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Market Value and Capital Structure: A Study of Indian Manufacturing Firms

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MARKET VALUE AND CAPITAL STRUCTURE: A STUDY OF INDIAN MANUFACTURING FIRMS

Dhananjaya K* and Krishna Raj**

Abstract

India's stock market witnessed significant development post 1990 due to a series of reform measures. As a result, firms are able to raise market-based capital, which helped them to reduce their dependence on institution-based finance. Consequently, the market valuation of a firm has become an important variable in corporate finance decisions. However, traditional theories of capital structure fail to offer an unambiguous explanation on the impact of market value on capital structure. To bridge this lacuna in capital structure literature, Baker and Wrugler (2002) propounded the market timing theory, which argues that firms time the market, that is, firms raise equity capital when market valuation is high and buy back when market valuation is lower, and hence the current capital structure of the firm is the cumulative result of past attempts to time the equity market. In this study, we attempted to understand the role of market value in influencing the capital structure decisions of the manufacturing firms in India. We found that market value negatively influences debt ratio both in the short term and long term, indicating the practice of market timing. Further, we found that the negative impact comes from changes in equity issues rather than changes in retained earnings or debt retirement.

Key words: capital structure, market valuation, and market timing,

JEL Classification: G3

Introduction

Over the last two decades, the stock market in India has witnessed tremendous growth due to the series of capital market reforms initiated in the early 1990s. As a result, it has emerged as an important alternative source of finance for corporates, which helps to diffuse the excessive burden on the banking system (RBI, 2015). Traditional theories seem to have overlooked the role of the stock market in influencing a firm's capital structure. For instance, in the irrelevance theory of Modigliani & Miller (1958), there is no gain from shifting between debt and equity as in efficient capital markets, the cost of these sources of finance do not change independently. But the trade-off theory argues that the capital structure is primarily determined by the costs and benefits of debt financing. Hence, temporal fluctuations in the market value of the firm should have only temporary or short-term effect on capital structure. Similarly, the agency theory maintains that debt financing involves agency cost and tax benefits, and optimum capital structure balances these two elements of debt financing. On the other hand, the pecking order hypothesis states that information asymmetry in the capital market determines the source of finance for the firm. Firms facing less information asymmetry problem would be dependent more on external finance and firms facing higher information asymmetry problem more on internal capital. However, as argued by Demirguc-Kunt & Maksmovic (1996), the optimum capital structure may not be possible in the absence of well-functioning equity markets, which implies that the stock market is an important determinant of capital structure. Yet, they argue that the impact of stock

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market on the capital structure of a firm is not unambiguous. Sudden access to a well-developed stock market may result in the substitution of outside equity for outside debt in the case of firms that were previously constrained to issue only outside debt, resulting in a decrease in the firms' debt-equity ratio. Alternatively, it may result in the substitution of outside equity for inside equity, in which case the debt-equity ratio will not be affected; or, it may lead to the firm opting for expansion since a well-functioning stock market enhances the entrepreneur's ability to diversify risks. The impact of the last option on debt-equity ratio depends on how the expansion is financed. In this connection, Baker & Wurgler (2002) expounded the market timing hypothesis, which argues that a firm's capital structure is the result of past market timing. Firms issue more equity when market value is high and buy back when they experience low market value. Hence, market timing theory establishes a direct connection between the firms' market value and their capital structure decisions. With this background, the paper attempts to empirically examine the impact of firms' market value on capital structure decisions in Indian manufacturing firms.

The paper is structured as follows. In section I, we briefly review the theoretical and empirical literature on capital structure decisions. In section II, we discuss the composition of the capital structure of sample firms. Section III focuses on the source of data and methodology used in the paper. Section IV presents the results of the analysis and findings, and section V contains the conclusion.

Determinants of Capital Structure: Theory and Evidence

The Modigliani-Miller irrelevance theorem kick started the debate on the issue of capital structure. Modigliani & Miller (1958) claimed that the value of the firm depends on its marginal productivity and cost of the capital, and that source of capital is irrelevant to its value. This came to be known as the Modigliani and Miller irrelevance theorem. According to Modigliani & Miller (1958), in a world of perfect capital market and no tax, a firm's investment depends on the return on investment and the cost of capital. Investment opportunity will be pursued if and only if the return on investment is equal to or more than the marginal cost of capital. This implies that marginal cost of capital is the cut-off point for the investment and that the kind of instruments used to finance the investment is irrelevant. However, unrealistic assumptions such as the existence of perfect capital markets, absence of taxes and lack of bankruptcy costs of debt financing, proposed in the Modigliani & Miller (1958) irrelevance theorem, came under severe criticisms. In response to this, Modigliani & Miller (1963) acknowledged the tax benefits involved in debt financing. They maintained that a firm's value would be influenced by the benefits conferred by debt financing through the tax deductibility of interest payments. Due to this, firms may be motivated to rely completely on debt financing as it provides a tax shield. But Miller (1977) pointed out that the tax advantage conferred by debt financing would be offset by the disadvantages of personal tax, and hence the irrelevance theorem would hold good even in the presence of tax. Further, Miller (1977) presumed that debt financing does not have any bankruptcy costs and hence, riskless. Therefore, according to Modigliani & Miller (1963), there is motivation for higher leverage due to the tax advantage and the absence of bankruptcy costs of debt financing. However, Baxter (1967) recognized the bankruptcy cost of debt financing. He pointed out that high leverage would increase the bankruptcy costs emanating from the probability of default. This would

