Do Capital Structure Decisions in Turbulent Environment Affect Value of Firm?

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Sakshi Khanna
Amit Srivastava
Jaypee University of Information Technology
(email2.sakshi@gmail.com)
(sriam_2000@yahoo.com)
Yajulu Medury
Bennett Coleman and Co. Ltd.
(yaj.medury@gmail.com)

Financing mix of the firms varies over time and across firms. This paper analyzes the differences in Indian firms' choice of capital structure during the period 1997-2013. It is a panel data study which examines the effect of the firms' choice of capital on the value of firms during recession. The results show that a significant difference exists in the values of those firms which have raised equity in the period of recession with respect to those which have not raised equity during recession. It also discusses the possible actions the managers could undertake while raising finance in post-recession.

***Keywords**: Capital structure decisions, Value of Firm, Recession, Panel Data*

1. Introduction

The primary objective of a firm is to maximize the shareholders wealth and in pursuit of it, the financial managers have the main responsibility of capital structure choices (i.e. debt and equity financing choice). Financing policy plays an important role in attaining strong economic fundamentals for the firms in the long run. A combination of debt and equity which minimizes the overall cost of capital and maximizes the returns to shareholders is an optimal capital structure. An optimal capital structure also enhances the competency of the firm, so it is very important for a firm to know how to obtain the financing (Khanna et al., 2014).

Capital structure and its influence on the firm's value/performance has always remained an important topic amongst the financial scholars since the research of Modigliani & Miller, 1958 to Kraus and Litzenberger's (1973) trade-off theory; Myers and Majluf's (1984) pecking-order theory and the recent market timing theory of Baker and Wurgler in 2002. In the framework of these theories, a lot of work has been done on the determinants of capital structure. Prior studies (Booth et al., 1999; Booth, 2001 etc.) find that the the firm's decision whether to go for equity or debt depends on both the internal firm level characteristics as well as on the external macroeconomic conditions.

From the last couple of decades the world economy is experiencing frequent financial crises and almost every firm is affected by economic shocks (Hong Peng, Muzafar, Chin-Hong, 2007). Thus the dependency of the firms' performance on economic environment is valuable information to policy makers. In order to obtain a unified financing policy that reduces the consequences of economic cycle on firm's performances, the linkage between firms financing policy and their performance in different phases of the cycle is an important area of study. This paper investigates the effect of the firms' choice of capital on the value of Indian firms during financial crisis (recession). The recent financial crisis of 2008-09 provides an opportunity to investigate the effect of the financial shock on capital structure decisions of the Indian firms. The economic slump began when the U.S. housing market went from boom to bust and large amounts of mortgage-backed securities and derivatives lost significant value. The crisis quickly spread to other economies around the world including India. A slowdown in the US economy was a bad news for India. Indian companies have major outsourcing deals from the US, so India's exports to the US decelerated. Crisis started from the withdrawal of capital from India's financial markets; a decline of 63% could be seen in India's balance of payments (Bajpai, 2011). The recession led to panic in the Indian stock market whereas on the other hand, the Indian banking system has had comparatively less exposure to the crisis. There had been a decline in the earnings and profit of the corporate sector.

While analyzing the financial data of the companies, it was found that there were some firms which had raised equity during the period of recession i.e. 2008-09. This raised curiosity in the authors' minds that why these firms had taken risk and issued equity during recession? What backs the decisions of the management while taking risks? Is there a difference in performance of the firms depending upon their firms' choices of capital which in return depends upon the efficiency of the management? In order to find answers to these questions, this paper explores the efficiency of the management in taking the decision regarding the choice of capital and how this impacts the performance of the firms. The paper tries to see whether there is a difference in the performance of those firms which have raised equity in the period of recession (i.e. 2008-09) with respect to those which have not raised equity during recession.

The pre-issue comparison of the financial data of the companies over the years show that the firms which had issued equity had stable and high performance in comparison to those companies which did not issue equity. Further to strengthen this finding, a panel data study was made, which examines how the choices of capital during the financial frictions affect their performance over time and across firms for the period 1997-2013. The choice of a firm's capital structure is measured by debt to equity capital and is used as a proxy for management efficiency and the firm's performance by net profitability margin.

The remainder of this paper is organized as follows. Section 2 discusses the relevant literature and provides the motivation for the study. Section 3 describes the methodology, provides the definitions of the variables used and describes the basic model used in this paper. Section 4 is on data analysis and results. Section 5 is for discussion. The last section, Section 6, concludes the main findings and discusses the limitations of the study.

