ESSAYS ON CORPORATE FINANCIAL DISTRESS AND BANKRUPTCY

A THESIS

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Abstract

A corporate event such as bankruptcy entails significant externalities – positive or negative on different stakeholders, including suppliers, creditors, lenders, or industry peers. We study the spillovers of corporate bankruptcies on the non-bankrupt firms in the industry. We examine if corporate bankruptcies entail positive externalities through a dominant competition effect or negative externalities through a dominant contagion effect, using different lenses of financial indicators of the non-bankrupt firms in the context of an emerging market like India. We explore the effects of bankruptcy clustering around a period, as against idiosyncratic or isolated bankruptcies, which have been examined in the bankruptcy spillover literature.

In our first essay, we explore the channels through which the spillovers of clustered bankruptcies propagate to the non-bankrupt firms in the industry. We document the dominance of the contagion effect, which propagates through the investment and debt channels. Non-bankrupt firms in industries that witness bankruptcy *waves* exhibit contraction in their incremental investments and have reduced the issuance of additional debt. The findings augment bankruptcy literature that documents the amplification of bankruptcy spillovers gauged through bankruptcy *waves* on interest spreads by extending the effects of such *waves* on the real economy. We find that bankruptcy codes shape the nature of externalities imposed by bankruptcy *waves* on non-bankrupt firms. A creditor-in-control bankruptcy code (Insolvency and Bankruptcy Code – IBC, in the present context) moderates the contagion of clustered bankruptcies. Furthermore, firms that are small, financially unconstrained, or belong to concentrated industries are relatively immune to the contagion of clustered bankruptcies on their incremental investment. Similarly, profitable or low-risk firms are not subject to the contagion of clustered bankruptcies as they do not exhibit any contraction in their incremental debt. The results are robust to several tests, including endogeneity (instrumental variable approach) and exclusion of macroeconomic and contemporaneous policy shocks.

In the second essay, we study the effect of bankruptcy clustering, assessed through the number of bankruptcies in an industry year, on non-bankrupt firms' stock price crash risk (SPCR). We document a positive relationship between the number of bankruptcies and non-bankrupt firm's SPCR. The increase in SPCR is more pronounced in financially constrained and financially distressed non-bankrupt firms. The results indicate that the financial constraints among non-bankrupt firms induced by the spillover of multiple bankruptcies in the industry and the resultant impairment in financial flexibility causes such firms to withhold bad news to prevent the exacerbation of their problems. As the sustained withholding of bad news and their revelation at once leads to a crash in the stock price, non-bankrupt firms witnessing multiple bankruptcies in their industry in a period exhibit a positive relationship with SPCR.

In the third essay, we explore if there are any wealth effects of bankruptcy announcements on non-bankrupt firms in the same industry under a creditor-in-control bankruptcy regime (IBC). We observe that the competition effect is dominant as the non-bankrupt firms experience positive wealth effects (valuation gains) around bankruptcy announcements of firms in their industry. The cross-sectional regression results show that the non-bankrupt firm's asset tangibility and lower distress risk contribute to the dominant competition effect. On the other hand, large-sized bankruptcies contribute to a contagion effect of bankruptcy announcements,

characterized by negative wealth effects (valuation losses). Our study considers the role of the environmental dimension of *munificence* and finds that *munificent* environments facilitate valuation gains for non-bankrupt firms around bankruptcy announcements in their industry.

Overall, our empirical study shows that bankruptcies clustered around a period have a pronounced effect on non-bankrupt firms in the industry. Bankruptcy codes play a significant role in shaping the externalities of bankruptcy spillovers. A creditor-in-control code moderates the negative externalities (contagion) of peer-firm bankruptcy on non-bankrupt firms.