increase the riskiness of the earning and the consequent cost of capital to the firm. Jensen & Mackling (1976) argued that debt financing also involves agency cost. According to them, financing through debt capital will motivate shareholders (agents) to invest in risky projects. If the project generates high return, shareholders will take away most of this return, and if it fails creditors will have to bear the cost as shareholders have limited liability.

Based on the tax benefit and bankruptcy cost of debt financing, DeAngelo & Masulis (1980) developed the static trade-off theory, wherein the tax benefits offered by debt financing are offset by increased bankruptcy costs of debt financing. Trade-off theory proposes that the firm will have a target capital structure, which balances between the benefits and costs associated with debt financing. However, Hovakimian *et al*, (2001) expounded a dynamic trade-off theory, wherein they argued that the optimum target capital structure is not static. It deviates as firms' conditions change from time to time. Jalal (2007) claims that the actual leverage ratio varies around the target within an acceptable range as a response to changes in the firms' conditions.

On the other hand, Myers (1984) proposed the pecking order theory, which argues that due to the problem of information asymmetry in capital markets, firms follow a pecking order in their financing decisions. According to Myers & Majluf (1984), inside managers possess more information about the true value of the firm than outside managers. Because of this outside investors face an adverse selection problem in their investment decisions. This may result in mispricing of equity by the markets, leading to higher cost of capital. They argue that the problem of information asymmetry and the resultant friction in the capital market is more in equity market than debt market, leading to varying costs of capital for the firms. In response to this problem, firms will follow a pecking order in their financing decisions, that is, they would prefer to finance all their projects through internal capital if possible, and if sufficient internal capital is not available, they will prefer debt capital to equity capital. Hence, equity capital is the least preferred capital in the presence of information asymmetry in the capital market. The theory clearly implies that the underdevelopment of capital markets will seriously limit the financing options available to firms, and this will adversely affect corporate investment. Conversely, it argues that as capital market develops, the problem of information asymmetry and the resulting adverse selection problem reduces, and firms will be able to finance their projects through the capital market.

However, none of the above theories unambiguously explains the role of the market value of the firm in capital structure decisions. For instance, though the modified version of trade-off theory recognizes the importance of market value in capital structure decisions, it argues that market value results in only a short-term deviation from target capital and that these deviations quickly reverse to target capital structure (Alti, 2006). Under the pecking order hypothesis, market value reflects the growth opportunities of the firm. However, Myres & Majluf (1984) argue that firms with growth opportunities will not issue equity immediately and will wait till information asymmetry reduces in order to avoid issuing shares at an average or unfavorable price. Due to this, firms may have to find an interim source of finance until they can issue equity. Therefore, market value may actually increase the debt capacity of the firm as the adverse selection problem is less in the case of debt financing than equity. Secondly, firms may not issue equity even if they experience higher market value if there is no

immediate need for the proceeds. Hence, the impact of the market value of capital structure is not unambiguous under the pecking order hypothesis. The most convincing and unambiguous explanation of the role of market value in the capital structure decision has been provided by Baker & Wurgler (2002), who proposed a market timing theory that directly links stock market and capital structure. According to them, equity market timing denotes the practice of raising equity capital at a high price and repurchasing shares at a low price with the objective to exploit the fluctuations in the cost of equity capital. Baker & Wurgler (2002) argue that firms are likely to issue equity rather than debt when the market value is high and tend to repurchase equity when the market value is low. Hence, the market timing theory argues that the current capital structure of the firm is the result of past attempts to time the market depending on the market value of the firm. The theory also implies that the financing decision is influenced by the conditions in stock market. Baker & Wurgler (2002) documented a strong negative relationship between past market valuations, measured by market-to-book value, and leverage ratio. While the trade-off theory argues that temporary fluctuations in the market-to-book value will have temporary effects, Baker & Wurgler (2002) showed that market-to-book value will have long-term impact on the capital structure of the firm. They further demonstrated that market timing leads to permanent change in the cash balance of the firms, which indicates that firms issue equity when market value is high even if there is no need for the proceeds. Therefore, according to Baker & Wurgler (2002), the natural explanation for the negative and persistent effect of the market value of capital structure is market timing, i.e., firms issue equity when market value is high and buy back when market value is lower.

