Herding Behavior in the Indian Stock Market : An Empirical Study

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Abstract

The herding behavior in financial markets indicates the process whereby the different participants of the market trade in a similar direction simultaneously. This kind of trading pattern seems like a consensus in the market. There are different reasons for herding to exist : to be part of a group, to avoid the feeling of being left out, reaction to some kind of new information, etc. In this paper, we tried to identify the existence of herding behavior in the Indian stock market. The markets were examined over a time frame of the last 15 years to determine the existence of herding behavior at various points of time. The three time periods selected for the study were 2003 – 2007 (pre - financial crisis), 2008 – 2012 (sub-prime crisis), and 2013 – 2017 (post) crisis. The study used security return dispersion as a substitute for herd behavior. In order to test the presence of herding behavior, linear regression model using dummy variables was used. The evidence supported the presence of herding in the Indian stock market during the financial crisis time period and the post-crisis period. In the pre - financial crisis period, there was no herding phenomenon observed.

Keywords : herding, Indian stock market, behavioral finance

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The way investors behave and react to the news in the stock market has been of keen interest to researchers all across the world. EMH states that all the information related to stocks is available to all participants in the stock market, and it is not possible for anyone to make any abnormal profits in the stock market. This implies that all the stocks are priced optimally at all times, which further enables the investors to take well informed decisions. However, there have been several research studies which have questioned the EMH. Cipriani and Guarino (2008) showed that information cascades impacted the information available to traders and prevented them from making an informed decision. Social factors like herding, emotional contagion, imitation, and information cascades along with psychological patterns like representativeness availability and anchoring heuristics are the basic key factors that determine individual decisions (Raut & Das, 2015). Mangala and Sharma (2014) opined that these factors not only affected the current but also the future investment decisions of investors.

Shiller (1987) believed that lack of rational thinking by the stock market investors was the prime reason for the

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stock market crash in the U.S. stock market in 1987. It was believed that investors followed the herd behavior in exiting the market in panic. The herding behavior in the financial markets indicates the process whereby the different participants of the market trade in a similar direction simultaneously.

An investor in the stock market would exhibit herding behavior when he/she follows the crowd and depends more on the information validated by a crowd rather than on his/her own information, because he/she believes that the crowd cannot be wrong. This may be despite the fact that the information the investor possesses is correct. Christie and Huang (1995) defined herding as a propensity of stock market investors who did not believe in their own rational decision making and choices but who agreed or went along with the market consensus, even if they did not agree with it personally. Herding highlights that investors do not trade on their own account but try to emulate the behavior of others following what they believe to be the market sentiment. This kind of behavior is generally seen in periods of market extremes.

We posit that since the Indian stock market is deemed highly inefficient and there is an information asymmetry, the chances of investors depicting irrational behavior are high which includes herding behavior as well. The Indian market is also influenced largely by the infusion of money by the foreign institutional investors and domestic institutional investors. The individual investors at times may be swayed in their decision making by the actions of such investors. Therefore, it becomes imperative to understand whether herding behavior is exhibited by Indian markets like other markets across the world or not. Specifically, do Indian investors depict herd mentality under extreme market conditions like financial crises and does the behavior continue beyond the period of the crisis ?

The Indian stock market thus becomes an interesting place to check for the phenomenon of herding. In this paper, we try to identify herding behavior in the Indian stock market for the last 15 years and try to determine if herding behavior exists at various points of time and also identify the reasons behind such behavior. Further, we have divided the time period into three distinct periods – before the sub-prime financial crisis (2003 – 2007), the crisis years (2008 – 2012), and after the crisis (2013 – 2017) to see whether the herding behavior arises only under certain extreme conditions like a crisis or is persistent beyond a crisis, indicating the spillover effect of irrationality.

This, in turn, will provide evidence of the extent of irrational behavior depicted by the Indian investors and thereby provide an opportunity to address the irrationality. Based on the results, managerial and policy implications have been suggested.