LIST OF ABBREVIATIONS

2SLS	2-Stage Least Square
AR	Abnormal Returns
AQR	Asset Quality Review
BHAR	Buy and Hold Abnormal Return
BIFR	Board for Industrial and Financial Reconstruction
CAR	Cumulative Abnormal Return
CDR	Corporate Debt Restructuring
CIN	Corporate Identification Number
CIRP	Corporate Insolvency Resolution Process
CMIE	Centre for Monitoring Indian Economy
CR4	Four-firm concentration
CRA	Credit Rating Agencies
DRT	Debt Recovery Tribunal
DTURN	Detrended Turnover
DUVOL	Down-to-Up Volatility
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GMM	Generalized Method of Moments
HHI	Herfindahl-Hirschman Index
IBBI	Insolvency and Bankruptcy Board of India
IBC	Insolvency and Bankruptcy Code
ICR	Interest Coverage Ratio
INR	Indian National Rupees
LLP	Limited Liability Partnership
M & A	Merger & Acquisition
MD & CEO	Managing Director & Chief Executive Officer
NCLT	National Company Law Tribunal
NCSKEW	Negative Conditional Skewness
NIC	National Identification Code
NPA	Non-Performing Asset
NPV	Net Present Value
PCA	Prompt Corrective Action
OLS	Ordinary Least Square
RBI	Reserve Bank of India
ROA	Return on Assets
S&P	Standard & Poor's
SARFAESI	Securitization and Reconstruction of Financial Assets and Enforcement of Security Interests
SEBI	Securities and Exchange Board of India
SICA	Sick Industrial Companies Act
SPCR	Stock Price Crash Risk
USD	United States Dollar
VIF	Variance Inflation Factor

CONTENTS

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d. Investigate whether interfirm heterogeneity causes variation in the effect of bankruptcy spillover among non-bankrupt firms.
e. Examine if a change in bankruptcy code from debtor-in-possession to creditor-in-control regime affects the spillovers of bankruptcy on non-bankrupt firms.
f. Examine and delineate the factors at the firm-, industry-, and macroeconomic levels that determine the relative dominance of the two opposing effects of bankruptcy spillovers, i.e., contagion versus competition effects.

1.4 Organization of the study

We organize the thesis as follows. In the second chapter (Essay 1), we examine the select channels (investment and debt) through which spillovers of clustered bankruptcies propagate in an industry. In the third chapter (Essay 2), we investigate how the clustering of bankruptcies affects the stock price crash risk of the non-bankrupt firms in the industry. The fourth chapter (Essay 3) looks into the wealth effects of bankruptcy announcements on non-bankrupt firms in the same industry under a creditor-in-control bankruptcy code. We conclude with the fifth chapter by summarizing the findings of the three essays, delineating the implications from managerial and policy perspectives, and also describing the study's limitations and the scope for further work.

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Appendix 1. A: Summary of cases under CIRP as of Dec 31, 2022 (Amount in INR Crore)

Number of firms admitted under CIRP of IBC		6199
	Resolution	Liquidation
Number of firms resolved/liquidated	611	1901
Aggregate admitted claims	832624	862313
Average admitted claims	1362.72	453.61
The average number of days taken for resolution/liquidation from the date of admission	587	444
Number of firms undergoing CIRP		3687

Appendix 1. B: Summary of the data waterfall mechanism in the three essays:

In the second chapter (first essay), we identify bankrupt firms as those that have filed for bankruptcy either under the BIFR or IBC during the period 2001 to 2021. We drop firms engaged in financial services or limited liability partnerships or whose unique identification code (Corporate Identification Number or CIN) is unavailable. From the remaining firms, we drop firms whose industry code (National Identification Code or NIC) from the Prowess database of the Centre for Monitoring Indian Economy (CMIE) is not available. We identify the non-bankrupt firms that belong to the same industry as that of the bankrupt firm based on the first 3-digit NIC. We drop such non-bankrupt firms for which data pertaining to either of the dependent, independent, or control variables are unavailable or missing. Our final sample of bankrupt firms under either bankruptcy regime comprise eight hundred eighty-five firms during the sample period. The Data and Methodology section (Section 3) of the first essay elaborates on the data waterfall mechanism.

We follow a data selection methodology in the third chapter (second essay) similar to that of the second chapter (first essay). The sample period in the second essay is from 2010 to 2021, and the non-bankrupt firms are identified based on the same Fama-French 48 industry

classification. The number of bankrupt firms during the sample period is three hundred and thirteen. We explain the data waterfall mechanism in Section 3 (Data) of the second essay.

In the fourth chapter (third essay), we arrive at the sample of bankrupt firms and non-bankrupt firms in the following manner. From the list of firms filing for bankruptcy under the CIRP of IBC, we drop private limited and limited liability partnership firms. We drop unlisted public limited firms from the remaining sample of bankrupt firms. Furthermore, we drop listed bankrupt firms engaged in financial services. Additionally, we drop such bankrupt firms belonging to the same industry whose admission to CIRP is announced within a gap of 7 days to avoid the results being affected by confounded effects. We identify non-bankrupt firms based on the first 3-digit NIC. Firms with missing financial data and illiquid trading are dropped from the list of non-bankrupt firms. We arrive at the final sample of the bankrupt firms comprising 271 listed firms. We provide a detailed explanation of the data waterfall mechanism in Section 4a (Data) of the fourth chapter (third essay).

