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Existence of Herding Behaviour in the Indian Stock Market: An Empirical Analysis During the COVID-19 Period

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Abstract

The current study focuses on herding behaviour that occurred in the "Indian Stock Market (ISM)" between 2011 and during the time of the Covid-19 pandemic. The study examines the closing price of the NSE benchmark Nifty and 33 companies from three sectoral indices selected out of fifteen available on a daily basis. The sectors are the Auto sector, Nifty Bank, and IT sector, from 1 January 2011 to 31 December 2020. Christie and Huang (1995) suggested the CSSD and Chang, *et al.* (2000) suggested the CSAD models to study the existence of herding behavior during the Covid-19 period. Findings based on the daily closing price reveal that for the ten-year data, no significant herding is present in the market, whereas Covid-19 had caused herding during the rising (up) and falling (down) market. The calculated herding period during the Covid-19 timeframe is from 11 March 2020 to 31 December 2020. The study found no herding between 1st January 2011 to 31 December 2019 in the ISM. The herding was evident during the Covid-19 time frame, possibly due to emotional biases, fear, and uncertainty of the pandemic. The study will be helpful to investors, decision-makers, and market regulators in decision-making in the capital market. It will also facilitate brokers and market participants to prepare different trading strategies to be successful in regular times and times of adversity.

Keywords: Covid-19 Pandemic, Herding Behavior, Indian Stock Market (ISM), National Stock Exchange

1. Introduction

In traditional finance, investors were considered rational and believed they made investment decisions based on reasons and logic. In reality, most individuals defer to taking their own decisions instead of following others' decisions. Kahneman, *et al*., (1979) examined the result of this irrational behaviour in their research paper "Prospect Theory: An Analysis of Decision under Risk". Since then, a new school of thought has emerged as behavioural finance. The field of Behavioural finance emphasises that an investor's decision is influenced by imitating fellow investors' decisions. Behavioural finance works on the principle of amalgamation of finance with psychology. Emotions, Cognitive, Heuristics and Prospects are a few attributes affecting decisions. Behavioural biases are irrational thoughts and assumptions that affect decision-making based on facts and evidence.

Several pieces of literature suggest that irrationality among investors causes herding in the market. Herding in the financial market is an investor's tendency to follow others' actions. It is one of human beings' most sought and essential behaviours, which explains the decision deviation from rational to irrational. Investors imitate others in most of their decision-making, bypassing their judgement and thought.

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Shiller, *et al*. (2020) observed the irrational behaviour of investors in the time of Covid-19. The increased spread of Covid-19 has severely impacted humanity and made the world standstill. Humankind for the first time, heard about the virus Covid-19, the pandemic, which is still unsettled. Initially, it was known to be SARS- CoV-2 virus triggered in Wuhan, China. The virus caused a global health emergency and left many economies to fall around the globe. Humans have previously seen multiple deadly occasions caused by some viruses such as Zika in 2016, Ebola in 2014, Swine flu (H_1N_1) in 2009, Avian Influenza in 2006 and Sickness flare-ups (SARS in 2002-2003) are among the few to be named (Abdeldayem & Al Dulaimi, 2020).

Herding has long been associated with humans, demonstrating it for ages, approximately 1200 BC. History provides evidence of irrationalities in investors' behaviour being the cause of significant booms and busts in the stock market. Majorly, herding exists in the Indian capital market during the bull phase (*Prosad, et al*., 2012). ISM is prone to herding behaviour in both the bull and bear markets. It is excessively found in the bear market (Poshakwale & Mandal, 2014). Herding usually occurs in extreme periods and crises (Christie & Huang, 1995; Nath & Brooks, 2020).

The "Efficient Market Hypothesis" (EMH), which contends that investors are rational and base their investment decisions on accessible information, is defined by the anomaly of herding. Herding behaviour is a phenomenon that could leave the stock market in doubt and despondent. During the Covid-19 period, the degree of herding behaviour may be higher. The adverse impact of this global pandemic must have led to herding in the ISM. It may have decreased investors' confidence in India. Due to the lockdown policy governments worldwide implemented, manufacturers and businesses were obliged to cut their workforces, leading to lower production and higher demand during the epidemic. The entire incident generated market concern and supply chain disruption (Bora & Basistha, 2021).

