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A study on capital structure and profitability of Nse nifty fifty companies

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Abstract
This empirical study investigates the interplay between capital structure decisions and a company's profitability over a 10-year period (2013-2022) using a sample of 50 stocks from the National Stock Exchange (NSE). Employing regression analysis and descriptive statistics, the research focuses on the ratios of debt-to-equity and debt to total funds as independent variables, while measuring profitability through Net Profit (NP), Return-on-Capital-Employed (ROCE), Return-on-Equity (ROE), and Net-Interest-Margin (NIM) as dependent variables. The findings reveal a positive relationship between capital structure decisions and profitability indicators, suggesting that businesses may experience increased profitability with a strategic incorporation of debt in their capital structure. The implications of these findings extend to informing financial decision-makers about the potential benefits of optimizing their capital structure. However, acknowledging the study's limitations is essential for a nuanced interpretation of the results.

Keywords: Capital Structure, Profitability, Debt-to-Equity Ratio, Debt to Total Funds Ratio, National Stock Exchange (NSE), Regression Analysis, Descriptive Statistics, Net Profit (NP)

Introduction

Capital structure, the composition of a company's financial resources in terms of debt and equity, plays a pivotal role in shaping the financial health and performance of a firm. Striking the right balance between debt and equity is a critical decision for businesses, influencing their risk profile, cost of capital, and overall profitability. This study delves into the relationship between capital structure and profitability, specifically focusing on companies listed on the National Stock Exchange's (NSE) Nifty Fifty index. Understanding the capital structure and its impact on profitability is of paramount importance for several stakeholders, including investors, financial analysts, corporate managers, and policymakers. Here's why this study is essential: Investment Decision-Making: Investors seek reliable information to make informed decisions about where to allocate their resources. By comprehending how a company's capital structure influences its profitability, investors can assess risk and expected returns more effectively. Risk Management: Capital structure is intricately linked to a company's risk profile. This study helps in identifying how different capital structures correlate with profitability, aiding in risk assessment and management. Corporate Financial Strategy: For companies, determining the optimal capital structure is a strategic decision. By examining the experiences of NSE Nifty Fifty companies, this study provides insights into successful financial strategies and potential pitfalls. Policy Implications: Policymakers and regulators can benefit from understanding the dynamics between capital structure and profitability. This knowledge can inform policies related to financial markets, corporate governance, and capital adequacy. Market Dynamics: The NSE Nifty Fifty index represents a diverse set of companies from various industries. Analyzing the capital structure and profitability within this index provides a broad perspective on market dynamics and sector-specific trends. Academic Contribution: This study contributes to the academic discourse by adding empirical evidence to the existing theories on capital structure and profitability. It provides a real-world context to theoretical frameworks, enriching the understanding of financial dynamics. In conclusion, unraveling the complexities of capital structure and its impact on profitability is crucial for fostering a healthy and sustainable business environment. The findings of this study are anticipated to provide valuable insights that go beyond theoretical frameworks, offering practical implications for various stakeholders in the financial landscape.

Literature Review

The literature review presents a comprehensive overview of studies investigating the relationship between capital structure and firm profitability. Key findings from various countries and industries include:
Sikarwar & Goyal (2021) [1]: Identified a strong connection between growth, uniqueness, non-debt tax shields, collateral value, size, profitability, volatility, and capitalization in stocks on the National Stock Exchange. Niresh (2012) [2]: Explored the effects of financial framework on profitability for Sri Lankan banks, providing insights for capital structure-related policy decisions. Endri *et al.* (2021) [3]: Studied 42 Indonesian mining businesses, revealing complex relationships between debt ratios and performance metrics. Ahmad (2014) [4]: Explored Pakistan's cement industry, indicating a negative association between liability quantity and profitability. Bhatt and Jain (2020) [5]: Analyzed Nepal's commercial banks, highlighting a highly positive correlation between profitability and bank size. Rosario and Chavali (2019) [8]: Examined 22 Indian hotel enterprises, emphasizing a strong link between debt variable and profit. Alalade, Oguntodu, Adelakun, *et al.* (2015) [7]: Investigated Nigerian food product companies, finding a

negative influence on return-on-equity and return-on-assets but favorable effects on Return-on-Capital-Employed. Anozie, Muritala, Ininm, Yisau, *et al*. (2023) [8]: Explored the impact of a firm's capital arrangement on Nigerian energy companies, revealing varied effects of short-term and long-term debt on performance. Zafar, Zeeshan, Ahmed, *et al*. (2016): Analyzed how capital framework affects Pakistani banks, confirming a favorable correlation between elements influencing financial performance and capital structure. Singh, Singh (2016) [22]: Examined Indian cement companies, finding an inverse link between debt and profitability.

