Herding Behaviour: Does it Exist in the Indian Stock Market?*

This article examines the herding behaviour in the Indian stock market for the period January 2019 to March 2020. For testing the herding activity, we use three independent datasets viz., small-cap, mid-cap, and large-cap stocks. Our findings suggest that herding behaviour exists in mid-cap stocks. Further, it is confirmed that herding activity is more prominent during the periods of negative market returns and days with net negative foreign institutional inflows.

Introduction

Herding is a process where investors in the market are trading in the same direction, mimicking the decisions and actions of previous investors, without paying any attention to their own beliefs or information (Bikhchandani and Sharma, 2000). The empirical literature on the topic highlights that herding behaviour by market participants can distort the value of the underlying stocks and increase volatility (Furman and Stiglitz, 1998; Morris and Shin, 1999). Testing of herding behaviour in financial markets is, therefore, increasingly researched in the recent period by employing different scenarios and assumptions in the context of developed and developing countries. However, except for a few studies, most of the studies are based on models developed by Christie and Huang (1995) and Chang *et al.* (2000). These models primarily identify herding behaviour based on return dispersions, particularly cross-sectional absolute deviations of returns.

The presence of herding activity questions the validity of the Efficient Market Hypothesis (EMH), which primarily assumes that all investors are rational and have the same information, and similarly predict the expected stock price. Resultantly, the stock price should reflect the information available in the market and the securities' actual value. However, in the presence of herding behaviour, investors are not essentially rational, and they may not derive the stock price by applying their knowledge and beliefs, but by observing and adopting the actions of other investors, even though not all market participants are fully informed. Because of this, herding activity disrupts market movements by shifting the value of securities away from their fundamental value (Demirer and Kutan, 2006).

The objectives of this article are three-fold. First, our primary focus in this article is to ascertain the presence of herding behaviour in Indian stock market by adopting the most widely used methodology posited by Chang *et al.* (2000). The herding activity is tested across these three categories – large-cap, mid-cap and small-cap stocks.[1] Testing herding behaviour across these three stated categories will be useful in identifying information asymmetries if any, in the Indian stock market, which is considered as the oldest, fast-growing and one of the most vibrant markets in Asia[2]. Examining the herd behaviour in Indian stock market therefore, immensely help regulators and policymakers to understand market efficiency and growth.

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[1] As per SEBI:

- The top 100 companies listed in the stock market based on market capitalization are classified as large-cap companies.

- The companies ranked from 101 to 250 in terms of market capitalization are known as mid-cap companies.

- The companies ranked from the 251st position onwards in terms of market capitalization are known as small-cap companies.

[2] According to Goldman Sachs report 2021, the market capitalisation of Indian stock markets is likely to surpass the UK and Middle East and the country will become 5th largest in the world by 2024 *(https://www.firstpost. com/business/goldman-sachs-says-india-could-surpass-uk-as-worlds-fifth-largest-stock-market-by-2024-9984671.html).*

Second, we test the herd behaviour during periods of positive and negative market returns, and third, we examine whether herd behaviour exists during days when there are net outflows and net inflows of foreign equity investments[3]. The rest of the article is organized as follows: Section II presents a brief review of literature on herding behaviour. Section III describes the data and empirical methodology used in the study. Section IV discusses the results, and the last section reports concluding observations.

II. Brief Survey of Literature

Previous research on herding in financial markets found mixed results. Different studies infer that herding activity is more common in emerging market economies than developed ones. Some studies indicate that information asymmetries in the market generally force investors to mimic the actions of their peers while taking investment decisions. Herding behaviour in markets is examined across five major economies *viz.*, US, Japan, Hong Kong, Taiwan, and South Korea by Chang *et al.,* (2000). The authors found strong evidence of herding in South Korea and Taiwan, while weak evidence in the case of Japan and no evidence in the US and Hong Kong markets.

