

Factors affecting Leverage Decision: Empirical Evidence from Indian Oil and Gas Sector

Dharmendra S. Mistry*

Pallavi C. Vyas**

Abstract

Leverage is the extent to which debt is used in company's capital which has value to take tax advantage and also when benefit out of the assets purchased with the help of the Debt is greater than the cost of the Debt used to finance the Assets. Therefore, the management should determine the requirement of the Debt, examine of the Financial Markets and at the design of the use of leverage in Capital Structure. In the present research work, analysis has been done towards finding out the impact of the independent variables i.e. Firm Size, Asset Tangibility, Profitability on dependent variable i.e. Leverage of Public Oil and Gas Sector in India during the period of 5 years i.e. 2015-16 to 2019-20 through the statistical model. The study revealed that the models fitted have been the best described the behaviour of dependent variable against suitable alternatives and there has been a significant impact of independent variables on Leverage decision. The study found that the independent variables i.e. Firm Size, Asset Tangibility and Profitability have a negative/indirect impact on the Leverage decision.

Keywords: Asset Tangibility, Firm Size, Leverage, Profitability

1. Introduction

Funds are required to operate the firm that are raised either borrowed funds i.e. Debt or/and owners' funds i.e. Equity. Mixture of Debt and Equity has risk and return implications. Hence, it is required to appropriate process to establish the required capital structure. Therefore, the capital structure can be defined as use of different sources of funds to manage operations and for growth of firm. Leverage is the extent to which debt is used in company's capital which has value to take tax advantage

and also when benefit out of the assets purchased with the help of the Debt is greater than the cost of the Debt used to finance the Assets. Therefore, the management should determine the requirement of the Debt, examine of the Financial Markets and at the design of the use of leverage in Capital Structure. Use of leverage varies from industry to industry, sector to sector. Leverage decision is affected by standpoint of sales, business risk, growth, standpoint of taxes, profitability,

* Professor and Principal, Prin M C Shah Commerce College, Ahmedabad, Gujarat, India

** Assistant Professor and Head of Economics Department, Prin M C Shah Commerce College, Ahmedabad, Gujarat, India

financial flexibility, degree of managerial aggressiveness. If the firms have aggressive capital structure i.e. use more debt than equity to finance their assets, they are considered to be highly leveraged firms, while if the firms have conservative capital structure i.e. use of less debt than equity to finance their assets, they are considered to be lowly leverage firms.

Hence, Leverage decision i.e. determining mix of Debt and equity capital which can be defined as debt to assets and stimulates profitability and precariousness of the business, is a crucial management decision. Looking to the requirements of the companies, Liabilities either short-term or long-term (Chen, 2004) are chosen by them. It is important to determine proportion of leverage in capital structure with a view to achieving maximum value for a firm as well as evaluating the worth of tax shield contrary to several expenses of monetary distress, as well as agency costs and moral hazard as well as to signpost projections to the less-aware investors. An optimal capital structure is achieved at a point where the cost of the capital is the smallest hence the Leverage Decision is therefore one of the most imperative problems to keep a capital structure that diminishes monetary and business risks, while get the most out of the shareholders' wealth.

In the present research work, analysis has been done towards finding out the impact of the independent variables i.e. Firm Size, Asset Tangibility, Profitability on dependent variable i.e. Leverage of Public Oil and Gas Sector in India during the period of 5 years i.e. 2015-16 to 2019-20 through the statistical model. The regression technique has been used to study the level of impact of the independent variables on the dependent variable of the selected companies on the

public sector of Oil and Gas Sector in India. It is hypothesised for the study that Firm Size, Asset Tangibility, Profitability collectively do not have the impact on Leverage of Public Oil and Gas Sector in India. The study has been carried out as follows: the present section gives the introduction about the present research work. The second section discusses a literature review on research work carried out on Leverage. The third section outlines the methodology of the present study. The fourth section discusses the result and discussion and the last part of the study outlines the conclusion.