Literature Review

Hsieh (2013) described herding behavior as the propensity of the investors to behave in the same way as the market behaves and make similar trades as other investors. The term 'herding' is used in this context as an analogy that most of the investors behave in a similar way and thus act like a herd. Herding behavior can be a deliberate behavior used by certain investors as an investing technique. Litimi et al. (2016) stated that herding pertains to investors who tend to follow what others are doing in the market, even if the actions of others are going contrary to the available information. Investors might behave in this way as they may believe that the information they have is not correct and the others are following certain information about which they have no knowledge.

Herding can be information driven or behavior driven. The first one is unintentional and the second one is intentional. Information-driven herding means that all the players in the market receive certain information and must take an investment decision based on it (Hirshleifer et al., 1994). According to the informational cascade model, looking at the information available to a group of investors may influence a large number of other unconnected investors to change their earlier taken decisions, ensuing in information cascade (Banerjee, 1992 ; Bikhchandani et al., 1992). Unintentional herding takes place when certain institutional investors invest in a

particular share with specific characteristics like high liquidity (Falkenstein, 1996) or when the institutional investors depend on similar sources of information and pick the same stocks for investment (Hirshleifer et al., 1994). Unintentional herding is pushed by similar response to publicly available information and information cues on a big scale (Bikhchandani & Sharma, 2001). Thus, when investors are attracted to similar features of stocks, it is also called as characteristic herding (Bennett et al., 2003 ; Gompers & Metrick, 2001 ; Nofsinger & Sias, 1999).

Sometimes, fundamental information also drives herding behavior and makes markets efficient because security prices adjust quicker to new pieces of information (Froot et al., 1992 ; Hirshleifer & Hong Teoh, 2003) since investors examine similar information and develop same inferences about the fundamental value of a stock, which makes the market move towards efficiency (Lakonishok et al., 1992). However, the herding process would continue only till the point the market value of a security equated its fundamental value (Chang & Lin, 2015).

Most of the time, herding is not based on fundamental factors, so it could lead to suboptimum outcomes and returns. In such a case, herding leads to chaos in the markets leading to creation of bubbles and crashes (Scharfstein & Stein, 1990). Herding is a major concern for investors as it could cause them to trade at suboptimum prices (Christie & Huang, 1995). This behavior acts as an obstacle for investors in diversifying their investments (Chang et al., 2000 ; Venezia et al., 2011). Such behavior also leads to fluctuations in the stock prices (Bikhchandani & Sharma, 2000). It can also lead in making of stock bubbles in the market (Kanojia & Malhotra, 2021).

Keynes (1936) pointed out that that agents under uncertainty and asymmetric flow of information did not choose the optimum mix of assets based on their fundamental factors but instead ended up choosing assets which showed high values in the market in the short run (Sewell, 2012). Moreover, Keynes's (1936) animal spirit theory postulated that investors worked on the basis of their instinct, were motivated to take certain decisions because of sentimental values, and followed impulse decision making and took irrational decisions in investments. This happened due to the primary three emotions of investors – uncertainty, panic, and fear. Also, uncertainty gave rise to irrational exuberance in the stock markets which gave rise to bubbles and gave a false sense of security to investors and negated the amount of risk present in the market (Olsen, 2011).

Another way to explain the irrational herding behavior of investors is through intentional herding. It is a behavior driven approach to herding where investors and traders imitate others, ignoring the fundamentals of the security. Devenow and Welch (1996) stated that investors tended to disregard their prior beliefs and followed other investors blindly as they felt insecure about the information they had.

There are two major theories which give an explanation of such behavior. According to Bikhchandani et al. (1992) and Park and Sabourian (2011), sensible investors duplicated the investment pursuits of other participants in the market because they believed that the others had better information regarding the stock market available to them. The second reason for herding behavior is derived from the reputation based model originally developed by Scharfstein and Stein (1990). Under this hypothesis, the institutional investors have the danger of being susceptible to reputational risk if they take investment decisions differently from the other investors. The investors believe that others have superior or more information and if they do not follow the same strategy, they may lag behind. Some investors fear that they may lose their money if they don't herd. Sometimes, investors herd by following the benchmark index too. When less informed investors do not have complete knowledge of market fundamentals, they behave on the basis of what they observe in the market (Lux, 1995).

