Investor Herd Behaviour during the COVID-19 Pandemic: Evidence from the Johannesburg Stock Exchange

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ABSTRACT
The COVID-19 pandemic has caused extreme volatility in financial markets globally. During periods of extreme volatility, investors tend to exhibit herd behaviour. However, herd behaviour results in market anomalies, which causes incorrect valuations and pricing. Hence, the objective of this study is to test whether COVID-19 has induced herd behaviour in South Africa's stock market. To achieve this objective, the FTSE/JSE Top 40 Index is used as a proxy for stocks trading on the Johannesburg Stock Exchange. The cross-sectional absolute deviation (CSAD) methodology is employed, and the sample period ranges from July 3, 2017 to June 30, 2021 with March 5, 2020 dividing the pre- and post-COVID-19 periods. The results suggest an absence of herd behaviour in the FTSE/JSE Top 40 Index during the full, pre- and post- COVID-19 sample periods. Therefore, this study concludes that the COVID-19 pandemic has not induced herd behaviour in the South African stock market. This could indicate that stock investors on the JSE follow their own thought and decision-making processes in periods of extreme volatility. Moreover, this may suggest that the South African stock market is efficient and that investors execute rational and well-thought out trades.

KEYWORDS: *COVID-19, Herd behaviour, Johannesburg Stock Exchange, Pandemic, Stock Market*

JEL CLASSIFICATION: *G11, G14, G40*

1. INTRODUCTION

The impact of the COVID-19 pandemic on financial markets has resulted in a period of disorder and turmoil around the world. According to the World Health Organization (WHO), COVID-19 was first recognised as a pandemic caused by the novel Coronavirus on March 11, 2020 (WHO, 2020a). The first reported case of COVID-19 in South Africa was confirmed on March 5 2020 (NICD, 2020). As of August 31, 2021, the cumulative number of COVID-19 cases identified in South Africa sits at approximately 2.8 million and the cumulative number of deaths are 81 830 (NICD, 2021). To curb the spread of the virus, countries all over the world have imposed travel and social distancing restrictions. Similarly, the South African government, under section 3 of the Disaster Management Act, 2002 (Act No. 57 of 2002), imposed a national lockdown to help curb the spread of COVID-19 in the country (Van Heerden and Roos, 2021).
Globally, the COVID-19 pandemic has had a huge impact on the economy and the performance of financial markets, especially in emerging countries, such as South Africa (Takyi and Bentum-Ennin, 2020). This is because emerging markets do not have enough

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resources to deal with the effects of the pandemic due to the low inflow of capital and slow economic growth and are, therefore, expected to get hit the worst (Topcu and Gulal, 2020). Due to several policies being put in place to limit the transmission of the virus, such as numerous lockdowns, a large number of businesses became insolvent, resulting in an increase in unemployment, causing the rate of consumption and output to decrease (Nicola et al., 2020). Consequently, this has led to a decrease in the expected future cash flows of firms, subsequently, resulting in a sharp drop in the price of stocks due to the market's reassessment of the value of stocks (Nicola et al., 2020). This has led to the destabilisation of financial markets globally (Dhall and Singh, 2020).

Traditional finance theories state that market participants are rational; however, in reality, market participants may not always be rational, and their financial decisions are often influenced by cognitive and emotional biases (Kapoor and Prosad, 2017). In the 1960s, the Efficient Market Hypothesis (EMH) was proposed by Eugene Fama, which is based on the notion of market efficiency. Malkiel and Fama (1970) note that a financial market can be deemed efficient if asset prices entirely reflect all available information. The flaw of traditional financial theories is their dependence on investors to behave rationally. However, human behaviour is unpredictable and, when faced with uncertainty, is inclined to sway in the direction of self-interest (Kapoor and Prosad, 2017). Therefore, this gave rise to a new form of financial theory, Behavioural Finance.

