Investors' Herding In Indian Stock Market; An Empirical Analysis

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Abstract: *investors' herding behavior is examined in Indian stock market for the period from 2007 to 2016, using Cross Sectional Absolute Deviation (CSAD) which is the absolute average of the total of the difference between the return of individual securities and the market return, as dependent variable and market return as independent variable in OLS Regression, As suggested in Chang et.al. (2000), the coefficients of squared market return for 43 selected constituent companies of India's flag index NSE S&P CNX Nifty 50 are not negative, except in cases of HCLTECH, MARUTI, TCS and ULTRACEMCO in the whole period; ACC, AXISBANK, GAIL, GRASIM and ULTRACEMCO in the bullish period and HDFC and TCS in the bearish period, showing evidence that there exists no herding in Indian stock market as a whole and the investors are rational in investment decisions.*
Key Words: *Behavioral Finance, Herding Behavior, NSE S&P CNX Nifty 50*

I. Introduction

The rapidly growing field of behavioral finance uses insights from psychology to understand how human behavior influences the investment decisions. The human psychology affects the markets and the resulting changes can be traced. Behavioral finance is a tool which helps to identify the market movements along with the behavioral pattern of the investors. Different behavioral changes can be observed as the decisions taken by the investors change in tune with drastically fluctuating economic atmosphere. One such change in the behavior has been identified and named as herding behavior which is characterized by mimicking the actions of other investors in investment decisions. Since it is one of the main determinants in the field of behavioral finance, the research is focused to investigate the herding behavior in Indian stock market by taking NSE S&P CNX Nifty 50 to represent the market for the period from 1st January 2007 to 31st December 2016.

Market fluctuations are completely based on the decisions taken by the market participants. Each and every decision is the outcome of the behavioral pattern of each investor. Likewise, herding behavior is occurred when the investors follow the crowd rather than taking the rational decision. The rationality of the Indian investors in taking the investment decision is traced based on the available information to find the influence of herding behavior in decision making, especially in NSE S&P CNX Nifty 50 Index. The study is intended to find out the presence of herding behavior, if any, in Indian stock market, by analyzing NSE S&P CNX Nifty 50 Index and its constituent companies for a recent period of ten years. The study also focuses to identify the changes in the herding behavior in bullish and bearish trends in the stock market.

II. Review Of Literature

From the medieval decades of 20th century, there were many studies on the behavior of investors and its impact on stock markets around the globe. The modern studies on investors' behavior was put forward by Kenneth R French (1980) while examining the two alternative models of generating stock return by comparing the returns for different days of the week ignoring holidays and found that the daily returns to the S&P portfolio are inconsistent with both trading time and calendar time model. Nai-Fu-Chen, Richard Roll and Stephen A. Ross (1986) explored the systematic influences of macro-economic variables on stock market returns and examined their influences on asset pricing and showed that sock returns are exposed to systematic economic news, that they are priced in accordance with their exposures. Bala Arshanapalli and John Doukas (1992) tested the linkages and dynamic interactions among stock market movements through co-integration approach and

showed that the degree of international co-movements in stock price indices had changed significantly since the crash of October 1987 except Nikkei Index of Japan and in the post-crash period three major European stock markets are strongly co-integrated with US stock market so when concluding except Japan, other stock markets have linkages after the October 1987 crash.

Studies on herding behavior with a new methodology was suggested by Christie And Huang (1995) who investigated the presence of herding behavior on the part of investors during market stress. Rational asset pricing model was used to compare the dispersion of actual returns with the dispersion of returns and showed in consistency with the predictions of the rationality hypothesis that herding is not an important factor in determining equity returns during periods of market stress. Eric C. Chang, Joseph W. Cheng and Ajay Khorana (2000) examined the herding behavior of investors in different global markets and found that no herding is present in developed markets and it is present in emerging markets. The study modified the model proposed by Christie and Huang (1995), which says that if the market participants herd, the individual asset returns will not deviate significantly from the overall market return, it will result in a smaller than normal CSSD (Cross-Sectional Standard Deviation of Returns), by using a non-linear regression which examines the relationship between the level of equity return dispersions measured by CSAD (Cross-Sectional Absolute Deviation of the Returns) and the overall market return. M.T Raju and Anirban Ghosh (2004) studied the volatility of the current price of an asset with its average past prices and it was found that India shows low volatility compared to emerging markets like Indonesia, Brazil, South Korea exhibited high volatility. Dejiban Mukherjee (2007) compared the trends, similarities and patterns in the activities and movements of the Indian stock market in comparison to its international counterparts. NSE & BSE of Indian stock market is compared with NYSE, HSE, TSE, RSE and KSE. The popular belief that the markets in general and Indian market in particular is more integrated with other global exchanges is validated. Yu-Je Lee, Gao Liang Wang (2007) discussed investment behavior and decision factors which affects the performance of Taiwan stock market and measured the effects on investors' behavior towards investment performance and effects on decision factors towards investment performance of Taiwan stock market. The results of the study showed that there was an impact on investment behavior to investor performance. Some strategies are to be adopted to allocate capital wisely. Investors with right strategy and investment behavior could make profit in this particular market scenario.