It is well-known that the volatile stock market and investors are prone to behavioural biases. Covid-19 is such an event that it compelled many stock markets to tumble. It is an assumption that the Indian market, too, has suffered due to the Covid-19 breakout. In this study, an attempt is made to find the impact of Covid-19 on the herding bias in the market and to examine whether Covid-19 caused herding in the Indian market.

The critical issue of the stock market is addressed in this study. In the face of adversity and pandemics, it is prevalent for biases to occur. This study examines the stock and market returns between 2011 and the end of the pandemic Covid-19 timeframe. The report focused on stock market aspects like returns and volatility, including herding in the stock markets.

The results of previous studies have proved to be inconsistent in the case of herd management in India's capital market. In the Indian capital market, several studies have shown that the herd's presence and lack of presence have not changed. This paper examines the herding in the ISM through an empirical analysis during the period of Covid 19. It attempts to determine the impact of Covid 19 on herd behaviour in Indian investors.

The study highlights and discusses herding behaviour and the impact of Covid-19 on the ISM. It is most concerned with the finding of herd behaviour in markets that will help investors avoid falling prey to pandemics or significant events such as the 2008 crisis, dot-com bubble, tulip mania, etc. The study will give investors an informed assessment of the market and ensure their investment in stocks is protected. The statistical tools used in the study are well-recognised and widely used to ascertain herding behaviour in the market.

2. Review of Literature

Herding is one of the most important biases of the behavioural finance school of thought. Behavioural Finance, as explained by Shefrin and Statman (2000), is the application of psychology in financial markets. Herding is explained as mutual imitation, leading to similar action among investors (Hirshleifer & Hong Teoh, 2003). Mimicking others' actions, dependent decision-making leads to herding and mispricing of the

securities (Christie & Huang, 1995). Getting influenced by others and subduing own information, believing that there is no way for all the investors to be wrong, leads to herding behaviour. Bikhchandani and Sharma (2000) analysed that herding is caused due to information cascading, which means dependency on the information held by others. Thus, investors fall prey to information-based herding. Herding is often due to excessive volatility in the financial market (Shiller, 1990). However, authors like Avery & Zemsky, (1998); Lakonishok, *et al*. (1992) do not believe herding is responsible for increased financial market volatility. Prosad, *et al*. (2012) found that herding in the ISM is dominant in the bull phase. Poshakwale and Mandal (2014) found that herding is found both in the bull and bear phases but more in the bear market. Studying the Indian and Chinese stock markets, (Lao & Singh, 2011) observed significant herding activity in the Indian and Chinese stock markets. They came to the conclusion that there was considerable herding found in the Chinese stock market. According to research by Tan *et al*., (2008a) the Chinese 'A' stock market experienced significant trading volume and volatility when there was a bull market because the herding behaviour was more severe. They discovered that the 'B' stock market lacked herding tendencies. Herding is a result of a lack of knowledge and confidence, according to studies by Chang *et al*. (2000), Caparrelli *et al*. (2004), and Chiang and Zheng (2010). Their study found that investors panicked during an uncertain market condition and caused herding. Investors showed massive herding in an abruptly hit ASE (Athens Stock Exchange) during 1998-2007, as studied by Economou *et al*. (2008). Herding is evident in the stock market of emerging economies country. It suggests that investors must learn from their behavioural mistakes while executing their trades (Lao & Singh, 2011). Extensive literature explains the causes and consequences of herding in the equity market in India and worldwide. These studies mainly cover herding in the whole market under extreme price movements and less on industry-level herding.

