Herding: Does it Exist for Consumer Goods Sector Stocks?

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Abstract

Consumer goods sector has long been considered as defensive and not prone to business cycles. However, the recent economic meltdowns, volatility spillovers and investment patterns suggest that the sector is subject to market movements and no more insulated. The present study examines the fast moving consumer groups industry stocks trading in the Indian equity market for the behavioral bias of herding. We use the modified methodology of cross sectional absolute deviation on the daily prices of the index and its constituents for the time period January 01, 2008 to December 31, 2018. No evidence of herd behavior is found at the aggregate market level or during market asymmetries of bear and bull phase. However, significant negative herding is seen during the sample period. The paper suggests the scope of future research and the implications of the study for the market participants.

Keywords: Consumer Goods Sector, Volatility Spillover, Herd Behavior, Cross Sectional Absolute Deviation, Behavior Bias

Introduction

Richard Thaler, the Nobel Prize winner of Economics argues that human beings are real and driven by their social preferences and biases, lacking self-control. These emotions affect their investment decisions too, thus questioning the market efficiency and price movements. Studies have pointed out that there exists a disparity between assumptions of financial theories and how investors actually behave (Daniel &Titman, 1999; Rubinstein, 2000). Financial market crashes provide an evidence that market participants behave normally rather than rationally (Statman, 1999). This has led to the surfacing of the theme of behavioral finance where psychology and investor behavior form the pillars of studying finance and its effects on the financial markets (Sewell, 2010). Lakonishok, Shleifer and Vishny (LSV), (1992) attribute the volatile shifts in the asset prices to investor behavioral reactions. One such behavioral bias is herding. The tendency

to follow the herd is too common and is evident from all the stock market bubbles and crisis. According to Bikhchandani & Sharma (2000), herding is a situation where humans disregard their private information and converge by imitating the crowd. They mimic the actions of others in the market while making investment decisions and trade in the same direction (Chiang and Zheng, 2010). Banerjee (1992) argues that during herding investors take decisions that are in congruence with the crowd, sometimes not even in accordance with their purpose. Galariotis, Rong & Spyrou (2015) define herding as a process where either investor converges to the average or imitate each other in the market. The seminal work of LSV (1992) shows that herding affects asset prices. Other studies examine the aggregate market activity to show how herd behavior differs with respect to the development of the financial markets (Chang, Chen and Khorana, 2000; Hwang and Salmon, 2004). Bikhchandani & Sharma (2000) argue that a profit maximizing investor herds because of an intrinsic preference for conformity with the larger crowd. Secondly, compensation and incentive schemes of money and fund managers are such that imitation is rewarded (Gümbel, 2005; Hedesström, Gärling, Andersson & Biel, 2015). On similar lines, managers herd due to reputational reasons also as it helps in avoiding poor relative performance. Another reason can be the belief that others have more information about an investment. Herding can be classified into spurious and intentional where former is an efficient outcome. The present study contributes to the empirical evidence of investor herding behavior, with a focus on fast moving consumer group (FMCG) company stocks trading in the Indian equity market. The motivation of this study is three fold. First, although there are aplenty studies on herding, there is a paucity of research that examine herd behavior at sector level. Literature shows that investors behave like lemmings and crowd around "hot sectors" while selling off the losers. It therefore becomes necessary to examine herd behavior at sector level. According to Choi and Sias (2009), trading decisions by investors are based upon industry-specific information. For instance, trade signals and investment recommendations by money and fund managers are generally at sector level that naturally forms a testing ground for any behavioral bias. Second, the growth rate of the FMCG segment in India is expected to boost the revenues of consumer goods companies to reach USD 1.1 trillion by the year 2020. Being the 4th largest sector in the Indian economy, the sector represents huge potential and is backed by structural growth drivers of online presence, demographic profile, government initiatives of foreign direct investments in single brand and multi brand retail, increasing disposable income of consumers, increase in rural consumption and discretionary spending that make the sector interesting to be examined. It is therefore imperative to examine if the behavioral bias of herding exists for the FMCG sector Index and its constituent equities. Third, majority of the studies performed on the Indian market use ordinary least squares regression (OLS) to observe herding. In this paper, we use quantile regression (QREG) as proposed by Koenker and Bassett (1978).

The rest of the paper is structured as follows: Section 2 reviews the relevant research followed by objectives of the study in section 3. Section 4 and 5 is data and methodology and interpretation of results respectively. Section 6 is conclusion followed by references.