Behavioural finance is related to the psychology of investors and its role in the financial decision-making process (Kapoor and Prosad, 2017). It is centred around the fact that investors' decisions are not always rational and are usually influenced by biases (Kapoor and Prosad, 2017). The two main biases explained by behavioural finance that influence an investor are heuristic simplification and cognitive bias (Muhammad, 2009). Herd behaviour is one of the most prominent cognitive biases in behavioural finance (Shah et al. 2019). According to Filip et al. (2015), herd behaviour refers to the tendency of investors to reject their own private information in favour of mimicking the decisions of other investors. Herding can be caused by the cost of reputation, the level of sophistication of the market, or by market participants comprehending information in a similar manner (Vieira and Pereira, 2015). Ganesh et al. (2016) note that herd behaviour can be rational or irrational. Rational herding arises when investors replicate the market consensus based on the assumption that the majority retains better information (Hwang and Salmon, 2004). On the contrary, irrational herding occurs when investors make decisions based on emotions, disregard fundamental information, and merely follow the crowd (Hwang and Salmon, 2004).

According to Mobarek et al. (2014), in periods of extreme volatility and abnormal information flows, herding is more noticeable due to investment forecasts' lower reliability and accuracy. During these periods of extreme volatility, investors adopt a market-wide consensus as a cost-efficient strategy instead of acquiring new information (Gleason et al., 2004). Furthermore, investors may believe that they can attain the average market return by merely following the herd (Gleason et al., 2004). Ultimately, herd behaviour can result in a deviation of asset prices from their fundamentals, consequently, leading to excessive volatility and short-term trends in financial markets (Yao et al., 2014).

The presence of herd behaviour in financial markets has been extensively researched in recent years. Investor herd behaviour has been studied in the context of different markets, including developed markets (Vieira and Pereira, 2015; Lee, 2017; BenSaïda, Jlassi and Litimi, 2015;

Litmi, 2017; Economou, *et al*., 2018; Ahmed, *et al*., 2015), and emerging and frontier markets (Poshakwale and Mandal, 2014; Kumar, Bharti and Bansal, 2016; Javaira and Hassan, 2015; Shah, Shah and Khan, 2017; Indārs, Savin and Lublóy, 2019). In the South African market, Ababio and Mwamba (2017a) report evidence of herd behaviour in the banking sector when the market is in a bear phase, and, in contrast, show evidence of herd behaviour in the real estate sector when the market is in a bull phase. Another study by Ababio and Mwamba (2017b) reports the presence of herding in the banking, general financial and real estate sectors during a period of high volatility. The differing results between Ababio and Mwamba (2017a) and Ababio and Mwamba (2017b) could be attributed to the sampling methods employed. Unlike Ababio and Mwamba (2017a and 2017b), Mekwa (2018) reports that there is no evidence of herding within the JSE or its sectors.

Several studies report the presence of herd behaviour during periods of crisis; Shrotryia and Kalra (2020) report that herding is present during high and low volatility periods, as well as normal conditions irrespective of market trends due to South African markets being influenced by United States financial conditions and their respective market-wide herding. In contrast, Seethram and Britten (2013) report that herding is absent overall in South Africa's stock market. Similarly, Munetsi (2018) reports that no herd behaviour is found in selected JSE indices. Whilst these studies report different findings, each result corroborates each study and suggests that herding is present during periods of crisis.

According to Chang, McAleer and Wang (2020), periods of crisis, such as the COVID-19 pandemic, trigger herd behaviour with evidence stemming from the Great Financial Crisis and periods of price bubbles. Current literature on the effects of the COVID-19 pandemic on financial behaviour is limited; however, research conducted by Espinoza-Méndez and Arias (2020), Selvan and Ramraj (2020) and Jabeen and Frahan (2021) on Europe's capital markets, India's capital markets and the Pakistan Stock exchange respectively, report strong evidence that the COVID-19 pandemic has induced herd behaviour in each financial market, with Jabeen and Frahan (2021) noting that, investor herd behaviour is more pronounced when the market is bearish compared to when it is bullish. Similarly, a study by Kizys, Tzouvanas and Donadelli (2020) examined government responses to the COVID-19 in the international market and reported that, while the government response can diminish investor herd behaviour, herd behaviour was more evident during the pandemic. A study by Kungal and Peerbhai (2021) examined if the COVID-19 pandemic induced herd behaviour in the South African Exchange Traded Funds (ETFs). In contrast to Espinoza-Méndez and Arias (2020), Selvan and Ramraj (2020), Jabeen and Frahan (2021) and Kizys et al. (2020), by Kungal and Peerbhai (2021) report that investor herd behaviour is non-existent in the South African ETF market.

