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Research Paper

Traditional Trade-off V/S Pecking Order, Which is a Better Theory?

Management

KEYWORDS : Traditional trade-off theory, Pecking order theory, Leverage, NSE

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ABSTRACT

Core objective of each firm is to maximize the firm value by selecting the projects with positive net present value and lowest cost of capital. Of course capital structure of firm is a critical element for firms to maximize their value. The purpose of this study is to examine financing behavior of Indian firms and to investigate that which theory of capital structure is better in explaining financing behavior of Indian firms and whether financing behavior of firms operating in India as a developing country and emerging economy is in accordance with financing behavior of developed countries or not. Two main theories of capital structure in this paper are tested: the traditional trade-off theory and the pecking order theory. Results suggest that the pecking order theory rather than the traditional trade-off theory is better in explaining the financing behavior of Indian companies. Results of this paper are consistent with the results for most of the developed countries.

1. Introduction

Firms for sustaining and growth need to invest projects. On the other hand maximizing of firm value is benefit for the stock-holders. Thus, goal of each firm is to maximize the value of the firm. This is obtained by selecting projects with positive net present value and financing them by lowest cost of capital. Two main theories of capital structure are examined in this paper: The traditional trade-off theory and the pecking order theory. The main objectives of this paper are to examine empirically the pecking order theory of capital structure and the traditional trade-off theory of capital structure and to suggest which theory of capital structure is better in explaining financing behavior of firms listed on National Stock Exchange of India (NSE).

2. Review of literature

Modigliani-Miller (MM) proposition is the first theory about capital structure. According to MM proposition, firm value is irrelevant to capital structure or financing decision. This proposition was presented by Modigliani and Miller in their research paper in 1958 (Modigliani & Miller, 1958). The following assumptions were laid down by them, which are hardly true in real world:

- Capital markets are ideal with no transaction and bankruptcy costs
- There are not different risk classes for firms
- Only one kind of tax matters is the corporate tax payable to the government
- All cash flows are perpetuities and no growth factor in cash flow is assumed
- Insiders and outsiders have no information asymmetry
- There is no moral hazard on manager's part and they work for shareholder's Wealth maximization
- Firms issue solely two varieties of claims: equity with risk and debt without risk

Modigliani & Miller (1963) recognized the benefits of personal tax and introduced a model of capital structure incorporating this. MM hypothesis Π implies that, to maximize market value of the firm, management should have virtually 100 percent debt in its capital structure. Indeed many firms have no debt. The big question for MM hypothesis Π is why do firms fail to take greater advantage of the deductibility of corporate interest to increase their equity value? (Ogden, Jen, & O'Connor, 2003)

2.1. The traditional trade-off theory

The traditional trade-off theory provides one answer to the question that why do firms fail to take greater advantage of the deductibility of corporate interest to increase their value of equity? According to this theory, as a firm increases debt relative to equity in its capital structure, expected costs of future financial distress and bankruptcy also raise, eventually enough to fully offset the benefit of the tax shield, at the margin. At this point, firm value is maximized, and beyond this point firm value actually falls. Typically, this theory explains why firms follow a moderate and cautious approach to debt issues, despite benefits of tax shields. The traditional trade-off theory presented modified model of Modigliani & miller 1963 as follows:

$$V_L = V_U + \tau_c D - PV[E(CFFD)]$$

Where V_L is value of levered firm, V_U is value of unlevered firm, τ_c is tax rate and PV [E (CFFD)] is present value of expected costs of future financial distress.

2.1.1. Interest tax shield

Beattie, Goodacre, & Thomson (2006) asserted the importance of interest tax shield on financing behavior of UK firms. MacKIE-MASON (1990) shows tax-paying firms favor debt. Long- term debt is significantly dependent on firm's efficient marginal tax (Graham, 1996). On the contrary, as Fama & French (1998) discovered there is not any net tax benefit in debt and in equilibrium, debt is along bad news about profitability that overrides interest tax shield or other benefits of debt.

