Corporate Governance Effectiveness: A Sectoral Comparison of the Indian Economy

** Ashish Soni*
*** Nitisha Agarwal*
**** Pritam Kumari*

Abstract

Stock price crash is a phenomenon that usually occurs due to the presence of bubbles in the stock prices, and this problem arises due to sub-optimal management practices such as tax evasion, working on projects with negative present value, and lack of transparency of financial information. Research studies in the field of crash risk suggest that effective corporate governance mechanisms can curb sub-optimal managerial decision-making. This suggests that the rate of stock price crash can be used as a measure of effectiveness of the corporate governance mechanisms within a company. This research explored and analyzed the effectiveness of the corporate governance mechanism in different sectors of the Indian economy using a sample of 55 companies listed on the Bombay Stock Exchange. The study used daily stock price data of these companies during the period from FY2004-05 to FY2013-14. The research findings showed that among all the sectors of the Indian economy, the auto sector, metal & mining sector, and IT sector showed higher levels of corporate governance effectiveness.

Keywords: **crash risk, corporate governance, negative coefficient of skewness**

JEL Classification: D89, G12, G17, G34, M52

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A series of corporate scandals (Enron, WorldCom, Satyam) and the recent financial crisis has revived the interest of regulators, practitioners, and researchers to investigate stock price crash risk. Stock price crash risk is defined as the conditional skewness of return distribution, and it captures asymmetry in the risk associated with a stock (Kim, Li, & Li, 2014). Alternately, it can be understood as the phenomenon which usually occurs due to the presence of bubbles in the stock prices (Moradzadehfard, Lotfi, & Fathi, 2011). Stock price crash risk is an important consideration for investment decisions and risk management.

Selfish management practices such as tax evasion, doing a project with negative present value, and lack of transparency of financial information are some of the frequently cited reasons for stock price crashes. In the absence of optimal contracts, selfish managers can exploit their informational advantage and engage in short-sighted, opportunistic behavior at the expense of long-run shareholders. In general, such actions, that is, undertaking investment decisions that aim to temporarily boost valuations, or engaging in earnings management to preserve an inflated stock price are unsustainable and will eventually result in stock price crashes when the true fundamentals are revealed.

Shleifer and Vishny (1997) and Healy, Hutton, and Palepu (1999) suggested that effective corporate

* *Chief Analytics Officer,* Costarch Analytical Consulting Pvt. Ltd. 1208 Rani Sati Nagar, Kings Road, Jaipur, Rajasthan-302 019. E-mail : ashishsoni@costarch.com
** *Senior Statistical Consultant,* Costarch Analytical Consulting Pvt. Ltd., F-133, Yadav Bhavan, Near DAV School, Nemi Nagar, Jaipur-302 021. E-mail : nitishaagarwal@costarch.com
*** *Chief Executive Officer,* Costarch Analytical Consulting Pvt. Ltd., 1208 Rani Sati Nagar, Kings Road, Jaipur, Rajasthan 302 019. E-mail : pritamkumari@costarch.com

governance mechanisms could curb sub-optimal managerial decision-making. This suggests that the rate of stock price crash can be used as a measure of effectiveness of the corporate governance mechanism within a company.

In this paper, we explore and compare the effectiveness of corporate governance mechanisms in different sectors of the Indian economy during the tenure of the UPA government (FY2004-05 to FY2013-14). Furthermore, we compare the effectiveness of the corporate governance mechanisms within each sector during the two terms of the UPA government.

Literature Review

Research in the field of crash risk has argued that a stock price crash occurs when investors realize that stock prices have been inflated. Jin and Myers (2006) reported that the information asymmetry between managers and shareholders, coupled with managers' self-interest, is related to stock price crash risk. Hutton, Marcus, and Tehranian (2009) reported that opaque earnings are associated with higher stock price crash risk and demonstrated that poor accruals quality in reported earnings allows managers to conceal bad news, which leads to stock price crashes. Similarly, Kim, Li, and Zhang (2011a) investigated how crashes arise from managers' bad news hoarding, which could be induced by equity-based compensation. Also, Kim, Li, and Zhang (2011b) studied crash risk in the context of corporate tax avoidance. Similarly, Callen and Fang (2013) explored stock price crashes in the context of lack of auditor monitoring.