This study contributes to the existing literature in three ways. Whilst the effects of herd behaviour due to COVID-19 have been researched in the cryptocurrency, global stock and ETF markets, herd behaviour during COVID-19 has not been researched in South Africa's stock market. Kallinterakis and Kratunova (2007) say that herding behaviour may be more evident and conspicuous in emerging markets due to lack of transparency, substandard regulatory frameworks, and the market participants' characteristics and motives relative to developed markets. Therefore, the first major contribution of this study is that it provides insight into whether herding is present in an emerging market such as South Africa's stock market before the onset of the COVID-19 pandemic or if the pandemic induced this behaviour.

Secondly, investing in stocks on the JSE provides diversification benefits for international and local investors when added to their portfolio, which comprises various asset classes. However, the efficiency of this diversification is challenged when investors' decisions are influenced by imitative behaviour (Rompotis, 2018). This is due to the tendency of investors to disregard fundamentals when trading, which causes prices to diverge from their 'true' values, subsequently leading to an increase in market volatility (Dang and Lin, 2016). Thus, this study's second contribution is that it sheds light on whether stocks on the JSE can be used as effective risk-reducing investment tools.

Finally, due to limited research on the effect crises have on Africa's stock markets (Boako and Alagidede, 2018), this paper aims to provide insights into how the stock market in South Africa reacts during periods of turmoil and crises. As a result, the findings of this study are especially valuable for investors and fund managers trading on the South African stock market. The results are also important for policymakers who are responsible for ensuring market efficiency in South Africa.

2. DATA AND METHODOLOGY

The study aims to investigate investor herd behaviour on stocks listed on the JSE from July 3, 2017 to June 30, 2021. To achieve this, the stocks within the FTSE/JSE Top 40 Index (J200) are used as the sample set. The FTSE/JSE Top 40 Index is chosen as it consists of large-capitalisation stocks which are less volatile, and the index is semi-annually screened to ensure its constituents are liquid (Johannesburg Stock Exchange, 2021). Stock markets in Africa are known for their low liquidity (Nyika, 2018); therefore, using the index ensures that no illiquid stocks are included in the sample set, since illiquid stocks can yield inefficient results and estimators (Brooks et al., 2006). To avoid the issue of survivorship bias, stocks that have been removed from the JSE Top 40 index during the sample period are included within the sample set.

The sample period is divided into pre- and post-COVID-19 to determine if herding is present before and after South Africa reported its initial case of COVID-19. The first reported case of COVID-19 in South Africa occurred on March 5, 2020 (WHO, 2020a). Therefore, the sample set is divided as shown in the table below, with the pre-COVID-19 subset ranging from July 3, 2017 to March 4, 2020 and the post-COVID-19 subset ranging from March 5, 2020 to June 30, 2021. Furthermore, a chow breakpoint test is conducted to confirm the appropriateness of the chosen subsamples. The study's sample periods are summarised in Table (1) below:

Table 1. Sample Periods

Sample	Period
Full sample	July 3, 2017 to June 30, 2021
Pre-COVID-19	July 3, 2017 to March 4, 2020
Post-COVID-19	March 5, 2020 to June 30, 2021

Source: authors own conception

Lao and Singh (2011) note that investor herd behaviour is a phenomenon that usually lasts for a brief period. Therefore, this paper utilises daily data within the sample period, as it may aid in the uncovering of the presence of herd behaviour, even if its existence is short-lived. Daily prices for the companies in the FTSE/JSE Top 40 Index are obtained using the IRESS database.

The daily closing prices of the stocks are utilised to determine the daily returns by logging the returns to make the series stationary using Equation (1) below:

$$R_t = \ln\left(\frac{P_t}{P_{t-1}}\right) \times 100 \tag{1}$$

where ln denotes the natural logarithm, and P_t and P_{t-1} represents the current and previous closing prices, respectively.