Thomas C. Chiang and Dazhi Zheng (2010) examined investors' herding activity for 18 countries after dividing them into advanced stock markets, Latin American markets and Asian markets during 1988-2009. Christie and Huang (1955) model with Cross Sectional Standard Deviations (CSSD) and Chang et.al. (2000) Model with Cross Sectional Absolute Deviations (CSAD) were used and it was found that there was existence of herding in each national market except the US and Latin America. Haroon Khan (2011) focused on herd behavior and market stress of four European countries viz. France, UK, Germany and Italy. Using Halmon and Salmon (2000, 2004, 2008) Model, cross sectional dispersions and estimated coefficients, the sensitivities of stocks were evaluated and it was found that UK market shows less herding behavior around the market portfolio than other markets and also there existed a similar trend in France and Italy. When the market is in stress, more exactly in the financial crisis, herding can be seen more evidently than other periods. Emma Lindhe (2012) studied the investment behavior among market participants in four Nordic countries viz. Denmark, Finland, Norway and Sweden to detect market wide herding with Christie and Huang (1995) Model. Market wide herding was indicated by a non-linear relationship between the individual dispersions and the market return. The Cross Sectional Absolute Deviations (CSAD) is used and found that the relationship appears to be linear indicating that Denmark, Norway and Sweden exhibit no market wide herding behavior. It is also noted that there is significant evidence of market wide herding in Finland.

Jaya, Sujata and Jhumar (2012) studied the Herding Behavior of Indian equity market (NSE). Regression model and linear regressing using quadratic functional form is used. Christie and Huang (1995) Model and regression model were used to find out the effect of market stress on individual return dispersion. The non-linearity between dispersion and market return were checked using curve estimate measure. The results showed that herding is not present in Indian stock market. However, herding behavior is observed in greater magnitude in bull phase and it is discovered that in bear phase investor did not get panic and did not engage into herding in order to avoid losses. Javad Moradi and Hamid Riza Abbasi (2012) examined the presence of participants' herding behavior in Tehran stock exchange using Christie and Huang (1995) model and Chang et.al. (2000) model. CASD and CSSD were used in Christie and Huang (1995) model to analyze the data and linear regression was used to detect herding in the whole market yield distribution in Chang et.al. (2000) model. The results showed that there is no herding in Tehran Stock Market. Rayenda Brahmana, Chee Wooi Hooy and Zamri Ahmad (2012) examined the role of herd behavior in determining the investors' Monday irrationality during 1990-2010. Employing Christie and Huang (1995) model, it was found that the herd behavior is the determinant for investors Monday irrationality, especially in small caps industry. Nicole Choi and Hilla Skiba (2014) studied the herding behavior of institutional investors in international markets and explained that the institutional investors herd more in markets characterized by low levels of information symmetry and suggested that institutional investors herding behavior was likely driven by correlated signals from fundamental

Information. Dalia El Shaity (2014) analyzed the herding behavior in the Egyptian stock market by using daily returns data of the 20 most traded stocks in the Egyptian exchange in addition to the daily returns of the market index EGX 100 using Christie and Huang (1995) and Chang et.al (2010) models and measured the dispersions using Cross Sectional Absolute Deviations (CSAD) of return and Cross Sectional Standard Deviations (CSSD) of returns. The results of Christie and Huang (1995) model estimated that there is no herding in Egyptian exchange and that rational asset pricing is prevalent and the result of Chang et.al (2000) model points out that when there is bull market, the herding is evident in the exchange and during bear market, not necessarily displaying herding behavior.

Ashish Kumar, Bharati and Sanchita Bansal (2016) examined herding behavior of NSE Nifty and thirty six companies in it using Christie And Huang (1995) model and the results showed that the presence of herding behavior cannot be identified during 2008 - 2015 and the same can be seen when the market is in extreme conditions and also during the bull and bear phase of the market. R Ganesh, G. Naresh and S. Thiyagarajan (2016) investigated industry herding behavior in Indian stock market using Christie and Huang (1995) model and Chang et.al (2000) model. Data on returns from top 50 stocks of Nifty was selected and it was found out that there was no significant level of herding in any of the industrial sectors which was analyzed in the study during the period. Ashish Kumar and Bharti (2017) analyzed the herding behavior in information technology sector using the methodology of Chang et.al. (2000) model and proved that the there was no evidence of herding behavior in Indian information technology sector and also found that the reason for the absence of herding is that the maximum participation of institutional investors. The current study is intended to fill the gap in the literature by studying the herd behavior in the Indian stock market for the period from 2007 to 2016, during which global as well as Indian economy underwent drastic environmental changes including the global economic meltdown and the recovery. From the above, it is clear that no much studies were conducted to know the presence of herding in Indian stock market, taking all sectors together as a whole, post the global financial crisis period. The current study is intended to do the same.

III. Data And Methodology

The Indian capital market is represented by the NSE S&P CNX Nifty 50 Index, as National Stock Exchange of India (NSE) is the twelfth largest stock exchange in the world and the largest stock exchange in Asia with a market capitalization of US$ 1.41 trillion (as on March 2016) and volume of US$ 442 billion (as on June 2014). The NSE's flagship index NSE Nifty 50 is used extensively by investors in India and around the world as a barometer of Indian capital market. As per the availability of the data, 43 companies out of fifty companies constituting the NSE Nifty 50 index are selected for the study. The data are collected from the website of NSE for the period from 2nd January 2007 to 30th December 2016. The data used for the study includes the closing prices of NSE S&P CNX Nifty 50 Index and closing prices of shares of 43 selected companies. Total trading days during the sample period were 2475, out of which 1296 and 1179 were identified as bullish and bearish respectively.