2.1.2. Costs of financial distress and bankruptcy

According to Myers, (1984) "costs of financial distress include the legal and administrative costs of bankruptcy, as well as the subtler agency, moral hazard, monitoring and contracting costs which can erode firm value even if formal default is avoided" (p.580). De Miguel & Pindado (2001) found an inverse relationship between financial distress costs and debt, due to the higher premium demanded by debt underwriters. (Beattie, et al., 2006) asserted that financial distress is important on financing behavior of UK firms.

2.1.3. Target leverage

The concept of target capital structure plays an important role in many models of corporate financing. However, empirical evidence on target leverage has been mixed (Hovakimian, 2004). Kayhan & Titman (2003) found that over long periods of time firms make financing choices that tend to move them towards their target debt ratios. Titman & Tsyplakov (2007) also discovered that firms move relatively slowly towards their target debt ratios. The results of Antoniou, Guney, & Paudyal (2008) confirmed that firms have target leverage ratios.

Leary & Roberts (2005) confirmed that financing behavior is consistent with the presence of adjustment costs, they found that firms actively rebalance their leverage to stay within an optimal range. Their evidence suggests that the persistent effect of shocks on leverage observed in previous studies is more likely due to adjustment costs than indifference toward capital

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structure.

Taggart, (1977) concluded that movements in the market values of long-term debt and equity are important determinants of corporate security issues. He also provides some evidence that timing strategies may speed up or postpone firm's adjustment to their targets.

2.2. The Pecking Order Theory

Information asymmetry had not been considered in trade-off theory. This assumption was later relaxed which led to the pecking order theory which was stood on the conflicts between the insiders and the outsiders due to different information at their hands.

Myers & Majluf (1984) and Myers (1984) proposed the pecking order theory. Besides information asymmetry between the insiders and the outsiders, Myers and Majluf assumed perfect market like Modigliani and Miller. Managers will not issue new undervalued shares, if they are acting in favor of shareholders. Managers will issue new equity shares with the hope of getting offset by NPV of growth opportunity or new investment opportunity. This leads to drop in share price. Hence, this is a bad news for assets in place. The issue becomes worse as the information asymmetry increases. For investing, firms with more growth opportunity are better than matured firms, because the price falling down is affected by growth opportunity value versus assets in place. Debt has the prior claim over equity and debt issuers are less exposed to information asymmetry. Therefore, issue of the debt should affect on price as compared to equity issue. Kim & Stulz (1988) found that share price increased with the announcement of debt issue. But in the case of equity issue, Masulis & Korwar (1986) discovered that the share price falls after announcement of equity issue.

As the pecking order theory suggests, firms rely on internal sources with lowest information asymmetry costs, then debt and ultimately equity with highest information asymmetry costs. Firms don't have optimal debt ratio and hence the firm's debt ratio is representing the accumulated external financing required. Myers (1984) came up with modified pecking order theory. He proposes that the firm should takes advantage from filling the financial slack by issuing equity when the information asymmetry is less.

Shyam-Sunder & C Myers (1999) demonstrated strong validity for the pecking order theory while Frank & Goyal (2003) provided little support for that and Korajczyk, Lucas, & McDonald (1992) found that debt issues do not have priority to equity issues. Frank & Goyal (2003) tested the pecking order theory of corporate leverage on a broad cross-section of publicly traded American firms for 1971 to 1998. They found that financing deficit is less important in explaining net debt issues over time for firms of all sizes. Mayer & Sussman (2004) found evidence consistent with the pecking order theory that firms, Paricularly large and profitable firms, mainly finance their projects with borrowing.

Lemmon & Zender (2004) found that the pecking order theory is a good descriptor of the observed financing behavior of a broad cross-section of firms. Their finding that, on average, large, profitable, low leverage firms use internally generated funds to finance their growth and allow their leverage ratios to drop over an extended period is consistent with the pecking order. Tong & Green (2005) provided the results that support tentatively the pecking order hypothesis. Fama & French (2005) rejected the pecking order's central predictions about how often and under what circumstances firms issue and repurchase equity.

