



## ORIGINAL PAPER

# Investigating the Effects of Financial Leverage, Net Interest Margin, Interest Coverage Ratio and Solvency Ratios on Earnings Per Share of Indian Banks

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### Abstract:

The study assesses the impact of financial leverage, interest coverage ratios, and debt-to-equity ratios on the earnings per share (EPS) of Indian banks during the COVID-19 pandemic. It analyzed 23 Indian banks in the NIFTY 100 index, including 10 private and 13 public sector banks. The results showed that financial leverage, interest coverage ratios, and debt-to-equity ratios significantly impacted EPS. The interest coverage ratio had a favorable effect, while financial leverage and debt-to-equity ratios had negative effects.

**Keywords:** *Financial Leverage; Debt to Equity ratio; Earnings per share; Interest coverage ratio; Pooled regression.*

**JEL Classification :** C33, G13, G32

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## **I Introduction**

As a major contributor to the national or regional economy, the banking sector represents the backbone of a country's financial system (Sunaryo, 2020). The banking industry faced challenges as a result of the COVID-19 pandemic new challenges such as: increase of online banking/e-banking usage, cardless shopping and branchless banking (Shah et al., 2023); (Somani & Kumar, 2020). In Vietnam, reasons for this shift in behavior include a growing preference for online shopping and a greater comfort level with using online banking.(Ngo et al., 2023). Technological advancements have caused a major shift in the financial sector(Mehdiabadi et al., 2020), but it seems that COVID-19 pandemic badly affected the banking sector. Banks that exist solely online have been shown to have several flaws and to be vulnerable to a wide variety of threats in today's era of FinTech institutions and competition from conventional banks that have created and developed mobile and Internet banking. The Return on Equity (ROE) and Return on Assets (ROA) showed a slight improvement during pandemic year 2020 (Schmidt-Jessa, 2022). Researchers found that the spread of the COVID-19 virus had a major impact on the efficiency and safety of 2073 banks across 106 countries between the Q1 2016 and the Q2 of 2021(Mohsin, et al., 2023). Moreover, it is continuously introducing reforms in the Indian Banking System in order to minimize the effects of COVID-19. As a whole, the world is suffering from COVID-19 pandemic. This leads to a change in the way the world works. As a result, another great depression occurs. In late December 2019, COVID-19 (a novel Coronavirus) started spreading in Wuhan, China, and after that, it spread to other parts of the world. A pandemic was declared on 11th March 2020 by the World Health Organization after it was observed the rapidity of the spread and the high degree of infection which caused an increase in death rates (Bobade & Alex, 2020). The global spread of Covid-19 has coincided with India's efforts to reverse its dismal GDP development. The spread of COVID-19 has disrupted recovery efforts significantly.

According to a report by the Reserve Bank of India in 2020, the COVID-19 pandemic has had a negative impact on 19 industries in India during the course of the previous two quarters, resulting stress of debt to amount to  $1.552 \times 10^7$  million rupees (Patel, et al., 2021).

Non-performing loans rose as the number of people who lost their jobs and were unable to make their loan payments because of the COVID-19 pandemic reduced bank profits and slowed down banking operations(Hawaldar, et al., 2022). Telecom AGR (adjusted gross revenue) liability and the Yes Bank fiasco impacted both sentiment and market valuation when bank NPAs decreased from over 10% of advances and profitability resumed. In response to the GST, many banks restructured loans to small and medium-sized businesses (SMBs) (Perwej, 2020). A short-term disruption of Indian banking due to the COVID-19 pandemic such as, reduced serviceability due to inaccessibility of data and infrastructure, an expected reduction in returns on FIs due to a temporary correction in valuations, routine operations were difficult to access, default in the repayment of a loan, non-essential operations are being scaled down, the number of cross-border and domestic trade transactions have decreased significantly.

