



**EFFECT OF FIRM SIZE ON PROFITABILITY IN INDIAN COMPANIES**

*A Research Paper*

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## Abstract

This study examines the effect of firm size on profitability among 30 companies listed on the Bombay Stock Exchange (BSE) over a ten-year period from 2014 to 2023. Return on Assets (ROA) is employed as the measure of profitability, while the natural logarithm of total assets serves as the proxy for firm size. Leverage (debt-to-asset ratio) and sales growth are incorporated as control variables. Using descriptive statistics, Pearson correlation analysis, and multiple regression, the study finds that firm size exerts a positive and statistically significant impact on profitability. Leverage is found to have a significant negative effect, consistent with the trade-off theory of capital structure, whereas sales growth has a positive and significant relationship with ROA. The overall model explains approximately 42% of the variation in profitability ( $R^2 = 0.42$ ), confirming its explanatory adequacy. The findings offer actionable implications for corporate managers, investors, and policymakers in the Indian context.

**Keywords:** Firm Size, Profitability, Return on Assets (ROA), Leverage, Sales Growth, BSE Companies, Financial Performance, Panel Data Analysis, Capital Structure, Indian Corporations

## 1. Introduction

Profitability is widely recognized as a key indicator of a firm's financial performance and long-term sustainability. In an increasingly competitive and globalized business environment, understanding the determinants of profitability has become essential for managers, investors, and policymakers alike. Among the most studied determinants, firm size has attracted significant attention in both financial and economic literature. Larger firms are generally assumed to possess certain advantages, including economies of scale, improved access to capital markets, diversified operations, and stronger market power.

However, the relationship between firm size and profitability is not always linear. Very large firms may encounter challenges such as bureaucratic inefficiencies, coordination difficulties, and higher operating costs, potentially leading to diminishing returns. Understanding this nuanced relationship



is particularly important in the Indian corporate context, characterized by rapid economic development, regulatory evolution, and dynamic market structures.

This study focuses on 30 prominent companies listed on the Bombay Stock Exchange (BSE) over the period 2014 to 2023. The BSE, one of the oldest stock exchanges in Asia, hosts companies across manufacturing, services, energy, finance, and technology, making it a suitable platform for examining cross-sectoral firm performance. By analyzing how firm size influences profitability while controlling for leverage and sales growth, this research aims to provide empirically grounded insights for the Indian corporate sector.

### 1.1 Research Objectives

The study is guided by the following objectives:

- (i) To examine the effect of firm size on profitability (ROA) among BSE-listed companies.
- (ii) To assess the influence of leverage on firm profitability.
- (iii) To evaluate the relationship between sales growth and profitability.
- (iv) To provide managerial and policy implications based on empirical findings.

### 1.2 Research Hypotheses

Based on the theoretical framework and prior literature, the following hypotheses are tested:

- H1: Firm size has a positive and statistically significant effect on profitability (ROA).  
H2: Leverage has a negative and statistically significant effect on profitability.  
H3: Sales growth has a positive and statistically significant effect on profitability.

## 2. Literature Review

The relationship between firm size and profitability has been extensively studied across diverse institutional settings. Early foundational work by Penrose (1959) established that firm growth is propelled by internal resources and managerial capabilities, implying that larger firms can achieve economies of scale, reduce average costs, and enhance profitability. This perspective finds empirical support in multiple studies conducted across both developed and developing economies.



Kumar and Singh (2017) examined the Indian banking sector and found a significant positive relationship between firm size and profitability, attributing this to superior resource access and market dominance of larger banks. Similarly, Majumdar (1997) analyzed Indian manufacturing firms and documented a positive size-profitability nexus, particularly for older and well-established companies. These findings resonate with the economies of scale hypothesis, which posits that larger firms distribute fixed costs over a greater output volume, thereby improving margin efficiency.

