

An Empirical Analysis of Herding Behaviour in Indian Stock Market

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ABSTRACT

This paper aim is to examine herding behaviour in Indian stock market with a sample of firms listed on National Stock Exchange of India during the year from 2003 – 2017. The study applies the method developed by the Chang, Cheng & Khorana (2000) to observe the herding behaviour. Also, this study tries to examine the herding behaviour of rising and declining movements for daily and weekly observations. Finally, to capture the global financial crisis effect on herding behaviour, the study time-frequency divided into three phases, i.e., before crisis, after crisis and during crisis, then examined the herding behaviour in Indian stock market. To check the unit root for the observations of the study, the research applied ADF statistics. The outcome of the research endorse the no indication of herding behaviour existed among the stocks of the Indian market, also investigated the herding behaviour before crisis, after crisis and during crisis, no evidence of herding behaviour detected in the Indian market.

Keywords: Herding behaviour, Cross-Sectional Absolute Deviation (CSAD), financial crisis, Rising market, declining market.

INTRODUCTION:

All over the world have seen financial markets are more volatile over the years. Traditionally, asset returns were measured based on the fundamentals, forecasting ability and market consensus which produced prevalent results and this information influences the performance of the asset in stock market. Due to this fact investor possible returns of stock and received returns differ, to avoid this problem and to improve the quality of investment decisions of investors, behavioural economists identify the importance of psychological biases on investment decision-making the process of the investor. Research has revealed that behaviour of the value of the share is inconsistent with the prediction of well-known rational models as anticipated returns are not steady over a period. Hence, there is need to develop studies and some models which can help the investor to make better strategies for investment.

Due to this inconsistency of models stock returns deviate more from the actual asset returns, to fill the gap Behavioural finance research provide models based on investor's behavioural anomalies, a variety of studies recognised various behavioural bias and anomalies in the stock market which are influencing investors decision-making process.

Different research studies provided evidence that behavioural biases and anomalies affect the investment strategy of investors in financial markets. Behavioural biases and anomalies contribute more when making investment decision-making process of investors. Among all of the behavioural biases, herding behaviour is one of the most common behaviours found in the investors while understanding their psychology. Herding behaviour can exist among the investor is when investor suppressing his information and follow the market consensus over the time or follow the other perspective instead of his self-recommendations,

According to (Grinblatt et. al., 1995) and (Nofsinger & Sias, 1999)proposed the more broad meaning of herding behaviour, as a group of market participants conduct the trade similarly way for a given time. This relationship

may observe if factors and common information independently influence investors. Similarly, (Abhijit V. Banerjee, 1992)also defined that herding occurs as individuals do what others do, even when their concealed information suggests they ought to obtain a different decision.

Also, herding behaviour could be explaining two different ways, i.e., rational and irrational views. In rational view, herding can be defined as a tendency of investors irrationally overlook their analysis and information and follow the market consent, even if the market participant has prevailed information in their hand. On another side, Irrational herding mainly happens due to protect reputational concerns of an investor. Similar to this scenario, the investor usually pays no attention to their study of available information and starts to follow the decisions of other investors by assuming that, decisions made by other investors are more consistent and they had accessed the information from better sources. The realities of herding behaviour in financial markets challenge the validation of Efficient Market Hypothesis (EMH) and Capital Asset Pricing Model.

REVIEW OF LITERATURE:

Following are selected research studies on herding behaviour. The studies have chosen either as they have contributed to considerable research progress, or due to relevancy for comparison with this study

The fundamental methods of herding behaviour were not examined directly in the literature of herding behaviour; In opposite to the traditional models, empirical researchers found the methods to detect the herding behaviour by clustering of investor decisions in a particular market or among the different group of market participants. Firstly, (Lakonishok, Shleifer, & Vishny, 1992)proposed a quantitative approach to examine whether herding behaviour exhibited between pension fund managers. The study analysed the trading convergence between market participant in concerning to the purchase and sale of asset at the same time. As the research result was found, there was no evidence of herding behaviour between pension fund managers. The method developed by (Lakonishok et al., 1992) is extensively applied in other studies to examine the herding behaviour between domestic and foreign investors. In Indian Stock market (Sehgal & Tripathi, 2009),(Agarwal, Chiu, Liu, & Rhee, 2011), (Patro, 2012)and Lakshman et al. (2013) were used the method proposed by LSV(1992) to detect the herding behaviour among FII's and Mutual fund investors. The results of the (Sehgal & Tripathi, 2009)study found that herding was not detected among the FII's and herding behaviour exhibited among the mutual fund investors during different sides of buy and sell, in the study of (Lakshman, Basu, & Vaidyanathan, 2013) presented evidence that herding behaviour exhibited among the mutual fund investor.

