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Exploring Mediating Effect of Sustainable Growth between Capital Structure and Firm Performance

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Abstract
This research examine the mediation impact of the sustainable growth rate, regarding the link between capital structure and firm performance in context of NSE 500 index. Using the Baron and Kenny approach, Sobel tests, and bootstrap techniques, the total debt ratio has positive direct influence on return on assets and Tobin's Q, but a negative direct effect on sustainable growth rate, implying that while debt increases profitability, it may impede long-term growth. The debt-to-equity ratio has diverse consequences, exhibiting negative direct affects on return on assets and Tobin's Q and good indirect effects through the sustainable growth rate, underlining the intricacies of leverage in corporate performance.

Keywords: Sustainable growth rate, return on assets, Tobin's Q, debt to assets ratio, debt to equity ratio, corporate finance

1. INTRODUCTION

Company performance is explained and assessed by the entity's total assets. Total assets are the total amount of assets held by an entity as of the end of a financial year, involving cash and other than cash equivalence such as net tangible assets, works in progress, capital expenditures, inventories, outstanding, loans and advances, cash and bank balances, tax liens, and diverse expenditures that weren't written off(Bahl, 2015). The financial structure impacts corporate performance through ideas such as the equilibrium theory, which weighs the advantages over the drawbacks of indebtedness and the concept of pecking orders, which prioritises internal funding. The notion of agency is also discussed, which addresses conflicts among management, shareholders, and debt holders that influence optimum capital allocation decisions(Buvanendra et al., 2017). Accounting and external assurance boost firm performance and industry-adjusted corporate valuation while lowering firm value fluctuation. Following recommendations doesn't boost business value, but it can assist with risk reduction, emphasising the crucial role of such behaviours in corporate performance and long-term viability(Elbardan et al., 2023). Financial liquidity, optimises a company's capacity to spend on long-term viability expenditure but has little impact on the fiscal health of firms. Liquidity has a beneficial impact on social and ecological spending in larger enterprises. Larger borrowing with lower liquidity has an adverse influence on longevity splurging(Farhan et al., 2023). Firm performance is defined as a company's capacity to generate high and sustained profits, create jobs, increase member earnings, foster production quality, and meet consumer requirements. It is the result of good management, which relies on metrics to analyse strategies, forecast, keep track progress, and make decisions(Taouab & Issor, 2019). Financial structure and growth impact company profitability, with research pointing to both favourable and adverse correlations. Capital structure often tries to reduce a company's financing costs while increasing profits. When it comes to leveraging debt, high growth businesses frequently exhibit a negative connection, whilst small-scale firms exhibit a favourable relationship. The research investigates these processes, offering understanding of the intricate interplay involving capital structure, corporate expansion, and performance outcomes(Manal et al., 2022). Higher proportions of audit services, tax services, management consultants, and accounting services positively impact the total revenues of accounting firms and point towards sustained and stable financial performance over a period(Lee, 2023). Competent industries have stronger firm performance, as assessed by Tobin's q or return on assets (ROA). Aggressive companies outperforms their non-competitive counterparts in the upper quantiles of Tobin's Q. Furthermore, the implementation of Clause 49 in 2005 increased performance greatly in less profitable businesses. This demonstrates how competitive and changes in regulation improve profitability in India's the industrial sector(Chakraborty, 2023). Firm performance when measured in terms of size, growth, and profitability delivers variable and varied results. Early concepts contend that larger enterprises benefit from economics of scale, resulting in increased profitability. Others believe that expansion may foster shortcomings, reducing profitability. Empirical research have diverse findings, a few finding positive connections involving size and profitability and others finding negative or negligible links. The research seeks to elucidate these links in rising Asia-Pacific economies(Yadav et al., 2021). A dearth of a governance body may have a substantial impact on corporate performance. Without a formal supervision mechanism, businesses lack strategic advice and the benefits of diversified experience, resulting in less effective decision-making and problem-solving abilities. This reduces the firm's capacity to manage complicated corporate scenarios while maintaining an unfair advantage, resulting in worse profitability(Bettinelli et al., 2023).

The current study aims to investigate how capital structure ratios, specifically the debt to assets ratio and the debt to equity ratio, affect a firm's performance, with a particular focus on the mediating effect of sustainable growth. The research seeks to understand the extent to which sustainable growth influences the relationship between these capital structure ratios and key firm performance measures, such as Return on Assets (ROA) and Tobin's Q, while accounting for the control of capital structure determinants. By exploring these dynamics, the study aims to provide insights into the critical role of sustainable growth in shaping the impact of capital structure decisions on firm performance.