Review of Literature

The academic debate on herd behavior remains vivid and inconclusive with empirical results producing conflicting findings, sometimes in support and other times against the presence of herd behavior. Keynes (1930) argue that in an imperfect world with information asymmetry and uncertainty, individuals are motivated to herd and follow the crowd because of the general belief that others might be better informed. The mindset of 'animal spirit' (Shiller, 2003), induces the figment of emotion and irrationality among the economic agents making them herd. Herd pattern can be studied at the participant level and the classic work of LSV (1992) shows that money managers do not exhibit herd behavior. Wermers (1999) using the LSV (1992) method confirms the presence of herding among US mutual funds. Patro and Kanagaraj (2012) and Lakshman, Sankarshan and Vaidyanathan (2013) also find mutual fund herding in India. Literature finds evidence that amateur investors herd more compared to professional investors (Venezia, Nashikkar and Shapira, 2011). Economic agents compare the cost of acquiring information and the incentives thereof to decide whether to herd or not (Kultti & Miettinen, 2006). Scharfstein and Stein (1990) document reputation based herding. Studies find that investors herd unconsciously during periods of uncertainty (Prechter& Parker, 2007; Baddeley, 2010). Herding has also been studied with respect to the constitution of the investor. Kim and Wei (2002) support that herding intensity is displayed more by individuals rather than institutional investors. The results are supported by Agarwal, Ming Chui, Chunlin & Rhee (2011) for Indonesian markets. Studies find that institutions follow information rather than "trend chasing" (Choe, Kho &Stulz, 1999; Hsieh ,2013; Iihara, Kato & Tokunaga, 2001). However, there is evidence for contrary behavior are also available. Finnish individual investors folow private information rather than the general market consensus (Ekholm & Pasternack, 2008). The major reasons for herd behavior as argued in the extant literature are reputational concerns, compensation and incentive and cost of availability of information and uncertain environment (Fernández, Garcia-Merino, Mayoral, Santos & Vallelado, 2011). The more robust finding as given by Griffin, Harris & Topaloglu (2003) is that herd behavior is localized and differs across countries and individuals and exchanges.

The other branch of research focus on herding from the risk -return relationship of the aggregate market and evaluates herding using the measures of dispersion. The pioneer in this is laid by Christie and Huang (1995) study to examine the dispersion measure of cross sectional standard deviation (CSSD) to find herd pattern. The methodology is further improved by Chang, Cheng & Khorana (CCK), (2000) using cross sectional absolute deviation (CSAD). The study finds that the developed markets of US, Hong Kong do not display herd pattern while Japan shows partial herding. On the other hand, South Korea and Taiwan show significant herd behavior. Emerging markets are more susceptible to herd behaviour owing to the limited disclosures, less transparency and efficiency of the financial markets and higher cost of information acquisition. Lao & Singh (2011) study the Chinese and Indian equity markets and find that India shows herd behavior during upswings while China displays significant herding during downswings. On the

other hand, Kumar, Bharti & Bansal (2016) conclude no signs of aggregate herd behavior or asymmetrical behaviour for the Indian equity market. Hwang and Salmon (2007) develop the model of beta herding that is based on the convergence of betas of individual stocks towards the market beta during periods of herding. The study finds equity markets of the US, UK and South Korea display beta herding during normal market conditions, however, during crisis periods, the investors seek fundamental value rather than herd. European markets also display herd pattern. Equity markets of Greece (Economou, Kostakis, Philippas, 2011; Caporale., Economou, Philippas, 2008), Italy (Caparrelli, D'Arcangelis & Cassuto, 2004) and Turkey (Kapusuzoglu, 2011) are found to herd. Sector specific herd behavior has been studied by Demirer & Kutan (2006) where it is found that Chinese markets uphold the models of rational asset pricing and significant herding is not observed. In another study, Kumar & Bharti (2017) examine the information technology sector of the Indian equity market to find no evidence of significant herding. A possible reason can be limited retail or individual investor participation in the equity market. The comparatively higher proportion of institutional investors that participate in the market have access to more relevant information and are skilled to make decisions on fundamentals rather than biases. Henker, Henker & Mitsios (2006) examine the Australian market sectors for herd behavior and conclude that the herd bias is not present at the aggregate level or industry level. Cakan & Balagyozyan (2014) analyse the Turkish banking sector for evidence of herd behavior using the method of Chang et al. (2000) and find asymmetrical behavior that is aggravated during upswings. Similar results are obtained by Bharti & Kumar (2019) study for the Indian banking sector stocks using daily data for the period April 2012 to March 2017. The study concludes significant herding for the aggregate banking sector stocks and also during upswings. Gebka & Wohar (2013) analyze 32 countries and five sectors for herd pattern using CSAD method. The study finds that the sectors of basic materials, consumer services and oil and gas stocks world-wide show deviations from the rational asset pricing theories and this deviation is more pronounced for up rather than down market movements. The information pattern at sector level has significant impact as investors, both, individual and institutional, use the sector indices as benchmark to track the portfolio performance and explain the returns (Diermeier & Solnik, 2001).

