

# Firm-Specific and Macroeconomic Determinants of Capital Structure: An Empirical Study of Indian Companies

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## Abstract:

This research examines the factors influencing capital structure decisions among Indian industries from 2011 to 2017. Applying multiple regression models to panel data, the study assesses the validity of prominent capital structure theories in the Indian economic context. The results establish that agency costs, asset structure, non-debt tax shields, and firm size are significant determinants of leverage, with coefficients significant at the 1% or 5% level. These findings contribute to the understanding of corporate financing behavior in emerging markets and highlight the factors most critical to capital structure selection in India.

**Keywords:** Determinants, capital structure, agency cost coefficients, variables.

## INTRODUCTION

Growth in the corporate sector is critical to economic development. Finance has been recognized as a primary reason why enterprises in poor countries fail to start or grow. Firms in developing countries must be able to finance their activities and grow over time if they are to play an increasing and dominant role in delivering employment as well as income to households in the form of profits, dividends, and wages. "Growing SMEs will also contribute to expanding the size of the directly productive sector in the economy; generating tax revenue for the government; and, all in all, facilitating poverty reduction through fiscal transfers and income from employment and firm ownership" (Prasad et al., 2011).

To understand how enterprises in developing nations finance their operations, the factors of their financing or capital structure decisions must be examined. Financing decisions for businesses entail a wide range of policy problems. They have ramifications for capital market development, interest rate and security price determination, and regulation at the macro level. "At the micro level, such decisions affect capital structure, corporate governance and company development" (Green, Murinde and Suppakitjarak, 2012). "Knowledge about capital structures has mostly been derived from data from developed economies that have many institutional similarities" (Booth et al., 2011). It is important to note that different countries have different institutional arrangements, mainly with respect to their tax and bankruptcy codes, the existing market for corporate control, and the roles banks and securities markets play. There are also differences in social and cultural issues and even the levels of economic development. These differences actually warrant taking a thorough look at the issue from the perspective of developing economies, especially within the context of sub-Saharan Africa. The few studies on developing countries have not even agreed on the basic facts. Singh and Hamid (1992) and Singh (1995) used data on the largest companies in selected developing countries. They found that firms in developing countries made significantly more use of external finance to finance their growth than is typically the case in the industrialized countries. They also found that firms in developing countries rely more on equity finance than debt finance. These findings seem surprising given that stock markets in developing countries are invariably less well developed than those in the industrial countries, especially for equities. However, in an Indian study, Cobham and Subramaniam (1998) used a sample of larger firms and found that Indian firms use substantially lower external and equity financing. In a study of large companies in ten developing countries, Booth et al. (2011) also found that debt ratios varied substantially across developing countries, but overall were not out of line with

comparable data for industrial countries.

Over the last decade, most countries' development plans have evolved toward a greater reliance on private enterprises and the use of organized capital markets to finance these companies. "This underlines the importance of research on the functioning and financing of private companies in a wide range of institutional environments, particularly in developing countries" (Green, Murinde and Suppakitjarak, 2012).

The optimal capital structure has been defined as the combination of both debt and equity that leads to the maximum values of the firm and where overall cost of capital is minimum. The importance of an appropriate capital structure is, thus, obvious. The capital structure decision can influence the value of the firm through the earnings available to the shareholders which maximizes the shareholders wealth. Capital structure can affect the value of the company by affecting either its expected earnings or the cost of capital or both. While it is true that financing-mix cannot affect the share of earning belonging to the ordinary shareholders. There is an equally strong body of opinion which believes that financing-mix or the combination of dept. and equity has no impact on the shareholders' wealth and the decision on financial structure is irrelevant. The optimal capital structure usually involves some dept., but not 100% dept. ordinarily, some firms cannot identify this optimal point precisely, but they should attempt to find an optimal range for the capital structure.