2. LITERATURE REVIEW AND HYPOTHESIS

2.1. Sustainable Growth Rate and Capital structure:

Capital structure factors in nations that are both prosperous and developing show substantial differences, with no consistency. Nevertheless, given the particular economic and market characteristics of Indian enterprises, a more in-depth knowledge of how these drivers affect them is required. Also, the impact on within against outsourced funding choices, tax concerns, and capital market flaws on Indian enterprises' capital structures is unproven(Agrawal et al., 2019). A limited study has been conducted on how specific to the sector characteristics and the economy collaborate with choices about capital structures to impact company profitability in a variety of economic settings. Furthermore, there has been little research on the differences in the effects of short-term as opposed to long-term debt on company profitability in various kinds of markets(Ahmed et al., 2024).This further leads to understanding the sustained growth rate which would define correct metrics of understanding firm performance as prescribed in Higgens 's Model and defies odds of firm performance(Amouzesh et al., 2011).But there is possible crack in predicting how company would firm in long term sense and this leads to finding best possible determinants for sustainable growth rate and need of proper understanding firm performance indicators in combination(Mukherjee & Sen, 2018).As previous research suggest the adverse influence of current trading liquidity and debt, and the favourable influence of profitability on long-term expansion, but firm size and asset efficiency weren't major examined predictors of sustainable growth rates in Eastern European firms(Vuković et al., 2022). There is a lack of knowledge of how distinct nonfinancial and financial elements influence SGR under various geopolitical circumstances, particularly between Russia and China. Furthermore, the potential advantages of combining energy-saving, geographical, and community responsibility policies on SGR require more research to see whether these measures can continually increase monetary growth and stability(Steblyanskaya et al., 2021). The widely neglected indirect impact of long-term asset expansion on company value via the sustainable growth rate (SGR). The argument proposes that additional studies should look into the complex connection between fixed investments and SGR, as well as variability in impacts among manufacturing subdivisions (Listiani & Supramono, 2020).

2.2. Firm performance and Sector specific factors:

The dearth of recherche into the PRAT algorithms application in emerging economies, especially post-communist Southeast European nations, where capital markets are undeveloped and fresh equity offerings are uncommon, is a weakness in sustainable growth rate research. More localised research are required to further comprehend the particular financial interactions and restrictions that businesses in these locations confront(Naumoski, 2022). Prior study on business performance has largely overlooked the unique effects of digital evolution in the utility industry. There is an important divide in understanding the way digital disruption affects longevity, liquidity constraints, and sustainability metrics, particularly among publicly traded energy companies(Wang & Xia, 2024).This signals the necessity of extensive panel research for looking at private corporate performance over time, along with in-depth case studies employing enterprises having extended commercial trajectories in a variety of industries(Chirico & Kellermanns, 2024). Amidst extensive studies on the consequences of Social Responsibility Disclosure on business viability, currently is a scarcity of studies that investigate how different capital structure adjustments influence the efficiency of corporate being accountable improving company efficiency. It ought to look into how leverage, equity, and distribution of ownership influence the link between corporate citizenship inclusion and company efficiency in a variety of industrial scenarios(Siddiqui et al., 2023). Supposedly substantial research on the relationship between capital structures and business performance, there is still a lack of understanding of sector-specific factors and their influence on company efficiency over financial cycles. Future study should include more complete data and solve detection difficulties in order to further comprehend these links across domains and current industry categorising methods(Rehan et al., 2023).

2.3. Sustainable Development Goal and Corporate Sustainability:

Those discrepancies emphasises the necessity for additional comprehensive investigations to determine the exact consequences of sustainable growth rates on corporate estimation, especially in light of Indonesia's dedication to sustainable development goals (SDGs). While the research finds an upbeat but is not statistically significant impacts of SGR on company valuation, this subject matter remains unexploited(Ramadhan et al., 2024).Beneath its significance as a mediator among firm-specific characteristics and firm performance, especially for Legally permissible enterprises. Furthermore, research should be expanded to include compliant enterprises as well as other industries and geographies, including ASEAN nations, without neglecting economy considerations into account(Ramli et al., 2022). The unclear unforeseen scenarios that corporate sustainability impacting firm performance, the distinct impacts of corporate long-