The Significance of the Study for India

The Indian equity markets are expected to be outperformers with the market capitalization expected to be USD 6.1 trillion by the year 2027 (The Business Standard, dated March 12, 2018). As the economy faces huge growth potentials, it acts like an investment magnet for the institutional and retail investors across the globe. Diversity of cultures and geographies add to the vastness of the country that is replicated in the investment pattern of the investors. Certain other characteristics for instance, proportion of retail investor participation, evolving nature of the market, transaction costs that can potentially dictate the behavioral biases and investment patterns for investors, make India distinct from other markets. Lao & Singh (2011) and Bikhchandani & Sharma (2001) opine that emerging economies are characterized by higher capital controls, more government

intervention, less transparency, tighter trading rules, market inefficiency and abnormal market volatility. These features may lead to increased herd behavior in such markets. It is therefore worthy to study the emerging equity market of India for such bias. However, the empirical research covering the evidence of herd behavior are not many for the Indian market, especially sector specific herding. Our study provides for bridging this gap in the most comprehensive manner. First, the extant literature available examines herding at a micro- participant level by studying the bias among analysts, newsletters and fund managers (Tayde & Rao, 2011; Garg & Mitra, 2015). We examine herding at an aggregate industry level. This is significant as it helps in measuring the industry returns and portfolio diversification strategies better. Second, our method of dividing the market state into bear and bull is different from the existing methods adopted by other studies. Lao & Singh (2011) find evidence of herd behavior for Indian markets during upward movements. In contrast some studies find no significant herding during asymmetrical market movements (Garg & Gulati, 2013; Kumar et al., 2016). It is important to explore the impact of asymmetrical herd behavior as it can help in timing the market and predicting market stress periods for better policy making. The study uses the concept of synchronization for identifying the bear and bull periods of market returns (Harding & Pagan, 2006). To the best of our knowledge, existing studies on Indian equity market have not used this method. Third, we use the quantile regression method (QREG), (Koenker & Basett, 1978) of estimation that provides a complete picture and helps in better analysis for extreme returns also rather than ordinary least squares.

Objectives

Following are the objectives of the study:

1) To examine the presence of herd behaviour in the stocks of the FMCG companies that trade on Nifty FMCG Index in the Indian equity markets.
2) To study the presence of herd behaviour for the FMCG 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 Nifty FMCG Index during extreme market movements.

Data and Methodology
Data

The current study uses daily equity prices of the Nifty FMCG Index and its constituent companies. The data has been extracted from the database of Prowess, Centre for Monitoring Indian Economy, (CMIE) for the time period is January 01, 2008 to December 31, 2018 for a total of 2723 days. There are a total of fifteen constituent companies in the sector index. The number of stocks do not remain constant over the entire sample period, hence only those companies for which the data was

available for the entire period have been included in the study. Thus, a total of thirteen companies are included and adjusted for intermediate bonus issues and stock splits.

Methodology

We use the methodology of dispersion to examine herd behaviour. The pioneer study by Christie & Huang (1995) uses cross sectional standard deviation (CSSD). The study argues that investors follow the general market and herd during periods of market stress. This leads to a decrease in the dispersion between individual stock returns and market return (dispersion). This relationship can be used to examine herd behaviour. CSSD is measured as:

$$CSSD_t = \sqrt{\sum_{i=1}^{N} \frac{(R_{i,t} - R_{m,t})^2}{N-1}} \quad (1)$$

Here, R_i and R_m are the return of the stock i and market m, at the time t. Market contains N number of stocks. Following is the regression equation to examine herd behaviour during market stress:

$$CSSD_t = \alpha + \beta^L D_t^L + \beta^U D_t^U + \epsilon_t \quad (2)$$

β is the regression coefficient for up (U) and down (L) market condition. As pointed by Chang et al. (2000), CSSD has the limitation that it measures herd behaviour only during stress times. However, herding can arise even during normal market conditions. CCK give the measure of CSAD, which is defined as the proximity of market returns to the individual stock returns. CSAD is given by:

$$CSAD_t = \frac{1}{N}\sum_{i=1}^{N} |R_{i,t} - R_{m,t}| \quad (3)$$

Where all symbols have their usual explained meaning.
The regression equation by Chang et al. (2000) is given by:

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

Here β is the regression coefficient. All other symbols have their usual meanings. According to the rational asset pricing theories, each individual security has a different sensitivity to the market return and should behave differently during stress periods. However, if investors behave collectively and ignore their private information, the dispersion as measured by CSAD should decrease and the linear relationship between market return and dispersion does not hold true. Thus, a nonlinear term of R^2_m is added to (4) to denote the nonlinear relation. The regression coefficient β_2 is negative and significant in the presence of herd behavior. Yao, Ma & Hi (2013) use the methodology of CSSD as given in (2) and overcome the limitation of insufficient independent variation and multicollinearity among the explanatory variables by adding average of market return ($\bar{R}_m$) and 1- day lag of CSSD ($CSSD_{t-1}$). Following is the regression equation:

$$CSSD_t = \beta_0 + \beta_1 |R_{mt}| + \beta_2 (R_{mt} - \bar{R}_m)^2 + \beta_3 CSSD_{t-1} + \epsilon_t \quad (5)$$

Pochea, Filip & Pece (2017) further improve the model by using CSAD instead of CSSD. Following is the regression equation:

$$CSAD_t = \beta_0 + \beta_1 R_{mt} + \beta_2 |R_{mt}| + \beta_3 (R_{mt} - \bar{R}_m)^2 + \beta_4 CSAD_{t-1} + \epsilon_t \quad (6)$$

All the symbols have their usual meanings as explained.

The present study uses QREG method of estimation on (6). QREG is based on median and therefore more reliable to study the extreme returns on the distribution as it can be analysed for the entire family of curves of return distribution. Following is the quantile regression equation:

$$CSAD_t \left(\frac{\tau}{xt}\right) = \beta_{0,\tau} + \beta_{1,\tau} R_{mt} + \beta_{2,\tau} |R_{mt}| + \beta_{3,\tau} (R_{mt} - \bar{R}_m)^2 + \beta_{4,\tau} CSAD_{t-1} + \epsilon_{t,\tau} \quad (7)$$

Here τ is the quantile of study.

During periods of herd behavior, the regression coefficient β_3 is negative and significant. In the current study, we perform QREG using (7) for τ = 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.

Herd Behavior Under Market Asymmetry of Bear and Bull Phase

Studies conclude that asymmetrical market movements during bear and bull runs affect herd behavior (Christie & Huang, 1995; Guo & Shih, 2008; Fu & Lin, 2010). On the other hand, Kumar et al. (2016) and Garg & Gulati (2013) find that Indian market do not herd during asymmetrical market movements. The current study examines herding for bull and bear market phases in the FMCG sector. The present paper uses the concept by Harding & Pagan (2006) for measuring business cycle co-movements using the concept of synchronization. The entire sample period is divided into bear and bull run and focuses on the local peaks and troughs of the stock prices. According to Candelon, Piplack & Straetmans (2008), bull phase becomes bearish when stock prices decline for a substantial period of time since the last peak price. Similarly, bear run turns bull, when prices increase for a substantial period of time since the last trough. We use the non-parametric approach that uses the temporal behavior of time series data of stock prices to divide the data into bear and bull phases. This helps in location of the turning points of the series for identification of the peak and trough, corresponding to the local maxima and minima. Following the Candelon et al. (20008) approach, if CVt is the closing value of the Nifty FMCG Index on day t, then a peak occurs when CVt reaches its maximum value within a window of 6 months, i.e. CVt>CVt±6months or conversely a trough occurs when CVt<CVt±6months. Similar approach is used by Lee, Chen & Hsieh (2013) to examine herd behavior in the Chinese market. This method helps in determination of the bull (bear) period as the time period between two consecutive troughs (peaks) respectively.