Venkatraman and Selvam (2014) defined corporate governance as the process and structure through which the affairs of a firm are managed for enhancing business prosperity and corporate accountability, and the ultimate objective of CG is to ensure the shareholders' wealth. A considerable body of literature suggests that effective corporate governance mechanisms can curb sub-optimal managerial decision-making (Shleifer & Vishny, 1997 ; Healy et al., 1999). This is achieved, for instance, by disciplining investments (Masulis, Wang, & Xie, 2007), preventing earnings management (Xie, Davidson, & DaDalt, 2003), and improving the information environment (Armstrong, Balakrishnan, & Cohen, 2012 ; Karamanou & Vafeas, 2005). These findings suggest that since effective corporate governance mechanisms help to reduce opportunistic managerial behavior, they should also be associated with lower firm-specific stock price crashes. Thus, the likelihood of stock price crash can be used as an indicator of corporate governance effectiveness. In other words, a lower rate of stock price crash indicates higher effectiveness of the corporate governance mechanism.

Research Objectives

The primary objective of this research is to explore the effectiveness of the corporate governance mechanisms in different sectors of the Indian economy during the tenure of the UPA government (FY2004-05 to FY2013-14). Furthermore, this research compares the effectiveness of corporate governance mechanism, within each sector, during the first term and second term of the UPA government.

Data and Research Methodology

↳ **Study Sample :** The population of this study includes companies listed on the Bombay Stock Exchange. For the purpose of this study, five companies were randomly selected from 11 sectors of the Indian economy that are represented by sectorial indices on the Bombay Stock Exchange. In addition, it was required that the selected companies:-

(1) Were active on the stock exchange from 2004 to 2014.

(2) Had fiscal year ending in March.

(3) Information of the company was available.

(4) Did not have financial changes accrued during the course of the study.
(5) Had at least 6 months of data each year.

↳ **Data :** The study sample consists of 55 firms listed on the Bombay Stock Exchange. These 55 firms represent 11 sectors of the Indian economy. Five randomly selected firms from each sector are included in this research. The data related to daily closing price for these firms for the period from 2004-2010 were taken from Yahoo Finance database. The crash risk data includes 550 firm-year observations.

↳ **Measuring Firm-Specific Crash Risk :** This research uses three measures of crash risk that are derived from previous studies on stock price crashes (Kim et al., 2011a). Since, we are interested in firm-specific factors that contribute to firm-specific crash risk; we first estimated firm-specific weekly returns for each firm and year. Specifically, in this research, the firm-specific weekly return *(W)* is defined as the natural log of one plus the residual return from the expanded market model regression (1)

$$r_{j,\tau} = \alpha_j + \beta_{1j} r_{m,\tau-2} + \beta_{2j} r_{m,\tau-1} + \beta_{3j} r_{m,\tau} + \beta_{4j} r_{m,\tau+1} + \beta_{5jrm,\tau+2} + \varepsilon_{j,\tau} \quad \text{..... (1)}$$

where,
$r_{j,\tau}$ is the return on stock *j* in week τ, and
$r_{m,\tau}$ is the return on the market index (Sensex) in week *t*.

The lead and lag terms for the market index return are included in the expanded market model to account for non-synchronous trading (Dimson, 1979). Firm-specific weekly return for firm *j* in week τ, $W_{j,\tau}$ is measured by the natural log of one plus the residual return from the expanded market model, that is,

$$W_{j,\tau} = \ln (1 + \varepsilon_{j,\tau}) \quad \text{..... (2)}$$

During a given fiscal year, crash week for a given firm is defined as those weeks during which the firm experiences firm-specific weekly returns 3.2 standard deviation below the mean firm-specific weekly returns over the entire fiscal year. The first measure of crash likelihood for a given firm during a given fiscal year is denoted by CRASH. This is an indicator variable that equals one for a firm-year, if the firm experiences one or more crash weeks during that fiscal year. It is zero otherwise (Hutton et al., 2009).