To study the herding behavior in stock market, the first established methodology was suggested by Christie and Huang (1995) which used Cross Sectional Standard Deviation (CSSD) to identify the presence of herding in the market during extreme market movements. CSSD is influenced by outliers and paved way to biased results. In order to overcome this drawback, Chang et.al. (2000) suggested a modified methodology which uses Cross Sectional Absolute Deviation (CSAD) to examine the herding behavior of the market. The current study uses the methodology suggested by Chang et.al. (2000) in which the dependent variable for the study is CSAD, which is the absolute average of the total of the difference between the return of individual securities and the market return. The independent variable is market return (r_{mt}) which is the return of the NSE S&P CNX Nifty 50 Index for the entire period. According to CSAD Approach, absolute dispersion between the market return and the individual stock return decreases as the investors imitate the action of others and begin to follow the crowd which is technically known as herding. The CSAD is calculated using the following equation.

$$CSAD_t = \frac{1}{n}\sum_{i=1}^{n}|r_{it} - r_{mt}| \qquad (1)$$

Where, *N* is the number of securities, r_{it} is the return on individual stock at time *t*, r_{mt} is the market return calculated on daily basis at *t*. The observed stock return for individual security is calculated as;

$$r_{it} = \left(\frac{P_t - P_{t-1}}{P_{t-1}}\right) \times 100 \qquad (2)$$

Where P_t is the price of the stock at time *t*, and P_{t-1} is the price at the time *t-1* and *t* stands for the specific day. Similarly, the market return at the time *t*, r_{mt} can be calculated as;

$$r_{mt} = \left(\frac{CV_t - CV_{t-1}}{CV_{t-1}}\right) \times 100 \qquad (3)$$

Where, CV_t is the closing value of the Nifty Fifty at time t. CV_{t-1} is the closing price of the previous day. The following OLS Regression is used in the study to demonstrate the herding behavior.

$$CSAD_t = \beta_0 + \beta_1|r_{mt}| + \beta_2(r_{mt}^2) + \epsilon_t \qquad (4)$$

Where, β_0, β_1, β_2 are the coefficients of regression and ϵ_t is the error term. The term $|r_{mt}|$ is the absolute market return for the time t. For herding should be present, β_2, which is the coefficient of the squared market return (r_{mt}^2) should be negative and significant. The bullish and bearish trend of the market is identified by analyzing the daily market return. If $r_{mt} > 0$, the market shows bullish trend and if $r_{mt} < 0$, the market is in bearish trend. The following OLS Regression is used to identify the herding behavior in the bullish and bearish market respectively.

$$CSAD_t^{bull} = \beta_0^{bull} + \beta_1^{bull}|r_{mt}^{bull}| + \beta_2^{bull}(r_{mt}^{2\,bull}) + \epsilon_t \qquad (5)$$

$$CSAD_t^{bear} = \beta_0^{bear} + \beta_1^{bear}|r_{mt}^{bear}| + \beta_2^{bear}(r_{mt}^{2\,bear}) + \epsilon_t \qquad (6)$$

DESCRIPTIVE STATISTICS

For the whole period and bullish and bearish periods, analysis of the basic behavior of the data has been done to identify the normality of data and the values of Skewness, Kurtosis are also examined to confirm the normality of the data.

Table 1: Descriptive Statistics of NSE S&P CNX NIFTY 50 Daily Returns

Descriptive Statistics	Whole Period	Bullish Period	Bearish Period
Mean	0.0398	1.0157	-1.0329
Standard Deviation	1.5081	1.1131	1.1024
Minimum	-12.2029	.0006	-12.2029
Maximum	17.7441	17.7441	0.0000
Skewness	0.3500	4.2140	-2.7850
Kurtosis	11.9370	42.9670	14.2250
No. Of Observations	2475	1296	1179

Source: Computations of the Researchers

Table 1 shows the descriptive statistics of NSE S&P CNX Nifty 50 closing price for the study period covering 10 years. It is evident that the values of Skewness and Kurtosis are not reaching its standard values. So it reveals that the data is non-normal in nature. Arithmetic mean, Standard Deviation, Skewness, Kurtosis, etc. were analyzed for the selected 43 securities as well for the whole period and bullish and bearish periods separately. It reveals that the 10 years daily returns of the all the 43 company's values of Skewness and Kurtosis are not near to the standard values i.e., Skewness is 0 and Kurtosis is 3, so it can be assumed that the raw data is non-normal in nature. Therefore, the daily closing prices of NSE S&P CNX Nifty 50 index and 43 selected companies are converted in to log form, for the purpose of smoothening the data, to enable the use of parametric statistical tools. Using the log values of closing prices, log returns are computed using equations (2) and (3).

IV. Herding Behavior Of Indian Stock Market

In order to find the herd behavior of Indian stock market, the index and the individual companies are compared.as per Chang et.al. (2000) model, the market return and the individual return are compared. For this, the value of Cross Sectional Absolute Deviation (CSAD) is calculated for each selected company using equation (1). CSAD is the absolute average of the total of the difference between the return of the individual securities and the market return.

For the identification of herding behavior in the stock market during the period of study, using the closing prices returns are calculated and then they are converted into log return series. The log return series of individual companies and the market return are compared to get the CSAD *i.e.,* the dependent variable of the model. When the CSAD increases or decreases in relation with market return is analyzed and the coefficient of r_{mt}^2 is taken to consideration. If the value is negative and significant, then it can be argued that herding behavior is present or not.

The CSAD is computed and taking it as dependent variable and series of market return (r_{mt}) and squared market return (r_{mt}^2) as independent variables, OLS Regression is run to identify the coefficients and error using equation (4), (5) and (6) for whole period, bullish period and bearish period respectively. This model is sufficient to test whether there is herding or not in the period. The results of the analysis are reported in Table 2.