Following Chang et al. (2000), this study employs the CSAD methodology to investigate the presence of herd behaviour. The CSAD methodology is based on the Capital Asset Pricing Model (CAPM), but it assumes that the interaction between the absolute deviation in stock returns and the absolute value of the market return is decreasing and non-linear in the presence of herd behaviour. This is contrary to CAPM's positive, linear relationship. The CSAD method follows the belief that investors follow their own strategies and beliefs during normal market conditions, leading to large dispersions in stock returns. However, during periods of turmoil, investors disregard their own beliefs and mimic each other's behaviour, resulting in a convergence between stock and market returns, leading to a smaller dispersion in stock returns. Contrary to the Cross-Sectional Standard Deviation (CSSD) model by Christie and Huang (1995), the advantage of the CSAD is that it assumes the relationship between stock return dispersion and the return of the market is non-linear, and the CSAD method can be used to detect herd behaviour even during normal market conditions. Therefore, this study employs the CSAD methodology. In accordance with Chang *et al*. (2000), the CSAD is computed as follows:

$$CSAD_t = \frac{1}{N}\sum_{i=1}^{N}|R_{i,t} - R_{m,t}| \tag{2}$$

where $CSAD_t$ represents the cross-sectional absolute deviation of the individual stocks on day t, $R_{i,t}$ refers to the return of the i'th stock in the index on day t, $R_{m,t}$ refers to the cross-sectional average return of an equally-weighted portfolio of the constituents of the FTSE/JSE Top 40 index on day t, and N is the amount of stocks in the index on day t. In accordance with Chang *et al*. (2000) the following formula is used to calculate $R_{m,t}$:

$$R_{m,t} = \frac{1}{N}\sum_{i=1}^{N} R_{i,t} \tag{3}$$

where $R_{m,t}$ refers to the cross-sectional average returns of all individual stocks in the index on day t.

To detect herd behaviour, the relationship between $CSAD_t$ and $R_{m,t}$ needs to be evaluated (Chang et al., 2000). The reason for this is that the $CSAD_t$ simply measures the deviation and does not indicate the significance and extent of the relationship between $CSAD_t$ and $R_{m,t}$. Following Selvan and Ramraj (2020), Espinosa-Méndez and Arias (2021) and Kunjal and Peerbhai (2021), the following formula is used to measure the relationship between $CSAD_t$ and $R_{m,t}$:

$$CSAD_t = \alpha + \gamma_1|R_{m,t}| + \gamma_2\left(R_{m,t}\right)^2 + \varepsilon_t \tag{4}$$

When herd behaviour is present, a non-linear and negative relationship is observed between the stock return dispersion and aggregate market return. Hence, when herd behaviour exists, γ_2 is negative and statistically significant. This would be enough evidence to conclude that herding is present (Economou et al., 2018). However, if γ_1 is positive and γ_2 equates to zero, it can be concluded that herding is absent (Mobarek, Mollah and Keasey, 2014). In order to detect whether herd behaviour is present prior to and after South Africa's first confirmed case of COVID-19, Equation (4) is estimated for the pre-and post-COVID-19 subsamples, as well as the full sample period. Thereafter, following Kunjal and Peerbhai (2021), the following equation is employed to establish whether herd behaviour is more evident in the pre- or post-COVID-19 subsamples:

$$CSAD_t = \alpha + \gamma_1 D^{COVID}|R_{m,t}| + \gamma_2(1 - D^{COVID})|R_{m,t}| + \gamma_3 D^{COVID}(R_{m,t})^2 + \gamma_4(1 - D^{COVID})(R_{m,t})^2 + \varepsilon_t \quad (5)$$

where D^{COVID} takes the value of 1 during the post-COVID-19 sample and 0 otherwise. If γ_4 is negative and statistically significant, herding is present pre-COVID-19. However, if γ_3 is negative and statistically significant, herding is present post-COVID-19.

If herd behaviour is more evident after South Africa confirmed its first COVID-19 case, γ_3 would be less (more negative) than γ_4. In accordance with Hwang and Salmon (2004) and Yao, Ma and He (2014), the Ordinary Least Squares (OLS) approach is used to estimate Equations (4) and (5). However, to estimate heteroscedastic and autocorrelation consistent standard errors, the Newey and West (1987) estimator is used. EViews is then used to perform the OLS regression, and the statistical significance of each coefficient is tested using the t-test and its associated p-values. Notably, the analysis begins with using the Augmented Dicky-Fuller test (ADF) to test for stationarity in the series.

