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South Bengal (Midnapore) Branch, West Bengal

Editorial Board

Editorial

We are very happy to inform our readers/ subscribers the publication of the Vol. XIV, No. 2 (July-December, 2024) of the reputed e-journal, Business Spectrum (ISSN:2249-4804) – the open access, fully referred and peer-reviewed bi-annual Journal of the IAA South Bengal Branch. In this issue, seven research papers on different relevant areas like finance and marketing have been published. In the paper titled '**A Study on the Liquidity and its Impact on the Profitability of Selected Real Estate Companies of India**' authored by Atul Kumar Paul, the crucial role of profitability and liquidity in the financial performance of a business organization have been examined by comparing the liquidity and profitability of three selected companies and their relationship over a specific study period by using the standard appropriate financial ratios. Relevant descriptive and inferential statistical tools have been used with the help of SPSS to draw the relevant conclusions. In the paper titled **'An Empirical Study on the impact of Operational Diversification on a Bank's Financial Performance'** authored by Arunava Praharaj and Sibaram Chatterjee, an attempt has been made to understand the banking industry scenario against the backdrop of intense competition as a result of financial sector reforms. Many banks are deliberately diversifying their businesses to lower operational risks in response to the growing competitions. The study has attempted to investigate into the role of operational diversification affecting the stability of the financial performance of the Indian banks. The authors have considered the relevant data of four commercial banks for a period of 20 years for measuring the impact of operational diversification and have found that it has significant impact on variation in the financial performance. The study further reveals that the banks with lesser size suffer from the problem of greater fluctuations in financial performance and vice versa. In the paper titled '**Impact of Illiquidity on Government Bond Yields: Evidence from India'** authored by Sahida Yeagsani and Arindam Das, an attempt has been made to find out the association between the illiquidity and the yields of the government bonds to understand the nature of illiquidity premium existing in the Indian government bond market. For this purpose, the data have been primarily collected from the NDS-OM platform and the Amihud Illiquidity measure has been used to estimate the illiquidity proxies. It has been found that the illiquidity in the Indian government bond market is on the lower side. For this study, the Driscoll Kraay Standard Error Method of the Fixed Effects Model has been used. It has been concluded that the Indian government bond market is a highly regulated market and is highly liquid. In the paper titled **'Mapping Financial Knowledge in Urban India: A Case Study of Bhavnagar City'** authored by Bosamiya Meet, B.C. Ajmera and Sanjay J. Bhayani, focuses on a primary-data-based study on financial literacy and awareness of the Bhavnagar city. The data have been collected through a structured questionnaire and some appropriate descriptive and inferential statistical tools have been used. It has been found that the demographic variables and location play a major role in financial literacy. In the paper titled '**Role of trade fairs in empowering womenpreneurs of West Bengal: A case study of Saras Mela'** authored by Istu Roy and Abhik Kumar Mukherjee, an effort has been made to focus on some relevant issues relating to socio-culturally empowering and economically uplifting the rural women entrepreneurs and local artisans in West Bengal (to enter the mainstream market and compete with the other vendors on an equal footing) who participated in a trade fair (Saras Mela) held in the Newtown Mela Ground of Kolkata, patronised by the Govt. of West Bengal through the West Bengal State Rural Livelihood Mission (WBSRLM), known as Anandadhara. Keeping pace with the changes in technology, a number of MoUs have been signed with different e-commerce platforms – a recent development, thus, enabling the rural artisans (from different districts of West Bengal, mainly functioning through the SHGs) to sell their products both offline and online through interactions with the urban consumers coming from different Indian states including the host state, West Bengal, and they get the opportunity of even reaching the foreign markets.

Editor-in-Chief
Prof. Sudipti Banerjea

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Mapping Financial Knowledge in Urban India: A Case Study of Bhavnagar City

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Abstract

An attempt has been made by researcher to study financial literacy and awareness of Bhavnagar city. The research paper is based on primary data. The data have been collected through structured questionnaire. The size of the sample was 251 respondents from Bhavnagar city. Researcher has used statistical tool like Descriptive statistics, Chi-Square test, Correlation and Regression analysis. The result of the research says that age, education qualification, gender, Monthly Household income and type of location are important factors for financial literacy. The result of the Chi-square test shows that there is significance relationship among financial literacy and age, gender, location, qualification and income. The regression analysis shows that predictors like income and location are significant factor for financial literacy. Regression model for financial awareness has also been developed and predictors like age, gender, qualification income and location have been significant for awareness.

Key words: Financial awareness, financial literacy, correlation and multiple regression analysis

Mapping Financial Knowledge in Urban India: A Case Study of Bhavnagar City

Introduction

Finance is an essential part of our daily lives, encompassing both short-term and long-term planning. It includes various components such as budgeting, investing, saving, personal financial management, expense tracking, and financial control. Financial literacy plays a crucial role in helping individuals make informed investment decisions, manage risks effectively and ultimately increase profitability.

With the advancement of digital tools and technologies, managing personal finances has become significantly easier. Today, instant money transfers can be made with just a few clicks and people can invest in shares, debentures, bonds, and government securities with ease. A remarkable observation in India is that even individuals with limited formal education are now using digital payment systems. Small businesses, street vendors, and local sellers are increasingly adopting digital payment platforms such as UPI, mobile wallets, and QR-based systems.

Despite this progress, financial literacy remains a key challenge. Low levels of financial literacy can hinder economic growth and limit individuals' ability to make sound financial decisions. In a fast-developing country like India, improving financial literacy is essential to ensuring inclusive and sustainable development.

This has inspired me to do research on "The Status of Financial Literacy in India." In this study, an attempt has been made to find out how much people in India know about finance, how they manage their money, and what knowledge they might be missing. The purpose of this research is to suggest ways to improve people’s understanding of finance and help them make better money-related decisions in their daily lives.

Bhavnagar City was selected for this study because it presents a diverse socio-economic population with varying levels of access to digital financial services. The city includes urban, semi-urban, and rural respondents, making it an appropriate location to examine the spread of financial literacy and awareness.

Review of literature

1. **Rekha Rani and Meenakshi (2019)** according to research of them they have taken 125 respondents and found out that the world’s 17.5% population is in India out of which about 76% of its adult population does not understand even the basic financial literacy This research reveals that the

knowledge of financial instruments is still very low as per the requirement of the economy and there is a need to take some actions for the improving their literacy level.

2. **Sree Nagalakshmi and Kaviya (2024)** they have find out that financial literacy skill is a vital element just in the discipline to achieve a quality of life as rural household India. It is an effective way of managing money. Each person has their own expenditure, savings, investment, borrowings which is their financial movement.
3. **Sekar M and Gowri M (2015)** they have survey 189 people of Coimbatore City and find out that overall financial literacy level of 50.90% among all respondents. Financial literacy is the mix of one's knowledge, skill and attitude towards financial matters. It helps to make informed decisions and well-being of an individual.
4. **Priyadarshi Dash & Rahul Ranjan (2023)** the research shows that 33 per cent and 29 per cent of the rural and urban population respectively do not have any bank account, credit/debit card and e-wallet. Financial literacy is an important indicator of household welfare, as a means to economic empowerment of people, especially in rural areas. Our study reveals interesting trends with respect to the level of financial literacy and its role in saving and investment patterns.
5. **Swati Sharma 2018** she has found out that the government, banks and many regulatory bodies in India are taking various steps to make people aware about the alternatives available for investment; still more than 50% of our population depends on traditional methods of investment. This leads to the requirement of financial literacy among the citizens of India.
6. **Kartik Tiwari (2023)** the research is based on secondar data the researcher finds out that According to a survey conducted by the National Institute of Securities Markets (NISM), only 24% of Indians are financially literate. Low levels of financial literacy in India can have significant implications for individual and societal well-being. It can lead to poor financial decision-making, such as taking on high-interest loans or investing in fraudulent schemes. This can have long-term consequences, such as falling into debt or losing savings. The government and financial institutions can work together to provide financial education to individuals through schools, community centres, and online resources.
7. **Hridhya.PK and Dr R. Jayaprakash Reddy (2020)** the research shows that financial literacy is very important component for the economy of any country. Improvement in financial literacy will result in improvement in financial inclusion, which in turn result in financial stability of the country. In India all the main regulatory bodies imposed various commendable efforts for the development of financial literacy in the country. Despite of all efforts the level of financial literacy among the individuals in our country is not that satisfactory.

8. **Neha Ramnani Bhargava (2016)** in her research emphasized that India, despite being home to the largest youth population, continues to face alarmingly low levels of financial literacy. The study stresses the importance of financial education as a solution, especially in a financial environment full of complex products. She concludes that effective financial literacy helps individuals make informed decisions, avoid financial traps, and contributes to national economic well-being.
9. **Sobhesh Kumar Agarwalla et al. (2013)** conducted a study among 754 working youth in six Indian cities and found that only 24% of respondents had high financial knowledge. The study also pointed out that gender, income, and family structure significantly influenced financial literacy levels. The findings stressed the importance of integrating financial education into youth programs to prepare them for financial independence.
10. **Srishti Chauhan and Kavita Indapurkar (2017)** examined the state of financial literacy during India's digitalization and demonetization period. Their study revealed that only 25% of urban and 15% of rural respondents were financially literate, highlighting the gender gap and the crucial role of education and income. The paper suggests that financial literacy is essential for financial inclusion, especially with the shift toward digital banking.
11. **Kumari M.S, Harshitha G, and Rakesh Nadig H.S. (2019)** studied the digital financial literacy of street vendors. The research found a lack of awareness and a preference for traditional banking methods among vendors, especially in rural areas. It recommends strengthening awareness campaigns and training to improve digital transaction adoption and financial inclusion.
12. **Rahul Singh Gautam, Dr. Shailesh Rastogi, and Aashi Rawal (2022)** conducted a panel data analysis using secondary data from 29 states and 2 union territories in India for three years (2018–2020). The study found that financial literacy has a significant positive impact on rural development and financial inclusion. It emphasized that the Kisan Credit Card (KCC) scheme is an effective tool in promoting financial literacy and inclusion. The authors suggested that increased financial education and access to banking services can drive rural development in India.
13. **Ayushi Jain (2024)** studied the investment behavior of Indian retail investors and found that financial literacy significantly influences investment preferences, risk perception, and decision-making confidence. The research highlighted that most investors prefer low-risk investment options and rely more on self-research than financial advisors. The study also pointed out a gap in participation in financial literacy workshops and emphasized the need for educational programs to improve informed investing.

Research Gap

Although several studies have examined financial literacy across different regions, there is a lack of micro-level research specific to Bhavnagar city. Additionally, few studies integrate financial awareness with demographic predictors using regression analysis. This study addresses these gaps by focusing on Bhavnagar city and applying correlation and regression tools to identify influencing factors.

Objectives

1. To check the financial literacy level in Bhavnagar City
2. To check the financial awareness level in males and females of Bhavnagar city
3. To study the determinants of financial literacy and financial awareness by using regression model.
4. To give constructive suggestion to make people of Bhavnagar city aware about financial services
5. To give constructive suggestion to increase the level of financial literacy of Bhavnagar city.

Hypotheses

The present study considers the following hypotheses:

1. There is no correlation between the independent variables (namely, Financial Awareness, Age, Education Qualification, Monthly Household Income, Location Type, and Gender) and the dependent variable (financial literacy).
2. There is no significant impact of the independent variables (namely, Financial Awareness, Age, Education Qualification, Monthly Household Income, Location Type, and Gender) on the dependent variable (financial literacy).

Research Methodology

The main aim of this study is to understand the level of financial literacy among people in Bhavnagar city. The researcher has selected Bhavnagar city due to its diverse population, rapid digital adoption, and representation of both urban and semi-urban communities, making it ideal for studying variations in financial literacy and awareness. To collect the required data, a questionnaire has been prepared using Google Forms. This questionnaire was shared with people from different backgrounds and responses were received from 250 individuals. The data collected from these respondents was first organized using Microsoft Excel. After that, IBM SPSS software has been used to do the analysis. The analysis includes both basic and advanced statistical methods.

Firstly, descriptive statisticswere used to understand the basic information about the participants and their level of financial knowledge. Then, to find out if there are any differences in financial literacy based on factors like gender, age, education, and occupation, non-parametric tests were used. Like correlation coefficient, chi-square test was applied to analyse the data.

Data analysis

Table- 1:Frequency Distribution of Age of the respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
18–25	157	62.3	62.3	62.7
26–35	58	23.0	23.0	85.3
36–50	19	7.5	7.5	92.9
Above 50	11	4.4	4.4	97.2
Below 18	7	2.8	2.8	100.0
Total	252	100.0	100.0	

Table 1 shows that most respondents (62.3%) are between the ages of 18–25, and 23% in the 26–35 age group. Very few respondents are above 50 (4.4%) or below 18 (2.8%). This indicates that most participants in the survey are young adults.

Table-2:Frequency Distribution of Gender of the respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Female	88	34.9	34.9	35.3
Male	163	64.7	64.7	100.00
Total	251	100.0	100.0	

Table-2shows that most of the respondents are male (64.7%), while female respondents make up 34.9% of the total.

Table-3: Frequency Distribution of Education Qualification of the respondents				
	Frequency	Percent	Valid Percent	Cumulative Percent
10th Pass	8	3.2	3.2	3.6
12th Pass	31	12.3	12.3	15.9
Below 10th	5	2.0	2.0	17.9
Graduate	124	49.6	49.6	67.5
Post-Graduate or above	83	32.9	32.9	100.0
Total	251	100.0	100.0	

Table-3shows that around 49.6% of the respondents are graduates and 32.9% are post-graduates or above. A smaller group have completed 12th (12.3%) and 10th (3.2%), while only 2.0% have education below 10th. This indicates that most of the participants have a higher level of education.

Table-4: Frequency Distribution of Monthly Household Income of the respondents				
	Frequency	Percent	Valid Percent	Cumulative Percent
₹10,001–₹25,000	93	36.9	36.9	37.3
₹25,001–₹50,000	49	19.8	19.8	57.1
₹50,001–₹1,00,000	30	11.9	11.9	68.7
Above ₹1,00,000	23	9.1	9.1	77.8
Below ₹10,000	56	22.2	22.2	100.0
Total	251	100.0	100.0	

Table-4shows that most respondents (36.9%) have a monthly income between ₹10,001–₹25,000. A smaller portion earns below ₹10,000 (22.2%), while 19.8% earn between ₹25,001–₹50,000. Only 11.9% earn between ₹50,001–₹1,00,000, and 9.1% earn above ₹1,00,000. This indicates that most participants belong to the low to middle-income group.

Table-5: Frequency Distribution of Location Type of the respondents				
	Frequency	Percent	Valid Percent	Cumulative Percent

Rural	64	25.4	25.4	25.8
Semi-urban	29	11.5	11.5	37.3
Urban	158	63.1	63.1	100.0
Total	251	100.0	100.0	

Table-5shows that most of the respondents (63.1%) are from urban areas. About 25.4% belong to rural area and 11.5% are from semi-urban locations. This indicates that most of the participants live in urban settings.

Table-6:Chi-Square Tests for Financial Literacy and Gender

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	113.842[a]	164	.999
Likelihood Ratio	115.127	164	.999
Linear-by-Linear Association	.884	1	.347
N of Valid Cases	251		

It is observed from Table-6 that the Pearson Chi-Square value is 113.842 with a significance level of 0.999, which is much higher than 0.05. This means that there is insignificant relationship between financial literacy and gender.

Table-7:Chi-Square Tests for Financial Awareness and Education Qualification

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	96.026[a]	32	.000
Likelihood Ratio	48.933	32	.028
Linear-by-Linear Association	7.335	1	.007
N of Valid Cases	251		

It is observed from Table-7 that thePearson Chi-Square value is 96.026 with a p-value of 0.000, which is less than 0.05. This indicates that there is a significant relationship betweenfinancial awareness and education qualification.

Table-8:Chi-Square Tests for Financial Literacy and Location Type

	Value	df	Asymptotic Significance (2-sided)

Pearson Chi-Square	232.805a	164	.000
Likelihood Ratio	243.607	164	.000
Linear-by-Linear Association	45.580	1	.000
N of Valid Cases	251		

It is observed from Table-8 that the Pearson Chi-Square value is 232.805 with a p-value of 0.000, which is less than 0.05. This means there is a significant association between Financial Literacy and Location Type.

Table-9:Chi-Square Tests for Financial Awareness and Income

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	**1004.000a**	**16**	**.000**
Likelihood Ratio	**750.172**	**16**	**.000**
N of Valid Cases	**251**		

It is observed from Table-9 that thePearson Chi-Square value is very high at 1004.000 with 16 degrees of freedom and a p-value of 0.000, which is less than 0.05. This means there is a significant association between financial awareness and income.