Table 2: OLS Regression Results for Whole Period, Bullish Period and Bearish Period

Symbol	Whole Period			Bullish Period			Bearish Period		
	Average CSAD	β₂	Signi.	Average CSAD	β₂	Signif.	Average CSAD	β₂	Signif.
ACC	0.174	-0.043	0.181	0.171	**-0.105**	**0.015**	0.179	0.068	0.185
AMBUJACEM	0.286	-0.031	0.325	0.282	-0.005	0.905	0.289	-0.075	0.138
ASIANPAINT	0.197	0.042	0.203	0.182	0.161	0.000	0.214	0.018	0.731
AUROPHARMA	0.326	-0.017	0.607	0.296	-0.048	0.264	0.359	-0.004	0.945
AXISBANK	0.237	-0.041	0.216	0.231	**-0.120**	**0.004**	0.243	-0.013	0.802
BANKBARODA	0.277	-0.020	0.542	0.284	-0.006	0.890	0.270	-0.090	0.083
BHARTIARTL	0.238	0.078	0.019	0.247	0.086	0.048	0.229	0.041	0.440
BOSCHLTD	0.154	0.121	0.000	0.157	0.176	0.000	0.151	0.017	0.720
BPCL	0.268	-0.020	0.535	0.253	-0.064	0.131	0.284	0.000	0.993
CIPLA	0.209	-0.005	0.871	0.212	-0.018	0.672	0.205	0.020	0.700
DRREDDY	0.181	0.023	0.471	0.180	0.051	0.225	0.183	-0.019	0.699
EICHERMOT	0.235	-0.057	0.078	0.240	-0.070	0.098	0.229	-0.038	0.462
GAIL	0.232	-0.006	0.846	0.231	**-0.094**	**0.029**	0.232	0.125	0.014
GRASIM	0.154	-0.040	0.221	0.152	**-0.137**	**0.001**	0.156	-0.013	0.804
HCLTECH	0.263	**-0.067**	**0.038**	0.264	-0.066	0.126	0.262	-0.071	0.170
HDFC	0.182	-0.030	0.359	0.191	-0.016	0.715	0.171	**-0.151**	**0.003**
HDFCBANK	0.147	-0.026	0.424	0.161	-0.022	0.615	0.133	-0.073	0.156
HEROMOTOCO	0.186	0.003	0.914	0.186	0.009	0.832	0.185	0.002	0.975
HINDALCO	0.396	0.028	0.366	0.386	-0.034	0.425	0.407	0.160	0.001
HINDUNILVR	0.203	0.013	0.690	0.206	0.024	0.572	0.200	0.001	0.983
ICICIBANK	0.226	0.019	0.559	0.230	0.014	0.745	0.221	0.051	0.285
INDUSINDBK	0.341	-0.043	0.163	0.339	-0.021	0.610	0.342	-0.070	0.140
INFY	0.161	0.026	0.432	0.157	-0.017	0.689	0.166	0.100	0.056
IOC	0.262	-0.023	0.489	0.253	-0.032	0.459	0.271	-0.008	0.876
ITC	0.214	-0.033	0.316	0.217	-0.029	0.510	0.210	-0.028	0.581
KOTAKBANK	0.228	0.018	0.573	0.218	-0.051	0.227	0.240	0.146	0.004
LT	0.167	0.034	0.303	0.179	0.045	0.299	0.153	-0.028	0.585
LUPIN	0.216	0.038	0.248	0.206	0.096	0.019	0.227	0.025	0.632
M&M	0.211	0.106	0.001	0.212	0.109	0.011	0.211	0.084	0.098
MARUTI	0.176	**-0.077**	**0.018**	0.173	-0.073	0.088	0.179	-0.088	0.088
NTPC	0.224	-0.033	0.318	0.221	-0.082	0.056	0.228	0.049	0.348
ONGC	0.219	-0.012	0.711	0.203	-0.048	0.266	0.235	0.001	0.978
RELIANCE	0.173	0.032	0.328	0.167	0.091	0.036	0.179	0.008	0.875
SBIN	0.221	0.010	0.768	0.209	0.039	0.369	0.235	0.001	0.988
SUNPHARMA	0.228	0.016	0.630	0.215	0.011	0.787	0.243	0.025	0.632
TATAMOTORS	0.305	-0.042	0.203	0.291	-0.103	0.016	0.320	-0.013	0.811
TATAPOWER	0.302	-0.013	0.695	0.287	-0.041	0.342	0.319	-0.004	0.936
TATASTEEL	0.303	0.006	0.839	0.286	-0.001	0.983	0.321	0.040	0.431
TCS	0.191	**-0.081**	**0.013**	0.194	-0.063	0.148	0.187	**-0.146**	**0.004**
TECHM	0.252	-0.029	0.384	0.244	-0.052	0.222	0.262	-0.017	0.741
ULTRACEMCO	0.187	**-0.077**	**0.017**	0.194	**-0.124**	**0.003**	0.181	0.004	0.945
WIPRO	0.222	-0.032	0.330	0.220	-0.065	0.131	0.225	0.062	0.223
YESBANK	0.347	0.135	0.000	0.337	0.173	0.000	0.357	0.073	0.144

Source: Computations of the Researchers

The market return is taken as the main indicator to find the presence of herding behavior. Applying the Chang et.al. (2000) model, if the coefficient of r_{mt}^2, the squared market return, shows significant negative value then it can be said that there is herding in the market. The data are analyzed using SPSS as each company has 2475 observations after adjusting the observations to compare with the number of observations of the NSE S&P CNX Nifty 50 for the whole period of 10 years and also for the bullish period and bearish period separately. Table 2 shows the regression results. It is observed that the coefficient of r_{mt}^2 is negative and significant only in cases of HCLTECH, MARUTI, TCS and ULTRACEMCO in the whole period, ACC, AXISBANK, GAIL, GRASIM and ULTRACEMCO in the bullish period and HDFC and TCS in the bearish period. In all other situations, no company's coefficient of squared market return becomes negative and significant, when the OLS regression is run at 95% confidence level. So it is evident that there is only a little herding behavior persisting in Indian stock market during the study period. When the bullish and bearish nature of the market is compared, it is noted that presence of herding is more in times of market prosperity.