To examine the herding behaviour, (Christie & Huang, 1995)proposed a new method called Cross Sectional Standard Deviation(cssd) as a measure of dispersion to investigate herding behaviour in an total market by observing the how individual stock returns move towards the return of the market in large price swings. The study was conducted under the rationale that, under the market stress, individual investor suppresses their beliefs and takes investment decision according to the market consensus. The study applied return dispersion method on daily and monthly observations of New York stock exchange and Amex firms during the year from 1962 to 1988. The study revealed that dispersion increases significantly during the period of large price movements and the results of the study are consistency with the asset pricing models. Hence, this approach is failed to detect the herding behaviour. Later (Chang, Cheng, & Khorana, 2000)developed a new method based on the Cross-Sectional Return Dispersion(CSAD) which an extended version of (Christie & Huang, 1995). The study examined the herding behaviour in some global stock markets and found that the results of the herding behaviour in the global markets are mixed. In developed markets, no evidence of herding behaviour was found. However, found evidence of herding behaviour in the developing stock markets like South Korea and Taiwan. The study also noted that the proposed methodology of (Christie & Huang, 1995) was more stringent, as it requires extreme return data to examine the herding behaviour. With concerning the methodology proposed by (Chang, Cheng, & Khorana, 2000), in 2004 (Hwang et al)developed a new method to analyse the herding behaviour in the American and South Korean markets. The proposed method was price-based, and it measures the herding behaviour with the cross-sectional dispersion of the factor sensitivity of the market. (Hwang et al., 2005) pointed out that when investors behaviorally biased and the same time their views on the risk-relationship of the stocks also different and if an investor does really herding with market consent, then it is possible that stock returns imitate the way of the market, hence beta of the stocks will deviate from equilibrium point.

(Rıza Demirel & Kutun, 2006)investigated the Chinese market by considering individual stock and sector-specific observations. The study attempted to investigate the herding at sector level in both Shanghai and Shenzhen stock exchange in china. The results noticed that no evidence of herding was found at sector level. Also, the researchers suggest that investors in the Chinese stock market formulate investment decision rationally. Also, study conducted for both Chinese stock markets and provided the similar results focusing on possession of

similar kind of information by traders of both exchanges. Later (Chiang & Zheng, 2010) examined the herding behaviour in the global market during the period from 1988 to 2009. CSSD and CSAD methodology was used to examine the same. Their research shows that herding behaviour is presented in advanced stock markets except for the US. Also, it was presented in both rising and declining directions of markets, and it was not found in US and Latin American markets. The study detected the herding behaviour is more in Asian markets during the rising markets than declining market trend. During the financial crisis Herding behaviour was detected in the US and Latin American stock markets (Chiang, 2011) investigated investor herding behaviour for ten Pacific-Basin markets. It includes five developed markets and six emerging Asian markets, the findings of the study states that evidence of herding behaviour in the Pacific Basin stock markets and it was noted from the study that herding behaviour is positively related with the returns of the stock and negatively with the market volatility. Kalman filter based model has been used to estimate dynamic herding behaviour which shows that herding behaviour in all markets is time-varying except US market. With methodology developed by (Christie & Huang, 1995) and (Chang, Cheng & Khorana, 2000) (Caporale, Economou, Philippas, & London, 2008) examined the existence of herding behaviour in the Athens stock market during the time from 1998 to 2007. The study supports the subsistence of herding behaviour in the Athens stock exchange. Also, researchers noticed that, the presence of herding is much weaker during the weekly and monthly intervals and researchers was suggested that in Athens stock market herding behaviour among the investors is a short phenomenon. Also, it was stronger during rising markets. The study was also provided positive and significant herding behaviour during and after the market crisis of 1999 in Athens. As the same methodology used in (Riza Demirel, Kutan, & Chen, 2010) study, to investigate the presence of herding behaviour in Taiwan stock market during the time from January 1995–December 2006 by employing returns of 689 companies segregated into 18 different industries. CSSD, CSAD and HS models are used in the study. The results of the study provided that no evidence of herding behaviour is detected in the sample and herding behaviour was found in the electronics industry.