Let us look into previously available literature covering herd behaviour in stock markets. Studies by Barberis and Shleifer (2003). They examined the American Exchange data by deploying the company's daily data on them. Their result showed that herding behaviour does not influence investors' investment behaviour. They concluded that retail investors in the USA tend to herd by considering the previous returns of the industry and selecting industries that have performed well in the last two years. Christie & Huang, (1995) devised CSSD model to "measure the average proximity of individual stock returns to the realised market return". They noted a cyclical pattern in the market, shifting between regular and extreme phases. Additionally, they observed the presence of herding behaviour during the volatile periods. The researchers found that investors tend to align with the overall market movement rather than relying on their individual judgment, leading to herding tendencies. In times of market stress or inflated price movement, they contrasted rational asset pricing models with forecasts of herd behaviour. The researchers noted a significant increase in dispersions when significant average price fluctuations suggested that individual returns were not aggregating around market and sectoral returns. By using CSAD model as a measure of dispersion, Chang *et al*. (2000) proposed the CSAD model. They established a nonlinear relationship between the equity (stock) return dispersions and the overall market return. Their study of herding behaviour in five developing and developed financial markets were the US, Hong Kong, Japan, South Korea, and Taiwan. They concluded that herding was not present in the developed market (such as U.S. & Hong Kong) but was evident in emerging markets (such as South Korea and Taiwan). Poshakwale and Mandal (2014) has examined the investor's behaviour and presence of Herding in the Indian Stock Exchange. Using the Kalman filter, they used daily S&P CNX Nifty 50 Index data from 1997 to 2012. Their study finds that the investors show robust herding behaviour. Herding is significant in both bull and bear markets and increases in a bear market. Kumar and Goyal, (2016) studied the presence of herding in the ISM from 2008 to 2015. They employed (Chang, *et al*., 2000) methodology to test herd formation. Their study found no evidence of herding in the ISM in both "bull and bear phases of markets and extreme market conditions". It indicates that the security market investors make rational decisions and refrain from indulging in Herding behaviour.

Satish and Padmasree (2018) in their article, examined the behaviour of the "Indian Stock Market (ISM)" from 2003-2017 (fifteen years). The study applied (Chang *et al*., 2000) to see how the ISM behaves like a herd and record how the global financial crisis affects this behavior. They studied the global effect in three phases, i.e., before, after, and during the crisis. They concluded that no herding was observed in the ISM and that the global phenomena had not caused the Herding behaviour in the ISM. Bora and Basistha, (2021) examine the volatility impact of Covid-19 on the ISM. They used "GARCH model" to capture the volatility in the pandemic period. The study period ranges from 3 September 2019 to 10 July 2020. The study found high volatility during the pandemic compared to the pre-pandemic period. Singh *et al*. (2020) studied the effect of Covid-19 on the stock markets of G-20 countries. The sample consisted of the Indices from all the G20 countries for 58 days after the covid news broke out in the international media and 150 days before the event. They applied event study methodology to evaluate abnormal returns and utilized panel data regression to provide insights into the underlying factors behind these abnormal returns. Their study found negative abnormal returns post the covid announcement in developing and developed countries. The study suggests that increased abnormal returns and increased Covid-19 cases caused panic in the stock market of G20 countries. The study emphasises that the market is driven by noise trading during uncertainty and suggests a long-term investment strategy. The study concludes that the panel data analysis confirms the market recovery from day 43 to day 57 of the event study period.

Based on the literature review, the presumption is that the Covid-19 pandemic could have a black swan impact on market volatility and abnormal behaviour like forced or unpermitted herd movements. An investor's herd behaviour may explain behavioural aberrations that violate the efficient market concept. This study aims to clarify the behaviour of the stock market in a Covid19 pandemic environment. In addition, the study looks at the behaviour of herds in various market conditions like bull and bear phase of markets. The present study aims to identify and test the existing model for examining the presence of herd behaviour during pandemics.

