INVESTOR REACTION DURING STOCK MARKET CRASH AND POST- CRASH MARKET REVERSAL

M. SUGANYA, Research Scholar, Department of Commerce, St. Joseph's College (Autonomous), Affiliated to Bharathidasan University, Tiruchirappalli. Tamil Nadu, India. E-mail.: manogarsuganya@gmail.com

V. BASTIN JEROME, Associate Professor of Commerce and Head - Department of Commerce Honours, St. Joseph's College (Autonomous), Affiliated to Bharathidasan University, Tiruchirappalli. Tamil Nadu, India. E-mail.: bastinjerome@gmail.com

Abstract

To examine the multi-criteria financial ratio analysis of sample companies during and the post-crash period, the required financial data were collected from PROWESS database. In this paper, the determinants of stock returns in five major stock market crashes and post-crash market reversals during the 2006-2020 was investigated. The result implies that the stocks of firms with higher debt ratios generally perform better in crashes (excluding the 2020 Covid -19 stock market crash when investors had a serious concern with crashes) in post-crash market reversals.

Keywords: stock market, Covid -19, Investor

Introduction

A common feature in time series of financial markets is the existence of fat tailed price/ returns distributions in the short term and the existence of crashes in the long term (Campbell et al., 1997; Mantegna and Stanley, 1998). In the hedging model of Gennotte and Leland (1990), the exogenous portfolio insurers precipitate price declines by selling stocks when prices fall, thus magnifying small price changes into large, discontinuous jumps. . The rational panic model Q of Barlevy and Veronesi (2003) shows that uninformed traders can precipitate a price crash because as prices decline, they surmise that informed traders received negative information, which leads them to reduce their demand for assets and drive the prices of stocks even lower.

On 18th May 2006, the BSE Sensex fell by 826 points to 11,391. On 21st January 2008, the BSE fell by 1408 points to 17,605 leading to one of the largest erosions in investor wealth. The BSE stopped trading for a while at 2:30 pm due to a technical snag although its circuit filter allows swings of up to

15% before stopping trading for an hour. On 6th July 2009, the Sensex fell by 869 points to 14,043. On 6th January 2015, the Sensex fell by 854 points to 26,987. On 24th August 2015, the BSE Sensex crashed by 1,624 points and the NSE fell by 490 points. Finally the indices closed at 25,741 points and the Nifty to 7,809 points. The reason given for this crash was given as a ripple effect due to fears over a slowdown in China, as the Yuan had been devalued during July middle leading to a fall in the currency rates of other currencies and the rapid selling of stocks in China and India. The 2020 stock market crash, also referred to as the Coronavirus Crash and the Coronavirus Correction· Was a major and sudden global stock market crash that began on 20th February 2020 and Crash ended on 7th April 2020. The crash only caused a short-lived bear market, and in April global stock markets re-entered a bull market, which continued through December 2020.The crash signalled the beginning of the COVID-19 recession. On 1st February 2020, as the FY 2020-21 Union budget was presented in the lower house of the Indian parliament, Nifty fell by over 3% (373.95 points) while Sensex fell by more than 2% (987.96 points). The fall was also weighed by the global breakdown amid coronavirus pandemic centered in India.

Review of Literature

In order to be consistent with the self-correcting nature of markets, crashes cannot be deterministically predictable but must contain stochastic components D. Sornette (2009). Stock market crashes do not coincide with the notion that stock prices reflect risk-adjusted expected future payoffs towards stockholders. The empirical evidence reveals a number of systematic cross-sectional patterns consistent across the studied crisis events. David J Abner, (2016), discussed rule 48, imposed after the 2010 flash crash, and reduced auction- price visibility, which slowed the process of being able to provide tight markets in ETFs. Changeling Chen, Jeong-Bon Kim, Li Yao, et.al (2016) stated that Earnings smoothing is a wide-spread practice in financial reporting.

The impact of earnings smoothing on future stock price crash document evidence that, within firm, the greater is the extent of earnings smoothing, the higher is the crash risk, and thus the larger is the value destruction or valuation loss to shareholders. Jeong – Bon Kim, Ira Yeng, Jie Zhou et.al (2017) recorded direct evidence on the causal relation between the quality of financial reporting and stock price crash risk. Xuejum Jin, Ziqing Chen, Xiaoan yang, et.al (2019) develop a new index to measure Chinese economic policy uncertainty and find that economic policy uncertainty has a remarkable positive effect on stock price crash risk. This effect is more prominent for firms with greater disagreement among investors, indicating that economic policy uncertainty affects crash risk through

two mechanisms: managers' concealment of bad news and investors' heterogeneous beliefs, in this study. The Present Study and Focus on the price movements and company financials to investigate the issue of stock market crashes with data for the five most important stock market crashes during 2006 – 2020 period.