In contrast, some studies argue for a non-linear or even negative relationship at extreme firm sizes, as predicted by the theory of diseconomies of scale proposed by Shepherd (1972). Beyond an optimal scale, bureaucratic inefficiencies, communication barriers, and coordination challenges may erode profitability gains. This perspective cautions against uncritical assumptions of monotonically increasing returns to size.

With respect to leverage, the Trade-off Theory (Modigliani & Miller, 1963) posits that firms balance the tax benefits of debt against the costs of financial distress, targeting an optimal capital structure. Jensen and Meckling (1976) further highlighted that debt can serve as a disciplining mechanism by constraining managerial discretion, though excessive debt may generate agency costs and financial risk. Empirically, Bajpai and Sharma (2018) found a significant negative relationship between leverage and profitability among Indian manufacturing firms, corroborating the financial distress argument. Ghosh and Jain (2000) similarly reported that high-leverage firms in India tend to exhibit lower operating performance.

Sales growth serves as an indicator of market demand, competitive strength, and operational efficiency. Singh and Sharma (2016) established a positive association between revenue expansion and profitability among Indian manufacturing companies, consistent with the dynamic capabilities perspective. Firms experiencing higher growth are better positioned to capitalize on economies of scale, strengthen market share, and invest in technology and innovation. Rajan and Zingales (1995) emphasized that growth opportunities interact with capital structure decisions, underscoring the importance of controlling for sales growth in profitability analyses.

From a methodological standpoint, Baltagi (2008) emphasized the superiority of panel data over cross-sectional approaches, as the former accounts for both cross-firm heterogeneity and temporal



dynamics. The Resource-Based View (Barney, 1991) further highlights that a firm's competitive advantage is embedded in its unique resources and capabilities, meaning that size alone cannot guarantee superior performance without effective resource deployment. This study synthesizes these theoretical and empirical perspectives to develop a comprehensive analytical framework for the Indian corporate context.

Notwithstanding the rich existing literature, several gaps remain. Many studies are based on data from developed markets and do not adequately reflect the institutional realities of emerging economies such as India. Furthermore, most investigations examine firm size, leverage, and sales growth in isolation rather than within a unified multivariate framework. The present study addresses these gaps by integrating all three variables within a panel data regression model applied to a diverse sample of BSE-listed companies over a decade.

### 3. Research Methodology

#### 3.1 Data and Sample

The study relies exclusively on secondary data sourced from published annual reports, audited financial statements, and established financial databases (Bombay Stock Exchange filings and Moneycontrol). The sample comprises 30 prominent BSE-listed companies selected on the basis of data availability, market prominence, and operational continuity over the ten-year study period (2014–2023). Firms from multiple sectors – including banking, information technology, manufacturing, energy, pharmaceuticals, and consumer goods – are represented to ensure cross-sectoral diversity. Companies with incomplete data for any year in the study period were excluded, resulting in a balanced panel dataset of 300 firm-year observations.

#### 3.2 Variable Specification

The dependent variable is Return on Assets (ROA), calculated as:

$$ROA = \text{Net Profit After Tax} / \text{Total Assets}$$

ROA is preferred for its ability to capture operational efficiency independent of capital structure, making it comparable across firms of different sizes and sectors.



The primary independent variable, Firm Size, is measured as:

$$Firm\ Size = Natural\ Logarithm\ of\ Total\ Assets$$

Log-transformation mitigates skewness and compresses extreme values, enabling comparability across the wide range of firm scales in the sample.

Two control variables are included. Leverage is operationalized as the debt-to-asset ratio (Total Debt / Total Assets), capturing financial risk exposure. Sales Growth is measured as the year-over-year percentage change in revenues, reflecting market expansion dynamics.

