Do Banking Sector Stocks Herd?: An Anecdote From India

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Abstract

The recent busts and booms in the financial markets reinforce the thought that investors are normal and not always rational in making investment choices. Their behaviour plays a major role in guiding the stock picking pattern. Our study investigates herd behaviour in the banking sector stocks trading in the Indian equity market. Employing the methodology of cross sectional absolute deviation and using quantile regression estimate on daily data for the period April 02, 2012 to March 31, 2017, we find significant evidence of herding in the overall market. The study also concludes that herd behaviour is asymmetric in nature and more pronounced during rising market movements for higher quantiles. Our study does not conclude any significant herding during extreme market movements. The findings of the paper have a noteworthy implications for the portfolio managers, policy makers and regulators.

Keywords: Herd Behaviour, Cross Sectional Absolute Deviation, Quantile Regression Estimate, Portfolio Management
JEL Codes: G1, C21, G11, G4

INTRODUCTION

The theory of market efficiency in financial literature is a guide to stock market price movements. The security prices incorporate all

information at all moments in time for the assets to be free of any mispricing and biases. However, if investors share heuristics or there are limitations in accessing information, then a broader and normal approach of behaviour finance prevails. According

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to Hirshleifer (2001), the expected return of an asset is a function of risks and misvaluations. A new breed of economists theorize that stock prices do not necessarily react to new information, but are at least predictable and react to behavioural patterns. One such investor behaviour is herding in financial markets (Froot, Scharfstein and Stein, 1992; Christie and Huang, 1995; Bhikchandani and Sharma, 2000; Chang, Cheng and Khorana, 2000). Herd phenomenon exists when market participants imitate the investment patterns and decisions of others whom they believe possess more information and indulge in buying or selling securities based on that over a period of time in large numbers. According to Banerjee (1992) herding is defined as "everyone doing what everyone else is doing, even when their private information suggests doing something quite different." Hwang and Salmon (2004) opine that "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." Bhikhchandani and Sharma (2000) explain that "herding arises out of obvious intent by investors to copy the behaviour of other investors". They classify herding into spurious and intentional and explain that former arises because investors have similar information that leads to similar investment decisions, consequently causing an efficient outcome (Froot et al., 1992). Whereas intentional herding is a result of conscious imitation that results in inclusion of behavioural biases in asset prices. Devenow and Welch (1996) further classify intentional herding into rational and irrational forms. When investor moves with the crowd assuming that others are better informed than him, it results in rational herding whereas irrational herding is when investors blindly follow the crowd's investment patterns (Banerjee, 1992; Bhikhchandani, Hirshleifer and Welch, 1992). In the aftermath of the financial crisis of 2008, herding and crowd behaviour have become disparaging terms and have come to the limelight again. It is widely believed by financial market participants that herding exasperates market volatility (Hellwig, 1980; Froot et al., 1992) in turn resulting in informational inefficient markets.

Volatility in the markets leads to sentiment driven investment patterns and market movements are not just a result of fundamental news but also sentiment driven investing behaviour. Shiller (1990) in partial support to the efficient market hypothesis also concludes that psychological and sociological beliefs of investors exert more influence on the financial markets than the economic sense. Numerous reasons that justify herding are fear of loss, belief that others know more about an investment or the lower cost of procuring information.

The present paper attempts to study the herd behaviour in an emerging economy- India. Although studies on herd behaviour are aplenty, yet very few have focussed on examining the fruitful market of India. Also, during herding, investors generally "crowd around" a particular "hot stock" to invest in and "losing stock" to sell out. Thus, herd behaviour should be prevalent around an industry or sector in the market as well and research on industry herding is imperative. Studies on sector specific herd behaviour have been very few and scarce in number. Our research aims to fill this gap by examining the stocks of banking sector trading in the Indian equity market for herd behaviour. In addition most of the studies that examine herd behaviour from the point of view of the aggregate market return employ ordinary least squares regression. The current paper however, uses quantile regression model to investigate herding. Our choice of the banking specific stocks is of significance as the sector in India is a study of contrasts. According to the McKinsey article dated June 2017, on one hand the sector supports the world's fastest growing economy and on the other hand is grappling under the heavy weight of non performing and stressed assets. However, despite the legacy of banks being under pressure, the sector as whole represents tremendous growth opportunities in creating value. Banks being the backbone of the economy face a problem of aggregation as the risk position in one bank affects others in the system. This interconnectedness and interdependency calls for an efficient risk management system that is capable of anticipating