The non-linear model developed by (Chang, Cheng & Khorana, 2000) applied in the study to detect the herding behaviour. The study indicates significant support for herding behaviour in all industries. Overall the results of the study provided the significant evidence of herding behaviour among the investors in Taiwan stock market. Concerning Indian stock market (Poshakwale & Mandal, 2014) investigated the herding effect in Indian stock market. It has been tested using CSSD and CSAD methodology. The resulting state that herding behaviour does not exist in Indian markets. It can infer from the result that Indian investors are aware and better informed. However, it exists in bull phase when the presence of herding tested for extreme market movements. From the study, it can found that Herding behaviour exhibited when the market is rising trend, but it does not exhibit when the market declining trend. It may be because investors pursue the market crowd when the market is in increasing state rather than following when a market is in decreasing state. (Garg & Gulati, 2013) investigated the existence of herding behaviour in Indian Stock Market by considering daily, weekly as well as monthly data of the securities listed in CNX 500 during the period 2000-2013. (Christie & Huang, 1995), and (Chang et al., 2000) measures were employed in the study. The result provides that Indian stock market not follow the herding behaviour. The existence of herd behaviour was also investigated during increasing market state, decreasing market state, high volume state, low volume state, pre-crisis, during the crisis and post-crisis. The results nullify the presence of herding behaviour in Indian stock market during the period. It seems that Investors' behaviour is entirely rational in Indian Stock Market. In another study (Poshakwale & Mandal, 2014) attempted to investigate the existence of herding behaviour in India during the time-period 1997-2012 by applying Kalman filter model. The findings of the research showed a substantial incidence of herding behaviour in Indian stock market. The result also proves that herding behaviour is exhibited in the Indian market during rising market trend and declining market trend and found that the presence of herding is more during declining trend than the rising trend.

Cakan & Balagoyzyan, (2015) examined the investor herding behaviour among the 16 Turkish banks listed on TSE, study found that Investor herding characterizes banking sector of this stock exchange, also study explored the asymmetries with respect to the trend of market and found herding behaviour among the investors was exhibited when the market is rising pattern.

Hilliard & Zhang (2015) examined the herding behaviour in Shanghai and Shenzhen stock markets of China. The study divides the study period into two frames, i.e. 2002-2005 and 2007 to 2012, from the results of the study showed herding behaviour exhibited overall market also herding behaviour found more in during the earlier period and small in during 2007 to 2012 and herding behaviour started to decrease on the Shanghai stock exchange after 2006. Finally, the study concludes with evidence that herding behaviour began to decline as Chinese stock market become matures and informational asymmetries decrease this due to the regulations

adopted by the Chinese securities regulatory commission in 2006 and study found that these regulations had a positive impact on information flows in the Chinese market.

From the available resources, it is found that herding behaviour is less explored in the developing countries; very few studies have been conducted so far in emerging countries particularly in India. The studies were not reaching any conclusive results also. Moreover, very few studies were found to examine the herding behaviour of Indian companies listed in the Indian stock market (NSE) over the fifteen year period.

OBJECTIVE OF THE STUDY:

The objective of the study is to examine the herding behaviour in the Indian stock market in the market wide sense, which is the standard behaviour of all investors in the market for the same portfolio.

The Hypothesis of the Study:

H1: Herding behaviour exists in Indian stock market from 2003 to 2017.

METHODOLOGY & DATA DESCRIPTION:

This section explains the methodology developed by the (CCK, 2000) to detect the existence of herding behaviour of stocks listed in the Indian stock market (NSE) from 2003 to 2017. According to (Chang et al., 2000) provided evidence of herding behaviour more likely present for the period of relatively significant price movements. The study proposed the following model to detect the herding.

$$CSAD_t = \alpha + \beta_1 |R_{mt}| + \beta_2 R_{mt}^2 + e_t \quad (1)$$

Where $CSAD_t$ indicates the return dispersion.

$$CSAD_t = \frac{1}{N} \sum_{i=1}^N |R_{it} - R_{mt}| \quad (2)$$

N is the number of stocks in the portfolio, R_{it} is the return of stock I at time t and R_{mt} is the equally weighted average of all stock returns in the portfolio at time t . In equation 1; $|R_{mt}|$ represents the absolute value of return of the market, β_1 is the coefficient of $|R_{mt}|$, $R_{m,t}^2$ is the square of $|R_{mt}|$, β_2 is the coefficient of $R_{m,t}^2$, β_2 is the coefficient of herding behaviour, if it comes as significantly negative it is the evidence of the herding behaviour presented in the stock market.