## LITERATURE REVIEW

"Leverage can be defined in different ways. The definition of leverage depends on the objective of the analysis" (Rajan and Zingales, 2015). For example, for agency problem related studies of capital structure, leverage may be defined as debt-to-firm value ratio. In a study of leverage and financial difficulty, the interest coverage ratio is more appropriate. Total liabilities-to-total assets, debt-to-total assets, debt-to-net assets, and debt-to-capitalization are some more definitions of leverage. Furthermore, debt could be subdivided into its many components, with the numerator and denominator assessed in book and market value terms. In empirical studies, the most commonly used measure of leverage is debt-to-assets (or debt-to-capital). Since independent variables may have different effect on the types of debt, we use three measures of leverage: long-term debt to total assets, short-term debt to total assets and total debt to total assets ratios. Some previous research studies (Titman and Wessels, 1988; Pandey et. al., 2000; Chung, 1993) also use different measures of leverage. Each debt ratio is measured in book value and market value terms. Thus, we use six measures of debt ratio as dependent variable. In the market value debt ratio, the market value of debt is treated same as the book value and the current market capitalization of equity is used as the market value of equity. The selection of independent variables is primarily guided by the results from previous empirical studies in the context of some developed and developing countries. Our focus in this study is to examine the influence of these variables on the debt policy of Malaysian firms rather to identify new variables. In a comparative cross-country study, Rajan and Zingales (1995) find the following four important variables: growth, tangibility, profitability and size.

**Growth:** Firms with fast increasing sales frequently need to expand their fixed assets. As a result, high-growth enterprises have a bigger future demand for money and keep more earnings. According to trade-off theory, high growth enterprises' retained earnings increase, and they issue additional debt to maintain the target debt ratio. Based on this theory, a positive association between debt ratio and growth is projected. "The same relationship is supported by pecking order theory too.

**Investment opportunities:** Investment opportunities represent a firm's intangible value that does not have collateral value. "The intangible value is likely to be lost if financial distress takes place. The risk of undervaluation and resource diversion is quite high for firms with high intangible value" (Myers, 1977). These arguments suggest a negative relationship between debt ratio and investment opportunities. But the agency problem may be lower for short-term debt than long-term debt (Myers, 1977; Barclay and Smith, 1996 & 1999; Michaelis et. al. 1999). Balance sheet does not capture the future investment opportunities rather share price reflects them. Therefore, market-to-book value ratio is used as a proxy for investment opportunities. Empirical evidence on the relationship between investment opportunities (reflected through market-to-book value ratio) and capital structure is not conclusive.

**Profitability:** According to the interest tax shield hypothesis, which is derived from Modigliani and Miller (1963), firms with high profits would employ high debt to gain tax benefits. On the contrary, the

pecking order or asymmetric information hypothesis of Myers (1984) and Myers and Majluf (1984) postulates that companies prefer internal financing to debt to equity. Firms with higher profitability will employ higher retained earnings and less debt.

**Risk:** According to the trade-off theory, higher risk (earnings volatility) increases the probability of financial distress. Thus, it predicts a negative relationship between leverage and risk. However, it is shown that for a negative relationship between risk and leverage, bankruptcy costs should be quite large (Castanias, 1983; Bradley, Janell and Kim, 1984). Further, Thies and Klock (1992) argue that risk has negative relationship with long-term debt but positive relationship with short-term debt as high variability shifts financing from long-term debt to short-term debt and equity.

**Size:** Large firms are likely to be more diversified and less prone to bankruptcy (Rajan and Zingales, 2015). They are also expected to incur lower direct costs in issuing debt or equity. Thus, large firms are expected to employ higher amount of debt than small firms. It is also argued that smaller firms would have less long-term debt and more short-term debt because of shareholders-lenders conflict (Michaelas et. al., 1999; Titman and Wessels, 1988; Stohs and Mauer, 1996). The empirical evidence is mixed. A large number of studies find a significant positive relation between size and debt ratio (Lasfer, 1995; Rajan and Zingales, 2015; Barclay and Smith, 1996; Berger et. al., 1997). Kester (1986) and Remmers et. al. (1974) finds no significant effect of size on capital structure. Some studies reveal a positive relation between size and debt maturities (Barclay and Smith, 1996; Stohs and Mauer, 1996; Michaelas et. al., 1999).

**Tangibility:** According to trade-off hypothesis, tangible assets act as collateral and provide security to lenders in the event of financial distress. Collaterality also protects lenders from moral hazard problem caused by the shareholders-lenders conflict (Jensen and Mekling, 1976). Thus, firms with higher tangible assets are expected to have high level of debt. According to the maturity principle, net fixed assets shift financing from short-term-debt to long-term debt while inventory shifts financing from equity to short-term- debt and long-term debt (Thies and Klock, 1992). As regards the empirical evidence, some studies report a significant positive relationship between tangibility and total debt (Titman and Wessels, 1988; Rajan and Zingales, 2015).