2. Review

The financial crisis started at the end of 2007 in the subprime credit market and led to a liquidity crisis in the short-term money markets (Brunner meier, 2008; Fosberg 2012, etc). The crisis had its consequences not only in US but it spread to other countries as well. The financial crisis not only affects the economy of a nation but also leaves many firms financially constrained. Consequently, most of the financially constrained firms face difficulties in raising capital – they may experience difficulty in accessing stock market, may face higher costs of borrowing and may have difficulties in opening or renewing a credit line. Furthermore, these financially constrained firms would forego investment opportunities due to difficulties in raising capital. These financially constrained firms may also sell their assets to get cash in order to support their operations (Campello, Graham, and Harvey, 2010). In order to understand the choice of capital of firms during recession, let's have a look at the various studies done in this area.

The literature shows mixed effect of crisis on the choice of capital structure during recession. Supporting the usage of internal funding and the dependence of firms more on bank credit is visible in the survey conducted by Campello, Graham, and Harvey in 2010, on the real effect of financial constraints during financial crises. On the other hand there are the studies which support the usage of debt and equity. The study done by Pattani, Vera, and Wackett (2011) observed that there was an increase in public debt as well as in public equity issuance by UK firms in 2008-09 and a decline in debt in 2009-10. At the same time there are the works of Fosberg (2012) and Kahle & Stulz (2013) which report a significant increase in debt ratios of US firms over the pre-crisis period of 2006-08 followed by a gradual decline in debt levels by the end of 2010 (i.e. post-crisis period). Supporting the usage of debt before and during crisis is also shown in work of Srivastava (2014) for Indian steel and banking industries listed on BSE 500 for the period of 1999-2000 to 2012-13.

In addition to these studies, there are studies which say that the crisis did not have a significant impact on the financing of firms. One such study is that of Akbar, Rehman, and Ormrod (2013) done for UK private firms. They found that the long-term financing was not affected by the crisis, but the crisis impaired the financing channels of short-term debt and trade-credit. They also suggest that in order to hedge against the negative impact of credit contractions, the firms held more cash and issued more equity. Similarly, Brun et al., (2013) argues that the increase in equity of French firms after the crisis resulted mainly from the increase in retained earnings particularly for SMEs and an increase in the issue premiums received by large firms.

From the literature it could be seen that there is no pronounced confirmation that the financial crisis have triggered substantial changes in firms' capital structure choices. Firm-level characteristics and effort in timing the market are still the strong factors that influence the determinants of the firms' capital structure choices (Kayo and Kimura, 2011, Khanna et al., 2013).

As it is known that the choice of capital structure of a firm affects its performance, so now let's see what the studies have to say about the relationship between capital structure in different phases of cycle and firm's performance. A significant negative relation of firm performance and financial distress is seen by Opler and Titman (1994). Supporting this was the work done by Asgharian (2002**)** for Swedish firms**.** He tested the performance-distress relationship and finds that the highly leveraged firms in distressed industries face relatively lower stock returns. In contrast to a negative relation, a weak relationship between financial distress and firm performance is also observed. Study done by Claessens, Djankov and Xu (2000) on a sample of more than 850 publicly listed firms in the four crisis countries (Indonesia, Malaysia, the Republic of Korea and Thailand) and two comparators (Hong Kong and Singapore) claim that firm-specific weaknesses that existed before the crisis was an important factor in the deteriorating performance of the corporate sector. The works done by Bergstrom and Sundgren (2002) on financially distressed firms of Sweden; Sufian and Habibullah (2010) on Indonesian bank; Pradhan (2011) on some 450 Indian manufacturing firms; Dolenc et al., (2012) on Slovenia firms; Tan (2012) on a sample of 277 firms from eight East Asian economies etc. indicate that the financial crises have a negative and significant impact on the profitability of firms during financial crisis.

The literature suggests that financial crisis have a mixed impact on the firm's choice of financing as well as on the firm performance. Therefore, this study will contribute in bolstering the research methodology and will provide some useful insights in designing more appropriate policy for India.

3. Methodology

The study analyzes the differences in the performance of Indian firms' for the period 1997-2013, depending upon whether they had issued equity during the recession period of 2008-09 or not. For the analysis the dependent variable is the firm's performance, measured by Net Profit Margin and the independent variable is the firm's choice of capital represented by debt to equity capital and is also used as a proxy for management efficiency. Table 1 shows how the variables are computed.

Table 1 *Variable and their Computations*

Variable Name	Computation
Net Profit Margin	Profit after tax/Sales
Book Leverage	Borrowings
Share capital	Paid up equity capital
Debt to equity	Book leverage/Share capital

Source: *Authors' Computation (Using COMPUSTAT)*

All the variables, mentioned in the Table 1 have been computed by authors using the definition of variables from COMPUSTAT.