Negative conditional return skewness *(NCSKEW)* is the second measure of crash risk used in this research (Chen, Hong, & Stein, 2001). In a given fiscal year for a given firm, *NCSKEW* is calculated by taking the negative of the third moment of firm-specific weekly returns for each sample year and dividing it by the standard deviation of firm-specific weekly returns raised to the third power. Specifically, for each firm *j* in year *t,* we computed *NCSKEW* as :

$$NCSKEW_{jt} = - \frac{[n\,(n\text{-}1)^{3/2}\, W^3_j\,]}{[(n\text{-}1)(n\text{-}2)(W^{2\,\tau}_{jt})^{3/2}]} \quad \text{..... (3)}$$

Down-to-up volatility *(DUVOL)* is the third measure used to compute the crash likelihood for firms (Chen et al., 2001). In a given fiscal year for a given firm, we first separated all the weeks with firm-specific weekly returns below the annual mean (down-weeks) from those with firm-specific returns above the annual mean (up-weeks) and calculated the standard deviation for each of these sub-samples separately. Then, the *DUVOL* measure is the log of the ratio of the standard deviation on the down-weeks to the standard deviation on the up-weeks.

Analysis and Results

↳ **Summary of the Companies Included in this Study :** The results in the Table 1 summarize the list of companies

included in this study. These companies represent 11 sectors of the Indian economy, namely auto, banking, capital goods, consumer durables, fast moving consumer goods, healthcare, information technology, metal & mining, oil & gas, telecom, and power. It is important to note that the sample companies included in this research vary significantly in terms of market capitalization, frequency of trading, and ownership type. The diversity of our sample ensures that the sampling bias is minimized, and the results are more generalized in the context of the Indian economy.

↳ **Stock Price Crashes over Time :** The frequency of stock price crashes across different sectors of the Indian economy during the last 10 financial years is summarized in the Table 2. The results reveal that the highest number of crash-years are observed in the capital goods sector (34% crash years), consumer durables sector (30% crash years), and fast moving consumer goods sector (26% crash years). On the other hand, the least number of crash-years are observed in the information technology sector (16% crash years), auto sector (18% crash years), and metal & mining sector (20%).

The percentage of crash-years across different sectors of the Indian economy during the first term and the second term of the UPA government is depicted in the Figure 1. The results show that between the first and second term of the UPA government, there was a decrease in the percentage of crash-years within the auto sector (from 24 to 12), capital goods sector (from 36 to 32), consumer durables sector (from 32 to 28), healthcare sector (from 32 to 16), and the power sector (from 24 to 20). On the other hand, it is observed that between the first and second term of the UPA government, there was an increase in the percentage of crash-years within the banking sector (from 20 to 24), fast moving consumer goods sector (from 24 to 28), information technology sector (from 8 to 24), metal & mining sector (from 12 to 28), and oil & gas sector (from 20 to 24). There was no change in percentage of crash-years within the telecom sector (24 during both tenures).

↳ **Comparison of Sectoral-Stock Price Crash Risk (Based on *NCSKEW*) :** The comparison of stock price crash