term viability attributes and disputes, consumer fluctuations, the blending between competitive and non-market approaches, company approach disparity, strategies integrating corporate long-term responsibility to efficiency, untapped corporate-level tactics. as well as the issue of company conservation disconnecting versus real outcomes(Park, 2023). There is little analysis concerning the way leveraged funding affects long-term growth over businesses and economies. It also fails to consider the impact of ethical business practices on this connection, as well as the hazards associated with high debt amid economic slumps(Rahim, 2017). Synthesising contradictory data on capital structure and firm performance, comprehending sector-specific repercussions, evaluating all aspects of capital structure and ownership composition, and researching how corporation size influences performance beyond industries. Furthermore, spreading research to diverse geographical contexts might give a deeper understanding of these interactions(Salim & Yadav, 2012). Need of addressing the distinctive features of small and medium-sized enterprises finance strategies and how they affect performance. It advocates for more investigation into small business the owners' choice of financing, as well as the creation of an upgraded financing setting, notably for longevity financing , with the aim to improve the liquidity of small and medium-sized enterprises in India(Jha & Kumar, 2024).Even profitability and market value performances were used in most cases but understanding of firm performance, restricted marker selection, and absence of spatial examination widely deceived. Future research should provide a complete, multivariate model with thoughtfully chosen parameters and gauges, which can be refined on a regular basis to meet the changing demands of organisations. Furthermore, a more diverse the involvement of stakeholders transcend those in management is required for a fair review(Selvam et al., 2016). There is a considerable research vacuum in understanding the complex implications of capital structure on company performance, especially in emerging economies. Existing research has frequently concentrated on developed nations, highlighting the necessity for broad examination in a variety of economic circumstances. Furthermore, the unique effects of short-term contrasted with long-term debt on performance are understudied. There is also little empirical information about how industry-specific characteristics and economic situations affect this connection. Furthermore, the importance of business management in moderating the consequences of capital structure for profitability deserves additional examination. Advanced approaches, such as large-scale analytics and neural networks, have the potential to deliver deeper insights into capital structure optimisation for better fiscal health and performance(Luo & Jiang, 2022). There aren't many research that look at the integrated impact of market uncertainties and financial crisis on corporate performance. Existing research is mainly focused and liquidity modelling or trade risk assessment during severe events, ignoring their combined influence on company performance(Vo, 2023). Embodied study reveals relationships between sustainable growth rate, economic expenses, the expenses for indagation and energy efficiency, but it does not investigate their dynamism interactions over time. There is a lack of knowledge of sectoral and territorial differences, notably between emerging and industrialised nations. Comprehensive cost-benefit evaluations of indagated projects and social spending are also required(Alina et al., 2019). For instance China's renewable energy sector, notably in solar electricity and energy from windmills, is expanding, but it is hampered by capital and labour market distortions, which have a detrimental influence on perpetual sustainable growth, especially between non-state enterprises. Directives ought to prioritise market liberalisation, organisational reform, mixed management, creative efficiency, and skew reduction. Future study should look at the effects of sectors, regions, and environmental, social and governance factors on long-term prosperity(Qiao et al., 2021). Albeit adequate has been done on the link amongst capital structure and business performance, there is still a considerable vacuum about comprehending the mediating function of growth possibilities given the backdrop of the Indian prospect. Our work makes a distinctive contribution to the current pool of research by primarily on the Indian stock exchange, a fast rising and distinctive trading environment that has received little attention in earlier study. Evaluating the mediation effect on future growth, which has received not much attention presently is critical for grasping the dynamic interaction throughout the capital framework and corporate performance.

2.4. Hypothesis

Hypothesis 1: Sustainable Growth Rate (SGR) mediates the relationship between Total Debt Ratio (TDR) and Tobin’s q (TQ).
Hypothesis 2: Sustainable Growth Rate (SGR) mediates the relationship between Total Debt Ratio (TDR) and Return on Assets (ROA).
Hypothesis 3: Sustainable Growth Rate (SGR) mediates the relationship between Debt to Equity Ratio (DER) and Tobin’s q (TQ).
Hypothesis 4: Sustainable Growth Rate (SGR) mediates the relationship between Debt to Equity Ratio (DER) and Return on Assets (ROA).