Table10: Correlations Coefficients

		FL	FA	.Age	Gender	Education Qualification	Monthly Household Income:	Location Type
FL	Pearson Correlation	1	.253**	.009	.059	.097	-.266**	.427**
	Sig. (2-tailed)		.000	.884	.348	.127	.000	.000
	N	251	251	251	251	251	251	251
FA	Pearson Correlation	.253**	1	-.104	.163**	.171**	-.223**	.263**
	Sig. (2-tailed)	.000		.100	.010	.007	.000	.000
	N	251	251	251	251	251	251	251
Age	Pearson Correlation	.009	-.104	1	.174**	-.017	-.008	.092
	Sig. (2-tailed)	.884	.100		.006	.792	.898	.147
	N	251	251	251	251	251	251	251
Gender	Pearson Correlation	.059	.163**	.174**	1	-.038	-.025	.158*

	Sig. (2-tailed)	.348	.010	.006		.545	.691	.012
	N	251	251	251	251	251	251	251
Education Qualification	Pearson Correlation	.097	.171**	-.017	-.038	1	.126*	.135*
	Sig. (2-tailed)	.127	.007	.792	.545		.045	.032
	N	251	251	251	251	251	251	251
Monthly Household Income:	Pearson Correlation	-.266**	-.223**	-.008	-.025	.126*	1	-.124*
	Sig. (2-tailed)	.000	.000	.898	.691	.045		.049
	N	251	251	251	251	251	251	251
Location Type	Pearson Correlation	.427**	.263**	.092	.158*	.135*	-.124*	1
	Sig. (2-tailed)	.000	.000	.147	.012	.032	.049	
	N	251	251	251	251	251	251	251
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

Table 10 helps us understand the relationship between Financial Literacy (FL), Financial Awareness (FA), and various demographic factors such as Age, Gender, Education Qualification, Monthly Household Income and Location Type. According to the data, FL has a significant relationship with Financial Awareness ($r = .253$, $p = .000$) and Location Type ($r = .427$, $p = .000$). It also has a negative significant relationship with Monthly Household Income ($r = –.266$, $p = .000$), which means that as income increases, financial literacy slightly decreases. However, FL does not have a significant relationship with Age, Gender or Education Qualification. Financial Awareness (FA) shows a significant relationship with Gender ($r = .163$, $p = .010$), Education Qualification ($r = .171$, $p = .007$), and Location Type ($r = .263$, $p = .000$). It also has a negative significant relationship with Monthly Household Income ($r = –.223$, $p = .000$), meaning that people with higher income may have slightly lower financial awareness. FA does not have a significant relationship with Age. Age is only significantly related to Gender ($r = .174$, $p = .006$), while Gender has weak but significant relationships with FA and Location Type, and no strong connection with FL. Education Qualification is significantly related to FA, Monthly Income, and Location Type but not to FL. Lastly, Location Type is positively and significantly related to almost all variables, especially FL and FA, which suggests that people from certain areas (like urban locations) may have better financial knowledge and awareness.

To check the impact of demographic factors and financial literacy on financial awareness, a multiple linear regression analysis was conducted as follows:

Table-11:Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.491	.241	.222	.97042	.241	12.886	6	244	.000

Table 11 shows that the R value is 0.491, which means there is a moderate and meaningful connection between financial literacy and the other factors (Location Type, Age, Education Qualification, Monthly Household Income, Gender, and Financial Awareness).The R Square value is 0.241, which means that about 24.1% of the changes in financial literacy can be explained by these factors. The Adjusted R Square is 0.222, which gives a more accurate result when using many variables.The standard error is 0.97042, which tells us how far the actual answers are from the predicted answers, on average. The F-value is 12.886, and the significance value is 0.000, which means the result is statistically significant. So, these factors together have a clear effect on financial literacy.

Table 12: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	72.811	6	12.135	12.886	.000
	Residual	229.777	244	.942		
	Total	302.588	250			
a. Dependent Variable: FL						
b. Predictors: Location Type,Age, EducationQualification,Monthly Household Income,Gender, FA						

With the help of the above ANOVA table, we can understand whether the regression model is statistically significant or not. In this study, financial literacy (FL) is the dependent variable, and the predictors are Location Type, Age, Education Qualification, Monthly Household Income, Gender, and Financial Awareness (FA). The table shows that the F-value is 12.886 with a significance level (p-value) of 0.000, which is less than 0.05. This means that the regression model is statistically significant.The Sum of Squares for Regression is 72.811, the Residual Sum of Squares is 229.777, and the Total Sum of Squares is 302.588. This shows that part of the variation in financial literacy is explained by the independent variables**.**

Table 13:Regression Coefficients

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.

	B	Std. Error	Beta		
FA	.523	.314	.102	1.666	.097
Age	-.009	.063	-.008	-.139	.889
Gender	-.014	.132	-.006	-.104	.917
Education Qualification	.065	.060	.063	1.082	.280
Monthly Household Income:	-.137	.040	-.197	-3.391	.001
Location Type	.467	.075	.367	6.242	.000
a. Dependent Variable: FL					

Table 13 shows whether the relationship between financial literacy (FL) and the independent variables (Location Type, Age, Education Qualification, Monthly Household Income, Gender, and Financial Awareness) is significant or not. According to the Table 13, Location Type and Monthly Household Income have a significant relationship with FL, with p-values of 0.000 and 0.001, which are less than the standard significance level of 0.05.On the other hand, the variables Financial Awareness (0.097), Age (0.889), Gender (0.917), and Education Qualification (0.280) have insignificant relationships with financial literacy, as their p-values are greater than 0.05.

To check the impact of demographic factors and financial awareness on financial literacy, a multiple linear regression analysis was conducted as follows:

Table- 14:Model Summary

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.427	.182	.162	.19686	.182	9.071	6	244	.000
Predictors: FL, Age,Education Qualification, Gender, Monthly Household Income, Location Type									

Table 14 shows that the R value is 0.427, which indicates a moderate relationship between the independent variables (Financial Literacy, Age, Education Qualification, Gender, Monthly Household Income, and Location Type) and the dependent variable.The R Square value is 0.182, meaning that about 18.2% of the variation in the dependent variable can be explained by these factors. The Adjusted R Square is 0.162, which gives a more accurate estimate when multiple predictors are used.The Standard Error of the Estimate is 0.19686, which shows how much the predicted values differ from the actual values on average.The F-value is 9.071, and the significance value (p-value) is 0.000, which is less than 0.05. This means the model is statistically significant, and the group of independent variables has a meaningful effect on the dependent variable

Table- 15:ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.109	6	.352	9.071	.000b
	Residual	9.456	244	.039		
	Total	11.565	250			
Dependent Variable: FA						
Predictors: FL, Age,Education Qualification, Gender, Monthly Household Income, Location Type						

With the help of the above ANOVA Table 15, we can understand whether the regression model is statistically significant or not. In this study, Financial Awareness (FA) is the dependent variable, and the predictors are Financial Literacy (FL), Age, Education Qualification, Gender, Monthly Household Income, and Location Type. The table shows that the F-value is 9.071 with a significance level (p-value) of 0.000, which is less than 0.05. This means that the regression model is statistically significant. The Sum of Squares for Regression is 2.109, the Residual Sum of Squares is 9.456, and the Total Sum of Squares is 11.565. This indicates that a part of the variation in Financial Awareness is explained by the independent variables used in the model.

Table-16: Regression Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.407	.111		3.661	.000
	Age	-.030	.013	-.139	-2.370	.019
	Gender	.073	.026	.164	2.769	.006
	Education Qualification	.035	.012	.173	2.924	.004
	Monthly Household Income:	-.025	.008	-.183	-3.022	.003
	Location Type	.040	.016	.162	2.504	.013
	FL	.022	.013	.110	1.666	.097
a. Dependent Variable: FA						

Table 16 shows whether the relationship between financial awareness (FA) and the independent variables (Age, Gender, Education Qualification, Monthly Household Income, Location Type, and Financial Literacy) is significant or not.

According to the Table 16 Age (p = 0.019), Gender (p = 0.006), Education Qualification (p = 0.004), Monthly Household Income (p = 0.003), and Location Type (p = 0.013) all have significant relationships with Financial Awareness, as their p-values are less than 0.05. This means these factors have a clear and statistically important effect on financial awareness. On the other hand, Financial Literacy (FL) has a p-value of 0.097, which is greater than 0.05, indicating that its relationship with financial awareness is not statistically significant. This analysis shows that demographic variables such as age, gender, education, income, and location type play a more important role in predicting financial awareness than financial literacy in this model.

Conclusion

The main purpose of this study was to understand the level of financial literacy among people and how it is affected by various factors like age, gender, education, income, location type, and financial awareness. The results show that location type and financial awareness have a strong and significant impact on financial literacy. People living in urban areas and those who are more financially aware tend to have higher financial literacy. While monthly income does not have a strong relationship with financial knowledge, which means that even people with high income may lack financial understanding. Also, education and gender have a significant effect on financial awareness, but not directly on financial literacy.

Overall, the study highlights the need to improve financial education, especially in rural areas and among less-educated and low-awareness groups. Financial training should be made available to all sections of society through simple, easy-to-understand programs using local languages and accessible platforms.

Suggestions

The researchers have following suggestion from findings of the study:

1. Location Type has a significant relationship with Financial Literacy (r = .427, p = .000). This shows that people from urban areas are more financially literate. Therefore, financial education efforts should be increased in rural and semi-urban areas through local campaigns, training programs, and awareness drives.

2. Financial Awareness (FA) is significantly related to Financial Literacy (FL) ($r = .253$, $p = .000$). To improve financial literacy, awareness programs should be increased. Government and NGOs can organize social media campaigns, TV/radio advertisements, and local events to educate people and improve their financial knowledge.
3. Gender and Education Qualification significantly influence Financial Awareness ($p = .006$ and $p = .004$). This means that women and people with lower education levels may need more support. Special financial education programs should be designed for these groups to help them understand basic financial concepts.
4. Monthly Household Income has an insignificant relationship with Financial Literacy ($r = –.266$, $p = .000$). This suggests that higher income does not guarantee better financial knowledge. So, financial education should be provided to people from all income groups, not just low-income families.
5. Age is found to have a significant relationship with Financial Literacy. Hence, schools and colleges should include financial education in the curriculum. Students should be taught about savings, budgeting, digital payments, and investment from an early age.
6. Many people lack financial awareness due to language and technical barriers. To overcome this, financial information should be provided in simple words and local languages through mobile apps, short videos, and community radio. This will make it easier for everyone to understand and learn.

Findings

1. There is a significant relationship between Financial Literacy (FL) and the independent variables Location Type and Financial Awareness (FA).
2. Financial Awareness (FA) also has a significant relationship with FL, meaning individuals who are more financially aware tend to be more financially literate.
3. Monthly Household Income shows an insignificant relationship with both FL and FA. This suggests that individuals with higher income are not necessarily more financially literate or aware.
4. Financial Awareness (FA) is significantly influenced by Gender, Education Qualification, and Location Type.
5. Age is only related to Gender and is not directly linked to FL or FA.
6. Location Type also has a significant relationship with Financial Literacy. People from urban areas tend to have higher levels of financial literacy and awareness.

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A Study on the Liquidity and its Impact on the Profitability of Selected Real Estate Companies of India

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Abstract

Profitability and liquidity play a crucial role in the success of a business as they are fundamental aspects that ensure the financial stability and liquidity of the company. When effectively and efficiently managed, they contribute to the overall financial position of the company. The main objective of this research paper is to compare the liquidity and profitability ratings of three selected companies and examine the relationship between them over a specific study period. The three companies chosen for this study are D.B.Reality Ltd, Ansal Properties Ltd., and Peninsula Land Ltd, based on their ranking and data availability. To assess profitability, Return on Total Assets (ROTA) has been utilized as an indicator, while Liquidity management has been evaluated using various variables such as Current Ratio (C.R), Liquid Ratio (LR), Absolute Liquidity Ratio (ALR), and Liquid Assets to Working Capital Ratio (LA-WCR). The collected data has been analyzed using statistical tools including Mean, Co-efficient of Variation, Composite Rank Test, and regression analysis by using SPSS. The findings of the study reveal a significant relationship between ROTA and C.R, LR, and LAWC, while the relationship between ROTA and ALR in the selected Real Estate Company is found to be insignificant.

Key word: Real Estate Company, Profitability Liquidity, Composite Rank

1. Introduction

Real Estate is an important profitable sector of the economy. Generally real estate includes various types of property, land, buildings, air rights above the land, and underground rights below the land. The term refers to real or physical property. From the view point of business, real estate denotes producing, buying and selling property. Real estate is technically land plus any other tangible improvement that might rest upon it or be installed in it. The real estate sector is the second largest employer in India after agriculture and its contribution to employment is very significant. The contribution of the real estate company to the Gross Domestic Product (GDP) has been estimated at around 6.5% to 7% and the sector is expected to generate millions of jobs**.**

Liquidity analysis indicate company's ability and to pay its current liabilities. Therefore, adequate liquidity is important to take any decision in each aspect, that is, the survival of a company. Generally, liquidity is analyzed by taking into account the purpose and period. Profitability is a measure of overall company's efficiency in achieving the set-out objectives. Measurement of profitability is needed for taking various decisions at normal as well as crucial times of a company. There are number of measures of profitability, all of which cannot be employed in each case. Only one ratio is used that is Return on investment. But the profitability and liquidity is interdependent of each other to take any decision.

2. Review of Literature

For the construction of this study, the following literatures are reviewed:

Lifland, S. (2011), this study explores the impact of individual and net working capital efficiencies on a company's enterprise value (EV) within the energy sector. Significant negative associations between net working capital efficiencies and EV are identified for large and mid-cap firms. The findings emphasize the crucial role of efficient inventory turnover, trade receivables collection, and trade creditor servicing in influencing acquisition costs for investor-acquirers.

Joshi, L. K., & Ghosh, S. (2012), the paper titled "Working capital management of CIPLA Limited: an empirical study" examines the working capital management of CIPLA CO Ltd by analyzing data from their annual report. The study uses different methods like Motaals test, Spearman's Rank Correlation, and Factor Analysis. The findings show a notable positive trend in most performance indicators, indicating satisfactory performance.

Babalola, Y. A. (2013)., this study examined how the size of manufacturing companies listed on the Nigerian Stock Exchange affects their profitability from 2000 to 2009. Profitability was measured using Return on Assets and firm size, represented by total assets and total sales. The study found that larger firms, in terms of both total assets and total sales; tend to be more profitable in Nigeria's manufacturing sector.

William,M (2014), in his paper,'A study on Short-term and Long-term solvency of Nestle Private Ltd'. analyses the short term solvency of the Company for a period of four years from 2012 to 2014. The data is collected on the annual report of Nestle Pvt Ltd Company. The two ratios are used in the project that is short term solvency ratio and long term solvency ratio.

Ram, M. R. (2017), aims to analyze the liquidity and short-term solvency of specific Indian pharmaceutical companies from 2007-08 to 2016-17. Four companies were chosen based on their total capitalization. The results of the study reveal that all the companies studied do not have enough cash reserves.

Azhar, K. A., & Ahmed, N. (2019), examine the connection between the size of companies and their profitability in the textile sector of Pakistan. The study uses statistical techniques like regression and correlation analysis. The findings show that there is no correlation between the size of a company and its profitability. However, there is a notable negative relationship between the total assets of a company and its profitability.

3. Objectives of the Study

The following are the basic objectives of the study area:

- To evaluate the comparative liquidity scores as against the selected Real Estate Companies.
- To analysis the comparative profitability scores as against the selected Real Estate Companies.
- To examine the impact of profitability on the liquidity of selected companies during the study period.