3. Research Methodology

In this paper we used the panel data and ordinary least square model for estimation of equations. Basic models of Shyam-Sunder & Myers (1999) are used for testing the pecking order theory and the traditional trade-off theory.

3.1. Research model for the pecking order theory

For testing the pecking order theory, first financial deficit of each financial year must be calculated. The formula is as follows:

$$DEF_{it} = DIV_{it} + \Delta GB_{it} + \Delta INV_{it} + \Delta W_{it} + R_{it} - C_{it} \quad \textbf{(1)}$$

Where C_{it} is net cash from operating activities of firm i and year t DIV_{it}, is dividend payouts of firm i and year t ΔGB_{it}, is net increase in gross block of firm I and year t, ΔINV_{it} is net increase in investment of firm I and year t, ΔW_{it} is net increase in working capital of firm I and year t, R_{it} is current maturity of long-term debt at start of the period of firm I and year t

Model for testing the pecking order theory of capital structure is as follows:

$$\Delta D_{it} = a + b_{po} DEF_{it} + e_{it} \quad (2)$$

Where ΔD_{it} is change in debt for firm i in year t, a is intercept, b_{po} is the coefficient for pecking order theory, DEF_{it} is total financial deficit for firm i in year t

3.2. Research model for testing the trade-off theory

$$\Delta D_{it} = a + b_{TA}(D^{*}_{it} - D_{it-1}) + e_{it} \quad \textbf{(3)}$$

Where ΔD_{it} is change in debt for firm i in year t, a is intercept, b_{TA} is the coefficient of target adjustment model, D^{*}_{it} is optimal (target) debt for firm I in year t, D_{it-1} is debt of firm i in year t-1. Method of calculating D^{*}_{it} is historical mean of debt of each company from 2008-2012.

3.3. Hypotheses of the study

3.3.1. Hypothesis 1

This hypothesis is for testing the pecking order theory of capital structure.

H_{10}:

There is no positive relationship between financial deficit and change in debt

H_{1A}:

There is positive relationship between financial deficit and change in debt

3.3.2. Hypothesis 2

This hypothesis is for testing the traditional trade-off theory of capital structure.

H_{20}:

There is no positive relationship between deviation from optimal (target) debt and change in debt

H_{2A}:

There is positive relationship between deviation from optimal (target) debt and change in debt

3.4. Sources of data:

For this study companies have been selected that were listed before 31-03-2008 on National Stock Exchange of India (NSE). A number of 139 companies from Auto, Industrial manufacturing, Energy, Telecom, Pharmaceuticals, Metals, Construction, IT, Services, Chemicals & Fertilizers, Textile, Fast Moving Consumer Goods (FMCG) and Consumer durables listed on NSE were selected for the study. Companies with missing data are not included in this study. Financial and securities sector companies are also eliminated from this study as their financial characteristic and the use of leverage is different from other companies. 5 years data are selected for this study from 2008 till 2012. All financial data collected are in terms of Rupees Crores.

4. Empirical results

4.1. Testing the pecking order theory of capital structure

Table 1: Testing the pecking order theory of capital structure of Indian firms

R^2	Adjusted-R^2	a	b_{po}	t-Statistic	P-value
0.014451	0.013029	235.1181	0.054635	3.187699	0.0015

According to table 1 R^2 is poor, it means only 1% of variation in debt is explained by financial deficit. According to P value of DEF, there is positive relationship between fund flow deficit (DEF) and change in debt (CID). Thus null hypothesis is rejected and alternative hypothesis will be accepted. But this equation is not a perfect relationship between fund flow deficit and leverage. In the perfect relationship, Intercept ('a' in the model) would be equal to zero and the coefficient of DEF or (b_{po} in the model) would be equal to one. Figure 1 presents the relationship between change in debt and financial deficit. Except some points, positive relationship between change in debt and financial deficit is visible.