2. Literature Review

The study on the Leverage has begun with the introduction of irrelevance theory – known as MM Theory, followed by Trade-Off Theory, Pecking Order Theory and Market Timing Theory. Corporate funding behaviour in developing nations can be influenced by the identical set of aspects as it can be in developed nations (Booth et al., 2001). Leverage decision can be affected by various factors such as owner's attitude in the direction of debt; profitability, size, tangibility and liquidity; firms' characteristics; Ownership structure; financial distress costs; interest coverage ratio and growth; leverage and enforcement system; age, financial constraints and government ownership; legal structure of the organization and the taxation policies (Skalická et al., 2017); investment risk (Merlo et al., 2013); Firm Size & Maturity, Inflation or market conditions, and market to book assets ratio; corporate governance and customer base (Juliet et al., 2018); firm related characteristics such as future growth options, earnings volatility, profitability and control; access to capital markets, and lender's attitude

towards the firm (Nyanamba et al., 2013); risk. In short, Conventionally, widely held of investigations focused on solitarily the firm's characteristics while analysing the factors of corporate leverage but of late, investigators divided elements of leverage into three characteristics; firms' feature, industry's features and country's features despite the fact clearing up the leverage decision.

From the above review of empirical works, it is clear that different authors have approached their research on Leverage Decision in different ways in varying levels of analysis. These different approaches helped in the emergence of more and more literature on the subject over a period of time. It gives an idea of extensive and diverse works on Leverage Decision. It has been noticed that the studies on factors affecting the Leverage decision in various aspects provide divergent results relating to the study period overlap or coincide. The main reason for the divergence in the results is the use of the different methods for the measurement of factors affecting Leverage Decision. All the studies aimed to analyze factor affecting Leverage Decision in India & abroad with several factors.

Research Problem: The survey of the existing literature reveals that no specific work has been carried out to examine and ascertain determinants of Leverage Decision of Public Oil and Gas Sector in India. Moreover, varying outcomes by preceding studies surfaced the system for future studies precisely on the oil & gas industry as the theory of Leverage from the oil & gas industry's standpoint has not been stretched. The present study is an attempt in this direction and therefore, aims to enrich the literature on the identification of determinants of Leverage Decision of Public Oil and Gas Sector in India

Research Question: The present study is an attempt to find the answer to the following research questions. Which factors are the most determining factors to take Leverage decision in Oil and Gas Sector in India?

3. Research Objective:

The present study has been carried out with the following objective:

To identify determinants of Leverage Decision of Public Oil and Gas Sector in India.

3.1 Methodology

Geographical Coverage and Duration: The present research work had geographical coverage of India. It has taken into account the duration of 5 years i.e. 2015-16 to 2019-2020.

3.2 Population, Sampling Method and Sample Size:

A few literature reviews indicate the work on Oil and Gas Sector abroad and in India. Oil and Gas Sector is the key sector for any country and therefore the present study takes into account the Oil and Gas Sector of India in general and Public Oil and Gas Sector in Particular. There were 7 Public sector companies in Oil and Gas Sector in India during the study period. The researcher wanted to take the entire population as sample for the present study. However, out of 7, the present study had been based on 6 Public Sector companies into account looking to the availability of data and time. The reason for omitting 1 Company was the non-availability of data. Hence, the sample has been good enough to give the entire picture of Oil and Gas Sector in India in general because Public Sector dominated the Oil and Gas Sector in India during the study period and Oil and Gas public sector in particular. The sample for the present study has been selected based on Non-Probability Sampling. Convenience Sampling Method has been used

to select the sample for the present study.

Data Collection:

The study has been based on secondary data collected from annual reports of the companies under the study and different websites.

Hypothesis:

The following hypothesis has been framed on the basis of literature review. Framing of the hypothesis would have resolved research problem as well as research question and to serve the research objective.

Null Hypothesis:

Independent Variables i.e. Firm Size, Assets Tangibility and Profitability are statistically

insignificant in explaining the Leverage Decision of the companies under the study.

Alternate Hypothesis:

Independent Variables i.e. Firm Size, Assets Tangibility and Profitability are statistically significant in explaining Leverage Decision of the companies under the study.

Hypothesis Testing:

The above hypothesis has been tested through the techniques of regression and correlation.

Research Model

Following Regression Model has been developed to test the hypothesis:

$$Y = b_0 + b_1x_1 + b_2x_2 + \dots + b_kx_k \text{ ----- (1)}$$

- Where, y - Dependent Variable
- X1, X2,Xk - Independent Variables
- b0, b1, b2, bk - Regression Coefficients

$$L = \alpha + \beta_1S + \beta_2T + \beta_3P + e \text{ ----- (2)}$$

- Where,
- L = Leverage
- S = Firm Size
- T = Assets Tangibility
- P = Profitability

b0, b1, b2, b3 = Beta value/ slop coefficients/ parameters of the model shows the rate of change in independent variable(s) for a unit change in Leverage

Table 1 Definitions and Predicted Signs of Dependent and Independent Variables		
Variable	Definition	Predicted Sign
Dependent Variable		
Leverage	Total Liabilities/Total assets	
Independent Variables		
Firm Size	Natural Log of TA	-
Asset Tangibility	Fixed Assets/Total Assets	-
Profitability	EBIT/Total Assets	-

Table 1 shows the variables used, their definitions and predicted impact of the independent variables on the dependent variable on the basis of literature review .