4. Research Methodology

This research paper uses empirical methods and a secondary approach to analyze data from three companies with the highest stock prices and data availability: D.B.Reality Ltd, Ansal Properties Ltd., and Peninsula Land Ltd. Data from 2011-2023 was collected from various sources, including books, journals, and annual reports. The analysis includes measures of profitability and liquidity, such as Return on Asset, Current Ratio, and Liquid Ratio. The researcher uses simple regression analysis to measure the relationship between independent and dependent variables. The ratios used in the study are shortly prescribed as:

4.1 Current Ratio:

The Current Ratio is a commonly used indicator of a company's ability to meet its short-term financial obligations. It is calculated by dividing current assets by current liabilities. A higher ratio indicates that the company has more current assets available to cover each rupee of current liabilities, suggesting a stronger ability to meet short-term obligations.

$$\text{Current Ratio} = \frac{Current\ Asset}{Current\ Liabilities}$$

4.2 Liquid Ratio

The Liquid Ratio (L.R) is a more effective measure of a company's liquidity compared to other tests. It is used to assess the company's ability to meet its current liabilities promptly. However, inventories and prepaid expenses may not be easily converted into cash and cash equivalents. Typically, a liquid ratio of 1:1 is seen as the optimal ratio, with a higher ratio being preferable.

$$\text{Liquid Ratio} = \frac{Current\ Asset - Inventory - Prepaid\ expenses}{Current\ Liabilities - Bankoverdraft}$$

4.3 Absolute Liquid Ratio

Absolute Liquid Ratio, also known as the Super Quick Ratio, is a more strict measure of a company's ability to pay off short-term debts. It only considers cash, bank balances, and marketable securities as current assets, and quick liabilities are calculated by subtracting bank overdraft from current liabilities. The standard ratio is typically accepted as 0.5:1.

$$\text{Absolute Liquid Ratio} = \frac{Cash + Bank + Marketable\ Securities}{Current\ Liabilities - Bank\ overdraft}$$

4.4 Liquid Asset to Working Capital Ratio

This ratio which is also known as the Operating Cash Working Capital Ratio, measures a company's ability to cover its operating expenses using quick assets. This ratio provides insight into a company's liquidity by focusing on its ability to meet daily expenses.

$$\text{Liquid Asset to Working capital ratio} = \frac{\text{Liquid Assets}}{\text{Working Capital}}$$

For investigating the significant impact of different liquidity measures on profitability (ROTA) for selected Indian Real Estate Companies four hypotheses have been tested using simple regression models. Each regression analysis involves fitting a model with ROTA as the dependent variable and liquidity measure (current ratio, liquid ratio, absolute liquid ratio, or liquid asset to working capital ratio) as the independent variable.

H_0: There is no significant impact of liquidity on profitability of the selected Indian Real Estate Companies.

Liquidity and profitability as measured by ROTA

$H_{01\text{-}1}$: Current Ratio has no significant impact on the ROTA

$H_{01\text{-}2}$: Liquid Ratio has no significant impact on the ROTA

$H_{01\text{-}3}$: Absolute Liquid Ratio has no significant impact on the ROTA

$H_{01\text{-}4}$: Liquid Asset to Working Capital Ratio has no significant impact on the ROTA

5. Data Analysis

Data analysis involves examining and interpreting data to gain insights and make informed decisions. The study examines the relationship between short-term liquidity and profitability in selected Indian real estate companies. Liquidity ratios, such as the Current Ratio (CR), Liquid Ratio (LR), Absolute Liquid Ratio (ALR), and Liquid Asset to Working Capital Ratio (LA-WC), were analyzed to determine their impact on Return on Total Assets (ROTA). The goal is to understand how effectively these companies manage liquidity and how it influences their financial performance. The analysis is shown in different tables considering various parameters used as indicators.

Table-1: Current Ratio of Selected Real Estate Companies

	Current Ratio		
Year	D.B.Reality Ltd	Ansal Properties Ltd	Peninsula Land Ltd
2011-2012	12.107	1.267	2.352

2012-2013	5.506	1.185	2.782
2013-2014	2.753	1.219	2.371
2014-2015	1.663	1.254	2.478
2015-2016	2.206	1.238	2.755
2016-2017	2.359	1.292	2.406
2017-2018	2.363	1.234	2.08
2018-2019	1.324	0.905	1.613
2019-2020	1.211	0.869	0.634
2020-2021	1.368	0.855	0.79
2021-2022	1.665	0.838	0.796
2022-2023	1.916	0.798	0.836
Average	3.037	1.080	1.824
Standard Deviation	3.077	0.203	0.840
Coefficient of Variation	101.31%	18.80%	46.02%

The current ratio analysis from 2011 to 2023 for three real estate companies shows distinct liquidity profiles in table-1. D.B. Realty Ltd has the highest average current ratio (3.037) but also the most variability (Coefficient of Variation of 101.31%), indicating inconsistent liquidity levels. Ansal Properties Ltd exhibits the lowest average current ratio (1.080) and the least variability (18.80%), suggesting stable and consistent liquidity. Peninsula Land Ltd has a moderate average current ratio (1.824) with moderate variability (46.02%), reflecting a balance between stability and fluctuations in liquidity. This analysis highlights the differing financial stability and risk profiles of the companies.

Table-2: Liquid Ratio of Selected Real Estate Companies

	Liquid Ratio		
Year	D.B.Reality Ltd	Ansal Properties Ltd	Peninsula Land Ltd
2011-2012	10.088	0.513	1.106
2012-2013	4.42	0.481	1.014
2013-2014	2.043	0.495	0.934
2014-2015	1.169	0.509	0.697
2015-2016	1.68	0.535	0.454
2016-2017	1.908	0.59	0.383
2017-2018	1.82	0.569	0.266
2018-2019	1.023	0.199	0.155
2019-2020	0.966	0.157	0.174
2020-2021	1.136	0.187	0.219
2021-2022	1.409	0.218	0.206
2022-2023	1.647	0.249	0.344
Average	2.442	0.392	0.496

Standard Deviation	2.576	0.171	0.350
Coefficient of Variation	105.47%	43.73%	70.47%

The table-2 presents the Liquid Ratio of three selected real estate companies: D.B. Realty Ltd, Ansal Properties Ltd, and Peninsula Land Ltd, over a given period. The Liquid Ratio measures a company's ability to cover its short-term liabilities with its most liquid assets. D.B. Realty Ltd has the highest average Liquid Ratio at 2.442, indicating stronger liquidity compared to the other two companies. However, its high Standard Deviation (2.576) and Coefficient of Variation (105.47%) suggest significant volatility and inconsistency in liquidity management.

In contrast, Ansal Properties Ltd shows the lowest average Liquid Ratio (0.392), implying weaker liquidity, but with a more stable performance, as evidenced by its lower Standard Deviation (0.171) and Coefficient of Variation (43.73%). Peninsula Land Ltd falls in between with a moderate average Liquid Ratio (0.496) and a Coefficient of Variation of 70.47%, indicating moderate liquidity and consistency. Overall, D.B. Realty exhibits high liquidity but with instability, while Ansal Properties maintains more consistent, albeit lower, liquidity.

Table-3: Absolute Liquid Ratio of Selected Real Estate Companies

	Absolute Liquid Ratio		
Year	D.B.Reality Ltd	Ansal Properties Ltd	Peninsula Land Ltd
2011-2012	0.078	0.016	0.425
2012-2013	0.037	0.013	0.360
2013-2014	0.044	0.015	0.302
2014-2015	0.004	0.015	0.240
2015-2016	0.018	0.007	0.104
2016-2017	0.010	0.006	0.095
2017-2018	0.013	0.004	0.050
2018-2019	0.002	0.003	0.036
2019-2020	0.232	0.137	0.168
2020-2021	0.231	0.150	0.213
2021-2022	0.177	0.181	0.202
2022-2023	0.089	0.187	0.332
Average	0.078	0.061	0.211
Standard Deviation	0.087	0.077	0.126
Coefficient of Variation	112.07%	125.75%	59.92%

The table displays the Absolute Liquid Ratio of the three real estate companies. Peninsula Land Ltd has the highest average Absolute Liquid Ratio (0.211), suggesting it maintains a relatively better position in covering its short-term liabilities with its most liquid assets. However, D.B. Realty Ltd (0.078) and Ansal Properties Ltd

(0.061) have much lower ratios, indicating weaker liquidity. Both D.B. Realty and Ansal Properties also exhibit high volatility, as shown by their high Coefficients of Variation (112.07% and 125.75%, respectively), implying inconsistent liquidity management. Peninsula Land Ltd, with a Coefficient of Variation of 59.92%, demonstrates more stability.

Table-4: Liquid Asset to Working Capital Ratio of Selected Real Estate Companies

	Liquid Asset to Working Capital Ratio		
Year	D.B.Reality Ltd	Ansal Properties Ltd	Peninsula Land Ltd
2011-2012	0.908	1.921	0.818
2012-2013	0.981	2.599	0.569
2013-2014	1.935	2.261	0.681
2014-2015	1.763	2.003	0.471
2015-2016	1.393	2.252	0.259
2016-2017	1.987	2.020	0.272
2017-2018	1.335	2.434	0.246
2018-2019	3.159	2.105	0.253
2019-2020	4.570	1.199	0.477
2020-2021	3.083	1.290	1.043
2021-2022	2.119	1.344	1.008
2022-2023	1.789	1.231	2.099
Average	2.085	1.888	0.683
Standard Deviation	1.053	0.497	0.529
Coefficient of Variation	50.491	26.302	77.525

The table shows the Liquid Asset to Working Capital Ratio for D.B. Realty Ltd, Ansal Properties Ltd, and Peninsula Land Ltd, which reflects each company's ability to cover its working capital needs with liquid assets in table-4. D.B. Realty Ltd has the highest average ratio (2.085), indicating a strong liquidity position, though with moderate variability, as shown by a Coefficient of Variation (50.491). Ansal Properties Ltd has a slightly lower average ratio of 1.888, with more consistent performance, evidenced by its lower Coefficient of Variation (26.302). Peninsula Land Ltd shows the weakest liquidity position with an average ratio (0.683) and the highest variability (Coefficient of Variation of 77.525), suggesting less reliable liquidity management and greater financial instability.

Table-5: Ranking in Respect of Liquidity of the Real Estate Companies

Liquidity Measure	D.B.Reality Ltd		Ansal Properties Ltd		Peninsula Land Ltd	
	Mean	Ranking as	Mean	Ranking as	Mean	Ranking as

		per mean		mean		per mean
CR	3.037	1	1.080	3	1.824	2
LR	2.442	1	0.392	3	0.496	2
ALR	0.078	2	0.061	3	0.211	1
LA-WC	2.085	1	1.888	2	0.683	3
Total(A)		5		11		8
Combined Score as per average						
	C.V (%)	Ranking as per C.V	C.V. (%)	Ranking as per C.V	C.V.(%)	Ranking as per C.V.
CR	101.31	3	18.80	1	46.02	2
LR	105.47	3	43.73	1	70.47	2
ALR	112.07	2	125.75	3	59.92	1
LA-WC	50.49	2	26.30	1	77.52	3
Total(B)		10		6		8
Combined Score as per consistency						
Grand Total(A+B)		15		17		16
Ultimate Rank		1		3		2

The table evaluates and ranks three real estate companies—D.B. Realty Ltd, Ansal Properties Ltd, and Peninsula Land Ltd—based on their liquidity through measures such as the Current Ratio (CR), Liquid Ratio (LR), Absolute Liquid Ratio (ALR), and Liquid Asset to Working Capital Ratio (LA-WC). D.B. Realty Ltd secures the top rank with a total score of 15, reflecting strong liquidity across most metrics, particularly in CR, LR, and LA-WC. Despite moderate consistency (based on Coefficient of Variation rankings), its superior liquidity positions it as the leader. Peninsula Land Ltd ranks second with a score of 16, performing well in ALR and showing moderate consistency, but its weaker LA-WC ratio affects its overall ranking. Ansal Properties Ltd ranks third with a score of 17, demonstrating the most consistent performance but generally weaker liquidity. The ultimate ranking highlights D.B. Realty's strong liquidity, while Peninsula Land and Ansal Properties follow due to lower liquidity and consistency.

Table-6: Return on Total Asset of Selected Real Estate Companies

	Return on Total Asset		
Year	D.B.Reality Ltd	Ansal Properties Ltd	Peninsula Land Ltd
2011-2012	0.0216	0.0080	0.0590

2012-2013	0.0001	0.0094	0.0700
2013-2014	-0.0130	0.0027	0.0180
2014-2015	-0.0076	0.0044	-0.0020
2015-2016	0.0170	0.0056	0.0050
2016-2017	0.0011	0.0018	-0.0350
2017-2018	-0.0235	-0.0082	-0.0720
2018-2019	-0.0368	-0.0112	-0.1770
2019-2020	-0.0410	-0.0350	-0.1860
2020-2021	0.0240	-0.0040	-0.0410
2021-2022	-0.0180	-0.0020	-0.0470
2022-2023	0.0080	-0.0770	0.0420
Average	-0.006	-0.009	-0.031
Standard Deviation	0.022	0.025	0.083
Coefficient of Variation	-381.22	-279.72	-271.73

Table-6 shows the Return on Total Assets (ROTA) for three real estate companies, showing negative averages: D.B. Realty Ltd (-0.006), Ansal Properties Ltd (-0.009), and Peninsula Land Ltd (-0.031). This indicates that, on average, these companies did not generate positive returns from their assets. Peninsula Land Ltd's higher standard deviation (0.083) reflects greater volatility in returns compared to D.B. Realty Ltd (0.022) and Ansal Properties Ltd (0.025). The negative and high Coefficient of Variation values for all three companies—D.B. Realty Ltd (-381.224), Ansal Properties Ltd (-279.727), and Peninsula Land Ltd (-271.736)—suggest significant risk relative to their average returns, highlighting poor financial performance and instability in asset utilization.

5.1: Analysis the Impact of Liquidity on Profitability

The cross sectional data which includes the mean liquidity and profitability ratio and ordinary least square regression methods have been deployed to examine the relationship between liquidity and profitability. The hypothesis so adopted as stated in the methodology can be analyzed as:

5.1.1: Association between ROTA and CR

Table-7: Impact of Variation of ROTA on CR

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.652[a]	.425	.367	.085443

a. Predictors: (Constant), CR

Source: Prepared by the Researcher based on Data Analysis

The study explores the liquidity represents by the current ratio (C.R) that affects profitability (ROTA) in chosen real estate firms. The analysis shows a substantial correlation (R = 0.696), with liquidity explaining 42.5% (R-squared) of profitability variance. The adjusted R-squared (0.367) accounts for predictor count, while the standard error (0.85443) gauges model accuracy (table-6).

Table-8: Predicting ROTA using CR

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	.054	1	.054	7.391	.022b
Residual	.073	10	.007		
Total	.127	11			

Source: Prepared by the Researcher

a. Dependent Variable: ROTA
b. Predictors: (Constant), CR

This study examines the relationship between liquidity and profitability in real estate companies. The analysis suggests a weak connection between the two variables, with the current ratio representing liquidity. The results indicate limited predictability of profitability based on liquidity. Additional analysis is necessary to fully understand the impact of liquidity on profitability in this specific context.

Table-9: Impact of CR on ROTA

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.160	.049		-3.269	.008
CR	.058	.021	.652	2.719	.022

a. Dependent Variable: ROTA ***Source: Prepared by the Researcher***

Table-9 demonstrates a notable impact of liquidity, as measured by the current ratio (C.R), on profitability (ROTA) for real estate companies. The coefficient of 0.652 and the t-statistic of 2.373, with a corresponding p-value of 0.022, suggest a significant positive relationship. This indicates that an increase in liquidity tends to coincide with higher profitability. The equation representing the impact of liquidity (C.R) on profitability (ROTA) is: ROTA = -0.160 + 0.058(C.R). + E. The coefficient for C.R is 0.058 with a significance level of 0.022.

Finally, it is concluded that increased liquidity, reflected by higher current ratios, tends to positively influence profitability among real estate companies, as indicated by the analysis.

5.1.2 Association between ROTA and LR

Table-10: Impact of Variation of ROTA on LR

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.737[a]	.544	.468	.142456676

a. Predictors: (Constant), LR

Source: Prepared by the Researcher

Table-10 indicates a substantial impact of liquid

kdity, represented by the liquidity ratio (L.R), on profitability (ROTA) among selected real estate companies. The high R-squared value of 0.544 suggests that approximately 54.4% of the variation in profitability can be attributed to changes in liquidity, indicating a strong relationship between the two variables.

Table-11: Predicting ROTA using LR

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	.050	1	.050	6.413	.030[b]
Residual	.077	10	.008		
Total	.127	11			

a. Dependent Variable: ROTA

Source: Prepared by the Researcher

b. b. Predictors: (Constant), LR

Table-11 suggests that liquidity (L.R) can predict profitability (ROTA) in real estate companies. The regression model's significant F-statistic (6.413) at a significance level of 0.030 indicates that changes in liquidity are associated with variations in profitability. Therefore, liquidity appears to be a relevant predictor of profitability for these companies.

Table-12: Impact of LR on ROTA

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

(Constant)	-.122	.040		-3.081	.012
LR	.069	.027	.625	2.532	.030

a. Dependent Variable: ROTA **Source: Prepared by the Researcher**

Table-12 demonstrates that liquidity (L.R) has a significant positive impact on profitability (ROTA) in real estate companies. The coefficient of 0.625 and the t-statistic of 2.532 with a corresponding p-value of 0.030 indicate that changes in liquidity positively influence profitability. By analyzing the regression output the final regression results are presented below:

ROTA = -0.122 + 0.069(L.R), where ROTA represents profitability and L.R represents liquidity.

The regression analysis shows that there is a significant relationship between liquidity and profitability in real estate companies. Companies with higher liquidity ratios tend to have higher profitability, emphasizing the importance of having enough liquidity for financial success.