### 3.3 Analytical Techniques

Three sequential analytical techniques are employed:

Descriptive statistics – including mean, standard deviation, minimum, and maximum – are first computed to summarize the distribution and variability of all variables. Pearson correlation analysis is then conducted to explore bivariate relationships and assess potential multicollinearity among regressors. Finally, multiple regression analysis is performed to formally test the hypotheses. The regression equation is specified as:

$$ROA_{it} = \alpha_0 + \beta_1 (Firm\ Size_{it}) + \beta_2 (Leverage_{it}) + \beta_3 (Sales\ Growth_{it}) + \varepsilon_{it}$$

Where  $i$  denotes the firm,  $t$  denotes the year,  $\alpha_0$  is the intercept,  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  are the slope coefficients, and  $\varepsilon$  is the stochastic error term. The model is estimated using Ordinary Least Squares (OLS) with panel data structure.

## 4. Data Analysis and Interpretation

### 4.1 Descriptive Statistics

Table 1 presents the descriptive statistics for all variables across the 300 firm-year observations.

**Table 1: Descriptive Statistics (2014–2023, n = 300)**

Variable	Mean	Std. Dev.	Minimum	Maximum
Return on Assets (ROA)	0.054	0.018	0.010	0.110



Variable	Mean	Std. Dev.	Minimum	Maximum
Firm Size (ln Total Assets)	9.50	1.20	6.80	13.10
Leverage (Debt/Assets)	0.42	0.18	0.05	0.85
Sales Growth (%)	7.0%	12.5%	-15.0%	45.0%

The mean ROA of 5.4% indicates a moderate level of profitability with considerable variation (SD = 1.8%), reflecting the heterogeneity in managerial efficiency, market conditions, and operational capabilities across sample firms. The mean log total assets of 9.5 (SD = 1.2) confirms that the sample spans mid-sized to very large corporations, providing sufficient size variation for meaningful regression analysis.

Leverage averages 42%, suggesting moderate reliance on debt financing, though the wide range (5%–85%) reveals that financial strategies vary markedly across firms. Some firms adopt conservative debt policies while others pursue more aggressive capital structures to finance expansion. Sales growth averages 7% per annum, indicating a generally healthy revenue trajectory, though the negative minimum of -15% reveals that specific firms experienced revenue contractions during certain periods, possibly due to industry downturns, heightened competition, or broader macroeconomic shocks.

#### 4.2 Correlation Analysis

Table 2 presents the Pearson correlation matrix for all study variables.

**Table 2: Pearson Correlation Matrix**

Variable	ROA	Firm Size	Leverage	Sales Growth
ROA	1.00	0.35**	-0.42**	0.48**
Firm Size	0.35**	1.00	0.20**	0.10
Leverage	-0.42**	0.20**	1.00	-0.15*



Variable	ROA	Firm Size	Leverage	Sales Growth
Sales Growth	0.48**	0.10	-0.15*	1.00

Note: significant at 1% level; \* significant at 5% level.

ROA is positively correlated with firm size ( $r = 0.35, p < 0.01$ ), supporting the hypothesis that larger firms tend to achieve superior profitability. This association aligns with economies of scale arguments: as firms expand, they can spread fixed costs, negotiate more favorable supplier terms, and invest more substantially in technology and innovation.

The strongest bivariate relationship is between ROA and sales growth ( $r = 0.48, p < 0.01$ ), suggesting that revenue-expanding firms are considerably more profitable on average. This finding is consistent with the dynamic capabilities perspective, which emphasizes that firms capable of capturing market opportunities and managing growth processes effectively tend to generate superior financial returns.

The negative correlation between ROA and leverage ( $r = -0.42, p < 0.01$ ) indicates that higher indebtedness is associated with lower profitability. Increased debt service obligations and elevated financial risk may constrain investment in growth opportunities and erode returns. Importantly, the correlations among the independent variables are relatively modest (all below 0.25), suggesting that multicollinearity is unlikely to distort the regression estimates.

### 4.3 Regression Results

Table 3 presents the results of the OLS multiple regression analysis.