3. Research Methodology

Herding becomes apparent when daily data is employed for analysis (Tan *et al*., 2008). The present study uses ten years of data which contains the daily closing price of the index of the NSE, Nifty50 and thirty-seven companies being part of it, from three sectors, namely Auto, Bank and I.T. of NSE from 1 January 2011 to 31 December 2020, collected from the Yahoo finance. Four of thirty-seven companies were omitted due to insufficient data for the study period. Thus, thirty-three companies were considered for the study. Nifty, the benchmark index of India's largest stock exchange NSE with the highest stock turnover, has been selected for the study. The data set consists of 2458 observations and has been adjusted for any corporate actions for accuracy in the analysis.

The sample data set was divided from the data to identify the herding behaviour of the market following the announcement of the Covid-19 in India. The analysis was focused on herding behaviour among the stock market participants, both before and after the outbreak of Covid-19. Therefore, the researcher has taken 11 March 2020 as the study's cut-off date, i.e., WHO and the Indian Government announced "Covid-19 as a Public Health Emergency of International Concern (PHEIC)". Hence, the entire sample data set was separated into two subsamples, Pre-Covid-19 and Post Covid-19, each covering the period from January 1, 2011, to March 10, 2020, and March 11, 2020, to 30 Dec 2020.

According to Mertzanis and Allam, (2018), people often have ample time and information to think and evaluate the market more effectively to make rational decisions adequately. The present paper examines data from 10 years before covid-19 pandemic to examine the herd behaviour in the normal state before covid-19 was announced.

The study employed the CSSD regression model proposed by Christie and Huang (1995) and CSAD model by Chang *et al*. (2000) to study the herding behaviour in the ISM. The CSSD model assesses the dispersion between market and stock returns. It implies

that when investors ignore individual knowledge and follow the crowd, there is less dispersion between market and individual stock returns.

The present study focused mainly on identifying presence of herding in the pre and post covid time period. The CSAD model is a modified version of CSSD. It computes the absolute average deviation by comparing the expected return of individual securities to the market return.

The daily calculated stock returns are as:

$$r_{it} = \ln\left(\frac{Pt}{Pt-1}\right) \quad (1)$$

here *Pt* is the price of the index at time *t,* and *Pt*-1 is the price at time *t*, where *t* stands for the specific day. Similarly, market return (r_{mt}) is also calculated, where CV stands for a closing value of the S&P Sensex index at time t.

$$r_{mt} = \ln\left(\frac{CVt}{CVt-1}\right) \quad (2)$$

To calculate the return on each individual stock using the market returns, the model is employed as suggested by Christie & Huang, (1995). This model assesses the herding when predicted dispersion is low or individual stock returns are closer to the market returns.

$$CSSD_t = \sqrt{\frac{\sum_{i=1}^{N}\left(R_i t - R_{m,t}\right)^2}{N-1}} \quad (3)$$

Here $CSSD_t$ is the "cross-sectional standard deviation" on day t, *Ri, t* is the return of asset *i* at time *t*, $R_{m,t}$ Represents the "cross-sectional average return" of the market portfolio at time *t*, and N is the number of assets. CSSD model captures the proximity between market returns ($R_{m,t}$) and stock return ($R_i t$). The regression model below examines the distribution of returns during highly fluctuating market conditions.

$$CSSD_t = \beta_0 + \beta_1 D_t^L + \beta_2 D_t^U + \varepsilon_t \quad (4)$$

In the equation D_t d is the dummy variable representing extreme market conditions when D_t^L is equal to 1 when the daily returns on the market are significantly in the extreme lower end of the distribution and equal to zero otherwise; and D_t^U will be equal to 1 when the market return is in the extreme upper tail of the distribution and equal to zero otherwise. This model uses 1% and 5% percentiles of the distributions to define the extreme market price. A negative and statistically significant β_L and β_U Provides evidence of herding, and there is no herding when β_L and β_U are positive.

The second model used to detect herding behaviour in the Indian stock market by the model suggested by Chang *et al*. (2000). This model identifies herding in less extreme market movements. The model uses CSAD, deviation method to find herding in the financial market.

$$CSAD_t = \frac{1}{N}\Sigma_{i=1}^{N}\left|R_{i,t} - R_{m,t}\right| \quad (5)$$

In equation above $R_{i,t}$ is the return of asset *i* at period *t*, $R_{m,t}$ is the cross-sectional average return of the market portfolio in time t, and N is the number of assets. According to the CSAD model, market returns and the dispersion of individual stock returns should have a linear relationship. Any indication that CSAD and market returns ($R_{m,t}$) have a nonlinear relationship could be an indication of herding in the market.