Diverse theoretical arguments also led to extensive empirical research on the determinants of capital structure. Most of the studies focused on firm specific determinants of capital structure such as asset tangibility, size, financial distress costs, profitability, growth rate, tax rates, non-debt tax shields, interest coverage, liquidity, etc. (Harris & Raviv, 1991, Fama & French, 2002, Frank & Goyal, 2003, Frank & Goyal, 2009, Ali Ahmed & Hisham, 2009, Tong & Green, 2005 and Daskalakis & Psillaki, 2008 among others).

A few studies have also examined the link between the stock market and corporate structure. For instance, in a cross country study, Demirguc-Kunt & Maksmovic (1996) examined the role of stock market development in debt-equity ratio at the aggregate level. Using an index of stock market development consisting of stock market size and liquidity, they found that during the initial stage of stock market development debt-equity ratio increases as both debt and equity capital increases. However, as stock markets develop further, equity capital substitutes debt capital resulting in lower debt-equity ratio. Following the market timing theory of Baker & Wurgler (2002), a few studies also examined the role of the market value of the firm on debt-equity ratio. For example, Chen & Zhao (2006) detected an inverse relationship between market-to-book ratio and debt-equity ratio, which indicates that stock market development will increase equity capital. Similarly, Rajan and Zingales (1995), Korajczk, Lucas & McDonald (1991), Jung, Kim & Stulz (1996), Welch (2004), Huang & Ritter (2009), etc. recorded a negative relationship between debt-equity ratio and market-to-book ratio, which supports the predictions of market timing theory. In findings complementary to these, Graham & Harvey (2001) show that 67 per cent of the Chief Finance Officers (CFOs) indicated that they time the market

when issuing equity. Similarly, Brav *et al* (2005) report that 86 percent of the CFOs said that undervaluation of the stock is the major reason for stock buyback. However, Rajan and Zingales (1995) argued that higher market-to-book value may also reflect the growth opportunities of the firm, in which case one may find a positive relationship with debt-equity ratio. Chen & Zhao (2006) also urged that more empirical investigation is required to clearly understand the relationship between leverage and market-to-book value in corporate financing. Our main focus in this study is to find out the link between market value and capital structure. We also include Rajan & Zingales (2005)'s three control variables, namely, asset tangibility, firm size and profitability, and Fama & French (2000)'s depreciation as control variables in the leverage regression.

Rajan & Zingales (1995) argue that a higher portion of tangible assets acts as collateral, which minimizes the agency cost involved in debt financing. Scott (1977) and Myers (1977) contend that a large amount of tangible assets may also help the firm to reduce the interest cost of debt financing. Therefore, firms with higher tangible assets will have higher debt capacity and this could positively influence the debt-equity ratio. Empirically, Titman & Wessels (1988), Rajan & Zingales (1995), Espinosa *et al* (2012), Bhaduri (2002), Khasnobis & Bhaduri (2002), Bole & Mahakud (2004), and Mahakud (2006) documented a positive relationship between asset tangibility and long-term indebtedness. On the contrary, a few studies also found a negative relationship between asset tangibility and debt-to-equity (Hall *et al*, 2004 and Sogorb-Mira, 2005). Two possible explanations may account for this result. Firstly, higher tangible assets may help in reducing information asymmetry in the equity markets enabling the firm to raise equity capital. Secondly, the firm with large fixed assets may already have generated enough internal capital for financing new projects, which reduces its dependency on external capital, particularly debt capital. However, Berger & Udell (1994) claimed that the asset structure may not be important for a firm which maintains a close relationship with lenders, such relationship serving as a substitute for physical collateral.

Firm size is another important variable which is found to be influencing capital structure. It has been argued that the probability of financial distress may be less in large firms than small firms (Titman & Wessels, 1988, Rajan & Zingales, 1995, and Bhabra, Tong & Dogan, 2008). In this regard, Warner (1977) showed that bankruptcy cost is the negative function of a firm's size. Psillaki & Daskalakis (2009) argue that large firms will be in a position to minimize the transaction and agency costs involved in debt financing. However, Rajan & Zingales (1995) add that the relationship between leverage and size is ambiguous. They argue that there may be an inverse relationship between the two as large firms may be able to raise more equity capital due to fewer information asymmetry problems. Empirically, most of the studies documented a positive relationship between leverage and size (Barton *et al* (1989), Rajan & Zingales (1995), Psillaki & Daskalakis (2009), Espinosa *et al* (2012), Bole & Mahakud (2004), Mujumdar (2014), Mohamad (1995) among others).