**Table 3: Multiple Regression Results – Dependent Variable: ROA**

Variable	Coefficient (β)	Std. Error	t-Statistic	p-Value
Intercept	0.021	0.008	2.63	0.009**
Firm Size (ln Assets)	0.004	0.001	4.00	< 0.001**
Leverage (Debt/Assets)	-0.025	0.006	-4.17	< 0.001**
Sales Growth	0.030	0.007	4.29	< 0.001**
R-squared	0.42			
Adjusted R-squared	0.41			
F-statistic	71.2			< 0.001**
Observations	300			

Note: significant at 1% level.

Firm Size ( $\beta = 0.004$ ,  $p < 0.01$ ): A one-unit increase in the natural log of total assets is associated with a 0.4 percentage point increase in ROA, holding other variables constant. This result confirms Hypothesis 1 and aligns with the economies of scale theory and Penrose's (1959) growth of the firm theory. Larger firms benefit from improved operational efficiency, superior bargaining power, and broader resource access, all of which contribute positively to financial performance.

Leverage ( $\beta = -0.025$ ,  $p < 0.01$ ): A one-unit increase in the debt-to-asset ratio is associated with a 2.5 percentage point decrease in ROA. This confirms Hypothesis 2 and is consistent with the Trade-off Theory of capital structure and Pecking Order Theory. Excessive debt amplifies financial risk, raises interest obligations, and may lead to underinvestment due to capital constraints – all factors that compress profitability.

Sales Growth ( $\beta = 0.030$ ,  $p < 0.01$ ): A one-percentage-point increase in sales growth is associated with a 3.0 percentage point increase in ROA, confirming Hypothesis 3. This finding underlines the importance of revenue expansion as a driver of operational efficiency and profitability, consistent with the resource-based view and dynamic capabilities framework.



The model's R-squared of 0.42 indicates that approximately 42% of the cross-sectional and temporal variation in ROA is explained by the three regressors. The highly significant F-statistic (71.2,  $p < 0.001$ ) confirms the joint statistical significance of the model, validating its overall explanatory power.

## 5. Findings and Discussion

### 5.1 Key Findings

The empirical analysis generates three primary findings. First, firm size has a positive and statistically significant effect on profitability among BSE-listed Indian companies. This is consistent with established theory and prior empirical evidence, and suggests that growth in firm scale generates measurable efficiency gains. Second, leverage exerts a significant negative influence on ROA, reinforcing the view that excessive reliance on debt can erode financial performance by imposing interest burdens and heightening financial fragility. Third, sales growth is strongly and positively associated with profitability, indicating that market expansion and revenue generation are fundamental drivers of superior firm performance.

Taken together, these findings suggest that among Indian large-cap firms, size-driven efficiencies and growth dynamics are key profitability levers, while debt management constitutes a critical risk dimension. The model explains 42% of the variation in ROA, a level consistent with comparable multivariate studies in corporate finance (Zhang & Li, 2019).

### 5.2 Theoretical Implications

The positive size-profitability relationship is consistent with Penrose's (1959) Theory of the Growth of the Firm, which emphasizes that internal resources and managerial capabilities enable larger firms to achieve economies of scale. The finding also supports the Market Power Theory, as larger BSE-listed firms may exercise pricing influence and competitive leverage in concentrated market segments.

The negative leverage-profitability relationship corroborates the Trade-off Theory (Modigliani & Miller, 1963; Myers, 1984), which argues that beyond the optimal debt level, financial distress costs



outweigh tax shield benefits. It is also consistent with the Pecking Order Theory, wherein more profitable firms retain earnings and rely less on external debt, resulting in a negative empirical correlation between leverage and profitability.

The positive sales growth-profitability nexus aligns with dynamic capability perspectives and the Resource-Based View (Barney, 1991), suggesting that firms capable of sustaining revenue expansion effectively deploy their resource base to generate superior returns.

### **5.3 Managerial and Policy Implications**

For corporate managers, the findings highlight that scaling operations through prudent investment and market expansion can enhance profitability. However, this must be accompanied by disciplined capital structure management. Firms should target leverage ratios commensurate with their earnings capacity, avoiding over-reliance on debt that may amplify financial risk. Revenue growth strategies – including market penetration, product diversification, and geographic expansion – are consistently associated with superior ROA and should form a central pillar of corporate strategy.