The objective of the present study is to analyze whether there is a difference in the performance with respect to management efficiency, in terms of their choice of capital during the period of recession (2008-09). For this the firms first are categorized into two sets depending upon whether they have issued shares in the year 2008-09 or not. The paper analyzes the performance of the firms over time and across firms.

For a particular year, there were some firms with missing information on the variables assets, sales, borrowings, equity capital. Therefore, for the study, the firms with missing values were dropped from the list for that particular year. Table 2 shows the number of firms used in the study. The table shows that there were comparatively less firms which issued equity during recession.

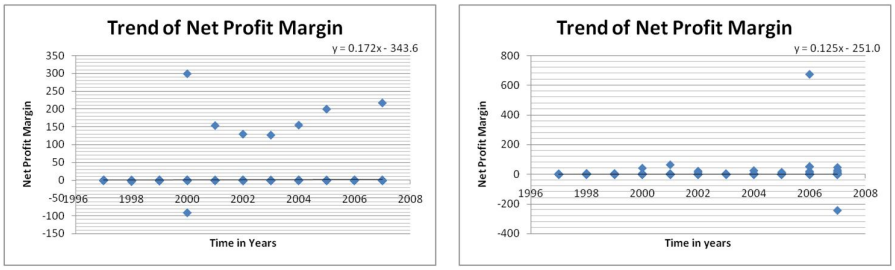
Table 2 *Number of Firms for the years 1997-2013*

Firms	No. of firms
Issued Equity	84
Not Issued Equity	179

Source*: Authors' Compilation*

First in order to know why the managers took risk of issuing shares during recession, a pre-issue financial data analysis of the firms was done. The Figure1 below shows the trend of net profit margin of the firms which had issued shares during recession and of those which did not issue.

The pre-issue comparison of the financial data of the companies over the years show that the firms which had issued equity had stable and high performance in comparison to those firms which did not issue equity. This gave confidence to the managers of the firms to take risk and issue equity even in the turbulent environment. This gives the authors an insight to study the differences in the performance of the firms, in context to the efficiency of the management. Further, to test this empirically a panel data analysis is done.



(a) Firms Which Issued Equity (b) Firms which did not issue equity

Figure 1 *Pre-Issue Financial Data Analysis*

Source: *Authors' Compilation*

3.1 The Model Used

In order to analyze the impact of financing mix on the value of firms over time and across firms, panel data analysis is used as the econometric analysis technique. As noted by Schulman et al., (1996), panel data allows to analyze, in depth, complex economic and related issues which could not be treated with equal rigor using time-series or cross-sectional data alone. The panel data analysis uses the affects of time as much as the affects of the cross sections (Wooldridge, 2002). This technique is preferred over the other techniques because this technique gives more accurate results. In panel data, the most commonly estimated models are the fixed effects model and the random effects model. The fixed effects model on the assumption that the coefficients change among the units and do not vary over time i.e., it is *time invariant.* On the other hand, the random effects model accepts that constant coefficients among the units do not vary. In this model the individual effects of the companies are coincidental and assume that the constant will be determined randomly. In order to determine which model

should be applied, Hausman Test is used. These tests are run for both the sets of firms – those which have issued equity and those which have not issued equity during recession.

4. Data Analysis and Results

This section discusses the results of the panel analysis for the two sets of firms-those which have issued equity in recession and those which have not issued.

Let's talk about the firms which have issued equity in recession. First the fixed effects model is run, then random effects model and finally the Hausman test. The tables below show the results respectively:

Table 3 *Fixed Effects Model*

Variable	Coefficient	Prob.
Const.	-2.81283	0.00***
Debt-to-Equity	0.335382	0.00***

***Source**: Authors' Compilation*

Table 4 *Random Effects Model*

Variable	Coefficient	Prob.
Const.	-3.00419	0.11
Debt-to-Equity	0.347705	0.00***

***Source:** Authors' compilation*

Table 5 *Hausman Test*

Test summary	Prob.
Cross-section random	0.0035***

***Source**: Authors' Compilation*

The Hausman test of the random effects model rejects the null hypothesis that the preferred model is random effects. Hence, the fixed effects model is run for the firms. Fixed effects explore the relationship between management efficiency and firm's performance within the entity (i.e. firm). Each firm has its own individual characteristics that influence its performance. This model removes the effect of the time-invariant characteristics so that an analysis can be made to show the effect of management efficiency on the performance of the firms individually. The result (from table 3) shows that debt-to-equity has a direct relation with firm performance and is significant. This shows that the management is efficient and is able to take decisions regarding the choice of capital structure efficiently.

