

Literature Review on Capital Structure and Firm Performance

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ABSTRACT

Capital structure theory suggests that there is no effect of capital structure on firm performance in perfect economy (with no tax and no transaction costs), and there is a positive relation between capital structure and firm performance in a real economy (with tax). On the other hand, in the presence of financial distress cost (bankruptcy costs and agency cost of debt), there is a positive relation between capital structure and firm performance at lower level of debt, and a negative relation at higher level of debt. This paper summarizes the development of the theory of capital structure since 1952. We consider both theoretical and empirical literatures that investigate the relationship between capital structure and firm performance. This paper concludes that the relation between capital structure and firm performance can be different due to differences in variables, corporate environment, leverage measures, performance measures, control variable, data issue, data analysis technique, market type, market location.

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1. Introduction

Capital structure is commonly defined as the proportion of debt and equity of a firm. Modigliani and Miller [14] assert that capital structure decision does not affect the firm value in a perfect market where there is no tax and no transaction cost. However, after few years, they relax the assumption of no tax market, and they stipulate that the debt is positively related with firm value because of the interest tax shield [16]. This suggests that possible maximum debt is optimum¹.

Afterwards, Baxter [1] has added bankruptcy cost², and Jensen and Meckling [11] have added agency costs³ to capital structure theory. Both of these studies [1, 11,] support Modigliani and Miller [16] as long as the debt is beneficial to firm. In the existence of either bankruptcy cost or agency cost,

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¹ The debt-equity proportion at where the firm value is maximum, known as optimum capital structure.

² Bankruptcy cost is the likelihood of a firm that becomes insolvent due to inability to pay its financial obligations (the debt and interests).

³ Agency costs arise from the conflict of interests when an agent works on behalf of a principal. In business firm management works as the agents of the shareholders (principal).

the firm value would not be increasing with the interest tax shield. They conclude the optimum capital structure where marginal benefit of tax is equal marginal cost of debt (cost arises for additional debt, for example, bankruptcy cost). It advocates that the optimal capital structure would be somewhere in between zero to hundred percent of debt. This is known as the *trade-off theory*⁴ of capital structure.

In other way, Donaldson [6] and Myers [17] argue that none of the above theory considers the actual cost of capital directly affects firm value. Higher the cost of capital, the lower the firm value would be. They believe that cost of internal equity (retained earnings) is the minimum. So, when a firm wants to finance, it should go for the retained earnings first. If a firm fails to finance from retained earnings, then the firm can go for external debt or external equity. They added that between external debt and external equity, a firm should choose external debt since the cost of debt is less than the cost of equity. Moreover, if a firm finance from debt, then interest tax shield would be added to the firm value. In this point, they partially support the trade-off theory of capital structure.

Since the capital structure theory is emerged, several empirical studies have tested whether the capital structure is related to firm performance or not. Different studies measure capital structure and performance with different financial measures and find different relations. However, no studies to best of my knowledge summarize the literature on theory and empirical to look into the reason why different studies find different outcomes. The summarizing of the theory and empirical literature would an outcome of this paper.

The outline of this paper is as follows. Section 1 discusses problem statement and objectives of this study. Theoretical background (of capital structure irrelevant, relevant and trade-off theory) and empirical literature regarding capital structure and firm performance are discussed in section 2. Section 3 concludes the paper.

1.2 Problem Statement and Objectives

Several empirical studies have been conducted on the capital structure theory. They have discussed either from the theoretical point of view [1, 6,7,8,11,14-16] or investigate the empirical evidence. Few studies have summarized all theoretical concepts in a single study or have investigated to find the reasons for different views on capital structure and firm value. Myers [17] discusses capital structure with respect to the dividend decisions. In addition, he recommends a moderate theory on capital structure by combining the all theories given prior to him. Harris *et al.*, [9] have summarized the theories and they propose possible determinants of capital structure. Myers [18] summarizes theories of capital structure to explain how corporations use the mix of securities and sources of finance for its investment. In a recent study, Boodhoo [3] reviews capital structure literature and recommends determinants of capital structure. None of the above studies considers the reasons for different in the relations between capital structure and firm performance. This study intends to fill the gap. The objective of this study is to explicitly review the theoretical background and empirical evidence of capital structure and firm performance literature. The outcome of this paper would help researchers to get the summary of all theories regarding the capital structure and firm performances, and some empirical evidences in a single paper. Now, we focus on the theoretical background of the relationship between capital structure and firm value.