For investors, the results suggest that screening for larger, revenue-growing firms with moderate leverage levels may identify financially resilient investment targets within the Indian equity universe. The significant explanatory power of the identified variables provides a tractable framework for firm-level financial analysis.

For policymakers, the findings underscore the importance of a conducive environment for firm growth. Policies that facilitate access to long-term equity capital, reduce regulatory barriers to scaling, and promote financial literacy among SMEs could contribute to improved profitability across the broader corporate sector. Given that high leverage constrains profitability, frameworks that encourage equity-based financing and efficient debt restructuring merit consideration.

## **6. Limitations and Directions for Future Research**

### **6.1 Limitations**

The study is subject to several limitations. First, the sample is restricted to 30 BSE-listed companies, primarily representing large, established corporations. The findings may not generalize to small and



medium enterprises (SMEs), startups, or unlisted firms, which typically face different financial and operational constraints. Second, the study omits several potentially influential factors, including corporate governance quality, ownership structure, research and development intensity, macroeconomic conditions, and industry-specific competitive dynamics. The exclusion of these variables may result in omitted variable bias, albeit partially mitigated by the inclusion of three theoretically grounded regressors.

Third, the study employs accounting-based measures (ROA) rather than market-based performance indicators such as Tobin's Q or Price-to-Book ratios, which may capture different dimensions of firm value. Fourth, OLS regression does not fully exploit the panel structure of the data; more rigorous fixed-effects or random-effects estimators could better control for unobserved firm-level heterogeneity. Fifth, diagnostic tests for heteroskedasticity and autocorrelation were not exhaustively conducted, which may affect the precision of standard error estimates.

## 6.2 Future Research Directions

Future research could expand the sample to include a larger and more diverse set of firms, particularly SMEs and companies listed on the National Stock Exchange (NSE), to enhance generalizability. Incorporating additional determinants – such as corporate governance indices, R&D expenditure, and macroeconomic indicators – would yield a more holistic understanding of profitability drivers. Advanced panel econometric techniques, including fixed effects, random effects, and dynamic GMM models, could improve estimation accuracy and address endogeneity concerns.

Future studies could also employ alternative profitability proxies, such as Return on Equity (ROE) or Tobin's Q, to assess whether findings are robust across different performance dimensions. Testing for non-linear or threshold effects in the size-profitability relationship could reveal whether optimal firm sizes exist that maximize returns. Cross-country comparative analyses – benchmarking Indian firms against counterparts in other BRICS or ASEAN economies – would enrich the understanding of how institutional environments moderate the determinants of profitability.

## 7. Conclusion



This study investigated the determinants of profitability among 30 BSE-listed Indian companies over the period 2014–2023, with a particular focus on the role of firm size. Employing descriptive statistics, Pearson correlation analysis, and multiple regression, the study provides robust empirical evidence that firm size exerts a positive and statistically significant influence on Return on Assets. Leverage is found to negatively affect profitability, while sales growth contributes positively – findings that align closely with canonical theories in corporate finance and strategic management.

The results confirm that economies of scale, disciplined debt management, and sustained revenue growth are the three principal levers of financial performance for large Indian corporations. In a rapidly evolving economic landscape characterized by digital transformation, globalization, and regulatory reform, these insights carry substantial practical relevance. Firms that successfully scale their operations while managing capital structure prudently and sustaining top-line growth are best positioned to generate sustainable returns.

The study contributes to the empirical literature by providing updated, multi-sector evidence from the Indian market within a unified multivariate framework. While the findings are bounded by the limitations of the sample and methodology, they offer a credible empirical foundation for corporate decision-making, investment appraisal, and policy design. The research agenda outlined herein – including larger and more diverse samples, advanced econometric techniques, and cross-country analyses – promises to deepen understanding of the complex dynamics linking firm characteristics to financial performance.



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