By employing different methods, herd behaviour is observed in the US and South Korean markets during the up and down market (Hwang *et al.,* 2004). Similarly, investors try to exhibit herd behaviour in Chinese dual-listed stocks (Tan *et al.,* 2008). On the contrary, no evidence of herd behaviour is found in China (Demirer *et al.,* 2006). A comprehensive study

on herd behaviour is conducted by using a sample of 18 advanced and emerging market economies by Chiang and Zheng (2010). The authors report no evidence of herding in US and Latin American markets; however, they found that investors in Asian markets exhibited a certain degree of herd behaviour during up and down markets. Similarly, evidence in support of herd behaviour is found in four developed European markets namely France, Germany, Italy, and the UK (Philippas *et al.,*2011). Herding behaviour is found in Italian stock market during extreme market conditions by Caparrelli *et al.,* (2004).

Some studies found that foreign investors engage in herding more often than local investors (Bowe and Domuta, 2004). The herding spill-over effects is also investigated at global level by Chiang *et al.,* (2010). The authors found the presence of contagion effects between markets during the crisis period. Similarly, intensified herding spill over effects found across markets during periods of high volatility (Klein, 2013). The author used Markov switching model for examining the correlation among different markets.

In the Indian context, studies find mixed results, some authors found no evidence in support of herd behaviour, while some authors found herd behaviour in Indian stock markets (Jindal (2014), Poshakwale *et al.,*2014). The impact of institutional herding on asset prices is examined by (Dasgupta *et al.,* 2010). The authors found that institutional herding negatively predicts long-term returns but positively predicts short-term returns. Examining the information-based herding behaviour between unprofessional and professional investors, Venezia *et al.,* (2011) find that the propensity to herd is lower in the case of professional investors. The authors also infer that the behaviour is persistent, and it is positively associated with return volatility.

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[3] While examining whether Foreign Institutional Investors exhibit herding and positive feedback trading while investing in the Indian stock markets Tayde *et al.,* (2011) find that that Foreign Institutional Investors exhibit herding and positive feedback trading during different phases of the stock market. This observed behaviour is prominent in but not restricted to large cap stocks as they enjoy better liquidity.

III. Data and Methodology

For empirical estimations, we used data from three different sources *viz.,* National Stock exchange (NSE), Centre Monitoring Indian Economy (CMIE), and CEIC. The market return is calculated from Nifty50 index collected from the NSE website. The information on small-cap, mid-cap, and large-cap stocks is extracted from the CMIE Prowess database. In all, we could include 91 small-cap, 95 mid-cap, and 83 large-cap stocks in the analysis. The data on net foreign equity investments[4] (FEI) is extracted from CEIC database. The sample period chosen for this analysis is January 2019 to March 2020[5].

To test whether herding activity is driven by the fluctuations in the market, we split sample period into four distinct sub-periods *i.e.,* (i) trading days with positive market returns (market-up) (ii) trading days with negative market returns (market-down), (iii) trading days with net positive foreign equity investments and (iv) trading days with net negative foreign equity investments.

Detecting herding towards the market

Herding may lead market participants to conform to the market consensus. In such a case, if the behaviour of market participants is endorsed on market returns, dispersions will decrease on account of their tendency to cluster around the average market return. To detect herding activity on the Indian stock market, we adopt the methodology suggested by Chang *et al.,* (2000) and subsequently modified by Galariotis *et al.,* (2015) and Lin *et al.,* (2015). According to Chang *et al.,* (2000), low dispersion of returns around their cross-sectional

average indicates that market investors try to mimic trading trends around the market average and discard their prior beliefs and information. The dispersion of returns is computed by the Cross-Sectional Absolute Deviation of returns (CSAD) as follows:

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

Where, $R_{i,t}$ is the return on stock i at time t and $R_{m,t}$ is the cross-sectional average of the N returns in the aggregate market portfolio at time t. Chang *et al.,* (2000) envisage that standard asset-pricing models predict the link between the CSAD and the absolute market returns as positive and linear. On the other hand, herding behaviour around the market consensus alters the linear relationship into a non-linear one. The non-linear relationship between CSAD and market return is expressed as follows:

$$CSAD_t = \alpha + \beta_1 |R_{m,t}| + \beta_2 R_{m,t}^2 + \varepsilon_t \qquad ...(2)$$

Where α is the intercept, β_1 and β_2 are regression coefficients, and ε_t is the error term. In equation (2), the non-linear relationship is captured by the squared market return ($R_{m,t}^2$). If there is no herding activity, equation (2) assumes β_1 to be positive and β_2 either equal to zero or β_2 is greater than zero. Negative and statistically significant β_2 values indicate herding behaviour.

IV. Results and Discussion

The descriptive statistics of small-cap, mid-cap, and large-cap stocks are reported in Table 1. It is observed that the median value of daily returns is the highest for large-cap stocks followed by mid-cap and small-cap stocks during the period of study. This suggests that large-cap stocks on average performed better than the other two groups. However, we also find higher volatility in large-cap stocks, closest to the volatility of the Nifty50 index. The skewness of returns of small-cap is positive while it is negative for other groups. Both mid-cap and large-cap return distributions are leptokurtic (kurtosis is more than

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[4] Net equity investments by foreign institutional investors and foreign portfolio investors.

[5] We have selected data from January 2019 to March 2020, since this period covers several important events such as budget announcements, general elections, rate-cut in corporate tax, arrival of Covid19 *etc.,* which may have considerable impact on movements in stock market.

ARTICLE

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Table 1: Descriptive statistics

Return	Median	Standard deviation	Skewness	Kurtosis	Min	Max
Market (Nifty50)	0.02%	1.55%	-2.36	21.62	-12.98%	6.62%
Small cap Stocks	-0.13%	1.25%	0.38	1.02	-3.36%	4.16%
Mid cap Stocks	-0.004%	1.47%	-2.72	21.48	-12.67%	5.64%
Large cap Stocks	0.003%	1.55%	-1.98	15.45	-11.92%	5.61%
Market-up	0.50%	0.99%	3.51	14.88	0.01%	6.62%
Market-down	-0.55%	1.53%	-4.95	30.48	-12.98%	0.00%
Positive FEI	0.03%	0.87%	-0.69	4.43	-4.38%	2.89%
Negative FEI	-0.01%	1.93%	-2.53	15.99	-12.98%	5.83%

3), while the return distribution of small-cap stocks is platykurtic (less than 3). Median return is positive during the episodes of the upmarket and net positive FEIs. The volatility greatly differs across periods with the market-down and net negative FEIs causing a higher degree of volatility indicating that negative news impacts the market to a greater degree.

Further, the descriptive statistics in respect of the CSAD measure are reported in Table 2. The statistics reveal that the average CSAD is higher for large-cap stocks as compared to small-cap and mid-cap stocks. The dispersion trend fits well with the hypothesis of information asymmetry, as large cap stocks tend to have greater coverage and availability of data, therefore greater dispersion from the mean. Similarly, the standard deviation of CSAD for the large-cap stock is higher than the other two groups.

Table 2: Descriptive statistics on CSAD

Item	Small-cap stocks	Mid-cap stocks	Large-cap stocks
Mean (per cent)	1.45	1.50	2.00
Median (per cent)	1.29	1.38	1.85
Std. Dev (per cent)	0.63	0.52	0.67
Skewness	2.97	2.74	1.28
Kurtosis	10.52	9.79	1.35
Minimum (per cent)	0.68	0.80	1.10
Maximum (per cent)	4.69	4.23	4.29

Dispersion of Returns

Table 3 reports the results of a regression equation (2) regarding herding behaviour in the market. Our results indicate that investors on the Indian stock market exhibit herding behaviour only in respect of mid-cap stocks, while in the case of small and large-cap stocks we do not find any evidence in favour of herding activity.