Further dummy variables are used to account for individual (company) effect and the coefficients are shown in the Table 6.

Table 6 Dummy Variable coefficient

ID	Coefficient	ID	Coefficient	ID	Coefficient	ID	Coefficient
1	-1.891908	22	-0.493357	43	-22.162289	64	-0.822759
2	-3.939483	23	-2.691826	44	-0.284072	65	-2.148594
3	-3.581197	24	-6.122885	45	-3.094361	66	-13.180819
4	2.209435	25	-3.210577	46	-5.06641	67	-1.545997
5	-0.097791	26	-2.965046	47	-0.434181	68	-0.477993
6	-2.811765	27	-1.077337	48	-2.119352	69	-1.2252
7	-3.159171	28	-3.244413	49	-2.235452	70	-2.841332
8	-3.294363	29	-2.171554	50	-4.762437	71	-6.359617
9	-1.492785	30	-4.837178	51	-1.957773	72	-2.835952
10	-0.636419	31	-0.660777	52	-28.790599	73	-3.111852
11	-30.343789	32	-1.763812	53	-5.958407	74	-1.159223
12	-1.089944	33	-5.573862	54	-3.980767	75	-0.441469
13	-7.082471	34	-2.248775	55	-1.134335	76	-5.954374
14	-2.099304	35	-5.875148	56	-1.425852	77	-1.614755
15	-0.403709	36	-6.551807	57	-1.785384	78	-7.988428

16	-1.561766	37	-0.306398	58	-5.8857	79	0.011004
17	-2.889222	38	-1.386151	59	-4.592096	80	-1.311925
18	-15.209089	39	-10.764667	60	-0.858304	81	-1.088195
19	-0.798312	40	-7.511557	61	-1.796183	82	-18.853559
20	-19.995789	41	146.363271	62	-1.778015	83	-7.390406
21	-1.669744	42	-23.469739	63	-6.03924	84	-1.392835

***Source**: Authors' Compilation*

Next is the analysis of those firms which have not issued equity during recession. Again the fixed effects model, random effects model and the Hausman test are performed. The tables below show the results.

Table 7 *Fixed Effects Model*

Variable	Coefficient	Prob.
Const.	4.455043	0.0544*
Debt-to-Equity	4.20E-08	0.9843

***Source**: Authors' Compilation*

Table 8 *Random Effects Model*

Variable	Coefficient	Prob.
Const.	4.456824	0.2360
Debt-to-Equity	-5.84E-09	0.9977

***Source**: Authors' Compilation*

Table 9: Hausman test

Test Summary	Prob.
Cross-section random	0.9339

***Source**: Authors' Compilation*

The Hausman test of the random effects model fails to reject the null hypothesis that the preferred model is random effects. Hence, the random effects model is run for the firms. The rationale behind random effects model is that, the variation across entities is random and it generalizes the inferences. It could be seen from table 8, that debt-to-equity has no significant impact on the firm's performance. Thus, one can say that for these firms the management is not much efficient in taking decisions regarding the choice of the capital.

5. Discussion

The results shown in the above section are very interesting. The results show that for the firms which had issued equity during recession, individual characteristics of each firm influences their performance and not in case of the firms which had not issued equity during recession. There is no variation among the firms which did not issue equity during recession and the effect is determined randomly. The results show that there is a significant impact of management efficiency on the performance of the firms' which issued equity during recession and not for the firms' which did not issue equity. Thus, it could be said that the management of those firms which had issued equity is more efficient than the management of the firms which had not issued equity. Efficient managers can time the markets properly and are able to take the correct decisions regarding the choice of capital. This not only helps the firms in carrying out their operations smoothly but also increases their efficiency even during the periods of recession.

The pre-issue data analysis of the two sets of firms shows that the firms which took the risk of issuing equity during recession were more stable and had high performance in comparison to the firms which had not issued equity. This supports the management in taking risk and could time their decisions regarding the choice of capital efficiently. The results of the manager's choice of capital structure are reflected in their firm's performance. Thus the stability of the firms helps the firm's management in taking efficient decisions regarding the choice of capital and in return these efficient decisions improve the performance of the firms.

6. Conclusion

This paper shows that the stability of a firm backs the decisions of the management regarding their choice of capital. It also shows that there exist differences in the firms' performances across firms and are a function of the management efficiency. The basis of this paper is that the efficiency of the management provides a competitive advantage to the firm which results in

their superior performance. Hence, a sound financial management provides firms with the capability to tolerate the financial crisis.

The paper uses only one proxy i.e. debt-to-equity to measure the efficiency of the management, the results of the study would have been more robust if more variables would have been used to measure the efficiency of the management.

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