Herding Behavior Bias and its impact on Stock Returns: A case of Pakistan Stock Exchange

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ABSTRACT

Purpose: This study investigates the presence of herding behavior, a tendency for investors to imitate each other's actions, within the Pakistan Stock Exchange (PSX) and examines how information asymmetry (lack of equal access to information) influences this phenomenon.

Methods: The study employs established herding behavior detection models by Christie and Huang (1995), Chang et al. (2000), and Chiang and Zheng (2010). Daily stock and market return data from the KSE-100 index are utilized for the analysis.

Results: The analysis reveals statistically significant evidence of herding behavior in the PSX, indicated by negative and significant coefficients. This suggests that investors in the PSX exhibit a tendency to follow the actions of others. Furthermore, the study finds a positive relationship between information asymmetry and herding behavior. This implies that investors may be more likely to herd when they perceive others to have superior knowledge due to limited information access.

Novelty: This study contributes to the understanding of herding behavior in an emerging market context (PSX). While previous research presents conflicting findings, this study provides further evidence of herding within the PSX and sheds light on the potential role of information asymmetry in influencing this behavior.

Future Implications: The study highlights opportunities for future research to explore the underlying causes of herding in the PSX. Utilizing primary data through surveys or interviews could provide richer insights. Additionally, incorporating economic indicators alongside market data can offer a more comprehensive understanding of the factors driving herding behavior in Pakistan and potentially other emerging markets.

Keywords: Herding Behavior, PSX, Behavioral Finance, Stock returns, Information Asymmetry.

1. Introduction

The stock market is a complex system where individual investors make decisions based on their analyses, expectations, and risk tolerance. However, a significant portion of investors exhibit herding behavior, blindly following the actions of others without independent evaluation. Herding behavior, a well-documented phenomenon in behavioral finance, contradicts the efficient market hypothesis proposed by Fama (1970), which suggests that all available information is reflected in stock prices. This study aims to explore the relationship between information availability and herding behavior within the Pakistan Stock Exchange (PSX).

1.1 Research Objectives

- Examine the impact of information availability/non-availability on herding behavior among PSX investors.
- Quantify the extent of herding behavior in the PSX and identify the factors contributing to it.
- Evaluate the presence of abnormal idiosyncratic volatility (unexplained price fluctuations) during pre- and non-pre-earnings announcement periods.

1.2 Research Significance

Understanding the prevalence and drivers of herding behavior is crucial for several reasons. First, it helps identify market inefficiencies caused by irrational investor actions. Second, it informs investors about potential biases in their decision-making processes. Finally, it provides valuable insights for policymakers and regulators seeking to enhance market stability and investor protection.

1.3 Research Gap

Existing research on herding behavior in the PSX presents conflicting findings. Yousaf & Shah (2018) suggest a lack of herding, while Babar et al. (2016) report its presence due to information unavailability and unorthodox investor behavior. This study aims to bridge this gap by employing a robust methodology to definitively assess herding behavior in the PSX and its

relationship with information availability. Additionally, it will analyze the impact of herding on abnormal idiosyncratic volatility, which has not been previously explored in the context of the PSX.

1.4 Research Problem

This research addresses the limited understanding of how information availability influences herding behavior among PSX investors. It seeks to quantify the extent of herding and identify its contributing factors. Furthermore, it investigates the potential association between herding and abnormal price fluctuations in the pre and non-pre-earnings announcement periods. By addressing these questions, this study will contribute valuable knowledge to the field of behavioral finance in the Pakistani context.

2. Literature Review

The investors behavior that tends to imitate others is known as herding. Ricciardi & Simon (2000) described herding behavior as people who blindly follow the other's decisions and follow the crowd. Bikhchandani (2000) in his study of the behavior of herding defined herding as behavior as a very conspicuous intention to replicate decisions made by the investing parties leads to market volatility and destabilization. Bikhchandani mentioned three reasons for herding behavior, informational cascades, herding bias with respect to reputation and compensation. Informational cascades are when multiple and numerous investors are in observation of the ensues of the last investor's usefulness and will do the same for themselves. Graham (2003) defined herding based on reputation as when the information available publicly isn't coherent with the information and knowledge of private managers, they become prone to follow the decision of others. Whereas herding based on compensation is, when an investing party is dependent on how the performance is compared to the performance of other investors (Niu et al, 2023).

Among the several studies, the integrated survey Christie & Huang (1995) can be found. More specifically, Christie alongside Huang in 1995 used CSSD to investigate the herding behavior. Herding intensity was found low when investors follow other people. Whereas rational asset pricing models suggest that larger dispersion occurs when the assets have various levels of sensitivity to the market. However, CSSD has a drawback, which is its susceptible to outliers easily, causing difficulty in normal situations to track herding behavior.