3. METHODOLOGY

3.1. Data

The data for this study was gathered based on the NSE 500 index spanning 2013 to 2023, including 500 stocks and totalling 5,000 observations. The following data were collected: sustainable growth rate , return on assets , Tobin's Q, revenue growth rate, debt to equity ratio , and total debt ratio . The data was obtained from the Bloomberg Database,

which ensures accuracy and dependability. A pretest has been performed on extracted data and the results of the pretest. As we have independent variables multicollinearity is close to 1 which shows low multicollinearity from the author's calculations

Independent variables Multicollinearity.	**VIF (Tobin's Q)**	**Tolerance (Tobin's Q)**	**VIF (Return on Assets)**	**Tolerance (Return on Assets)**
Constant	--	--	--	--
Sustainable Growth Rate	1.001	0.999	1.001	0.999
Total Debt to Total Equity	1.011	0.989	1.011	0.989
Total Debt to Total Assets	1.01	0.99	1.01	0.99
Revenue Growth Year over Year	1	1	1	1

3.1.1. ***Variables***

Type of Variable	**Full Form**	**Short Form**
Independent(Capital structure)	Debt to Equity Ratio	logDE
	Total Debt Ratio	logDA
Control variable(Capital structure determinants)	Revenue Growth Rate	logRG
Dependent(Firm performance indicators)	Return on Assets	logROA
	Tobin's Q	logTOBINQlog
Mediator	Sustainable Growth Rate	logSGR

3.1.2. ***Robustness of Model***

Analysis of robustness of model :logROA before Controlling for SGR:R Square = 0.409, indicating that 40.9% of the variance in logROA is explained by logRG, logDA, and logDE.After Controlling for SGR:R Square = 0.810, indicating that 81.0% of the variance in logROA is explained by logRG, logDA, logDE, and logSGR.The significant increase in R Square suggests that logSGR is a strong mediator for logROA.logTOBINQlog before controlling for SGR:R Square = 0.227, indicating that 22.7% of the variance in logTOBINQ is explained by logRG, logDA, and logDE.After Controlling for SGR:R Square = 0.309, indicating that 30.9% of the variance in logTOBINQ is explained by logRG, logDA, logDE, and logSGR.The increase in R Square suggests that logSGR is also a mediator for logTOBINQ, but its impact is less pronounced compared to logROA.Robustness of the Model:High R-squared for logROA after including logSGR.All predictors are statistically significant.

3.2. Methodology

This research investigates the mediation effects in the relationships between capital structure variables and firm performance by employing a comprehensive, multi-method approach. The analysis integrates the Baron and Kenny approach, Sobel tests, and bootstrap techniques to thoroughly assess the direct and indirect effects of capital structure on performance metrics(MacKinnon et al., 2007).

3.2.1. ***Baron and Kenny Approach***

To establish the mediation effect by following the causal steps method proposed by (Baron & Kenny, 1986).
Direct Effect (Path c):Regress the outcome variable on the predictor variable

$$logTOBINQlog_{it} = \beta_0 + \beta_1\, logDE_{it} + \beta_2\, logDA_{it} + \beta_3\, logRG_{it} + \varepsilon_{it} \quad (1)$$

$$logROA_{it} = \beta_0 + \beta_1\, logDE_{it} + \beta_2\, logDA_{it} + \beta_3 logRG_{it} + \varepsilon_{it} \quad (2)$$

$Path\ a$: Regress the mediator on the predictor variable:

$$logSGR_{it} = \beta_0 + \beta_1\, logDE_{it} + \beta_2 logDA_{it} + \beta_3\, logRG_{it} + \varepsilon_{it} \quad (3)$$

$Path\ b$: Regress the outcome variable on both the mediator and the predictor variable:

$$logTOBINQlog_{it} = \beta_0 + \beta_1\, logSGR_{it} + \beta_2\, logDE_{it} + \beta_3\, logDA_{it} + \beta_4\, logRG_{it} + \varepsilon_{it} \quad (4)$$

$$logROA_{it} = \beta_0 + \beta_1\, logSGR_{it} + \beta_2\, logDE_{it} + \beta_3\, logDA_{it} + \beta_4\, logRG_{it} + \varepsilon_{it} \quad (5)$$