Extant literature also shows that profitability is another major determinant of capital structure. Theoretically, there are divergent views on the role of profitability in influencing leverage. According to the pecking order hypothesis, there is an inverse relationship between profitability and leverage as profitable firms will be able generate more internal capital and hence reliance on external capital diminishes (Harris & Raviv 1991, Rajan & Zingales 1995, and Booth *et al* 2001). On the contrary, the

trade-off theory makes the opposite prediction. (Jensen and Meckling, 1976, Myers, 1977, and Harris & Raviv, 1990). Debt financing offers tax advantages to the firms and this is more so in the case of highly profitable firms, which may induce these firms to go for more debt. Creditors will also be more willing to lend to a profitable firm. Empirically, several studies recorded a negative relationship between leverage and profitability, which is consistent with the prediction of pecking order hypothesis (Harris & Raviv (1991), Rajan & Zingales (1995), Booth *et al* (2001), Gaud *et al* (2005), Ozkan (2001) Van der Wijst and Thurik (1993), and Hall *et al* (2004), Strebulaev (2007), and Um (2001)). On the other hand, Espinosa *et al* (2012) found a positive relationship, which may support the trade-off theory.

Besides the above major determinants, we also include depreciation as another control variable. Trade- off theory highlights the tax advantages conferred by debt financing. Hence, there may be a positive relationship between tax rates and leverage ratio, suggesting that firms facing higher tax rate may be motivated to increase their debt finances. Alternatively, firms can also save tax through depreciation charges. In such case, depreciation acts as a non-debt tax shield and hence a negative relationship between depreciation and leverage may be expected (Chauhan, 2015). Hence, one would expect a negative relationship between depreciation and debt financing.

Capital Structure – Some Stylized Facts

Table 1 presents the composition of stockholders' equity. As evident from the table, reserves and funds are the major components of stockholders' equity, of which retained earning accounts for about 78 per cent. This shows that internal capital continues to be the major source of finance for firms in India. A high share of cumulative retained profit may also be due to stock market development and the resulting capital gain for shareholders as investors may be willing to accept lower dividends with higher capital gains. Hence, one could argue that the development of stock markets, on the one hand, will help the firms to raise equity capital from the market, and on the other hand, also help them build internal capital through retained earnings. This will help the firms to reduce the dependence on external finance and the risk associated with external finance, particularly debt finance.

Table 2 presents the composition of corporate debt. It is clear from the table that bank borrowing is the major source of debt for public limited manufacturing firms. The share of borrowing from banks has steadily increased over a period of time. This shows that in the Indian financial system banks still play a major role in financing the corporate sector. Secondly, the table shows that the capital raised through bonds and debentures accounts for only 11 percent in 2015-17. This demonstrates that the corporate bond market in India is playing only a limited role in corporate financing. Clearly, there is excessive pressure on the banking sector as far as corporate financing is concerned As a result, there is a disproportionate risk concentrated in one part of the financial system.

Table 1: Composition of Stockholders' Equity

Stockholders' Equity	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
	%	%	%	%	%	%
Paid-up equity capital	5.16	4.79	4.64	4.36	4.19	3.99
Paid-up preference capital	0.38	0.35	0.30	0.30	0.41	0.50
Capital contribution and funds by govt, others	0.00	0.21	0.19	0.17	0.16	0.15
Money received against convertible share warrants	0.13	0.08	0.09	0.03	0.03	0.02
Forfeited equity capital	0.01	0.01	0.01	0.01	0.01	0.00
Reserves and funds	94.09	94.48	94.68	95.11	95.03	95.26
Of which retained profit	76.97	75.34	77.61	79.05	78.88	78.78
Share application money & suspense account	0.23	0.08	0.10	0.03	0.19	0.07

Source: Compiled from CMIE Prowess Data Base

Concentration of credit and the consequent risk constitute a serious threat to the financial soundness of banks with the potential to create a systemic crisis, particularly during downturns in business cycles. The unprecedented increase in bad loans in Indian Public Sector Banks in the past few years is a clear indication of the problem of concentration of risk.

Table 2: Composition of Corporate Debt in Public Limited Manufacturing Firms

	1990-94	1995-99	2000-04	2005-09	2010-14	2015-17
Borrowing from banks	29.94	33.74	40.83	55.82	54.72	54.71
Borrowing from financial institutions	25.67	22.57	12.78	3.17	1.65	1.78
Borrowings from central & state govt.	3.55	2.65	2.88	2.35	1.12	0.96
Borrowings syndicated across banks & institutions	0.00	0.14	0.51	0.05	0.01	0.00
Debentures and bonds	16.31	16.55	17.87	7.71	9.84	10.99
Foreign currency borrowings	9.40	9.62	9.59	20.45	22.42	16.51
Loans from promoters, directors and shareholders	0.02	0.21	0.33	0.31	0.22	0.29
Inter-corporate loans	2.39	1.83	1.99	2.92	2.50	2.35
Deferred credit	1.72	1.09	2.03	1.81	2.84	2.82
Interest accrued and due	2.03	1.58	3.41	1.32	0.62	1.82
Hire purchase loans	0.05	0.12	0.08	0.05	0.19	1.07
Fixed deposits	5.36	4.37	2.42	0.77	0.65	0.19
Commercial papers	0.74	0.86	0.94	0.54	1.46	4.79
Other borrowings	2.81	4.66	4.35	2.74	1.75	1.72