Previous research showed mixed views of herding behavior, multiple different research proved that there is herding bias in various markets whereas others proved its absence. Demirer & Kutan (2006) proved the absence of herding behavior, via CSSD to test eighteen sectors of the Chinese Exchange from the period 1999-2002. Whereas, Tan, Chiang, Mason, along with Nelling in 2008 depicted the presence of the herding bias via CSAD.

Furthermore, Economou et. al, (2011) tested herding behavior from the period 1998-2008 around 4 stock exchanges namely Italy, Greece, Spain, and Portuguese and they found herding behavior in Italy and Greece exchanges whereas it wasn't the same in Spain.

Bowe & Domuta (2004) concluded by examining the Jakarta Stock Exchange that during the crises period, foreign herding was increased. Therefore, they found out that domestic herding was less than foreign herding during the financial crises. Rahman, Chowdhury, Hassan, & Shibley Sadique (2015) found the evidence of herding behavior in the Saudi Stock Market and mentioned that

herding behavior increases in bullish markets. Whereas Jlassi & Naoui (2015) found strong herding behavior in the US market especially when the market rises. Herd behavior is mostly found when the market is under stress.

Furthermore, Vietnam's stock market Vinh & Anh (2016) showed the presence of herding behavior. Chiang, Chinan, Li, Tan, & E (2015) also found similar results with regard to the Pacific markets/exchanges. The outcomes concluded proving bias of herding has a direct link with the stock market's performance and an indirect link with market (Phan et al., 2023).

Moreover, brief and concise bodies of work have been carried out with respect to herd bias in Pakistani market and the results found are mixed in the Pakistan stock market (Mubeen et al, 2021). Javaira & Hassan (2015) used the measures of CSSD and CSAD, but the results showed the absence of herding behavior in the Karachi Stock Market. Similar results were found in the study of Javed, Zafar, & Hafeez (2013). The study found no evidence of herding behavior in the Karachi Stock Exchange market by using the CSAD and CSSD measures. Zafar & Hassan (2016) found evidence of herding in the Pakistan Stock Exchange Market during the bearish and bullish trends. The availability of accurate and timely information is an issue in a developing country like Pakistan which leads the investors to herd (Ghani, et al, 2022).

2.1 Herding and Behavioral biases

Abnormalities in behavior which are called behavioral biases also have some contribution to herding. Prechter (2001) stated that humans have built-in herding behavior. He also claimed that it creates adverse feelings when one considers acting against another's opinion.

Cipriani & Guarino (2005) highlighted in his study many participants herd because they want to protect their image and reputation. They also mentioned many investors do not prefer to imitate information that is private & restrain themselves from purchasing and selling off because it ensues to inefficient knowledge of stocks which as ensues manifests in the stock prices.

Financial perspective will manifest the herding behavior in two aspects, one is rational and the second is irrational. Christie & & Huang (1995) mentioned that individuals tend to ignore their information and follow the market even if they don't agree. Investors follow others because it makes them feel confident and minimizes the factor of uncertainty. Whereas, on the other hand, to protect individuals' irrational behavior, rational behavior is driven. Individual investors herd rationally who they think are informed better and they have the information that is not available in the market. Therefore, both rational and irrational herding concludes that the investors don't tend to make their decisions based on their information.

Moreover, Demirer, Kutan, & Chen, Do (2010) stated that during the state of extreme market conditions, the chances of herding behavior are very high, as the investors follow the market, they are likely to be affected by stress. It is therefore concluded that investors get abnormal returns during extreme market conditions.

2.2 Herd Behavior and Financial Crises

It has been determined that herd behavior and financial market chaos / crises are interrelated. It has been determined that herding and financial market crises are interrelated such as the increase and decrease in price levels. Various research studies have been conducted to investigate herding concerning crises, for example, Hwang (2004) argued that herding behavior occurs prior to a crisis. They studied the marketplaces in South Korea and the United States and found that herding

demonstrates immense movement towards the market which is expressed in the volatility of the returns.

Economou, Kostakis, & Philippas (2011) used the data of individual stocks and discovered the evidence of herding in the Greece and Italy markets. Mobarek, Mollah, & Keasey (2014) extended the study and focused mainly on herding in crises. The study investigated 11 Europe countries where it was found that during financial crises, herding is present. The study led to an ensues that manifested Germany's positive influence of herding on other markets.

