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Does Stock Market Respond to Financial Crisis?

Shefali Tiwari
Shri Raojibhai Gokalbhai Patel Gujarati Professional Institute of Management, Indore, MP, India
shefali_tiwari17@rediffmail.com

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Abstract

This research paper studies the impact of financial crisis on Indian stock market via stock prices in relation with financial performance of companies, listed at Bombay Stock Exchange. To achieve this objective, performance of services sector companies from BSE 30 index were scrutinized by analyzing their quarterly moving data for duration from January 2006 till December 2013, for the possible change in relationship between stock prices and financial performance. Sales, net profit, gross profit, earning per share, return on equity, gross profit margin, return on assets and average share price were taken as independent variables for study. Share price was taken as dependent variable which represents stock market. Predictive regression models were developed to analyze the change in relationship between stock prices and financial performance, probably due to financial crisis.

Keywords: Financial Crisis, Stock Market, Financial Performance, Financial indicators, Key financial ratios.

Introduction

Stock market is a very significant component of the financial sector, as it plays a key role in a boosting economy of many countries. It routes money by encouraging investments in productive sector. The financial performance of company is read by its share price. There is a strong correlation between share price and financial performance, but financial performance is not the only factor for driving share prices.

This paper deals with impact of financial crisis on the pact between stock price and financial performance of the selected big services companies of India. The financial storm which started in 2006 led turbulence in international markets. Many international companies had to shut down their operations, deep fall in indices of a number of countries, and shattering of stock prices worldwide. The US and European countries also could not remain unaffected and could not sustain this crisis. And also a number of Asian countries were under financial stress.

Current study tries to analyze the extent of effect of financial crisis on Indian financial market. The performance of companies in the Indian services sector and the behavior of stock price between the period before, during and after financial crisiswere studied. In India, the monetary and financial sector is characterized by high growth in money and credit, which reflected fast expansion and strong economic growth. From other side, financial crisis resulted in downward trends in global demand conditions. Also, the influence of economic slowdown and rising unemployment started to gradually affect the economic growth.

Literature Review: Financial crisis is a challenging issue to define and understand its impact on capital market. Mitton[1] studied three characteristics of corporate governance namely, possession structure, disclosure quality and diversification of companies and their influence on the stock price of firms during the financial crisis. He found that the impact of shareholders on superior stock performance was large and the corporate diversification had an opposite effect on the stock price. Lim, Brooks and Kim[2] scrutinized the changes of the 1997 financial crisis on the efficiency of Asian stock markets using the correlation test separately for three periods before, during and after the financial crisis. A negative impact on the efficiency of Asian stock markets was explored. Alper and Yilmaz[3] examined renowned stock markets of Turkey. Financial crisis began in Turkey in 1994, Asian financial crisis 1997 and Latin America crisis during 1998 – 2001 were studied to find impact on stock markets of Turkey. This study proved that international septicity exists among stock markets. A. Mehta[4] examined the impact of global economic crisis on financial performance of exclusively banking sector of UAE for a period of four years i.e. during 2005 to 2009. She used fundamentals, calculated financial ratios of banks and made a comparison of results before crisis and during crisis period. The results displayed that a profitability of banks had been significantly influenced by global crisis and it led to liquidity crisis. Rafaqet Ali and Muhammad Afzal[5] researched impact of global financial crisis on cash markets of India and Pakistan. For this data from January 2003 to August 2010 of BSE-100 indices and KSE-100, representing stock markets' indices of India and Pakistan respectively were used. EGARCH model was used to explore the impact. It was revealed that negative shocks and down trends influences evidently the volatility than positive shocks. Recent global financial crisis made mild negative impact on stock returns and enhanced volatility in Indian and Pakistani stock exchanges but this impact is relatively stronger on Indian stock market. Olowe[6] studied the impact of global financial crisis on movement of stock return and volatility of Nigerian stock market to this international event. The study showed that stock returns and volatility of Nigerian stock market were free from the severity of this crisis. Ravichandran and Maloain[7] studied the stock markets of six gulf countries and explored that their stock markets could face negative pressure but surprisingly these markets became strengthened during post crisis period.