Limitation: The present study has been based on secondary data. The outcome of the study has been based on the accuracy of the data so collected. The study has been limited to the public sector only.

Further Scope of Study: The present study has taken into account the Public Oil and Gas

Sector of India only. It can be extended to both the public and private sector. Based on the literature review, almost all the factors affecting Public Oil and Gas Sector in India have been covered. However, some more factors affecting LeverageDecision can be taken into account because factors may differ country to country.

4. Result and Discussion:

	df	SS	MS	F	Significance F
Regression	3	0.678602033	0.226201	40.45992	0.000000000613401939895397
Residual	26	0.145359115	0.005591		
Total	29	0.823961148			

Table 2 shows ANOVA Result of the regression models. As far as the Significance F value is concerned, it gives an idea that the regression result has been reliable (statistically significant). As Significance F is less than 0.05 (5%), the regression model has been fit and hence the selected independent variables have

been significant in explaining the dependent variable. The models fitted have been the best described the behaviour of dependent variable against suitable alternatives and there has been a significant impact of independent variables on Leverage decision.

Multiple R	0.907516
R Square	0.823585
Adjusted R Square	0.803229
Standard Error	0.074771
Observations	30

Table 3 divulges the Summary of Regression Statistics. It can be seen that Adjusted R Square is 0.80 which indicates that after adjustments the model explains 80% variation in the Leverage because of a set of predictors. The model also states that the Dependent Variable i.e. Leverage can be predicted from a linear combination of factors affecting Leverage i.e.

Firm Size, Asset Tangibility, Profitability. The remaining change in leverage is due to the other factors not taken into account and it represents all those factors that affect Leverage but are not taken into account explicitly/clearly. The model summary reveals that a set of selected determinants of Capital structure are strongly influencing

Leverage and have an impact on their fluctuation. It shows that 100% change in the set of predictors i.e. Firm Size, Asset

Tangibility, Profitability will result in 80 % change Dependent Variable i.e. Leverage.

Table 4 Regression Result				
	Coefficients	Standard Error	t Stat	P-value
Intercept	1.344046	0.273481497	4.91457	0.0000421023264433891
Firm Size	-0.02484	0.016690589	-1.48842	0.148671
Asset Tangibility	-0.61161	0.262516541	-2.32978	0.027852
Profitability	-0.01574	0.001980209	-7.94673	0.00000002004531888284

Table 4 shows the Regression Result. Coefficients of factors affecting Leverage decision propose that each 1 per cent change in Firm Size, Asset Tangibility and Profitability lead to negative change in Leverage. The change in Firm Size, Asset Tangibility and Profitability will adversely affect the proportion of leverage behaviour. In other words, with the increase in Firm Size, Asset Tangibility and Profitability, there will be decrease in Leverage i.e. Liabilities of the Firms under the study. Moreover, as far as P-values of Independent variables are concerned, Asset Tangibility and Profitability are statistically significant in determining

Leverage Decision because the P-values of these independent variables are less than 0.05. In other words, as the P-value is less than 0.05, the selected independent variables provide enough evidence to reject null hypothesis for the entire population and the data favour the hypothesis that there is a non-zero corelation between the independent variables and dependent variables. Changes in the independent variable are associated with changes in the dependent variable at the population level. Hence, the regression model to determine the leverage of Public Oil and Gas Sector Companies in India will be as under:

$$L = \alpha + \beta_1S + \beta_2T + \beta_3P + e$$

$$L = 1.344046 - 0.02484*S - 0.61161*T - 0.01574*P$$

Table 4 Correlation Result				
	L	S	T	P
L	1			
S	-0.52674	1		
T	-0.08526	-0.42696	1	
P	-0.8862	0.559232	-0.07521	1

Table 4 shows Correlation results. It shows that the independent variables i.e. Firm Size, Asset Tangibility and Profitability have a negative/indirect correlation with the

Leverage. It means that as independent variables i.e. Firm Size, Asset Tangibility and Profitability decrease, Dependent Variable i.e. Proportion of Debt in Capital Structure

increases. As the values of correlation coefficient of Profitability and Firm Size are closer to 1, they are closely/strongly related to Leverage.