Table 1. List of Companies Included in this Study

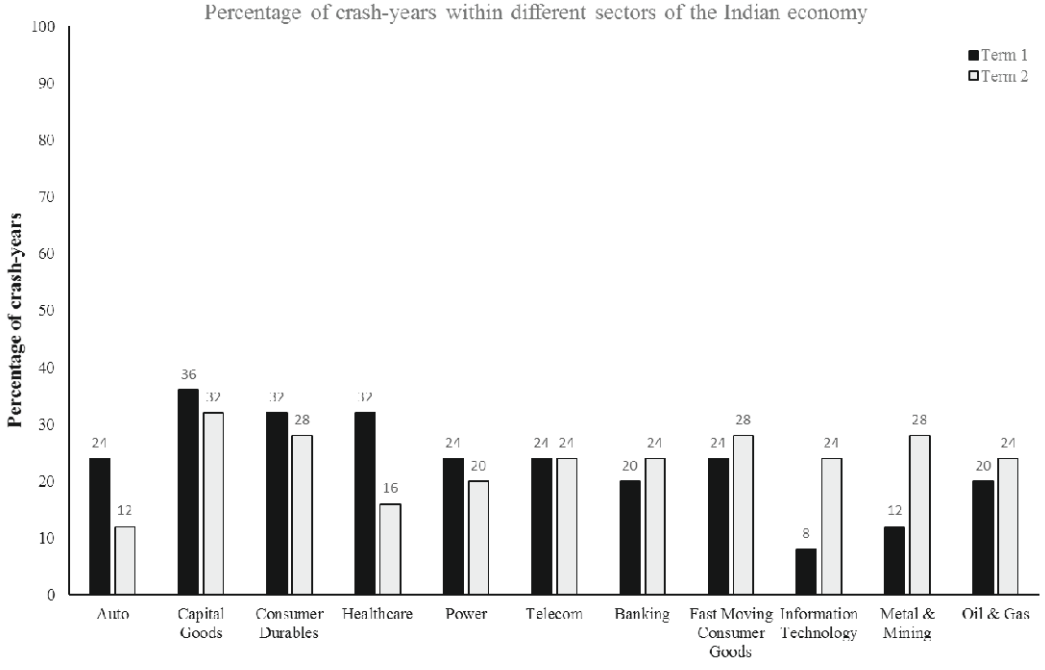
Industry	Company 1	Company 2	Company 3	Company 4	Company 5
Auto	Cummins India Ltd.	Maruti Suzuki India Ltd.	MRF Ltd.	Motherson Sumi Systems Ltd.	Mahindra & Mahindra Ltd.
Banking	Axis Bank Ltd.	HDFC Bank Ltd.	ICICI Bank Ltd.	Kotak Mahindra Bank Ltd.	State Bank of India
Capital Goods	Fag Bearings India Ltd.	Bharat Electronics Ltd.	Havells India Ltd.	Jindal Saw Ltd.	SKF India Ltd.
Consumer Durables	Bajaj Electricals Ltd.	Whirlpool of India Ltd.	TTK Prestige Ltd.	VIP Industries Ltd.	Titan Company Ltd.
Fast Moving Consumer Goods	Dabur India Ltd.	Hindustan Unilever Ltd.	Nestle India Ltd.	United Spirits Ltd.	ITC Ltd.
Healthcare	Apollo Hospitals Enterprise Ltd.	Lupin Ltd.	Biocon Ltd.	Dr. Reddy's Laboratories Ltd.	Sun Pharmaceutical Industries Ltd.
Information Technology	HCL Technologies Ltd.	Infosys Ltd.	Oracle Financial Services Software Ltd.	Wipro Ltd.	Tata Consultancy Services Ltd.
Metal & Mining	Bhushan Steel Ltd.	Hindustan Zinc Ltd.	JSW Steel Ltd.	Tata Steel Ltd.	Steel Authority of India (SAIL) Ltd.
Oil & Gas	Bharat Petroleum Corporation Ltd.	Indraprastha Gas Ltd.	Reliance Industries Ltd.	Oil and Natural Gas Corporation Ltd.	Petronet LNG Ltd.
Telecom	Bharti Airtel Ltd.	Dish TV India Ltd.	Tata Consultancy Services Ltd.	Zee Entertainment Enterprises Ltd.	Oracle Financial Services Software Ltd.
Power	PTC India Ltd.	Torrent Power Ltd.	Tata Power Company Ltd.	Bharat Heavy Electricals Ltd.	Reliance Infrastructure Ltd.