Appendix 1. C: Top 10 firms in terms of admitted claims that have undergone resolution or liquidation under CIRP.

Resolution		**Liquidation**	
Company	**Admitted Claims (in INR Crore)**	**Company**	**Admitted Claims (in INR Crore)**
Dewan Housing Finance Corporation Limited	87247.68	Lanco Infratech Limited	53451.00
Bhushan Steel Limited	57505.05	Parasrampuria Synthetics Limited	23498.21
Essar Steel India Limited	54565.22	ABG Shipyard Ltd	19316.68
Bhushan Power & Steel Limited	47901.61	Athena Energy Ventures Private Limited	15101.30
Reliance Infratel Limited	42394.16	IVRCL Limited	14096.10
Aircel Limited	36101.92	Punj Lloyd Limited	13389.61
Lanco Thermal Power Limited	33331.13	Bharati Defence and Infrastructure Limited	11866.63
Alok Industries Limited	30706.69	Corporate Power Limited	11770.67
Jet Airways (India) Limited	15432.33	Firestar International Limited	10811.61

Electrosteel Steels Limited	13958.36	Pinky Shipyard Private Limited	10700.70
Total	419144.15		184002.51

bankruptcy laws can impact the propagation of such effects. Also, the usage of debt channel to gauge the transmission of spillovers is crucial in the context of an economy like India wherein bank debt remains a predominant source of credit for firms (Bhaumik et al., 2011).

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2.6 Tables

Table 2.1: Year-wise break up of bankruptcies

Year	Number of bankruptcies	Total Assets of bankrupt firms (in INR billion)
2001	114	116.85
2002	88	95.58
2003	60	36.98
2004	57	94.45
2005	30	28.15
2006	23	35.33
2007	15	23.38
2008	13	12.20
2009	11	12.90
2010	14	34.02
2011	18	40.21
2012	25	89.17
2013	28	123.63
2014	27	209.98
2015	66	463.10
2016	51	398.07
2017	75	3620.21
2018	99	1344.91
2019	64	529.13
2020	6	20.65
2021	1	2.70
Total	885	7331.6
The Table exhibits the year-wise break-up of bankruptcies from 2001 to 2021 and the aggregate assets of the bankrupt firms.		

constrained or distressed firms are more prone to withhold bad news in expectation of a turnaround in the short run. Also, a manager who is not a promoter is more likely to withhold bad news for fear of possible termination. Similarly, firms with dispersed ownership, or where promoter holding is less than 50%, are more susceptible to stock price crashes during bankruptcy-induced spillovers.

Our empirical study is helpful to policymakers in assessing whether the recently enacted bankruptcy code is effective in achieving the objectives and to academics and practitioners alike. Furthermore, the study also sheds light on the role of ownership structure and board characteristics on the possible influence on the relationship between bankruptcy spillovers and SPCR.

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3.7 Tables

Table 3.1: Definition of Variables

Variable	Definition
Altman z-score (for Emerging markets)	6.56 * (Net Working Capital/Total Assets) + 3.26 * (Retained Earnings/Total Assets) + 6.72*(Operating income/Total Assets) + 1.05*(Book value of Equity/Total Liabilities) + 3.25
Asset tangibility	(Net property, plant and equipment, and Inventory)/Total assets
Bankruptcy Rate	Indicator variable with value of 1 if the number of bankruptcies in an industry-year as a percentage of total number of non-bankrupt firms in the industry-year is 10% or more, and 0 otherwise.

factors at all three levels. Asset tangibility and the distance to a firm's default contribute to the dominant competition effect. At the environment or industry level, complexity (concentration) and munificence contribute to a dominant competition effect. With respect to bankruptcy firm/event attributes, we observe that large bankruptcies entail a dominant contagion effect. Bankruptcies filed by the financial creditors of a firm entail valuation gains for non-bankrupt firms. Analysis based on a subsample of non-bankrupt firm attributes shows that financially unconstrained, low-risk (assigned rating grade of High Safety and above), or transparent firms are relatively immune to valuation losses around bankruptcy announcements in their industry. Overall, we find that bankruptcy announcements in an emerging market have informative value more than other indicators of firm failures.