⁴The trade-off theory of capital structure states how much of debt and how much of equity finance, a firm should choose to maximize the firm value by balancing the benefits and costs arisen from the financing decisions.

2. Literature Review

2.1 Capital Structure Theory (irrelevant and relevant)

The concept of the relation between capital structure and cost of capital is firstly introduced by Durand [7]. He considers two approaches in valuing a firm: net operating income (NOI)⁵ and net income (NI)⁶ approaches for with and without tax economy. With NOI approach, he asserts (without tax) that firm value does not depend on capital structure choices (debt to equity). With NI (without tax), however, he asserts that the firm value is positively related to debt level in the capital structure at a given cost of capital. It suggests that a hundred percent debt is optimum. Durand (1952) also verifies firm value⁷ using above approaches with tax world. He finds that under either method the debt amplifies firm value. Since debt is considered at book value, and the cost of capital is given, the value of equity is increased with the value of a firm.

In 1958, Modigliani and Miller [14] theorized how firm value is related to capital structure choices, and they introduce a cost of equity formula. They provide two propositions on capital structure theory: proposition I and proposition II in a perfect world (no taxes and other economic frictions)⁸. Proposition I states that the firm value is not related to its capital structure choices. And, proposition II states that the cost of equity is positively related to the capital structure choices (debt-to-equity) (see equation (ii)). The weighted average cost of capital (WACC)⁹ is,

$$R_A = W_E R_E + W_D R_D \quad (1)$$

Where, $R_A = \text{WACC}$, W_E and W_D are the weights of equity and debt respectively, and R_E and R_D are the costs of equity and debt respectively. If W_D goes up, then W_E goes down because the sum of weights is 1. Since R_E greater than R_D (as equity is riskier), with increase in W_D at a given R_D , R_E will be increased to keep R_A unchanged. MM consider this increase in cost of equity (R_E) as a compensation for the variability in equity returns due to higher debt in the capital structure. They derive the following formula of cost of equity:

$$R_E = R_A + (R_A - R_D) \frac{D}{E} \quad (2)$$

where, $\frac{D}{E}$ is the firm's debt to equity ratio. Here, cost of equity (R_E) is positively related to debt (D) at given R_A and R_D . Hence, at a given level of cost of capital, the increasing cost of equity is off set by the cheaper cost of debt. It implies that cost of capital is not changing with the changes in debt-to-equity choices. Therefore, if cost of capital is not changing, the firm value¹⁰ would not change.

⁵ Net operating income (NOI) is mostly known as earnings before interest and tax (EBIT). In NOI method without tax, he measures firm value by discounting earnings before interest (EBIT) by the cost of capital. Here, EBIT is equal to earnings before interest since tax is zero. He splits firm value into two: value of bonds and value of equity. The value of equity is measured by deducting the book value of debt from the firm value.

⁶ Net income (NI) is mostly known as earning after interest and tax (EAIT). In the NI method without tax, he subtracts the amount of interest on debt from operating income to measure net income. Then, he measures value of equity by discounting net income at the cost of capital. For both methods, he calculates share price by dividing value of equity by the number of shares outstanding.

⁷ He measures net income (NI) by subtracting the interest and tax from the EBIT. He again adds the amount of interest with the NI to get how much total amount is available for the bondholders and the shareholders. Then he divides the amount by the cost of capital to find the firm value.

⁸ The assumption of perfect market: with no tax, no bankruptcy cost, stocks and bonds are perfect substitutes, existence of risk-free assets, and firms are homogeneous in terms of asset.