Indirect Effect (Path $a \times b$)
Calculate the product of coefficients from Path a and Path b.
A mediation effect is present if the effect of the predictor on the outcome is reduced in the presence of the mediator.
3.2.2.*Sobel Test*
To test the significance of the mediation effect of logSGR on the relationships between the predictors (logDE, logDA, logRG) and the outcomes (logTOBINQlog, logROA).Indirect Effect Calculation:Compute the product of the coefficients from the predictor to the mediator and from the mediator to the outcome:
Indirect Effect = $a \times b$
Sobel Test Statistic:Calculate the Sobel test statistic using the following formula

$$Z = \frac{(a \times b)}{\sqrt{\left((b^2 \times SE_a^2) + (a^2 \times SE_b^2)\right)}}$$

$a = coefficient\ from\ predictor\ to\ SGR$
$b = coefficient\ SGR\ to\ firm\ performance\ indicators$
$SEa = standard\ error\ of\ a$
$SEb = standard\ error\ of\ b$

3.2.3 *Bootstrap Analysis*

To estimate the mediation effect and its confidence intervals using the bootstrap method, providing a robust assessment of the indirect effects.Generate numerous bootstrap samples 1,000 from the original dataset through random sampling with replacement.For each bootstrap sample, estimate the mediation model and compute the indirect effect (product of the coefficients $a \times b$).Using distribution of the bootstrap estimates to construct bias-corrected percentile confidence intervals for the indirect effect. Assess mediation effect significance by checking if the confidence interval includes zero.This multifaceted methodology enables a thorough exploration of how capital structure influences firm performance through sustainable growth rate. It combines traditional statistical techniques with advanced resampling methods to ensure comprehensive and reliable results.

4.RESULT AND DISCUSSION

4.1. Descriptive statistics

Table 1: Descriptive statistics

Variable	Mean	Std. Deviation	Minimum	Maximum
logTOBINQlog	-0.511	1.208	-8.517	1.483
logROA	1.786	1.096	-6.812	4.574
logSGR	2.301	0.985	-6.725	5.571
logDE	3.285	2.259	-9.21	10.458
logDA	2.377	1.9	-9.21	7.403
logRG	2.708	1.145	-4.431	10.115

The dataset Table 1 presents descriptive statistics with notable variability. LogTOBINQlog averages -0.511, indicating lower values, while logROA at 1.786 shows positive returns. LogSGR (sustainable growth rate) averages 2.301, suggesting consistent growth, and logDE at 3.285 indicates high debt-equity ratios. LogDA averages 2.377, reflecting debt-asset ratios, and logRG at 2.708 shows moderate revenue growth. The ranges highlight diverse firm performances across all metrics.

4.2.Exploration of Mediation Effect

4.2.1.*Exploration through Baron and Kenny method*

Table 2: Baron and Kenny method results

Model	Variable	B	Std. Error	Sig.	Lower Bound	Upper Bound	Tolerance	VIF	Dependent Variable
Path a	logRG	0.114	0.005	0	0.104	0.123	0.996	1.004	logSGR
	logDA	0.037	0.012	0.002	0.014	0.06	0.063	15.757	
	logDE	-0.046	0.01	0	-0.066	-0.027	0.063	15.764	
Path b	logRG	0.041	0.006	0	0.028	0.053	0.976	1.025	logTOBINQlog
	logDA	0.861	0.015	0	0.832	0.891	0.06	16.65	
	logDE	-0.936	0.013	0	-0.961	-0.91	0.06	16.679	
	logSGR	0.291	0.008	0	0.275	0.308	0.982	1.019	
Path b	logRG	-0.011	0.003	0	-0.016	-0.006	0.972	1.029	logROA
	logDA	0.974	0.006	0	0.962	0.986	0.058	17.357	
	logDE	-1.024	0.005	0	-1.034	-1.013	0.058	17.384	
	logSGR	0.713	0.003	0	0.707	0.72	0.979	1.022	
Path c	logRG	0.056	0.004	0	0.047	0.065	0.993	1.007	logROA
	logDA	0.931	0.01	0	0.911	0.951	0.062	16.143	
	logDE	-	0.009	0	-1.008	-0.973	0.062	16.163	

		0.991							
Path c	logRG	0.065	0.006	0	0.052	0.078	0.993	1.007	logTOBINQlog
	logDA	0.628	0.014	0	0.601	0.656	0.07	14.223	
	logDE	-0.724	0.012	0	-0.748	-0.701	0.07	14.241	