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4.7 Tables

Table 4.1: Year-wise break-up of bankruptcies under IBC

Year	Number of filings	Total Admitted Claims (in INR billion)
2016-17	7	129.64
2017-18	73	2129.46
2018-19	64	922.95
2019-20	63	549.26
2020-21	32	71.29
2021-22	32	74.22
Total	271	3876.82

Table 4.2 – Definition of Variables

Variable	**Definition**
Amihud's Illiquidity Ratio	$\frac{1}{D_{i,t}} * \sum_{d=1}^{D} \frac{abs(ret)_{i,d}}{Volume_{i,d}}$ Ret represents daily stock returns, and Volume represents trading volume (in INR) for firm i. D indicates the days the stock has been traded in a given financial year. The ratio is rescaled by multiplying by 1 million.

Chapter 5: Conclusion

5.1 Introduction

Corporate bankruptcy is a significant event that affects the bankrupt firm's existence and future. Bankruptcy affects other stakeholders, including the non-bankrupt firms in the industry, either directly or otherwise. We examine the spillovers of corporate bankruptcies on the non-bankrupt firms in the industry through different lenses and the mechanism or channel through which the spillovers propagate. The central tenet of our study is that corporate bankruptcies' spillovers are amplified when clustered around a period. We argue that bankruptcy clustering entails a pronounced effect on non-bankrupt firms compared to idiosyncratic or isolated bankruptcy. Therefore, examining the spillovers of clustered bankruptcies on the non-bankrupt firms in the industry is essential.

In the second chapter (first essay), we infer that bankruptcy spillovers propagate in an industry through the investment and debt channels. The non-bankrupt firms contract their incremental investments and reduce issuing additional debt when they are subject to bankruptcy clustering gauged through bankruptcy *waves.* However, firm characteristics determine whether the contagion of clustered bankruptcies is pronounced or muted in non-bankrupt firms. Non-bankrupt firms that are large, financially constrained, or belong to competitive industries exhibit a pronounced contraction in their incremental investments due to the contagion of bankruptcy *waves*. Similarly, less profitable, or low-risk firms are likelier to reduce issuing additional debt consequent to bankruptcy *waves* in their industry. We note that the orientation of the bankruptcy code also influences the externalities of corporate bankruptcies. While bankruptcy clustering has an overall contagion effect on the non-bankrupt firms, evident through the debt and investment channels, the negative externalities or the contagion of such

clustering are moderated when creditor rights are strengthened through a creditor-in-control bankruptcy regime.

In the third chapter (second essay), we document that non-bankrupt firms' stock price crash risk increases after multiple bankruptcies in their industry in a year. The non-bankrupt firms in an industry witnessing several bankruptcies are constrained to issue additional debt, as a result of which they face the risk of imminent distress. Consequently, such non-bankrupt firms withhold bad news that could jeopardize their ability to raise additional debt. The sustained withholding of bad news with the expectation of a turnaround of firm prospects in the short term leads to an increased stock price crash risk. Non-bankrupt firms that are not financially constrained, non-bankrupt firms that are not financially distressed, non-bankrupt firms that have promoters as their majority shareholders, or non-bankrupt firms that have promoters as their managers are relatively immune from the contagion of multiple bankruptcies and do not exhibit an increase in their crash risk. A creditor-in-control bankruptcy code that facilitates easier availability of debt at cheaper rates to financially distressed firms helps moderate the increase in non-bankrupt firms' crash risk even during multiple bankruptcies.

In the fourth chapter (third essay), we examine if bankruptcy announcements entail valuation gains through a dominant competition effect or valuation losses through a dominant contagion effect for non-bankrupt firms in the industry. We find that the non-bankrupt firms experience valuation gains through a dominant competition effect around bankruptcy announcements under a creditor-in-control bankruptcy code, i.e., the Insolvency and Bankruptcy Code (IBC). Non-bankrupt firms that have a high proportion of tangible assets in their balance sheet and are least likely to default in the short term exhibit valuation gains more prominently. Furthermore, a munificent environment facilitates valuation gains around bankruptcy announcements for non-bankrupt firms. In contrast, large-sized bankruptcies induce a dominant contagion effect –

leading to valuation losses for non-bankrupt firms around the announcement of such bankruptcies.

5.2 Implications

Our study has several implications at managerial and policy levels. The pros and cons of both types of bankruptcy codes –debtor-in-possession and creditor-in-control- have been delineated in bankruptcy literature, stressing the importance of maintaining a healthy balance between the two. The emphasis on studying the effect of regime change in bankruptcy laws/codes gains credence in the context of markets or regimes where debt, particularly bank borrowing is the predominant source of external capital for firms. In the specific context of India, bank lending is one of the significant sources of borrowing for firms (Bhatt and Kishor, 2013; Bhaumik et al., 2011).