In the literature, some studies also showed that the herding effect is transferable in the markets. The herding effect can be easily transferred from one market to the other. Chiang, Mason, Nelling, & Tan (2007) claimed that when there were the crises in the 1990s in Asia affected other markets in the same regional area. Whereas other researchers found the opposite results. Forbes & Rigobon (2002) claimed that there is no transferable effect of herding. Whereas similar findings were detected in various countries. Other crises, such as the black Monday crash that happened in 1987, showed that markets that are interdependent are affected by crises. Corsetti, Pericoli, & Sbracia (2005) pointed out in his study that confirmed that crises have an impact on interconnected markets. He also mentioned in his study that in 1997 the crises that happened in Hong Kong affected Hong Kong markets as well as the French market.

2.3 Herding and information Asymmetry:

We've well studied that information is key. Especially in the context of financial markets where market is entirely dependent on the information that is being circulated. That is because investors rely on what they hear and read and to make calculated or un-calculated decisions, is entirely an individual's call. Similarly, Beatriz and Teresa (2011), have mentioned in their study, investors are surrounded by ambiguity and uncertainty and to overcome that, they rely on the next individuals investing choice, thinking that they might possess some additional information and might be more well-informed , which in turn becomes one of the causes of the bias.

Al-Shboul (2012) reported that in the Australian market that one return growth was up to 51% because of the sophistication of investors in the market as well as because of information availability.

The theory of the Efficient Market Hypothesis is that investors are rational when they expect the return of the stocks and reflects all of the market information available. Whereas, in reality, the investors who get abnormal returns on their stocks tend to trigger other investors to follow them. Iihara, Kato, & Tokunaga, (2001) shows in his study that professional investors herd more as compared to amateur investors. Similarly, Chiang, Li, Tan, & Nelling (2011) showed in their studies that information non availability and herding are interrelated.

Speed & Hisham (2018) scrutinised the control of herd bias with respect to PSX and conspicuously mentioned that, as per their results, the relation between cognitive factors and herding is moderated and tampered by information availability as well. The investors that have no information increase premium risk. Investors who are unaware depict a role of price hunters and blindly opt for the approach of the people/investors; they think did some background research/study so that they can gain more information about the company. Zhou & Lai (2009) showed in his research that institutional herding is caused by the unavailability of information in Taiwan Stock Exchange.

Degirmen, Pabst, & Songur (2012) studied the herding behavior in both developed and developing markets. And they claimed one of the reasons that distinguish bias between developing and

developed markets/exchanges is quality of information. Bias of herding is influenced by the accuracy of information signals in the market. As investors trust their private information, the herding tendency tends to grow smaller as more informative signals are received. Furthermore, it is stated in his study that the sharing of information is greater in developed markets than in developing ones, and the quality of information is better in developed markets. In addition, the study found that the herding behavior in developing markets is more because of the limited accuracy of information.

Dutta et al (2024) explored the influence of informational asymmetry on stock liquidity in India. After controlling for the effects of firm-specific risk and investor sentiment, the results show that informational asymmetry, as measured by the delay factors has a significant positive association with illiquidity, indicating that market liquidity decreases with less transparency and a high level of informational asymmetry. The results also show that investor sentiment has a significant association with illiquidity, whereas firm-specific risk and illiquidity seem to have no noticeable relationship.

To support the argument further, theory is developed, Bikhchandani, Hirshleifer, & Welch (1992) which is also referred to by many researchers. According to the theory, an information cascade happens when the actions of the individual are independent of his private information. In the cascade, the decisions taken by investors have no information because they ignore their private information. This is the reason that causes the blocking of information and information cascades to begin. In the markets, information uncertainty triggers informational cascades. Whereas, information uncertainty does not only include the value of assets instead includes credible levels of information. In ambiguity, participants believe the other investing parties comprise accurate data and information which motivates the participants to follow the action of informed investors.

Moreover, in Pakistan, people tend to depict a more risk averse attitude which ensues to the conclusion that people are scared of losses and potential reputational damage, leading from those losses (Ali, et al, 2018). Hence, they tend to follow each other in the hope that the other individual might have additional key information which they might have missed out on which then leads to increased herding in the markets. (Mubeen, et al, 2021)

Implications of herding can be elaborated as a cause of inefficiency of the markets. Thomas C. Chiang (2013) mentioned that, facing stressful marker conditions, investors are usually intricate and under complex, which leads to them investing on the mere basis of what everyone is opting for. This ultimately decreases market efficiency as the right kind of information which is key for investment decisions is not being articulated amongst the investors which causes havoc and ultimately, losses for investors.