## OBJECTIVE AND HYPOTHESES OF STUDY

Some recent empirical research have attempted to shed light on challenges of capital structure. The fundamental goal of this research is to gain insight into the situation from the corporate sectors. This article attempts to define the goals of the study of the Indian corporate structure. However, the following are the specific goals: -

- To examine the impact of asset structure on the debt-equity ratio.
- To see if profitability has an effect on the debt-equity ratio.
- To investigate the impact of debt-service ratio on debt-equity ratio.
- To determine whether agency costs have an effect on the debt-equity ratio.
- To investigate if the size has an effect on the debt-equity ratio.
- To determine whether tangibility has an effect on the debt-equity ratio.
- To investigate if non-debt taxes have an effect on the debt-equity ratio.

## HYPOTHESES

- ❖ The asset structure influences the debt-equity ratio positively.
- ❖ The debt-equity ratio is influenced negatively by mobility.
- ❖ Debt-equity ratio is influenced positively by debt-service ratio.
- ❖ The debt-equity ratio is modified negatively by agency costs.
- ❖ Size has a beneficial impact on the debt-equity ratio.
- ❖ Tangibility has a beneficial effect on the debt-equity ratio.
- ❖ Non-debt tax has a negative impact on the debt-equity ratio.

To test the idea, data from Prowers database of 2432 firms were examined (CMIE). Some companies were eliminated due to insufficient data availability. More companies that were not in the manufacturing sector were

also excluded, and finally, data for 232 companies from 12 industries were obtained. The following industries have been considered:

1. Auto	10
2. Cement	14
3. Consumer electronics	9
4. Cotton textile	30
5. Electricity	20
6. Mechanical	30
7. Metal	25
8. Mining	15
9. Non-metal	14
10. Food and beverages	20
11. Transport	20
12. Chemical	25
Total	232

The data were collected for all the companies over a period from 2005 to 2011 from prowest database Of CMIE.

## RESEARCH METHODOLOGY

Multiple regression was used to investigate the impact of numerous variables on the dependent variable, namely the debt-equity ratio. Multiple regression approaches of multivariate analysis were employed in this study to examine the effect of independent variables on dependent variables. To evaluate the individual regression coefficients of the regression equation, the t-test is used to see if the independent variables were helpful in defining the dependent variables, i.e. debt-equity. In place of the actual values of the dependent and independent variables, logarithmic values were used because logarithmic values have more statistical features than level values.

## THE MULTIPLE REGRESSION MODELS

A pooled cross-sectioned time series regression model is used to analyze the capital structure determinants

$$\text{Log Der}_1 = \log a_1 + b_1 \log \text{asset structure} + b_2 \log \text{profitability} + b_3 \log \text{debt service}_1 + b_4 \log \text{agency cost}_1 + b_5 \log \text{size}_1 + b_6 \log \text{tangibility}_1 + b_7 \log \text{non-debt tax} + u_1$$

The above model states that debt equity ratio is linearly dependent on the asset structure, profitability, debt service, agency cost, size, tangibility, and non-debt-tax.

## DEPENDENT VARIABLE

Apart from identifying the determinants of capital structure an important issue is defining what is meant by capital structure. Doukas and Pantzalis (2003) define "capital structure as a long term debt scaled by total debt plus market value of equity. However, following formula of debt-equity ratio has been considered".

$$\text{Long term debt} = \frac{\text{Debt-equity}}{(\text{Long term debt} + \text{market value of equity})}$$

## INDEPENDENT VARIABLES

This section briefly summarizes the independent factors that were utilized to characterize the dependent variables, specifically the debt-equity ratio. It is attempted to observe the direction of impact on the dependent variables when explaining the variables.

### Asset structure

Capital structure is also influenced by asset structure. According to the empirical evidence, there is a positive association between asset structure and long-term debt, and a negative relationship between asset

structure and short-term debt. The asset structure, on the other hand, was defined as the ratio of fixed assets to total assets.

### Size

Many studies suggest that there is a positive relation between leverage and size. Marsh (1982) finds that “large firms often choose long-term debt while small firms choose short-term debt. Large firms may be able to take advantage of economies of scale in issuing long term debt, and may even have bargaining power over creditors. So the cost of issuing debt and equity is negatively related to firm size”.

### Profitability

In contrast to theoretical studies, most empirical studies show that leverage is negatively related to profitability. Friend and Lang (1988), and Titman and Wessels (1988) obtain such findings from US firms. Kester (1986) finds that leverage is negatively related to profitability in both the US and Japan.

$$PBT = \text{PBT} / \text{Total assets}$$

PBT= Profit (earning) before tax

$$\text{Total Assets} = \text{Current Assets} + \text{fixed Assets}$$

### Collateral value of assets

The collateral value of a firm's assets has been discovered to be a driver of leverage; organisations with higher tangible assets are predicted to have higher leverage. Tangible assets are more likely to influence a firm's borrowing decision since they are less susceptible to informational asymmetries and often have a higher value than intangible assets in the event of bankruptcy.