3. EMPIRICAL RESULTS

The descriptive statistics for the cross-sectional absolute dispersion of the FTSE/JSE Top 40 Index stock returns ($CSAD_t$) and the cross-sectional average return of stocks in the FTSE/JSE Top 40 Index ($R_{m,t}$) are summarised in Table (2) below. The daily market return in both the post-COVID-19 subsample period and the full sample period ranges from -10.74% to 6.74%, whereas, in the pre-COVID-19 subsample, it ranges from -4.92% to 6.31%. However, the daily market return's average is larger in the post-COVID-19 subsample (0.03%) when compared to the full period (-0.02%) and the pre-COVID-19 sample period (-0.04%). Furthermore, during the post-COVID-19 period, the average daily cross-sectional absolute dispersion of individual stock returns is greater (1.85%) when compared to the full sample period (1.43%) and the pre-COVID-19 sample period (1.23%), suggesting that, after South Africa's first confirmed case of COVID-19, the dispersion of returns is greater.

Table 2. Summary of Descriptive Statistics

	Full sample		Pre-COVID-19		Post-COVID-19	
	$R_{m,t}$	$CSAD_t$	$R_{m,t}$	$CSAD_t$	$R_{m,t}$	$CSAD_t$
Mean	-0.015	1.434	-0.036	1.229	0.028	1.850
Median	-0.001	1.253	-0.046	1.125	0.083	1.587
Maximum	6.742	11.128	6.306	11.128	6.742	8.358
Minimum	-10.740	0.547	-4.916	0.547	-10.740	0.767
Std. Dev.	1.403	0.807	0.998	0.586	1.986	1.009
Skewness	-1.084	4.479	-0.007	8.274	-1.207	2.786
Kurtosis	15.164	36.677	6.353	127.275	10.754	12.991
Jarque-Bera	6354.403	50548.64	313.309	438142.5	906.917	1799.537
Probability	0.000	0.000	0.000	0.000	0.000	0.000

Source: authors' own estimation

To determine if herding is present, the relationship between the cross-sectional dispersion of stock returns and the linear market return is analysed. Equation (4) is estimated to investigate the relationship between these variables for the entire sample period, refer to Table (3) below for the results:

Table 3. Estimated Regression Coefficients for the Full Sample Period

	α	γ_1	γ_2	$Adj.R^2$
$CSAD_t$	1.095***	0.277*	0.047	0.511
	(14.661)	(1.833)	(1.357)	

Notes: 1. For detailed equation see equation (4).
2. T-statistics values using the Newey and West (1987) estimator are found in parentheses.
3. ***, **, * represent statistical significance at the 1%, 5%, and 10% levels of significance, respectively.
4. Sources: Authors' own estimations.

According to the results in Table (3), the linear market return's (γ_1) coefficient is positive and statistically significant at the 10% level of significance. This indicates that the stock return dispersions ($CSAD_t$) increases with the stock market returns' magnitude ($R_{m,t}$) (Kunjal and Peerbhai, 2021). However, to identify the presence of herding, the squared market return coefficient (γ_2) must be investigated (Mobarek et al., 2014). Essentially, if γ_2 is negative and statistically significant, it can be concluded that herding is present (Economou et al., 2018). However, γ_2 is positive and statistically insignificant as shown in Table (3). Therefore, the positive and statistically insignificant γ_2 coefficient is an indication that it is not different from 0 and it cannot be concluded that herding is present (Mobarek et al., 2014). Hence, the findings show no presence of herd behaviour within the JSE stock market from July 3, 2017, till June 30, 2021. Furthermore, the adjusted R^2 value (0.51) implies that the model's explanatory power is significant in explaining $CSAD_t$.

To identify the presence of a structural break between the pre-COVID-19 and post-COVID-19 periods, a Chow Breakpoint test is employed, and the results shown in Table (4) below. The null hypothesis of no structural break on March 5, 2020 is rejected at the 5% level of significance. This indicates that a structural break occurred on March 5, 2020 and further substantiates the pre- and post-COVID-19 sample period dates.