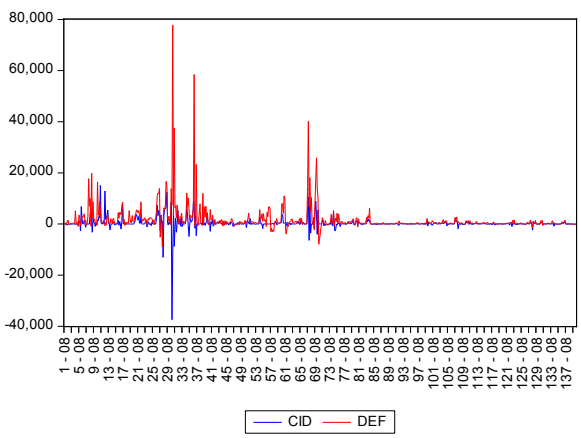


Figure 1: relationship between change in debt and financial deficit

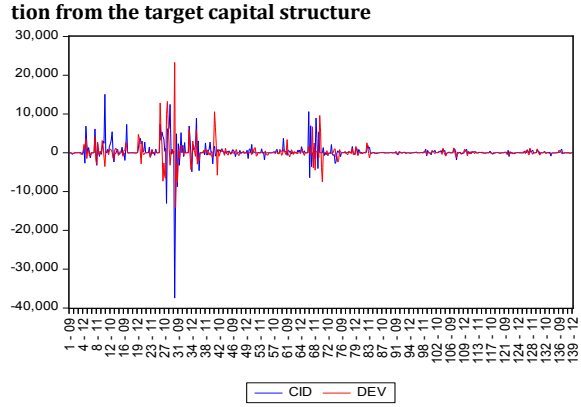
4.2 Testing the traditional trade-off theory of capital structure

According to table 2, R^2 is equal to approximately 0.02; this indicates that only 2% of issue or retiring the debt of Indian firms are explained by the deviation from the target debt. The P value of deviation from the target is significant. But the coefficient of the deviation from the target debt is negative and poor. It means that there is negative relationship between change in debt and deviation from the target debt. That alternative hypothesis will reject and null hypothesis will be accepted. Thus, definitely it can be said that Indian firms are not following the traditional trade-off theory of capital structure. In the other words, they don't have optimal capital structure. The relationship between change in debt and deviation from the target debt has been shown in figure 2. Negative relationship between change in debt and deviation from the target debt is very clear in figure 2.

Table 2: Testing the traditional trade-off theory of capital structure for Indian firms

R^2	Adjusted -R^2	a	b_{TA}	t-Statistic	P-value
0.017740	0.015967	299.5023	-0.161870	-3.163172	0.0016

Figure 2: relationship between change in debt and deviation from the target capital structure



5. conclusion

According to empirical results, it is very clear that Indian firms are not following the traditional trade-off theory of capital structure. This result is consistent with the result of Shyam-Sunder & C Myers (1999). As it mentioned earlier they demonstrated strong validity for the pecking order theory of capital structure. Another research confirming the results of this paper is by Kayhan & Titman (2003), they found that financial deficits (the amount of capital raised externally) generally have a positive effect on changes in debt ratios. Lemmon & Zender (2004) found that the pecking order theory is a good descriptor of the observed financing behavior of a broad cross-section of firms. According to Beattie, et al.(2006) 60% of UK firms claim to follow a financing hierarchy, consistent with pecking order theory. Unfortunately there is not reliable literature on testing the pecking order theory of capital structure in India. As it is shown in table 1, the pecking order theory is better in explaining the financial behavior of Indian firms rather than the traditional trade-off theory. Results of Bhaduri (2002) also confirms results of this paper. Generally it should be said that results of this paper is consistent with what is found in developed countries.

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