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Assessing the Influence of the 2008 Sub-prime Mortgage Crisis on Indian Firms' Capital Structure Choices

Karuna
Assistant Professor, Department of Commerce, Shri Ram College of Commerce, University of Delhi, India
Email ID: karuna@srcc.du.ac.in

Abstract

The study assessed the influence of the 2008 Subprime Mortgage Crisis on the capital structure choices of Indian firms. Employing a quantitative research methodology, the analysis involves 317 Indian firms listed on the National Stock Exchange (NSE) from 2008 to 2012. Utilizing fixed-effect panel and random regression models, the research aims to elucidate the factors shaping Indian firms' capital structure decisions post the 2008 financial crisis. By assessing this impact, the study seeks to offer a comprehensive understanding of how the crisis shaped financing choices and its implications for Indian firms' future financial strategies.
***Keywords**: Sub-Prime crisis, Mortgage, capital structure, Indian firm*

Introduction

The 2008 Subprime Crisis was an unfavourable financial event stemming from the collapse of the United States housing market, triggered by the proliferation of high-risk mortgage lending practices. This Mortgage Crisis rippling across the globe, presented a pivotal moment that significantly impacted various facets of the global economy as it significantly affected the availability and cost of capital. Banks and financial institutions, reeling from massive losses, tightened lending standards, making it tough for firms to secure financing. The spike in risk and uncertainty caused by the crisis made long-term borrowing less appealing. Consequently, firms grappled with reduced access to credit and faced higher costs when seeking external funding. The crisis induced a marked shift in firms' financing preferences, pushing them to rely more on internal financing and short-term debt to weather the economic crisis.

India, among the many affected nations, experienced profound repercussions, especially within its financial markets and economic stability. For Indian firms, this crisis prompted a reassessment of their capital structure choices, necessitating a closer examination of how they financed their operations and changes in their capital structure preferences over the year.

The impact of the Subprime Crisis on India reverberated through various channels, notably affecting the country's capital markets. The outflow of investments by Foreign Institutional Investors (FIIs) triggered a substantial downturn in the Indian Stock Market. As equity prices plummeted during the crisis onset, the market experienced heightened leverage (Abdeljawad et al., 2018). This financial instability, coupled with macroeconomic turmoil, resulted in a significant decline in India's GDP growth rate by 2.1 per cent. Additionally, the current account deficit surged to 2.6 per cent of the GDP, marking the highest level since the initiation of economic reforms in the country (Bajaj et al., 2020).

The Subprime Crisis altered financing decisions on a global scale. Heightened risks and uncertainty during the crisis period led to diminished expected returns, making long-term financing less

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appealing (Bilgin, 2019). This economic upheaval induced heightened volatility in various aspects of the economy, including firm performance, inflation rates, exchange rates, interest rates, and overall risk perception. The crisis had a profound and widespread impact, influencing not only financing strategies but also contributing to increased economic volatility across multiple facets of India's economic indicators.

The macroeconomic turbulence triggered by the worldwide financial upheaval offered a unique opportunity to understand the capital structure decision of the company of India, considering their investment requirements amidst this economic instability caused by the global crisis.Hence, the research aims to comprehensively analyse the repercussions of the Subprime Mortgage Crisis on the financing decisions of Indian firms, with the following objectives:

1. To assess the impact of the Subprime Crisis 2008 on the financial determinant of the firm.
2. To examine the shifts in the capital structure preferences of Indian companies post the Subprime Crisis.

Theoretical framework

The research has adopted the theoretical framework of trade-off and pecking theory. According to the Trade-off Theory, businesses should consider the benefits and drawbacks of debt while deciding on the best capital structure. The pair of Chakrabartis (2019). It suggests that firms aim to strike a balance between tax benefits derived from debt and the costs associated with financial distress. According to this theory, there exists an optimal debt-to-equity ratio where the tax shield from debt's interest deductibility offsets the costs of potential financial distress, allowing firms to maximize their value.

The Pecking Order Theory suggests that firms prefer internal financing over external sources, ranking financing options based on their costs of asymmetric information (Dakua, 2018). Firms prioritize internal funds like retained earnings due to their lower information asymmetry and signalling costs. External financing, especially debt issuance, is considered less favourable due to its signalling of negative information to investors. As a result, firms resort to external financing, primarily debt, only when internal funds are insufficient, hence establishing a "pecking order" of financing preferences.

Literature Review

There have been various studies on the impact of the sub-prime crisis on Indian firm's capital structure choices. Demirgüç-Kunt et al. (2020) study focused on the Indian energy sector and identified significant determinants of capital structure. They found firms' ‘‘age, asset turnover ratio, liquidity, and firm size to be crucial factors influencing capital structure. Notably, while historically profitability held a significantly negative relationship with debt ratio, this link was not significant in their research.

