Examining the Features of Resilient Firms

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The purpose of this paper is to examine the features of resilient firms that reported positive price movements during market downturns. In the last decade, the stock market had two crashes; the first one occurred in year 2000, where the stock market lost more than 40% of its value. The crash destroyed more than $8 trillion in investors' wealth; its effect was devastating on all industries at all levels (Pattanaik, 2009). The second one occurred in year 2008, where the stock market lost more than 50% of its value and shook the global economy. The study highlights the financial characteristics of those firms that reported positive price movements during the 2008 crash period and tests their significance. It employs both fundamental and market measures.

Introduction

In the last decade, investors were confronted with two traumatic experiences with the occurrence of two stock market crashes. As a consequence, they lost more than 40% of their investments in the first crash (year 2000) and more than 50% of their investments in the second one (year 2008). These market crashes had devastating effects on all industries at all levels and shook the global economy (Nofsinger, 2001). During the same period, many firms reported positive price movements despite the negative factors that overwhelmed the financial market. In an effort to help investors to be better informed, the paper aims at examining the financial structure of these firms with a positive price movement by highlighting their unique characteristics and testing their significance. The next sections of the paper deal with the literature review, research methodology, data analysis, study limitations, and conclusions.

Literature Review

Many studies discussed the causes of stock market crash and provided different explanations. Pattanaik (2009) argued that the deregulation of the financial services industry is a main cause of the 2008 crash market. Dell'Aricia et al. (2008) believed the longer-lasting boom factor and the high inflation with the lower growth were among the main factors that resulted in the crisis. Demyanyk and Hemert (2008) highlighted the classic lending boom-bust scenario, where the fluctuation of the subprime mortgage market that was consistent with the unsustainable growth in credit expansion led to the collapse of the financial markets. Rogers (2008) underscored the effect of the rapid development of free market globalization for the economic recession that was followed by the financial crisis. He added that as a consequence, globalization produced two conflicting results; the first is a boost in the economic growth (benefit); the second is deepening the wealth-poverty gap (detriment). Roll (1989) suggested that a crash occurs because of the revised expectations of the worldwide economic activity. Taylor (2009), however, referred the main cause of year 2008 crisis to the abundance of credit because of the unusually low interest rate policy set by the Fed. Di-Martino et al (2007) gave emphasis to the fact that with the decline in the subprime market in late 2006, lending institutions began to anticipate the looming problems; they tightened their lending policies and businesses were not able to obtain loans to expand or even survive the weak economy.
Resilient

Other studies used business cycle model. Shiller (1984) highlighted that stock prices swing from fundamental values because of the trading activities of the uninformed investors. Occhino and Pescatori (2010) showed evidence that debt delinquencies aggravate credit risk and when ignored lead to a financial crisis. They explained, as the excessive debt increases, businesses decrease their investments in projects, which increases the probability to default; this creates a vicious cycle, which leads to the financial crisis. Zuckerman E. and Rao H. (2004) related the market crash of year 2000 to the main features of trading in technology stocks early in the 1990s. Investors and stock traders were not able to explain the implications of the rise and fall of the Internet stock for many years; Ofek and Richardson (2003) pointed out that during that period, the very high volume of trade in Internet stocks indicated a wide gap between the prices and their fundamental values. Demers and Lev (2001) gave two broad reasons for how Internet stocks reached unjustifiably high prices in the late 1990s and early 2000. The first focuses on the fundamental values that highlight the elements of capital gains and losses. Investors change their opinion often based on indicators rather than on fundamental values. The second suggests that fundamentals were indeed responsible for market prices but investors' interpretations of fundamentals were irrationally optimistic in making their assessments.

Financial Performance

In assessing firms' financial performance, there is a wide variety of measures used. Allouche *et al*. (2008) used ROA, ROE, ROCE as well as the financial structure of 1,271 Japanese companies to test the firms' performance. Similarly, the results of a study done by Onaolapo, A and Kojala, S (2010) showed evidence that a firm's capital structure surrogated by debt ratio had a negative impact on the firm's performance (ROA and ROE). Gompers *et al*. (2003) tested the relationship between corporate governance, equity returns, and the firm's value using financial measures along with other measures. They concluded that corporate governance is positively correlated with equity returns and firm's values. Berger and Ofek (1995), in a study about the firms' performance, found a positive correlation between return on assets (ROA) and return on capital employed (ROCE). Dastgir and Velashani (2008) found that comprehensive income is a good measure of a firm's performance.
Bettis and Hall (1982), Densetz and Lehn (1985), Habib and Victor (1991), Gorton and Rosen (1995), Mehran (1995), Ang, Cole and Line (2000), Margaritis and Psillaki (2006), Rao et al (2007), Zeitun and Tian (2007) used ROA and ROE as performance proxies in their studies. Dastgir and Velashani (2008) reported that Earnings Per Share (EPS) is positively correlated with a firm's performance and argued that EPS is also a measure of shareholder value.