All around the world, economies have been affected by COVID-19 pandemic. May 2020 estimates by the Asian Development Bank (ADB) put the cost of a global pandemic caused by the Coronavirus (COVID-19) at between USD 5.8 trillion and USD 8 trillion, or 6.4% to 9.7% of global GDP. Due to COVID-19 pandemic, there has been a prolonged crisis in Indian banking sector such as: a) Distribution of shared workforce

services is becoming increasingly popular, b) Digital transactions are becoming more and more popular, c) Insurance policies for health and life are becoming increasingly popular, d) Lack of deployment opportunities leads to surplus capital accumulation, e) A decline in revenue and margins has led to an increase in defaults, Increase in defaults due to lower revenue and margins (Bobade & Alex, 2020). The COVID-19 pandemic poses a serious challenge for banks such as the following: revenue generation declines due to lower footfall, lower demand, reduced and remote staffing, and due to skewed interest expenses, net interest income will be likely to be stressed (Perwej, 2020). Therefore, numerous parameters, including the Debt to Assets ratio, the Debt-to-Equity ratio, the Interest Coverage Ratio, the Financial Leverage Ratio, and the Net Interest Margin, have changed as a result of the COVID-19 epidemic. EPS is a metric used to evaluate a company's profitability to shareholders.

Some of these studies revealed that Debt to Equity ratios had a negative and significant impact on EPS (Tarigan, et al., 2021; Ndubuisi, et al., 2019; Ur Rehman, 2013). On the other hand, certain research studies also revealed that DER had affirmative effect on EPS (Sriyono, et al., 2018, Nugraha, et al., 2020). Some other studies also concluded that Debt to Equity Ratio had no significant effect on Earnings per Share (Dewi, 2021). Moreover, Debt to Equity Ratio (DER) had a significant effect on Earnings Per Share or EPS (Larasati, et al., 2020; Taani & Banykhaled, 2011). Therefore, by improving on previous research approaches, this study attempts to fill this knowledge gap by investigating the effects of DER on the EPS of Indian banks that are included in the NIFTY 100 from January 2020 to June 2022 (Nugraha, et al., 2020) concluded that DAR negatively affects EPS. Only a few studies have been found on the effect of DAR on EPS. There is no previous research study focused on the effect of the Interest Coverage Ratio (ICR) on EPS.

Several research have been done on the link between DER, DAR, and EPS in the non-banking sectors such as manufacturing companies (Tarigan, et al., 2021) non-financial firms (Ndubuisi, et al., 2019), companies' property (Sriyono, et al., 2018), real estate and construction companies (Dewi, 2021), chemicals sector (Nugraha, et al., 2020), sugar companies (Ur Rehman, 2013) but there is no study toward banking sector. So that it is also one reason to provide such innovative research study because there is no previous study has been conducted on banking sector.

## **II Literature Review**

In this analysis, we break down the literature review into several sections. The literature review highlights a few important research works about the NIM, DER, DAR and financial leverage ratio which is focusing on several ratios and their relationship with EPS. Some research papers shows that Earnings Per Share is positively affected by Interest Margin (Thenu, 2018) based on PT Bank Central Asia Tbk for 10 years, while (Canh, 2015) studies only 6 years of PT Bank Central Asia Tbk whereas (Kiet, 2020) other study have been conducted to analyze the revenue from commercial banks in Vietnam in relation to bad loans, net interest margin, ROE, and ROA. Also, every quarter from 2014 to 2018, we gathered 100 pieces of secondary data from the five largest commercial banks in Vietnam. Results show that NPL, NIM, ROE, and ROA all play a role in EPS.

There is a study (Kumar, 2017) which is related to the Indian steel companies which were studied to determine the connection between their degree of financial leverage and their EPS, for the sample period from 2006-07 to 2014-15. In order to

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conduct this study, SAIL's and Tata Steel's Annual Reports were used as secondary sources of data. Degree of financial leverage was negatively correlated with earnings per share at SAIL, but not at Tata Steel Limited. Separate research using data from 371 Indian companies listed on the Bombay stock exchange found no statistically significant change in net profit, earnings per share, or diluted earnings per share in the construction and food industries either before or after the COVID-19 pandemic (Alsamhi et al., 2022). Moreover, according to Roman et al. (2022) the concept of public confidence in banks represents a very important issue for the sustainable growth and development of the banking field.