Statement of the Problem

Stock market is subjected to Volatility between 2006 and 2020. The Indian Stock Market has declined more than 5% for five times between 2006 and 2020. The earlier researchers concentrated on the duration between 2006 and 2015. Considering many major economic turmoil's after 2015 and the pandemic situation arised in 2020, the present study concentrates on the duration between 2006 and 2020.

Need of the Study

The studies mainly focus on the factors leading to a crash and on the volatility and Co-movements of stock market indexes during and after the crash. The many studies have been conducted to study stock market return changeability and global financial crisis in the capital market. Relatively not many studies have stock market pre and post-crash that affects the capital market.

Objective

- To analyse the investor reaction during stock market crash
- To analyse the investor reaction during stock market crash during post-crash market reversal.

Hypothesis of the Study

The present study tests the following null hypotheses.

- **NH1:** There is no significant investor reaction during the crash period
- **NH2:** There is no significant investor reaction during the post-crash period.

Methodology of the Study

a) Sample Selection

The constituents of the major board index of S&P BSE SENSEX were considered for the purpose of sample selection. The study investigates the stock market crashes of India during the period of 15 years from 2006 to 2020. Among S&P BSE SENSEX constituent companies, the data was available for 28 companies except Bajaj Auto Limited and Bajaj Finserv ltd. Thus the sample consists of those 28 companies.

b) Period of Study

The stock market crash was a four-day collapse of stock prices more than 5%. The study investigate the stock market crashes happened between 2006 and 2020. Four-day collapse of more than 5% happened during 2006, 2008, 2009, 2015 and 2020.

c) Sources of Data

This study is mainly based on secondary data. To examine the multi-criteria financial ratio analysis of sample companies during and the post-crash period, the required financial data were collected from PROWESS database. A decline of more than 5% in a single trading day was considered for analysis. The other relevant information for this study were collected from books, research articles and other websites.

d) **Tools used for the study**

The following statistical tools namely mean, median, standard deviation, Skewness, kurtosis, regression and UTADIS method were used.

Limitations of the study

- The study was based on secondary data, so the limitations of secondary data are applicable here.
- The study period is limited to only 15 years.

Analysis and Interpretation

Table 1s Results of Descriptive Statistics for Stock Market Crash

Variable	Mean	Median	Minimum	Maximum	Standard Deviation	Skewness	Kurtosis
Panel 1: 2006 Crash							
Total Assets	607769.8	141301.4	12102.9	566806.1	1216277	3.156042	12.69236
Total Liabilities	486238.9	96508.95	8961.8	4941606	1021049	3.386303	14.5198
Tcap	320767.2	98833.85	12961.2	2747714	577868.9	3.043654	12.50059
Current Ratio	2..138171	1.474506	0.353117	9.397276	1.883834	2.313164	8.929242

Debit to Equity Ratio	4.027437	3.502158	1.045076	8.903966	2.124319	0.694886	2.443413
Market to Book Equity Ratio	4.033135	3.41566	0.682935	15.21269	3.212704	2.048188	7.12496
Beta	-0.0065	-0.01426	-0.02213	0.16922	0.034863	4.814998	24.79231
Crash Return	-0.04651	-0.00212	-0.51047	0	0.100156	-3.74656	17.7558
Recovery Return	0.02057	0	0	0.183266	0.04449	2.834668	10.06712
Panel 2: 2008 Crash							
Total Assets	940068.4	205318.7	17369.2	9650430	1925594	3.585192	16.30854
Total Liabilities	752979.3	174148.2	14514.2	7221251	1509693	3.296126	13.79799
Tcap	487396.3	170670	19848.5	4056073	851731.6	3.025879	12.41687
Current Ratio	2.186466	1.392576	0.459336	11.92007	2.248902	3.130597	13.70421
Debit to Equity Ratio	6.018438	4.301714	-19.4684	71.40231	13.85121	3.711463	19.52569
Market to Book Equity Ratio	5.175377	4.150431	-10.0166	35.90642	7.370599	2.41943	12.41943
Beta	0.00163	0.000409	-0.0123	0.023978	0.009372	0.556745	2.551398
Crash Return	-0.10399	-0.06499	-0.40419	-0.00933	0.102899	-1.44298	4.188824
Recovery Return	0.055355	0.049284	0.002296	0.137867	0.038587	0.555191	2.369787
Panel 3: 2009 Crash							