⁹ WACC stands for weighted average cost of capital. Cost of capital and WACC are used interchangeably.

¹⁰ Firm value = net income/cost of capital.

Soon after MM propositions, some arguments regarding the assumptions were raised. Since, there is no arbitrary opportunity in a perfect market, Durand [8] argues with hypothetical example that investors would not invest on stocks. He also shows that debt and equity are not perfect substitute at different earnings levels. Finally, he argues that perfect market does not exist in the real world.

Modigliani and Miller [15] agree with Durand [8] all arguments. However, there is no constraint to assume the conditions. They justify their assumptions that the perfect market is the standard market. Regarding debt-equity substitution, they put a hypothetical example of 'home-made leverage'¹¹ to show that an investor can switch at his target capital structure. Hence, they ultimately support their propositions.

In 1963, Modigliani and Miller [16] introduce tax in measuring firm value. In real market, interest is tax deductible expenses. Firm can enjoy the tax benefit from the interest on debt. This tax benefit is added to the firm value, i.e.

$$V_L = V_U + tD \quad (3)$$

Where, V_L is the value of levered firm¹², V_U is the value of unlevered firm, t is the tax proportion, and D is the amount of debt in the capital structure. The above equation (3) suggests that possible maximum debt is the optimum capital structure.

Accordingly, the cost of equity in proposition II is as follows:

$$R_E = R_U + (R_U - R_D)(1 - t) * \frac{D}{E} \quad (4)$$

Where, $R_U = WACC$ of unlevered firm or cost of equity of the firm without debt, and $t =$ tax proportion. Here, the firm's cost of equity (with debt and tax) is less than that of without tax. Consequently, higher the debt, lower the cost of capital, higher the firm value.

In summary,
MM propositions 1 (without tax): firm value is independent of the capital structure.
MM propositions 1 (with tax): firm value increases as the debt increases due to interest tax shield.
MM proposition 2 (without tax): cost of equity is positively related to its debt-equity ratio at a constant WACC. The firm value does not change with the introduction of debt in the capital.
MM proposition 2 (with tax): cost of equity is positively related to its debt-equity ratio while WACC is decreasing due to interest tax shield. Hence, the firm value will be increasing with increasing in debt due to interest tax shield.

2.1.1 Introduction of bankruptcy cost

As we already mention that the bankruptcy cost of a firm is introduced by Baxter [1]. He argues that when a firm introduces debt in its capital structure, fixed financial cost is created. The firm has to pay interest and principal back irrespective to its earnings. It inflates the variability of returns to the equity-holders. This variability in returns intensify the riskiness of the firm, thereby the bankruptcy cost of the firm. This bankruptcy costs should be deducted from the firm value measured in the equation (ii). So, debt is adding to firm value as long as the interest tax shield is higher than the

¹¹ It shows how an individual investor can switch over from stock investment to bond (debt) investment to attain a target debt-equity and or attain a target possible profit.

¹² If there is no debt in the capital structure of a firm, then the firm is unlevered firm. If a firm has debt in its capital structure, then it is a Levered firm.

bankruptcy cost. If the bankruptcy cost is higher than the interest tax shield, then it will reduce the total firm value. To protect a firm from bankruptcy cost, the firm can borrow that much of debt that creates interest not exceeding the minimum possible future earnings. At this point, Baxter [1] believes cost of capital would be minimum as well as firm value maximum, and the bankruptcy cost is minimum (where variability of income is the least). He suggests a debt level, where interest amount is equal to the minimum possible future earnings. Thereby, it is supporting the trade-off theory of capital structure.

2.1.2 Inclusion of agency costs

The concept of principal (the owners of a firm) and agent (the managers of that firm) is firstly oriented by Berle [2] who disclose that if a large firm dilutes its equity, then the ownership and control of that firm become separated. Due to this separation, managers may take decisions to pursue their own interest instead of shareholders interest. It implies that performance will fall when managers own less than 100% instead of managers own 100% of a firm. The reason for falling in performance is due to the agency problem.