During the sample period of 2017-2019, EPS were positively impacted by manufacturing firms' current ratios and negatively impacted by their debt-to-equity ratios on the Indonesia Stock Exchange. (Tarigan et al., 2021). Debt-to-equity ratio was found to significantly impact earnings per share. (Larasati et al., 2020) found that return on equity (ROE) has an effect on EPS. Profitability (ROE), market value (PBV), operating cash flow (OCF), and leverage (DER) ratios all have a substantial effect on EPS (Taani & Banykhaled, 2011). The debt equity ratio is positively related to returns on assets and sales growth for Pakistani sugar firms, but negatively related to earnings per share, net profit margin, and returns on equity (Ur Rehman, 2013). A study of Bangladeshi public manufacturing companies' profitability is conducted in another research study. This research found that while both debt and equity ratios positively affected ROA, the debt-to-equity ratio had a negative effect. This report also reveals the detrimental effect that the debt-to-equity ratio has on earnings per share (Rahman et al., 2019). Using data from the Indonesia Stock Exchange (IDX), we find that the variable current ratio has no appreciable impact on EPS for the LQ45 businesses that were listed there between 2011 and 2015. Similarly, Return on Asset has a negligible impact on EPS. The Debt-to-Equity Ratio is a major factor in determining EPS (Nugroho et al., 2020). Earnings per share were not significantly impacted by the debt-to-equity ratio. Earnings per share were not affected by the current ratio, while Total Asset Turnover was significantly positive (Dewi, 2021). This research paper is based on sample research method of food and beverage manufacturing companies for the sample period from 2012 to 2016 for a number of 12 companies. With the help of F test result revealed that ROE, Current Ratio, Net Profit Margin DER have a positive effect on EPS and t test shows that Current Ratio has a negative effect on EPS (Sriyono et al., 2018). EPS was negatively correlated with the Debt-to-Equity ratio and total debt to total assets measures of financial leverage, but return on equity was not (Ndubuisi et al., 2019).

### **III Hypotheses Development**

1.  $H_{0a}$ : **Net interest margin** has no impact on **EPS** of Indian Banks during COVID-19.
2.  $H_{0b}$ : **Interest coverage ratio** has no impact on **EPS** of Indian Banks during COVID-19
3.  $H_{0c}$ : **Financial leverage ratio** has no impact on **EPS** of Indian Banks during COVID-19
4.  $H_{0d}$ : **Debt to Equity ratio** has no impact on **EPS** of Indian Banks during COVID-19
5.  $H_{0e}$ : **Debt to Assets ratio** has no impact on **EPS** of Indian Banks during COVID-19

#### **IV Research Methodology**

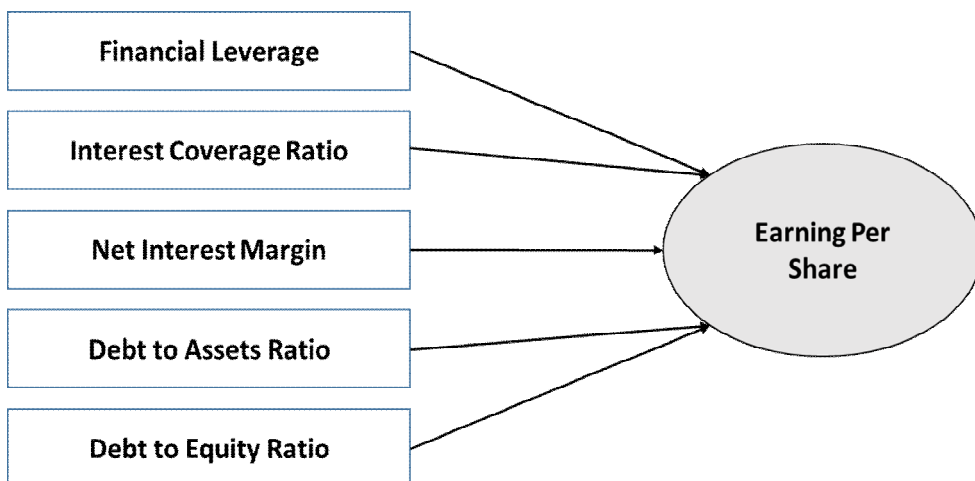
There was a total of 23 financial institutions in India considered for the study, 10 from the private sector and 13 from the public sector. Ten quarterly reports from 23 Indian banks were used as secondary data to calculate a variety of ratios for the study's sample period of January 2020 through June 2022. Since the global COVID-19 epidemic would hit in January 2020 and continue to wreak havoc until June 2022, researchers focused on that time frame. EPS during these times are of importance, and so is the effect of financial leverage, net interest margin, interest coverage ratio, debt to assets, and debt to equity. Because of the lockout, even most stores were shut down. Financial leverage, net interest margin, interest coverage ratio Debt to Assets and debt to equity ratio are the independent variables in the model, with EPS as the dependent variable. These ratios of Indian banks are extracted and calculated using secondary data based on their quarterly income statements and balance sheets found on websites like [www.in.investing.com](http://www.in.investing.com), [www.moneycontrol.com](http://www.moneycontrol.com), and [www.screener.in](http://www.screener.in). All of the factors in the study's equation must remain constant over time. The unit root test has been used to examine for stationary behavior; this test is also known as the Augmented Dickey Fuller Test due to the inclusion of test equations for the trend, intercept, and trend-intercept. There would have been the right number of differentiations done if the data weren't stationary. A pooled regression model has been developed to test the assumptions about the model's significance and the nature of the connection between the independent and dependent variables. Coefficients of independent variables in constructed models have been determined to be statistically significant by comparing the p-value to the significance level. Those prototype models are further optimised by removing the independent variables for which the coefficients are not statistically significant from the models.

