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INVESTORS' HERDING BEHAVIOUR IN INDIAN STOCK MARKETS DURING COVID 19: A CSSD AND CSAD APPROACH

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ABSTRACT

The World has witnessed one of the most severe crises, a resulting effect of COVID 19 virus. This virus was never seen before in the human history and was declared as Pandemic by World Health Organization (WHO) on 11th March, 2020. Any crises like situation creates an imbalance in the economy which also gets penetrated in the stock markets of the country. The investors sentiments get weakened due to the negative impact of such incidences on various aspects of economy. Investors tend to exit from the market in such situation and look forward for better investment options or cash liquidity. Nevertheless, investors depict such behaviour in groups and herding tend to be me prevalent during such period of market stress (Bouri et al. 2021). Therefore, the present research tries to explore the herding behaviour of investors in Indian stock market. The study examines the presence of herding possibilities in Nifty 50 stocks of Indian stock market during the phase of Covid 19. The Cross-Sectional Standard Deviation (CSSD) methodology proposed by Christie and Huang (1995) and Cross-Sectional Absolute Deviation (CSAD) suggested by Chang et al. (2000) has been applied to detect the herding effect on stock prices of 50 composite stock of Nifty 50 index of Indian Stock Market.

Keywords: COVID 19, herding, Cross-Sectional Standard Deviation (CSSD), Cross-Sectional Absolute Deviation (CSAD)

1. INTRODUCTION

The World has witnessed one of the most severe crises, a resulting effect of Covid 19 virus. This virus was never seen before in the human history and was declared as Pandemic by World Health Organization (WHO) on 11th March, 2020. The severity of Covid affected the human lives with more than 50,000 deaths in around 218 countries worldwide. Countries across the world were affected politically, socially, economically as well as financially. The pandemic has resulted shut downs which has led to the financial crises like situation in various economies. India was declared the third worst affected county by the virus. Initially, few cases were recorded with lower fatal rates due to strict lockdowns and demographic dividend (Goel et al. 2020). The opening up of the economy post lockdown however has resulted into the spike of Covid 19 cases increasing the death rates in the country.

Any crises like situation creates an imbalance in the economy which also gets penetrated in the stock markets of the country. The investors sentiments get weakened due to the negative impact of such incidences on various aspects of economy. Investors tend to exit from the market in such situation and look forward for better investment options or cash liquidity. Nevertheless, investors depict such behaviour in groups and herding tend to be me prevalent during such period of market stress (Bouri et al. 2021). Herding refers to the group of investors trading in the same direction (Heui et al. 2021). Herding reflects a group tendency of investors in which one tries to imitate the other or they take collective decision in group. Since the behaviour of investors is collective, the stock prices often show inefficiency in the market moving away from their equilibrium level leaving profitable opportunities for investors. The herding will cause deviation in the asset prices increasing market volatility and unwanted market crash (Heui et al. 2021).

Therefore, the present research tries to explore the herding behaviour of investors in Indian stock market. The study examines the presence of herding possibilities in Nifty 50 stocks of Indian stock market during the phase of Covid 19. The paper is further structured at follows: Section 2 reviews the literature related to the topic, Section 3 elucidates data and methodology, Section 4 discusses the analysis and finding and Section 5 concluded the topic.

2. REVIEW OF LITERATURE

Fama 1995, has very well documented the markets being efficient and hence investors behaviour is rational in efficient markets. In efficient markets, stock prices adjusts back to their equilibrium price very quicky not giving any scope to earn above average returns. However, not all investors are skilled enough to process this information so quickly and they end up following the actions of other investors. This behaviour of investors can be termed as Herding.

The studies to examine herding behaviour in stock markets is extant in abundance and the same is highly prevalent during sever market conditions (Chang et al. 2000). The study of Chiang and Zheng (2010) reported that herding is more prominently seen in Asian stock markets than that of Latin American markets and especially during the slowdown period. This study was done by using a sample of 18 countries.

Bouri et al (2021) examined the association between pandemic induced market uncertainty and herding behaviour for 49 global stock markets. The herding effect for strongly seen in the Asian markets and a strong relationship was established between the pandemic and herd behaviour of investors in the market.

Bharti and Kumar (2022) investigated the behavioural bias of herding in Indian markets during the period of Covid 19. Cross Sectional Absolute Deviation (CSAD) and quantile regression were applied to study the impact of market volatility and government response on herding during this period. The results reported significant herding in the market exasperating the volatility. Mishra and Mishra (2021) examined the herding behaviour of 51 stocks of banking and financial services sectors listed on Indian Stock Market. CCSD, CCAD and quantile regression has been applied to detect the same. The result provides evidences of presence of herding during the Covid period. The study of Selvan and Ramraj (2020) has also reported the similar results in Indian Capital Markets. The similar results are found in the study of Ghorbel et al. (2021), BRICS nations were found to have presence of herding behaviour during whole of the Covid period. Litimi (2017) examined the impact of herding and the volume turnover on the conditional volatilities of prices on the French stock exchange and various other sectors of the market. The results showed that herding has reduced the volatility of the French market and its various sectors.