To capture the asymmetric effects of the market, the following equation has been applied to examine the presence of herding behaviour during rising and declining market situations. Extreme market movements may lead to herding behaviour as investors may pursue the actions of others when market is either increasing or decreasing state.

$$CSAD_t^{up} = \alpha + \beta_1^{up} |R_{mt}^{up}| + \beta_2^{up} R_{mt}^{up,2} + e_t \quad R_{mt} > 0 \quad (3)$$

$$CSAD_t^{down} = \alpha + \beta_1^{down} |R_{mt}^{down}| + \beta_2^{down} R_{mt}^{down,2} + e_t \quad R_{mt} \leq 0 \quad (4)$$

Where, in equation 3 $|R_{mt}^{up}|$ represents the absolute market return in the rising state. β_1^{up} is the coefficient of $|R_{mt}^{up}|$, R_{mt}^2 is the square of R_{mt} , β_2^{up} is the coefficient of R_{mt}^2 also it is the coefficient for herding behaviour if it comes to the negative value and significant. Equation 4 $|R_{mt}^{down}|$ represents the absolute market return in the declining state. β_1^{down} is the coefficient of $|R_{mt}^{down}|$, R_{mt}^2 is the square of R_{mt} , β_2^{down} is the coefficient of R_{mt}^2 also it is the coefficient for herding behaviour if it comes to the negative value and significant. The returns of the stocks are rising when it R_m value is greater than zero (and it is declining when R_m value is equal and less than zero).

Augmented Dickey-Fuller statistics applied to validate the stationarity of the various data series. Tests like Jarque-Bera, Durbin-Watson test, were also applied to check the normality, the autocorrelation of the error terms.

Data Description:

For the present study data collected from the secondary sources. CMIE PROWESS database was used to collect the data. Daily and weekly observations of stocks listed in the NSE from Jan 1st, 2003 to Dec 31, 2017, were collected for the present study. The study has 3680 daily and 780 weekly observations. The stock return R_{it} is calculated by using the log formula $\ln(P_t/P_{t-1}) * 100$. Since the study was conducted for an extended period to capture financial crisis effects on herding behaviour, the study time-frequency divided into three phases, i.e., a pre-financial crisis during the financial crisis and post-financial crisis and then examined the herding behaviour in Indian stock market

ANALYSIS AND DISCUSSION:

Table 1 provides the summary statistics for Daily market return, return dispersion during the 2003 – 2017 for National Stock exchange of India. Mean market return of entire sample period is 0.0004 with a maximum of 0.2905 and minimum of -0.2563. The stock market return is very much unstable in Indian stock market with SD(Standard deviation) of 0.0159. This high SD can be due to abnormal variations in the market caused by the uncertainties in the market. The mean value of CSAD is 0.0182 with a maximum of 1.1169 and Minimum of 0.0087. The study is divided into three phases as before crisis, after crisis and during crisis, at before and during the crisis period the standard deviation is more, i.e., 0.0178 and 0.0176 than the post-crisis of 0.0115 means that during the crisis and precede the crisis period Indian market is high volatility nature.

Skewness and Kurtosis measure applies to understand the underlying statistical distribution of return of the stock in Indian stock market. Skewness is assessing the scale of asymmetry of the probability distribution; when a distribution of returns is equal about the mean, like the normal distribution, then skewness is zero. Kurtosis measures the uniformity of the distribution of data series. The average values of under Kurtosis is three if the kurtosis is greater than three, the distribution of the series is normal and it is consists with leptokurtic position; and if the series distribution is platykurtic nature and relative to the normal when the value of the normal distribution is less than three. From the descriptive statistics of Table 1 provides results of the skewness be 40.5640 and kurtosis is 1701.9409 for CSAD and Skewness is 0.3278 and Kurtosis is 64.1341 for the market return. The presented and skewness values are high and significantly differ from the zero and three; hence the series indicates market return and CSAD are the leptokurtic positions.