Looking at the results of Regression and Correlation, it can be said that Leverage has significantly been affected by Firm Size, Asset Tangibility and Profitability. Hence, the Null Hypothesis is rejected and Alternate Hypothesis is accepted. It can be said that there are independent variables i.e. Firm Size, Asset Tangibility and Profitability which are statistically significant in explaining the Leverage of the companies under the study.

5. Conclusion

The study found that the independent variables i.e. Firm Size, Asset Tangibility and Profitability have a negative/indirect impact on the Leverage decision. Hence, it can be concluded that as independent variables i.e. Firm Size, Asset Tangibility and Profitability increase, Dependent Variable i.e. Leverage i.e. Proportion of Debt in Total Assets decreases.

Hence, it can be concluded that with the increase in Size of the firm, there will be repayment of Liabilities of the firm. Similarly, with the increase in Asset Tangibility i.e. Fixed Assets, there will be reduction in Liabilities of the firm. Correspondingly, with the increase in profitability, there will also be decrease in Liabilities of the firm. It means that firms should make use of increased Firm Size, Asset Tangibility and Profitability in repayment of their Long-term Liabilities and thereby to reduce the fixed financial burden in the form of interest as well as in repayment of Short-term Liabilities and thereby to improve its Liquidity

position. It can be said that with the increase in Firm Size, Asset Tangibility and Profitability, Oil and Gas Public Sector in India prefer to have conservative capital structure rather than aggressive capital structure that means that the higher the Firm Size, Asset Tangibility and Profitability will be, the lower the use of Debt than Equity to finance the Assets.

The objective of this research was well served by presenting a comprehensive framework of Oil and Gas Public Sector in India to support management in the determination of Leverage decision, fluctuations in the determinants of Leverage decision and their impact on the Leverage. This research provides the firm's specific factors which cause fluctuation in proportion of Debt in Capital Structure to facilitate the management to take one of the significant decisions of the financial management i.e. Leverage Decision. The concluded summary of this research offers financial managers major determinants of Leverage Decision are Firm Size, Asset Tangibility and Profitability. It is therefore suggested that Promoters/Financial Managers must observe and analyse these three major factors for determining the proportion of Debt in Capital Structure. As and when there will be increase in Firm Size, Asset Tangibility and Profitability, it is suggested that Oil and Gas Public Sector Companies in India should repay the Long-term Liabilities with a view to reduce financial burden i.e. interest as well as the Short-term Liabilities with a view to improve Liquidity position.

References :

Ang, J. S., Chua, J. H., & McConnell, J. J. (1982). The Administrative Costs of Corporate Bankruptcy: A Note. *Journal of Finance*, 37(1),

219-226.

Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *Journal of Finance*, 57(1), 1-32.

Booth, L., Aivazian, V., Demircug-Kunt, A., & Maksimovic, V. (2001). Capital structures in developing countries. *The journal of finance*, 56(1), 87-130.

Cariola, A. (2010). The Influence of Local Institutional Differences on the Capital Structure of SMEs. *International Small Business Journal*, 28(3), 234-257.

Chen, J. (2004). Determinants of Capital Structure of Chinese Listed Companies. *Journals of Business Research*, 57(1), 1341-1351.

Chen, J. J. (2004). Determinants of capital structure of Chinese-listed companies. *Journal of Business research*, 57(12), 1341-1351.

Cinde, R. W. (2016). Factors Affecting the Capital Structure in Textile and Garment Listed in Indonesia Stock Exchange. *IOSR Journal of Business and Management*, 18(10), 83-88.

Frank, M. Z., & Goyal, V. K. (2009). Capital structure decisions: which factors are reliably important? *Financial management*, 38(1), 1-37.

Gonenc, H. (2003). Capital Structure Decisions under Micro Institutional Settings: The Case of Turkey. *Journal of Emerging Markets Finance*, 2(1), 57-82.

Goyal, V. K., Nova, A., & Zanetti, L. (2011). Capital Market Access and Financing of Private Firms. *International Review of Finance*, 11(2), 155-179.

Hamzah, H. H., & Marimuthu, M. (2019). An Overview: Oil and Gas Capital Structure. *International Journal of Academic Research in Accounting, Finance and Management*

Sciences, 9(4), 330-334.