#### **V Significance of the Study**

The study may offer new perspectives on how debt to equity, Debt to Assets, net interest margin, leverage ratio, and interest coverage ratio affect earnings per share (EPS). This also enables to find those ratios which have significant impact on earnings per share (EPS) which results in future forecasting on profitability position using the estimated values of balance sheets' and income statements' items if pandemic would affect in the same manner as like in the year 2020 to mid-2022. Such study could assist the shareholders to assess to make long term position of their holdings and also help the educated customers of banks to understand the impact of solvency and capital adequacy on growth of their banks. Moreover, the government, RBI and the policy makers could judge the profitability using the formulated models. The study could act as a base even for the scholars working in this area, to ascertain the interrelationship between some new ratios.

**Theoretical Framework** – Earnings per share are considered the dependent variable in the conceptual framework, whereas financial leverage, the interest coverage ratio, the net interest margin, the debt-to-equity ratio, and the Debt to Assets ratio are considered the independent variables. Figure 1 can be used to demonstrate this.

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**Figure 1** Flow chart showing the Predictors and Dependent Variables  
**Source:** Research findings.

### VI Results and Discussion

As the data of ten quarters of 23 banks i.e., balanced panel data, has been used to measure the impact of financial leverage, net interest margin, interest coverage ratio Debt to Assets and debt to equity ratio on EPS. For the purpose of the finding the impact of above variables on EPS of Indian banks, pooled regression model has been used. Further the Using Step-by-Step Regression, we constructed a model to capture the effects of multiple important variables which impact the EPS of Indian Banks at the current situation.

#### Formulation of pooled regression model

Based on the objective/ Hypothesis of the study the dependent variable is EPS (earnings per share), whereas the regressors are financial leverage, net interest margin, interest coverage ratio, debt to equity and Debt to Assets ratio. To test if the model is statistically significant and the connection between the independent and dependent variables follows the alternative hypothesis outlined from **H0A** to **H0E**, a multiple regression model has been constructed. The outcome of the regression model is displayed in Table1.

**Table 1.** Formulation of pooled regression model for Model-1

Model Description									
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	.422 <sup>a</sup>	.178	.160	17.757005	.178	9.707	5	224	.000
ANOVA <sup>a</sup>									
Model 1		Sum of Squares		df	Mean Square		F	Sig.	
Regression		15302.902		5	3060.580		9.707	.000 <sup>b</sup>	
Residual		70629.718		224	315.311				
Total		85932.620		229					
Coefficients <sup>a</sup>									
Model 1		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics		
		B	Std. Error	Beta			Toleranc	VIF	
(Constant)		16.650	3.714		4.483	.000			
FLR		-.146	.047	-.189	-3.072	.002	.973	1.028	
ICR		9.145	2.509	.298	3.645	.000	.550	1.818	
DAR		-4.445	4.006	-.090	-1.110	.268	.552	1.811	
DER		-1.074	.272	-.252	-3.949	.000	.904	1.106	
NIM		-1.293	9.222	-.009	-.140	.889	.986	1.014	
Collinearity Diagnostics <sup>a</sup>									
Model	Dimension	Eigenvalue	Condition Index	Variance Proportions					
				(Consta	FLR	ICR	DAR	DER	NIM
1	1	3.663	1.000	.01	.01	.01	.01	.01	.00
	2	.968	1.945	.00	.10	.00	.00	.00	.86
	3	.814	2.121	.00	.88	.00	.00	.00	.11
	4	.387	3.077	.03	.01	.31	.02	.10	.00
	5	.109	5.792	.09	.00	.51	.94	.00	.00
	6	.059	7.880	.87	.00	.16	.03	.89	.02
a. Dependent Variable: EPS (Earnings per share)									
b. Predictors: (Constant), Net interest margin (NIM), Interest coverage ratio (ICR), Financial leverage (FLR), Debt to equity ratio (DER), Debt to Assets ratio (DAR) <sup>b</sup>									