Ghayas & Akhter (2018) [11]: Studied 35 Indian pharmaceutical organizations, highlighting the impact of short-term and overall debt on Return-On-Equity. Sofat & Singh (2017) [12]: Investigated the top 100 manufacturing firms on the BSE, revealing relationships between debt ratios and factors like asset composition, business risk, and Return-on-Assets. Ayaz, Zabri, Ahmad (2021) [13]: Explored connections between corporate structure and performance in Malaysia, discovering a shift from positive to negative correlation when the mix of equity and debt exceeds the ideal level. Osama, Nsour (2019) [14]: Explored the impact of earnings and financial makeup on the value of Jordanian manufacturing firms.

Gómez, Rivas, Bolaños (2014) [15]: Determined factors influencing the financial structure of nonfinancial companies in Lima, Peru. Abrar & Javaid (2016) [16]: Analyzed funding sources and profitability of microfinance organizations worldwide, showing that deposits increase capital-structuring debt levels, supporting overall profitability. Kyissima, Xue, Kossele, Abeid (2020) [17]: Examined the stability of the financial arrangement for 716 listed Chinese companies, indicating the impact of size, profitability, and investment prospects on capital structure. Abeywardhana (2015) [18]: Explored the connection between financial framework and non-financial SMEs' profitability in the UK, finding a significant inverse correlation. Alipour, Mohammadi, Derakhshan (2015) [19]: Examined factors influencing Iranian firms' capital structure, highlighting the importance of various factors including payables. Khalifa Tailab (2014) [20]: Analyzed the impact of financial results on American energy firms, revealing adverse effects of total debt on ROE and ROA. Omoregie, Olofin, Ikpesu (2019) [21]: Investigated the link between capital arrangement and profitability-liquidity trade-off in Nigerian listed manufacturing enterprises, finding no evidence of a trade-off. Singh & Bagga (2019): Evaluated the consequence of financial framework on the profitability of Nifty fifty businesses in NSE India. Yegon, Cheruiyot, Sang, Cheruiyot, Kirui, Rotich (2014) [23]: Compared the capital framework and financial profits of Kenya's banking industry, discovering significant correlations between short-term debt and profitability and notable negative connections with long-term obligation.

Revathy & Santhi (2016) [24]: Investigated the link between financial structure variables and profitability of 70 Indian companies, highlighting the significant impact of capital makeup on revenue. Ambadkar (2019) [25]: Studied the relation between financial arrangement and profitability of Foreign Direct Investment firms in the Indian manufacturing industry. El-Sayed Ebaid (2009) [26]: Assessed the impact of financial arrangement decisions on business success in Egypt, finding little to no bearing on the success of the firm.

Mathur, Tiwari, Ramaiah, Mathur (2021) [27]: Investigated the connection between financial success and capital structure for BSE 500 listed pharmaceutical companies, revealing unfavorable impacts of high debt coverage ratio and competition on accounting performance. Rahman, Sarker, Uddin (2019) [28]: Examined the effect of financial framework on the success of publicly traded industrial enterprises in Bangladesh, highlighting diverse impacts of debt and equity ratios on ROA, ROE, and EPS.

Hossain (2016) [29]: Explored the outcomes of managerial rights and capital framework on the profitability of Bangladeshi enterprises. Marlina, Pinem, Hidayat (2020) [30]: Examined how capital structure is impacted by cash flow, earnings, and sales growth for Indonesian companies, revealing various effects on Capital Structure.

Overall, the literature review demonstrates a wide range of findings and perspectives on the relationship between capital structure and firm profitability, highlighting the complex and multifaceted nature of this association across different industries and regions.

Problem statement

Finding the ideal balance in their capital framework is a challenge for many businesses, which makes it difficult for them to maximize their financial performance and profitability.

Need of the study

The capital structure selection is the most important component of financial decisions because it directly affects an enterprise's success. Therefore, much care and consideration must be taken while making the capital structure decision. Capital structure decision involves figuring out how to combine the various funding sources required for financing assets and business operation. For determining the appropriate mix of these funds, capital structure analysis plays an important role.

Objectives of the study

1. To examine the capital structure pattern (types) of selected firms registered on NSE in India.
2. To know how capital structure decision affects firm’s profitability among Nifty50 stocks.

Scope of the study

The present study is primarily restricted to the Nifty 50 companies which are traded on NSE India. The study covers financial records for a duration of ten years from 2013-2022.This investigation was carried out to analyze how debt/equity and debt to total fund ratio affects firm’s financial performance and also to find the various capital structure patterns of the selected companies listed with India’s National Stock Exchange.

Research methodology

The study has collected the data of 10 years of NSE NIFTY 50 companies in support of the analysis. The study used “Regression” and “Descriptive Statistics” to find the relationship and variance between reliant and autonomous variables.

