

An Examination of Herding Behavior in an Emerging Economy -A Study of Indian Stock Market

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Abstract

The present study makes an attempt to examine the presence of herding in Indian stock market amongst the investors, using the daily closing price of NSE's benchmark index Nifty and thirty six companies forming part of it for a period commencing from January 1, 2008 to December 31, 2015. It explores the likely consequences of different levels of herding in Indian stock market. The study employs the methodology suggested by Chang et al. (2000) of cross sectional absolute deviation (CSAD) to test herd formation. The results of the study do not provide any evidence of herding in the Indian security market during the chosen period. The study further denies the evidence of herding during bull and bear phases of markets and also during the extreme market conditions. These results indicate that Indian security market investors tend to take investment decisions of their own and do not indulge in any herd tendency and imitate the investment behavior of other fellow investors.

Index terms— herd behavior, indian stock market, investors, emerging market, cross sectional absolute deviation.

1 Introduction

he existing asset pricing models that have evolved over the past decade assume investors are utility maximizing and rational and evaluate the investments based on the trade-off between risk and reward. The traditional finance framework ignores that investors make systematic errors in the way they think and create distortions in the process. The underlying assumption of investor rationality is a flawed one and that alone has led to the capital markets across the globe witnessing major booms and busts. Behavior finance is a paradigm that has emerged in response to investor irrationality. The present paper examines one such concept of behavior finance on investor herding in Indian stock market. Herding is characterized by mimicking the actions of other investors, which constitute the market consensus (Bikhchandani and Sharma, 2000). It prevails in the market because investors are concerned with what others think of their decisions (Scharfstein and Stein, 1990). It is an investment practice where investors imitate the actions of others and follow the "group" rather than their own information and take investment actions that are not in congruence with their information. Herding can be spurious when its outcome is efficient, i.e. when all investors take the same action because of the same information present with them. On the other hand, it can be intentional where an investor just follows the group without any thought to his information which may tell him to act otherwise (Banerjee, 1992). According to Devenow and Welch (1991) herding requires coordination in order to follow some signal or to observe the action of others. Avery and Zemsky (1998) define herding as the behavior which occurs when agents imitate the prior actions (buying or selling) of others. Hirshleifer and Teoh (2003) also define herding as any behavior similarity or dissimilarity brought about by the direct or indirect interaction of individuals. There are various reasons why herding prevails with the most obvious one being the pressure of social conformity (West, 1988). Also the group knows something that an individual might be missing. Herding in stock market make the prices move away from their fundamental value besides increasing volatility in their returns (Tan et al., 2008). It further has the tendency to weaken the financial markets which may make the entire financial system look fragile.

The study provides a thorough analysis of herd behavior in Indian stock market by examining the presence of herding during bear and bull phases and extreme stress period both in benchmark index and its ingredient companies for the period under reference. The findings of our study may be extremely useful in gaining an insight into the functioning of the Indian stock market for both academicians as well as policy makers. An understanding of the herd phenomenon will help the investors in making apt valuation of the stocks and correct forecasting of their future movements.

The rest of the paper is divided into 4 sections. The second section provides a brief review of the previous studies, followed by the objectives of the study. The next section is the methodology and interpretation of results. The paper concludes followed by references.

2 II.

3 Review of Literature

The existing literature on herd behavior suggests that the pattern is not uniform across financial markets of the world. The results of the studies on the topic are quite contrasting on the basis of country and time. One school of analysis observes that markets exhibit herding pattern although with varying intensities across different phases and market conditions (Chang et al, 2000; ??eng, 2010, Lindhe, 2012;Prosad et al, 2012). In contrast to this, the second group opines that no significant herding exists in the financial markets (Demirer and Kutun, 2010;Garg and Jindal, 2014). This section is divided into two parts; one which enumerates the presence of herding and the other which examines for the absence of herding.