Methodology

The objective of this research is to explore the impact of the financial crisis on relationship between stock prices and financial performance of company. Data includes both quarterly financial statement reports and share prices from services sector companies from BSE 30 for the period January 1, 2006 to December 31, 2013. The numbers of services companies in BSE 30 index are 8.Due to non-availability of reports of Housing Development Finance Corporation Ltd. and Wipro Ltd. They have been excluded from study. Here financial performance is independent variable, stock price is dependent variable, and financial crisis is mediating variable. Secondary data from financial report of services' companies are used. Financial performance indicators include sales, gross profit, earnings per share, net profit, return on equity, return on assets, gross profit margin, and average share price. The data was divided into three periods; before financial crisis from Januarry1 2006 up to March 31, 2007, during financial crisis from April 1, 2007 up to June 31, 2010and after financial crisis from July 1, 2010 up to December 31, 2013. Correlation and regression methods were used to analyze the data by using SPSS software. Multiple linear regressions were applied to see how the independents variables affect the dependent variable.

Results and Discussion

Findings for Correlation: In Table-1 sales and share prices were strongest correlated during the financial crisis than before and after the financial crisis. Further, the correlation value is increasing during the financial crisis in comparison to both class i.e before and after the financial crisis. Hence, the relationship between the financial performance and stock price is weak during financial crisis as compared to the relationship before and after financial crisis.

Table-1
Correlation between share price and sales

Companies	Correlation		
	Before	During	After
Bharti Airtel Ltd.	0.340394	0.74927229	0.600177
HDFC Bank Ltd.	-0.45286	0.91050834	0.832646
ICICI Bank Ltd.	-0.8491	-0.3655726	0.382513
Infosys Technologies Ltd.	-0.21958	0.78969677	0.310241
Reliance Communication Ltd.	0.99614	0.21480161	0.049238
Tata Consultancy Ltd.	-0.11455	-0.7182845	-0.04121

Table-2
Correlation between Share Price and Gross Profit

Companies	Correlation		
	Before	During	After
Bharti Airtel Ltd.	0.747779	0.802266599	0.715510575
HDFC Bank Ltd.	0.560173	0.256432445	-0.470763636
ICICI Bank Ltd.	-0.37383	-0.280335116	0.232307972
Infosys Technologies Ltd.	-0.70716	0.663138567	0.170502015
Reliance Communication Ltd.	0.868792	0.415385627	0.010048502
Tata Consultancy Ltd.	-0.13554	-0.210856035	-0.198679684

Table-3
Correlation between Share Price and Net Profit

Companies	Correlation		
	Before	**During**	**After**
Bharti Airtel Ltd.	0.934592	0.437652	0.67858
HDFC Bank Ltd.	-0.6320	0.211123	-0.41236
ICICI Bank Ltd.	-0.09465	0.327674	0.087151
Infosys Technologies Ltd.	-0.84443	0.592595	-0.21689
Reliance Communication Ltd.	0.045888	0.723226	0.388799
Tata Consultancy Ltd.	-0.18615	-0.12933	-0.22423

Table-4
Correlation between Share Price and EPS

Companies	Correlation		
	Before	**During**	**After**
Bharti Airtel Ltd.	0.866706	0.381592	0.203265
HDFC Bank Ltd.	0.795332	0.84228	-0.06458
ICICI Bank Ltd.	-0.09356	0.283888	0.023063
Infosys Technologies Ltd.	-0.86734	0.430843	-0.20785
Reliance Communication Ltd.	-0.6543	0.356549	0.507246
Tata Consultancy Ltd.	-0.18122	0.556167	0.245669

Table-5
Correlation between Share Price and Return on Equity

Companies	Correlation		
	Before	**During**	**After**
Bharti Airtel Ltd.	0.665378	-0.04412	-0.25646
HDFC Bank Ltd.	0.445273	0.621305	-0.47524
ICICI Bank Ltd.	0.020761	0.233665	0.028863
Infosys Technologies Ltd.	-0.666131	0.165566	-0.40784
Reliance Communication Ltd.	-0.94551	0.625026	0.364002
Tata Consultancy Ltd.	-0.1997	-0.09863	-0.27132

Here also Table-2 is showing the highest correlation during financial crisis for share price and gross profit. The correlation coefficient is positively high during financial crisis than before and after financial crisis. The relationship between the financial performance and stock price is weak as compared to the relationship before and after financial crisis, as seen by percentage change in correlation values.

