICICI Bank's market leadership but also contribute to sustainable and inclusive banking practices in an increasingly competitive financial landscape.

7.2. Limitations of the Study

The limitations of the study are as follows:

i. This research study is conducted within a specific time frame and focuses on certain criteria only.
ii. The day-to-day fluctuations in data have been excluded from the study due to limitations in obtaining detailed and comprehensive information for the research.
iii. All the computations have been done on the basis of data as at balance sheet date.
iv. In the absence of certain information which was not disclosed by the concerned bank, the computation of ratios has been done on the basis of GAAP.
v. The study focuses on the fund management of ICICI bank only. Hence, findings may differ for other banks.
vi. The secondary data has its own limitations.

References

Aguilar, O., & Balaji, S. (2019, November). *Save-to-transform as a catalyst for embracing digital disruption: Deloitte's second biennial global cost survey – Cost management practices and trends in the banking sector*. Deloitte. https://www2.deloitte.com/us/en/pages/financial-services/articles/cost-management-banking-industry.html

Ernst & Young (EY). (2015). *Effective cost management and profitability analysis for the financial services sector*. https://docobook.com/effective-cost-management-and-profitability-analys.pdf

Haslem, J. A. (2015, July 27). *Concepts of bank funds management*. Bankers' Magazine, 165(3), 92–97. (Originally published in 1982). https://ssrn.com/abstract=2615334

ICICI Bank Ltd. (2011). *Annual report and summary financial statements 2010–11*. https://www.icicibank.com/about-us/annual/2011

ICICI Bank Ltd. (2012). *Annual report and summary financial statements 2011–12*. https://www.icicibank.com/aboutus/annual.page?year=2011&type=IRAnnual%20Reports

ICICI Bank Ltd. (2013). *Annual report and summary financial statements 2012–13*. https://www.icicibank.com/aboutus/annual.page?year=2012&type=IRAnnual%20Reports

ICICI Bank Ltd. (2014). *Annual report and summary financial statements 2013–14*. https://www.icicibank.com/aboutus/annual.page?year=2013&type=IRAnnual%20Reports

ICICI Bank Ltd. (2015). *Annual report and summary financial statements 2014–15*. https://www.icicibank.com/aboutus/annual.page?year=2014&type=IR-Annual%20Reports

ICICI Bank Ltd. (2016). *Annual report and summary financial statements 2015–16*. https://www.icicibank.com/aboutus/annual.page?year=2015&type=IR-Annual%20Reports

ICICI Bank Ltd. (2017). *Annual report and summary financial statements 2016–17*. https://www.icicibank.com/aboutus/annual.page?year=2016&type=IR-Annual%20Reports

ICICI Bank Ltd. (2018). *Annual report and summary financial statements 2017–18*. https://www.icicibank.com/aboutus/annual.page?year=2017&type=IR-Annual%20Reports

ICICI Bank Ltd. (2019). *Annual report and summary financial statements 2018–19*. https://www.icicibank.com/aboutus/annual.page?year=2018&type=IR-Annual%20Reports

ICICI Bank Ltd. (2020). *Annual report and summary financial statements 2019–20*. https://www.icicibank.com/annual-report-microsite/index.html

ICICI Bank Ltd. (2021). *Annual report and summary financial statements 2020–21*. https://www.icicibank.com/aboutus/Annual-Reports/2020-21/AR/index.html

ICICI Bank Ltd. (2022). *Annual report and summary financial statements 2021–22*. https://www.icicibank.com/ms/aboutus/annual-reports/2021-22/AR/index.html

ICICI Bank Ltd. (2023). *Annual report and summary financial statements 2022–23*. https://www.icicibank.com/ms/aboutus/annual-reports/2022-23/AR/index.html

ICICI Bank Ltd. (2024). *Annual report and summary financial statements 2023–24*. https://www.icicibank.com/ms/simplify/assets/pdf/ICICI%20Bank%20Report.pdf

ICMAI Aurangabad. (2014). *Relevance and applicability of cost management in banking sector*. http://www.icmaiaurangabad.in/downloads/ncc2014/Relevance_and_Applicability_of_Cost_Management%20in_Banking_Sector.pdf

Oracle Financial Services. (2017). *A strategic approach to cost efficiency in the banking industry: Boosting profitability amidst new challenges*. Oracle. https://www.oracle.com/us/industries/financial-services/strategic-approach-efficiency-wp-3886143.pdf

Peacock Live Projects. (n.d.). *A study on credit appraisal system at ICICI Bank* [Project Report]. Scribd. https://www.scribd.com/document/660828570/205-F-ICICI-A-STUDY-ON-CREDIT-APPRAISAL-SYSTEM-AT-ICICI-BANK

Shollapur, M. R., & Baligatti, Y. G. (2010). Funds management in banks: A cost-benefit perspective. *International Business & Economics Research Journal (IBER), 9*(11), 21–29. https://www.researchgate.net/publication/260383660_Funds_Management_In_Banks_A_Cost-Benefit_Perspective

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