Regression Analysis: Was employed to analyze capital structure's impact on profitability. Here, profitability is the dependent variable, whereas capital structure is the independent variable.

Descriptive Statistics: Summarizes the variables used in the data set. The following list includes formulas used for this study:

NP = â0 + â1x1 NP = â0 + â1x2 ROCE = â0 + â1x1 ROCE = â0 + â1x2 ROE = â0 + â1x2 ROE = â0 + â1x2 NIM = â0 + â1x2 NIM = â0 + â1x2
Where,
X1 – Debt/Equity Ratio
X2 – Debt to Total Funds Ratio NP – Net Profit
â0 – Constant
ROCE – Return-on-Capital-Employed ROE – Return on Equity
NIM – Net Interest Margin

Hypothesis
Null hypothesis: There doesn't exist link between a firm's financial structure and profitability.
Alternative hypothesis: It has a link between company's earnings and financial arrangement of a firm.

Results and Analysis

Table 1: Profitability Predictor

X1 (Debt / Equity Ratio)					
Model	**Dependent variable**	**R**	**R2**	**Adjusted r square**	**Std. Error of the estimate**
1	NP	0.10892	0.01186	0.00988	9221.89156
2	ROCE	0.44160	0.19501	0.19339	15.61395
3	ROE	0.04969	0.00247	0.00046	1.89152
4	NIM	0.78865	0.62197	0.62121	0.70246

a. Predictors: Debt / Equity Ratio
Table 1 represents the results of a profitability predictor model, where independent variable X1 is analyzed in relation to various dependent variables such as NP (Net Profit), ROCE (Return on Capital Employed), ROE (Return on Equity), and NIM (Net Interest Margin). Model 1 has a weaker positive relationship (R = 0.109) with the net profit (NP), explaining only 1.19% (R^2 = 0.012) of its variance and have very high significant errors. Model 2 has a moderate positive relationship (R = 0.442) with ROCE, explaining 19.5% (R^2 = 0.195) of its variance and is moderately accurate. Model 3 has a very weak positive relationship (R = 0.050) with Return-on-Equity, explaining only 0.25% (R^2 = 0.002) of its variance and indicates reasonable accuracy in predictions. Model 4 has a solid positive relationship (R = 0.789) with Net-Interest-Margin, explaining 62.2% (R^2 = 0.622) of its variance and suggests that the predictions of this model are highly accurate.

Table 2: Profitability Predictor

X2 (Debt to Total Fund Ratio)					
Model	**Dependent variable**	**R**	**R2**	**Adjusted r square**	**Std. Error of the Estimate**
1.	NP	0.04870	0.00237	0.00036	9266.07824
2.	ROCE	0.60636	0.36768	0.36641	13.83846
3.	ROE	0.08433	0.00711	0.00511	1.88711
4.	NIM	0.54085	0.29251	0.29109	0.96099

b. Predictor: Debt to Total Fund
In table 2 independent variable X2 is analyzed with dependent variables such as NP, ROCE, ROE, and NIM. Model 1 has a very weak positive relationship (R = 0.049) with net profit (NP), explaining only 0.24% (R^2 = 0.002) of its variance and have very high significant errors. Model 2 has a moderate positive relationship (R = 0.606) with ROCE, explaining 36.8% (R^2 = 0.368) of its variance and is moderately accurate. Model 3 has a poor favorable connection (R = 0.084) with ROE, explaining 0.71% (R^2 = 0.00711) of its variance and represents reasonable accuracy in predictions. Model 4 has a moderate positive relationship (R = 0.541) with NIM, explaining 29.3% (R^2 = 0.29251) of its variance and shows that the predictions of this model are highly accurate.

Table 3: Descriptive Statistics.

	X1(Debt / Equity Ratio)	**X2(Debt to Total Fund Ratio)**	**NP**	**ROCE**	**ROE**	**NIM**
Mean	1.785601	0.349783	6864.791	18.74056	0.284622	0.417298
Standard Error	0.129883	0.013146	414.8822	0.778273	0.084696	0.051095
Median	0.588937	0.340338	3879	12.64	0.17	0.011072
Standard Deviation	2.901371	0.293666	9267.765	17.3853	1.891958	1.141365
Kurtosis	6.220925	-1.36351	8.09448	5.317283	491.7531	4.972729
Skewness	2.456582	0.242491	1.948997	1.930748	22.09657	2.551075
Minimum	0	0	-30664.2	-1.28	-0.23	-0.38371
Maximum	15.05699	0.874542	67845	117.4	42.31	4.78
Sum	891.0149	174.5415	3425531	9351.54	142.0264	208.2319
Count	499	499	499	499	499	499