Table 4. Chow Breakpoint Test Results

F-statistic	Log likelihood ratio
54.71***	152.81***
(0.000)	(0.000)

Notes: 1. Breakpoint test for March 05, 2020.
2. Probability values are shown in parentheses.
3. *** indicates statistically significant at the 1% level.
4. Authors' own estimations.

The results of the Chow breakpoint test are an indication that a significant structural break occurs in the relationship between $(CSAD_t)$ and $(R_{m,t})$ in the pre- and post-COVID-19 periods. The results for the pre-COVID-19 and post-COVID-19 sample periods are estimated using Equation (4) and are shown in Table (5). The results in Table (5) suggest that the pre-COVID-19 sample γ_1 is negative and insignificant, whilst γ_2 is positive and significant. The cross-sectional dispersion of stock returns decreased (since γ_1 is negative) but at an increasing rate (because γ_2 is positive). The positive and statistical significance of γ_2 indicates the absence of herd behaviour in the pre-COVID-19 sample period. Likewise, in the post-COVID-19 sample, γ_1 is positive and insignificant, whilst γ_2 is positive and insignificant as well. The dispersion of stock returns increased at an increasing rate. Furthermore, the scale of the increasing rate (γ_2) is lower after South Africa reported its first COVID-19 case. Like the pre-COVID-19 sample results, these results suggest that herd behaviour is absent in the post-COVID-19 sample.

Table 5. Estimated Regression Coefficients for the Subsamples

	$CSAD_t$	
	Pre-COVID-19	**Post-COVID-19**
α	1.192***	1.345***
	(21.708)	(11.857)
γ_1	-0.241	0.306
	(-1.557)	(1.482)
γ_2	0.219***	0.037
	(2.912)	(0.931)
$Adj.R^2$	0.416	0.573

Notes: 1. For detailed equation see Equation (4)
2. T-statistics values using the Newey and West (1987) estimator are found in parentheses.
3. ***, **, * represent statistical significance at the 1%, 5%, and 10% levels of significance.
4. Source: Authors' own estimations.

Equation (5) is estimated for the full sample period to further support whether investor herd behaviour, in the JSE Top 40 Index, has been induced by the COVID-19 pandemic. Refer to Table (6) below for the results:

Table 6. Estimated Regression Coefficients

	α	γ_1	γ_2	γ_3	γ_4	$Adj.R^2$
$CSAD_t$	1.252***	0.371**	-0.318**	0.031	0.234***	0.579
	(22.351)	(2.219)	(-2.296)	(0.847)	(3.400)	

Notes: 1. For detailed equation see equation (5).
2. T-statistics values using the Newey and West (1987) estimator are found in parentheses.
3. ***, **, * represent statistical significance at the 1%, 5%, and 10% levels of significance.
4. Source: Authors' own estimations.

The results in Table (6) show that γ_3 is positive and less than γ_4, which therefore indicates a lower dispersion of the stock returns after South Africa's first confirmed COVID-19 case. However, a negative and statistically significant γ_3 is needed to conclude that herding is present post-COVID (Economou et al., 2018). Since γ_3 is positive and statistically insignificant, the results suggest that the COVID-19 pandemic did not induce herd behaviour in the South African stock market (Bouri et al., 2021). Therefore, investor herd behaviour was absent in the post-COVID-19 sub period. Furthermore, γ_4 is positive and statistically significant, which indicates that prior to South Africa's first confirmed COVID-19 case, investor herd behaviour was again not present (Bouri et al., 2021). These results align with the results obtained from the individual pre- and post-COVID-19 regressions in Table (5), thereby supporting the conclusion of the absence of herd behaviour prior to and after South Africa's first confirmed COVID-19 case.