There are many factors that may impact herding. Lakonishok et al. (1992), Choi and Sias (2009), and Venezia et al. (2011) stated that herding took place more in case of small stocks as compared to large capitalization companies. Past performance of stocks was another factor that contributed to herding. Popularly called feedback trading, it depicts unintentional herding (Froot et al., 1992 ; Sias, 2004). In a study, it was found that some positive

feedback strategies contributed to herding (Grinblatt et al., 1995). Another study found that UK based mutual funds tended to herd on stocks that had performed well in the past (Wylie, 2005).

Past research studies have studied herding behavior from two aspects – one from the market or country point of view and the other from individual investor's perspective (Chang et al., 2000). There have been studies which indicated no evidence of herding in the U.S. and Hong Kong markets, partial herding in Japan, but a large amount of evidence of herding in Taiwan and South Korean stock markets (Chang et al., 2000) were found. Christie and Huang (1995) studied herding in the U.S. market at a sectoral level and found no evidence of herding. Galariotis et al. (2015) found no evidence of herding in the United States stock markets. However, they believed that when a number of sub-periods are considered, there is an evidence of herding intermittently within these sub-periods. In contrast, there have been studies which have found evidence of herding in major stock markets across the world barring the U.S. They were also able to determine that when herding was triggered in one country, it may have a spillover effect on other connected economies (Chiang & Zheng, 2010).

In contrasting studies on observation of herding behavior, Lin and Swanson (2003) found no evidence regarding any kind of herding behavior in the Taiwanese stock market. On the other hand, Demirer et al. (2010) found robust evidence of herding in the Taiwanese stock market. The evidence was found to be more prominent during fall in the market indices rather than the rise. Similarly, Chang et al. (2000) found no evidence of herding in the Hong Kong stock market ; whereas, Chiang and Zheng (2010) indicated the presence of herding in the Hong Kong stock market. Regarding research done on Chinese markets, Demirer and Kutan (2006) found no evidence of herding ; whereas, Lao and Singh (2011) discovered substantial evidence of herd behavior in Chinese and Indian stock markets. This study also pointed out that herding was more prominent along with large price movements.

In their study based on data from 18 countries, Dang and Lin (2016) showed that herding behavior was more likely to occur in emerging markets due to a large number of unsophisticated investors in them. Also, the release and flow of information systems was not very robust in these economies. This led to suboptimal decision making by a large number of investors and their propensity to go with the crowd increased.

Another set of researchers focused on herding behavior of institutional investors. Existence of herding is mostly found among institutional investors like mutual funds. There have been numerous studies regarding the herding behavior of fund mangers (Lakonishok et al., 1992 ; Shyu & Sun, 2010). Wermers (1999) was one of the first studies on herding behavior in mutual funds, especially growth-oriented funds, among the trades of small firms. Barber et al. (2008) ascertained trades of individual investors on the basis of order size and showed that individual investors' buying and selling activities were strongly correlated based on month and time of the trade. They concluded that individual investors herd and that their coordinated trading preferences were persistent.

Hseih (2013) found that herding was more prevalent in institutional investors as compared to individual investors. The institutional investors herded on small capitalization and low turnover stocks and followed momentum strategies. The individual investors, on the other hand, herded on small sized stocks with high turnover and herded on stocks with negative (positive) past returns.

Research has shown existence of herding behavior during periods of crises. Economou et al. (2011) and Klein (2013) found exaggerated herding behavior in many European stock markets during the economic crisis period. During the EU crisis, Galariotis et al. (2016) discovered that macroeconomic information announcements led to herding in the European bond markets. They did not find any evidence of herding either before or after the debt crisis. Clements et al. (2017) used vector autoregressive framework and found evidence of herding in DJIA at the beginning of the housing crisis in U.S. in 2008, during the European debt crisis, and the Chinese stock market crash of 2015. Stavroyiannis and Babalos (2020) found instances of negative herding for the Eurozone during the period from 2000 – 2016.

