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THE DYNAMICS OF HERDING IN INDIAN EQUITY MARKETS: EVIDENCE FROM IT STOCKS

Raghavendra S. Chauhan

Assistant Professor, Guru Gobind Singh Indraprastha University, Delhi, India
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Abstract: The present study examines the existence of herding amongst the investors and market participants in Indian equity market. The study distinct itself from previous other studies as it looks for herding patterns specifically in a sectorial index (IT)in contrast to the multi-sectorial benchmark index in an emerging economy. For determining the existence of herding the methodology of Chang et al. (2000) based on cross sectional absolute deviation (CSAD) has been employed. The analysis is based on the daily closing values of CNX Nifty IT index and its constituents' scripts for a period of 6 years ranging from April 1, 2009 to October 31, 2015. The results of our study show no conclusive evidence of herding in the IT sector stocks in Indian stock market. A deeper analysis aimed at measuring herding patterns in bullish and bearish phases too indicates an absence of herding in Indian stock market. The results of our study have meaningful implications for the policy makers for regulation of the markets and for investors in chalking out their investment strategies. The study presents an integrated approach of investors towards asset pricing and indicates that investors do not indulge in "imitation buying" and make decisions based on their information.

Keywords: Herding, Cross Sectional Absolute Deviation, Equity Market, Bull and Bear Phase, Asset Pricing.

Introduction

The existing foundations of financial theories of market efficiency and asset pricing are based on the premise of rational and utility maximizing investors. However, researchers across the globe have been fervent to investigate a new dimension to investor behavior and psychology. The classical finance theories ignore that market participants make errors and are guided by behavioral patterns in making investment choices and decisions. This leads to market anomalies and fluctuations. The modern financial theory has placed people and their psychology in the center of the debates. Such irrational human behavior has been the reason of global financial market overvaluations and eventual crises across time and its relevance has led to the emergence of behavioral finance. One such irrational pattern as observed is herding behavior (Lakonishok et al., 1992; Christie and Huang, 1995) which involves mimicking the actions of other investors, which constitute the market consensus (Bikhchandani

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and Sharma, 2000).Banerjee (1992) defines herding as "everyone doing what everyone else is doing, even when their private information suggests doing something quite different." As per Hwang and Salmon (2004) "herding arises when investors decide to imitate the observed decisions of others or movements in the market rather than follow their own beliefs and information."Hirshleifer and Teoh (2003) alsodefine herding asany behavior similarity or dissimilarity brought about by the direct or indirect interaction of individuals. Herding can be classified as spurious Vs intentional (Bikhchandani and Sharma, 2000). Spurious herding is type of pseudo herding pattern where an investor takes similar decisions as others due to the same information and data possessed by them (Hirshleifer et al., 1994). Intentional herding is the conscious herd behavior which includes imitation. The presence of herd behaviour often results in volatility in the stock market (Christie and Huang, 1995; Chang et al., 2000; Avramov et al., 2006) and has the tendency to drive prices away from their fundamental values (Tan et al., 2008). West 1988 points out the reason of social conformity for the presence of herding. It can also be driven by irrational sentiments and motives. The present study aims to examine an emerging economy- India, to study the presence of herd behavior. It is a comprehensive study and contributes to the body of knowledge by investigating the herd behavior in the emerging market since most of the previous studies concentrate more on the developed economies. The current research examines the prevalence of herd behavior during bull and bear phases and extreme market conditions for the CNX Nifty IT index and the sector companies included. Substantial research conducted till date has focused on studying the multi sectoral benchmark index of a country and only a few have tried to examine a particular sector for behavior patterns. The IT sector has reckoned India to emerge as a global force and has provided a major fillip to the economic growth. According to the NASSCOM report, IT sector is expected to contribute towards 10 percent of GDP and account for 14 percent of total services revenue (Source: www.nasscom.in). Another reason for studying the sector is that portfolio managers and asset management companies readily track IT specific sector index as a benchmark for managing active portfolios. Against this backdrop, it is imperative to select the IT sector for analyzing herding pattern. The rest of the paper is arranged as follows: Section I is the introduction followed by review of existing literature and objectives in section II and III respectively. Section IV is methodology followed by interpretation of results in section V and then conclusion.