Chiang and Zheng (2010) investigated the effect of herding on 18 countries of Asian and Latin American region. The results revealed that herding is signals are more prominent in Asian markets than the Latin American markets. The study also pointed that such market behaviour of herding is more apparently seen during the time of crisis.

The studies pertaining to analysing the market behaviour during the period of Covid 19 across the world has been tested avidly. (Bouri et al. 2021; Milcheva 2021; Ozkan 2021; Salisu et al. 2021; Scherf et al. 2021; Akhtaruzzaman et al. 2020). The intentions were to study the impact of Covid 19 on market prices and volatility. All the studies believed that, market prices during the period of uncertainty resulted into negative returns. The studies investigated the response of these markets whether is driven by herding. The studies have implemented Cross-sectional approach to identify the herding behaviour of stock markets.

The studies thus reveal dearth in literature for the Indian context. The present study therefore is intended to investigate the herding behaviour of 50 stocks of Nifty 50 index of Indian Stock Market by applying Cross Sectional Standard Deviation (CSSD) and Cross-Sectional Absolute Deviation (CSAD) approach.

3. DATA AND METHODOLOGY

The study employs CSSD and CSAD methodology to examine the herding behaviour of 50 stocks of Nifty 50 index of Indian Stock Market. The study intends to detect whether the markets depict any herding behaviour through the time period of First Phase of COVID 19. The study therefore has considered a data set of closing values of 50 composite stocks of Nifty 50 index for the time period of 1st March 2020 to 30th November 2020; First phase of COVID 19 pandemic. This time period is significant as it was the onset of COVID 19 first wave in India followed by lockdown and unlock phase.

The daily stock returns were calculated of all the 50 companies along with the return of Nifty 50 index for the said time period with the help of $R_{i,t} = \ln \frac{CP_{i,t}}{CP_{i,t-1}}$, where $R_{i,t}$ is the return of stock i at time t. $CP_{i,t}$ is the closing price of the stock i at time t whereas $CP_{i,t-1}$ is the closing prices of stock i at time $t-1$. With the intention of detecting the herding effect in stock prices of Nifty 50, the dispersion measure has been employed which is also a widely used approach empirically. The dispersion quantifies the closeness of individual stock return with market return. The CSSD methodology given by Christie and Huang (1995) and CSAD suggested by Chang et al. (2000) has been applied to detect the herding effect on stock prices of Nifty 50. The lower and upper tail of distribution has been found for CSSD which is mentioned as below:

$$CSSD_t = \alpha + \beta_1 D_t^L + \beta_2 D_t^U + \varepsilon_t$$

D_t^L is 1 if market return on day t lies in the extreme lower (left) tail of the distribution and equal to 0 if not.
D_t^U is 1 if the market return on day t lies in the extreme upper (right) tail of the distribution and equal to 0 if not.
The CSSD measure has certain limitation; the results may get affected by outliers in the return distribution (Chrisie & Huang, 1995), the CSSD model is a liner one and the model may not always hold true during the time of high dispersion in markets. It may not help to identify herding during such periods. The measure CSAD given by Chang et al (2000) is a powerful methodology as it is based on the dispersion between stock returns and market return. It explains that if herding behaviour is apparently observed in the market, the relationship between market and CSAD is non-linear. The present study has investigated CSAD by establishing its relationship with Market return, Market absolute return and Market return square. The non-linearity in relationship shall be reflected by negative market return. Small values of CSAD suggest investors' agreement of stock prices with the market. The prices move in tandem with the market indicating a rational behaviour of investors. Whereas, higher values of CSAD indicates higher dispersion of stock prices in comparison to market demonstrating herding behaviour of investors. The CSAD model can be represented as:

$$CSAD_t = \beta_1 + |\beta_2 R_{m,t}| + \beta_2 R_{m,t}^2 + \varepsilon_t$$

β_1 represents the market return, $|\beta_2 R_{m,t}|$ represents absolute market return and $\beta_2 R_{m,t}^2$ is the square of market return.
The relationship between market return and CSAD is no longer linearly increasing, rather becomes non-linearly decreasing or increasing at a decreasing rate. Negative and significant coefficient value $\beta_2 R_{m,t}^2$ (non-linear term) implies herding in the above equations.

4. ANALYSIS & FINDINGS

Figure 1: Scatter plot between CSAD and Market return

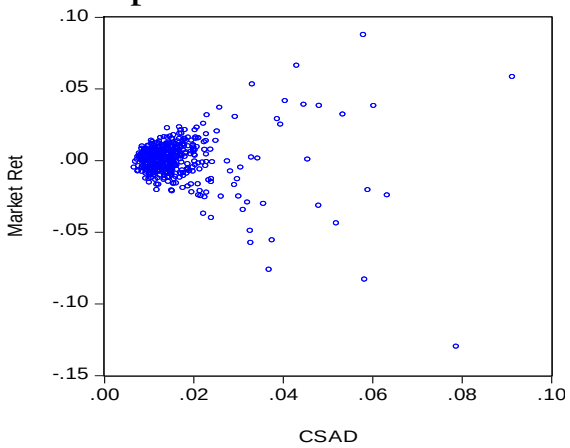

Figure 1 depicts the relationship between CSAD and Market return with the help of scatter plot. It can be observed from the above chart that there do not exist any linear relationship between CSAD and Market return. The dots of CSAD are clustered majorly where the market return is zero (Ng et al. 2022). The clustering of CSAD cannot be seen beyond the market return of 0.05. This is further substantiated with the empirical analysis performed in the section below.