Testing of non-linearity is done using the following regression model.

$$CSAD_t = \beta_0 + \beta_1\left|R_{m,t}\right| + \beta_2\left(R_{m,t}^2\right) + \varepsilon_t \quad (6)$$

In the equation β_0, β_1 and β_2 are regression coefficients and ε_t is the error term. Here $R_{m,t}$ is the absolute return on the market for the time *t*. The rational asset pricing model suggests that, β_1 should be positive and β_2 should be zero. When β_2 is negative in the model, it is concluded by saying that there exists herding in the market (Chang *et al*., 2000), simultaneously when there is a nonlinear relationship between $CSAD_t$ and the market returns, there exists herding in the market.

3.1 Analysis and Interpretation

Before proceeding to analyse the data, "Augmented Dickey-Fuller (ADF) and Philips and the Perron (PP)" unit root test method was used to ascertain the stationarity of the data and the results obtained at the level and first difference. Both stocks and Nifty data

comprising 2458 observations were tested for unit root test. A 'p'-value less than the significance level (0.05) was obtained at the first difference. Hence, the hypothesis that the data has the unit root and is not stationary is rejected. After obtaining the stationary data, the returns with the model CSSD and CSAD were calculated.

Table 1. Unit root test table (ADF and PP)

Unit root test	ADF		PP	
Individual Stocks				
With Constant and Trend	t-statistic	Prob.	t-statistic	Prob.
At level	-1.7670	0.6238	-1.7261	0.6317
1st Difference	-47.8492	0.000	-49.9913	0.000
Nifty Index				
With Constant and Trend	t-statistic	Prob.	t-statistic	Prob.
At level	-3.3574	0.0575	-3.4136	0.0497
1st Difference	-17.5065	0.000	-49.8939	0.000

Source: Author's calculations

Table 1 indicates that the market data was initially non-stationary, and the critical value was more significant than the 5% confidence level. The problem of non-stationary data was solved using the first data difference at critical levels less than the 5% confidence level and observing the stationary data. The graphical pattern below shows the charting of non-stationary and stationary data.

Table 2 showcases the different statistics calculated from the Nifty (market return), CSSD, and CSAD. Notably, the mean and skewness of the market returns are negative, and the minimum return also turns negative. Negative return and negative signs reflect

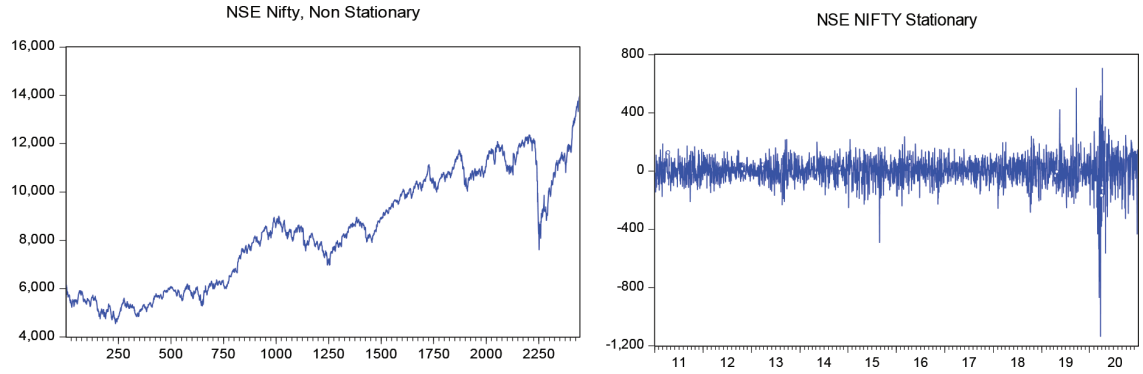

Figure 1. Chart pattern of Stationary and non-stationary data of index NIFTY.