5.1.3: Association between ROTA and ALR

Table-13: Impact of Variation of ROTA on ALR

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.511[a]	.261	.138	.181289013

a. Predictors: (Constant), ALR ***Source: Developed by the Researcher***

Table-13 indicates that the study investigates the relationship between profitability (ROTA) and liquidity (A.L.R) in real estate companies. The model shows a low correlation, with an R-squared value of 0.261, suggesting that approximately .26.1% of the variation in profitability can be explained by changes in liquidity.

Table-14: Predicting ROTA using ALR

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	.004	1	.004	.312	.589[b]
Residual	.123	10	.012		
Total	.127	11			

a. Dependent Variable: ROTA **Source: Prepared by the Researcher**

b. Predictors: (Constant), ALR

Table-14 presents a regression model is aiming to predict profitability (ROTA) based on liquidity (A.L.R) in real estate firms. The analysis suggests a non-significant prediction, with a regression sum of squares of 0.004 and an F-statistic of .312, yielding a p-value of 0.589. Thus, liquidity measured by A.L.R may not reliably predict variations in profitability for these companies.

Table-15: Impact of ALR on ROTA

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.075	.062		-1.203	.257
ALR	.256	.458	.174	.559	.589

a. Dependent Variable: ROTA **_Source: Developed by the Researcher_**

The regression analysis indicates a positive correlation between liquidity and profitability in real estate companies, but the effect may not be statistically significant, indicating inconsistent profitability effects.
Finally, it is concluded that there may be a connection between liquidity and profitability in real estate companies, but the impact is not statistically significant, indicating that the effects on profitability are inconsistent.

5.1.4: Association between ROTA and LAWC

Table-16: Impact of Variation of ROTA on LAWC

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.751[a]	.564	.521	.074389

a. Predictors: (Constant), LAWC **_Source: Prepared by the Researcher_**

Table-16 illustrates a regression analysis investigating the association between profitability (ROTA) and liquidity (LAWC) in chosen real estate firms. With an R-squared value of 0.564, approximately 56.4% of the variability in profitability can be explained by changes in liquidity. This suggests a strong relationship between ROTA and LAWC for the selected companies.

Table-17: Predicting ROTA using LAWC

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	.072	1	.072	12.943	.005[b]
Residual	.055	10	.006		

Total	.127	11			

a. Dependent Variable: ROTA **Source: Developed by the Researcher**

b. b. Predictors: (Constant), LAWC

Table-17 presents a regression model predicting profitability (ROTA) based on liquidity (LAWC) for real estate companies. The significant F-statistic of 12.943 with a p-value of 0.005 suggests that changes in liquidity reliably predict variations in profitability. This indicates the importance of liquidity in determining ROTA for these companies.

Table-18: Impact of LAWC on ROTA

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.436	.135		3.219	.009
LAWC	-.310	.086	-.751	-3.598	.005

a. Dependent Variable: ROTA ***Source: Prepared by the Researcher***

It demonstrates that liquidity (LAWC) significantly influences profitability (ROTA) in real estate companies in table-17. The coefficient for LAWC is -3.10 with a standard error of 0.002, yielding a Beta coefficient of -.751 and a t-statistic of -3.598. This indicates that changes in liquidity have a substantial impact on ROTA. The intercept is also significant (p = 0.009), further affirming the model's validity in explaining variations in ROTA through changes in liquidity. ROTA = 0.436 - 0.310(LAWC) + E, where ROTA represents profitability and LAWC represents Liquidity for Real Estate Companies. This regression analysis underscores the significant impact of liquidity (LAWC) on profitability (ROTA) in real estate firms.

6. Findings:

The following important findings are considered:

1. D.B. Realty Ltd had the highest (3.037), indicating strong liquidity but with high variability (Coefficient of Variation: 101.31%). Ansal Properties Ltd showed the lowest average CR (1.080) with the least variability (18.80%). D.B. Realty's liquidity has been inconsistent over the years, while Ansal Properties Ltd exhibited more stability but at lower liquidity levels.
2. D.B. Realty Ltd led with 2.442, followed by Peninsula Land Ltd (0.496) and Ansal Properties Ltd (0.392). D.B. Realty had high variability (Coefficient of Variation: 105.47%). While D.B. Realty maintained high liquidity, it showed considerable volatility, indicating fluctuating financial management.

3. Peninsula Land Ltd had the highest (0.211), suggesting better short-term financial health compared to D.B. Realty Ltd (0.078) and Ansal Properties Ltd (0.061). The ratios for all companies were low, reflecting challenges in maintaining high levels of absolute liquid assets.
4. D.B. Realty Ltd again led with 2.085, indicating strong coverage of working capital requirements, followed by Ansal Properties Ltd (1.888) and Peninsula Land Ltd (0.683). D.B. Realty's high average suggests good liquidity for operational needs, though with moderate variability (Coefficient of Variation: 50.49%).
5. The analysis ranks the companies based on their liquidity profiles: D.B. Realty Ltd: Ranked 1st overall due to strong liquidity across most metrics, despite variability. Peninsula Land Ltd: Ranked 2nd with moderate liquidity and consistency. Ansal Properties Ltd: Ranked 3rd, with consistent but lower liquidity.
6. All three companies exhibited negative average ROTA, indicating they struggled to generate returns on their assets. Peninsula Land Ltd had the lowest average ROTA (-0.031) and the highest variability, suggesting the highest financial risk.
7. A significant positive relationship was found between CR and ROTA. Higher CRs, indicating better liquidity, tended to enhance profitability. The regression analysis (R = 0.652, R-squared = 0.425) confirms that CR accounts for 42.5% of profitability variance. A stronger correlation was observed (R = 0.737, R-squared = 0.544), indicating that LR explains 54.4% of the variance in profitability, underscoring its importance in financial performance.

7. Conclusion

The analysis reveals significant insights into the liquidity and financial health of three real estate companies: D.B. Realty Ltd, Peninsula Land Ltd, and Ansal Properties Ltd. D.B. Realty Ltd consistently exhibited the strongest liquidity but with high variability, indicating fluctuating financial management. In contrast, Ansal Properties Ltd demonstrated the lowest liquidity but with greater stability. Despite their liquidity, all three companies struggled to generate positive returns on their assets, with Peninsula Land Ltd facing the highest financial risk. The study highlights a positive correlation between liquidity ratios (CR and LR) and profitability, suggesting that higher liquidity levels enhance profitability. Notably, CR accounted for 42.5% and LR for 54.4% of the variance in profitability. The rankings place D.B. Realty Ltd at the top, followed by Peninsula Land Ltd, and Ansal Properties Ltd, reflecting their overall liquidity and financial performance.

Based on the findings, D.B. Realty Ltd should work on stabilizing its liquidity to manage variability while leveraging its strong liquidity position to improve returns. Peninsula Land Ltd needs to enhance its liquidity and profitability management to reduce financial risk. Ansal Properties Ltd should focus on improving its liquidity levels, even though it demonstrates stability, to better compete in the market. All companies should consider strategies to improve asset returns, as indicated by the negative ROTA. Enhancing liquidity is crucial, as higher liquidity correlates positively with profitability, so targeted financial management and operational efficiency improvements are recommended to bolster financial performance and stability.

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Role of Trade Fairs in Empowering Womenpreneurs of West Bengal: A Case Study of Saras Mela

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Role of trade fairs in empowering womenpreneurs of West Bengal: A case study of Saras Mela

Abstract

Purpose – This study investigates the role of Saras Mela, a government-sponsored trade fair in West Bengal, in fostering women's entrepreneurship and socio-economic empowerment. Design/methodology/approach – An exploratory qualitative methodology was employed using in-depth interviews and non-participant observation. Primary data were collected from five selected women entrepreneurs and key officials. Thematic analysis was conducted using MAXQDA software. Findings – Saras Mela serves as a pivotal platform for rural womenpreneurs by providing market access, government support, and financial incentives. Participants noted improved income, confidence, and social standing. However, gaps were observed in training related to marketing and product promotion. Originality/value – This study contributes to the limited literature on trade fairs as instruments of women's empowerment in India, offering policy insights for inclusive rural development.

1. Introduction:

A trade fair (called a *Mela* in vernacular language) is a basic element of the marketing mix which happens to be an important promotional event to reach a huge target market at one go (Datta and Sarkar, 2020). The main purpose of trade shows is to provide attendees and companies with a wide range of opportunities to engage and interact with each other. The exhibitions offer buyers a natural and almost ideal platform to offer marketing solutions. Trade shows and exhibitions ranked second only to advertising as a marketing communication tool for each organization. Therefore, trade fairs and exhibitions have now become an important part of the marketing campaigns of business organizations.

Trade fairs are among the most effective platforms for businesses to showcase their products. Various agencies organise such events to help entrepreneurs directly reach out to their prospective customers (B2B and B2C) by allowing them to display their wares. Saras Mela is one such trade fair organised under the patronage of the Government of West Bengal. This paper explores the role played by this trade fair, namely, Saras Mela in empowering the womenpreneurs with their economic upliftment and socio-cultural dominance in West Bengal.

The Saras Mela, during the period of this study, took place in Newtown Mela Ground of Kolkata. *The Paschim Banga Panchayat and Gramme Unnayan Department* which falls under the purview of *West Bengal Panchayat and Rural Development Department*, which works in various districts of Kolkata to uplift rural people and encourage local artisans to enter the mainstream market and compete with other vendors on an equal footing, happens to be the host of this fair. The *West Bengal State Rural Livelihood Mission (WBSRLM*), known as Anandadhara oversees the whole operation of this mela. This fair connects the rural artists and urban consumers, promoting their wares and preserving other forms of fading art and craft. Further, it assists these craftsmen in selling their handmade goods, and also the native culture, including its music, dancing, and traditions, achieves popularity and thus get preserved. Keeping pace with changes in technology, Memorandums of Understanding have been signed with different e-commerce platforms, which happen to be a recent development. This would help improve the connection of the craftsmen, who can now sell their goods both offline and online. This would enable the craftsmen to contact many others who might not be physically able to attend the Mela. This would also make the participating entrepreneurs capable of reaching the foreign markets. Usually, the number of participants in this fair range around 250 registered stalls, with participants coming from different Indian states like Assam, Rajasthan, Chhattisgarh, Jharkhandetc. along with those from the host state of West Bengal. A unique feature of this fair happens to be a food court having stalls from each district offering the distinctive cuisines and delectable specialties unique to the district concerned.

This fair serves as a platform for connecting rural people to the outside world and building connections with a bigger market, all district self-help organisations are urged to participate. Both the clients and the craftspeople would profit from this. Customers will have a new platform where they can browse a variety of artworks.

2. Review of Literature:

A literature review is an important section of any academic study where a researcher reports scientific studies related to a specific discipline incorporating the articulation of existing theories in the discipline. In it the researcher tries to extend domain of knowledge by reporting the findings where theories are tested, examined, and/ or restated (Mishra, 2015, p. 801). It is more than a summary of the sources; it has an organizational pattern that combines both summary and synthesis. While a summary is a recap of the important information of the sources, a synthesis happens to be a re-organization, or a reshuffling, of that information.

Besides enlarging knowledge about the topic, writing a literature review demonstrates skills in two areas:

1. *Information seeking*: the ability to scan the literature efficiently, using manual or computerized methods, to identify a set of useful articles and books
2. *Critical appraisal*: the ability to apply principles of analysis to identify unbiased and valid studies.

The studies have been prepared to confer with the maximum possible literature on the subject and which was directly or indirectly concerned to the women entrepreneurship:

- Shingla and Singh (2015) in their book "Women empowerment through entrepreneurship development" acknowledge the impact of entrepreneurship development on women's status. The study area was the Vaishali district of Bihar. They found that there was a substantial improvement in the overall status of women in their families.
- Suba and Sneka (2016) in their paper, titled "Women entrepreneurship in India", focuses on women's capabilities because they had more professional degrees to cope up with the market need. They tried to explore whether women can come out of the stereotype mindset and they can develop their creativity amidst this dynamic world. The authors found that most of the wo……men faced a common problem,

which was non-cooperation from her husband and close family members. Finally, they concluded that if women got positive support from family, society, and government they can make a better future for our nation's economy.

- Bhuyan (2016) in his study titled," A Study on the Performance of Micro, Small and Medium Enterprises (MSMEs) in India". He has found that MSMEs are an important contributor to the GDP of a country like India. He has also discussed they are important facilitators of employment generation in a country.
- Smith et al. (2017) tried to explore, through their work," Trade Fairs and Economic Empowerment of Women Entrepreneurs" which Studies have shown that women entrepreneurs are increasingly participating in trade fairs, contributing to economic growth and innovation.
- Hazarika and Goswami (2018) conducted a study on "Micro-entrepreneurship Development in the Handloom Industry: An Empirical Analysis among the Tribal Women in Assam" that women entrepreneurship got importance all over the world for the development issue of women. They observed the Government of India tried to give attention to the better education of women, inequality of women, and empowerment of women. This study tried to identify those factors which affect tribal women to own a handloom micro-enterprise. The authors found that those women are risk-taker. They concluded that weaving is a part of their tradition and they enriched this handloom culture.
- Singh and Kumar (2018) in their work focused on "Handloom Entrepreneurship & Government Intervention- A Case Study of Varanasi" the working model of entrepreneurs in the handloom sector of Varanasi. The author observed that the handloom business became their family business but lack of management skills and entrepreneurial ability they cannot achieve their proper place. The main objective of this paper was to highlight the functioning and relevance of master waves and their roles in the value chain of handloom weaving. Finally, the author found that they changed their trends and

they had started kept their records in ledger books mostly they started to participate in various exhibitions also.

- Senapati and Ojha (2019) in their work titled "Socio-economic Empowerment of Women through Micro-entrepreneurship: Evidence from Odisha, India" observed that micro, small and medium enterprises (MSME) play a crucial role in those countries that can contribute to women empowerment providing them employment opportunities. They have explored that finance is the key challenge in start-ups and marketing strategies are required.
- Das and Guha (2019) conducted a study titled "Measuring Women's Self-Help Group Sustainability: A Study of Rural Assam" that the self-help group-bank linkage program is now a major global microfinance program in India. These financial institutions help income-generating activities in rural Assam.
- Johnson et al. (2021)in their study entitled," Skill Development Through Trade Fair Participation: Implications for Women's Empowerment" explore trade fairs often require participants to enhance their presentation, negotiation, and marketing skills. These opportunities for skill development can have a spill-over effect into other aspects of women's lives, boosting their confidence and overall capabilities

3. Objectives of the Study:
This study makes an effort to attain the following objectives:

- To identify the support provided by the fair organising authorities of Saras Mela to the participating womenpreneurs;
- To explore the role played by Saras Mela in empowering the womenpreneurs.

4. Research Methodology

Nature of the Study:

The present research study is an exploratory study which is based on a particular trade fair sponsored by the Government of West Bengal, namely the Saras Mela held in the city of Kolkata. Further, it is by nature a survey-based study.

Nature of Data:

This study is based on primary data which have been collected from select womenpreneurs participating in Saras mela. The data collection was done through the form of personal observation, and in-depth interviews of the selected entrepreneurs.

Sources of Data:

The primary data for the proposed study was collected from the women entrepreneurs who participated Saras Melaheld in Kolkata during January 2022. Data from some of the officials associated with of Saras mela were collected from Anandadhara State Office (WBSRLM), aSociety under the P&RD Department. Any secondary data required for this study was collected from the relevant websites of the government, regulatory agencies, participants, media publications, books, journals, etc.

Data Collection Instrument:

In this study, interview guides were framed for collecting data from participating women participants in trade fairs. In-depth interviews were conducted at the venues of Saras Mela ground. Open-ended questions were posed to an individual women entrepreneurs, and their answers are analysed for patterns and themes.In connection with this study, open-ended questions were asked across five dimensions of support to each of the sampled women entrepreneurs.Further, in-depth interviews were conducted on officers of Saras mela organising authorities with the objective of getting their views on the role played by the respective trade fair in promotion of women entrepreneurship within the state of West Bengal.

Methods of Data Collection:

For the purpose of data collection in relation to this study, two different methods were employed. They are briefly discussed hereunder:

In-depth interviews: The data for the purpose of this research study were primarily collected from selected participating women entrepreneurs through in-depth interviews of select womenpreneurs. To be specific, data were collected from a total five women entrepreneurs participating in Saras mela which is held at Kolkata. Regarding the officials of trade fairs, data were collected from officials of organising authorities of Saras mela,their opinions were gathered by conducting in-depth personal interviews, which were conducted by the researcher by visiting their offices. The duration of each of the interviews with the participating womenpreneurs ranged between 30 minutes to 45 minutes per interviewee.

Non-participant Observation: In relation to this study, the researcher acted as a non-participant observer i.e. herself acting as a tool for data collection, when she went to meet the women entrepreneurs at the fair venue and collect data therefrom. Through this process of data collection, the researcher watched the subjects of her study.