The results of the Jarque-Bera (JB) test is very high for both CSAD and RM, indicating that stock returns differ significantly from the normal distribution. JB statistics is a statistical measure; to test the return of the series is follow the assumptions of normally distribution. Also it measures the deviation of the skewness and kurtosis of the data series from the normal distribution. Since skewness and kurtosis distribution is leptokurtic position, hence the subsequent test of OLS has to consider on account of breach of the assumptions of normal distribution. To confirm the stationarity of the data, ADF test statistic is applied. The significant t statistics of CSAD is -18.020 (000), and RM is -54.111(000) confirm that series is stationary at level with intercept, thereby rejects the null hypothesis, i.e., non-stationary series.

Table 1: Summary Statistics for Daily Observations

Observations	Whole period		Before crisis		During		After Crisis	
	csad	Rm	csad	Rm	csad	Rm	csad	Rm
Mean	0.0182	0.0004	0.0206	0.0011	0.0174	0.00044	0.0162	0.0005
Min	0.0087	-0.2563	0.0115	-0.2563	0.0087	-0.1162	0.0087	-0.0993
Max	1.1169	0.2905	1.1169	0.2195	0.1516	0.2905	0.0410	0.0489
SD	0.0261	0.0159	0.0438	0.01785	0.0066	0.0176	0.0030	0.0115
Skewness	40.5640	0.3278	24.6581	-1.7607	8.2882	3.0680	1.6648	-1.2285
Kurtosis	1701.9409	64.1341	614.7704	57.3617	147.0540	68.4062	9.8012	9.0483
Jarque-bera	4.45e+08	572508.3	19729407	155427.9	1034670	212365.0	2955.12	2196.698
ADF	-18.020 ***	-54.113 ***	-17.6013 ***	-16.2328 ***	-5.6325 ***	-16.4140 ***	- 11.7605 ***	-28.7995 ***

*** At one per cent significant level

- Where ADF refers to the Augmented Dickey-Fuller to determine whether data is stationary or not

Table 2 provides the descriptive statistics for weekly market return, CSAD during the 2003 – 2017 for National Stock exchange of India. Mean market return of entire sample period is 0.0020 with a maximum of 0.2128 and minimum of -0.2139. The stock market return is highly volatile in Indian stock market with a SD of 0.0362. This high SD can be due to abnormal variations in the market caused by the uncertainties in the market. The mean value of CSAD is 0.0403 with a maximum of 0.0898and Minimum of 0.0000. The values of standard deviation are 0.0362 for the whole data, 0.0357 for the pre-crisis, 0.0423 for during crisis and 0.0292 for post-crisis. It indicates that volatility intensity more prevails in the weekly observations than daily observations.

In weekly data series also the Jarque-Bera test is very high for both CSAD and RM, indicating that stock returns differ significantly from the normal distribution. Results from the Table 2 descriptive statistics, the skewness is 1.3030 and kurtosis is 6.4766 for CSAD and skewness is -0.5278 and kurtosis is 7.0737 for RM, values are high

and significantly differ from the zero and three, means the series indicates market return (Rm) and CSAD are the leptokurtic positions. To check the stationarity of the various series, Augmented Dickey-Fuller test is applied. The significant t statistics of CSAD is -7.6743 (000), and RM is -15.7860(000) confirm that series is stationary at level with intercept, hence rejects the null hypothesis, i.e., non-stationary series.

Table 2: Summary Statistics for Weekly Observations

Observations	Whole Data		Before-crisis		During		After-Crisis	
	csad	Rm	csad	Rm	csad	Rm	csad	Rm
Mean	0.0403	0.0020	0.0442	0.0056	0.0391	-0.0021	0.0376	0.0027
Min	0.0000	-0.2139	0.0276	-0.1484	0.0000	-0.2139	0.0247	-0.1054
Max	0.0898	0.2128	0.0738	0.0947	0.0898	0.2128	0.0898	0.1479
SD	0.0097	0.0362	0.0089	0.0357	0.0112	0.0423	0.0072	0.0292
Skewness	1.3030	-0.5278	0.8485	-0.8305	1.4286	-0.3799	2.1963	-0.0735
Kurtosis	6.4766	7.0737	3.6907	5.0813	6.8490	7.4399	13.7480	6.0837
Jarque-bera	616.7824	578.5281	36.3725	76.8240	250.8580	221.5062	1471.75	104.0501
ADF	-7.6743 ***	-15.7860 ***	-4.0567 ***	-12.9627 ***	-4.8819 ***	-8.1137 ***	-9.9898 ***	-14.6741 ***