Juliet, W. K., Barbar, N., & Elizabeth, W. (2018). DETERMINANTS OF FACTORS AFFECTING CAPITAL STRUCTURE DECISION OF LISTED INSURANCE COMPANIES IN KENYA. *International Journal of Social Sciences and Information Technology*, IV(IX), 51-72.

Kaur, J. (2018). Determination of Factors Affecting Capital Structure of Micro, Small & Medium Enterprises in India. *International Journal of Science and Research*, 8(6), 974-977.

Khaki, A. R., & Akin, A. (2020). Factors affecting the capital structure: New evidence from GCC countries. *Journal of International Studies*, 13(1), 9-27.

Mat Kila, S., & Wan Mansor, W. (2008). Capital Structure and Firm Characteristics: Some Evidence from Malaysian Companies. *Journals of Applied Finance*, 15(7), 19-25.

Matthews, H. (1994). Capital Structure Decision Making in Privately Held Firms: Beyond the Finance Paradigm. *Family Business Review*, 7(4), 349-367.

Merlo, P., Dankiewicz, R., & Ostrowska-Dankiewicz, A. (2013). Probabilistic and statistical methods of risk analysis in the investments effectiveness evaluation and their application in business practice. *Actual problems of Economics*, (12), 437-446.

Modigliani, F., & Miller, M. (1958). The Cost of Capital, Corporation Finance and the Theory of Investment. *The American Economic Review*, 48(3), 261-297.

Modigliani, F., & Miller, M. H. (1963). Corporate Income Taxes and the Cost of Capital: A Correction. *The American Economic Review*, 53(3), 433-443.

Mouamer, F. M. (2011). The determinants of capital structure of Palestine-listed

- companies. *Journal of Risk Finance*, 12(3), 226-241.
- Myers, S. C. (1984). The capital structure puzzle. *The journal of finance*, 39(3), 574-592.
- Myers, S. C., & Majluf, N. S. (1984). Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have. *Journal of Financial Economics*, 13(2), 187-221.
- Nyanamba, S. O., Nyangweso, G. N., & Omari, S. M. (2013). Factors that Determine the Capital Structure among Micro-Enterprises: A Case Study of Micro-Enterprises in Kisii Town, Kenya. *American International Journal of Contemporary Research*, 3(7), 139-147.
- Pahuja, A., & Sahi, A. (2015). Factors Affecting Capital Structure Decisions: Empirical Evidence from Selected Indian Firms. *International Journal of Marketing, Financial Services and Management Research*, 3(3), 76-86.
- Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure: some evidence from international data. *Journal of Finance*, 50(5), 1421-1460.
- Ronoowah, R. (2004). Determinants of Capital Structure: New Evidence from Small Island Developing State. *The ICFAI Journals of Applied Finance*, 13(3), 5-28.
- Ross, S. (1977). The Determination of Financial Structure: The Incentive-Signalling Approach. *The Bell Journal of Economics*, 8(1), 23-40.
- Sabir, M., & Malik, Q. A. (2012). Determinants of Capital Structure – A Study of Oil and Gas Sector of Pakistan. *INTERDISCIPLINARY JOURNAL OF CONTEMPORARY RESEARCH IN BUSINESS*, 3(10), 395-400.
- Serrasqueiro, Z., & Nunes, P. M. (2012). Is Age a Determinant of SMEs' Financing Decisions? Empirical Evidence Using Panel Data Models. *Theory & Practice*, 36(4), 627-654.
- Skalická Dušátková, M., Zinecker, M., & Meluzín, T. (2017). Institutional Determinants of Private Equity Market in Czech Republic. *Economics and Sociology*, 10(4), 83-98.
- Soni, A. (2017). Determinants of Capital Structure: A Study of Indian FMCG Sector. *Asian Journal of Management*, 8(4), 1120-1130.
- Sureshbabu, N., & Chalam, G. V. (2014). Key Factors Influencing Capital Structure Decision of Indian Computer Software Industry. *Indian Journal of Applied Research*, IV(VI), 103-105.
- Titman, S. (2007). A Dynamic Model of Optimal Capital Structure. *Review of Finance*, 11(3), 401-451.
- Titman, S., & Wessels, R. (1988). The Determinants of Capital Structure Choice. *Journal of Finance*, 43(1), 1-19.
- Warner, J. B. (1977). Bankruptcy Costs: Some Evidence. *Journal of Finance*, 32(2), 337-347.