Review Of Literature

Most of the existing studies on herd behavior in stock markets focus on the developed economies of Europe and USA. There has been limited research of herd behavior in Asian economies, especially Indian stock market. The researchers across the globe have observed herding patterns that are not uniform and there have been mixed observations. Some studies point that herding behavior exists significantly across different market phases and conditions (Chang et al., 2000; Chiang and Zeng, 2010, Lindhe, 2012; Prosad et al., 2012), others suggest that financial markets are efficient and no such pattern is observed (Demirer and Kutan, 2010; Garg and Jindal, 2014). Below are the studies that are divided into two sub sections. The first one consists of researches that show the evidence of herding and second section shows its absence.

Studies on the Presence of Herding

Investors are considered to be herding if the investment decisions change in congruence with others, even when their information tells them to act otherwise (Ferruz and Vergas, 2007). Christie and Huang (1995) argue that investors are more likely to suppress their private beliefs in favor of consensus during periods of unusual market

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movement. BelhoulaNaoui (2011) argues that not all traders react logically to any new information. Chang et al. (2000) opine that herd behavior causes dispersions in valuations leading to biased opinions and incorrect decision making and this aggravates the volatility in returns and cause destabilizing impact on the financial systems (Hadiwibowo, 2010) specificallyduring a crisis period (Demirer and Kutan, 2006). Wermers (1999) finds weak evidence of herding in pension stocks whereas Pirinsky (2002) and Sias
(2003) find significant level of herding in an average stock by institutional investors. Lee et al. (2012) study the Chinese stock market and find evidence that herding is present. Guo and Shih (2008) study the herding pattern in high tech stocks in Taiwan and conclude that more significant evidence of return dispersion in high-tech industries than in traditional industries. Demirer and Kutan (2006) opine that small capitalization stocks, large number of retail investors in non-financial sectors are more likely to herd. Fu and Lin (2010) conclude that the asymmetric reactions exist. Investors' tendency toward herding is saliently higher during market downstream.Cakan and Balagyozyan (2015) study the Turkish stock exchange from 2002 to 2014 and find significant herding in all sectors namely finance, technology and services in highly volatile markets. Lao and Singh (2010) study the Indian and Chinese markets and provide the evidence for presence of herding. Choe et al. (1999) follow the model of Wermers (1999) and Lakonishok et al. (1992) to study the pattern of herding by foreign investors on Korean stock exchange and witness the evidence during the end of Korean crisis in 1997. Nofsinger and Sias (1999) too report the presence of institutional herding in US. Kim and Nofsinger (2005) find a high price effect of institutional herding in the Japanese stock market. Jeon and Moffet (2010) report similar results in their study in context of Korea.

Studies on the Absence of Herding

In contrast to the above studies, there is a group of researchers who opine that significant herding does not exist. The pioneer study by Lakonishok et al. (1992) on Indian market concludes that pension fund stocks have no evidence of herding. In contrast to the study by Lao and Singh (2010), Demirer and Kutan (2006) find no evidence of herding in Chinese stock marketsJaved et al.(2013) study the KSE 100 index of Karachi using monthly data and fail to find any evidence of herding. Gleason et al. (2003) reject the presence of herding in Americanstock market during extreme market fluctuations. Christie and Huang (1995) use daily and monthlyreturns for NYSE and Amex firms and find noherding. Chang et al. (2000) findherding in South Korea and Taiwan markets bydeveloping a non-linear model and no evidence isobserved in USA, Hong Kong and Japan markets.Intraday data of American Stock Exchange isanalyzed by Gleason et al. (2004)and no evidence of herding among the sector ETFS.Henkeret al.(2006) find no marketwide herding in Australian market.Patterson and Sharma (2005) analyze the intraday herding phenomenon, based on a sample of 8000 stock-days' trade data from the New York Stock Exchange (NYSE) between 1998 and 2001, using the same methodology as Bikhchandani et al. (1992). The intraday herding hypothesis is consistent with the models put forward by Avery and Zemsky (1998) and Banerjee (1992). Overall, they find evidence for the market efficiency hypothesis but no significant evidence of herding.Garg and Gulati (2013) find no significant herd pattern in Indian stock markets. In view of the above studies, the present paper tries to examine the existence of herding pattern in Indian stock market with special reference to information technology sector.