The results also support the basic idea that the investors take the investment decision rationally and the individual decision making is done only after analyzing the market. The presence of herding behavior is not found in Indian stock market because of the maximum participation of institutional investors and they take investment decision based on the relevant information as noted by Ashish Kumar and Bharti (2017). However, the presence of herding behavior has already been found in other stock markets. A study conducted Chiang et.al. (2010) proved that herding is present in each national market except US and Latin America. Haroon Khan (2011) claimed that when the market is in stress especially during the financial crisis, herding can be observed during the period of 1998- 2003. The current study observes that there is no hint of herding behavior during the study period and no such behavior is reflected for companies in correspondence with NSE S&P CNX NIFTY 50 index. The result is supported by Jaya, Sujata and Jhumar (2012) in Indian stock market and by Javad Moradi and Hamid Riza Abbasi (2012) in Tehran stock market. The presence of herding behavior has been identified by many studies, especially in case of institutional investors in international markets. Nicole Choi and Hilla Skiba (2014) and Rayenda Brahmana, Chee Wooi Hooy and Zamri Ahmad (2012) found out that herding behavior is main determinant for investors Monday irrationality. The result shows only little herding behavior can be observed during the study period and the same result is supported by many Indian studies on herding behavior. Rayenda Brahmana, Chee Wooi Hooy (2012) has already found that the herding behavior is one of the main constituent in stock market. Rational investors always take the decision on the basis of individual information and are not ready to follow the crowd. If herding is absent it is clear that all the investors are rational and takes decision individually after studying the market. So it is evident that the irrational investors are interested to herd as they are not satisfied in their own idea about the market. They always depend on other peoples' decision and follow them and also not ready to take risk in the market. This will only help to earn a regular pattern of return on investment and the possibility to bag big profit is low. A complete market study is required for taking an investment decision and a rational investor always do this.so it can be concluded that, there is no hint of herding behavior in many of the situations except some individual securities, observed during 2007-2016 in Indian stock market.

V.   Conclusion

The behavioral patterns of investors are of keen interest for many researchers in finance. The current study has been intended to examine the herding behavior of Indian stock market. It is concluded that herding behavior is absent in NSE S&P CNX Nifty 50 during 2007-2016 as a whole. It is argued that investors are rational and are not following the decisions of the crowd while taking the investment decision in many times except in case of some individual companies. Investors are more rational in investing in times of market slow down or bearish market. But the number of instances where herding is present is very less compared to the bullish market. Many studies argued that the presence of herding can be identified in international markets and herding is one of the main determinants of investors' irrationality. This behavior plays a major role in the investment decisions taken by the people, which finally reflects over the changes in the prices of certain stock. The institutional investors show herding when the market is characterized by low levels of information symmetry. Therefore, every change in the behavior basically depends upon the information available to the investors. The dispersion of sufficient information into the market helps its absorption by the investors suddenly and in taking correct investment decisions and there arises no need to mimic the behavior of the crowd.

Bibliography

[1].   Ackert, L. F., & Deaves, R. (2011). Understanding Behavioral Finance. New Delhi: Cengage Learning.
[2].   Arshanapalli, B. (1993). International Stock Market Linkages:Evidence From The Pre- And Post-October 1987. Journal of Banking and Finance, 193-208.
[3].   Bairagi, U., & Rastogi, C. (2017). An Emperical Study of Saving Pattern and Investment. ASM's International E-Journal of Research and Management.
[4].   Brahman, R., Hooy, C. W., & Ahmad, Z. (2012). The Role of Herd Behaviour In Determining Monday Irrationality. Asian Academy Of Management Journal of Accounting and Finance, 1-20.
[5].   Chang, E. C., Cheng, J. W., & Khorana, A. (2000). An Examination of Herd Behavior In Equity Markets: An International Perspective. Journal of Banking & Finance, 1651-1679.
[6].   Chen, N.-F., Roll, R., & Ross, S. A. (2012). Economic Forces and the Stock Market. The Journal of Business, 1-22.
[7].   Chiang, T. C., & Zheng, D. (2010). An Empirical Analysis of Herd Behavior In Global Stock Markets. Journal of Banking and Finance, 1911-1921.
[8].   Christie, W., & Huang, R. (1995). Following The Pied Piper: Do Individual Returns Herd Around The Market. Financial Analysts Journal, 31-37.
[9].   El-Shiaty, D., & Badawi, A. A. (2014). Herding Behavior in The Stock Market: An Empirical Analysis. 1-19.
[10].   French, K. R. (1980). Stock Returns and The Weekend Effect. Journal of Fmancml Economics, 55-69.
[11].   Ganesh, R., Naresh, G., & Thiyagarajan, S. (2016). Industry Herding Behaviour in Indian Stock Market. American Journal of Finance And Accounting, 1-25.
[12].   Henry, P. B. (2000). Do Stock Market Liberalizations Cause Investment Booms. Journal of Financial Economics, 1-53.