4 a) Studies on presence of herding

A large number of empirical studies have found evidence of herding behaviour in different markets across the globe among market participants. The studies of Oslen (1996); Cote and Sanders (1997) confirm the presence of herding in the forecast by analysts in their respective studies. The mutual fund houses also exhibit herding (Wermers, 1999). Wermers (1999) concludes higher levels of herding in small stocks and growth stocks using the trading activity of mutual funds from 1975 to 1994. Chang et al. (2000) examine the markets of US, Hong Kong, Japan, South Korea and Taiwan for herding and find that South Korea and Taiwan exhibit significant herding while Japan exhibits partial herding and U.S. and Hong Kong stock markets do not show any evidence of herd pattern. Bikhchandani and Sharma (2000) examine the causes and effects of herding and the empirical measures used in the studies in the past. The authors conclude that more research needs to be done for developing markets as there is greater degree of information asymmetry and momentum strategies could be more profitable. Chiang and Zheng (2010) in their study on a panel of countries support the existence of herding in all countries covered in the study, especially in Asian markets during bull phases, except in U.S. and Latin America. My and Truong (2011) observe the Vietnamese stock market and conclude that herding exists with respect to different market periods. Lao and Singh (2010) state that herding is present in Indian and Chinese markets by using CSAD approach of Chang et al. (2000). Their study says that the intensity of herding increases during extreme market conditions in both the markets. Herding is reported to be greater for Chinese market during bear phase and high trading volume while it is more prevalent during bull phase in India. Lindhe (2012) examines herding in Nordic countries of Finland, Sweden, Norway and Denmark by using the model of Chiang and Zheng (2010). The study concludes that that Finland exhibits significant local market wide herding while all countries herd around European market in addition to each other. Khan et al. (2011) analyze the presence of herding in the stock markets of Great Britain, France, Germany and Italy with the help of model proposed by Hwang and Salmon (2001, 2004). The study provides evidence of herding behaviour in all the markets under consideration forming part of the study. Yao et al. (2013) use the CSSD methodology to examine the presence of herding in Chinese stock market in both A and B sectors. The results of their study provide the evidence in favor of herding during the period from 1999 to 2008 only for B sector and it has also been observed that herding is more prominent during periods of market decline. ??hen Ramadan (2015) in his study on Amman stock exchange concludes that investors prefer to emulate the stock market return as the deviation between stock return and market return and the deviation decreases and investors follow the herding pattern.

Even though the literature on herding behavior is extensive, less research is available for Indian markets. Some of the prominent studies on India have also been included in the review to comment on the presence of herding in Indian stock market under different periods and phases of stock market in the country. Lao & Singh (2010) examine herding patterns in Indian and Chinese stock markets. The study reports that herding behavior is more during extreme market conditions in both the markets but the pattern is dissimilar. Prosad et al. (2012) in their study on Indian stock market find that herding is present in Indian stock market during the bull phase. Poshakwale and Mandal (2014) examine the herd behavior on Nifty from 1997-2012 using Kalman filter test and conclude that investors in Indian market exhibit herding behavior in both bull and bear market, however it rises more in bear phase.

5 b) Studies on absence of herding

In contrast to the above studies, there have been many researchers who are of the view that significant herding is absent across the financial markets. Demirer and Kutan (2010) investigate the presence of herd behavior in China by using both individual firm and sector-level data. The authors find that equity return dispersions are higher during large changes in index and herding does not exist in Chinese markets. Lakonishok et al. (1992) in one of the pioneer study on herding in Indian context deny the presence of herding amongst pension fund managers in Indian stock market. The data set used in their study comprises of quarterly portfolio holdings of 769 all-equity pension funds from year 1985 to 1989. Garg and Jindal (2014) study the Indian equity markets from 2000 to 2012 using the methodology suggested by Christie and Huang (1995) and Chang et al. (2000) and find no evidence of herding pattern and conclude that rational asset pricing models are applicable in Indian context.

6 III.

Objectives of the Study 1. To examine the existence of herding behavior in Indian equity market. 2. To understand and analyze the presence of herding in bear and bull market. 3. To interpret the occurrence of herding in extreme market scenario defined as the upper and lower end tails of the return distribution.

IV.

7 Data & Methodology a) Data Description

To accomplish the above objectives, the data for daily values of CNX Nifty Index and thirty six companies that form a part of Nifty Index over a period from January 1, 2008 to December 31, 2015 has been collected from Prowess, Centre for Monitoring Indian Economy. The study employs Nifty index as it is the benchmark index of the country and also records the highest stock turnover. The data consists of a total of 1982 observations and is adjusted for any bonus issues or stock splits during the period for correct analysis.