The detailed analysis of mediation using the Baron and Kenny method in Table 2 reveals the following insights:Path A (Independent Variables to Mediator):LogDA significantly affects logSGR (B = 0.037, p = 0.002), suggesting that as the total debt ratio increases, the sustainable growth rate increases.LogDE significantly affects logSGR (B = -0.046, p < 0.001), showing that as the debt to equity ratio increases, the sustainable growth rate decreases. These results demonstrate that all three independent variables (logRG, logDA, logDE) significantly impact the mediator (logSGR), satisfying the first condition for mediation.Path B (Mediator and Independent Variables to Dependent Variables):For Dependent Variable 1 (logTOBINQlog), logSGR significantly affects logTOBINQlog (B = 0.291, p < 0.001), indicating that as the sustainable growth rate increases, Tobin's Q increases. Additionally, logDE (B = -0.936, p < 0.001), logDA (B = 0.861, p < 0.001), and logRG (B = 0.041, p < 0.001) all significantly affect logTOBINQlog.For Dependent Variable 2 (logROA), logSGR significantly affects logROA (B = 0.713, p < 0.001), indicating that as the sustainable growth rate increases, return on assets (ROA) increases. LogDE (B = -1.024, p < 0.001), logDA (B = 0.974, p < 0.001), and logRG (B = -0.011, p < 0.001) also significantly affect logROA. The mediator (logSGR) significantly impacts both dependent variables (logTOBINQlog and logROA), indicating its role in the relationships between the independent variables and the dependent variables.Path C (Independent Variables to Dependent Variables without Mediator):For Dependent Variable 1 (logTOBINQlog), logDE (B = -0.724, p < 0.001), logDA (B = 0.628, p < 0.001), and logRG (B = 0.065, p < 0.001) significantly affect logTOBINQlog.For Dependent Variable (logROA), logDE (B = -0.991, p < 0.001), logDA (B = 0.931, p < 0.001), and logRG (B = 0.056, p < 0.001) significantly affect logROA. All three independent variables (logRG, logDA, logDE) have significant direct effects on both dependent variables (logTOBINQlog and logROA) without including the mediator, indicating that the independent variables have direct impacts on the dependent variables.Combined Analysis:Comparing Path A and Path B, the independent variables (logRG, logDA, logDE) significantly affect the mediator (logSGR), and the mediator (logSGR) significantly affects both dependent variables (logTOBINQlog and logROA) while controlling for the independent variables. These findings provide evidence of mediation, as the effects of the independent variables on the dependent variables are partially explained by the mediator (logSGR).In Path C, the direct effects of the independent variables on the dependent variables remain significant even after including the mediator, indicating partial mediation. This means that the sustainable growth rate partially explains the effect of revenue growth rate, total debt ratio, and debt to equity ratio on both return on assets and Tobin's Q.For logROA, the model shows a substantial increase in explanatory power when logSGR is included, indicating that the sustainable growth rate is a strong mediator for return on assets. For logTOBINQlog, the increase in explanatory power when logSGR is included is moderate, suggesting that while the sustainable growth rate mediates the relationship, other factors may also play significant roles.

4.2.2. *Exploration through the Sobel Test*

Table 4: Summary Table of Variables, Coefficients, Standard Errors, and Sobel Test Results

Path	Variable	Coefficient a	Standard Error SEa	Coefficient b	Standard Error SEb	Sobel Test Statistic
Path a	logRG	0.114	0.005			
	logDA	0.037	0.012			
	logDE	-0.046	0.01			
Path b1	logSGR			0.308	0.008	
Sobel Test (b1)	logRG	0.114	0.005	0.308	0.008	19.62
	logDA	0.037	0.012	0.308	0.008	3.07
	logDE	-0.046	0.01	0.308	0.008	-4.57
Path b2	logSGR			0.713	0.005	
Sobel Test (b2)	logRG	0.114	0.005	0.713	0.005	22.51
	logDA	0.037	0.012	0.713	0.005	3.08
	logDE	-0.046	0.01	0.713	0.005	-4.6