[13]. Jethwani, K., & Achuthan, S. (2013). Stock Market Efficiency and Crisis: Evidence From India. Asia-Pacific Finance and Accounting Review, 1-9.
[14]. Khan, H. (2011). Herd Behavior and Market Stress: The Case of Four European Countries. International Business Research, 1-15.
[15]. Kumar, A., & Bharti. (2017). Herding In Indian Stock Markets: An Evidence From Information Technology Sector. IOSR Journal of Economics And Finance, 1-7.
[16]. Kumar, A., Bharti, & Bansal, S. (2016). An Examination of Herding Behavior in an Emerging Economy. Global Journal of Management and Business Research, 1-9.
[17]. Kumar, R. (2013). The Effect of Macroeconomic Factors on Indian Stock Market Performance: A Factor Analysis Approach. IOSR Journal of Economics and Finance, 14-21.
[18]. Lindhe, E. (2012). Herd Behavior in Stock Markets- A Nordic Study. 1-52.
[19]. Moradi, J., & Abbasi, H. (2012). A Test of Investors' Herding Behavior In Tehran Exchange. Interdisciplinary Journal of Business Research, 1-17.
[20]. Mukherjee, D. (2007). Comparative Analysis of Indian Stock Market with International Markets. 1-33.
[21]. Prosad, J. M., Kapoor, S., & Sengupta, J. (2012). An Examination of Herd Behavior: An Empirical Study on Indian Equity Market. International Conference on Economics and Finance Research, (Pp. 1-5).
[22]. Raju, M. T., & Ghosh, A. (2004). Stock Market Volatility – An International Comparison. 1-51.
[23]. Ravichandran, K., Thirunavukarasu, P., Nallaswamy, R., & Babu, R. (2005). Estimation of Return on Investment in Share Market Through Ann. Journal of Theoretical and Applied Information Technology, 1-11.
[24]. Scharfstein, D. S., & Stein, J. C. (1990). Herd Behavior and Investment. The American Economic Review, 465-479.
[25]. Steindel, Ludvigson, S., & Charles. (1999). How Important is The Stock; Market Effect on Consumption. Frbny Economic Policy Review.

Appendix 1

The name of the companies selected for the study and their symbols

Sl. No	Security Symbol	Security Name
1	ACC	ACC Ltd.
2	AMBUJACEM	Ambuja Cements Ltd.
3	ASIANPAINT	Asian Paints Ltd.
4	AUROPHARMA	AurobindoPharma Ltd.
5	AXISBANK	Axis Bank Ltd.
6	BANKBARODA	Bank of Baroda
7	BPCL	Bharat Petroleum Corporation Ltd.
8	BHARTIARTL	Bharti Airtel Ltd.
9	BOSCHLTD	Bosch Ltd.
10	CIPLA	Cipla Ltd.
11	DRREDDY	Dr. Reddy's Laboratories Ltd.
12	EICHERMOT	Eicher Motors Ltd.
13	GAIL	GAIL (India) Ltd.
14	GRASIM	Grasim Industries Ltd.
15	HCLTECH	HCL Technologies Ltd.
16	HDFCBANK	HDFC Bank Ltd.
17	HEROMOTOCO	Hero MotoCorp Ltd.
18	HINDALCO	Hindalco Industries Ltd.
19	HINDUNILVR	Hindustan Unilever Ltd.
20	HDFC	Housing Development Finance Corporation Ltd.
21	ITC	I T C Ltd.
22	ICICIBANK	ICICI Bank Ltd.
23	IOC	Indian Oil Corporation Ltd.
24	INDUSINDBK	IndusInd Bank Ltd.
25	INFY	Infosys Ltd.
26	KOTAKBANK	Kotak Mahindra Bank Ltd.
27	LT	Larsen & Toubro Ltd.
28	LUPIN	Lupin Ltd.
29	M&M	Mahindra & Mahindra Ltd.
30	MARUTI	Maruti Suzuki India Ltd.

31	NTPC	NTPC Ltd.
32	ONGC	Oil & Natural Gas Corporation Ltd.
33	RELIANCE	Reliance Industries Ltd.
34	SBIN	State Bank of India
35	SUNPHARMA	Sun Pharmaceutical Industries Ltd.
36	TCS	Tata Consultancy Services Ltd.
37	TATAMOTORS	Tata Motors Ltd.
38	TATAPOWER	Tata Power Co. Ltd.
39	TATASTEEL	Tata Steel Ltd.
40	TECHM	Tech Mahindra Ltd.
41	ULTRACEMCO	UltraTech Cement Ltd.
42	WIPRO	Wipro Ltd.
43	YESBANK	Yes Bank Ltd.

Source: www.nseindia.com

Appendix 2

Descriptive Statistics of Returns of NSE S&P CNX Nifty 50 Index and Selected Listed Companies

Symbol	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Panel A: Whole Period							
NIFTY	2475	-12.2029	17.7441	0.0398	1.5081	.350	11.937
ACC	2475	-14.8339	13.5286	0.0280	2.0321	-.148	4.610
AMBUJACEM	2475	-11.6311	14.8684	0.0388	2.2338	.242	3.462
ASIANPAINT	2475	-90.0209	9.6587	0.0801	2.5593	-17.606	621.054
AUROPHARMA	2475	-79.2112	19.4616	0.0740	3.3813	-6.478	141.721
AXISBANK	2475	-80.0906	19.4263	0.0681	3.1796	-6.239	164.292
BANKBARODA	2475	-80.1534	22.5594	0.0490	3.1078	-6.511	181.199
BHARTIARTL	2475	-48.9068	25.4235	0.0042	2.5187	-2.540	61.923
BOSCHLTD	2475	-14.0886	18.4164	0.0871	1.7536	1.524	15.497
BPCL	2475	-51.3096	17.8251	0.0713	2.8056	-4.543	89.893
CIPLA	2475	-14.3252	9.4675	0.0495	1.8294	-.093	4.200
DRREDDY	2475	-14.5609	10.6809	0.0709	1.8381	-.348	5.033
EICHERMOT	2475	-15.4257	20.0185	0.1973	2.6053	.976	8.282
GAIL	2475	-36.0462	13.1901	0.0460	2.2793	-1.502	28.405
GRASIM	2475	-79.5441	16.6951	0.0026	2.5408	-12.458	391.254
HCLTECH	2475	-51.1774	18.7909	0.0582	2.9121	-4.128	78.668
HDFC	2475	-79.3549	22.4730	0.0489	2.8432	-8.411	248.057
HDFCBANK	2475	-79.9202	16.3003	0.0567	2.5429	-12.340	396.445
HEROMOTOCO	2475	-9.8971	21.7203	0.0739	1.9735	.874	9.529
HINDALCO	2475	-17.4452	18.2425	0.0398	3.0165	.149	2.842
HINDUNILVR	2475	-8.1183	17.3821	0.0694	1.7722	.646	6.152
ICICIBANK	2475	-79.8116	23.0381	0.0189	3.1927	-6.125	160.278
INDUSINDBK	2475	-17.5089	17.3077	0.1684	2.9151	.518	5.041
INFY	2475	-51.1110	16.7851	0.0026	2.4617	-7.078	146.726
IOC	2475	-51.0426	16.9915	0.0283	2.6792	-5.180	104.078
ITC	2475	-50.6394	11.1260	0.0386	2.1730	-6.241	137.788
KOTAKBANK	2475	-50.3998	19.1384	0.0736	3.0062	-3.419	59.797
LT	2475	-50.2902	24.5349	0.0350	2.6607	-2.892	63.315