8 b) Methodology

The present study makes use of the Christie and Huang (1995) model of cross sectional standard deviation (CSSD) to understand, analyze and interpret the concept of herding. According to this model, the dispersion between the market return and individual stock return decreases as the investors ignore their individual information and rely on the "crowd behavior" and herd. Chang et al. (2000) modify the existing model and propose to calculate cross sectional absolute deviation (CSAD). CSAD is the absolute average of the total of the difference between the expected return of individual securities and market return.
$$CSAD_t = \frac{1}{n} \sum_{i=1}^n |r_{it} - r_{mt}|$$
 (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 present paper uses CSAD approach to evaluate the presence of herding using OLS regression method. Accordingly, following regression equation is formed:
$$CSAD_t = \beta_0 + \beta_1 r_{mt} + \beta_2 |r_{mt}| + \epsilon_t$$
 (2)

Where, r_{mt} is the return on market at time t and β_0 , β_1 and β_2 are regression coefficients and ϵ_t is the error term. The term $|r_{mt}|$ is the absolute return on market for the time t . For herding to be present, the coefficient of $|r_{mt}|$, i.e. β_2 should be negative and significant. The above equation (2) examines the existence of herding behavior in Indian equity market.

In congruence with other objectives of the paper, the following regression equations are formed:

1. To understand and analyze the presence of herding in bear and bull market.
$$CSAD_t = \beta_0 + \beta_1 r_{mt} + \beta_2 |r_{mt}| + \beta_3 D_{L,t} + \beta_4 D_{U,t} + \epsilon_t$$
 (3)

Where $r_{m,t} < 0$ for bear or down market and $r_{m,t} > 0$ for bull or up market.

2. To interpret the occurrence of herding in extreme market scenario defined as the upper and lower end tails of the return distribution.
$$CSAD_t = \beta_0 + \beta_1 r_{mt} + \beta_2 |r_{mt}| + \beta_3 D_{L,t} + \beta_4 D_{U,t} + \epsilon_t$$
 (4)

Here, D is the dummy variable and takes the value 1 or 0 at time t . $D_{L,t} = 1$ if the return lies in the lower tail of the return distribution at 5 percent significance level and zero otherwise. Similarly, $D_{U,t} = 1$ if the market return lies in the upper tail of the return distribution and zero otherwise.

V.

9 Analysis and Interpretation of Results

10 a) Descriptive Statistics

Table 1 shows the descriptive statistics of the whole market return and CSAD for daily data. From table 1, it is observed that the mean value of CSAD of the whole period is 0.0177 and standard deviation is 0.010 while mean return on daily basis for Nifty index is 0.00013. Kurtosis is greater than 3, implying that the market return and CSAD series are non-normal in nature. The Jarque-Bera test statistics are significant for both CSAD and return series which too leads to the rejection of the null hypothesis of a normal distribution for both the

series. Nevertheless, the ordinary least squares -regression has still been employed as the sample used in the study has a sufficiently large size 1 . The higher values of skewness and kurtosis can be because of the presence of outliers. The removal of outliers will not have any significant effect on the regression coefficients (Yao et al., 2013). Therefore, original data has been used in the study. The Augmented Dickey-Fuller test statistics are significant for both CSAD t and r mt for the Indian stock market which means null hypothesis of presence of unit root can be rejected and both the series are stationary at levels. Table 1 below also shows the descriptive statistics of CSAD t and r mt during up and down market movements. The mean return of the market during up market is 1.023 percent while during down market is -1.072 percent at time t.

i. Regression results for the complete market period Herding behavior is tested using regression model on equation (2) and the results are presented in table 2. From here it may be observed that the coefficient of r mt 2 i.e. β_2 is positive and significant which indicates that herding is not present in the Indian stock market during the chosen period of study. These results are in contrast to the results of the study carried by Chang et al. (2000) which confirmed the presence of herding in emerging economies of Taiwan and South Korea.

ii. Regression results for the bull and bear markets (Asymmetry in herding behavior) Table 3 gives results for the presence of herding in Indian market during bull and bear phase. The table shows that herding is not present in both phases of market as the regression coefficients of nonlinear coefficient of return (β_2) are positive for both the phases of the capital market and asymmetry in herding behavior is not observed in Indian stock market. The results of our study refute the results of several studies which have documented the asymmetric pattern in herding behavior (Christie and Huang, 1995;Demirer and Kutun, 2006).From our results it can easily be concluded that investors in Indian stock market tend to take rational investment decisions atleast when it pertains to the blue chip stocks present in the Nifty index.

iii. Regression results for the extreme market conditions Table 4 reveals the results for extreme up and down market conditions. Extreme up market condition is when the market returns lie in the 5 percent of the upper tail of the return distribution curve whereas extreme down market is defined when the returns lie in 5 percent of the lower tail of the distribution. Further, from the same table it may be observed that the value of herding coefficient measured by β_2 is not significant during extremely down conditions thus denying the presence of herding during extremely downward market. Likewise, there is no hint of herding in the extreme up movement of the market as well.