Interpretation of Sobel Test Results from Table 4.Significance of Mediation: Typically, a Sobel test statistic larger than 1.96 (in absolute value) indicates a significant mediation effect at the 0.05 significance level.First Path b Model (logSGR on logTOBINQlog)logDA: The Sobel test statistic of 3.073 indicates a significant mediation effect of logSGR on the relationship between logDA and logTOBINQlog.logDE: The Sobel test statistic of −4.57 also indicates a significant mediation effect of logSGR on the relationship between logDE and logTOBINQlog, despite the negative coefficient.Second Path b Model (logSGR on logROA):logDA: The Sobel test statistic of 3.083.indicates a significant

mediation effect of logSGR on the relationship between logDA and logROA.logDE: The Sobel test statistic of −4.60 also indicates a significant mediation effect of logSGR on the relationship between logDE and logROA, despite the negative coefficient.Both Path b models show significant mediation effects of logSGR on the relationships between the independent variables (logRG, logDA, logDE) and their respective dependent variables (logTOBINQlog and logROA). The Sobel test statistics suggest that these mediation effects are statistically significant, supporting the presence of a mediating role of logSGR in both models.

4.2.3. *Exploration through Bootstrap method*

Table 5: Bootstrap Analysis Results Combined Table of Direct, Indirect, and Total Effects

Predictor	Mediator	Outcome	Effect Type	Estimate	Std. Error	z-value	p-value
logDE	logSGR	logROA	Indirect	0.015	0.007	1.995	0.046
logDA	logSGR	logROA	Indirect	-0.027	0.009	-3.169	0.002
logRG	logSGR	logROA	Indirect	0.078	0.004	20.789	< .001
logDE	logSGR	logTOBINQlog	Indirect	0.006	0.003	1.986	0.047
logDA	logSGR	logTOBINQlog	Indirect	-0.012	0.004	-3.143	0.002
logRG	logSGR	logTOBINQlog	Indirect	0.033	0.002	18.325	< .001
logDE	N/A	logROA	Direct	-0.987	0.005	-186.301	< .001
logDA	N/A	logROA	Direct	0.933	0.006	152.374	< .001
logRG	N/A	logROA	Direct	-0.019	0.003	-7.492	< .001
logDE	N/A	logTOBINQlog	Direct	-0.734	0.012	-63.04	< .001
logDA	N/A	logTOBINQlog	Direct	0.645	0.014	47.122	< .001
logRG	N/A	logTOBINQlog	Direct	0.038	0.006	6.058	< .001
logSGR	N/A	logROA	Direct	0.747	0.003	227.561	< .001
logSGR	N/A	logTOBINQlog	Direct	0.318	0.008	38.449	< .001
logDE	N/A	logROA	Total	-0.972	0.009	-110.848	< .001
logDA	N/A	logROA	Total	0.906	0.01	89.032	< .001
logRG	N/A	logROA	Total	0.059	0.004	13.234	< .001
logDE	N/A	logTOBINQlog	Total	-0.727	0.012	-61.25	< .001
logDA	N/A	logTOBINQlog	Total	0.633	0.014	45.307	< .001
logRG	N/A	logTOBINQlog	Total	0.071	0.006	11.165	< .001
logTOBINQlog	N/A	logROA	Residual Cov.	0.116	0.003	34.626	< .001

Interpretation of the Bootstrap Analysis Table 5.The bootstrap analysis results for the direct, indirect, and total effects of the variables in the study provide robust insights into the relationships between the capital structure variables, the sustainable growth rate (SGR), return on assets (ROA), and Tobin's Q (a proxy for firm value). Here is a detailed interpretation of the results presented in the table:Direct Effects: The debt-to-equity ratio on the sustainable growth rate is positive but not very strong (Estimate = 0.020, p = 0.046). This suggests a slight positive influence of higher debt levels relative to equity on the growth rate a company can sustain.The total debt ratio on the sustainable growth rate is negative and significant (Estimate = -0.037, p = 0.002). This indicates that higher levels of debt relative to assets are associated with a lower sustainable growth rate.The revenue growth rate has a strong positive direct effect on the sustainable growth rate (Estimate = 0.105, p < .001). Companies with higher revenue growth tend to have higher sustainable growth rates.The direct effect of the debt-to-equity ratio on return on assets is strongly negative (Estimate = -0.987, p < .001), suggesting that higher leverage negatively impacts profitability relative to assets.The total debt ratio on return on assets is strongly positive (Estimate = 0.933, p < .001), indicating that a higher proportion of debt in the asset structure is associated with increased profitability.Revenue growth rate has a slight negative direct effect on return on assets (Estimate = -0.019, p < .001). This implies that while revenue is growing, it might not be translating into proportional profitability increases.Sustainable growth rate has a very strong positive effect on return on assets (Estimate = 0.747, p < .001), suggesting that firms growing at a sustainable rate tend to be more profitable.The debt-to-equity ratio on Tobin's Q is strongly negative (Estimate = -0.734, p < .001), indicating that higher leverage is associated with lower market valuation relative to the replacement cost of assets.The total debt ratio has a significant positive direct effect on Tobin's Q (Estimate = 0.645, p < .001), suggesting that higher debt levels relative to assets are perceived positively by the market.Revenue growth rate has a small but significant positive direct effect on Tobin's Q (Estimate = 0.038, p < .001). Higher revenue growth is associated with higher market valuation.Sustainable growth rate has a strong positive effect on Tobin's Q (Estimate = 0.318, p < .001), indicating that firms with higher sustainable growth rates are valued more highly in the market.Indirect Effects.The debt-to-equity ratio on return on assets through sustainable growth rate is