LUPIN	2475	-80.0273	10.7950	0.0876	2.5458	-12.580	396.679
M&M	2475	-48.7834	23.9861	0.0441	2.5861	-2.108	58.458
MARUTI	2475	-12.2773	10.6107	0.0906	2.0878	.012	2.709
NTPC	2475	-13.9632	12.8310	0.0265	1.9792	.058	5.098
ONGC	2475	-76.3886	16.4853	-0.0074	2.7501	-9.192	248.951
RELIANCE	2475	-51.5310	21.3693	0.0250	2.3982	-3.878	90.701
SBIN	2475	-89.7921	20.0266	0.0202	3.0294	-10.307	312.842
SUNPHARMA	2475	-80.0295	22.0815	0.0424	2.7617	-12.028	327.484
TATAMOTORS	2475	-80.8668	18.8256	0.0460	3.2408	-6.190	158.312
TATAPOWER	2475	-90.2190	23.2237	0.0069	3.0701	-10.051	303.865
TATASTEEL	2475	-15.1194	17.0037	0.0347	2.9244	-.010	3.274
TCS	2475	-49.9807	15.4957	0.0551	2.3101	-3.779	92.029
TECHM	2475	-75.4633	25.6120	0.0106	3.0250	-5.885	160.585
ULTRACEMCO	2475	-9.0728	14.6419	0.0641	2.0943	.274	3.206
WIPRO	2475	-39.4542	11.3325	0.0163	2.2497	-2.212	40.733
YESBANK	2475	-20.1886	25.2488	0.1320	3.0792	.542	7.119
Panel B: Bullish Period							
NIFTY	1296	.00063	17.74407	1.01567	1.11308	4.214	42.967
ACC	1296	-5.70166	13.52862	.85685	1.77131	1.022	3.685
AMBUJACEM	1296	-5.63380	14.86842	.87056	2.03337	1.039	3.839
ASIANPAINT	1296	-12.96226	9.65866	.55216	1.70947	.137	5.596
AUROPHARMA	1296	-17.09667	19.46161	.97893	2.49141	.862	6.550
AXISBANK	1296	-8.63455	19.42635	1.37814	2.46180	1.215	5.373
BANKBARODA	1296	-80.15338	22.55937	1.10374	3.32587	-10.694	276.830
BHARTIARTL	1296	-48.90677	25.42352	.81761	2.62820	-4.481	104.431
BOSCHLTD	1296	-5.51999	18.41638	.46626	1.66071	2.115	15.587
BPCL	1296	-6.58858	15.12162	.78852	2.22782	.865	3.216
CIPLA	1296	-6.73878	9.46746	.63297	1.69811	.554	2.478
DRREDDY	1296	-10.22548	8.08340	.55762	1.73621	.069	3.395
EICHERMOT	1296	-7.74206	20.01848	.84992	2.53132	1.821	8.938
GAIL	1296	-5.56921	13.19007	.80288	2.03889	.965	3.163
GRASIM	1296	-20.70720	16.69506	.81080	1.88710	.112	20.100
HCLTECH	1296	-50.87219	18.79091	.90546	2.81684	-3.976	91.428
HDFC	1296	-79.35492	22.47298	1.11126	3.10160	-12.824	351.913
HDFCBANK	1296	-79.92023	16.30027	.96909	2.87906	-16.738	482.026
HEROMOTOCO	1296	-7.49176	21.72027	.65091	1.91785	1.332	11.780
HINDALCO	1296	-7.48945	18.24249	1.39921	2.65251	1.052	3.438
HINDUNILVR	1296	-5.65049	17.38213	.53873	1.73498	1.274	8.915
ICICIBANK	1296	-79.81160	23.03811	1.43248	3.26573	-11.231	297.431
INDUSINDBK	1296	-5.29451	17.30769	1.39278	2.64836	1.715	6.178
INFY	1296	-49.85190	13.01482	.72993	2.24324	-8.347	200.310
IOC	1296	-49.91437	16.99148	.62882	2.51895	-5.526	126.946
ITC	1296	-50.63939	11.12604	.62942	2.37509	-9.442	193.207
KOTAKBANK	1296	-47.40921	19.13843	1.26615	2.66333	-3.697	89.088
LT	1296	-50.29022	24.53488	1.18431	2.74159	-5.581	115.912
LUPIN	1296	-7.16120	10.79502	.62627	1.81482	.631	2.623
M&M	1296	-48.78342	23.98610	.95889	2.62217	-3.860	109.012
MARUTI	1296	-9.17098	10.61071	.87144	1.90518	.534	2.711