11 VI.

12 Conclusion

The study intends to understand, analyze and interpret the existence of herding behavior in Indian stock market. The study focuses on Nifty (benchmark index of NSE) and the companies that form part of this index. The study also examines the herding pattern in up and down market and during extreme market conditions in the stock market. The empirical results based on Chang et al. (2000) model confirm no herding in the stock market for the complete period of study, for up and down market and also during the extreme price movements in the market. According to the Chang et al (2000) model of herding, presence of significant negative non-linear coefficient indicates the presence of herding, else a statistically positive value of non-linear coefficient in regression equation denies the evidence of herding. Thus, on the basis of our results it may safely be stated that there is no herding in the Indian equity market. Lao and Singh (2010) in their study using weekly data have also observed that herding is a short lived phenomenon and it is not apparent in the Indian stock market. The reason for absence of herding can be attributed to the fact that there is a limited participation by retail investors in the financial market and the institutional investors are the major participants in the Indian equity markets who have better access to information, reports by equity research analysts, skilled traders and managers. Therefore, it reduces the scope of herding as private information is followed rather than the crowd. The herding behavior during down movement might exist due to the principle of loss aversion (Tversky, and Kahneman, 1991). However, the results are not significant for a conclusive argument due to the major institutional shareholders employing their private information to make informed decisions.

Figure 1:

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1

Descriptives	CSAD (whole period)	t r mt (whole period)	CSAD (up market move- ment)	r mt (up market move- ment)	CSAD (down market move- ment)	r (down market move- ment)
Mean	0.017783	0.000130	0.015463	0.010236	0.020274	-0.01
Median	0.015026	0.000448	0.013121	0.00709	0.017234	-0.00
Maximum	0.132163	0.163343	0.132163	0.163343	0.111453	0.00
Minimum	0.003595	-0.13014	0.003595	0.00000933	0.006362	-0.13
Std. Dev.	0.010220	0.015484	0.008865	0.011167	0.010968	0.01
Skewness	3.472892	0.096935	4.718842	4.082581	2.916753	-3.03
Kurtosis	23.76960	14.32539	44.53274	40.73473	15.89384	20.00
Jarque-Bera	39568.66	10584.92	77474.55	63660.18	7969.508	1297
Probability	0.000000	0.000000	0.0000	0.0000	0.0000	0.00
No. observations of	1980	1980	1025	1025	955	955
Augmented Dickey Fuller test (CSADt)	-23.2252 (0.0000*)					
Augmented Dickey Fuller test (Rmt)	-21.10808(0.0000*)					
Source: Author's calculations.						
*significant at 5 percent level						

Figure 2: Table 1 :

2

Variable	Coeff.	S.E	t-Stat	Prob.
? 0	0.01150	0.00027	48.5972	0.0000*
? 1	0.55943	0.02217	25.2027	0.0000*
? 2	1.76376	0.28936	6.09547	0.0000*
R square	0.56379			
Adjusted R square	0.56335			
Source: Author's calculations				
Significant at 5 percent level				

Figure 3: Table 2 :

3

Regression for Bull Market					Regression for Bear Market			
Variable		Coeff	S.E	t-Stat	Prob	Variable	Coeff	S.E
? 0		0.011190	0.0003	36.9656	0.0000*	? 0	0.01203	0.0000
? 1	up	0.353141	0.0277	12.70392	0.0000*	? 1	down	0.00031
? 2	up	2.851348	0.32686	8.724896	0.0000*	? 2	down	0.0000
R square		0.502267				R squared		0.03121
Adj. R						Adj	R-	0.46219
square		0.501293				squared		9
F-statistic		515.6556				F-statistic		
Prob	(F-					Prob(F-		
stat)		0.0000*				stat)		0.0000*

Figure 4: Table 3 :

4

Variable	Coeff	S.E	t-Stat	Prob.	Variable	Coeff	S.E	t-Stat	Prob.
? 0	0.00334	0.00397	0.84152	0.4044	? 0	0.000091	0.01310	0.00697	0.9945
? 1	U 0.73518	0.12212	6.01981	0.0000*	? 1	L 1.14765	0.37053	3.09732	0.0049
? 2	U 0.33791	0.67707	0.49908	0.6201	? 2	L -2.1357	2.29148	-	0.3606
R square	0.92231				R squared	0.84214			0.9320
Adj. R square	0.91893				Adj R squared	0.82898			
F-stat	273.064				F-stat	64.0186			

Figure 5: Table 4 :

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12 CONCLUSION

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