Sample Size:

An appropriate sample size for a qualitative study is one that adequately answers the research question. Moreover, samples in qualitative investigations tend to be small. The researcher actively selects the most productive sample to answer the research question (Marshall, 1996). Qualitative research studies have been found to consider small sample size (even less than ten) when they happen to be adequate for the study (Kimmel & Fairchild, 2017). For the purpose of this study, five women entrepreneurs were identified from the participating women entrepreneurswho participated in Saras Mela.The following Table 1reflects the places and the products sold by the sampled Womenpreneurs participating in Saras Mela 2022:

Table1

Sampled women entrepreneurs of Saras Mela

Respondents	Product Sold	Places
Respondent 1	Bed Sheet, Hand Embroidery, Sharee, Kurti, cushion cover	Polba
Respondent 2	Showpiece, Bag, Bottle Bag, Wall Hanging.	Goghat
Respondent 3	Jewellery	Singur
Respondent 4	Bottle craft, Home decor,	Dadpur
Respondent 5	Jewellery, Wooden, Bamboo & Cane bamboo.	Paschimpara

Source: Compiled by Authors

5. Analysis & Findings

Validity and Reliability

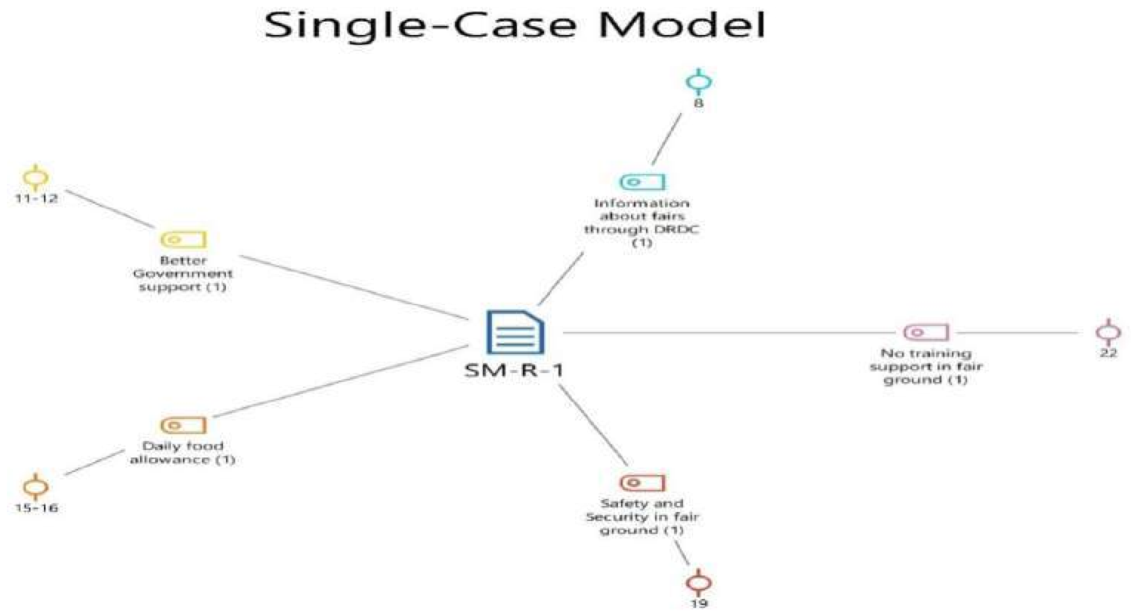
The validity and reliability of the collected data have been checked using the triangulation approach. Conducting interviews with the women entrepreneurs, conducting interviews with the fair authority officials and non-participant observation by the researcher are the three data sources which gave uniform results.

Analysis of data

The data gathered for the study which is textual in nature, has been analysed using qualitative data analysis software MAXQDA (Version 2020). The coding mapsgenerated through this software have been presented in Figure 1 below, reflectingthe Single-Case Model of selected five respondents (numbered as Respondent 1 to Respondent 5).

Figure 1

Coding Map showing the response of respondents of Saras Mela



Source: Analysis of Primary Data

On performing thematic analysis of the transcribed data (in-depth interviews), five major themes have emerged. These five themes are – Information about fairs through District Rural Development Cell (DRDC), Better Government Support, Daily Food Allowance, Daily Food Allowance, Safety & Security in fair Ground, and No training support in fairground, which are discussed hereunder:

Information about fairs through DRDC: West Bengal Panchayat and Rural Development department, West Bengal State Rural Livelihood Mission (WBSRLM) and the DRDC play a significant role for connected the women entrepreneurs with Saras Mela, which is causing their business to grow and develop. According to the words of the women entrepreneurs who claim to receive calls and texts from those offices and are given information regarding the fair.

Better Government Support: The vision and activities of the West Bengal state government, in the perspective of the participating women entrepreneurs, have been essential in helping them to develop their entrepreneurial skills. Since the State Government offered them with this chance, women entrepreneurs would not have been able to attend the Trade Fair, they are happy with this effort of the State Government.

Daily Food Allowance: According to the words of the women entrepreneurs, Rs 200/- is provided to them as a food allowance by the fair authority daily.

Safety & Security in fair Ground: The fair authorities of Saras Mela is highly worried about the safety and security of the participating women entrepreneurs, according to the feedback supplied by them. The families of the women business owners are also relieved as a result. The fair authority of Saras Mela is understood to take good care of each and every woman entrepreneur, and each woman entrepreneur has a strong bond with the other women entrepreneurs, enabling them to live and work together as a single, cohesive family at the fair. Because the fair's organisers create appropriate facilities for females, such as separate lodging, restrooms, and kitchen areas, the women entrepreneurs believe they won't experience any infrastructure issues at the event.

No training support in fairground: According to the women entrepreneurs, the fair authorities does not offer them any training in product marketing, product promotion, etc.

Further,with the objective visualisation of the themes identified above, a Word Cloud was generated using the transcribed data. In this process, potentially unwanted words were filtered out, finally reaching to four key words, they being ‘Authority’, ‘Government’, ‘DRDC’ and ‘Allowance’.Figure 2 presentedbelow showsthe word cloud representation depicting the most frequentlyused words articulated by the selected womenpreneurs. Here, the word ‘Authority’ has been found to be mostly used signifying the recognition by the participants of the major role taken by the organising authorities in various aspects of the fair.

Figure 2

Word Cloud depicting role played by Saras Mela

Source: Analysis of Primary Data

Further, Table 2 presentedbelow confirms and extends the reportreflected in the Word Cloud representation, bydepicting the frequencies of the words articulated by all the respondents, while they were being interviewed. 'Authority' tops the chart (reflecting highest frequencies in case of all respondents), followed by 'Government'(for three respondents)and 'Incentive'(for two respondents).

Table 2

View of Respondents regarding the role played by Saras Mela

	Respondent-1		Respondent-2		Respondent-3		Respondent-4		Respondent-5	
Word	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)
Authority	11	73.33	11	73.33	11	52.38	11	61.11	11	73.33
Government	4	26.67	4	26.67	6	28.57	3	16.67	3	16.67
DRDC	2	13.33	2	13.33	2	9.52	2	11.11	2	10.11
Incentive	2	10.53	1	6.67	1	4.76	5	27.58	5	27.58

Source: Analysis of Primary Data

It is worth noting that theme of 'training' of participants for honing up their marketing and promotional skills, did not get reflected on the data visualisation through Word Cloud. Moreover, for checking the reliability of the data collected triangulation approach has been used by relying on three sources, namely Womenpreneurs (through in-depth interviews), Fair authorities (through in-depth interviews) and Researchers (through non-participant observation).The triangulation of the data collected from the three sources of Saras Mela have been presented in Table 3 below:

Table 3

Triangulation of data collected from Saras Mela

Communication about organisation of fairs	**Womenpreneurs:** West Bengal Panchayat and Rural Development Department, West Bengal State Rural Livelihood Mission (WBSRLM) and The District Rural Development Cell (DRDC) informed the women entrepreneurs through SHGs group. **Fair authority officials**: Officials informed women entrepreneurs about fairs through SHGs. **Non-participant observation**: Researcher observed that fair officials informed the women artisans about fairs in right time.
Findings: It was found by triangulation method that women entrepreneurs got information about fare in right time.	
Experiences and Benefits from trade fairs	**Womenpreneurs s:** Women entrepreneurs are pleased about this State Government initiative. **Fair authority officials:** Officials said that participative women entrepreneurs are really benefited and they are already develop their economic condition that is why they can provide better education support of their son. **Non-participant observation:** It was observed that women entrepreneurs developed their economic position for this initiative of the State Government. When researcher talk to them they told after

	participating this fair they were made their home and they tried to provide better education to their son and daughter.

Findings: It was found by triangulation method that this policy of Government of West Bengal is really effective for the development of participative women entrepreneurs.

Daily Allowance	**Womenpreneurs:** According to the words of the women entrepreneurs Rs. 200is provided to them as a meal allowance by the fair authority on a daily basis. **Fair authority officials:** Official said the same information about allowance, which is provided by fair authority for fooding of women entrepreneurs. **Non-participant observation:** Researcher observed that allowance, which is provided by fair authority for daily fooding of participating women entrepreneurs.

Findings: It was found by triangulation method that authority provides daily food allowance for participative women entrepreneurs.

Challenges faced by participants	**Womenpreneurs:** According to the words of participative women entrepreneurs authority of Saras Mela is very concerned about their safety and security of women entrepreneurs. **Fair authority officials:** Fair authority of Saras Mela is very concerned about the safety and security of women entrepreneurs because the authority thought it

	was their responsibility to provide enough safety to women artisans. They also told which is closely related to the reputation regarding security of the fair. **Non-participant observation:** It was observed by research scholar that Fair authority of Saras Mela is very concerned about the safety and security of women participants. It was also observed that so many security guard were moving around in the fair ground.

Findings:

It was found by triangulation method that this policy of Government of West Bengal is really effective for the development of participative women entrepreneurs.

Training regarding marketing &promotional facilities	**Womenpreneurs:** The women entrepreneurs have disclosed that no training is provided to them by the fair authority regarding product marketing and product development **Fair authority officials:** Officials said that no training provided by fair authority. Mainly authorities like to provide product development training, and sometimes they provide product Marketing or promotional training. **Non-participant observation:** Researcher observed that no training is provided to women entrepreneurs by the fair authority regarding product marketing and

product development.

Findings: It was found by triangulation method that participative women entrepreneurs getting no support regarding training of marketing and product promotion.

Source: Analysis of Primary Data

From the above triangulation exercise, uniformity can be observed among the responses provided by the three sources across all the five themes.

6. Conclusion

The trade fair namely, Saras Mela have laid an exclusive platform for the local artisans through which they can exhibit their products and wares, and thus make their skills and prowess known to the market at large. The womenpreneurs participating in this trade fair have reported that this outlet has made them financially strong and empowered, which in turn helps to improve their status and standing within the family. Thus, it can be concluded that such exercises adopted by the state government happen to play a major role in empowering the women in a patriarchal society like India.

7. Limitations of the study

Like any study, this study also suffers from certain limitations which are highlighted hereunder:

- The inherent limitations associated with survey-based study using primary data could not be ignored.
- This study is based on one edition of the Saras Mela held at a particular location (namely, held in Kolkata during January 2022). The study can be further enriched by incorporating data from subsequent editions of the said trade fair held at different parts of the state.
- Due to paucity of resources, for the purpose of this study data could be collected only from five participating womenpreneurs, which could be enriched by including more sampled womenpreneurs.

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An Empirical Study on the impact of Operational Diversification on a Bank's Financial Performance

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Abstract

The banking industry is seeing intense competition as a result of financial sector reforms. Many banks have deliberately diversified their businesses to lower operational risks in response to the growing competitions in the Indian banking sectors. Operational diversification refers to the strategy of generating revenue from multiple sources rather than relying on a single source of income. Keeping in view, the present study aims to investigate how operational diversification affects the stability of the financial performance of Indian banks.

The present paper uses Entopy Index for measuring the operational diversification indices of the banks. Four commercial banks, UCO, BOI, AXIX and HDFC have been selected for collecting relevant data for the period 2003-04 to 2022-23. The present study observes that operational diversification has a significant impact on variation in financial performance. The study also confirms that the banks with lesser size, suffer from the problem of greater fluctuations in financial performance and vice versa.

KEYWORDS: Entropy Index, Operational Diversification, Financial Performance

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1. Introduction

The primary goal of the banking sector reforms was to increase the banks' operational effectiveness in order to raise their overall productivity and profitability. But the early 1990s financial sector changes created intense rivalry in the banking industry. A bank's over-reliance on traditional commercial operations can be dangerous, as demonstrated by the emerging market nations' mid-1990s financial crisis. One of the main causes of bank hardship following financial deregulation is improper loan portfolio diversification.One ideal form for a financial institution is the universal banking model, which enables banks to integrate a variety of financial services like investment, commercial, and insurance banking. The rules pertaining to banking and securities businesses have been generally open, which has enabled these diversifications of activity and blurred lines between various financial firms. It is anticipated that diversification of operations would assist the banks in gaining economies of scope by spreading fixed costs, providing a financial supermarket to clients who require numerous products, and utilizing managerial talents and competences across services.

Adding a variety of investments to a portfolio is known as diversification, which is a risk management technique. An endeavor is made to reduce exposure to any one asset or risk by maintaining a mix of unique assets in a diversified portfolio. Risk mitigation is the main goal of diversity. But diversification is not without its problems. Maintaining a portfolio with numerous holdings can be time-consuming and costly due to the additional transaction costs and brokerage commissions incurred when purchasing and selling multiple holdings. Essentially, spreading out is a strategy that works with diversification to reduce both risk and reward.

An organization that spreads its operations or business activities into new markets or industries is said to be pursuing operational diversification. Experimenting with different business ventures that might or might not be connected to the company's core skills or current product and service offerings is what defines this kind of diversification. By being involved in several markets or businesses, the objective is to diversify risk and improve overall stability. A thriving business can be revitalized with a well-executed diversification plan. Furthermore, it can boost the prosperity of businesses that are already profitable. Operational diversification reducesexposure to market and business segment risksby diversifying into other markets or sectors; offers a more consistent source of income by allowing success in one market to counterbalance swings in another.

2. Literature Review

In thearticle Sahoo, D. (2012) investigated how the operational diversification strategy affected the banks' financial performance stability. Through the use of panel data regression techniques, the study finds that banks that have diversified their activities to a greater extent experience more volatility in their financial performance. This phenomenon may be attributed to the banks' inability to determine the appropriate regions of diversification and how much is optimal.Bapat, D. and Sagar, M. (2016)examined the effects of size and ownership changes on bank performance, diversification, and other areas. When comparing public sector banks with private sector banks, they found a noteworthy variation in the diversification measures. When comparing the diversity metric for most years based on bank size, no discernible changes were found to be significant. We discovered a negative correlation with return on assets and a positive correlation between non-performing assets (NPA) and return on assets (ROA).

Vyas, D. and Raju, G. R. (2018) identified the factors that influence the Indian banking sector's operational efficiency. The variables employment in the banking sector, investments in the banking sector, bank deposits, world gold prices, and Brent crude oil prices were utilized in the analysis of the data using fixed effects and random effects. The operational efficiency of Indian banks is significantly positively correlated with global macroeconomic variables such as the price of gold, while the price of Brent crude oil has a negative correlation but no meaningful effect on the operational efficiency of Indian banks. The Random Effects Model is shown to be a good strategy for estimating this model when compared to the two estimations.Nisar, S., Peng, K., Wang, S. and Ashraf, B. (2018) established that the entire revenue diversification into non-interest income positively affects the banks' stability and profitability. The influence of various non-interest income-generating activities on bank performance and stability was also noted. For example, fees and commission income had a negative effect on profitability and stability, whereas other non-interest income had a beneficial effect. According to their findings, banks that diversify into particular categories of non-interest income-generating industries can reap the benefits of revenue diversification.

Ndungu, J. G. and Muturi, W. (2019) explored the impact of product, geographic, and income diversification on the financial performance of banks. They discovered that while product diversification had a negative effect, income and geographic diversification had a positive effect. The report suggested that managers at commercial banks prioritize developing and implementing diversification strategies inside their organizations. The impact of functional, regional, and loan portfolio diversification on the stability of commercial banks in India was investigated concurrently by Chandramohan, K., Lunawat, D., and Lunawat, A. (2022). The effect of diversity on bank stability was calculated using the Generalized Method of Moments (GMM) model. This strategy is justified for two reasons. Firstly, it includes the stability and persistence of risk, which have been overlooked in the literature on diversification up to this point. It also addresses the endogeneity issues between stability and diversification. They discovered that diversification enhances bank stability in all three dimensions-functional, geographic, and loan-portfolio diversification.

Thakur, N. and Arora, S. (2023) investigated the factors influencing income diversification for both non-interest and interest income as well as non-traditional income sources in their paper. Tobit regression model using panel data was employed because to the limited nature of the dependent variables, which are proxies for income diversification. The results showed that costs-income ratios, bank sizes, technology improvements, return on assets, market competitiveness, and economic inflation all had a favorable impact on income diversification.