The purpose of this paper is to explore the uniqueness of the financial structure of the firms that had a positive price movement during the crash period of year 2008 and to compare them to the measures of the other firms, and then, to test the significance of these measures. The research problem is set in the following question:
Are the financial measures of the firms that reported positive price movement during the market downturns of year 2008 significantly different from those of the other firms during the same period?

Research Methodology

The study tests the structural difference of financial measures of two groups of firms; the first group is made of firms that reported positive price movement during the year 2008 market downturn; the second group is made of firms that reported a negative price movement during the same period. Analysts, practitioners and academicians used financial ratios in assessing stock returns in financial markets. This study uses a combination of accounting measures and market measures, which are ROE, ROA, P/E and P / BV, (De Vaney S. 1994; Arslan, O. and Baha, M., 2010; Bhandari 1988; Basu 1977; Tze, S., and Boon H., 2009; Irwin, 2001). The study employs the following procedure:

1- Firms are divided into two groups; the first group is made of firms that reported positive price movements during the 2008 crash period; the second

group is made of firms that reported negative price movements during the same period.

2- Then, firms of both groups are divided into the following nine sub-groups based on the type of the economic sector: 1- Consumer Discretionary, 2- Consumer Staples, 3- Energy, 4- Industry, 5- Information Technology, 6- Material, 7- Health Care, 8- Financial, and 9- Others (includes Transportation, Utilities, and Tele-Communication Services).
3- The financial measures of all groups are summarized and their mean and standard deviation are calculated.
4- The significance of the financial measures is tested using controlled experiments across the various groups at 1%, 5%, and 10% level of significance.
5- Among each subgroup, the significance of the financial measures of the two main groups (i.e. firms with positive price movements versus firms with negative price movements) is tested.
6- The study is a two-step-process; in the first step, Z distribution is employed to test if the mean of stocks with the positive price movements group is different from that of the negative price movements group across the nine economic sectors; the following test statistics is used:

$$z = \frac{(\bar{x}_1 - \bar{x}_2) - D_0}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

In the second step, Z distribution is employed to test if the mean of all stocks with the positive price movements group is different from that of the negative price movements of the nine economic sectors all together (i.e. they belong to the same population).

Data used is a secondary type and is taken from Compustat. The original number of firms listed is 9,859; the number of firms that remained in the study is 9,344, after extreme outliers were removed from the study; outliers are defined as being those firms with an ROA less than -100% and ROE less than -200%. To capture the price movement during the 2008 downturn, data of these companies were taken from two time frames i.e. January 01, 2008 and December 31, 2008.

Data Analysis

Testing the significance of the difference between stocks with positive price movements (PPM) with the negative price movements (NPM) group among the nine economic sectors is done at 1%, 5%, and 10% levels of significance. Table 1

reflects the P/E mean (M), standard deviation (S) and the number of firms (N) of the two groups of firms across the nine economic sectors and all sectors as one group.

Table 1- Price Earnings (P/E) Summary

Economic Sector	**PPM (+)**			**NPM (-)**		
	M	**S**	**N**	**M**	**S**	**N**
Consumer Discretionary	29	25	172	24	20	1283
Consumer Staples	23	13	42	22	14	352
Energy	32	40	41	35	78	480
Financial	23	42	248	31	90	2696
Health Care	31	42	107	40	79	808
Industry	25	125	101	39	133	763
Information Technology	84	84	113	41	71	1230
Material	20	16	61	25	52	444
Others	20	9	30	41	140	373
Overall	**26**	**34**	**915**	**33**	**86**	**8,429**

Testing the difference between the P/E mean of the two groups is summarized in Table 2. The testing is done using Z distribution of comparing the means. The critical value of two-tail-test of the three levels is very strong evidence (1%), Z = $\pm$ 2.33; strong evidence (5%), Z = $\pm$ 1.96; some evidence (10%), Z = $\pm$ 1.65 .