Case of Extreme Market Conditions

Following this, we also examine if markets show herd behavior during extreme returns that are characterized when R_m lies to the extreme left or right of the return distribution. We classify extreme movement as the market return when it lies above 5 percent or below 5 percent of the distribution. Following is the equation:

$$CSAD_t\left(\frac{\tau}{xt}\right)(UP) = \beta_{0UP,\tau} + D.\beta_{1UP,\tau}|R_{mt\,UP}| + (1-D).\beta_{2UP,\tau}|R_{mt\,UP}| + D.\beta_{3UP,\tau}(R_{mt\,UP} - \overline{R}_m)^2 + (1-D).\beta_{4UP,\tau}(R_{mt\,UP} - \overline{R}_{mt})^2 + \beta_{5UP,\tau}CSAD_{t-1} + \epsilon_{t\,UP,\tau} \quad (8)$$

$$CSAD_t\left(\frac{\tau}{xt}\right)(DOWN) = \beta_{0DOWN,\tau} + D.\beta_{1DOWN,\tau}|R_{mt\,DOWN}| + (1-D).\beta_{2DOWN,\tau}|R_{mt\,DOWN}| + D.\beta_{3DOWN,\tau}(R_{mt\,DOWN} - \overline{R}_m)^2 + (1-D).\beta_{4DOWN,\tau}(R_{mt\,DOWN} - \overline{R}_{mt})^2 + \beta_{5DOWN,\tau}CSAD_{t-1} + \epsilon_{t\,DOWN,\tau} \quad (9)$$

D is the dummy variable in the above regression equations. D=1 when R_m lies to the extreme right or left of the distribution for significance level 5 percent, otherwise D=0.

Interpretation of Results

Table 1 provides descriptive statistics for CSAD and R_m for the entire sample period. The average daily return for FMCG Index is 0.056% and varies in the range of 8.303 % to -8.513%. It has a high volatility as is seen from the standard deviation of 1.22%. CSAD has a mean of 1.36% with a standard deviation of 0.65%. Furthermore, the significant value of the Jerque–Bera test show that market return and CSAD follow non-normal distribution with a leptokurtic feature. Thus, using quantile regression estimator is better than OLS. The series of R_m and CSAD are also tested for unit root using the Augmented Dickey Fuller test. The significant value of t-statistic confirms that the series is stationary at level.

Table 1: Descriptive statistics

	CSAD	R_m
Mean	1.368855	0.056941
Median	1.237427	0.089944
Maximum	9.879849	8.303774
Minimum	0.000000	-8.513102
Std. Dev.	0.651920	1.227986
Skewness	3.257684	-0.257944
Kurtosis	26.60573	7.481304
Jarque-Bera	67938.78 (0.0000)*	2307.828 (0.0000)*
ADF	-9.288099 (0.0000)*	-51.33580 (0.0000)*

Source: Author's calculation *significant at 5 percent level

Empirical Results

Table 2 gives the results for CSAD for FMCG sector stocks trading in the Indian equity market. The estimation results for each quantile for the overall FMCG sector stocks show that β_3 is not negative, rather positive and significant for the quantile values of 5%, 50% and 75%. Studies show that there is a case of negative herd behavior (Gleason, Mathur &Peterson, 2004; Goodfellow, Bohl &Gebka, 2009) rather than positive herding. As a result, we get positive versus negative value of β_3. In such cases market participants ignore the general market consensus, and rather follow their private information. This may be due a behavioral bias of overconfidence or excessive market volatility that induces the investors to follow fundamentals and fly towards quality. Our results are in congruence with Gebka & Wohar (2013) study that finds no evidence of positive herding or negative β_3 for any of the sectors for different countries. Ouarda, Bouri & Bernard (2013) also conclude that herding exists in all sectors except consumer goods for the Euro Stoxx 600. On the other hand, Lee, Chen & Hsieh (2013) report that sector herd behavior is visible for the Chinese equity market.

Table 2: Quantile Regression Results for Aggregate FMCG Sector

τ	β_0	β_1	β_2	β_3	β_4
0.05	0.4437 (18.4907)	0.0009 (0.0741)	0.175462 (7.2925)	0.0104* (2.8395)	0.0973 (4.9029)
0.10	0.4987 (23.0308)	0.0045 (0.3616)	0.2154 (9.8053)	0.0041 (1.3527)	0.1235 (8.2619)
0.25	0.5757 (12.001)	0.0189 (1.6661)	0.1912 (2.3797)	0.0260 (0.7405)	0.1996 (6.2180)
0.50	0.6402 (22.0834)	0.0308 (2.9156)	0.1553 (4.1474)	0.0486* (3.8126)	0.3308 (15.757)
0.75	0.7970 (17.6006)	0.0087 (0.5803)	0.1337 (3.7025)	0.0617* (5.4441)	0.4328 (13.542)
0.90	0.9260 (11.0448)	-0.0100 (-0.4452)	0.1899 (1.7481)	0.0694 (1.8105)	0.5374 (10.642)
0.95	1.1111 (7.2532)	0.0116 (0.1571)	0.0585 (0.1262)	0.1191 (0.5596)	0.6138 (33.491)