*** Significant level at one percent

- Where ADF refers to the Augmented Dickey-Fuller to determine whether data is stationary or not

Fig. 1: The relationship between Return dispersion [CSAD] and Equally Weighted Market Returns for Daily observations (N=3168) of Indian Stock Exchange (2003-2017)

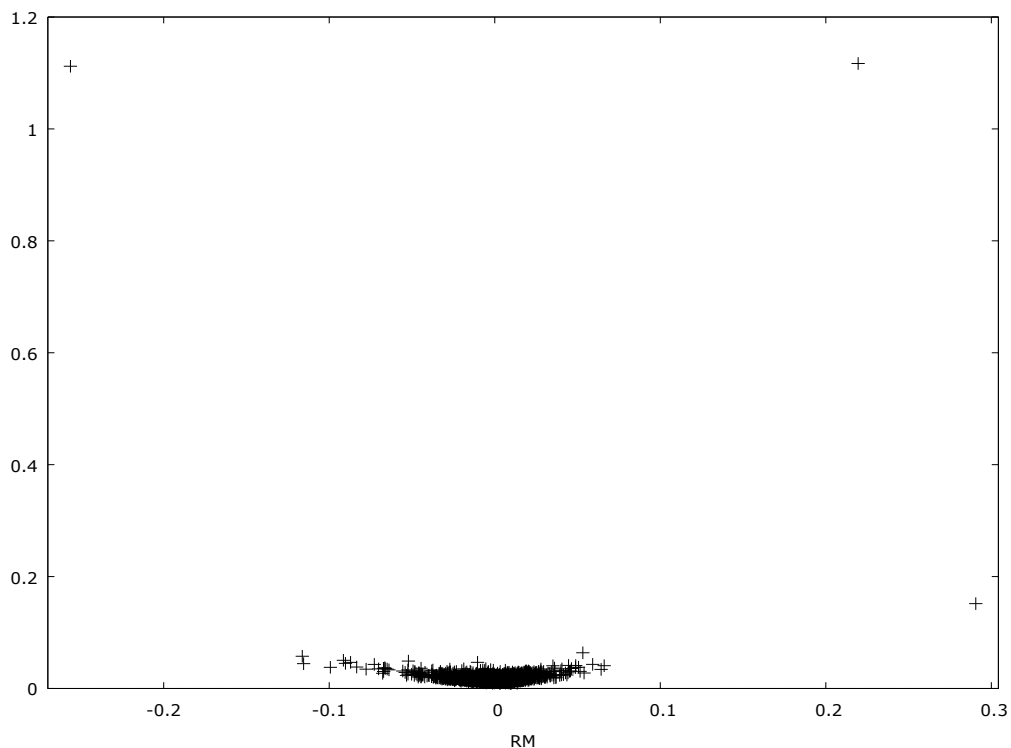
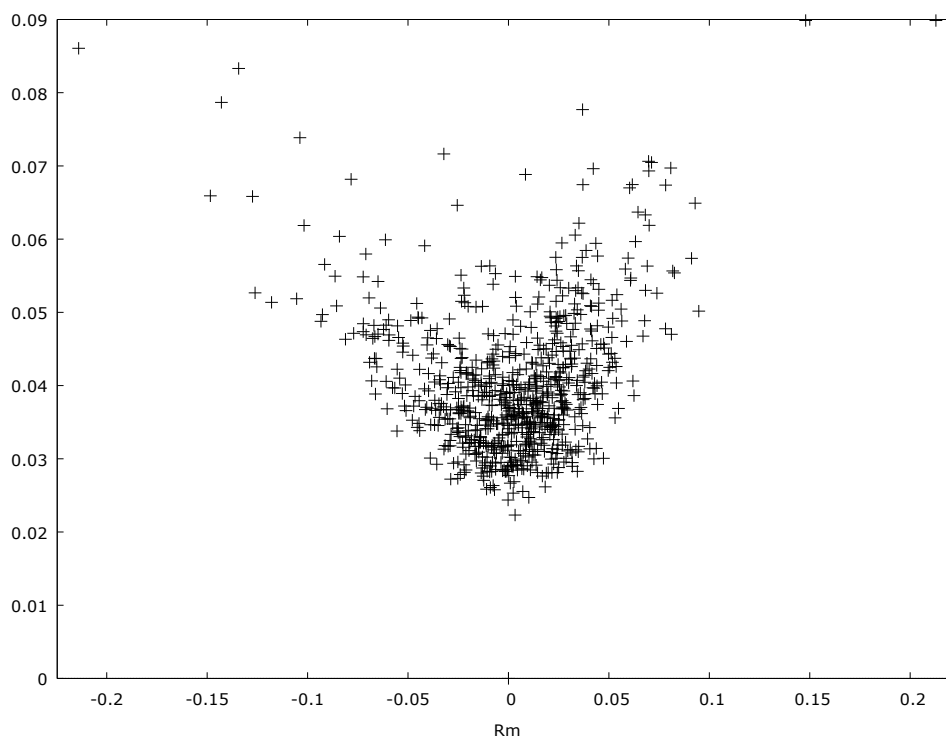