Source: Author's compilation

Table 2. Descriptive statistics for CSSD and CSAD

Descriptive			
Statistics	R_{mt}	CSSD	CSAD
Mean	-2.1222	17.6314	9.5382
Std. Deviation	65.10475	70.23239	64.79439
Skewness	-33.275	29.386	35.023
Std. Error of Skewness	0.049	0.049	0.049
Minimum	-2807.00	0.35	0.25
Maximum	786.80	2848.24	2804.74

Source: Author's calculations

less volatility and the presence of herding behaviour. Standard deviation is high in CSSD calculated value which shows the volatile nature of the market. The total observed data is 2458 containing ten years of data.

Table 3 summarises the regression analysis of Equations (4) and (6) to evaluate herding in the market throughout the study period. The model suggests the dispersion quantifies how close, on average individual returns are to the realised average. According to the "rational asset pricing model", the dispersion will rise when the absolute value of the market return decreases. The model asserts that the sensitivity of various assets to market return differs. On the other hand, if the behaviour of herding is observed, this does not mean that security returns will deviate significantly from total market returns; when humans conceal their views and rely on individual market activities as a basis for investment decisions. This behaviour may reduce the spread, although it may increase the spread at a decreasing rate if the herd is aggressive. The CSSD model employed

Table 3. Regression analysis of and for the whole period of study

Regression Analysis					
CSSD	Coefficients	Prob.	CSAD	Coefficients	Prob.
	17.107	0.000		7.975	0.000
	6.076	0.000		0.045	0.813
	29.9	0.031		0.068	0.000
R	0.142	0.000	R	0.924	0.000
Adj R SQ	0.019		Adj R SQ	0.853	
SE	69.53		SE	24.86	
Durbin-Watson	2.07		Durbin-Watson	2.071	

Source: Author's calculations

found no herding behaviour in the market, as the and are positive and significant at a 95% significance level, since the necessary condition to declare the presence of herding in the stock market, the coefficients and it must be negative and significant. The purpose of the dummy variables is to identify differences in investor behaviour in exceptionally up or down markets and generally in regular markets. To identify days with extreme price movements, the model employs one or 5 per cent of the observations in the "upper and lower tails" of the market return distribution.

On the other hand, using the CSAD as a measure of dispersion, Studies based on the "rational asset pricing model" indicates that equity price dispersion is not only an increasing function of market returns but also a linear relationship. Suppose individual market players attempt to replicate the overall market behaviour while ignoring their own priors at times of significant average price fluctuations. In that case, the linear and growing relationship between dispersion and market returns would no longer be reliable. In its place, the relationship could start to increase nonlinearly or even start to decrease. This particular intuition is the foundation of the CSAD model.

In the Table 3, the regression results find as positive and insignificant whereas is positive and significant at a 95% significant level. As per the model rule, it is to be concluded that there was an absence of herding in the Indian stock market before the Covid-19 period. The result signals the prevalence of rationality in the Indian market for the selected period. A short discussion of the findings is made in the conclusion section.

From the Equation number (6), the following equation is generated to evaluate the effect of Covid-19 on herding. The model is well used by (Espinosa-méndez *et al*., 2020; S.C.B. Samuel Anbu Selvan, 2020) in their study to capture the herding specifically during Covid-19 in the Indian stock market. In Equation number 7, and is the "absolute market and individual stock return of stock" *I* respectively.

$$CSAD_t = \alpha + \beta_1 D_t Covid \left| R_{i,t} - R_{m,t} \right| + \beta_2 \left(1 - D_t Covid\right) \left| R_{i,t} - R_{m,t} \right| \left(R_{m,t}\right)^2 + \beta_3 D_t Covid \left(R_{m,t}\right)^2 + \beta_4 \left(1 - D_t Covid\right) \left(\left(R_{m,t}\right)^2 + \varepsilon_t \quad (7)$$

The equation explains the Covid dummy as (D_t^{Covid}), which equals one from March 11 2020 and zero before that.