In the Indian context, there have been a few studies on herding behavior. Poshakwale and Mandal (2014) and Garg and Gulati (2013) found no evidence of herding in the Indian stock market. However, it was suggested that herding is visible during the bull phase and not when the markets are on a decline. In a study on secondary market investors by Isidore and Christie (2018), there was evidence of existence of various behavior biases among the investors. In another study by Satish and Padmasree (2018), the authors did not find any evidence on herding in the Indian stock market over the period from 2003–2017. The authors incorporated the CSAD methodology of Chang et al. (2000) and did not find a single evidence of herding pre, during, and post the financial crisis. Kanojia et al. (2020) studied the returns of the Nifty 50 over a period of 9 years from April 2009 – March 2018. They too did not find any traces of herding during normal and extreme market conditions, citing the reasons as low market participation and dominance of institutional investors in the stock markets of India.

In view of the above literature reviewed and to the best of our knowledge, there is only one study by Satish and Padmasree (2018) that has analyzed the same time period as us with the exception that the methodology adopted by them is different from that of the current research. Moreover, most of the studies have suggested that herding behavior is depicted only during the bull run and not during market declines. All these factors along with a dearth of research on herding in the Indian market represent the need to further explore the herding behavior of the Indian market during the time of crisis to either confirm or contradict the findings of previous studies.

Objectives of the Study

✧ The paper aims to check the presence of herding behavior in the Indian stock market.

✧ The paper aims to ascertain how stockholders react during bull and bear markets.

Methodology and Data

The study was conducted on companies listed on the Nifty 50 for a time period ranging from 2003 – 2017. The data was thus analyzed for 15 years. The years were further categorized into three subtime periods, which incorporated the pre - financial crisis period (2003 – 2007), crisis period (2008 – 2012), and the post - crisis period (2013 – 2017).

Firms were assigned to one of the 12 industry groups based on the industry classification in NSE. The industries which are taken into consideration are – IT, automobile, pharma, banks, PSU, media, private banks, energy, FMCG, metal, financial services, and realty sector. Daily tests retained only 10 industry groups and media and private banks were excluded from the sample.

To check if herding exists in the Indian market, the methodology used by Christie and Huang (1995) was adopted. This methodology uses cross sectional standard deviation (CSSD) to check for dispersion in single stock return vis-à-vis market return.

It is believed that herd behavior is much noticeable during periods when prices exhibit abnormally large average movements or during market stress. In other words, the herding phenomenon should be more prevalent when the markets are doing badly. In order to substantiate this, the level of dispersion in the market is calculated, S_t , in the extreme tails of the distribution of market returns and tests whether it differs substantially from the average levels of dispersion that does not include the extreme market returns.

The tests are performed using the following regression :

$$S_t = \alpha + \beta_1 D_L + \beta_2 D_u + \varepsilon, \qquad\qquad (1)$$

where,

D_L = 1 if on the return distribution, on day t, the market return lies on the extreme lower tail. D_L will be equal to 0 otherwise. D_u = 1 if on the return distribution, on day t, the market return lies on the extreme upper tail. D_u = 0 otherwise.

The α coefficient signifies the average deviation of the sample that does not include the areas covered by the two dummy variables. According to the rational asset pricing models, if there are significantly positive coefficients for β_1 and β_2, and negative estimates of β_1 and β_2, it would imply the presence of herd behavior.

Portfolio returns and dispersions are calculated. The herding within the industries is also determined and the level of dispersion is also calculated for industry portfolios.

Analysis and Results

Table 1 gives the average returns of dispersion and standard deviation of dispersion for the different industries over 2003 – 2007. For the daily data of the period from 2003 – 2007, the average level of dispersion is 2.04% a day across all stocks, with a standard deviation of 0.67%. Pan industries, the level of dispersion ranges between 1.62% for IT to 3.68% for metal. The two industries which have the lowest and highest standard deviations of dispersion are auto and metal, respectively. The distribution of dispersions is relatively tight across the remaining industries.

Table 2 gives the average returns of dispersion and standard deviation of dispersion for the different industries over 2008 – 2012. For the period of 2008 – 2012 daily data, the average level of dispersion across all stocks is 0.67% a day, with a standard deviation of 0.82%. Across industries, the level of dispersion ranges from a low of 1.57% for public sector banks to 2.16% for auto. The two industries which exhibit the minimum and maximum standard deviations of dispersion are public sector banks and financial services, respectively. The low level of dispersion for PSBs may be on account of the regulated nature of that particular industry.