Objectives of the Study

1. To find the evidence of herd behavior in the Indian IT sector index.

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2. To observe the herd pattern in Indian IT sector index during bear and bull markets.
3. To explore the asymmetry in herding in the IT sector.
4. To examine the occurrence of herding in extreme market scenario defined as the upper and lower end tails of the return distribution.

Data and Methodology

a) Data

To achieve the above objectives, the study makes use of the daily closing values of the S&P CNX Nifty IT index of the National Stock Exchange and its constituent companies over a period from April 1,2009 to October 31, 2015.The historical data has been retrieved from Prowess database, Centre for Monitoring Indian Economy. The data consists of 1617 observations and is adjusted for any bonus issues and stock splits during the period of study.

b) Calculation of stock returns

The present study makes use of Chang et al. (2000) methodology of cross sectional absolute deviation (CSAD) to examine the concept of herding. This is a modified version of cross sectional standard deviation (CSSD) as proposed by Christie and Huang (1995).According to (1), CSAD is the absolute value of the average of the total of the difference between the expected return of individual securities and market return.According to CSAD model, the absolute dispersion between the market return and individual stock return decreases as the investors imitate the action of others and rely on the crowd information thereby ignoring their individual information and begin to herd. The CSAD model is not affected by outliers, unlike CSSD.

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

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 company share, r_{it} is calculated as:

$$r_{it} = \ln(\frac{Pt}{Pt-1}) * 100 \quad (2)$$

whereP_t is the price of the stock at time t and P_{t-1} is the price at time t-1 and t stands for the specific day.

Similarly, market return at time t, r_{mt} has been calculated as:

$$r_{mt} = \ln(\frac{CVt}{CVt-1}) * 100 \quad (3)$$

Where CV is the closing value of the S&P CNX IT index at time t. The study uses OLS regression to demonstrate the herd pattern in Indian stock market. Accordingly, the following regression equation is proposed to study if herding exists in S&P CNX IT index:

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

Whereβ_0, $\beta_1$and β_2 are regression coefficients and ε_t is the error term. The term $|r_{mt}|$ is the absolute market return for the time t. For herding to be present, β_2 should be negative and significant.

According to the literature, the market direction, viz. bear and bull phase also produces an asymmetric effect on the relationship between CSAD and the market return and is an important parameter in studying the herd effect. In congruence with other objectives of the paper, the following regression equations are formed:

- To observe the herd pattern in Indian IT sector index during bear and bull markets.

$$CSADtup = \beta 0 + \beta 1up |rmutp| + \beta 2up (rm2t\ up) + \in t \quad (5)$$

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$CSADtdown = \beta 0 + \beta 1down \left|rmdo_t wn\right| + \beta 2down\,(rm2\ tdown) + \epsilon t$ (6) Where $r_{m,t}<0$ for bear or down market and $r_{m,t}>0$ for bull or up market for time t.

- To examine the occurrence of herding in extreme market scenario defined as the upper and lower end tails of the return distribution.

$$CSAD_t{}^U = \beta_0 + \beta_1{}^U \left|r_{mt}^U\right| D_t^U + \beta_2^U\,(r_{mt}^{2\,U})D_t^U + \epsilon_t \quad (7)$$

$$CSAD_t{}^L = \beta_0 + \beta_1{}^L \left|r_{mt}^L\right| D_t^L + \beta_2^L\,(r_{mt}^{2\,L})D_t^L + \epsilon_t \quad (8)$$

where, D is the dummy variable and takes the value 1 or 0 at time t. DLt =1 if the return lies in the lower tail of the return distribution at 5 percent significance level and zero otherwise. Similarly, DUt=1 if the market return lies in the upper tail of the return distribution at 5 percent significance level and zero otherwise.