Table1: Descriptive Statistics

	CSSD	CSAD	LEFT_TAIL	MARKET_RET	RIGHT_TAIL	ABS_MKT_RET
Mean	3%	2%	5%	-0.2275%	5%	1%
Median	2%	2%	0%	0.29%	0%	0.85%
Std. Dev.	7%	1%	22%	5%	22%	2%
Skewness	12.589	2.812	4.196	-9.912	4.196	3.222
Kurtosis	166.557	12.401	18.607	120.514	18.607	16.964

Table 1 enumerates the descriptive statistics of the variables. The average market return during the period of COIVD

is negative -0.227%. The CSSD and CSAD exhibited positive returns during the said period indicating bearish sentiments in the markets (Bharti and Kumar 2022). The volatility of index is also very high reported at 5%. The skewness of market return indicates that the daily return during the period of COVID is negatively skewed whereas CSSD and CSAD is positively skewed. All the kurtosis values exhibit leptokurtic distributions.

The stationarity testing is required before modeling any data in time series data set. Since this is a time series analysis, the variables must be stationary in nature. The stationarity of CSSD, CSAD, Market Return and Absolute Market Return has been tested using an Augmented Dickey Fuller test (ADF); where the null hypothesis is "Variable has a unit root indicating that variable is not stationary". Table 2 exhibits the result of ADF test of stationarity signifying the absence of unit root in all the variables as the value of ADF is significant at 5% rejecting the null hypothesis.

Table 2: Test results of Augmented Dickey Fuller test (ADF) statistics

Variable	**ADF Statistic**
CSAD	0.04
CSSD	0.04
Market Return	0
Absolute Market Return	0

Regression Analysis

In order to analyse the herding behaviour in the Indian Stock market, the present research employs the CSSD approach suggested by Christie & Huang (1995). The below table 3 exhibits the results of Regression analysis of CSSD. The positive and statistically significant values of coefficient at upper and lower (Right and left tail) indicates an absence of herding. The positive and significant coefficient values of 0.14 and 0.04 of D_t^L *and* D_t^U indicates markets to be more rational and away from herding during this period of COVID. The positive values however indicate anti-herding (Gebka & Wohar 2013). It is when investors give unnecessary importance to their own views or to the views of other group of market participants. Increased values of Left and right tail as seen in the below table indicates that investors do not herd towards market signals or any other key inference. In fact, the investors are more rational in their investment approach.

Table 3: Regression results of CSSD

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.024786	0.005261	4.711089	0
LEFT_TAIL (Lower)	**0.141139**	0.023266	6.066304	**0**
RIGHT_TAIL (Upper)	**0.041737**	0.023266	1.793894	**0.0745**

The herding in Indian Stock Markets is further tested by using CSAD approach suggested by Chang et al. (2000) which is a more powerful method and allows to detect herding with greater precision. The regression is enumerated in the below table 4. The Market absolute return, $R_{m,t}$ should be small and significant and market return square, $R_{m,t}^2$ should be negatively significant to prove herding in the market. As suggested by the model of Chang et al. (2000) the herd behaviour in the market exist if the coefficient $R_{m,t}^2$ is negative and significant. As enumerated in the below table 4, the $R_{m,t}^2$is negative (-0.04) but insignificant at 1%, 5%, and 10% levels which depicts the absence of herding behaviour during the period of COVID.

Table 4: Regression results of CSAD

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013502	0.000952	14.18611	0
MARKET_RET	0.052869	0.029385	1.799208	0.0737
ABS_MKT_RET	**0.55695**	0.07967	6.990732	**0**
MARKET_RET_SQ	**-0.047679**	0.895227	-0.05326	**0.9576**

CONCLUSION

The present paper has investigated the impact of COVID 19 as an influencing factor leading to herding behaviour of investors in the Indian Stock Market. The study has employed CSSD and CSAD methodology to detect the herding on daily stock prices of 50 stocks of Nifty 50 and the index Nifty 50. In contrast to the findings of Gorbhel et al (2021), Bharti and Kumar (2022), the findings failed to detect any kind of herding in the behaviour of investors as suggest by CSSD and CSAD approach in the Indian stock markets. Similar finding were also shown in the study of Mishra and Mishra (2021) where Indian markets did not revealed any kind of herd sentiments. The study can further be extended to detect the herding in the market by applying more powerful models like Wavelet Coherence (WC) analysis (Ghorbel et al. 2021) and Quantile Regression (Bharti & Kumar 2019, 2022) on the data set of Indian markets. The Study was limited to the time period of 1st March 2020 to 30th November 2020; First phase of COVID 19 pandemic. It can further research upon the entire period of COVID as well as pre and post phase. Further research in the similar direction shall have noteworthy insinuations for policy makers and investors which shall help in making our markets more mature and efficient.

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