3. Methodological Treatment

Models for Measuring Operational Diversification Indices:

A multifaceted approach to operations is implied by operational diversity. The banks use the diversification approach to lower risks. In order to increase their firm, they also diversify their operations, especially in cases when there is little chance of expansion in their current field. By introducing new services to their portfolio, or expanding the scope of their current offerings, they can achieve this growth. Additional reasons for the banks' diversification efforts could be strengthening their capital basis, acquiring market dominance, optimizing value, etc.

This study measures the operational diversification indices using the Entropy Index (EN_DIV), which was recommended by Hart (1971). Relative and absolute diversification indices are two metrics used to measure the two degrees of diversification.

The Entropy index of absolute diversification is measured as follows:

$$\text{EN\_ADIV}_{it} = \sum_{j=1}^{m} S_{jt} \cdot ln\left(\frac{1}{S_{jt}}\right)$$

The Entropy index measures relative diversification of operation of a bank with m operation as follows:

$$\text{EN\_RDIV}_{it} = \frac{\text{EN\_ADIVit}}{\ln(m)}$$

4. Data Sources

We have gathered secondary data from the annual reports of the individual banks that are being examined in this study in order to examine the effect of operational diversification on the stability of financial performance of Indian banks. The current study has chosen four commercial banks from two categories: public banks (HDFC and AXIX) and nationalized banks (UCO and BOI). From 2003–2004 to 2022–2023, that is the only time frame for the study. Balanced panel data for 4 banks from 2003–04 to 2022–23 is then included in this analysis. There are 4 observations for each year, totaling 80 (20 × 4) observations.

5. Regression Model for Estimation of Variations in Financial Performance

A number of other factors, including the bank's size and relative position in the industry, its other operational strategies, such as efforts to advertise and promote services, its level of financial performance, etc., may also contribute to fluctuations in financial performance in addition to variations in the extent of operational diversification. This section aims to quantify the effect of operational diversification on the variations in the financial performance of Indian banks during the research period. Finding the key variables that have a substantial impact on the stability of the financial performance of the institutions under investigation, either positively or negatively, is the main goal of this examination.

Multivariate Profitability Analysis

A. Specification of the Function

The study assumes that variations in financial performance of a bank (VFP) depends on its market share (MS), bank size (BS), extent of operational diversification (OD), the return of assets (RA) and the net interest margin (NIM)

$$\text{i.e.,} VFP_{it} = \int (MS_{it}, BS_{it}, OD_{it}, RA_{it}, NIM_{it}),$$

The linear regression equation based on the above function can be written as :

$$VFP_{it} = + MS_{it} + BS_{it} + OD_{it} + RA_{it} + NIM_{it} \ldots\ldots\ldots\ldots\ldots\ldots \text{ Equation no. (i)}$$

B. Hypothetical impact of Factors influencing fluctuation in financial performance

Market Share (MS_{it}): Increased market share is anticipated to strengthen a bank's standing in the industry and, as a result, stabilize its financial results. Stated differently, it is expected that banks having a larger market share will see less variability in their financial results.

Bank Size (BS_{it}): A bank's size affects the stability of its financial performance in two different ways. Larger banks can reap the rewards of economies of scale and stabilize their financial performance, on the one hand. However, larger banks may have X-inefficiency, which could negatively impact the stability of their financial performance. Thus, the way in which these various pressures interact determines the nature of the influence that a bank's size has on the stability of its financial performance.

Operational Diversification (OD_{it}): A bank's efficiency in terms of expenses and profit is increased through operational diversification. It is anticipated that risk sharing and increased productivity as a result of operational diversification will assist banks in stabilizing their financial performance. There are additional incentives for very large, highly financed, and efficient banks to diversify. They outperform each other or the specialized ones; they make less money through traditional kinds of intermediation. Gains from diversification are more than outweighed by the expense of being exposed to additional non-interest income, particularly when trading income volatility.Banking institutions can gain from diversification as long as they select the appropriate niche and thoroughly research it based on their unique traits, competencies, and risk tolerance. It's also feasible though, that the banks' profits become more erratic as they shift their product mixes away from conventional intermediation operations and toward fee-based ones. The bank's financial stability may suffer as a result of this profit fluctuation. Therefore, the degree to which diversification affects the fluctuation in the bank's financial performance is contingent upon the relative potency of these two disparate factors.

Return on Assets (RAit): Generally, higher level of return on assets is likely to make performance of a bank more stable. Hence, lesser volatility in financial performance of a bank is expected when its return on assets is higher. Return on assets compares the value of a business's assets with the profits it produces over a set period of time. Return on assets is a tool used by managers and financial analysts to determine how effectively a company is using its resources to make a profit.

Net Interest Margin (NIM_{it}): It is the ratio between net interest income and total income of the bank.Net interest margin (NIM) reveals the amount of money that a bank is earning in interest on loans compared to the amount it is paying in interest on deposits. NIM is one indicator of a bank's profitability and growth. It reveals how much the bank is earning in interest on its loans compared to how much it is paying out in interest on deposits.

C. Measurement of Variables

Three years' moving average is taken for each of the independent variables in order to control for any measurement mistakes, control for any simultaneity in the anticipated relationships, and control for the adjustment process. As a result, starting year is used to quantify all independent variables, which are all based on the simple average of the three years prior.

Variation in Financial Performance (VFP_{it}):With the year under reference at the center, the variation in financial performance is expressed in terms of the standard deviation of its financial performance over a period of five years. One of the key determinants of financial performance is return on assets, or RA. Therefore, the following metrics are used to measure the variance in return on assets (VRA):

$$VRA_{it} = \delta(RA_{i,\,t-2}, RA_{i,\,t-1}, RA_{it}, RA_{i,\,t+1}, RA_{i,\,t+2})$$

Market Share (MS_{it}):Market share of bank i in year t (MS_{it}) is measured as the ratio of its income (Ii) to total income of all thebanks in the sector,

$$i.e, MS_{it} = \left[\frac{I_{it}}{\Sigma_{i=1}^{n} I_{it}} + \frac{I_{i,t-1}}{\Sigma_{i=1}^{n} I_{i,t-1}} + \frac{I_{i,t-2}}{\Sigma_{i=1}^{n} I_{i,t-2}}\right]/3,$$

wherenstands for income of banks in the industry.

Bank Size (BS_{it}):The bank size in year t (BS_{it}) is measured as the natural logarithm of its total assets(*TA*), *i.e,*

$$BS_{it} = \frac{\ln\left(TA_{it}\right)+\ln\left(TA_{i,t-1}\right)+\ln\left(TA_{i,t-2}\right)}{3}$$

Operational Diversification (OD_{it}): In this study, Entropy's Index has been used to measures of operational diversification and relative measures of diversification have been used for regression purpose.

Relative Diversification – Entropy's Index

$$EN\_RDIV_{it} = \frac{\left[EN\_RDIV_{it} + EN\_RDIV_{i,t-1} + EN\_RDIV_{i,t-2}\right]}{3}$$

Return on Assets (RA_{it}): The Return on assets (RA) is used for the measurement of level of performance of the bank. The returns on assets of the i-th bank in the year t (RA_{it}) is measured as the ratio of net profit (NP_i) of the bank to its total assets (TA_i), i.e.,

$$TA_{it}= [NP_{it}/TA_{it} + NP_{i,t-1}/TA_{i,t-1} + NP_{i,t-2}/TA_{i,t-2}] / 3$$

Net Interest Margin (NIM):It is the ratio between net interest income and total income of the bank.

$$NIM_{it} = [NII_{it}/TI_{it} + NII_{i,t-1}/TI_{i,t-1} + NII_{i,t-2}/TI_{i,t-2}] / 3$$

D. Estimation Techniques

The equation specified above has been estimated by applying panel data estimation technique for a set of 4 banks, operating in India over the period from 2003-04 to 2022-23. Use of panel data not only helps in raising the sample size and hence the degree of freedom considerably increases, it also incorporates the dynamics of banks' behaviour in the market place. In panel data estimation, three models, namely the pooled regression model (OLS), fixed effects model (FEM) and random effect model (REM) are estimated for each analysis, i.e. multivariate profitability analysis and explaining efficiency variation. The choice amongst the pooled regression model, the FEM and the REM is very important as it largely influences the conclusions on the individual coefficients. Three statistical tests, viz., the restricted F-test, the Breusch and Pagan (1980) Lagrange Multiplier test, and the Hausman (1978) test are carried out to select the appropriate model. The restricted F-test is applied to make a choice between the pooled regression model and the FEM. If the computed F-value is greater than the critical F-value, choice of the FEM is made over the pooled regression model. On the other hand, the Breusch and Pagan Lagrange Multiplier test is carried out to make a choice between the pooled regression model and the REM. The test is based on the null hypothesis that the variance of the random disturbance term is zero and it uses a test statisticsthat follows z distribution. Rejection of null hypothesis suggests that there are random effects in the relationships. Finally, if both the FEM and the REM are selected over the pooled regression model following the restricted F test and the Breusch and Pagan Lagrange Multiplier test respectively, the Hausman test is applied to make choice between the FEM and the REM. The test is based on the null hypothesis that the estimators of the FEM and the REM do not differ significantly and uses a test statistic that has an asymptotic distribution. If the null hypothesis is not rejected, the REM is better suited as compared to the FEM. The severity of the problem of multico-linearity across the independent variables is also examined in terms of the variance inflation factors.

6.Explaining the Estimation of Variations in Financial Performance : Multiple Regression Results

The descriptive statistics of the variables used in the regression model for explaining variations in financial performance across the sample banks and over time, are presented in Table 1.

Table 1: Descriptive Statistics

	VRA_{it}	EN_RDV_{it}	MS_{it}	BS_{it}	RA_{it}	NIM_{it}
Max	0.0230	0.1510	1.4628	6.1740	0.0170	0.1471
Min	0.0004	0.0683	0.1903	4.5521	-0.0083	0.0740
Mean	0.0060	0.1196	0.7500	5.4081	0.0063	0.1195
S.D.	0.0052	0.0202	0.2871	0.3825	0.0070	0.0191
N	64	64	64	64	64	64

Source: Computed by the authors

Variations in Profitability with Entropy's Relative Diversification Index: Table 2 shows the regression results for variations in profitability with Entropy's Relative Diversification Index. The F-statistics of the pooled regression model, the fixed-effect model, and the Wald-statistic of the random effect model are statistically significant.

Table 2: Regression Results for Variations in Profitability with Entropy's Relative Diversification Index

Ordinary Least Square Model			Fixed Effect Model		Random Effect Model	
Variables	**Coefficient**	**t-stat**	**Coefficient**	**t-stat**	**Coefficient**	**Z-stat**
Intercept	-0.003	-0.570	-0.006	-0.95	-0.003	-0.57
EN_RDV_{it}	0.093	2.580***	0.045	1.35	0.093	2.58***
MS_{it}	-0.002	-1.70*	-0.003	-2.32**	-0.002	-1.70*
BSZ_{it}	0.003	3.11***	0.003	2.99***	0.003	3.11***
RA_{it}	-0.577	-10.96***	-0.702	-11.78***	-0.577	-10.96***
NIM_{it}	-0.095	-2.25**	-0.001	-0.03	-0.095	-2.25**
F-Stat		83.21***	**F-Stat**	77.40***	**Wald**	416.07***
R^2		0.878	R^2 **within**	0.876	R^2 **within**	0.860
Adj. R^2		0.867	R^2 **between**	0.866	R^2 **between**	0.946

		R^2 overall	0.860	**R^2 overall**	0.878
No. of Obs.	64	**No. of Obs.**	64	**No. of Obs.**	64

Source: Computed by the authors

*** indicates 1% level of significance, ** indicates 5% level of significance & * indicates 10% level of significance

Table 3: Tests for Selection of Appropriate Model for Explaining Variations in Profitability with Entropy's Relative Diversification Index

Purpose	Null Hypothesis	Test Statistics
Selection between Pooled regression Model and Fixed Effects Model (restricted F test)	All = 0	F(3, 55) = 7.40***
Selection between Pooled regression Model and Random Effects Model (Breusch-Pagan Lagrange Multiplier test)	Var(u) = 0	$x^2_{(1)} = 6.52$***
Selection between Fixed Effects Model and Random Effects Model (Hausman Test)	Difference in co-efficient is not systematic	$x^2_{(5)} = 92.65$***

Source: Computed by the authors

In order to select the appropriate model for explaining variation in financial performances, the restricted F-test, the Lagrange Multiplier test and the Hausman test are carried out and the value of the test statistics along with respective hypothesis are presented in Table 3. It is found that all the three test statistics are statistically significant. Statistically significance of the test statistics in Hausman test (significant at 10% level) suggests for choice of the FEM over the REM. Hence, when we consider Entropy's Relative Diversification Index as independent variable, the regression results of the FEM are used for statistical inference and further analysis of the individual coefficients.

The study observes that operational diversification of the bank based on Entropy's Relative Diversification Index has a positive impact on variation in financial performance, not statistically significant. This implies that variation in financial performance does not differ significantly across the bank depending on their operational diversification. Operational diversification does not have any significant impact on the stability of the financial performance of the bank. The study also confirms that market size has a statistically negative impact on the fluctuation in financial performance. This means that variation in financial performance is negatively and statistically significant and influenced by the market share of the bank. This implies that banks with greater market size are likely to have greater stability in their financial performance. So in order to minimize fluctuation in financial performance the banks have to capture larger market share by providing loan at a great concessional rate, providing services at door steps, etc.

From the study it also observes that the bank size is statistically significant with positive effect, which implies that impact of bank size on the variation in financial performance in a positive way. This suggests that the banks that have greater size suffer from the problem of greater fluctuation in financial performance and vice versa. The variable return on assets has impacted negatively and statistically significant, which implies that the banks having higher level of return on assets face lesser fluctuation in financial performance which leads to make performance more stable.

The study also makes an attempt to find out the impact of net interest margin on variation on financial performance. The study finds that net interest margin has a negative impact on variation in financial performance but not statistically significant.

7. Summary and Conclusions

The early 1990s saw significant changes to the financial sector, which increased competition in the banking industry. A bank's over-reliance on traditional commercial operations can be dangerous, as demonstrated by the emerging market nations' mid-1990s financial crisis. Many banks have deliberately pursued the path of diversifying their businesses to lower their operational risks in response to the growing competition in the Indian banking sector and the entry of local and foreign private banks thereafter. This viewpoint informs the current study's attempt to investigate how operational diversification affects the stability of Indian banks' financial performance.The goal of the study is to identify the key variables that have a major impact on a bank's fluctuations in financial performance. This article measures operational diversification using the Entropy Index (EN_RDIV) and confirms the results. For this investigation, four commercial banks have been chosen and the study period is 20 years from 2003-04 to 2022-23. Consequently, yearly observations for four banks from 2003-04 to 2022-23, i.e. four for each year, and a total of 80 (20 x 4) observations, make up the balanced panel data used in this study. According to the study, banks with larger branches experience more financial performance variations, and vice versa.The goal of the study is to identify the key variables that have a major impact on a bank's fluctuations in financial performance. Therefore, more research in this area is needed. According to this study, operational diversification under the Entropy Index (EN_RDV) influences profitability fluctuations in a way that is both beneficial and statistically insignificant. It suggests that depending on the operational diversification of the banks, variances in financial performance do not differ greatly amongst them. The stabilization of a bank's financial performance is not greatly enhanced by operational diversification.

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Impact of Illiquidity on Government Bond Yields: Evidence from India

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ABSTRACT

In this paper the association between the illiquidity and the yields of the government bonds has been examined to understand the nature of illiquidity premium existing in the Indian government bond market. For this purpose the data have been primarily collected from the NDS-OM platform and the Amihud Illiquidity measure has been used to estimate the illiquidity proxies. The illiquidity proxies so calculated are found to be in decimal fractions and are very close to zero, indicating that the illiquidity in the Indian government bond market are on the lower side. In other words, the liquidity of this market is on the higher side. The effect of these illiquidity proxies on the yields of the bonds are estimated using the Driscoll Kraay Standard Error Method of the Fixed Effects Model. From the major findings of the study, it can be concluded that the Indian government bond market is a highly regulated market and is highly liquid. The illiquidity of the market has a negative impact on the yield of the bonds.