the changes in the environment. During extreme stress periods in the financial markets, when herd behaviour might exist, banks should provide the fix points and ideally should stay outside the asset bubbles. Such "financial system fixes" should provide stability. Even if other institutions exist, it is the primary responsibility of the banks to prevent any shocks. Also if the price signals are misleading and institutional arrangements fail, the risk of banking sector is endogenous. It is thus imperative to study herd behaviour from the point of view of the banking sector especially in the aftermath of the 2008 financial crunch. The rest of the paper is arranged as follows: Section 2 is the review of literature followed by the originality of the study in section 3. Section 4 is objectives, data and methodology. The next section is results and analysis. The last section concludes the paper followed by implications of the study in section 7 and references.

REVIEW OF LITERATURE

The literature on herd phenomenon in financial markets can be classified under two types. The first category is the one that studies the prevalence of the herd behaviour at a participant or micro-level like security analysts, foreign institutional investors, mutual funds and newsletters and the second category that studies the aggregate market wide herding by using the market return dispersions. The most prominent research in the first category is the seminal work of Lakonishok, Shleifer and Vishny [LSV] (1992). The study examines the investment behaviour of 341 money managers and finds no herd pattern. The LSV (1992) method is used to examine herd behaviour among mutual funds by Wermers (1999) for the US market to confirm the presence of herding. Mutual funds in India also herd and the level is more compared to the developed countries (Patro and Kanagaraj, 2012; Lakshman, Sankarshan and Vaidyanathan, 2013). Venezia, Nashikkar and Shapira (2011) use the LSV (1992) measure to examine the Israel market for the time period 1994 to 1997 for firm specific and macro herding by

investors. The study finds that amateur investors herd more compared to the professional investors. Banerjee (1992) argues that the decisions of investors is based on the decisions of other agents. Kultti and Miettinen (2006) conclude that investors weigh the cost of acquiring information with the incentives. If the incentives exceed costs, then herd pattern gets started after the third agent and if incentives are not sufficient to cover the observation costs, then all investors follow their independent decisions. Reputational based herding is documented by Scharfstein and Stein (1990). Risk averse behaviour and periods of uncertainty may also lead to herding among investors (Palley, 1995; Avery and Zemsky, 1998). Other studies find that people reason consciously under conditions of certainty while they herd unconsciously during periods of uncertainty (Prechter and Parker, 2007; Baddeley, 2010). Kodres and Pritsker (1995) find that broker-dealers with positions in foreign currency and S&P 500 Index futures contract herd. In addition, pension and hedge funds with positions in S&P 500 Index contract also herd. Herding has also been studied with respect to the residence status of the investor. Kim and Wei (2002) conclude that all groups of foreign investors (resident and non resident) herd albeit the intensity is more for individual investors compared to institutional investors. A possible explanation for the same can be the quality and timeliness of information which is more with institutional investors viz a viz individuals. Similar results were obtained by Agarwal, Ming Chui, Chunlin and Rhee (2011) for Indonesian markets. In contrast, some studies conclude that institutional investors exhibit significantly higher herd behaviour than individuals (Choe, Kho & Stulz, 1999; Bowe and Domuta, 2004; Hsieh, 2013; Nofsinger and Sias, 1999; Iihara, Kato and Tokunaga, 2001). However, they point out that institutions follow information rather than 'trend chasing'. Herding among security analysts has been researched empirically by De Bondt and Forbes (1999) for the UK markets. Reputation concerns, consensus forecast credibility and forecast ability of the analysts are the reasons for analysts to herd (Cote