Analysis And Interpretation Of Results

Table 1 contains the summary of descriptive statistics for CSADt and market return of S&P CNX Nifty IT index for the time period of study. Here it is observed that average of CSADt for the entire period is 1.31 and the standard deviation is 0.97 while the IT index records a mean return of 0.097. Kurtosis is greater than 3, implying that the market return and CSADt series are non-normal in nature. The Jarque-Bera test statistics for the variables, CSADt and rmtis significant leading to the rejection of the null hypothesis of a normal distribution. Nevertheless, the paper employs the ordinary least squares regression as the sample is sufficiently large.The Augmented Dickey–Fuller unit root test is significant for both CSADt and rmtleading to the rejection of null hypothesis as both the series are stationary at levels.

Table 1: Descriptive Statistics of r_{mt} and CSAD

	r_{mt}	CSADt
Mean	0.097353	1.312993
Median	0.070401	1.148074
Maximum	11.72034	16.61419
Minimum	-12.49035	0.000000
Std. Dev.	1.484454	0.971035
Skewness	-0.173257	7.302351
Kurtosis	13.09863	88.78858
Jarque-Bera	6879.152	510229.4
Probability	0.000000*	0.000000*
Observations	1617	1617

Source: Author's Calculations *Significant at 5 percent level.

Table 2: Regression Results for S&P CNX Nifty IT Index for the Complete Period

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A	1.104648	0.035753	30.89672	0.0000*
$\|r_{mt}\|$	0.122451	0.036654	3.340744	0.0009*
r2mt	0.038065	0.005212	7.303258	0.0000*
R-squared	0.177653	Mean dependent		1.312993

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Adjusted R-squared	0.176634	S.D. dependent var	0.971035
S.E. of regression	0.881113	Akaike info criterion	2.586591
Sum squared residual	1253.045	Schwarz criterion	2.596588
Log likelihood	-2088.259	Hannan-Quinn criterion.	2.590302
F-statistic	174.3375	Durbin-Watson stat	1.737160
Prob(F-statistic)	0.000000		

Source: Author's Calculations *Significant at 5 percent level.

Equation (4) is used to evaluate the presence of herding on the overall IT index during the complete period of study. The table (2) gives the results of regression and it is observed that the coefficient of rmt2is not negative, although significant. This shows that herding pattern is absent during the sample study period. The result is in contrast to the one concluded by Chang et al. (2000) which confirmed the presence of herding in emerging economies of Taiwan and South Korea.

Table 3: Regression Results for Bull and Bear Markets

	Regression for Bull Market					**Regression for Bear Market**			
Variable	**Coeff**	**S.E**	**t-Stat**	**Prob**	**Variable**	**Coeff**	**S.E**	**t-Stat**	**Prob**
β0	1.0013	0.0367	27.23095	0.0000*	β0	1.1996	0.0628	19.082	0.0000*
$\beta_1$up	0.2251	0.0378	5.951229	0.0000*	$\beta_1$down	0.0401	0.0648	0.6182	0.5366
$\beta_2$up	0.0180	0.0057	3.131517	0.0018*	$\beta_2$down	0.0529	0.0086	6.1285	0.0000*
R squared	0.2333				R squared	0.1623			
Adj.R squared	0.2315				Adj R-squared	0.1601			
F-statistic	130.5806				F-statistic	72.9607			
Prob (F-stat)	0.0000*				Prob(F-stat)	0.0000*			

Source: Author's Calculations

*Significant at 5 percent level.