For the Covid-19 period, the above calculation yields a value that indicates whether herding was prevalent in the market or not. During the covid-19 period herding behaviour was significant when the value of has a negative value, which is majorly found due to fear of loss, emotional biases, and uncertainty prevailing in the market for a particular period (Hallahan *et al*., 2004).

Table 4 reports the results of the CSAD model for the Covid-19 period ranging from 11 March 2020 to 31 December 2020. The necessary condition for the acceptance of herding in the market is, the be negative and significant. The findings of the study suggest negative (-3.437) which is statistically significant and suggests that there is herding activity present during the covid-19 pandemic in the Indian stock market, particularly concerning the three sectors.

The markets' asymmetrical nature is viable during unusual events such as Covid-19. Dropped market

Table 4. Covid-19 effect on the stock market

Co-efficient	Values	Probability
β_0	7.023	0.000
β_1	-0.007	0.275
β_2	0.009	0.000
β_3	-3.437	0.000
R	0.975	
Adjusted R squared	0.95	
Durbin Watson	2.125	

Source: Author's calculations

profitability and lagged decision-making lead to the occurrence of such phenomena. The Indian stock market also became a victim of herding behaviour, which is in sync with many Indian and foreign authors' findings in their respective studied stock markets (Dhall & Singh, 2020; Espinosa-méndez, *et al*., 2020; Raimundo Júnior, *et al*., 2020; Talwar, *et al*., 2021) have found the presence of herding during the adverse situation and Covid-19.

4. Conclusion

The current article investigated the existence of herding behaviour in the Indian stock market. The main objective of the study was to determine how Covid-19 impacts herding behaviour in a developing economy like India. The Cases of Pandemics create uncertainty and chaos in the financial market. Covid-19, too, impacted the stock market in a significant manner. This paper argued that situations like pandemics and uncertain events create turmoil in the market and cause panic among investors. Previous studies have provided that a pandemic or any crisis brings lots of fear and uncertainty, leading to irrational decision-making by investors and causing panic in the stock market (Bhatia & Gupta, 2020; Chiang & Zheng, 2010; Poshakwale & Mandal, 2014).

Utilising the data from NSE, both "CSSD and CSAD" methods were employed to examine the presence of herding in the Indian market in the pre- and post-Covid-19 declaration. Our results for the study empirically found that the market behaved rationally prior to Covid-19 and suffered from herding during the Covid-19 period. It was found that the market had volatility in the market. However, before the Covid-19 period, no herding was evident, conveying that the Indian stock market is relatively stable. Previously (Satish, 2020) found no trace of herding in the Indian market and prophase about the rationality of the Indian stock market and its investors. Dhall and Singh (2020) failed to provide evidence for herding at the industry level before Covid-19, which contradicts Lao and Singh (2011) findings on that of herding behaviour in the stock market of India.

In the time of Covid-19 period, fear, confusion, and emotional biases impacted the market, which resulted in herding in the Indian Stock Market during the extreme market returns. Overall, it is concluded that the study's findings illustrate the absence of herding behaviour in the Indian stock market for the selected time period except during Covid-19.

The study's relevance is crucial for investors, policymakers and market regulators. The Covid-19 pandemic has been detected to have affected the market, which resulted in a deterioration of investor behaviour. In order to reduce the explosion of irrational decisions that lead to market volatility, market players must be aware of herd behaviour. In order to ensure the interest of investors, market regulators should make quality information and guidelines available. Full disclosure of the companies' qualitative and quantitative information of listed entities will be crucial in making informed decisions.

This study covered only three industrial sector companies, which could be expanded and explored for the comparative study between several emerging economies' stock exchanges. The employed method in the study was Christie and Huang, (1995) and Chang, *et al*. (2000); the robustness of the findings could be achieved with other available OLS estimators. In place of daily returns, the trading volume could be considered for estimating the herding in the market. Besides targeting the equity market, derivative segments (Futures and Commodity) can be the target for upcoming researchers.

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