Table 2- Price Earnings (P/E) Significance

Economic Sector	***Test Statistic***	***Remarks***
Consumer Discretionary	2.65	**Strong evidence**
Consumer Staples	0.22	Insignificant
Energy	-0.34	Insignificant
Financial	-2.66	**Strong evidence**
Health Care	-1.84	**Some evidence**
Industry	-1.04	Insignificant
Information Technology	+5.21	**Very strong evidence**
Material	-1.65	**Some evidence**
Others	-2.84	**Strong evidence**
Overall	-4.80	**Very strong evidence**

The P/E of the two groups (i.e. PPM and NPM) of the six economic sectors are significantly different; the mean P/E of the two groups for Consumer stable, Energy, and Industry sectors are not statistically different. However, unexpectedly, the P/E means of the two groups of all economic sectors when put together showed extremely strong evidence (Z = -4.80) that they are not equal.

Table 3 is the output of the summary measures of the mean and standard deviation of price / book value of the two groups.

Table 3- Price / Book Value (P/BV) Summary

Economic Sector	PPM (+)			NPM (-)		
	M	S	N	M	S	N
Consumer Discretionary	5	23	172	1	14	1283
Consumer Staples	3	3	42	2	4	352
Energy	4	7	41	3	29	480
Financial	2	1	248	1	2	2696
Health Care	4	44	107	1	23	808
Industry	2	5	101	39	133	763
Information Technology	4	8	113	1	20	1230
Material	4	10	61	4	75	444
Others	2	1	30	1	24	373
Overall	7	97	915	1	25	8,429

Table 4 is the summary results of testing the significance of the price/book value mean of the two groups among the nine sectors. Five economic sectors showed statistical evidence that the means of the price/book value of the two groups are significantly different; the P/BV mean of two groups of Energy, Health care, Material, and Others sectors didn't exhibit any significant difference. As for the overall sectors, it is quite interesting to notice that the means of the two groups are statistically different with a Z of +1.76.

Table 4- Price / Book Value (P/BV) Significance

Economic Sector	*Test Statistic*	*Remarks*
Consumer Discretionary	2.18	**Strong evidence**
Consumer Staples	2.83	**Strong evidence**
Energy	0.65	Insignificant
Financial	9.34	**Very strong evidence**
Health Care	0.56	Insignificant
Industry	+1.79	**Some evidence**
Information Technology	+3.84	**Very strong evidence**
Material	-0.10	Insignificant
Others	+0.90	Insignificant
Overall	+1.76	**Some evidence**

Table 5 represents the summary measures of the mean and standard deviation of Return on Assets (ROA) ratio of the two groups.

Table 5- Return on Assets (ROA) Summary

Economic Sector	PPM (+)			NPM (-)		
	M	S	N	M	S	N
Consumer Discretionary	174	1932	172	-213	3587	1283
Consumer Staples	5	19	42	-4	21	352
Energy	5	30	41	0	27	480
Financial	3	8	248	0	9	2696
Health Care	-9	29	107	-18	36	808
Industry	3	9	101	3	15	763
Information Technology	13	135	113	4	196	1230
Material	0	18	61	1	45	444
Others	5	4	30	0	15	373
Overall	32	820	915	-36	1480	8,429

Table 6 is the summary results of testing the significance of ROA mean of the two groups among the nine sectors. Five economic sectors showed statistical evidence that the ROA means of the two groups are significantly different; the means of the two groups among the other four economic sectors didn't show any significant difference. Again, the means of the two groups for the overall sectors showed strong evidence that they are significantly different with a Z of +2.16.

Table 6- Return on Assets (ROA) Significance

Economic Sector	*Test Statistic*	*Remarks*
Consumer Discretionary	2.18	**Strong evidence**
Consumer Staples	2.96	**Very strong evidence**
Energy	1.04	Insignificant
Financial	4.41	**Very strong evidence**
Health Care	2.75	**Very Strong evidence**
Industry	+0.61	Insignificant
Information Technology	+0.62	Insignificant
Material	-0.42	Insignificant
Others	+4.97	**Very strong evidence**
Overall	+2.16	**Strong evidence**

Table 7 is the output of the summary measures of the mean and standard deviation of Return on Equity ratio (ROE) of the two groups among the nine economic sectors.