Table-3 represents the value of the correlation between share price and net profit. The correlation of here represents positive correlation during financial crisis than before and after the financial crisis. It is observed that the correlation value is going up during financial crisis and it is reducing in before and after financial crisis. The relationship between the financial performance and stock price is strong during financial crisis.

The Table-4 shows the correlation between share price and EPS for three periods of financial crisis. Again the correlation during financial crisis is stronger and positive than before and after the financial crisis. Before and after financial crisis the correlation was much lower than during the financial crisis. The relationship between the financial performance and stock price is weak as compared to the relation between during and after financial crisis.

This Table-5 exhibits the correlation between share price and return on equity. It is a strong significant correlation between the two variables during financial crisis than other two periods. So, both of the variables have strong relation correlated during the financial crisis, but they inversely correlated in other period.

Table-6 represents the correlation between share price and ROA. There is diverse relationship and move in different direction in three periods. Which mean the correlation for these variables during financial crisis is more than the correlation before and after financial crisis.

Table-6
Correlation between Share Price and Return on Assets

Companies	Correlation		
	Before	During	After
Bharti Airtel Ltd.	0.893597	0.064908	-0.08009
HDFC Bank Ltd.	-0.25665	0.079819	-0.22905
ICICI Bank Ltd.	0.024524	0.26991	0.072101
Infosys Technologies Ltd.	-0.68144	0.218963	-0.35043
Reliance Communication Ltd.	-0.56805	0.037618	0.352186
Tata Consultancy Ltd.	-0.19201	-0.12971	-0.14019

Table-7
Correlation between Share Price and Gross Profit Margin

Companies	Correlation		
	Before	During	After
Bharti Airtel Ltd.	0.212914	0.439518	0.011383
HDFC Bank Ltd.	-0.30132	-0.54787	-0.43719
ICICI Bank Ltd.	-0.31172	-0.27121	-0.04785
Infosys Technologies Ltd.	0.206216	-0.54309	-0.36035
Reliance Communication Ltd.	-0.71628	0.053738	-0.20692
Tata Consultancy Ltd.	-0.13375	0.642126	0.045304

Table-7 shows that there is strong correlation between share price and gross profit margin during financial crisis than before and after the crisis period. Where, the correlation value rises up during financial crisis and it slopes down in other two periods. They have opposite and different in three periods. The relationship between the financial performance and stock price is weak during financial crisis as compared to the relationship before and after financial crisis, as calculated by percentage change in correlation values.

Results of Regression: On the basis of results of correlation multiple regression models were developed. The models were developed through an iterative process using various parameters like criteria of significance (0.05 taken as level of significance), no auto-correlation (Durbin Watson value close to or lesser than 2), and no multi-collinearity (VIF of less than 5).

The independent variables significantly impact the share price. The value of R-square was 0.567 which mean 56.7% of variation in share price is explainable by sales, net profit, EPS, return on assets, return on equity and gross profit margin. The computed coefficients of the model in Table 8 are expressed as below;

Y= 5.188+0.589S - 0.449 NP+ 0.143 EPS -0.270 ROE +0.067 ROA - 0.349 GPM

Sales, net profit and gross profit margin explain more effect in the share price. This regression model shows that share price will increase with increase in sales. But net profit and gross profit margin are negatively related to share price, which is an unexpected result and must be further researched.

Table-8
Model Summary of Regression

Model Summary[b]						
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Change Statistics**	
					R Square Change	**F Change**
1	.753[a]	.567	.446	1.7164270	.565	5.183

Model Summary[b]				
Model	Change Statistics			Durbin-Watson
	df1	df2	Sig. F Change	
1	6[a]	24	.002	2.022

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
		B	Std. Error	Beta		
1	(Constant)	5.188	.933		5.563	.000
	Sales	6.130E-008	.000	.589	3.173	.004
	Net profit	-2.789E-007	.000	-.449	-2.600	.016
	EPS	2.335	2.625	.143	.890	.383
	return on equity	-19.157	13.945	-.270	-1.374	.182
	return on assets	5.219	14.673	.067	.356	.725
	gross profit margin	-2.400	1.038	-.349	-2.313	.030

Predictors: (Constant), gross profit margin, EPS, Net profit, return on assets, Sales, return on equity, Dependent Variable: Average share price.