Jensen and Meckling [11] further discuss agency problem in two ways: equity-holders versus managers, and equity-holders versus debtholders. In agency costs¹³ between *equity-holders and managers*, they state that a higher proportion of equity insists managers to pursue their personal interest. It reduces the firm performance and thereby firm value. However, inclusion of debt can increase monitoring and bonding actions by debtholders. It increases the performance and thereby firm value. It suggests that debt is beneficial to equity-holders. On the other hand, in agency costs between *equity-holder versus bond-holders*, Jensen and Meckling [11] point out that if equity-holders largely depend on bondholders' monitoring, debt-holders may place some restrictions that are better-off to the bondholders, and hurt to the equity-holders. It reduces the firm value. So, substantial debt is costly to the equity-holders.

Following these paradoxical (beneficial versus costly) relation between debt and firm value, Jensen and Meckling [11] recommend a combination of debt and equity that maximize the firm value. Maximum firm value would be at where marginal benefit of debt and marginal cost of debt are equal. It suggests that a moderate level of debt is the optimum [1].

In 1986, Jensen [10] has added that agency costs may arise from using free cash-flow¹⁴. If managers have excess cash then they neither desire to pay out additional dividend nor repurchase stocks, rather they even desire to invest in loss carrying projects because they always prefer to control more assets. It reduces firm value. Jensen [10] believes that managers are bonding to debtholders to pay out cash in a way that reduces free cash-flow at managers' discretion. Hence, debt restrain from investing in value decaying projects. However, considering the costs of substantial debt, he again supports the trade-off theory of capital structure.

¹³Jensen and Meckling (1976) graphically show firm value curves with a hundred percent ownership by managers and partial ownership by managers. After a certain level of expansion path, firm value with a hundred percent ownership by managers is higher than that of a partial ownership by managers. They point out the maximum firm value (optimum level of expansion) with a partial ownership by manager, and how much value it would have been with a hundred percent ownerships by manager. The difference of these two is the agency cost. They also believe if the firm operates in perfectly competitive capital and product markets then the agency cost is absent.

¹⁴ Free cash-flow is defined as the excess cash-flow after investing positive net present value (NPV) projects discounted at relevant cost of capital. NPV measures the difference between present value of cash inflow and that of outflow, that is, how much value is adding to the firm.

2.1.3 Pecking order theory

In 1961, Donaldson [6] in his study [17] hypothesizes the pecking order theory, where he observes that the large firms strongly choose internal financing (retained earnings) provided regular dividend is paid-out. Because, retained earnings incur the least tangible cost. Even though, firms sometime need to finance from external sources, managers prefer issuing debt (bank borrowing or corporate bond) first. Donaldson finds majority of these large firms did not issue equity in the past 20 years and their share prices are incredibly high. Issuing equity is the last resort of financing since it incurs underwriting and administrative costs.

In 1984, Myers [17] that capital structure theories from previous studies [1,7,14-16] do not explain the actual financing behavior of a firm. When a firm announces its financing strategy, investors predict inside information. Investors expect that the firm would announce the possible least cost financing decision. Since cost of retained earnings is less than cost of external financing (debt and equity), it is obvious that firm value would be higher if a firm finances from retained earnings instead of debt. Myers [17] suggesting that if a firm fails to finance from retained earnings, then debt is preferable instead of equity due to interest tax-shield and less administrative costs. When a firm finances from debt, Myers [17] argue that it is consistent with the trade-off theory of capital structure [1,11] He treats equity as the last resort of financing, as it is the most expensive one.

Based on the capital structure theory [14-16], the trade-off theory (with bankruptcy costs and agency costs) [1,10,11], and the pecking order theory [6,17], it is evident that there is a debt level which would maximize firm value and thus the firm performance. Several studies have empirically tested these theories by investigating the effects of debt on the firm performance. We now turn to the empirical literature.

2.2 Empirical Literature

Several empirical studies examine the capital structure theories given by Modigliani and Miller [14,16], Baxter [1], Jensen and Meckling [11], and Jensen [10]. We discuss some empirical evidences from existing literature.