1. Introduction

Liquidity premium is a critical factor in determining bond yields, particularly within the government and corporate bond markets. Several published works (Amihud and Mendelson, 1986 *etc*.) on liquidity in the financial market theorize the existence of liquidity premium. The general idea is that if two assets have the same cash flows then they should also have the same prices, assuming that the market is frictionless. However, in different classes of financial markets, it is witnessed that assets having the same cashflows have different prices which indicates the existence of friction. So, when due to frictional costs increase then it should be compensated by a decrease in the price of the asset and an increase in the returns of the asset to compensate the investors for the illiquidity. This theory suggests that the security with higher liquidity risk should be compensated with higher returns as compared to a security of the same class but is more liquid. In other words, a liquidity premium is a compensation that an investor gets for investing in highly illiquid securities. This theory arises from the concept of opportunity cost. Fundamentally, an investor is foregoing an asset of the same class with higher liquidity for one with lower liquidity (or vice versa) and should be compensated with higher returns to account for the opportunity cost associated with the difference in liquidity."

A substantial body of literature has explored the relationship between liquidity and bond yields, with a focus on its impact on both government and corporate debt. Recent researches, however, underscore the variability of liquidity premiums depending on factors like market structure, bond type, and prevailing economic conditions.

In government bond markets, liquidity is often a key driver of yield spreads and bond pricing. While government bonds are generally considered low-risk investments, their liquidity can differ significantly across countries, issuances, and market conditions. Recent studies, including those by Greenwood and Vayanos (2014), highlight the significant role of liquidity in bond pricing. They argue that even highly-rated sovereign bonds can exhibit liquidity premiums, depending on trading volume, market depth, and overall economic conditions. A study by Choi *et al.* (2020) further explores this relationship, revealing that less liquid government bonds, particularly in times of financial instability, experience more pronounced liquidity premiums. In such periods, investors demand higher yields to compensate for the increased difficulty in trading these securities.

Additionally, Beber and Pagano (2015) contribute to this discourse by showing that liquidity premiums intensify during times of financial crises, when investors are more risk-averse and face greater constraints on their risk-bearing capacity. Their findings suggest that sovereign bond yields widen during periods of market disruptions due to heightened liquidity concerns. This aligns with earlier work by Krishnamurthy (2002), who argued that liquidity plays a dominant role in driving yield spreads in government bond markets during times of financial stress.

While the corporate bond market has traditionally been more sensitive to liquidity fluctuations, recent studies have extended this analysis to government bonds. Houweling *et al.* (2020) examine liquidity risk premiums in both sovereign and corporate bonds and emphasize how shifts in market liquidity lead to asymmetrical changes in yield spreads. Their research suggests that less liquid government bonds, especially those with low trading volumes or issued by governments with weaker liquidity profiles, exhibit notable liquidity premiums relative to more liquid sovereign debt.

Moreover, research by Ellul and Yerramilli (2020) highlights the importance of liquidity risk in government bond markets, especially in emerging economies. They find that in these markets, liquidity risk significantly affects yield spreads, with investors demanding a premium for holding less liquid government bonds due to greater uncertainty and potential price volatility during unfavourable market conditions.

This paper contributes to the existing body of literature by focusing specifically on the link between liquidity and yield spreads in government bond market of India. Our goal is to offer deeper insights into how liquidity influences bond pricing. Given the importance of sovereign debt in global financial markets, understanding liquidity premiums in government bonds is crucial for both policymakers and investors.

2. Objectives of the study

The objectives of the study are:
1) To assess the illiquidity relating to the government bond market in India.
2) To examine the association between the bond-specific liquidity and the yields of government bonds in India.

3. Hypotheses of the study

The study deals with assessing the liquidity of the Indian government bond market and examining the kind of effect that illiquidity may have on the yields of the bonds selected. The following hypotheses are formed:

H_0: The illiquidity proxies have no significant effect on the bond yields.

H_1: The illiquidity proxies have a significant effect on the bond yields.

4. Review of Literature

The connection between liquidity and bond yields has been a pivotal area of research within financial economics, with the liquidity premium being one of the key concepts. This premium refers to the extra yield that investors require for holding less liquid bonds—those that may be more difficult to trade without affecting their prices. The fundamental idea is that investors demand compensation for the additional risks associated with assets that are harder to liquidate, a concept first articulated by Amihud and Mendelson (1986). Over time, research has expanded and refined this concept, offering valuable empirical evidence and theoretical models that explore the complex interactions between liquidity, bond yields, and the broader dynamics of bond markets.

Early studies primarily concentrated on corporate bonds and their susceptibility to liquidity risk. Longstaff *et al.* (2005) showed that liquidity risk is a critical determinant of corporate bond yield spreads, suggesting that liquidity premium is particularly relevant in the corporate debt markets, where bonds tend to be less liquid compared to government bonds. Following this, Chen *et al.* (2007) deepened this understanding by demonstrating that liquidity premiums vary based on the size and characteristics of the issuer, reinforcing that liquidity risk is not uniform across different segments of the bond market. Moreover, Krishnamurthy (2002) emphasized that liquidity premiums are also influential in government bond markets, especially during periods of market instability.

In more recent years, the relationship between liquidity and bond yields has become increasingly intricate, particularly in the wake of major financial crises such as the 2008 global financial crisis and the COVID-19 pandemic. These disruptive events have caused liquidity premiums to fluctuate significantly, reflecting changes in investor risk sentiment and broader market volatility. For example, during the European sovereign debt crisis, Beber and Pagano (2015) showed that liquidity premiums on government bonds, particularly in peripheral nations like Greece and Italy, increased considerably. This occurred due to investors' reduced willingness to hold government bonds from countries with uncertain fiscal futures—a pattern that was similarly observed during the pandemic (Choi *et al*., 2020).

More recent studies have increasingly focused on the role of liquidity risk in government bonds. For instance, Greenwood and Vayanos (2014) pointed out that liquidity risk plays a key role in determining bond yields, even for highly-rated sovereign bonds. They showed that liquidity factors can help explain movements in the yield curve. In a similar vein, Houweling *et al.* (2020) analysed liquidity premiums in both sovereign and corporate bonds, finding that liquidity risk is priced asymmetrically. Government bonds are particularly sensitive to liquidity risk during global market stress, which influences the risk premiums investors demand.

The growing significance of market microstructure has also been an important theme in contemporary literature. The structure of bond markets, including factors like bid-ask spreads, trading volumes, and transaction costs, is now recognized as a crucial determinant of liquidity premiums and bond yields. Edelen *et al.* (2020) examined how trading volumes and transparency affect liquidity premiums in government bonds. They found that government bonds with lower liquidity and less frequent trading typically demand higher liquidity premiums. This observation is consistent with findings from other researchers who emphasize that liquidity is inversely correlated with bond yields, especially in periods of heightened market uncertainty (Fleming *et al.*, 2020).

More recently, researchers have also begun using machine learning and big data analytics to explore liquidity dynamics in bond markets. Becker and Ivashina (2021) utilized large datasets and machine learning models to assess liquidity risk in government bond markets, providing more real-time insights into the fluctuations of liquidity premiums over time. These innovative approaches offer a more detailed understanding of how liquidity premiums evolve and how they are reflected in bond yields.

The influence of central bank policy on bond market liquidity has also gained considerable attention. Krishnamurthy and Vissing-Jorgensen (2020) found that during periods of quantitative easing (QE), central bank purchases of government bonds reduce liquidity premiums by increasing the demand for these securities and mitigating the liquidity risks perceived by investors. This observation was further validated by Kohn (2021), who studied the long-term effects of central bank interventions on liquidity risk in bond markets, concluding that such interventions can lower liquidity risk for government bonds.

The role of foreign investors in sovereign bond markets has also been an important focus. Foreign capital flows can influence liquidity premiums, particularly in emerging markets. Aizenman *et al.* (2021) demonstrated that foreign investor behaviour plays a significant role in determining liquidity premiums in sovereign debt markets, particularly in emerging economies. When foreign investors pull back or become less confident in the stability of the domestic economy, liquidity premiums tend to rise, leading to higher yields for government bonds in these countries.

The impact of liquidity shocks has been another significant area of recent research. During sudden market disruptions, liquidity premiums tend to spike as investors demand higher yields for holding bonds that may be difficult to trade. Hsieh *et al.* (2020) illustrated this effect during the early stages of the COVID-19 pandemic, when liquidity premiums surged across global bond markets, even for government bonds traditionally perceived as safe assets, such as U.S. Treasuries.

Additionally, the rise of digital assets and bond tokenization has introduced new dimensions to bond market liquidity. The use of blockchain technology and the tokenization of bonds have been proposed as potential ways to reduce liquidity premiums by enhancing the ease of trading bonds. Studies such as those by Choi *et al.* (2021) suggest that tokenized bonds can improve liquidity by streamlining transactions, which could in turn lower the liquidity premiums traditionally associated with government bonds.

Looking to the future, the integration of financial technology (fintech) and digital transformation within financial markets is expected to reshape the understanding of liquidity premiums. As new financial instruments and technologies evolve, the traditional dynamics of liquidity and bond yields will continue to be influenced by these advancements.

From this review of literature, it is found that there is a major gap of literature in the field of the bond market in India with reference to the impact of illiquidity on the bond yields. The Government bond market has been chosen for the empirical study as most of the bond-related transactions in India are related to Government bonds.

5. Database and Methodology

The initial data, for conducting this study, have been gathered from the archival section of the Negotiated Dealing System-Order Matching system (NDS-OM) platform. NDS-OM is an online platform that supports the purchase and sale of government securities (G-Secs). The NDS provides auction facility for both primary market dealings and secondary market dealings. NDS-OM was launched in 2005 to facilitate secondary market dealings of government securities. The trade history is available for download for a maximum duration of twelve months at a time. The population data have been collected for five consecutive financial years from 2018-19 to 2022-23.

Other individual information like the date of the bond issue, the date of redemption, the nominal rate and other information are taken from several websites and platforms like moner.in, cbonds.com, rbi.org.in, and indiabonds.com.

The sample data of 104 bonds have been chosen from the universe of bonds available based on simple random sampling. At first, the all-inclusive set of data was collected from the website of the NDS-OM platform, where data for up to 6 months were collected in one excel sheet. So, for 5 years 10 excel sheets were collected. These sheets contained the dealings of almost all the bonds which were traded in that particular year. The data sets were huge in volume and was difficult to process and consequently a set of samples is chosen by use of the function of random sampling in the excel.

The period of the study is limited to the preceding 5 financial years *i.e.*, 2018-19, 2019-20, 2020-21, 2021-22, and 2022-23. Thus, the number of observations for the study is 520.

The data used in the study is panel data in nature. This type of date is helpful in dealing with the heterogeneity of cross-sections. It is a combination of both time-series data and cross-sectional data. Panel data may be used to better address challenges that cannot be examined using cross-sectional or time-series data. In the current empirical investigation, the panel regression approach was employed to investigate the influence of independent factors on the dependent variable which is as follows:

$\text{Yield}_{it} = \beta_0 + \beta_1\text{Amount Outstanding}_{it} + \beta_2\text{Nominal Rate}_{it} + \beta_3\text{Remaining Maturity Years}_{it} + \beta_4\text{ Treasury Rate}_{it} + \beta_5\text{ Illiquidity}_{it} + \varepsilon_{it}$

where the subscript 'it' refers to the bond ID 'i' and year 't' and illiquidity refers to the liquidity proxies computed by using the Amihud illiquidity measure. The independent variables chosen here are largely based on Elton *et al.* (2001) and Chen *et al.* (2007) depending on the availability of information regarding the various independent variables proposed in these papers.

Description of Variables:

The variables that have been used to conduct the study are described as follows:

- Amount Outstanding: The amount outstanding of a bond is the part of the principal amount of the bond that is still unpaid. It is the difference between the Face Value of the bonds and any amount relating to the principal amount that has been paid for by the issuing government. In case of nonpayment of any sum by the government, then the total face value of the bonds and the amount outstanding become the same. As evident in most of the bonds studied, there has been no payment of the principal amount of the bond so the issue value and the outstanding value are the same.
- Nominal Rate: A nominal interest rate is the rate which does not include the inflation effect. It is the rate which is mentioned during the time of issues and is the rate at which the issuing government will pay interest on the outstanding amount. Generally, the state and the central government pay interest on the bonds on mostly semi-annually basis and also annual basis.

- Remaining Maturity Years: It is the year of maturity of the bonds minus the current financial year. In other words, remaining maturity years is the number of years left till maturity from the financial year of the study in question. For example, the year in question is 2018-19 and the year of maturity of a bond is 2029, then the Remaining years till maturity is 10 years (2029-2019). For the simplicity of the study the last date of the financial year is considered.
- Treasury Rate: It is the effective annual interest rate that the government pays on its debt obligations, expressed in terms of percentage. In other words, it is the annual interest rate that an investor expects from the debt instrument that they have invested in. This interest rate is not just a rate it potentially influences the rate at which other borrowers and investors borrow or invest in the economy. This rate also influences the rates of loan related to the purchase of real estate, vehicles and other assets.
- (Il)liquidity: Liquidity in general, can be assessed by the ratio of volume traded multiplied by the closing price divided by the price range from high to low, for the whole trading day on a logarithmic scale. It is worth noting that any liquidity measure is not a concrete measure and is affected by some factors that cannot be quantifiable and included in a single one. Illiquidity is the inverse of liquidity and is measured by the Amihud method of illiquidity. The Amihud measure of illiquidity is a sought-after measure of liquidity which is the average of the ratio of absolute returns over trading volume, measured at a daily frequency for non-zero volume days over the previous year. It is defined as the lambda parameter from the Kyle model (1985). It can also be termed as the returns to volume measure. This method was popularized by Amihud in 2002. The idea behind this measure is that it indicates a relationship between the change in price and the trading volume. Hence, illiquidity here can be described as the mean ratio of the daily absolute returns and the trading volume of the day. It is denoted by,

  $ILLIQ_{iy} = 1/D_{iy1Diy(RiytVOLDiyt)}$

  where,

  t = time,

  y = year,

  i = stock identity,

  D_{iy} = number of non-zero days for which data is available,

  R_{iyt} indicates returns on stock I,

  $VOLD_{iyt}$ indicates the daily volume of transactions in a respective currency like the Dollar.

  This ratio provides the absolute change in price that is the percentage change in price per unit of currency due to the daily influence of the order flow. Information about the components of the formula is derived from the raw data set and is converted into numbers which are then used in the formula in the Excel sheet.
- Yield: It is the daily transaction wise expected annualized rate of return that is expected by an investor if the said bond is held till its maturity. It is the expected total returns received by the investor during its life time if there is no default in the interest payment and default in the repayment of the principal amount.

  The daily data of yield is present in the primary data sheets collected from the NDS-OM website of RBI. The daily figures are converted into yearly figures for the purpose of the study.

In order to confirm whether the panel data analysis is appropriate or not, the Breusch and Pagan Lagrangian multiplier test is conducted.

Here it is hypothesized that:

H_0: There is no panel effect.

H_1: There is panel effect.

The test statistic is Chi^2 and the rejection of the null hypothesis will signify that there is panel effect.

The Hausman test is conducted to choose between the fixed effect and the random effects model, whichever would be appropriate for the regression model.
For the test, the following are the null and alternative hypothesis:
H_0: The difference in the coefficients is not systematic
H_1: The difference in coefficients is systematic
The test statistic is Chi^2 and the rejection of null hypothesis will indicate that fixed effect model should be chosen.
Tests for the detection of heteroskedasticity and autocorrelation show that in both cases the P-values are significant, so, the null hypothesis of homoskedasticity is rejected and the null hypothesis of non-existence of first-order autocorrelation is also rejected. Therefore, it confirms that the panel data is affected by auto-correlation and heteroskedasticity. Hence, the fixed effect regression model is not in its most effective form and it has to be modified to take into the effect of autocorrelation and heteroskedasticity. Accordingly, the Driscoll Kraay Standard Error method of the fixed effects model is used as a robust measure. It is a superior method that curbs the issue of autocorrelation and heteroskedasticity. This method frees the Standard Error from bias and makes it a robust model.

6. Estimation and Interpretation of Regression Model

In order to select the appropriate model for the estimation of the data, certain diagnostical tests have been conducted in the STATA. Then the Driscoll Kraay standard error method of the fixed effects model has been applied.

Table 1: Test Results Related to the Data and Model for Yields

Name Of the Test	Measure	Value	Result
Heteroskedasticity	BPLM Test	$Chibar^2$= 73.07***	Heteroskedasticity
Goodness of Fit	Overall R^2	0.7566	Good

*Note: *** means significant at 1% level, ** means significant at 5% level and * means significant at 10% level.*

Table 2: Tests for selection of the appropriate model for estimation

Fixed Effect F Value	Random Effect Wald Chi^2 Value	BPLM Test $Chibar^2$ Value	Hausman Test Chi^2 Value	Model Applied
427.87***	949.00***	73.07***	168.74***	Fixed Effect

*Note: *** means significant at 1% level, ** means significant at 5% level and * means significant at 10% level.*

Table 1 and Table 2 represent the various tests used to investigate the qualities of the data set with respect to the presence of heteroskedasticity, autocorrelation and determination of the type of data set *i.e.* pooled or panel and whether to use the fixed effect model or the random effect model. Here, the null hypotheses are rejected by the fixed effect model as well as the BPLM test then the Hausman test has been conducted and the null hypothesis of the Hausman test is rejected. Accordingly, the fixed effect model has been applied. A robust measure of the fixed effect model *i.e.*, the Driscoll Kraay standard error method of the fixed effects model has been applied due to the presence of autocorrelation and Heteroskedasticity and the Nominal Rate has been omitted as a result. The goodness of the fit is also significant. This means the model applied is an appropriate measure for the analysis.