Table 3 gives the average returns of dispersion and standard deviation of dispersion for the different industries over 2013 – 2017. For the period of 2013 – 2017 for daily data, the average level of dispersion is 1.6% a day across all stocks, with a standard deviation of 0.51%. Across industries, the level of dispersion ranges from a low percentage of 1.32% for private banks to 1.69% for metal. The two industries which have the lowest and highest standard deviations of dispersion are FMCG and IT, respectively.

Table 1. *Dispersion of Stock Prices (2003 – 07)*

Industry	2003 – 07		
	Average Return Dispersion	Standard Deviation of Dispersion	Average Number of Firms
Nifty 50	2.04%	0.67%	36
Auto	2.07%	0.83%	13
Energy	1.67%	1.00%	8
FMCG	1.80%	0.88%	11
IT	1.62%	0.92%	5
Pharma	1.89%	0.89%	8
Metal	3.68%	60.18%	7
PSBs	1.83%	0.89%	10
FinServ	2.09%	0.95%	10
Pvt. Banks	2.01%	0.94%	9

Table 2. *Dispersion of Stock Prices (2008 – 12)*

Industry	2008 – 12		
	Average Return Dispersion	Standard Deviation of Dispersion	Average Number of Firms
Nifty 50	0.67%	0.82%	36
Auto	2.16%	1.00%	13
Energy	1.79%	0.97%	8
FMCG	1.79%	0.83%	11
IT	1.72%	1.12%	5
Pharma	1.93%	1.04%	8
Metal	1.91%	1.06%	7
PSBs	1.57%	0.69%	10
FinServ	1.85%	1.23%	10
Pvt. Banks	1.63%	0.82%	9

Table 3. *Dispersion of Stock Prices (2013 – 17)*

Industry	2013 – 17		
	Average Return Dispersion	Standard Deviation of Dispersion	Average Number of Firms
Nifty 50	1.60%	0.51%	36
Auto	1.67%	0.63%	13
Energy	1.50%	0.63%	8
FMCG	1.45%	0.58%	11
IT	1.39%	0.96%	5
Pharma	1.52%	0.72%	8
Metal	1.69%	0.85%	7
PSBs	1.33%	0.70%	10
FinServ	1.49%	0.68%	10
Pvt Banks	1.32%	0.83%	9

The output in Table 4 provides the regression estimates for the time period from 2003 – 07 and the estimates across industries. The first row of the output table contains the estimates of β_1 and β_2 for the entire sample, with coefficients of β_1 and β_2 being positive. Thus, dispersions are significantly lower at both the higher and lower tails than the average. The positive and statistically significant β_1 and β_2 values indicate no herding phenomena observed during the given time period.

The output in Table 5 provides the regression estimates for 2008 – 12 and the estimates across industries. The first row of the output table, that shows the estimates of β_1 and β_2 for the entire sample, indicates that the coefficients of β_1 and β_2 are negative. Thus, dispersions are significantly higher in both the higher and lower tails than the average dispersion. The negative and statistically significant β_1 and β_2 values indicate a herding phenomenon being observed during the given time period.

The output in Table 6 provides the regression estimates for 2013 – 17 and the estimates across industries. The

Table 4. *Regression Output (2003 – 07)*

Sector	β₁ Coefficient Intercept	β₁ Coefficient D_L	β₁ P-Value Intercept	β₁ P-Value D_L	β₂ Coefficient Intercept	β₂ Coefficient D_U	β₂ P-Value Intercept	β₂ P-Value D_U
Overall	0.019882837	0.00823	0	0.0000	0.020207	0.00965	0	0.0000
T stat	138.6950133	–13.2309			123.7139	6.06214		
Pharma	0.018197123	0.01166	0	0.0000	0.018671	0.0141	0	0.0000
Auto	0.020000778	0.01065	0	0.0000	0.020502	0.01316	0	0.0000
Energy	0.015706918	0.0097	0	0.0000	0.016237	0.01179	0	0.0000
FMCG	0.017229802	0.00981	0	0.0000	0.017728	0.01215	0	0.0000
IT	0.015912129	0.0132	0	0.0000	0.015452	0.01106	0	0.0000
Banks	0.019243976	0.01181	0	0.0000	0.019791	0.01471	0	0.0000
Financial Services	0.019964293	0.01136	0	0.0000	0.020575	0.01399	0	0.0000
Metal	0.018785133	0.01233	0.291624	0.87326	0.019415	0.01459	0.238146	0.927552
Public Sector Banks	0.017481469	0.01057	0	0.0000	0.018016	0.01283	0	0.0000