Source: Authors' construction based on CMIE Prowess Data Base

Another important observation from table 2 is that the share of foreign currency borrowing has increased from 9.40 percent in 1990-94 to 22.42 percent during 2010-14. An increased foreign currency

borrowing is dangerous in the event of a large currency depreciation. Patnaik *et al* (2016) pointed out that unhedged foreign currency borrowing is a concern in emerging markets where the exchange rate is not fully floating. They also observed that in an emerging market with a managed floating exchange rate regime, firms may choose to have unhedged foreign currency borrowing because they expect the central bank to intervene when faced with large depreciations.

Another important feature of corporate debt is the dominance of secured borrowing, which has steadily increased over the period, as evident from table 3. This implies that an asset-based lending approach dominates in banks and financial institutions. In this regard, Reddy (2004) questioned the practice of asset based lending, particularly in an era where technology and other intangible assets are more important than the material components of firms. This is more so in the case of the service sector, where intangible components such as technology, software, human capital, brand, and so on are more valuable than tangible assets. One argument for collateral-based lending is that it reduces the problem of NPAs. But as argued by Reddy (2004), in micro-finance, with no collaterals and high interest rates, the level of NPAs is very low[1]. Clearly, there is a need for income-based lending, where the lending is based on a firm's ability to generate income, and not its stock of collateral assets.

Table 3: Secured and Unsecured Borrowings

	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
	%	%	%	%	%	%
Secured Borrowings	57.72	56.33	60.37	63.50	65.75	65.78
Unsecured Borrowings	42.28	55.86	39.63	36.50	34.25	34.22
Secured long run	60.26	61.16	62.49	62.07	65.63	64.56
Secured short run	39.74	38.84	37.51	37.93	34.37	35.44
Unsecured long run	46.19	45.18	45.57	55.87	68.76	69.90
Unsecured short run	53.81	54.82	54.43	44.13	31.24	30.10

Source: Compiled from CMIE Prowess Data Base

Table 4 presents the frequency of firms in terms of debt-equity ratio. About 64 per cent of the firms are sound in terms of leverage. Around five per cent are overleveraged with a debt-equity ratio of more than 5. Though there are only a few firms with a high debt-equity ratio, their share in total debt is very high. For example, the top 20 highly indebted firms accounted for 63.18 per cent of the total bank borrowings of the sample firms in 2015-16 (Table 6). This concentration of credit and the resulting rise in NPAs have become a major problem in the Indian Banking Sector, particularly among the public sector banks. For example, The Hindu (2016) reported that the exposure of PSBs to the top 20 NPA accounts stood at Rs. 1.54 lakh crore as of June 2016, which is about 28.52 per cent of the total NPAs of PSBs in FY2016. State bank of India, the largest bank in India, had an NPA concentration ratio of 27.36 per cent in FY2016. RBI (2017) also found that large borrowers accounted for 56 per cent of the gross advances and 86.5 per cent of GNPAs of SCBs in India. Table 5 presents the percentage distribution of firms in terms of interest coverage ratio. As evident from the table, the position has

[1] For example, Bangalore-based leading microfinance institute Ujjivan Financial Services Pvt. Ltd reported Gross NPA rate of just 0.28 per cent in FY 2016-17 as against 13.37 per cent in Public Sector Banks.

worsened over a period of time as the percentage of firms in distress has increased from about 13 per cent in 2009-10 to 21.10 per cent in 2015-16. Another 10 per of the firms have ICR in the range 0 to 1, which again indicates that they are very vulnerable. Further, 105 firms with negative ICR accounted for about 30 per cent of the total bank borrowings of the sample firms in 2015-16. Table 7 shows the position of top 20 indebted firms, which accounted for 63.18 per cent of the total bank borrowings of the sample firms in 2015-16. The majority of the firms reported negative profits, a negative return on assets, lower current ratio and interest cover ratio, and higher debt-equity ratio, which clearly point to the vulnerability of these firms. This has ramifications for the banking sector in terms of rising bad debts given the fact that borrowing from the banks constitutes about 60 per cent of the total corporate debt as shown in table 2 and 3. Clearly, it appears that corporate distress is one of the major reasons behind the increasing problem of bad loans in the banking sector.