Table 3: Results of Driscoll Kraay Standard Error Method of Fixed Effects Model

Regression with Driscoll-Kraay standard errors Number of obs= 520						
Method: Fixed-effects regression	Number of groups = 104					
Group variable (i): Bond Id	F (5,103) = 100204.92					
maximum lag: **2**	**Prob > F = 0.0000**					
within R-squared = 0.7566						
Yield	**Coef.**	**Std. Err.**	**t**	**P>|t|**	**[95% Conf. Interval]**	
Amount Outstanding	-0.63857***	0.1405	-4.54	0.000	-0.917	-0.359
Nominal Rate	0 (omitted)					
Remaining Maturity Years	0.24540***	0.0399	6.14	0.000	0.166	0.324
Treasury Rate	1.55239***	0.1490	10.41	0.000	1.256	1.848
Illiquidity	-0.24920***	0.0822	-3.03	0.003	-0.412	-0.086
Constant	0 (omitted)					

*Note: *** means significant at 1% level, ** means significant at 5% level and * means significant at 10% level.*

The Table 3 shows that the Amount Outstanding is significant at 1% level of significance with a P-value of 0.00. Thus, the null hypothesis is rejected and the alternative hypothesis is accepted. So, we can say that the amount outstanding has a significant effect on the Yields of the bonds. The coefficient is -0.63857 which is indicative of the presence of a negative relationship between the amount outstanding and the yields of the bonds and if there is a change in the Amount Outstanding by 1 unit then the Yield will change by 0.63857 unit in the opposite direction. This is in tune with the existing theoretical relationship established between the amount outstanding and the yields that if the value of the bond increases, then the returns of the bond decrease and vice versa.

The nominal rate is omitted from the model due to suspected auto-correlation and heteroskedasticity.

The Table 3 shows that the remaining maturity years is significant at 1% with a P-value of 0.00. Thus, the alternative hypothesis is accepted and it can be said that the remaining maturity years has a significant effect on the yields of the bonds. The Coefficient is 0.24540 which is indicative of the presence of a positive relationship between the remaining maturity years and the yields of the bonds and if there is a change in the remaining maturity years by 1 unit then the Yield will change by 0.24540 units in the same direction. This result also affirms with the theory that higher the number of years to maturity, higher should be the returns of the bonds to compensate the investors for the risks undertaken for a longer time.

The Table 3 also shows that the treasury rate is significant at 1% with a P-value of 0.00. Thus, the alternative hypothesis is accepted and it can be said that the treasury rate has a significant influence on the yields of the bonds. The coefficient is 1.55239 which suggests that there exists a positive influence of the Treasury Rate on the Yields of the Bonds and that if the treasury rate changes by one unit, then the Yield will change by 1.55239 in the same direction. This result also confirms with the theories which suggest that the relationship of Treasury rate and the yields rate of return is linear. Treasury rate of an economy is vital in determining the future prospects of the government and in turn the country. It is the comprehensive yield an investor expects when he/she holds the government security of the country. Therefore, there is a direct positive influence on the yields of the individual bonds.

The Table 3 also shows the illiquidity is significant at 1% with a P-values of 0.003. Thus, the alternative hypothesis is accepted and it can be said that illiquidity has a significant influence on the Yields of the bonds. The coefficient is -0.24920 which means that there is a negative relationship between both and if illiquidity changes by a unit, then the Yields will change by -0.24920 units. However, the liquidity premium theory predicts that there should exist a positive relationship between the illiquidity and the yields of a financial instrument. So, the findings are not in line with the theories. In developed markets like the United States and the European markets, the presence of illiquidity premium is evidenced. This result indicates that the government bond market of India is highly regulated by the RBI and that is why the relationship is different from the theories.

7. CONCLUSION

In this paper the association between the liquidity and the yields of the government bonds has been examined to understand the nature of illiquidity premium existing in the Indian government bond market. For this purpose the data have been primarily collected from the NDS-OM platform and the Amihud Illiquidity measure has been used to estimate the illiquidity proxies. The illiquidity proxies so calculated are found to be in decimal fractions and are very close to zero, indicating that the illiquidity in the Indian government bond market are on the lower side. In other words, the liquidity of this market is on the higher side. The effect of these illiquidity proxies on the yields of the bonds are estimated using the Driscoll Kraay Standard Error Method of the Fixed Effects Model. The test gives a coefficient of -0.2492043 for illiquidity indicating a negative effect of illiquidity on bond yields. This finding is not consistent with the existing literature on liquidity premium and in contrast with the studies conducted on the European markets. This result can be due to the fact that the government bond market is highly regulated and highly controlled by the RBI. In the Indian government bond market, the price-setting mechanism is highly controlled. Thus, to sum up it can be concluded that the Indian government bond market is a highly regulated market and is highly liquid. The illiquidity of the market has a negative impact on the yield of the bonds.

APPENDIX

The following table represents the estimated value of the illiquidity proxies year wise, using the Amihud Illiquidity Measure:

BOND ID	2019	2020	2021	2022	2023	TOTAL	MEAN
1	0.0193225	0.0160505	0.1594430	0.0148798	0.0088579	0.2185538	0.0437108
2	0.0008850	0.0006838	0.0007120	0.0096347	0.0004792	0.0123946	0.0024789
3	0.0006013	0.0024126	0.0021574	0.0009470	0.0005051	0.0066233	0.0013247
4	0.0005043	0.0004664	0.0012094	0.0017304	0.0008720	0.0047825	0.0009565

BOND ID	2019	2020	2021	2022	2023	TOTAL	MEAN
5	0.0032767	0.0012582	0.0027046	0.0092364	0.0026954	0.0191713	0.0038343
6	0.0003540	0.0000006	0.0008695	0.0007325	0.0020964	0.0040530	0.0008106
7	0.0031916	0.0416844	0.0284084	0.7614105	0.1195253	0.9542201	0.1908440
8	0.0000539	0.0005399	0.0009084	0.0000887	0.0000019	0.0015928	0.0003186
9	0.0032052	0.0001017	0.0010889	0.0000901	0.0022404	0.0067263	0.0013453
10	0.0000003	0.0000006	0.0000005	0.0000004	0.0000297	0.0000314	0.0000063
11	0.0033272	0.0150106	0.0130956	0.0160555	0.0190344	0.0665234	0.0133047
12	0.0000042	0.0004606	0.0003546	0.0012542	0.0001794	0.0022529	0.0004506
13	0.0009130	0.0144363	0.0031716	0.0008548	0.0002384	0.0196142	0.0039228
14	0.0030971	0.0031892	0.0036954	0.0001633	0.0013486	0.0114936	0.0022987
15	0.0094876	0.0035966	0.0022884	0.0003482	0.0362024	0.0519232	0.0103846
16	0.0003300	0.0002085	0.0002910	0.0000843	0.0000378	0.0009516	0.0001903
17	0.0031920	0.0031670	0.0005935	0.0047899	0.0055365	0.0172788	0.0034558
18	0.0025141	0.0116717	0.0051009	0.0003963	0.0058754	0.0255583	0.0051117
19	0.0106716	0.0001061	0.0000107	0.0005671	0.0000184	0.0113739	0.0022748
20	0.0002149	0.0007669	0.0012398	0.0014616	0.0001758	0.0038591	0.0007718
21	0.0012411	0.0007800	0.0002903	0.0004945	0.0041550	0.0069609	0.0013922
22	0.0318343	0.0010255	0.0001049	0.0036667	0.0022210	0.0388524	0.0077705
23	0.0367816	0.0008269	0.0052690	0.0002015	0.0092299	0.0523089	0.0104618
24	0.0012805	0.0004318	0.0006389	0.0000588	0.0000001	0.0024101	0.0004820
25	0.0006414	0.0091011	0.0013520	0.0044184	0.0189243	0.0344373	0.0068875
26	0.0000470	0.0022063	0.0001901	0.0003884	0.0001411	0.0029729	0.0005946
27	0.0000009	0.0000194	0.0001675	0.0004759	0.0001579	0.0008215	0.0001643
28	0.0187261	0.0056091	0.0015962	0.0086857	0.0122642	0.0468813	0.0093763
29	0.0018831	0.0033574	0.0046897	0.0109204	0.0021008	0.0229514	0.0045903
30	0.0126385	0.0025199	0.0028466	0.0374299	0.0036427	0.0590775	0.0118155
31	0.0339127	0.0134751	0.0175505	0.0143183	0.0125932	0.0918499	0.0183700
32	0.0039143	0.0155764	0.0047721	0.0197301	0.0266528	0.0706457	0.0141291
33	0.0166756	0.0327619	0.0533207	0.2484728	0.1650792	0.5163103	0.1032621
34	0.0009365	0.0013980	0.0031945	0.0102878	0.0407729	0.0565897	0.0113179
35	0.0020680	0.0000197	0.0015330	0.0000042	0.0000557	0.0036805	0.0007361
36	0.0004688	0.0031426	0.0022425	0.0054998	0.0059016	0.0172553	0.0034511
37	0.0004178	0.0024986	0.0002153	0.0000171	0.0007923	0.0039411	0.0007882
38	0.0308521	0.0061859	0.0125117	0.0050772	0.0029145	0.0575415	0.0115083

BOND ID	2019	2020	2021	2022	2023	TOTAL	MEAN
39	0.0010321	0.0077330	0.2231493	0.0407207	0.0356418	0.3082768	0.0616554
40	0.0008007	0.0029785	0.0017009	0.0017602	0.0017040	0.0089443	0.0017889
41	0.0041516	0.0074083	0.0134952	0.0059672	0.1971730	0.2281953	0.0456391
42	0.0109222	0.1265648	0.1657549	0.0102720	0.0055630	0.3190769	0.0638154
43	0.0000070	0.0001299	0.0000081	0.0035433	0.0000594	0.0037477	0.0007495
44	0.0014540	0.0044532	0.0073571	0.0274834	0.0394096	0.0801574	0.0160315
45	0.0137201	0.1076680	0.0186339	0.1074261	0.0823896	0.3298377	0.0659675
46	0.0083418	0.0092591	0.0458224	0.0132746	0.0405280	0.1172259	0.0234452
47	0.0017593	0.0002676	0.0057797	0.0102224	0.0003599	0.0183889	0.0036778
48	0.0005589	0.0009340	0.0000184	0.0061844	0.0000052	0.0077009	0.0015402
49	0.0044025	0.0505297	0.0592660	0.0114164	0.0170719	0.1426866	0.0285373
50	0.0008007	0.0006162	0.0008283	0.0019283	0.0005102	0.0046837	0.0009367
51	0.0029651	0.0003389	0.0009371	0.0353046	0.0021522	0.0416979	0.0083396
52	0.0021652	0.0493726	0.7110617	0.0050035	0.0126867	0.7802896	0.1560579
53	0.0031034	0.0031584	0.0004940	0.0004097	0.0000033	0.0071688	0.0014338
54	0.0006834	0.0008598	0.0664646	0.0124438	0.0971666	0.1776183	0.0355237
55	0.0000334	0.0001241	0.0000385	0.0002146	0.0001810	0.0005915	0.0001183
56	0.0049652	0.0065655	0.0825479	0.0067675	0.0011479	0.1019940	0.0203988
57	0.0000299	0.0002736	0.0001095	0.0009410	0.0044065	0.0057605	0.0011521
58	0.0025975	0.0035875	0.2260499	0.0250720	0.0251103	0.2824172	0.0564834
59	0.0134784	0.0028318	0.0014288	0.0231941	0.0008180	0.0417511	0.0083502
60	0.0031985	0.0001763	0.0003268	0.0022829	0.0031521	0.0091366	0.0018273
61	0.0794348	0.0122313	0.0033130	0.0029899	0.0087102	0.1066792	0.0213358
62	0.0093738	0.0012600	0.0017467	0.0063175	0.0050875	0.0237855	0.0047571
63	0.0139316	0.0042641	0.0081637	0.0005871	0.0200526	0.0469991	0.0093998
64	0.0208097	0.0392647	0.0058520	0.1121801	0.0404688	0.2185752	0.0437150
65	0.0129280	0.0104634	0.0175016	0.0130300	0.0739784	0.1279015	0.0255803
66	0.0001999	0.0001295	0.0006902	0.0071189	0.0034188	0.0115572	0.0023114
67	0.0005840	0.0058229	0.0013239	0.0004609	0.0023524	0.0105441	0.0021088
68	0.0219497	0.0073258	0.0092242	0.0002514	0.0470086	0.0857598	0.0171520
69	0.0128935	0.2341496	0.0319753	0.0040575	0.0343145	0.3173903	0.0634781
70	0.0201140	0.0033385	0.0320946	0.0073869	0.2736905	0.3366245	0.0673249
71	0.2479089	0.1197322	0.0375433	0.1141724	0.0683342	0.5876911	0.1175382
72	0.0006815	0.0011314	0.0021905	0.0001056	0.0017762	0.0058853	0.0011771

BOND ID	2019	2020	2021	2022	2023	TOTAL	MEAN
73	0.0344676	0.0558429	0.0095941	0.0065205	0.0023649	0.1087901	0.0217580
74	0.0049877	0.0031132	0.0168389	0.3276579	0.0018339	0.3544316	0.0708863
75	0.0032383	0.0041376	0.0104002	0.0509516	0.0053124	0.0740401	0.0148080
76	0.0001966	0.0016828	0.0003429	0.0017894	0.0040653	0.0080770	0.0016154
77	0.0033021	0.0004556	0.0009785	0.0022473	0.0006875	0.0076711	0.0015342
78	0.0000002	0.0000238	0.0000653	0.0031738	0.1002614	0.1035244	0.0207049
79	0.0002374	0.0004512	0.0000109	0.0000921	0.0031235	0.0039152	0.0007830
80	0.0004999	0.0000592	0.0003472	0.0000639	0.0014068	0.0023769	0.0004754
81	0.0041642	0.1512189	0.0234764	0.0057588	0.0337806	0.2183988	0.0436798
82	0.0057783	0.0163128	0.0146167	0.0046297	0.0218956	0.0632331	0.0126466
83	0.0000857	0.0093399	0.0064714	0.0038649	0.0010867	0.0208486	0.0041697
84	0.0017092	0.0003265	0.0000674	0.0000293	0.0000072	0.0021397	0.0004279
85	0.0011460	0.0001608	0.0006438	0.0000228	0.0021578	0.0041313	0.0008263
86	0.0002074	0.0012082	0.0000289	0.0004883	0.0003091	0.0022419	0.0004484
87	0.0294226	0.0783640	0.5733377	0.0471853	0.1289847	0.8572943	0.1714589
88	0.0060798	0.0041189	0.0008132	0.0288958	0.0057281	0.0456357	0.0091271
89	0.0023873	0.0087792	0.0081110	0.0036643	0.0138492	0.0367912	0.0073582
90	0.0432576	0.0025026	0.0001924	0.0019273	0.0001811	0.0480611	0.0096122
91	0.0087058	0.0029422	0.0034199	0.0072390	0.0046583	0.0269652	0.0053930
92	0.0067768	0.0058940	0.0197061	0.0133404	0.0298316	0.0755489	0.0151098
93	0.0785702	0.0861211	0.0066957	0.0084427	0.0228556	0.2026853	0.0405371
94	0.0001774	0.0000678	0.0005358	0.0000780	0.0001531	0.0010122	0.0002024
95	0.0034518	0.0006733	0.0068387	0.0039012	0.0009627	0.0158277	0.0031655
96	0.0107306	0.0076269	0.0000068	0.0020215	0.0000034	0.0203892	0.0040778
97	0.0008140	0.0002218	0.0003819	0.0027438	0.0004900	0.0046515	0.0009303
98	0.0025745	0.0006309	0.0008277	0.0001846	0.0012283	0.0054461	0.0010892
99	0.0000218	0.0000047	0.0000234	0.0000012	0.0000050	0.0000562	0.0000112
100	0.0120671	0.0007783	0.0005599	0.0702954	0.0032829	0.0869836	0.0173967
101	0.0005456	0.0001341	0.0000061	0.0007017	0.0001630	0.0015506	0.0003101
102	0.0013999	0.0006312	0.0002242	0.0028911	0.0024457	0.0075921	0.0015184
103	0.0011368	0.0004779	0.0010497	0.0005312	0.0011151	0.0043106	0.0008621
104	0.0140976	0.0014892	0.0002342	0.0069877	0.0091768	0.0319855	0.0063971

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