and Sanders, 1999; Trueman, 1994) with higher levels of herding exhibited by subjects with greater reputational concern and consensus forecast credibility. Newsletters also herd on Value Line and around each other especially to maintain the high reputational capital and analysts are willing to sacrifice their accuracy for protection of reputational concerns (Graham, 1999). Rajan (1994) gives the evidence of the banking crisis of the New England bank and argues that even rational bank managers are influenced by other banks and set credit policies accordingly. Fernández, Garcia-Merino, Mayoral, Santos and Vallelado (2011) in their study analyse the impact of availability of financial information and individuals' cognitive profile to infer that information limitations in an uncertain environment contribute to herd behaviour.

The second set of research focuses on the aggregate market level activity using return dispersions to examine herd behaviour. The pioneer study in this method is by Christie and Huang (1995) using the metric of cross sectional standard deviation (CSSD). CSSD measures the difference between individual security return and market return. The study examines the firms listed on NYSE and AMEX to find no herd pattern during periods of market stress or high price volatility. A variant of CSSD is cross sectional absolute deviation (CSAD) by Chang et al. (2000) that can be used to study herd phenomenon. During periods of herding, due to collective behaviour of the investors, the dispersion between individual security return and market return should decrease. During perfect herding CSAD should be equal to zero. The study finds no herd behaviour for the US and Hong Kong markets while Japan has partial herding and South Korean and Taiwanese equity markets display significant herd pattern. A different methodology is proposed by Hwang and Salmon (2007) of beta herding. The study proposes a non parametric measure to investigate herd behaviour in the US, UK and South Korea equity markets from July 1963 to December 2003. The model is based on the convergence of betas of individual stocks towards the market beta during

periods of herding. The study concludes that beta herding is evident during smooth functioning of the market while during crisis, investors seek fundamental value rather than herd. Cakan and Balagyozan (2014) study the Turkish banking sector for the period 2007 to 2012 and find enough evidence of herding. Kumar, Bharti and Bansal (2016) examine the Nifty index of the Indian equity market for the period 2008 to 2015 and conclude no evidence of herd behaviour. On the contrary, Lao and Singh (2011) find that Indian markets exhibit herd pattern during up swings. In another sector specific study of stocks of information technology industry in India by Kumar and Bharti (2017), no considerable herd pattern is concluded. Stock markets of Athens exhibit herding (Caporale, Economou and Philippas, 2008) and Italian markets display herd behaviour during stress periods (Caparrelli, D'Arcangelis and Cassuto, 2004). Chiang and Zheng (2010) conclude herding in Chinese A-share markets whereas Yao, Ma and He (2014) and Lao and Singh (2011) conclude Chinese B-share markets show significant herd pattern during decline phase. However Tan, Chiang, Mason and Nelling (2008) infer herd pattern during both up and down phases of the Chinese A-share and B-share equity markets. Luo and Schinckus (2015) find herding in the US impacts the Chinese markets. Chiang and Zheng (2010) infer that herd phenomenon from the crisis country spills to other Asian countries. Khoshsirat and Salari (2011) reject herding at the aggregate market level for Tehran stock exchange but find evidence in automobile and minerals industries. Pochea, Filip and Pece (2017) examine the stock markets of the Central and Eastern European countries and conclude that herd behaviour is present under asymmetric market movements and in all countries except Poland and Romania.

ORIGINALITY OF THE STUDY

The present research differs from the existing studies on the following grounds:

- 1) The existing literature focuses more on the developed equity markets with only a handful

of studies in the past done on India. Indian markets make for an interesting study as the equity markets are likely to be "outperformers" (Economic Times, 24th June, 2018) and Indian equity market cap is expected to touch USD 6.1 trillion by the year 2027 (Business Standard, March 12, 2018). It is therefore important to examine if behavioural bias of herding exists in the Indian equity market as it can have significant implications for the market participants.