Source: www.bseindia.com

Table 2. Stock Price Crashes Over Time

Economic Sector	Firm-Years with Crashes	Total Firm-Years	Percentage of Crash Years
Auto	9	50	18
Banking	11	50	22
Capital Goods	17	50	34
Consumer Durables	15	50	30
Fast Moving Consumer Goods	13	50	26
Healthcare	12	50	24
Information Technology	8	50	16
Metal & Mining	10	50	20
Oil & Gas	11	50	22
Telecom	12	50	24
Power	11	50	22

Figure 1. Percentage of Crash Years Within Different Sectors of the Indian Economy



risk across different sectors of the Indian economy, using *NCSKEW* as a measure of crash-risk, is summarized in the Table 3. The results indicate that the first term stock price crash risk in the auto sector, banking sector, capital goods sector, consumer durables sector, fast moving consumer goods sector, information technology sector, metal & mining sector, telecom sector, and power sector was higher than the second term stock price crash risk. On the other hand, the first term stock price crash risk in the healthcare sector and oil & gas sector was lower than the second term stock price crash risk. However, the *t* - test results comparing the crash risk between the first term and the second term (within each sector) are statistically insignificant ($p > 0.05$).

↳ **Comparison of Sectoral-Stock Price Crash Risk (Based on *DUVOL*) :** The comparison of stock price crash risk across different sectors of the Indian economy, using *DUVOL* as a measure of crash-risk, is summarized in the Table 4. The results indicate that the first term stock price crash risk in all the sectors of the Indian economy is

Table 3. Comparison of Sectoral-Stock Price Crash Risk (Based on NCSKEW)

Economic Sector	Govt. Term	*N*	Mean	Std. Dev	*T*-test	Interpretation
Auto	Term 1	25	0.113	1.452	t (df = 48)=-0.120,	No difference
	Term 2	25	0.063	1.473	p > 0.05	
Banking	Term 1	25	0.226	1.400	t (df = 48)=-0.555,	No difference
	Term 2	25	-0.047	2.024	p >0.05	
Capital Goods	Term 1	25	0.518	1.368	t (df = 48) =-0.608,	No difference
	Term 2	25	0.233	1.903	p>0.05	
Consumer Durables	Term 1	25	0.745	1.086	t(df = 34)=-1.403,	No difference
	Term 2	25	0.019	2.345	p>0.05	
Fast Moving Consumer Goods	Term 1	25	0.475	1.981	t(df=48)= - 0.753,	No difference
	Term 2	25	0.045	2.057	p>0.05	
Healthcare	Term 1	25	0.073	1.655	t(df = 48)= -0.586,	No difference
	Term 2	25	-0.290	2.615	p>0.05	
Information Technology	Term 1	25	-1.017	2.976	t(df=38)=1.634,	No difference
	Term 2	25	0.100	1.681	p>0.05	
Metal & Mining	Term 1	25	0.478	1.300	t(df = 48)=-0.973,	No difference
	Term 2	25	-0.007	2.130	p>0.05	
Oil & Gas	Term 1	25	0.187	1.371	t(df=48)=-0.816,	No difference
	Term 2	25	-0.245	2.264	p>0.05	
Telecom	Term 1	25	0.224	2.105	t(df=48)=-0.518,	No difference
	Term 2	25	-0.070	1.907	p>0.05	
Power	Term 1	25	0.328	1.664	t(df = 48)= - 0.763,	No difference
	Term 2	25	-0.081	2.103	p>0.05	

higher than the second term stock price crash risk. However, the t-test results comparing the crash risk between the first term and the second term within each sector, except for the consumer durables sector, is statistically insignificant (p >0.05).

The stock price crash risk comparison within the consumer durables sector indicates that the first term stock price crash risk (M = 0.182, SD = 0.161) is higher than the second term stock price crash risk (M = - 0.010, SD = 0.355). Furthermore, the t - test results indicate that this difference in the stock price crash risk during the first term and second term is statistically significant, [t (df = 33) = -2.467, p <0.05].

Discussion

A good corporate governance practice is regarded as an important aspect in reducing risks for investors, attracting capital for investment, and improving the performance of companies in the long run. This research explores the corporate governance effectiveness across different sectors of the Indian economy using firm-specific stock price crash risk. The objective of this paper was to explore the relationship between firm specific stock price crash risk and corporate governance effectiveness. The paper analyzed the stock price crash risk of the companies listed on the Bombay Stock Exchange (BSE) during the study period and observed that there is considerable difference in corporate governance effectiveness across different sectors.