Empirical studies show that the bias of the bankruptcy code toward the debtor or the creditor has adverse consequences. While a strong creditor-in-control bankruptcy code inhibits innovation and risk-taking among firms, a bankruptcy code favoring the debtor increases the cost of the debt for the surviving non-bankrupt firms, as the lenders price the recovery risk ex-ante. The large sample period in our two essays (first and second) enables us to study the effects of contrasting bankruptcy codes (BIFR versus the IBC) and underscore the effects of the codes with different orientations on bankruptcy spillovers. These findings can help the policymakers in finetuning the bankruptcy code in a manner that does not favor one stakeholder over the other in the bankruptcy process.

The findings from our fourth chapter concerning valuation gains or losses around bankruptcy announcements are particularly relevant to portfolio managers. Our findings regarding firm and industry-level characteristics open avenues for portfolio managers to explore strategies such as staying long on stocks of firms that exhibit a dominant competition effect and short on stocks

of firms that exhibit a dominant contagion effect of the bankruptcy announcements in order to maximize the returns on their portfolio.

5.3 Scope for future research

We attempt to understand the possible mechanisms of bankruptcy spillovers in the industry under the broader context of bankruptcy clustering. We extend the bankruptcy spillover literature by examining the effects of bankruptcy clustering through bankruptcy *waves* on real economic activities such as investment and debt. While we assess investment and debt through capital expenditure (Capex) and external borrowings, respectively, we see further scope in broadening the lens of investment and debt. With respect to the investment channel, there exists scope for examining mergers and acquisitions (M&A) activities in the specific context of bankruptcy spillovers. Under a creditor-in-control bankruptcy code (i.e., the IBC), the bankruptcy of 611 firms has been resolved as of December 31, 2022, through a change in management in the form of a takeover or acquisition by other firms. The admission of a bankrupt firm to the corporate insolvency resolution process (CIRP) creates an avenue for non-bankrupt firms in the same industry or other industries to invest in the bankrupt firm assets and expand their business through takeover or acquisitions. Therefore, observing if bankruptcies lead to increased M&A activities in any industry would be a promising prospect.

The primary debt market in India is evolving rapidly, while bank borrowing remains the predominant source of external capital for firms in India. Empirical study on the bond/debenture market spreads corresponding to industry bankruptcies can be a promising prospect to examine.

Through the third chapter (second essay), we have assessed the impact of bankruptcy clustering on non-bankrupt firms' stock price crash risk (SPCR). SPCR is one of the metrics based on which risk can be gauged. Similarly, other risk measures, such as rating downgrades, changes

in the cost of debt, and spreads of the non-bankrupt firms around bankruptcy announcements in their industry, can be used to assess if firm risk changes due to spillovers arising from bankruptcy clustering.

In our fourth chapter (third essay), we have examined the wealth effects of bankruptcy announcements. While our focus remains on the wealth effects in the short run, i.e., the period immediately preceding and succeeding the announcement of bankruptcy, it would be interesting to examine if the valuation gains or losses persist over time. In this direction, there exists scope for conducting an event study with a longer horizon of six months to one year or further and gauging the wealth effects through Buy and Hold Abnormal Returns (BHAR).

5.4 Limitations

We have focused on bankruptcy spillovers in the context of an emerging market economy – India, which has witnessed a paradigm shift from the debtor-in-possession bankruptcy code (BIFR) to the creditor-in-control code (IBC) in 2016. One of the limitations of our study is the limited availability of data under the IBC regime. The IBC is still nascent, continuously evolving with legislative changes and amendments in the Insolvency and Bankruptcy Act whenever necessary. Furthermore, data availability under the erstwhile bankruptcy regulator (BIFR) is selective and not exhaustive. For example, we could not find data on the amount of debt owed or debt defaulted by the bankrupt firm under the BIFR regime. Similarly, the date on which the bankrupt firm is admitted under BIFR is unavailable, which could have enabled us to extend the examination of the wealth effects under the BIFR regime. Overall, granular data on bankruptcies would enrich our empirical study further.

5.5 Conclusion

We find significant evidence, statistically and economically, of spillovers of corporate events such as bankruptcy on non-bankrupt firms in the same industry. In the context of an emerging

market like India, clustered bankruptcies entail significant externalities on the non-bankrupt firms when examined through different lenses, such as debt, investment, crash risk, and wealth effects. We find evidence that the bankruptcy code, through the relative strength of creditor rights, influences the externalities of bankruptcy spillovers on the non-bankrupt firms.