Table 7- Return on Equity (ROE) Summary

Economic Sector	PPM (+)			NPM (-)		
	M	S	N	M	S	N
Consumer Discretionary	3	53	172	-19	399	1283
Consumer Staples	12	85	42	2	102	352
Energy	5	37	41	-1	63	480
Financial	11	13	248	4	48	2696
Health Care	-12	43	107	-67	652	808

Industry	**8**	**37**	**101**	**12**	**41**	**763**
Information Technology	**-38**	**76**	**113**	**-4**	**104**	**1230**
Material	**-1**	**38**	**61**	**0**	**50**	**444**
Others	**15**	**13**	**30**	**8**	**38**	**373**
Overall	**3**	**36**	**915**	**-8**	**280**	**8,429**

Table 8 is the summary results of testing the significance of the means of return on equity ratio (ROE) of the two groups among the nine sectors. Six economic sectors showed statistical evidence that the means of the ROE of the two groups are significantly different; the means of the two groups among the remaining three sectors are not significantly different. As for the overall sectors, the ROE means of the two groups showed very strong evidence that they are statistically different with a Z of +3.56.

Table 8- Return on Equity (ROE) Significance

Economic Sector	***Test Statistic***	***Remarks***
Consumer Discretionary	1.83	**Strong evidence**
Consumer Staples	0.67	Insignificant
Energy	0.85	Insignificant
Financial	5.78	**Very strong evidence**
Health Care	2.38	**Very Strong evidence**
Industry	-.96	Insignificant
Information Technology	-4.39	**Very strong evidence**
Material	-0.15	Insignificant
Others	+2.10	**Strong evidence**
Overall	+3.56	**Very strong evidence**

Limitations of the study

There are three limitations in the study. Neither the internal nor the external validity was tested. Almost 400 companies were identified as outliers and were removed from the study.

Conclusions and Recommendations

The research output showed evidence that the mean of the four measures (i.e. P/E, P/BV, ROE, and ROA) of the firms with positive price movement compared to that of the firms with negative price movement is significantly different (SE = Significant Evidence) among several economic sectors as reflected in Table 9.

Table 9 – Significance Summary

Economic Sector	**Market Measures**		**Fundamental Measures**	
	P/E	**P/BV**	**ROE**	**ROA**

Consumer Discretionary	**SE**	**SE**	**SE**	**SE**
Consumer Staples		SE	SE	
Energy				
Financial	**SE**	**SE**	**SE**	**SE**
Health Care	SE		SE	SE
Industry		SE		
Information Technology	SE	SE		SE
Material	SE			
Others	SE		SE	SE
Overall	**SE**	**SE**	**SE**	**SE**

The results of the study are mixed. The means of all measures of the energy sector firms didn't show any significant difference among the two groups of stocks with different price movements, while consumer discretionary and financial sectors showed significant evidence that the mean of all measures of stocks with positive price movements group is significantly different from that group of stocks with negative price movements. As for other sectors, information technology showed significant evidence that stocks with positive price movement group is significantly different from the negative price movement group for the two market measures only. On the other hand, the fundamental measures of stocks with positive price movements of health care and other sectors showed significant evidence that they differed from the group of stocks with negative price movements. An interesting finding is about the overall sectors; the mean of all measures (market and fundamental) of stocks with the positive price movement stocks group is significantly different from that of the other group.

The review of the market measures across sectors showed mixed results for the mean of the P/E measure; stocks with positive price movements had in some sectors an average that exceeded that of the other group, which is in support of the market theory, while other sectors along with the overall sectors had the opposite. As for the price to book value measure, results were more consistent and almost all stocks with the positive price movement had a mean P/BV greater than that of the negative price movement group, which is in harmony with the market theory.

As for the fundamental measures (i.e. ROA and ROE) across all sectors, the results were more coherent than those of the market measures. Stocks with positive price movements group had significantly higher means than that of the negative price movement group; these results are robust as they show that the firms with positive price movements were performing well before the crash. Another interesting finding applicable to all measures (market and fundamental) is that stocks with positive price movements group had standard deviation measure smaller than that of the negative price movement group. Bringing these two findings together, it seems that consistently well performing firms are more likely not to be adversely affected

during crash periods; is it a safe tip? It is recommended to conduct further studies by using different time periods and or other markets.

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