The provided data represents a variety of statistical tests for various variables (X1, X2, NP, ROCE, ROE, and NIM). Below is a quick summary regarding the data: X1: The mean of X1 is approximately 1.79, with a standard deviation of 2.90. The data has positive skewness, suggesting a right-side tail. X2: The mean of X2 is around 0.35, and the standard deviation is 0.29. The data shows slight positive skewness, suggesting a longer right side tail. NP: The mean of NP is approximately 6864.79, with a volatility of 9267.77. The data has optimistic skewness and maximum kurtosis, indicating significant outliers or extreme values. ROCE: The mean of Return on Capital Employed is 18.74%, with the variance of 17.39. The information is optimistically skewed and exhibits positive kurtosis. ROE: The mean of Return-on-Equity is approximately 0.28%, with a deviation of 1.89. The data has positive skewness and has high positive kurtosis. NIM: The mean of Net-Interest-Margin is around 0.42, and the volatility is 1.14. The data shows positive skewness and positive kurtosis.
In table 1, R represents relationship between dependent and independent variables. We found that amongst all the dependent variables (NP, ROCE, ROE, NIM) NIM (0.79) has a strong favorable relationship with X1 (Debt – to– equity ratio) while ROE (0.05) has a weak relationship with X1. Similarly, R^2 represents variance. X1, which is the uncontrollable variable, is the cause, whereas dependent

variables are the effect. The dependent variable's value is affected by changes in the independent variable. From amongst all the dependent variables NIM (0.62197) has the greatest value, indicating the corresponding regression model explains the most deviation in the dependent variable. Whereas ROE (0.00247) has least variance which demonstrates that the volatility in the controllable (dependent) variables are not being greatly explained by the independent variable. Adjusted R Square represents the best fit to the model. As seen in the above table it is clear that NIM (0.62121) has the highest value which represents that it is the best fit amongst the given options. While ROE (0.00046) has the least value, which does not fit to the model. Residual standard error is an indicator of the correctness of a regression model's predictions. In this case, NP (9221.89156) has the highest value, indicating a higher degree of error or uncertainty, while the NIM (0.70246) has the lowest value, which indicates lesser extent of error or uncertainty. In table 2, we found that ROCE (0.61) has a solid favorable relationship with X2 (Total Debt – to – Total fund ratio) while NP (0.049) has a weak relationship with X2. Similarly, from amongst all the R^2 values ROCE (0.37) has maximum value indicating that a higher proportion of the dependent variable's volatility is described by the uncontrollable variable. Whereas NP (0.00237) has least variance which shows that the variation in your dependent variable is not being greatly explained by your independent variable. From the above table it is clear that ROCE (0.37) has the highest value which represents that it is the best fit amongst the given options. While NP (0.00036) has the least value, suggesting that it is not an ideal fit. In this case, NP (9266.07824) has the highest value, indicating a higher degree of error or uncertainty, while the NIM (0.96099) has the lowest value, indicating a lesser amount of error. From table 3, amongst all the mean values NP (6864.791) has the maximum value while ROE (0.284622) has the least average value. Similarly, from amongst all standard error of regression values NP(414.8822) has the highest value, indicating a higher degree of error or uncertainty, while the NIM (0.051095) has the lowest value, indicating asmaller extent of error. In the above table Median refers to midpoint in a dataset when the values are arranged either in descending or ascending order. Amongst all the values NP (3879) has the uppermost value, it suggests that half of these data points in that variable are larger or equivalent to 3879, and other half are lower or equal to 3879. While NIM (0.011072) has the least value, which suggests half of data points in that variable are bigger or equals to 0.011072, and another half are lesser or equivalent to 0.011072. From the above table, standard deviation denotes the amount of variation the individual values deviate from the average value. Amongst all the values NP (9267.765) has greatest value indicating that it has more variability compared to other variables. While X2 has lower value (0.293666) this implies it has less variability in contrast to others variables. In the above table, Kurtosis is a word used in statistics to describe how drastically a distribution's tails deviate when compared to a normal deviation. The highest value is in ROE (491.7531) implies that the distribution associated with that has extremely heavy tails and a highly peaked shape. While the lowest value is in X2 (-1.36351) suggests that the distribution associated with that has relatively lighter tails and a less peaked shape. In the above table, Skewness quantifies the quantity to which data deviates from a symmetrical or normal distribution. The greatest number is in ROE (22.09657) suggesting a significant positive skewness, indicating a longer right tail. While the least value is in X2 (0.242491) which shows slight positive skewness, suggesting the right side's tail.

Conclusion

This study was conducted to ascertain how capital makeup influences a company's profitability of NSE NIFTY 50 companies. The study spans through 2013 - 2022.The study used regression analysis and descriptive statistics for interpretation. Hypothesis was aimed to discover out the (positive or negative) relationship between the chosen variables. The conclusions demonstrate

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