**Source:** Research findings

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**Table 2.** Status of Hypotheses after the Formulation of Model-1

H <sub>0a</sub> : Net Interest Margin has not significant impact on EPS of Indian Banks	Rejected (Dropped)
H <sub>0b</sub> : Interest coverage ratio has not significant impact on EPS of Indian Banks	Accepted
H <sub>0c</sub> : Financial leverage ratio has not significant impact on EPS of Indian Banks	Accepted
H <sub>0d</sub> : Debt to equity ratio has not significant impact on EPS of Indian Banks	Accepted
H <sub>0e</sub> : Debt to Assets ratio has not significant impact on EPS of Indian Banks	Rejected (Dropped)

**Source:** Research findings.

Table 1 presents the findings from Multiple Regression Model 1. The table consists of four parts: the outcomes of the model summary, the outcomes of the ANOVA, the results of the coefficients, and the Collinearity Diagnostics. The explanatory variables in the first component can account for 17.8% of the explained variable, according to component where the value of R square is 0.178. (Dependent variable). The value of F statistics in the second component of variables is significant since the p value is less than 0.05, indicating that the aforementioned Model-1, which was defined by taking the independent variables into consideration, fits the data better than the intercept alone. When it comes to the third component's independent variable coefficients, only one, the ICR, has a positive coefficient, while the other four, the net interest margin (NIM), FLR, DER, and DAR, all have a negative coefficient. The inverse association between these independent variables and the influence on EPS of Indian banks from January 2020 to mid-2022 is shown by the negative coefficients of these four variables. In the last component (fourth) of table where the results of Condition Index based on Collinearity Statistics are below the value of 15 so collinearity is not suspected in this case. Similarly, the tolerance is within the limit (less than 1) and VIF (variance Inflation factor) value is also within the limit (less than 10). The purpose of the correlation analysis is to prevent collinearity among the variables and to demonstrate the extent of the degree of relationship among the variables utilized in the study. Table 2 shows the validity of hypotheses after formulation of Model-1. After creating a regression model by considering every single one of the 5 independent variables, the status of the hypotheses is shown in Table 2 of the results. Two hypotheses, H<sub>0a</sub> and H<sub>0e</sub>, have been eliminated from the model after its framing because the variables associated with those hypotheses do not have statistical significance (p values greater than 0.05). So, while framing a new improved model, these two variables will be removed. As a result, a new revised model is created using only three variables with significant coefficients. Table 3 presents the findings of the Model-2, a new updated model.



**Table 3.** Formulation of pooled regression model for Model-2

<b>Model Description</b>									
Mode l 2	R	R Squa re	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Chang e	df1	df2	Sig. F Change
2	.417 <sup>a</sup>	.174	.163	17.72737 0	.174	15.815	3	226	.000
<b>ANOVA<sup>a</sup></b>									
Model 2		Sum of Squares	Df	Mean Square	F	Sig.			
	Regression	14909.938	3	4969.979	15.815	.000 <sup>b</sup>			
	Residual	71022.682	226	314.260					
	Total	85932.620	229						
<b>Coefficients<sup>a</sup></b>									
Model 2	Unstandardized Coefficients			Standardized Coefficients	t	Sig.	Collinearity Statistics		
	B	Std. Error	Beta	Tolerance			VIF		
2	(Constant)	15.974	3.618		4.415	.000			
	FLR	-.148	.047	-.192	-3.130	.002	.975	1.025	
	ICR	7.321	1.893	.238	3.868	.000	.963	1.038	
	DER	-1.148	.261	-.269	-4.405	.000	.981	1.020	
<b>Collinearity Diagnostics<sup>a</sup></b>									
Model 2	Dimension	Eigenvalue	Condition Index	Variance Proportions					
				(Constant)	FLR	ICR	DER		
	1	2.760	1.000	.01	.03	.04	.01		
	2	.816	1.839	.01	.96	.01	.01		
	3	.363	2.757	.02	.01	.81	.08		
	4	.061	6.722	.96	.00	.15	.89		
a. Dependent Variable: EPS									
b. Debt to equity ratio (DER), Financial leverage (FLR), Interest coverage ratio (ICR) <sup>b</sup>									