A study by Margaritis and Psillaki [13] investigates direct causality and reverse causality¹⁵ effects. They examine French traditional manufacturing industry (textiles and chemicals firms) and growth industries (computers and related activities, and R&D firms) from 2002 to 2005. They measure capital structure by debt to assets ratio, and performance by EBIT to total assets ratio. They control¹⁶ sales growth, ownership (as owned by family or non-family) and industry categories (financial, other than financial and generic). Using data envelopment analysis (DEA)¹⁷, they find a positive effect of debt on EBIT over the entire data. It implies that debt works as disciplinary tool to reduce inefficiency, to generate cash-flow to service debt, and improve performance.

Vătavu [20] found that debt inversely affects firm performance. He investigates 196 manufacturing firms listed on the Bucharest Stock Exchange in Romania from 2003 to 2010. He

¹⁵ To test the reverse causality, Margaritis and Psillaki (2010) use quadratic regression. They find that performance has a positive effect on low level of debt. The result supports the efficiency-risk hypothesis that debt and firm performance are positively related at low level of debt. However, the result does not support the franchise-value hypothesis that debt and firm performance are not negatively related at higher level of debt.

¹⁶ Family firms in all except chemical industry hold less debt in their capital structure. Compare to nonfamily firms, family firms are earning more EBIT in all industries. Chemical firms have no significant difference in debt between family and nonfamily firms. The reason, they assume, is most of the chemical firms are large. Growth is positively related to debt in all industry. Hence, they report that debt has a positive effect on firm performance towards all industries.

¹⁷ a deterministic non-parametric technique, to construct industry's frontier and firm performance.

exploits data from the Bucharest Stock Exchange's official website. He measures capital structure by short term debt, long term debt, total debt and total equity to total assets ratios; and performance by ROA and ROE. He controls¹⁸ asset tangibility, tax, business risk, liquidity and annual inflation rate. Using cross sectional regression analysis, he finds that short term debt and total debt negatively affect, while total equity positively affects ROA and ROE. Long term debt is statistically insignificant in all models (due to missing data). They identify couple of reasons to be negatively related are insufficient internal funding for profitable investment and lack of efficiency in using assets.

Dezi and Giudice [5] investigated the relationship between capital structure and firm performance of 320 SMEs¹⁹ in the southern Italian textile industry. They collect data from AIDA Bureau Van Dijk Electronic Publishing (BvDEP) database from 2008 to 2010 and also receive replied questionnaire from respondents (the entrepreneur-managers of firms) through a dedicated website. They measure performance by return on investment (ROI) and return on sales (ROS); and capital structure by equity, debt and trade credit. The questionnaires from respondents are divided into two groups: group A (firms having both ROI and ROS are positive) and group B (firms having both ROI and ROS are negative). By conducting Mann-Whitney test they find that group A prefers equity instead of debt financing while group B prefers debt instead of equity financing. The average cost of debt for group B is found higher than that of group A due to riskiness of the firms. In other words, the financial distress cost arising from debt for group B is higher than the benefits of interest tax shield. Dezi and Giudice [5] recommend a moderate level of debt where marginal benefit of debt and marginal cost of debt are equal. It supports the trade-off theory of capital structure [1,4,10,11]. In a study Krishnan and Moyer [12] compare and contrast the relations between capital structure and performance among four countries in Asia (Hong Kong, Korea, Malaysia, and Singapore). They collect data of 81 firms for five-year average ended in 1992 from Disclosure Worldscope. Capital structure is measured by long term debt to equity and total debt to equity ratios; and performance is measured by ROE, ROI, pre-tax profit margin and market return on stock. By using regression analysis, they find²⁰ that the difference in debt is not seemed to affect firm performance among these four countries. However, they find that the country of origin and tax rate have the influence on the capital structure and firm performance. The differences in performances among these countries may also due to either Chaebol structure (i.e., small number of large firms control the market) or less intervention of the government in private sector or both. Hence, Krishnan and Moyer [12] conclude that debt does not affect firm performance.