- 2) Certain characteristics are specific to the Indian equity markets that make its functioning distinct from the international context. For instance, retail investor participation, evolving nature of the market, transaction costs, investment in financial assets vis-a-vis other asset classes. These features have a potential to dictate the behavioural biases and investment patterns for investors.
- 3) There are only a handful of studies available globally that examine sector-specific herd phenomenon, and the number is even lesser for the Indian equity market. To the best of our knowledge, the current study is the first one to examine if herd pattern exists for the banking sector stocks in the Indian equity market.
- 4) The present study uses the quantile regression estimate rather than the ordinary least squares estimate to examine herd pattern. Quantile regression provides regression analysis over the entire return distribution, thus providing a complete picture and helps in better analysis for crisis periods as well.

OBJECTIVES, DATA AND METHODOLOGY

Objectives

Following are the objectives of the study:

1. To investigate the presence of herd behaviour in the stocks of the banks that trade on CNX Bank Nifty Index in Indian equity markets.
2. To examine herd behaviour for the banking sector stocks that trade in Indian equity markets under asymmetrical market movements, i.e.

bear and bull phases.

3. To identify the herd behaviour in different quantiles of returns of CNX Bank Nifty Index during extreme market movements.

Data

The study uses the daily data files of CNX Bank Nifty Index extracted from the data base Prowess, Centre for Monitoring Indian Economy, (CMIE). The time period of the study is April 02, 2012 to March 31, 2017. The data for constituent firms, totalling eleven, that comprise the CNX Bank Nifty Index is also sourced from Prowess. We adjust the daily prices for any intermediate stock splits and bonus issues to make the entire data comparable. We have a total of 1239 observations.

Methodology

The present study uses the metric of CSAD (Chang et al., 2000) to examine herd pattern in the stocks of banking sector in Indian equity market. "CSAD is the absolute average of the total of the difference between the expected return of individual securities and market return" (Chang et al., 2000). CSAD is given by:

$$CSAD_t = \frac{1}{N} \sum_{i=1}^N |R_{i,t} - R_{m,t}| \quad (1)$$

Where, R measures the return on security i and market m, at the time t. The market consists of N stocks at time t. R_{it} is calculated as:

$$R_{i,t} = \ln\left(\frac{P_t}{P_{t-1}}\right) * 100 \quad (2)$$

Where P is the price of the security at time t and t-1 respectively. Similarly R_{mt} is calculated as:

$$R_{m,t} = \ln\left(\frac{CV_t}{CV_{t-1}}\right) * 100 \quad (3)$$

Where CV is the closing value of the CNX Bank Nifty Index at time t and t-1 respectively.

The regression equation by Chang et al. (2000) is given by:

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

Where, β_0 , β_1 and β_2 are the intercept and regression coefficients respectively. CSAD is motivated by the Capital Asset Pricing Model (CAPM). The rational asset pricing theories argue that the dispersion and individual asset return have a linear relationship and extreme market movements result in increase in dispersion as the betas of individual stocks respond differently. However, during periods of herding, due to the collective behavioural patterns of investors towards the general market consensus, the dispersion should decrease or increase at a decreasing rate as investors converge towards the market consensus and suppress their private information. Thus, the linearity of (4) does not hold true anymore. The addition of the term R_{mt}^2 makes the relationship non linear. For herd behaviour to exist, the coefficient β_2 is significant and negative.

In the current study, we use the regression estimator of quantile regression (QREG), (Koenker and Bassett, 1978) on (4) instead of ordinary least squares (OLS) to test for the presence of herd behaviour. QREG is a mean based study and therefore a better estimator compared to OLS. Also the time series data of returns is not normal, and QREG can be easily employed on non normal data. Third, it helps in studying the extreme quantiles of the return distribution. Accordingly, by setting the levels of quantiles, herd behaviour for extremely low or extremely high returns can be analyzed.