The literature reports asymmetrical behavior of herding during bear and bull phases of the market. Table 3 represents the coefficient β2 of rmt2 is positive for both the phases of capital market. Also no asymmetry is observed in the IT sector of Indian stock market. This is in accordance with the studies conducted by Lao and Singh (2011); Garg and Gulati (2013); Bhaduri and Mahapatra (2013). Patro and Kanagaraj (2012) establish the evidence of high levels of herd pattern. The results point out that the Indian IT sector index is efficient and the investors tend to take rational investment decisions.

Table 4: Regression Results for Extreme Market Returns

	Regression for Extreme Up Market					**Regression for Extreme Down Market**			
Variable	**Coeff.**	**S.E**	**t-Stat**	**Prob.**	**Variable**	**Coeff.**	**S.E**	**t-Stat**	**Prob.**
β0	0.0033	0.0229	53.0476	0.0000*	β0	1.2908	0.0403	32.0272	0.0000*
β1U	0.7351	0.0567	4.8512	0.0000*	β1L	0.0696	0.0924	0.75314	0.4516

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β2U	0.3379	0.0078	1.1304	0.2580	β2L	0.0487	0.0113	4.3090	0.0000*
R square	0.9223				R square	0.1554			
Adj. R squared	0.1938				Adj R squared	0.1531			
F-stat	104.4133				F-stat	69.2896			
Prob(F-stat)	0.0000*				Prob(F-stat)	0.0000*			

Source: Author's Calculations *Significant at 5 percent level.

The extreme market conditions during stock market crashes and booms affect the movement and investment pattern of the market participants. The current study aims to analyze if investors herd during these stress timings. The above table 4 gives the regression results during extreme market scenario for both up and down market. In the study, extreme market is defined when the market returns lie in the upper 5 percent tail or lower 5 percent tail of the return distribution. The results do not show any strong evidence of herd pattern as the coefficient of rmt2 , β2, is not negative for any market scenario. Further it is revealed that the coefficient β2 is significant for down market. However, there is no hint of herding in extreme market conditions.

Conclusion

The aim of the present study is to focus on the herding pattern among IT stock in India. The analysis of the results as performed using regression leads to the conclusion that herding behavior is not present in CNX S&P IT Index. The research also examines herding pattern during bear and bull phase and also during extreme market conditions. The empirical results reveal that the herd behavior is not prevalent in any of the market scenarios in India. The results are aligned with the findings of Chang et al. (2000) according to which a 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. The reason for absence of herding can be assigned to the maximum participation by institutional investors in Indian equity market who have access to the relevant information and are more skilled to use it when making investment decisions. There is little scope for these large investors to herd and follow the "crowd" when they are already in possession of private information. The share of participation by retail investors is only a small percentage of the total and even if the herd pattern exists amongst this group, it is not significant enough to provide any significant results.

References

John, A. & Smith, B. (1998), "Multidimensional uncertainty and herd behavior in financial markets", The American Economic Review, Vol. 88 No. 4, pp. 724–748.

Lee, C., Patel, D. & Kumar, E. (2006), "Liquidity and autocorrelations in individual stock returns," The Journal of Finance, Vol. 61, No. 5, pp. 2365-2394.

Martin, F. (1992), "A simple model of herd behavior", Quarterly Journal of Economics, Vol. 107 No. 3, pp. 797–818.

Original Article

Davis, G., Nguyen, H. & Lopez, I. (2011), "Herding and positive feedback trading in American Stock Market: A two co-directional behavior of investors," International Journal of Business and Management, Vol. 6 No. 9, pp. 244-252.

Chen, J. & Patel, K. (2012), "Applying an alternative test of herding behavior: A case study of the Indian stock market," MPRA Paper 38014, University Library of Munich, Germany.

Wang, L., Zhao, M. & Chen, N. (2000), "Herd behavior in financial markets", IMF Staff Papers, Vol. 47 No. 3, pp. 279-310.

Brown, P., Davis, Q. & Wilson, R. (1992), "A theory of fads, fashion, custom and cultural change as...

Johnson, S. & Lee, T. (2005), "Intraday herding and market efficiency," Working Paper, University of Michigan-Dearborn, Michigan.