Table 5. *Regression Output (2008 – 12)*

Sector	β₁ Coefficient Intercept	β₁ Coefficient D_L	β₁ P-Value Sector	β₁ P-Value Intercept	β₂ Coefficient D_U	β₂ Coefficient Sector	β₂ P-Value Intercept	β₂ P-Value D_U
Overall	0.01929	–0.00951	0	0.0000	0.019744	–0.01205	0	0.0000
T stat	108.6825	–12.3225			95.88196	–6.0385		
Pharma	0.018287	–0.01147	0	0.0000	0.01895	–0.01379	0	0.0000
Auto	0.020576	–0.01133	0	0.0000	0.0212	–0.01382	0	0.0000
Energy	0.016938	–0.01087	0	0.0000	0.017583	–0.01308	0	0.0000
FMCG	0.017173	–0.00992	0	0.0000	0.017616	–0.01193	0	0.0000
IT	0.01681	–0.01416	0	0.0000	0.016107	–0.01196	0	0.0000
Banks	0.015605	–0.00971	0	0.0000	0.016087	–0.01153	0	0.0000
Financial Services	0.018329	–0.01116	0	0.0000	0.01904	–0.01364	0	0.0000
Metal	0.018692	–0.01177	0	0.0000	0.019357	–0.01332	0	0.0000
Public Sector Banks	0.01515	–0.00894	0	0.0000	0.015526	–0.01077	0	0.0000

first row of the output table contains the estimates of β₁ and β₂ for the entire sample and indicates that the coefficient of β₂ is negative throughout. Thus, dispersions are significantly higher than average in the lower tail, which also indicates that the coefficients of β₁ and β₂ both are negative. Thus, dispersions are significantly higher than average in both the higher and lower tails. The negative and statistically significant β₁ and β₂ values indicate a herding phenomenon being observed during the given time period.

Table 6. *Regression Output (2013 – 17)*

	β₁				β₂			
	Coefficient		**P-Value**		**Coefficient**		**P-Value**	
Sector	**Intercept**	**D_L**	**Sector**	**Intercept**	**D_U**	**Sector**	**Intercept**	**D_U**
Overall	0.015677	–0.00699	0	0.0000	0.0159	–0.00854	0	0.0000
T stat	146.8993	–15.0681			126.9972	–7.03944		
Pharma	0.014624	–0.0089	0	0.0000	0.015005	–0.01091	0	0.0000
Auto	0.0163	–0.00912	0	0.0000	0.016542	–0.01121	0	0.0000
Energy	0.014509	–0.00857	0	0.0000	0.014825	–0.01011	0	0.0000
FMCG	0.013996	–0.00774	0	0.0000	0.014276	–0.00972	0	0.0000
IT	0.013425	–0.01126	0	0.0000	0.01277	–0.00924	0	0.0000
Banks	0.012426	–0.00739	0	0.0000	0.012835	–0.00907	0	0.0000
Financial Services	0.01435	–0.00814	0	0.0000	0.014685	–0.00989	0	0.0000
Metal	0.01618	–0.0103	0	0.0000	0.016618	–0.01211	0	0.0000
Public Sector Banks	0.012597	–0.0075	0	0.0000	0.012988	–0.00914	0	0.0000

Discussion

The data investigates the presence of herding behavior in the Indian stock market over a period of 15 years divided into three distinct time periods. This is done by using a dummy variable regression test as given by Christie and Huang (1995). The coefficient of the dummy variable identifies the herding phenomenon in extreme upward and downward price movements. The findings of this study are partially consistent with the results given in literature. There is no herding behavior observed in the 2003 – 2007 time period, which is before the financial crisis. The positive and statistically significant β₁ and β₂ for this time period indicate no incidence of herding. These results indicate that the dispersion in daily equity returns tend to increase during extreme market movements. These findings support the research results obtained by Satish and Padmasree (2018) and Kanojia et al. (2020).