Following is the quantile regression equation:

$$CSAD_t(\tau/x) = \alpha + \eta_1 |R_{m,t}(\tau)| + \eta_2 [R_{m,t}(\tau)]^2 + \epsilon_t \quad (5)$$

In the above equation, τ is the quantile for analysis and η_1 and η_2 are regression coefficients. During periods of no herding, the coefficients η_1 and η_2 are positive as dispersion increases linearly with market returns. Under this scenario, investors follow the

fundamentals and ignore any biases. However, during periods of herding when market participants follow the crowd, the dispersion decreases or increases at a decreasing rate and regression coefficient η_2 is statistically significant and negative. In the current study, we perform quantile regression estimate using (5) for $\tau = 0.05, 0.10, 0.25, 0.50, 0.75, 0.90$ and 0.95 . The choice of the quantiles is important as it will help in determining if herd pattern arises at a particular level of the market return distribution.

To study the herd behaviour during asymmetrical market movements, i.e. bear and bull phase, we use the following regression equation:

$$CSAD_t\left(\frac{\tau}{x}\right) = \alpha + \eta_1 (1 - D) |R_{m,t}(\tau)| + \eta_2 * D |R_{m,t}(\tau)| + \eta_3 (1 - D) [R_{m,t}(\tau)]^2 + \eta_4 * D [R_{m,t}(\tau)]^2 + \epsilon_t \quad (6)$$

Where D is the dummy variable and $D=1$ for $R_{m,t} < 0$ and 0 otherwise. We infer herding when η_3 and η_4 are negative and statistically significant for bull and bear markets respectively. In order to study herd pattern during extreme markets we use the following equation:

$$CSAD_t\left(\frac{\tau}{x}\right) = \alpha + \eta_1 (D) * |R_{m,t}(\tau)| + \eta_2 (D) * [R_{m,t}(\tau)]^2 + \epsilon_t \quad (7)$$

The extreme market returns are characterised by the right and left tails of the market return distribution. Extreme low return occurs when market return lies below 5 percent levels of the distribution on the left side and extreme high return is when the market return lies to the extreme right of tail of the distribution corresponding to the level of 95 percent. D is the dummy variable and $D=1$ when the market return lies in the extreme return tails or zero otherwise. Herding is present when the regression coefficient η_2 is statistically significant and negative.

EMPIRICAL RESULTS AND ANALYSIS**Table 1 : Descriptive Statistics**

Descriptives	CSAD_t (whole period)	R_{mt} (whole period)
Mean	1.0918	0.0592
Std. Dev.	0.4865	1.4310
Skewness	1.4919	0.0711
Kurtosis	6.1434	5.9542
Jarque - Bera	968.1408*	450.8698*
Probability	0.0000	0.0000
No. of observations	1239	1239

Source: Author's calculations

*Significant @ 5 percent

The descriptive statistics of CSAD and R_{mt} are given in table 1 for the whole period of study. The mean return of the Bank index is 0.0592 and standard deviation is 1.4310. The kurtosis value of more than 3 implies that the distribution is non normal. The Jarque Bera test value is also significant, and leads to the rejection of normal distribution. We therefore use

the quantile regression estimator to examine herd behaviour using the above variables. Also quantile regression is more robust in handling the extreme data points and outliers.

Empirical results of herding using quantile regression estimator**Table 2 : Quantile Regression Results for Overall Market**

Quantile (τ)	α	η_1	η_2	Pseudo R²
0.05	0.4526 (18.908)	0.0718(1.737278)	0.01839(1.5683)	0.0640
0.10	0.5254 (22.5621)	0.0611 (1.5624)	0.01985(1.8142)	0.0651
0.25	0.6757(36.3896)	0.0524(2.4891)	0.0234(8.2313)	0.0626
0.50	0.8518(37.8521)	0.1176(3.6879)	0.0194(2.5461)	0.0793
0.75	1.1049(33.3912)	0.1330(2.6266)	0.0182(1.4645)	0.0882
0.90	1.3639(22.9704)	0.3000(2.6368)	-0.0066(-0.2757)	0.1007
0.95	1.5787(19.9350)	0.4274(5.0305)	-0.0291*(-3.4248)	0.1212

Source Author's calculations t-statistics in parenthesis * significant at 5 percent level

Table II shows that η_2 is negative and significant for the quantile at 95 percent. This means that homogeneous behaviour prevails for the quantile value of 95%. We conclude that the banking sector

stocks trading on Nifty herd.