Fig. 1, plot the CSAD measure for each day and the corresponding equally-weighted market return over the period from January 2003 to December 2017. The CSAD-market return relationship is linearly positive.

Fig.1: The relationship between Return dispersion and Equally Weighted Market Returns for weekly observations (N=768) of Indian Stock Exchange (2003-2017)



In Table 3. The results of the CCK (2000)'s linearity model presents the results of the aggregate market level and different phases of the market during 2003-2007. The Linearity Model covering all days indicates no evidence of herd behaviour over the entire time frame. The β_2 -coefficient [$\beta_2=6.7867$] is positive, and the t-value is significant. Also, the study examines the herding behaviour when the market is rising trend, and the market is declining trend. The assessment is conducted based on the daily level data and coefficients [$\beta_{UP} = 6.4119$ and $\beta_{Down}=15.4209$] of various market conditions indicates investors do not follow the herding behaviour at both directions, the result of the raising and declining market breakdown reveals asymmetry as they present evidence of herding behaviour not found both market conditions. There is a definite and linear relationship between market return and equity return dispersion in all direction of the market for the daily sample. It may be because individual shares have different reactions to the market return which reflect different values of investors in the rational market. Durbin Watson test statistic validates the absence of autocorrelation; statistics of residual terms indicates that the series is free from autocorrelation.

The study segregated the time frame into three periods in which financial crisis analysed [Pre-Crisis 2003-2007, During Crisis 2008-2012 and After Crisis 2013-2017] Table 3 provides the results for the daily sample. The estimated coefficient (β_2) is found to be insignificant, suggesting that no significant evidence found to support the decrease of return dispersion during the financial crisis. The result indicates that herding behaviour is not found among the market participant during the financial crisis and these phenomena exist in both phases. These findings support the assumptions of traditional finance theories which can curb the dispersion increases during the period of market pressure since the sensitivity of an individual stock to market movement is different. The study also examined the herding behaviour when the market is rising, and the market is declining trend during the financial crisis, the coefficients of regression results showed no evidence of herding is presented in the raising and declining market during the pre, during and post-financial crisis.

In Table 4. The results of the CCK (2000)'s linearity model presents the results of weekly observations for aggregate and different phases of the market during 2003-2007. The Linearity Model covering all days indicates herding behaviour is not presented over entire time frame except declining market for the whole period. The coefficient [$\beta_{Down}= -0.0526$] is negative and statistically significant, it means herding behaviour found during down market trend for weekly sample over the long period. Also, Table 4 provides the weekly regression results to examine the herding behaviour in three different time phases, i.e. before crisis, after crisis and during crisis and different market direction (Rising and Declining), coefficients of regression results indicate the herding behaviour is absence for weekly observations except rising trend in during crisis period [$\beta_{up}=-0.0263$]. Also, this finding supports the assumptions of rational asset pricing theory which curb that variation of stock return

increases during the period of market pressure as the sensitivity of an individual stock to market movement is different. Durbin Watson test statistic validates the absence of autocorrelation; residual term indicates that the series is free from autocorrelation.