Table 4. Comparison of Sectoral-Stock Price Crash Risk (Based on *DUVOL*)

Economic Sector	Govt. Term	*N*	Mean	Std. Dev	*T*-test	Interpretation
Auto	Term 1	25	0.077	0.232	t (df = 48)=-0.736,	No difference
	Term 2	25	0.029	0.232	p >0.05	
Banking	Term 1	25	0.069	0.186	t (df = 48)=-1.189,	No difference
	Term 2	25	-0.023	0.338	p >0.05	
Capital Goods	Term 1	25	0.126	0.199	t (df = 48)=-1.073,	No difference
	Term 2	25	0.055	0.263	p >0.05	
Consumer Durables	Term 1	25	0.182	0.161	t (df = 33)=-2.467,	Significant
	Term 2	25	-0.010	0.355	p <0.05	difference
Fast Moving Consumer Goods	Term 1	25	0.100	0.300	t (df = 48)=-1.674,	No difference
	Term 2	25	-0.042	0.299	p >0.05	
Healthcare	Term 1	25	0.041	0.221	t (df = 48)=-0.837,	No difference
	Term 2	25	-0.038	0.418	p > 0.05	
Information Technology	Term 1	25	-0.104	0.523	t (df = 33)=0.888,	No difference
	Term 2	25	-0.002	0.229	p >0.05	
Metal & Mining	Term 1	25	0.101	0.218	t (df = 48)= -1.769,	No difference
	Term 2	25	-0.037	0.323	p >0.05	
Oil & Gas	Term 1	25	0.058	0.206	t (df =48)=-1.176,	No difference
	Term 2	25	-0.027	0.294	p >0.05	
Telecom	Term 1	25	0.082	0.389	t (df =48)=-1.253,	No difference
	Term 2	25	-0.036	0.260	p >0.05	
Power	Term 1	25	0.056	0.234	t(df = 48)=-0.916,	No difference
	Term 2	25	-0.021	0.351	p >0.05	

Conclusion

The analysis of corporate governance effectiveness across different sectors of the Indian economy indicates that there is considerable difference in corporate governance effectiveness across different sectors. The results indicate that corporate governance mechanisms in the information technology sector, auto sector, metal & mining sector, and the banking sector are comparatively more effective than the corporate governance mechanisms in other sectors of the economy. Furthermore, the within sector comparison of corporate governance effectiveness indicates that there is no difference in the corporate governance effectiveness between the first term and the second term of the UPA government.

Research Implications

Previous research studies have suggested that effective corporate governance mechanisms can curb sub-optimal managerial decision-making. This suggests that the rate of stock price crash can be used as a measure of effectiveness of the corporate governance mechanisms within a company. This research is an important contribution in the field of corporate governance. It is the first research that explores and compares the effectiveness of corporate governance mechanisms in different sectors of the Indian economy during the tenure of the UPA government (FY2004-05 to FY2013-14) using stock price crash risk as an indicator. This research provides an important tool to the policy makers to measure corporate governance effectiveness in different sectors of the Indian economy.

Limitations of the Study and Scope for Further Research

In this research, we explored and compared the effectiveness of the corporate governance mechanism in different sectors of the Indian economy during the tenure of the UPA government using stock price crash risk as an indicator. However, it is important to highlight that corporate governance is a complex set of procedures, and attributing the stock price crash risk entirely to a week corporate governance mechanism may not be always correct. Though the reasons of using stock price crash risk as an indicator of corporate governance effectiveness is documented clearly in this study, but as an objective decision maker, one must also look at other reasons which might have resulted in the stock price crash before deciding about the effectiveness of a company's corporate governance mechanism.

The present study is confined to only 55 listed companies from 11 different sectors of the Indian economy. Though utmost care was taken during the research to randomly select the sample companies, however, due to the limited number of companies within each sector, the results may deviate slightly due to sampling error. Therefore, further investigation is required with larger sample size in order to get more precise results. In addition, other factors that affect the stock price crash risk might also be included in the future research studies.

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