Herd Behaviour Under Asymmetrical Market Movement

Table 3 : Quantile Regression under Asymmetric Market Movement

Quantile (τ)	Pseudo R2	α	η_1	η_2	η_3	η_4
T= 0.05	0.0702	0.4482	0.0337	0.1013	0.0277	0.011150
		(19.1344)	(1.3878)	(1.7348)	(9.8364)	(0.5425)
T =0.10	0.0665	0.5265	0.0449	0.0901	0.0228	0.0106
		(20.2410)	(1.0009)	(1.4187)	(1.9981)	(0.4551)
T =0.25	0.0650	0.6814	0.0620	0.0167	0.0165	0.0369
		(31.342)	(1.2787)	(0.5942)	(1.1998)	(7.3898)
T =0.50	0.0815	0.8571	0.1190	0.0793	0.0138	0.0363
		(39.219)	(4.8449)	(1.8203)	(4.2280)	(3.111)
T =0.75	0.0927	1.1131	0.1502	0.0818	0.0072	0.0395
		(35.1434)	(3.2024)	(1.6020)	(1.4528)	(2.9708)
T =0.90	0.1026	1.3816	0.2571	0.2528	-0.0078	0.0126
		(19.9119)	(3.7669)	(0.7802)	(-1.0954)	(0.0870)
T =0.95	0.1242	1.6242	0.4133	0.2808	-0.0281*	0.0071
		(17.9024)	(3.9635)	(2.0149)	(-2.6344)	(0.2286)

Source Author's Calculations. t-statistics in parenthesis *significant at 5 percent level.

Under asymmetrical market movements, as given in Table 3, the results show that the coefficient of η_3 is negative and significant. We conclude that herding exists for upper quantile at 95%. Using equation (6) we infer that herd behaviour exists during bull markets. We also conclude that herding is asymmetric in nature. With increased stress on the banking sector in India, the investors are wary and

tend to herd across the general market consensus during upswings in the index as they take the good news with a "pinch of salt". However, during bear markets, investors follow the fundamentals and avoid the "crowd behaviour".

Herd Behaviour for Extreme Market movement

Table 4 : Quantile Regression Estimate for Extreme Market movements

T, Quantile	Extreme Up Market				Extreme Down Market			
	Pseudo R ²	α	η_1	η_2	Pseudo R ²	α	η_1	η_2
T=0.05	0.0223	0.4842	-0.0818	0.04061	0.0321	0.5167	-0.0861	0.0545
		(23.131)	(-1.0938)	(4.9524)		(28.562)	(-2.2311)	(9.6104)
T=0.10	0.0221	0.5932	-0.0313	0.0336	0.037	0.6026	-0.1026	0.0552
		(33.121)	(-0.7348)	(6.5933)		(39.047)	(-2.3393)	(8.3808)
T=0.25	0.027	0.7634	-0.025	0.0309	0.0406	0.7373	-0.0648	0.0472
		(42.909)	(-0.7259)	(6.8931)		(46.105)	(-1.4263)	(6.2816)
T=0.50	0.0265	1.0062	0.0277	0.022	0.0484	0.951	-0.1667	0.0753
		(48.753)	(0.4505)	(2.9857)		(47.278)	(-1.278)	(2.5815)
T=0.75	0.0319	1.3083	0.0039	0.021	0.0743	1.248	-0.0965	0.0716
		(44.859)	(0.0815)	(3.6315)		(44.1896)	(-0.4024)	(1.2849)
T= 0.90	0.0392	1.6864	0.1742	-0.0024	0.1033	1.5987	0.2177	0.0032
		(28.652)	(1.6459)	(-0.2026)		(31.943)	(0.6711)	(0.0495)
T=0.95	0.047	2.0061	0.3974	-0.031	0.1308	1.873	0.133	0.0271
		(23.508)	(2.5973)	(-1.8697)		(30.947)	(0.261)	(0.224)

Source: Author's Calculations t-statistics in parenthesis *significant at 5 percent

From the above Table 4, the value of regression coefficient η_2 is negative during extreme up market conditions for the quantiles at 0.90 and 0.95. However, the value is not significant at 5 percent level. We therefore conclude that herding does not exist for the Indian banking sector stocks during extreme market movements, either up or down. This is in contrast to the results obtained by Chang et al. (2000) that note that herding may be more pronounced during market stress periods and extreme index movements.