Total Assets	103178	247782.2	20855.9	10539566	2073960	3.672687	17.06827
Total Liabilities	940068.4	205318.7	17369.2	9650430	1925594	3.585192	16.30854
Tcap	575996.3	205844.5	22928.1	4938457	1010398	3.190565	13.69818
Current Ratio	2.168633	1.489022	0.374756	11.39337	2.121	3.138938	13.94428
Debit to Equity Ratio	6.546065	5.255137	-23.7662	46.43938	10.34917	1.288147	11.42812
Market to Book Equity Ratio	5.947726	4.829035	-13.11711	36.04266	7.668194	1.763314	10.7084
Beta	1.035696	0.033178	-0.02102	28.17465	5.318775	5.003578	26.03624
Crash Return	-0.06622	-0.04982	-0.251	0	0.068014	-1.00457	3.292101
Recovery Return	0.030321	0.019371	0	0.131589	0.035288	1.219316	3.712858
Panel 4: 2015 Crash							
Total Assets	2484514	756505	62048.7	23615269	4640795	3.600831	16.63681
Total Liabilities	2117324	630039.9	59109.8	20514956	4018442	3.656454	16.99278
Tcap	1339702	603661	78205.6	11226241	2216667	3.401712	15.35851
Current Ratio	1.757991	1.468855	0.065324	5.671517	1.324537	0.940892	3.825824
Debit to Equity Ratio	-7.33022	5.473584	-367.009	40.63752	71.13845	-4.85467	25.11008
Market to Book	-8.60614	4.404986	-425.159	68.21208	82.77088	-4.76987	24.66846

Equity Ratio							
Beta	-0.01489	-0.01563	-0.01969	-0.00929	0.002733	0.36536	2.353364
Crash Return	-0.03118	-0.00626	-0.51243	0	0.096079	-4.72448	24.18374
Recovery Return	0.0174	0.004848	0	0.11073	0.028563	1.963491	6.086206
Panel 5: 2020 Crash							
Total Assets	4231651	1240310	72055	39513939	7915040	3.427366	15.37726
Total Liabilities	4215625	1237835	71090.8	39505015	7913753	3.431639	15.39948
Tcap	2248621	933430.3	97113.8	19908190	3917467	3.512117	16.01627
Current Ratio	1.907437	1.651312	0.237064	6.75233	1.391226	1.621563	6.271455
Debit to Equity Ratio	563.8694	151.7097	35.62065	4427.531	990.5136	2.687827	10.00297
Market to Book Equity Ratio	313.3745	112.9437	20.72362	2230.71	476.077	2.753329	10.84959
Beta	-0.0109	-0.01182	-0.01344	0.003681	0.003362	3.22594	14.04345
Crash Return	-0.060377	-0.045554	-0.17914	0	0.052806	-0.858716	2.910042
Recovery Return	0.033116	0.030734	0	0.089114	0.027972	0.595442	2.134264

Source: Data Collected from Prowess Data Base Computed using E-Views

Table 1 shows the results of descriptive statistics such as mean, median, minimum, maximum, standard deviation, skweness, and kurtosis of Total Assets, Total Liabilities, Tcap, Current Ratio, and Debit to Equity Ratio, Market to Book Equity Ratio, Beta, Crash return, Recovery Return. The highest mean value was recorded for the variable, Total Assets in the year 2006, at 607769.8, followed by

Total Liabilities at 486238.9 and Tcap at 320767.2. The least value was recorded for the variable beta, crash return, and Recovery return. In the year of 2009, the beta of kurtosis value is high 26.03624, and the lowest value of kurtosis is 2.353364 in the year of 2015. For all the crash period of years, the crash return value of Standard Deviation and Kurtosis is positive value. Recovery return value is positive for all the variables.

Table 2 Model Summary of Regression Results of the Stock Market Crashes from 2006 to 2020

Model 1	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.3562	0.1269	0.0514	0.0859

Sources: Collected from Prowess database and BSE website and Computed using Excel.

Table 2 shows the various regression(R) values of influence of independent variables on the increase in the dependent variable called dividend. It is seen that R is 0.3562, R^2 is 0.1269, and adjusted R^2 is 0.0514.

Table 3 ANOVA Values of the Regression for the Stock Market Crashes from 2006 to 2020

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	0.1382	11	0.0126	1.8742	0.0486
Residua	0.9512	129	0.0074	-	-
Total	1.0894	140	-	-	-

Sources: Collected from Prowess database and BSE website and Computed using Excel.