Table 4: Distribution of Firms in Terms of Debt-equity Ratio

Debt-equity ratio (times)	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Equal or less than one	1035 (63)	1047 (62.77)	1036 (61.7)	1022 (60.65)	1026 (60.78)	1044 (62.62)	1051 (64.39)
More than one less or equal to 5	565 (34)	569 (34.11)	582 (34.66)	607 (36.02)	591 (35.01)	552 (33.11)	499 (30.57)
More than 5 less or equal to 10	36 (2)	28 (1.68)	33 (1.96)	36 (2.14)	47 (2.78)	43 (2.57)	38 (2.32)
More than 10	19 (1)	24 (1.44)	28 (1.66)	20 (1.19)	24 (1.42)	28 (1.67)	44 (2.69)

Source: Compiled from CMIE Prowess Data Base. Percentage in bracket.

Table 5: Distribution of Firms in Terms of Interest Coverage Ratio

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Less than 0	234 (12.97)	214 (11.73)	316 (17.27)	321 (17.64)	354 (19.50)	382 (21.50)	364 (21.10)
More than 0 less than or equal to 1	118 (6.54)	116 (6.36)	182 (9.95)	181 (9.95)	200 (11.01)	195 (10.97)	173 (10.02)
More than 1 less than or equal to 5	927 (51.38)	949 (52.05)	898 (49.09)	918 (50.46)	858 (47.27)	768 (43.24)	717 (41.56)
More than 5 less than or equal to 10	196 (10.86)	196 (10.75)	140 (7.65)	131 (7.20)	123 (6.77)	145 (8.16)	149 (8.63)
More than 10	329 (18.23)	348 (19.08)	293 (16.01)	268 (14.73)	280 (15.42)	286 (16.10)	322 (18.66)

Source: Compiled from CMIE Prowess Database. Percentage in bracket.

Table 6: Top 20 Indebted Firms (As of March 2016)

Company Name	Profit after tax (crore)	Return on Assets (%)	Current ratio (times)	Debt to equity ratio (times)	Interest cover (times)	Total Bank Borrowings (Crores)
Reliance Industries Ltd.	27384	6.23	0.66	0.42	10.53	67341
Bhushan Steel Ltd.	-2839.37	-5.3	0.77	9.92	-0.23	32555.68
Videocon Industries Ltd.	-55.81	-0.15	2.01	2.31	0.97	22304.06
Jaiprakash Associates Ltd.	-3239.9	-5.75	0.85	2	-0.02	21841.25
Jindal Steel & Power Ltd.	-1018.88	-2.29	0.46	2.27	0.38	18299.99
Hindalco Industries Ltd.	607.25	0.52	1.95	0.78	1.23	17644.1
Alok Industries Ltd.	-3722.8	-12.84	1.17	12.7	-1.21	16081.2
Vedanta Ltd.	5472.79	6.35	0.57	1.11	2.63	15889.84
J S W Steel Ltd.	-3529.67	-5.08	0.51	1.82	-0.68	10315.94
Electrosteel Steels Ltd.	-326.55	-2.55	0.24	23.27	0.7	9082.16
Bajaj Hindusthan Sugar Ltd.	-114.28	-0.91	1.1	3	0.86	6812.19
Bombay Rayon Fashions Ltd.	48.85	0.36	1.24	2.06	1.06	5355.27
Jyoti Structures Ltd.	-503.34	-9.04	0.94	50.46	0.09	4760.6
Century Textiles & Inds. Ltd.	-54.52	-1.1	0.61	2.63	0.77	4414.57
National Fertilizers Ltd.	197.09	1.12	1.15	1.28	1.52	4177.23
Jayaswal Neco Inds. Ltd.	-86.54	-0.86	0.74	1.96	0.89	3867.47
United Spirits Ltd.	981.16	5.22	0.91	1.5	2.47	3719.14
Kesoram Industries Ltd.	137.12	-8.8	1.1	16.81	0.07	3682.21
Piramal Enterprises Ltd.	1061.15	3.82	0.36	1.1	2.29	2870.05
Metalyst Forgings Ltd.	-270.21	-1.1	0.72	3.49	0.27	2768.95

Source: Compiled from CMIE Prowess Database

Source of Data and Methodology

The study aims at examining the role of a firm's market value on its capital structure decisions in the case of public limited manufacturing firms in India. To do this, we included only those firms for which we could get the Date of First Trading (DFT) on BSE or NSE. CMIE Prowess gives the date of first trading in the stock exchange and not IPO date. Therefore, we used first trading date instead of IPO as we could not identify the IPO date for all the firms. Studying firms from DFT helps us to understand the evolution of leverage from a given starting point, that is, DFT. We got the sample firms with DFT from 1995 through 2015. We have not included the cases before 1995 as the stock market was largely underdeveloped. We have not considered any samples beyond March 2015 in order to get at least one year of data after DFT. We studied the firms in 3 sub-samples -- DFT+1 year, DFT+5 year, and DFT+10 year -- to understand both the short-term and long-term impact of market value on equity issues. The sample size is 605, 490, and 317 firms for DFT+1, DFT+5, and DFT+10 respectively. Sample size decreased when we considered longer periods either due to the exit of firms or due to non-availability of complete data.