CONCLUSION

The present study is one of its kind that examines the herd behaviour for banking sector stocks trading in the Indian equity market. We use the method of CSAD proposed by Chang et al. (2000) and employ quantile regression estimate. The current study investigates for herding in the overall banking sector stocks in the Indian equity market, during asymmetrical movements in equity market and for extreme market movements. The analysis of the results show that the banking sector stocks in India

herd. In addition, we find support that herd behaviour exists during asymmetrical market movements and is more pronounced during bull phase. Our results are consistent with the findings of Cakan and Balagyozyan (2014) study that finds evidence of herding in the Turkish banking sector during up market movements. A possible reason for this can be the recent state of banking industry in India. The Indian banking sector is undergoing a major revamp. Post crisis period of 2008 has witnessed some major changes in the Indian banking sector with many new banking reforms being instituted. Add to this, the downward pressure of ever growing non performing assets that are estimated to be 10.2% between March 2017 and September 2017 (Financial Stability Report, December 2017, Reserve Bank of India). The SME credit has persistently remained negative throughout. The return on assets has been consistently declining and adding to the pressure on bottom. In such financial environment, any "good news" is absorbed by the investors with scepticism leading to collective behaviour. However, during bear phases investors are more confident to follow

their private information rather than herd. Previous studies find that quality and quantity of information has an effect on investor behaviour (Hwang and Salmon, 2004). During times of market stress and uncertainty, information cascades are formed that lead to herding at an aggregate market level. In contrast our study finds that during times of extreme market movements, investors are better off following their private information despite sharing common fundamentals. Our result is in congruence with Gebka and Wohar (2013) study that shows deviations from the rational behaviour are lower during stress periods. The scope of herd behaviour is vast for the Indian markets and it deserves further research.

IMPLICATIONS OF THE STUDY

The findings of this paper have a significant implication for the portfolio managers. Herding in the banking sector stocks implies the presence of diversifiable risk. The concentration of only banking sector stocks in the portfolio exposes the investor to a particular idiosyncratic risk. The current research also has implications for policy makers and regulators. Since investors are exposed to asymmetric, incomplete and sometimes even false information in the financial environment, the irrational herd behaviour is largely rooted in the investment choices that leads to sub optimal decision making and even asset mispricing. Thus, it is pertinent to have better information disclosures mechanisms that focus on quality and timeliness for efficient working of the financial markets. In addition appropriate financial education and financial literacy should be imparted through regular interventions by the policy makers and regulators.

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Appendices

Appendix A: Quantile regression estimate graph for overall market

$$CSAD_t(\tau/x) = \alpha + \eta_1|r_{m,t}(\tau)| + \eta_2[r_{m,t}(\tau)]^2 + \epsilon t$$

Appendix B: Quantile regression estimate for asymmetrical market conditions

$$CSAD_t\left(\frac{\tau}{x}\right) = \alpha + \eta_1(1-D)|r_{m,t}(\tau)| + \eta_2 * D|r_{m,t}(\tau)| + \eta_3(1-D)[r_{m,t}(\tau)]^2 + \eta_4 * D[r_{m,t}(\tau)]^2 + \epsilon t$$

Appendix C: Quantile regression estimate for extreme up market conditions

$$CSAD_t \left(\frac{\tau}{x} \right) = \alpha + \eta_1(D) * |r_{m,t}(\tau)| + \eta_2(D) * [r_{m,t}(\tau)]^2 + \epsilon_t$$

Quantile regression estimate for extreme down market conditions