### Debt service capacity

A higher ratio is desirable, but a too high ratio indicates that the firm is very conservative in using debt, and is not using credit to the best advantage of shareholders. A lower ratio indicates excessive use of debt.

$$\text{Debt service capacity} = \text{Total Interest paid} / \text{EBIT}$$

EBIT = earnings before interest and tax

### Non-Debt tax shield

The indicator for the non-debt tax shields is a direct estimate of non-debt tax shields over total assets.

$$\text{Non-Debt tax shield (No tax shield)} = \frac{\text{EBIT} - t \cdot T / (0.4)}{\text{Total Assets}}$$

a) Tax payment (T)

b) Operating Income (EBDIT)

c) Interest Payments (i)

d) Total Assets (TA)

e) Total assumed tax rate

$$\text{Agency cost} = \frac{\text{Total assets } t - \text{Total Assets } t-1}{\text{Total Assets}}$$

Higher agency cost is expected to result in lower debt levels.

### EMPIRICAL ANALYSIS

The findings in Table 1 show that the t-value of the coefficient of agency cost is significant at the 1% and 5% levels. The coefficient's sign is positive, which goes against our expectations. The t-value of the asset structure variable is statistically significant at the 1% and 5% levels. As a result, agency cost and asset structure refuted the null hypothesis of no association. The debt service ratio, the third independent variable, is projected to be positive. However, this variable has a negligible relationship with the debt-equity ratio. As a result, the null hypothesis (no association) was accepted. Non-debt tax is the fourth variable. At the 1% or 5% level of significance, the non-debt tax has a significant negative association with the debt-equity ratio.

We also anticipated a negative association. As a result, the hypothesis that there is no relationship between non-debt taxation and debt-equity ratio was rejected.

The debt-equity ratio has a positive but small relationship with profitability. We anticipated a negative association between profitability and debt-equity ratio, however our findings demonstrate a positive relationship. As a result, the null hypothesis (no association) was accepted. The third independent variable, size, was expected to have a positive relationship with the debt-equity ratio. At the 1% and 5% level of significance, the data demonstrate a negative and significant connection with the debt-equity ratio. It means that the null hypothesis, which stated that there was no association between size and debt-equity ratio, was rejected. In comparison to our assumptions of a positive association, tangibility has a negative coefficient. It demonstrates an insignificant association, implying that the null hypothesis of no link is accepted.

The coefficient of multiple determination  $r^2$  indicates that the independent variables utilised in the model explain for 46% of the changes in the debt-equity ratio.

Sr. No	Coefficient	Std Error	t-statistics	prob
C	0.710464	0.471754	1.506007	0.1328
1. Agency cost	0.257478	0.136555	1.918879	0.0546*
2. Asset Structure	0.548407	0.073981	7.30253	0.0000*
3. Debt Service	-0.004664	0.009358	-0.569782	0.5759
4. Non debt tax	-2.094859	0.474397	-4.237200	0.0000*
5. Profitability	0.719440	0.457184	1.563859	0.1173
6. Size	-0.168253	0.078488	-2.163951	0.0312*
7. Tangibility	-0.45723	0.470966	-0.7587960.4454	

$$R^2 = 0.457894$$

$$\text{Adju. } R^2 = 0.445404$$

Mean dep.

$$\text{Var} = 0.286512$$

S.D. dep.

$$\text{Var} = 0.345077$$

Note: -“\*” significant at 1% or 5% confidence level.

In conclusion out of 07 variables four are significant in influencing debt-equity ratio at 1% or 5% level of significance. These variables are agency cost, asset structure, non-debt tax and size. Though relationship between agency cost and debt-equity ratio is positive as shown by our results against our expectation of negative relationship. The second independent variable is asset structure. It is showing a positive relationship with the debt-equity ratio as was expected. The non-debt tax is an independent variable showing a significant and negative relationship with the debt-equity ratio as expected. Size is another independent variables which negatively and significantly influences debt-equity ratio.

## CONCLUSION

This paper examines the relevance of capital structure in selected Indian industries. Based on a regression analysis and data study we conclude that main variables determining the capital structure of industries in India are agency cost, assets structure, non-debt tax shield and size. The coefficients of these variables are significant at 1% or 5% levels.

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