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

Table 3: Quantile Regression under Asymmetric Market Movement- Bear and Bull markets

	Bull Market					Bear Market				
τ	**β 0**	**β 1**	**β 2**	**β 3**	**β 4**	**β 0**	**β 1**	**β 2**	**β 3**	**β 4**
0.05	0.427 -5.034	-0.019 (-0.823)	0.15 -0.884	-0.0004 (-0.006)	0.1372 -6.77	0.6534 -6.049	-0.0138 (-0.492)	0.102 -0.905	0.0494 -1.233	0.0068 -0.1
0.1	0.5437 -4.809	0.0012 -0.044	0.0945 -0.379	0.0293 -0.271	0.1244 -5.117	0.7284 -6.351	0.0054 -0.151	0.086 -0.515	0.0507 -0.783	0.0344 -0.568
0.25	0.7751 -12.58	0.0117 -0.547	-0.0188 (-0.277)	0.0744* -4.109	0.1147 -4.474	0.7941 -7.285	0.0295 -1.003	-0.0167 (-0.293)	0.0818* -5.4	0.1718 -2.083
0.5	0.8047 -6.216	0.0131 -0.561	0.0304 -0.353	0.0636* -2.768	0.2599 -2.561	0.7694 -9.548	0.0426 -2.21	0.0042 -0.07	0.0903* -5.916	0.3307 -6.05
0.75	0.9091 -5.879	-0.0295 (-1.243)	0.1287 -1.62	0.0415* -2.498	0.3653 -2.938	0.7399 -6.85	0.0671 -1.963	0.0184 -0.225	0.0905 -3.677	0.5272 -7.734
0.9	1.0705 -2.038	-0.0889 (-1.318)	-0.0561 (-0.049)	0.1388 -0.238	0.5224 -2.182	1.0719 -5.691	0.0661 -0.633	0.0439 -0.133	0.0906 -0.933	0.5337 -3.558
0.95	1.4634 -11.3	-0.0447 (-0.340)	-0.7888 -2.633	0.5478* -6.469	0.5362 -11.403	1.3388 -3.928	0.0949 -0.694	-0.0414 (-.0.137)	0.1504* -1.592	0.5075 -2.884

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

Table 3 gives the results for QREG for FMCG sector stocks for bear and bull phase of the market. Numerous studies find mixed results of herd behaviour during up and down market return pattern. Guo & Shih (2008) and Bharti & Kumar (2019) demonstrate that herding assumes more significance during up market conditions whereas Demirer, Kutan & Chen (2010) find bear market phase to aggravate the bias. As such there is no conclusive evidence of the impact of market return on investor behavior as it differs for each market and sector. We use the method of Harding & Pagan (2006) to identify the bear and bull phase of the market. The results in table 3 reveal that the regression coefficient β_3 is positive and significant (case of negative herding) at the lower quantile of 25%, median quantile of 50% and higher quantile of 75% for both bear and bull phases of the market. Table 4 gives the results for extreme market condition that is characterized when the market return is below or above 5% of the distribution. A negative and significant value of β3 implies herding activity. The table shows that although the value of β_3 is negative at the quantiles of 25% and 90%, it is not significant. Hence, we conclude that herd behavior is not present in the consumer goods sector during extreme market movements also.