   An opposite scenario is observed in the other two time periods, 2008 – 2012 (crisis period) and 2013 – 2017 (post crisis period). The negative and statistically significant β₁ and β₂ for these time periods indicate ample evidence of herding behavior. These results indicate that the dispersion in daily equity returns tend to decrease during extreme market movements. This result, especially for the crisis period from 2008 – 2012, indicates the tendency of the people to panic during a crisis time. This is characterized by sell offs in the market due global pressure on stock markets in this time period. The herding behavior indicated in this time period was somewhat expected. These findings are in consonance with the results of Demirer et al. (2010).

   The herding phenomenon observed in the third time period, 2013 – 2017, in the study, is a surprise as it was felt that stock markets had stabilized in India during this time period. The talk of recession had come to an end. The stock markets seemed to be on the rise after a 4 year downfall trend. With this background, it was expected that the Indian stock markets would return to some form of efficiency and rational decision making. The results indicating a herding phenomenon are belying the expectation of rational and efficient markets and a spillover effect is clearly visible. These findings provide results which are contrary to the research findings obtained by Satish and Padmasree (2018) and Kanojia et al. (2020).

Conclusion

Dispersion quantifies and depicts how close are the average individual stock returns to the mean of the market, and it reveals the presence of herd behavior when individual returns follow the lead of the portfolio returns. The purpose of the study is to compare the predictions of herd behavior during periods of market stress or exaggerated price movements. The study looks at three time periods over the last 15 years to identify the existence of herding behavior. The three time periods are identified as 2003 – 2007 (pre - financial crisis), 2008 – 2012 (financial crisis), and 2013 – 2017 (post financial crisis). The evidence supports the presence of herding in the Indian stock market during the financial crisis time period and the post crisis period. In the pre financial crisis period, there was no herding phenomenon observed.

Managerial Implications

Herding behavior is one of the significant biases exhibited by investors across the globe. Despite the awareness, investors continue to make irrational decisions. Therefore, it becomes imperative to educate both investors and financial advisors on the drawbacks of engaging in herding. Investors should be advised by their brokers to exercise restraint and not get influenced by the crowd. A decision should be taken only after carrying out an indepth analysis of the stocks and not by blindly following the crowd. Investor awareness programs can be conducted, biases likely to be exhibited by investors should be identified, and then steps should be taken to reduce the irrationality. Self introspection and consulting financial advisors during market extremes would also help.

Limitations of the Study and Scope for Future Research

While the study is one of the few studies that try to understand herding behavior over a period of 15 years, it is not bereft of limitations. The study does not measure the intensity of herding or volume of trading. Also, the paper does not identify factors that drive herding behavior and whether the factor(s) remain the same across time periods or vary.

There is scope for further of research on this topic by increasing the number of companies and sectors in the study. The herding behavior may be studied for shorter time periods of 18 – 24 months to have a better understanding of the efficiency of Indian markets. The time period for the study can also be shortened by looking at specific events in the financial history during this time period. Moreover, sector specific studies on real estate and commodities can also be conducted. Similar studies can be conducted in other emerging markets to understand whether markets exhibit similar behavior or not.

Authors' Contribution

Dr. Pooja Gupta conceived the idea and developed qualitative and quantitative design to undertake the empirical study. She worked on the Introduction and Analysis. The literature review was developed by Dr. Bindya Kohli. Both the authors extracted research papers with high repute, filtered these based on keywords, and generated concepts and codes relevant to the study design. Dr. Kohli improvised the paper as per the reviewers' comments and worked on the Limitations, Managerial Implications, and Future scope. Both the authors made equal contribution based on their mutual understanding. Dr. Kohli passed away in January 2021– when this manuscript was undergoing revision after review. The final revisions were done by Prof. Pooja Gupta.

Conflict of Interest

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