Table 3: Regression outcome for return dispersion and return of the market for Aggregate Market level and Pre, during and Post Crisis period [2003-2017]

$$CSAD_t = \alpha + \beta_1|R_{mt}| + \beta_2R_{mt}^2 + e_t$$

$$CSAD_t^{up} = \alpha + \beta_1^{up}|R_{mt}^{up}| + \beta_2^{up}R_{mt}^{up2} + e_t \quad R_{mt} \geq 0$$

$$CSAD_t^{down} = \alpha + \beta_1^{down}|R_{mt}^{down}| + \beta_2^{down}R_{mt}^{down2} + e_t \quad R_{mt} < 0$$

Variable	Whole Period			Before (2003-2017)			During(2008-2012)			After (2013-2017)		
	All	Rising	Declining	All	Rising	Declining	All	Rising	Declining	All	Rising	Declining
α	4.54E-07	0.0125	0.0208	0.0222	0.0026	0.0232	0.0162	0.0153	0.0164	0.0152	0.0157	0.0148
β_1	-0.0546	0.5012	-0.7411	-0.7524	-0.2633	-0.9291	0.0594	0.1402	0.0465	0.0965	0.0225	0.1147
β_2	6.7867***	4.8461***	18.2425***	21.2145***	23.0125***	19.6400***	1.3404***	1.0828***	2.0028***	1.3539***	5.0039***	1.2796***
Adj.R ²	0.3955	0.9796	0.9213	0.9393	0.9847	0.9661	0.8410	0.8551	0.7259	0.5945	0.5451	0.5477
D.W	2.3015	1.9825	1.9994	1.951	1.951	1.6345	2.0616	2.0859	2.0484	2.0400	2.0472	2.0453
R ²	0.3958	0.3742	0.9215	0.9394	0.9394	0.9662	0.8415	0.8561	0.7279	0.5958	0.5476	0.5513

*** Significant level at one percent

Table 4: Regression outcome for return dispersion and return of the market for weekly observation and Pre, during and Post Crisis [2003-2017]

$$CSAD_t = \alpha + \beta_1|R_{mt}| + \beta_2R_{mt}^2 + e_t$$

$$CSAD_t^{up} = \alpha + \beta_1^{up}|R_{mt}^{up}| + \beta_2^{up}R_{mt}^{up2} + e_t \quad R_{mt} \geq 0$$

$$CSAD_t^{down} = \alpha + \beta_1^{down}|R_{mt}^{down}| + \beta_2^{down}R_{mt}^{down2} + e_t \quad R_{mt} < 0$$

Variable	Whole Period			Before(2003-2017)			During(2008-2012)			After(2013-2017)		
	All	Rising	Declining	All	Rising	Declining	All	Rising	Declining	All	Rising	Declining
α	0.0164	0.0362	0.0343	0.0396	0.0424	0.039	0.0333	0.0327	0.0314	0.0348	0.0346	0.0348
β_1	-0.0312	0.1737	0.1705	0.1701	0.0696	0.0599	0.1741	0.2137	0.2342	0.0802	0.0747	0.0799
β_2	7.8685***	0.2855***	-0.0526***	-0.0531 No sig	1.4053***	0.9533***	0.0680 No sig	-0.0263***	-0.1145 No sig	1.2953***	1.9392***	1.0236***
Adj.R ²	0.5825	0.5723	0.5691	0.4424	0.4677	0.3291	0.7000	0.6336	0.6884	0.5374	0.4783	0.4144
D.W	1.8973	2.0656	2.0455	2.0607	2.0200	1.5208	2.0797	2.0286	2.0004	1.9947	1.5879	2.0004
R ²	0.5828	0.5761	0.5742	0.4511	0.4814	0.3425	0.7046	0.6451	0.6981	0.5445	0.4851	0.4370

*** Significant level at one percent

CONCLUSION:

The presented study purpose is to detect the herding behaviour in Indian Stock Market during 2003-2017. The study applied CSAD methodology developed by (Chang, Cheng & Khorana, 2000). The results of the study provided evidence that herding behaviour is not exhibited in Indian Stock Market for a long period and these results validate the presence of rational asset pricing models. Also, the study found Herding behaviour is absence during the pre-financial crisis period, crisis period and post-financial crisis period. Herding behaviour is also not present during the market is in rising and declining state but the volatility of the stock high. From the results, the study finally concludes that stock prices of the Indian stock market pursue the assumptions of the standard finance theories like EMH and Capital market pricing models.

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