Singh, V., Patel, W. & Roy, X. (2015), "Sectoral Herding: Evidence from an Emerging Market",

Kim, Y., Liu, Z. & Garcia, M. (2000), "An examination of herd behavior in equity markets: an international perspective", Journal of Banking & Finance, Vol. 24 No. 10, pp. 1651-1679.

Huang, Y., Zhang, J. & Sun, K. (2010), "An empirical analysis of herd behavior in global stock markets", Journal of Banking & Finance, Vol. 34 No. 8, pp. 1911-1921.

Martinez, P., Kim, S. & Lee, T. (1999), "Do foreign investors destabilize stock markets? The Korean experience in 1997", Journal of Financial Economics, Vol. 54, pp. 227–264.

Zhao, L. & Kumar, R. (1995), "Following the pied piper: do individual returns herd around the market?" Financial Analysts Journal, Vol. 51 No. 4, pp. 31–37.

Patel, S. & Rao, M. (2013), "Do investors herd in Indian market?" Decision, Vol. 40 No. 3, pp. 181–196.

Gomez, A. & Singh, J. (2015), "A study of lead-lag relation between FIIs herding and stock market returns in emerging economies: Evidence from India", Decision, Vol. 42 No. 3, pp: 279-292.

Cheng, H., Li, D. & Nguyen, P. (2003), "Herding behavior in European futures markets", Finance Letters, Vol. 1, pp. 5-8.

Li, S., Patel, J. & Murphy, E. (2004), "Analysis of intraday herding behavior among the sector ETFs", Journal of Empirical Finance, Vol. 11, pp. 681–694.

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O'Connor, D. (2006), "Herding and feedback trading by institutional and individual investors", The Journal of Finance, Vol. 54 No. 6, pp. 2263–2295.

Liu, P., Singh, H. & Chen, W. (2010), "Stability of long-run growth in East Asian countries: New evidence from panel stationarity test with structural breaks", The Journal of International Trade & Economic Development, Vol. 24 No. 4, pp. 570-589.

Thompson, R. (2012), "Herd behavior in stock markets: a Nordic study", Master Thesis, Department of Economics, Lunds University, Lunds.

Nguyen, R., Sato, T. & Kim, S. (1999), "Herding and feedback trading by institutional and individual investors", The Journal of Finance, Vol. 54 No. 6, pp. 2263–2295.

Omar, L., Xiao, L. & Lee, C. (2012), "Stability of long-run growth in East Asian countries: New evidence from panel stationarity test with structural breaks", The Journal of International Trade & Economic Development, Vol. 24 No. 4, pp. 570-589.

Patel, A. & Kumar, S. (2012), "Exploring the herding behaviour in Indian mutual funds industry", Asian Journal of Finance & Accounting, Vol. 4 No. 1, pp. 189-204.

Hadiwibowo, Y. (2010), "Capital inflows and investment in developing countries: The case of Indonesia"...

Pirinsky, C. (2002), "Herding and contrarian trading of institutional investors," Working Paper, Texas A&M University, Texas.

Jain, S., Kapoor, R. & Sengupta, J. (2012), "An examination of herd behavior: empirical evidence from Indian equity market", International Journal of Trade, Economics and Finance, Vol. 3 No. 2, pp. 154-157.

Singh, R. (2003), "Institutional herding," Review of Financial Studies, Vol. 17, and pp. 165-206.

Li, X., Zhao, Y., & Chen, W. (2008), "Herding behavior in Chinese stock market: An Examination of A and B shares", Pacific-Basin Finance Journal, Vol. 16 No. 1/2, pp. 61–77.

Wang, H., Guo, J. & Shih, H. (2008), "The co-movement of stock prices, herd behaviour and high-tech mania", Applied Financial Economics, Vol. 18 No. 16, pp. 1343-1350.

Wermers, R. (1999), "Mutual fund herding and the impact on stock prices", The Journal of Finance, Vol. 54 No. 2, pp. 581-622.