positive but small (Estimate = 0.015, p = 0.046), suggesting a minor mediation effect.Total debt ratio on return on assets through sustainable growth rate is negative and significant (Estimate = -0.027, p = 0.002), indicating that part of the positive direct effect of debt on profitability is offset when considering sustainable growth rateDebt-to-equity ratio on Tobin's Q through sustainable growth rate is positive but small (Estimate = 0.006, p = 0.047), indicating a minor mediation effect.Total debt ratio on Tobin's Q through sustainable growth rate is negative and significant (Estimate = -0.012, p = 0.002), indicating that the positive perception of debt by the market is reduced when sustainable growth rate is considered.Complementary Mediation: The indirect effect (logDE through SGR on ROA and Tobin's Q) is significant and has the opposite sign to the direct effect. This indicates that while the direct effect of logDE is negative on ROA and Tobin's Q, the indirect effect through SGR is positive, partially offsetting the negative direct effect.Competitive Mediation: The indirect effect (logDA through SGR on ROA and Tobin's Q) is significant and has the same sign as the direct effect. This indicates that both the direct and indirect effects are in the same direction, but the indirect effect through SGR reduces the magnitude of the direct positive effect.Conclusion of Bootstrap mediation analysis.The results indicate different types of mediation for each predictor:Debt-to-Equity Ratio (logDE): Complementary Mediation.Total Debt Ratio (logDA): Competitive Mediation.Revenue Growth Rate (logRG): Complementary Mediation.This analysis highlights the nuanced role of SGR as a mediator, showcasing how it can both complement and compete with the direct effects of capital structure variables on firm performance.

5. CONCLUSION AND SCOPE FOR FUTURE STUDIES

5.1. Conclusion

The study thoroughly investigates the role of mediation of the sustainable growth rate (SGR) in the relationship that exists between capital structure variables and firm performance indicators . The study used a triangulated approach, utilising Baron and Kenny's technique, Sobel tests, and bootstrap mediation exploration, to provide notable findings:This emphasises the importance of increasing revenue in driving company performance through sustained growth.Total Debt Ratio (logDA): Has a favourable direct influence on ROA and Tobin's Q but have an adverse direct effect on SGR, suggesting competitive mediation. This shows that, while debt might improve business profitability directly, it could also hinder long-term growth.Debt-to-Equity Ratio (logDE): Has mixed effects, with large negative direct impacts on ROA and Tobin's Q and favourable indirect effects via SGR, showing complementing mediation. This emphasises the complexities of leverage in determining corporate performance.

5.2. Scope for future studies

Sector-precise Analysis: subsequent studies might look at how these relationships change among industries, providing more precise insights and actionable suggestions.Impact of Market circumstances: Investigating the effect of unforeseen variables such as economic downturns and volatile markets may provide a more complete picture of the drivers of company success.Future study might look at other possible mediators, such as inventiveness and operational efficacy, or market share, in order to acquire a better understanding of the factors influencing business success.

6. LIMITATIONS

The findings may not be applicable to all sectors or countries. The observed associations may be influenced by characteristics particular to a sector or location as this is based on Indian prospects.The analysis fails to consider into account qualitative aspects such as managerial quality, corporate governance, or organisational culture, which may have a major influence on business performance and mediate the associations examined.Any endogeneity between the independent variables and firm performance indicators might have skew the results. Future studies might use advanced econometric approaches to alleviate this restriction.This study assumes that the influence of capital structure factors is consistent across all enterprises. However, firm-specific criteria such as size, industry, and market position may impact these connections.

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