Table-9
Model Summary of Regression

Model Summary [b]						
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Change Statistics**	
					R Square Change	**F Change**
1	.532[a]	.283	.231	3.3589329	.263	6.434

Model Summary [b]				
Model	**Change Statistics**			**Durbin-Watson**
	df1	**df2**	**Sig. F Change**	
1	5[a]	86	.000	.226

Coefficients [a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	1.018	.939		1.084	.281
	Sales	4.500E-008	.000	.378	1.888	.062
	gross profit	-1.506E-007	.000	-.436	-2.271	.026
	EPS	12.528	2.641	.418	4.570	.000
	return on assets	-.764	4.848	-.015	-.158	.875
	gross profit margin	-.240	1.820	-.015	-.132	.896

Predictors: (Constant), gross profit margin, EPS, gross profit, return on assets, sales, Dependent Variable: Average Share Price.

The independent variables significantly impact the dependent share price. The value of R-square was 0.273 which implies that the independent variables are responsible for 28.3% of change in the dependent variable. The computed coefficients for the model are mentioned in the table above and equation is given below

Y= 1.018+0.38S - 0.436 NP + 0.418 EPS - 0.015 ROA - 0.015 GPM.

Highest effect on share price is explainable by Sales, Gross profit and EPS. This regression model shows that share price will increase with increase in sales. But net profit and gross profit margin are negatively related to share price, which is an unexpected result and must be further researched.

The independent variables significantly impact the dependent share price. The value of R-square was 0.030 which implies that the independent variables are responsible for only 3% of change in the dependent variable. The computed coefficients for the model are mentioned in the table above and equation is given below

Y= 80.895 +.140 S-.121 NP + .117 EPS -.109 ROE + .023 ROA-.007 GPM

Highest effect on share price is explainable by Sales, Gross profit and EPS. This regression model shows that share price will increase with increase in sales. But net profit and gross profit margin are negatively related to share price, which is an unexpected result and must be further researched.

Table-10
Model Summary of Regression

Model Summary [b]						
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Change Statistics**	
					R Square Change	**F Change**
1	.192[a]	0.03	-0.035	1803.831	0.03	0.459

Model Summary [b]				
Model	**Change Statistics**			**Durbin-Watson**
	df1	**df2**	**Sig. F Change**	
1	6[a]	90	0.837	2.062

Coefficients [a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	80.895	634.751		.127	.899
	Sales	6.536E-006	.000	.140	.789	.432
	Net profit	-2.336E-005	.000	-.121	-.773	.441
	EPS	1299.672	1289.205	.117	1.008	.316
	return on equity	-4277.401	5665.746	-.109	-.755	.452
	return on assets	1341.891	8347.629	.023	.161	.873
	gross profit margin	-52.623	1085.574	-.007	-.048	.961

Predictors: (Constant), gross profit margin, EPS, Net profit, return on assets, Sales, return on equity, Dependent Variable: Average share price.

Conclusion

This study divides the time period into three categories to analyse the impact of financial crisis on relationship between stock price and financial performance. The explored results showed that the relationship between the two changes during financial crisis as compared to pre or post period of crisis. The study was done with specific reference to services' sector companies of BSE 30. It seems that investors are well aware of global economic events and give more importance to the financial performance during the financial crisis as compared to other periods. As well as, some companies showed weak relation and others have a strong relation which means in depth study of those companies is needed to reveal reasons for this variation. The possible reason may be sudden withdrawals made by foreign institutional investors' (FIIs'). FIIs pumped around Rs. 10,00,020 crore in Indian capital market, between January 2006 and January 2008. This elevated the Sensex remarkably 20,000 over the period. But FIIs' pulled back and withdrew from January, 2008 to January, 2009 from the capital market. The suction was a resort to safety as well as to meet their credit obligations at their home country. Due to these withdrawals the Sensex tumbled down from over 20,000 to less than 9,000 in just a years' time. It seriously evaporated the liquidity in the stock market. Though the initial impact of the financial crisis has been limited to the stock market and the foreign exchange market but in a chain reaction it spread to the rest of the financial system and all of these affected the real sector resulting into slowdown in real growth.

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