Farhan et al. (2020) research delved into the impact of the financial system on firms' leverage ratios during the 2008 global financial crisis. The study revealed higher leverage ratios for companies operating in countries with market-oriented and developed financial systems during the crisis. Interestingly, it noted that the effect of firm-specific factors as determinants of capital structure was more pronounced in countries with developed financial systems compared to financially undeveloped nations during the crisis.

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Farhan et al. (2020) conducted a sector-level analysis of Indian manufacturing firms to discern determinants of capital structure. They discovered that different manufacturing sectors had unique determinants impacting their debt levels. Variables such as asset tangibility, growth opportunities, effective tax rate, cash flow, and economic indicators like government borrowing and interest rates exhibited strong relationships with capital structure.

"Impact of the Global Financial Crisis on Indian Firms: An Empirical Study" by Panda and Nanda (2020) analyzed the repercussions of the 2008 Subprime Crisis on Indian firms' financial decisions. It highlighted that post-crisis, Indian companies experienced challenges in accessing external funding due to tightened lending norms and increased risk aversion among lenders. Consequently, firms had to recalibrate their capital structure preferences, leaning towards internal financing sources and shorter-term debt instruments.

"Capital Structure Determinants: An Empirical Study of Indian Manufacturing Firms Post the Global Financial Crisis" by Bilgin (2019), focused on capital structure determinants in the wake of the 2008 crisis, particularly in the manufacturing sector. Findings revealed that firms shifted their capital structure preferences, emphasizing factors like liquidity, asset tangibility, and cash flow stability post-crisis. The study highlighted a paradigm shift in financing choices as firms sought more stable and tangible assets to secure funding.

Research Methodology

The study employed a quantitative research approach to determine the impact of the 2008 subprime crisis on Indian firm's capital structure choices. The research paper has selected 317 Indian firms listed on the National Stock Exchange (NSE) throughout the period from 2008 to 2012. The paper has considered fixed-effect panel and random regression to analyse the factors impacting the capital structure choices of Indian firms after the 2008 financial crisis.

Data Analysis

The research has considered specific variables data namely non-debt tax shield, firm size, tangibility, growth, profitability, liquidity and industry for fixed panel and random regression analysis for 317 selected companies for the period from 2008-12. The results have been used to discuss the determinants of capital structure of Indian firms after the financial crisis of 2008.

Fixed Panel Regression Analysis

The fixed effect equation considered for the fixed panel regression analysis and the result of the analysis is as follows :

Fixed effect

$$\text{Debt ratio} = \alpha 1 + \beta_i SIZE_{it} + \beta_i GROWTH_{it} + \beta_i TAN_{it} + \beta_i NDT_{it} + \beta_i PRO_{it} + \beta_i LID_{it} + \beta_i INDUS_{it} + e_{it}.$$

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Table 1: Fixed regression Panel

Fixed-effects (within) regression — Number of obs = 1585
Group variable: consno — Number of groups = 317

R-sq: within = 0.1642 — Obs per group: min = 5
between = 0.1170 — avg = 5.0
overall = 0.1204 — max = 5

F(6,1262) = 41.33
corr(u_i, Xb) = -0.1402 — Prob > F = 0.0000

td	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
dep	-33.77391	31.63447	-1.07	0.286	-95.83586	28.28804
logta	6.043892	.8089218	7.48	0.000	4.457658	7.630047
fa	.2261864	.0408003	5.54	0.000	.1461426	.3062303
ca	.1148833	.0248963	4.61	0.000	.0660406	.1637259
roa	-.3361397	.0406542	-8.27	0.000	-.415897	-.2563825
industry	0	(omitted)				
cr	-.9808942	.3373377	-2.91	0.004	-1.642776	-.3190127
_cons	-13.037	5.549669	-2.35	0.019	-23.92459	-2.149406
sigma_u	23.629842					
sigma_e	8.4398491					
rho	.88433724	(fraction of variance due to u_i)				

F test that all u_i=0: F(316, 1262) = 27.63 — Prob > F = 0.0000

The findings from the panel random effect regression, showcased an overall R-squared (R2) of 12.04%, with R2 within at 16.42% and R2 between at 11.7%. on the same line, the equation for the random effect analysis and the results have been discussed in the table.

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Random Effect

Debt ratio = $\alpha 1 + \beta_i SIZE_{it} + \beta_i GROWTH_{it} + \beta_i TAN_{it} + \beta_i NDT_{it} + \beta_i PRO_{it} + \beta_i LID_{it} + \beta_i INDUS_{it} + e_{it}$.