The study employs panel data technique for the analysis for DFT+5 and DFT+10 and cross section regression for DFT+1 analysis. In order to overcome the problem of heteroskedasticity and

autocorrelation, we used heteroskedasticity and autocorrelation corrected (robust) standard errors. The model is specified as follows:

$$\left(\frac{D}{A}\right)_t - \left(\frac{D}{A}\right)_{t-1} = a + b\left(\frac{M}{B}\right)_{t-1} + c\left(\frac{FA}{A}\right)_{t-1} + d\left(\frac{EBITDA}{A}\right)_{t-1} + e\log(S)_{t-1} + f\left(\frac{D}{FA}\right)_{t-1} + \mu_t \quad (1)$$

Description of these variables is provided in table 7. All the dependent variables are lagged by one year as changes in leverage in response to these variables may happen in lags. This also overcomes the problem of reverse causality, which may exist between dependent and independent variables.

Table 7: Description of Variables

Sl No	Variables	Definition	Notation in (1)
1.	Change in Debt ratio	Change in ratio of total debt to total assets	$\left(\frac{D}{A}\right)_t - \left(\frac{D}{A}\right)_{t-1}$
2.	Market- to-book ratio	Market capitalization plus book assets minus book equity all divided by total assets	$\left(\frac{M}{B}\right)$
3.	Asset tangibility	Ratio of fixed assets (FA) to total assets	$\left(\frac{FA}{A}\right)$
4.	Logsales	Logarithm of sales turnover	$\log(S)$
5.	Profitability	Ratio of operating profit to total assets	$\left(\frac{EBITDA}{A}\right)$
6	Depreciation	Ratio of total depreciation (D) to fixed assets	$\left(\frac{D}{FA}\right)$

Findings and Discussions

Extant literature shows that a firm's capital structure is influenced by two factors, namely a) internal factors and b) market valuation. Variables such as firm size, asset tangibility, profitability and depreciation have been used to control the impact of internal variables on capital structure. Market-to-book ratio is used to explain the role of market valuation on capital structure. Table 8 presents the estimated results of regression (1).

As evident from the table, market-to-book ratio is found to be negatively influencing the debt ratio in all three sub samples. This indicates that a firm's debt ratio decreases as its market value increases, suggesting that firms prefer to issue equity when the market value is high. Our results also suggest that the impact of market valuation remains even after ten years from the date of first trading in the stock market. This indicates that market valuation has long-term impact on capital structure. This is contrary to the predictions of the trade-off theory that market value results in only a short-term deviation from the optimum capital structure and quickly reverses to the target rate. Therefore, our results are consistent with the predictions of the market timing theory that firms with better market value may prefer equity to borrowing, and that market value has a persistent impact on capital structure. Alternatively, a negative relationship of market value with leverage would support the

arguments of Myers (1977), Rajan and Zingales (1995), and Frank and Goyal (2009) that firms with higher growth opportunities would use more equity finance. Since market value reflects the future growth opportunities of the firm, a higher market value would induce the firm to use more equity finance.

Table 8: Results of Panel Data

Dependent Variable: Change in debt ratio	DFT +1	DFT+5	DFT+10
Market to book value	-0.0063 (-2.50*)	-0.00086 (-2.16**)	-01122 (-1.63***)
Asset tangibility	0.480 (2.54*)	0.0294 (0.81)	0.0877 (3.49*)
Size	-1.501 (-7.27*)	-1.6782 (3.69*)	-1.154 (3.41*)
ROA	0.126 (2.03**)	-0.1305 (-0.99)	-0.209 (-3.05*)
Depreciation	-0.1726 (-0.72)	0.0786 (0.58)	0.0786 (0.58)
F test	20.44 (0.000)	18.39 (0.000)	8.15 (0.000)

t values in parentheses. *Significant at 1%. ** Significant at 5%.*** Significant at 10%.