NTPC	1296	-11.74028	12.83096	.76136	1.79880	1.073	6.182
ONGC	1296	-6.09817	16.48527	.93910	1.97697	1.192	4.976
RELIANCE	1296	-6.28700	21.36925	.85202	1.98864	1.555	11.074
SBIN	1296	-6.82157	20.02665	.95339	2.28255	1.075	5.384
SUNPHARMA	1296	-11.64492	22.08146	.43731	2.01978	.814	13.128
TATAMOTORS	1296	-7.90040	13.59095	.95471	2.59265	.815	2.579
TATAPOWER	1296	-15.00000	16.16166	.71041	2.36397	.981	5.780
TATASTEEL	1296	-8.63073	17.00368	.99123	2.63899	.829	2.937
TCS	1296	-49.98072	15.49569	.64525	2.48336	-5.791	135.995
TECHM	1296	-11.47158	25.61202	.65093	2.55382	1.844	11.877
ULTRACEMCO	1296	-8.44973	14.64188	.78768	1.99819	.720	3.844
WIPRO	1296	-39.45417	11.33250	.57615	2.30930	-3.489	70.908
YESBANK	1296	-13.88983	25.24882	.98074	2.96676	1.342	10.595
Panel C: Bearish Period							
NIFTY	1179	-12.2029	0.0000	-1.0329	1.1024	-2.785	14.225
ACC	1179	-14.8339	7.0732	-0.8830	1.9071	-1.060	6.031
AMBUJACEM	1179	-11.6311	10.3563	-0.8756	2.0825	-.358	3.603
ASIANPAINT	1179	-90.0209	7.6603	-0.4388	3.1668	-19.208	543.892
AUROPHARMA	1179	-79.2112	12.5968	-0.9208	3.9111	-8.587	155.978
AXISBANK	1179	-80.0906	8.1341	-1.3719	3.2568	-12.198	289.611
BANKBARODA	1179	-11.5106	15.4013	-1.1105	2.3568	.217	4.790
BHARTIARTL	1179	-12.6738	7.2874	-0.8899	2.0499	-.353	2.320
BOSCHLTD	1179	-14.0886	17.6845	-0.3297	1.7591	1.296	18.144
BPCL	1179	-51.3096	17.8251	-0.7171	3.1443	-6.745	111.603
CIPLA	1179	-14.3252	7.6367	-0.5920	1.7528	-.701	6.379
DRREDDY	1179	-14.5609	10.6809	-0.4641	1.7985	-.783	7.330
EICHERMOT	1179	-15.4257	18.1366	-0.5202	2.4954	.225	8.407
GAIL	1179	-36.0462	7.2061	-0.7860	2.2400	-3.926	54.805
GRASIM	1179	-79.5441	8.1025	-0.8859	2.8521	-18.018	491.627
HCLTECH	1179	-51.1774	8.6601	-0.8731	2.7257	-5.819	99.225
HDFC	1179	-11.0199	6.0573	-1.1189	1.9482	-.788	2.825
HDFCBANK	1179	-11.0018	6.4068	-0.9463	1.5955	-1.105	4.342
HEROMOTOCO	1179	-9.8971	17.7677	-0.5603	1.8349	.525	10.053
HINDALCO	1179	-17.4452	8.1124	-1.4546	2.6659	-.637	2.680
HINDUNILVR	1179	-8.1183	8.4284	-0.4466	1.6667	-.020	3.263
ICICIBANK	1179	-19.8567	7.7056	-1.5349	2.2513	-1.262	7.359
INDUSINDBK	1179	-17.5089	12.4352	-1.1775	2.5835	-.522	5.013
INFY	1179	-51.1110	16.7851	-0.7969	2.4440	-7.945	159.691
IOC	1179	-51.0426	14.1683	-0.6318	2.6958	-5.636	106.272
ITC	1179	-9.3882	9.0013	-0.6108	1.7056	-.163	2.893
KOTAKBANK	1179	-50.3998	11.3286	-1.2373	2.8102	-5.178	82.183
LT	1179	-10.8944	9.0529	-1.2284	1.8854	-.415	2.940
LUPIN	1179	-80.0273	7.9894	-0.5045	3.0529	-15.101	391.013
M&M	1179	-15.6282	7.7797	-0.9615	2.1342	-.716	4.221
MARUTI	1179	-12.2773	7.2611	-0.7677	1.9381	-.467	3.299
NTPC	1179	-13.9632	7.3901	-0.7814	1.8500	-.849	4.890
ONGC	1179	-76.3886	8.1301	-1.0479	3.0850	-13.427	310.955
RELIANCE	1179	-51.5310	5.8582	-0.8841	2.4804	-7.847	149.013

SBIN	1179	-89.7921	11.2524	-1.0056	3.3963	-15.232	396.463
SUNPHARMA	1179	-80.0295	10.4600	-0.3917	3.3427	-14.208	311.273
TATAMOTORS	1179	-80.8668	18.8256	-0.9529	3.5722	-9.657	213.502
TATAPOWER	1179	-90.2190	23.2237	-0.7664	3.5369	-13.776	349.188
TATASTEEL	1179	-15.1194	12.7466	-1.0168	2.8621	-.562	3.413
TCS	1179	-9.9617	6.3689	-0.5935	1.9037	-.770	2.949
TECHM	1179	-75.4633	11.6309	-0.6932	3.3319	-9.907	215.880
ULTRACEMCO	1179	-9.0728	11.5240	-0.7312	1.9008	-.268	3.034
WIPRO	1179	-13.6138	6.8334	-0.5992	2.0107	-.991	3.903
YESBANK	1179	-20.1886	13.1095	-0.8010	2.9280	-.229	4.016

Source: Computations of the Researchers

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