Market movements and herding

To investigate whether stock market returns induce investors to herd, an attempt is made to distinguish between 'market-up' days and 'market-down' days and test the herding activity between these two groups. This classification helps to observe another tenet *i.e.,* whether negative returns are more likely to induce herding than positive returns. The results indicate the presence of herding behaviour in case of mid-cap stocks only on days when the market

Table 3: Regression Results for full Sample

(1)	Small-Cap		Mid-Cap		Large Cap	
	(2)	(3)	(4)	(5)	(6)	(7)
	β_1	β_2	β_1	β_2	β_1	β_2
Full sample	0.037	8.54***	0.43***	-1.40***	0.49***	1.71***
p – value	0.7786	0.0211	0.0000	0.0001	0.0000	0.00028
R²	*0.01*		*0.57*		*0.53*	

Table 4: Market movements and herding

(1)	Small-Cap		Mid-Cap		Large Cap	
	(2)	(3)	(4)	(5)	(6)	(7)
	β_1	β_2	β_1	β_2	β_1	β_2
Market-up	0.34**	2.09	0.28***	4.33***	0.30***	3.94***
p – value	0.0583	0.6382	0.0007	0.0117	0.0005	0.0142
R²	*0.18*		*0.58*		*0.61*	
Market-down	-0.36	19.54	0.35***	-0.89***	0.41***	1.27***
p – value	0.2407	0.1915	0.0000	0.0314	0.0000	0.02710
R²	*0.02*		*0.64*		*0.52*	

Note: Market-up means when Nifty returns (daily) are observed positive and Market-down means when Nifty returns are negative

is down (*i.e.*, negative market returns). Our results are consistent with Christie and Huang (1995) who stress that a 'herding' is more likely to form under conditions of market stress. We found no evidence of herding in respect of small and large-cap stocks either for up or down market.

Foreign flows and herding

To examine whether herding behaviour is driven by the fluctuations in foreign flows, we classify trading days into two groups – (i) days when there are net foreign inflows and (ii) days with net foreign outflows. The results confirm the herding behaviour during days when there are net outflows of Foreign Equity Investment (FEI) in respect of mid-cap stocks. We find no such evidence in the case of small and large-cap stocks. The lack of evidence of herding behaviour is in line with earlier studies conducted in different markets using a similar methodology (Gleason *et al.* (2004)).

Table 5: Results of Regression Model

(1)	Small-Cap		Mid-Cap		Large Cap	
	(2)	(3)	(4)	(5)	(6)	(7)
	β_1	β_2	β_1	β_2	β_1	β_2
Positive FEI	-0.0620	19.17	-0.05	16.86***	-0.16	18.58***
p – value	0.8310	0.1384	0.65	0.003	0.12	0.000
R²	*0.09*		*0.24*		*0.41*	
Negative FEI	-0.045	9.71***	0.48***	-1.87***	0.52***	2.12***
p – value	0.8127	0.0319	0.0000	0.0000	0.0000	0.0003
R²	*0.14*		*0.66*		*0.57*	

Note: Market-up means when Nifty returns (daily) are observed positive and Market-down means when Nifty returns are negative

V. Conclusion

This article investigated the herding behaviour in the Indian stock market during the period January 2019 to March 2020. The methodology *viz.,* Cross-Sectional Absolute Deviation (CSAD) posited by Chang *et al.,* (2000) is used for testing the herding activity in the market. The results suggest that overall, investors in the Indian Stock Market do not exhibit herding behaviour, except for some evidence of herding activity in respect of mid-cap stocks. Further, the investors' mimicking behaviour is more noticeable during days with negative market returns and days with net outflows of foreign equity investment. Though herding was not found for the other categories, we did find evidence of non-linear association between CSAD and market returns for large-cap and small-cap stocks implying greater individual decision making.

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Annex-I:

Net Foreign Equity Investment