Table 3 shows Anova results such as sum of squares, degrees of freedom and mean square for the two sources of variation i.e., regression and residual. The value of regression displays information about the variation accounted for by the regression model. The results of ANOVA for total assets, total liabilities, current ratio, debt to equity ratio, market to book equity ratio, reveal that the significance p-value was 0.0486. This implies that the regression model is significant. The sum of squares of the residual value (0.9512) is less than the sum of squares of the regression (0.1382) indicating that the variation in the dependent variable is fully explained by the regression model.

Table 4 Coefficient Values of the Regression for the Stock Market Crashes from 2006 to 2020

Model 1	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.1884	0.0355	-0.0470	0.0381

Sources: Collected from Prowess database and BSE website and Computed using Excel.

Table 4 shows the calculated coefficients, T- values and level of significance. The extent of relationship of each independent and dependent variable was ascertained from the calculations along with their statistical significance.

Hence the Null Hypothesis (NH2) namely, "There is no significant investor reaction during the post-crash period". Was rejected and the alternative hypothesis namely, "there is significant investor reaction during the post-crash period" was accepted.

Table 5 Model Summery of Multiple Regression Results for Post- Crash Market from 2006 to 2020

Model	Coefficients	Standard Error	T-Statistics	P-value
Intercept	-0.0267	0.0301	-0.8874	0.3765
Total Assets	0.0000	0.0000	2.2287	0.0276
Total Liabilities	0.0000	0.0000	-2.7307	0.0072
Tcap	0.0000	0.0000	1.2837	0.2016
Current Ratio	0.0003	0.0046	0.0753	0.9401
Debt to Equity Ratio	0.0002	0.0001	1.7308	0.0859
Market to Book Equity Ratio	-0.0002	0.0002	-1.2297	0.2210
Beta	-0.0023	0.0031	-0.7383	0.4617
Consumer	-0.0519	0.0307	-1.6927	0.0929
Manufacturing	-0.0241	0.0308	-0.7803	0.4366
High Technology	-0.0903	0.0338	-2.6711	0.0085
Health Care	0.0000	0.0000	65535.0	0.0000

Sources: Collected from Prowess database and BSE website and Computed using Excel.

Table 5 shows the various regression(R) values revealing the influence of independent variables on the increase in the dependent variable called Stock price Returns. It is seen that R is0.1884, R^2 is 0.0355, and adjusted R^2 is-0.0470.6

Table 6 ANOVA Values of the Regression for the Post –Crash Market from 2006 to 2020

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	0.0069	11	0.0006	0.4748	0.9159
Residual	0.1873	129	0.0015	-	-
Total	0.1942	140	-	-	-

Sources: Collected from Prowess database and BSE website and Computed using Excel.

Table 6 shows ANOVA results including sum of squares, degrees of freedom and mean square for the two sources of variation – regression and residual. The value of regression displays information about the variation accounted for by the regression model. The results of ANOVA for total assets, total liabilities, current ratio, debt to equity ratio, market to book equity ratio, reveal that the significance p-value was 0. 9159. This implies that the regression model is significant. The sum of squares of the residual value (0.1873) is less than the sum of squares of the regression (0.0069) indicating that that variation in the dependent variable is fully explained by the regression model.

Table 7 Coefficient Values of the Regression for the Post - Crash Market from 2006 to 2020

Model	Coefficients	Standard Error	T-Statistics	P-value
Intercept	0.0304	0.0134	2.2739	0.0246
Total Assets	0.0000	0.0000	-0.5250	0.6005
Total Liabilities	0.0000	0.0000	1.1890	0.2366
Tcap	0.0000	0.0000	-1.0886	0.2784
Current Ratio	-0.0007	0.0020	-0.3619	0.7180
Debt to Equity Ratio	0.0000	0.0000	-0.9958	0.3212
Market to Book Equity Ratio	0.0001	0.0001	0.7978	0.4265
Beta	0.0004	0.0014	0.3031	0.7623
Consumer	0.0069	0.0136	0.5069	0.6131
Manufacturing	-0.0029	0.0137	-0.2113	0.8330

High Technology	0.0042	0.0150	0.2828	0.7778
Health Care	0.0000	0.0000	65535.0	0.0000

Sources: Collected from Prowess database and BSE website and Computed using Excel.