Table 4: Quantile Regression under Extreme Market Movements

Extreme Up Market							
τ	**0.05**	**0.1**	**0.25**	**0.5**	**0.75**	**0.9**	**0.95**
β 0	0.449	0.501	0.568	0.644	0.808	0.928	1.113
	(17.877)	(20.787)	(13.679)	(22.711)	(17.52)	(13.238)	(9.44)
β 1	0.093	0.154	0.347	0.295	0.217	0.521	0.437
	(1.696)	(1.513)	(6.976)	(2.588)	(1.4)	(5.398)	(1.584)
β 2	0.18	0.209	0.203	0.159	0.148	0.181	0.045
	(7.341)	(9.61)	(3.226)	(4.911)	(2.977)	(3.722)	(0.151)
β 3	0.033	0.024	-0.0015	0.0128	0.05	-0.0114	0.0003
	(4.985)	(1.996)	(-0.260)	(0.44)	(1.949)	(-0.610)	(0.004)
β 4	0.01	0.0042	0.0147	0.0424	0.0533	0.0663	0.1189
	(3.586)	(1.622)	(0.53)	(3.918)	(2.892)	(9.26)	(0.879)
β5	0.09	0.1232	0.204	0.328	0.423	0.536	0.6187
	(4.754)	(7.498)	(7.2)	(15.895)	(12.075)	(10.592)	(33.393)
Extreme Down Market							
τ	**0.05**	**0.1**	**0.25**	**0.5**	**0.75**	**0.9**	**0.95**
β 0	0.46	0.521	0.565	0.644	0.803	0.941	1.146
	(10.762)	(23.914)	(11.828)	(16.76)	(16.88)	(11.972)	(17.711)
β 1	0.164	0.2187	0.2841	0.1363	-0.0036	0.234	0.3473
	(3.776)	(4.884)	(3.893)	(1.951)	(-0.029)	(2.472)	(2.587)
β 2	0.158	0.1611	0.169	0.143	0.1458	0.1404	-0.0364
	(2.33)	(6.628)	(2.159)	(1.691)	(4.681)	(1.589)	(-0.387)
β 3	0.012	0.0029	-0.0046	0.0466	0.0948	0.0586	0.0354
	(2.349)	(0.596)	(-0.294)	(2.621)	(2.699)	(4.348)	(1.795)
β 4	0.021	0.0234	0.0356	0.0574	0.0616	0.0899	0.1673
	(0.715)	(8.224)	(0.928)	(1.508)	(7.602)	(2.779)	(6.242)
β5	0.084	0.1225	0.2132	0.3313	0.4248	0.5383	0.6144
	(3.663)	(8.38)	(6.872)	(15.977)	(12.106)	(10.936)	(18.368)

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

Conclusion and Implications

The present research extends its contribution to the extant literature in several ways. First we document herding in an emerging market that is distinct in its structure and has contrasting behavior compared to other emerging markets that show herd pattern. Second, the FMCG sector is the fourth largest sector in the Indian economy that is likely to be an outperformer among other Asian countries. The market capitalization of the retail sector is expected to touch USD 1.1 trillion by the year 2020 that will give a major boost to the revenues of the consumer goods companies. This expected growth is backed by the fundamentals for the sector undergoing rapid changes and strong structural growth drivers like demographic dividends, rising rural disposable incomes driving discretionary spending, presence of online and ecommerce market and high urbanization rate. Motivated by the above arguments the study of the sector assumes critical importance as the investment behavior in the sector can have significant impact on the overall market efficiency. Most of the studies on herd behavior have focused on the broad equity market with only a handful of research available on sector level. In this paper we extend the research on herd pattern in FMCG sector in the Indian equity market using the approach by Chang et al. (2000). We find that consumer goods sector does not engage in significant positive herd behavior for the entire sample period or during bull and bear phase and extreme market conditions. The paper essentially proposes future avenues for research on the subject of industry herding using determinants like liquidity, volume and volatility. Also the impact of other sectors can be examined on a particular industry to understand the co-movement between sector returns that can be of importance for the portfolio managers. Future studies can also examine the effect of macroeconomic variables on herding to distinguish between fundamental and non-fundamental herd behavior. Another area of study can be to assess how domestic and foreign shareholding pattern affects herding due to information asymmetry.

Our study has implications for portfolio managers and policymakers. Financial analysts and fund managers have an affectation for a specific sector or industry. The evidence of herd behavior at that level implies that market timing strategies can be used for generating abnormal returns. Second, presence of herd pattern implies that there is idiosyncratic risk in the market and more number of securities are required for the same level of diversification (Economou et al. 2011; Chang et al., 2000). Third, FMCG sector stocks that were once considered to be defensive and non-cyclical in nature are no more recession proof. As a result, their returns are expected to be dependent on market phases which further necessitates the need for examination of the investment behavioral pattern in the sector. Fourth, the study uses daily prices of the index and constituents to examine herd behavior. However, further research can be performed for longer time horizon that may yield different results.

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