**Source:** Research findings.

The findings of multiple regression model 2 are presented in Table 3. The table is divided into four sections: the model summary results, the ANOVA results, the coefficients results, and the convergent diagnostics of model 2. The explanatory variables can account for 17.4% of the explained variable in the first component, where the value of R square is 0.174. (Dependent variable). The value of F statistics in the second component of variables is noteworthy since the p value is less than 0.05, indicating that the aforementioned Model-2, which was defined by taking the independent variables into consideration, fits the data better than the intercept alone. When it comes to the third component's independent variable coefficients, only one, ICR, has a positive coefficient, while the other two, financial leverage (FLR) and DER, both have negative coefficients. The negative coefficients of these two variables show that they have an antagonistic effect on the EPS of Indian banks from January 2020 to mid-2022. The key finding is that, with a p-value of less than 0.05, all three variables exhibit significant coefficients. Tolerance and the Variance Inflation Factor (VIF) obtained for each variable are under the limit for the test of multi-collinearity, indicating that there is no multi-collinearity between the variables, supporting the use of the

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multiple regression model. Compared to Model-1, where both R and R squared have somewhat decreased values.

### **VII Conclusions**

The world economy has been hit hard by the COVID-19 epidemic, and it is likely that this event will go down in history as an extraordinary one. The banking industry has been hit the worst by the COVID-19 epidemic, although all financial sectors have been affected. The effects of financial leverage, interest coverage ratio, net interest margin, debt to equity ratio, and debt to assets ratio on Indian banks' EPS were regressed using a panel data set spanning Q1 2020 through Q2 2022. Table 3 demonstrate the outcomes of a formulated pooled regression model examining the connection between EPS and financial leverage, interest coverage ratios, and Debt to Equity ratios. The EPS of Indian banks is significantly impacted negatively by the financial leverage ratio (FLR), meaning that as FLR rises, EPS falls. This demonstrates that throughout this time period, Indian banks did not earn more money than their debt warranted. Interest rates tend to be high when there is a lot of financial leverage involved. Interest expenses eat away at profits, which in turn reduces earnings per share. Financial leverage has a negative effect on earnings per share since it increases interest payments. The effect of the interest coverage ratio on earnings per share at Indian banks was analyzed. As a result, the interest coverage ratio has a positive effect on the EPS of Indian banks, suggesting that they would be able to make their interest payments despite the current COVID-19 epidemic. The model testing also suggests that the Debt-to-equity ratio has adverse significant influence on EPS at the  $0.000 < 0.05$  level, suggesting that it affects the pricing of earnings per share. But the data also showed that the Debt to Assets ratio (with a coefficient of -4.445 and a significance level of  $0.889 > 0.05$ ) and the net interest margin (with a coefficient of -0.268 and a significance level of  $0.268 > 0.05$ ) do not have a negative effect on EPS. The DAR and the Net Interest Margin appear to have no bearing on the earnings per share of Indian banks. Bank management may find the study's findings helpful as they formulate financial and other policies and future budgets. The results of this study may not be generalizable to the banking sectors of other countries because they were conducted exclusively in India. Moreover, other characteristics of banking stability and how they affect profitability may inspire further study because the study only looked at banking efficiency. Additionally, it is possible to contrast the models created before and after the epidemic. Similar studies might be conducted in developed nations, and discussions comparing these types of countries are encouraged.

### **Acknowledgement**

We express our heartfelt gratitude to the leadership teams of University Constantin Brancusi in Tg-Jiu, Romania, University of Craiova in Romania, and Purnea University in Bihar, India, for establishing an exceptional collaborative research platform that offers abundant opportunities for the growth and development of young researchers in this contemporary research domain.

### **Authors' Contributions**

The authors contributed equally to this work.

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## **Investigating the Effects of Financial Leverage, Net Interest Margin, Interest Coverage Ratio and Solvency Ratios on Earnings Per Share of Indian Banks**

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Article Info

*Received:* April 27 2024

*Accepted:* May 28 2024

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**How to cite this article:**

Kumar, S., Meher, B.K., Kumari, P., Birau, R., Anand, A., Nioata (Chireac), R.-M. (2024). Investigating the Effects of Financial Leverage, Net Interest Margin, Interest Coverage Ratio and Solvency Ratios on Earnings Per Share of Indian Banks. *Revista de Științe Politice. Revue des Sciences Politiques*, no. 82, pp. 86 – 98.