With regard to the impact of asset tangibility on the borrowing of firms, we found a significant positive influence on long-term debt ratio indicating that a higher proportion of tangible assets increases the debt capacity of the firm as lenders will be willing to lend to a firm with higher tangible asserts (Rajan & Zingales, 1995). Alternatively, the positive influence of tangible assets also supports the proposition that higher tangible assets help in reducing the information asymmetry problem associated with debt financing, which may help the firm to minimize the interest costs of debt, as argued by Scott (1977) and Myers (1977). However, firm size is found to be negatively related to debt ratio. This suggests that large firms have lower debt, indicating that they raise more equity capital to finance their operation. This may be due to the fact that before the 1990s, firms in India were constrained to depend more on debt capital as the stock market was largely underdeveloped. Therefore, as stock market became more efficient, firms, particularly large ones, took advantage of it and raised more equity capital from the market. Alternatively, for large and growing firms, the problem of information asymmetry reduces and hence they would be able to raise capital from the market on better terms.

Further, we found a significant and positive relationship between profitability and debt ratio in DFT+1 suggesting that profitability positively affects the debt capacity of firms. But in the long run (DFT+10) profitability is negatively related to debt capacity, suggesting that as firms expand, their profitability helps them to raise more equity capital. Alternatively, the negative relationship may also reflect the dependence on internal capital, which is consistent with the predictions of the pecking order hypothesis. However, we did not find any significant relationship between depreciation and debt ratio in all three sub samples, which suggests that tax-based explanations are not relevant in the case of our sample firms.

Results of regression (1) indicate that a firm's market value negatively influences the long run debt ratio. However, the negative relationship between market value and debt ratio may also be due to higher retained earnings or lower debt. In order to ascertain that the negative relationship is actually due to changes in equity issues, we further examined the relationship between fresh equity issues and the market value of the firm. We studied the firms in the 3 sub samples DFT + 1, DFT+5 and DFT+10

to understand both the short-term and long-term impact of market value on equity issues. Our regression model is as follows:

$$\left(\frac{e}{A}\right)_t = a + b\left(\frac{M}{B}\right)_{t-1} + c\left(\frac{FA}{A}\right)_{t-1} + d\left(\frac{EBITDA}{A}\right)_{t-1} + e\left(\frac{D}{FA}\right)_{t-1} + f\log(S)_{t-1} + \mu_t \quad (2)$$

Where, $\left(\frac{e}{A}\right)_t$ is the ratio of fresh equity issue to total assets.

Estimated results of regression (2) are presented in table 9. As shown in the table, market value is positively and significantly related to equity issues. This shows that the higher market value leads to lower debt ratio through an increase in equity issues, which confirms that the negative impact of the market value on debt ratio is indeed due to changes in equity issues than changes in retained earnings or debt retirement. Further, the impact of market value on equity issues is more pronounced in DFT+10, which indicates that the impact of market value on capital structure is persistent, as opposed to the argument of the trade-off theory that market value should have only a short impact on capital structure. This shows that the market value of a firm leads to a long-term change in its capital structure, which is consistent with the market timing theory of Baker and Wurgler (2002).

Table 9: Results of Regression (2)

Dependent Variable: Fresh equity issues	DFT+1	DFT +5	DFT +10
Market to book value	0.0017 (2.77*)	0.00151 (2.14*)	7.08 (3.83*)
Asset tangibility	-0.020 (-1.26)	-0.00061 (-3.57*)	-0.00092 (-2.03**)
Size	-0.709 (-2.86*)	-0.0065 (-3.09*)	-0.00058 (-2.05**)
Profitability	0.018(0.66)	-0.00048 (-2.30**)	0.00061 (2.92*)
Depreciation	-0.023 (-0.76)	-2.01 (-0.99)	-0.00002 (-0.07)
F test	4.18(0.060)	9.88 (0.000)	108.39 (0.000)

t values in parentheses. *Significant at 1%. ** Significant at 5%. *** Significant at 10%

Conclusion

In this study, we attempted to examine the impact of a firm's market value on its capital structure. We used market-to-book ratio as the measure of the market value of a firm and debt ratio as the measure of capital structure. Our results show that debt ratio is negatively influenced by market value. Further, we showed that the negative relationship actually comes through equity issues and the impact remains even after ten years from the date of first trading in the equity market. This is consistent with the predictions of the market timing theory that market value has long-term impact on the firm's capital structure. Our results suggest that better market valuation enables firms to raise capital from the equity market, thereby diffusing the excessive burden on the banking system by sharing the risk of financing the corporate sector. The stock market also helps to disseminate information about the growth prospects of firms, which would help them to borrow on better terms. It also increases the public visibility and information transparency of firms. Further, our findings show that both asset tangibility and size are inversely related to leverage ratio. This suggests that large firms are in a better position to raise capital from the stock market, as compared to small ones. Therefore, strengthening initiatives such as the SME platform of NSE and BSE would increase the visibility of small and medium firms with

high growth potential, and this in turn would help them to increase their access to both bank based and market based capital. The government may also consider tax deductibility for dividend payments and grant exemption from capital gains for SME stocks in order to attract investors and increase the liquidity of these stocks.

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