Uddin [19] identified why the results of different researchers regarding the capital structure and firm performance are varying. He also verifies the effect of capital structure on performance and the effect of performance on firm capital structure in his study. He collects book-value based data from the annual reports of 14 pharmaceutical companies, listed on Dhaka Stock Exchange from Bangladesh Securities Exchange Commission library, Dhaka Stock Exchange library, Chittagong Stock Exchange library, and University of Liberal Arts library. He reveals, with some empirical literature and hypothetical examples, the reasons are differences in variables, corporate environment, leverage

¹⁸ Tax is positively, and tangibility is negatively related to both performance indicators. Annual inflation rate has positive influence on ROA. Business risk is high when firms are taking higher debt. Results suggest that performance is high when firms i) finance more from equity, ii) invest less in tangible assets, and iii) keep more liquid assets.

¹⁹ They select firms which have operating revenue between €500,000 to €5million, and employee number 5 to 35.

²⁰ The ROE and ROI in Hong Kong are higher from the other three countries due to either Chaebol structure (i.e., small number of large firms control the market) or less intervention of the government in private sector or both. However, ROE and ROI are not significantly different among three countries (other than Hong Kong). Pre-tax margin of Hong Kong firms is significantly different from Korea. The tax has an influence on capital structure after 'controlling for country of origin'. Debt level of firms in Korea is higher than other three countries. This difference in debt is not seemed to affect firm performance among these four emerging countries.

measures, performance measures, control variable, data issue, data analysis technique, market type, market location. He assesses corporate performance by, introducing a different measure that considers multiple inputs and outputs named, Malmquist productivity change index and its components. Total fixed assets, wage and salary are used as productivity index, the input variables; and net profit, and value added are as output variable. Malmquist productivity analysis considers constant returns to scale is followed by the production input. Uddin [19] performs two models: *productivity or performance model* shows the leverage sensitivity on firm performance and *leverage model* shows the performance sensitivity on firm leverage with efficient-risk hypothesis and franchise-value hypothesis. Based on OLS regression, no significant effect of leverage is found on Malmquist productivity change index and its components. He also conducts the reverse causality tests to find whether Malmquist productivity change index and its components affect the firm performance or not. The results suggest that there is no significant effect of Malmquist productivity change index and its components on the leverage of firm. Hence, the performance of pharmaceutical sector in Bangladesh is irrelevant to the capital structure decisions.

As discussed in previous sections we see that there are several studies have been done in terms of development of theory of capital structure. All those studies have tested the relevant or irrelevant theory, trade-off theory and pecking order theory of capital structure. These studies reveal that there is a relation between capital structure and firm performance. Most of the above studies suggest that capital structure affects firm performance. They find that the effect is either positive [13]; negative [20] or positive to some extent and negative thereafter [5] or no relation [12]. Evidences also suggest that the firm performance also related to its size, age, market share, asset tangibility, and liquidity and business risk etc. Uddin [19] has identified some reasons for finding different results for different studies. The reasons are the choice of differences in variables, corporate environment, leverage measures, performance measures, control variable, data issue, data analysis technique, market type, and of market location.

3. Conclusion

The objective of this paper is to summarize the development of the theory of capital structure: irrelevant, relevant, trade-off and pecking order theory. Different theories on capital structure are consistent with different conditions. This paper also summarizes some empirical literature. Different empirical studies are giving different relations between capital structure and firm performance, such as, positive, negative, positive to some extent and negative thereafter (*trade-off*), and no relation. Performance of a firm also depends on firm (for example, firm's assets size, market share, asset tangibility, liquidity and so on) and market characteristics (such as, industry, inflations, and business risk etc.). This paper concludes that the relation can different because of using differences in variables, corporate environment, leverage measures, performance measures, control variable, data issue, data analysis technique, market type, market location [19]. This paper will help students, academicians, and researchers to get the summary of all theories regarding the capital structure and firm performances, and some empirical evidences in a single paper. This study could include more literature. However, future study may extend by including more evidences from the literature.

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