In summary, the findings of this study indicate no presence of herd behaviour on JSE stocks for the full sample period, ranging from July 3, 2017 to June 30, 2021. The Chow breakpoint test confirms a structural break did occur on March 5, 2020 - the date of South Africa's first confirmed case of COVID-19. However, an analysis of the sub periods indicates that herd behaviour is absent in the pre- and post-COVID-19 subsamples. Therefore, this study concludes that there is no presence of herd behaviour within stocks on the JSE and, thereby, suggesting that the volatility related to the COVID-19 pandemic and the pandemic itself has not induced herd behaviour within the JSE stock market. This may be an indication that investors are uninfluenced by the herding bias due to the absence of herd behaviour; hence, in normal market conditions as well as periods of crises and volatility, investors make informed decisions according to their own beliefs, which may be an indication that the South African stock market is efficient. The findings are consistent with Kunjal and Peerbhai (2021), whose study shows that investors who trade in ETFs did not exhibit herd behaviour when trading in ETFs on the JSE prior to and after the first confirmed case of COVID-19 in South Africa. However, these results are inconsistent with the findings of Ababio and Mwamba (2017a and 2017b) and Shrotryia and Kalra (2020) who find herd behaviour in the JSE, the reason for this inconsistency could be related to the different sample periods in each study.

There are significant implications for policymakers and regulators that arise from the findings of this study. Firstly, if investors are thought to be rational in their trading decisions, this could indicate that investors are using private information and therefore could exhibit investor overconfidence on the stock market. Therefore, policies could be put into place by policymakers to ensure that the information about stocks and the stock market is fully disclosed, and that perfect information is provided in a way which encourages efficiency of the stock market and discourages predisposed investment decisions. Secondly, policy makers can ensure that perfect information on stocks is available in databases that are easily accessible by ensuring databases are regularly updated with information. Lastly, policy makers or regulators can promote behavioural finance and educate future investors and financial advisors on behavioural biases which can influence rational investment decisions of those investors and financial advisors.

4. CONCLUSIONS

Numerous research reports have been written on herd behaviour in South Africa’s stock market pre-COVID-19, however, these reports have contrasting conclusions. Some reports conclude that herd behaviour is only present in extreme market conditions, such as periods of crises, or during a bull or bear market, while others conclude that herding not present at all. These contradictions may be due to different methodologies and sample sets. This study aims to investigate the presence of herd behaviour on the stock market in South Africa, the JSE. The sample of this study constitutes the JSE Top 40 Index, and the period of analysis ranges from July 3, 2017 to June 30, 2021. This paper employs the CSAD methodology to determine whether herd behaviour is present within stocks on the JSE and to determine whether the COVID-19 pandemic induced investor herd behaviour within stocks on the JSE. The results conclude that there is no evidence of herd behaviour on the South African stock market when employing CSAD techniques prior to and during the COVID-19 pandemic. Additionally, the findings indicate that investors may be rational when trading on the stock market and execute trades based on their own information which may lead to investor overconfidence and therefore create implications for policymakers and regulators to action. Policymakers can ensure perfect information of stocks by creating policies which ensures this information is provided to investors, which may create efficiency in the stock market. Furthermore, regulators and policymakers can educate investors on more behavioural finance to promote rational investing and curb irrational investing decisions.

The limitations of this study include the following: first and foremost, this study is limited to the South African stock market, in particular the FTSE/JSE Top 40 Index. The index includes the 40 highest market investable stocks from the JSE All Share Index and hence can be considered 'blue chip stocks.' Therefore, the study does not consider stocks that are outside the Top 40 index. Secondly, the study only focuses on shares and no other instruments such as bonds, commodities, or Real Estate Investment Trusts (REITs). Thirdly, the study focuses on only the COVID-19 financial crisis, and not the 2008 financial crisis which may impact the degree of herd behaviour. Similarly, the study only investigates the presence of the herd behaviour bias and not any other biases. Therefore, based on the limitations of this study, future studies could incorporate all JSE stocks in their sample or could even include stocks from a specific sector, as the FTSE/JSE Top 40 Index has stocks from various sectors and not just one. This analysis will enable the detection of market- and sector-wide herd behaviour. Moreover, studies on herd behaviour could include other asset classes such as bonds, commodities, and real estate, as this could give a better indication as to whether investors herd in other financial instruments. Moreover, future studies could test for the presence of other behaviour biases on the JSE during the COVID-19 pandemic, as this could be beneficial in understanding the influence other behavioural biases may have on the thinking of investors and investment managers during periods of crises.

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