Table 7 shows the calculated coefficients, T- values and level of significance. The extent of relationship of each independent and dependent variable was ascertained from the calculations along with their statistical significance.

Hence the Null Hypothesis (NH2) namely, "There is no significant investor reaction during the post-crash period". Was rejected and the alternative hypothesis namely, "there is significant investor reaction during the post-crash period" was accepted.

Findings

The variables do not follow the random distribution during the crash periods namely 2006, 2008, 2009, 2015, 2020. The post-crash result implies that the stocks of firms with higher debt ratios generally perform better in crashes (excluding the 2020 Covid -19 stock market crash when investors had a serious concern with crashes) in pre post-crash market reversals.

Conclusion

In this paper, the determinants of stock returns in five major stock market crashes and post-crash market reversals during the 2006-2020 period was investigated. The regression coefficient of the crash return variable is statistically significant with a negative sign in all post- crash market reversal regressions.

References

Lauterbach, B., and U. Ben-Zion, 1992, Panic behaviour and the performance of circuit breakers: Empirical evidence, working paper, Bar Ilan University.

Ma, C., R. Rao, and R. Sears, 1989, Volatility, price resolution, and the effectiveness of price limits, Journal of Financial Services Research 3, 165-199.

Schwert, W. G. (1983). Size and Stock Returns, and Other Empirical Regularities. Journal of Financial Economics 12, 3-12.

Wang, J., Meric, G., Liu, Z., & Meric, I. (2009). Stock Market Crashes, Firm Characteristics, and Stock Returns," Journal of Banking and Finance 33, 1563-1574.

Wang, J., Meric, G., Liu, Z., & Meric, I. (2010). "A Comparison of the Determinants of Stock Returns in the 1987 and 2008 Stock Market Meltdowns," Banking and Finance Review 1, 15-26.

Wang, J., Meric, G., Liu, Z., & Meric, I. (2011). "The Determinants of Stock Returns in the October 9, 2007-March 9, 2009 Bear Market," Journal of Investing 20, 18-24.

Amihud, Y., Mendelson H., and Pedersen, L.H., 2006, Liquidity and asset prices, Foundations and Trends in Finance 1, 269-364.

Amihud, Y., Mendelson, H., Wood, R.A., 1990, Liquidity and the 1987 Stock Market Crash, Journal of Portfolio Management 16, 65–69.

Ang, A., Hodrick, R. J., Xing, Y., and Zhang, X., 2006, the cross-section of volatility and expected returns, Journal of Finance 61, 259-299.

Bernardo, A.E., and I. Welch. (2004). Liquidity and Financial Market Runs. Quarterly Journal of Economics, 119, 135-158.

Blume, M., MacKinlay, A., Terker, B., 1989. Order imbalances and stock price movement son October 19 and 20, 1987. Journal of Finance 44, 827–848.

Brunner Meier, M., and L. Pedersen, 2009, "Market Liquidity and Funding Liquidity, "Forthcoming, Review of Financial Studies.

About IJBER

The *International Journal of Business and Economics Research (IJBER)* is a peer-reviewed, open-access scholarly journal published by Dr. BGR Publications, Thoothukudi, Tamilnadu, India. IJBER provides a global platform for publishing high-quality research in business, economics, management, finance, marketing, commerce, human resources, entrepreneurship, and applied social sciences.

The journal maintains a rigorous editorial process, ensures timely publication, and offers global visibility through open access and multidisciplinary reach.

Journal Codes
- e-ISSN: 2455-3921
- Linking ISSN (ISSN-L): 2455-3921
- ZDB Catalogue Id: 2899795-5

Indexing
- ISSN National Centre of India
- ISSN International Centre
- ROAD
- Index Copernicus International

90034 94749

https://drbgrpublications.in

India | Tamilnadu | Thoothukudi

Dr.BGR Publications

Dr.BGR Publications

CERTIFICATE

OF PUBLICATION

This certificate is presented to

Ms. M.Suganya & Dr. V.Bastin Jerome

Published the article titled "**Investor reaction during stock market crash and post- crash market reversal** " in the *International Journal of Business and Economics Research (IJBER), e-ISSN: 2455-3921*, as part of the Special Issue on the "National Conference on Innovation and Technopreneurship in Commerce", organized by the Department of Commerce and Commerce with Computer Applications, ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR, MADURAI - 625514

This special issue published on DECEMBER 2025.

Mr. A. Stephen Jeyaraj
Co-Chief Editor

Dr. K. Ramya
Co-Chief Editor

Dr. I. Benjamin Prabahar
Chief Editor