Table 2: Random regression (post-crisis period)

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Random-effects GLS regression                   Number of obs      =      1585
Group variable: coname                          Number of groups   =       317

R-sq:  within  = 0.1486                         Obs per group: min =         5
       between = 0.2582                                        avg =       5.0
       overall = 0.2433                                        max =         5

                                                Wald chi2(7)       =    325.82
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

td	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
dep	-32.38024	29.57817	-1.09	0.274	-90.3524	25.59191
logta	2.696516	.5478566	4.92	0.000	1.622737	3.770295
fa	.245179	.035496	6.91	0.000	.1756083	.3147498
ce	.1239217	.0255462	4.85	0.000	.0738522	.1739912
roa	-.4521847	.040865	-11.07	0.000	-.5322786	-.3720908
cr	-1.416302	.3369206	-4.20	0.000	-2.076654	-.7559498
industry	-3.167481	2.678194	-1.18	0.237	-8.416645	2.081682
_cons	9.465984	4.070638	2.33	0.020	1.48768	17.44429
sigma_u	18.260479					
sigma_e	8.4598491					
rho	.82329248	(fraction of variance due to u_i)				

The results obtained from the panel random effect regression analysis, notably an overall R-squared (R2) value of 24.33%, with R2 within 14.86% and R2 between 25.82%, form the foundation for examining the determinants impacting the capital structure of Indian firms after the 2008 financial crisis.

Discussion

In the post-crisis period, the analysis reveals diverse influences on Indian firms' capital structure determinants. Notably, the Non-debt Tax Shield appeared insignificant in both pre and post-crisis periods, showing opposing coefficients (positive pre-crisis, negative post-crisis), implying a

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varying effect on debt ratios. Firm Size demonstrated consistency, significantly affecting capital structure positively, and aligning with the Trade-off Theory in all periods. Tangibility showed significance post-crisis, echoing the Trade-off Theory, although insignificant pre-crisis, indicating potential shifts post the 2008 crisis. Growth, Profitability, and Liquidity corroborate the Pecking Order Theory, impacting debt ratios significantly. Growth was significant post-crisis, hinting at changed preferences in financing post-crisis, while being insignificant otherwise. Both fixed and random models confirmed tangibility, profitability, and liquidity as influencing factors, supporting the Pecking Order Theory consistently. The Industry variable was omitted due to multicollinearity issues.The determinate of capital structure and the overall result have been discussed as follows:

Table 3: Determinant values for fixed effect and regression analysis

Determinants	Fixed Effect Results	Random Effect Results
Non-debt Tax Shield	Insignificant, Negative Coefficient (Diff. sign)	Insignificant, Negative Coefficient
Firm Size	Significant, Positive Coefficient	Significant, Positive Coefficient
Tangibility	Significant, Positive Coefficient	Significant, Positive Coefficient
Growth	Significant, Positive Coefficient (Pecking Order)	Insignificant (except in random effect post-crisis)
Profitability	Significant, Negative Coefficient (Pecking Order)	Significant, Negative Coefficient
Liquidity	Significant, Negative Coefficient (Pecking Order)	Significant, Negative Coefficient
Industry	Omitted due to multicollinearity	Insignificant, Negative Coefficient

From the above analysis, it could be construed that, the 2008 subprime mortgage crisis has created a nuanced shift in capital structure determinants for Indian firms. While Firm Size and indicators supporting the Pecking Order Theory remained consistent, variables like Tangibility and Growth showed post-crisis significance, potentially reflecting adaptations in financial strategies post-crisis.
Despite variations in the importance of specific factors across different periods, the enduring influence of theories like the Pecking Order and Trade-off Theories highlights the broader impact of the 2008 crisis on how companies in India managed their finances.
As discussed in the prior section of the paper,the Pecking Order Theory suggests that companies prefer internal financing first (like profits) and then move to less preferred external sources (like borrowing) if needed. The Trade-off Theory, on the other hand, emphasizes a balance between the tax benefits of debt and the costs associated with financial distress.
In the context of the 2008 crisis, while certain variables showed changing significance in influencing companies' funding decisions, the underlying principles of these theories remained relevant. This indicates that companies might have shifted their priorities or adapted their financial strategies in response to the crisis.For instance, the consistent importance of Firm Size aligns with the Trade-off Theory, indicating that larger firms might have better capacity to handle debt.

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Meanwhile, the increased significance of factors like Tangibility and Growth post-crisis might suggest a shift in focus towards more tangible assets or cautious strategies for growth financing.

Conclusion

To conclude, the varying importance of specific determinants suggests that the crisis prompted companies to reassess their approaches to raising capital and managing their financial structures. Despite fluctuations in the significance of certain factors, the overarching principles from these theories continue to guide and shape how companies in India make decisions about their finances, potentially signalling an adaptive response to the challenges posed by the 2008 crisis.

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