Keynes (1930) stated in his study the reason people jump on other decisions is based on assumption that others have key information, and they don't. He also argues that Bias behavior of herd is positively impacted asymmetry or misalignment in information due to uncertainty about the credibility of information.

Wang (2000) his study found that information asymmetry results in the instability among investors. At this situation of misalignment, investing parties having credible and ample information take the edge over others. So, when the unaware investing parties respond to the various information, they face the miscast issue and make an adverse selection, moreover, they buy the stocks at the overvalued prices. Those uninformed investors request for extra premium in exchange owing to the risk and ambiguity they tend to off trade. Following the situation, it

increases the price volatility. Lou in 2014 mentioned, the number of unaware participants increases, so will the premiums on demand.

The scenario, with more unaware parties, asymmetric problems are ever increasing, along with the distinction between higher & lower costs/prices. Therefore, the higher premium is the compensation for the uninformed investors. De Long, Shleifer, Summers, & Waldmann (1990) suggested that within the information asymmetry if the investors trade in the market price volatility would be increased because of the greater risk premium. However, if asymmetric information is detected, exchange happens with respect to various information. Thus, it would impact the personal information quality that each investor possesses regarding future cash flows.

3. Methodology

The research is based on the secondary data such as price data, stock market data (stock returns) and quarterly reports of the companies listed on the Pakistan Stock Exchange from the period 2007-2023 was collected from the website of the Pakistan Stock Exchange in KSE-100 Index. Initially all 100 Companies data was targeted but only 90 Companies data was available for process for full 2007 till 2023 period. Cross Section Standard Deviation (CSSD), Cross Section Absolute Deviation (CSAD), and herding are used as dependent variables whereas Information asymmetry, volatility in stock prices, volume, and returns of the market are considered as independent variables for this study.

3.1 Cross Sectional Standard Deviation (CSSD)

In general terms, CSSD is used to check the relation between the stock returns and market returns to identify existence of herding behavior. The formula for CSSD is given by:

$$\boldsymbol{CSSD_t} = \sqrt{\frac{\sum_{\boldsymbol{i=0}}^{\boldsymbol{n}}(\boldsymbol{R_{it}}-\boldsymbol{R_{mt}})^{\boldsymbol{2}}}{(\boldsymbol{N}-\boldsymbol{1})}} \ldots (i)$$

Where N represents total entities of portfolio, R_{it} is the stock return of firm i on day t. R_{mt} is the portfolio's equally weighted return at time t. The calculated CSSD is used in the following model in order to test the herd behavior:

$$\boldsymbol{CSSD_t} = \boldsymbol{\alpha} + \boldsymbol{\beta_1^U D_t^U} + \boldsymbol{\beta_2^L D_2^L} + \boldsymbol{\varepsilon_t} \ldots (ii)$$

This equation states that when the market return is attached to a high return value then D_t^U would be equal to 2, whereas D_2^L would be 1 if the same would be in the lower tail. In the opposite conditions, 0 would be attached to both D_t^U and D_2^L. As herding is noted when the dispersion of market and stock return is low, a low value of CSSD would mean that the herding exists (Zafar & Hassan, 2016).

3.2 Cross Sectional Absolute Deviation (CSAD)

When the bias of herding exists, returns of stocks and market are compared, and if herding exists then the stock returns would be close to the market returns of the particular market. In this research, CSAD along with a different independent variable, which will be used to identify any herding bias. In this measure, distribution of returns of stock and market, are calculated and analyzed. The equation for the CSAD measure is given below:

$$\mathrm{CSAD_t} = \alpha + \gamma_1 \mathrm{r_{m,t}} + \gamma_2 \left|\mathrm{r_{m,t}}\right| + \gamma_3 \mathrm{r^2_{m,t}} + \varepsilon_t \ldots (iii)$$

Whereas $R_{m,t}$ is the market return at time t, γ_2 is the coefficient of absolute market returns and γ_3 is the coefficient of squared market returns at time t. if γ_3 is found negative and significant, herding exists.

3.3 Information Asymmetry:

When it comes to exchanges, Information is key. Vital source for the investors to look upon prior to their investments in the stocks. To find the asymmetry in both bearish and

bullish markets, Chiang & Zheng (2010) modified Chiang, Li, Tan, & Nelling (2011) model as given:

$$\mathrm{CSAD_t} = \gamma_o + \gamma_1 \mathrm{DR_{m,t}} + \gamma_2 (1 - \mathrm{D}) \mathrm{R_{m,t}} + \gamma_3 \mathrm{DR^2_{m,t}} + \gamma_4 (1 - \mathrm{D}) \mathrm{R^2_{m,t}} + \gamma_5 \mathrm{CSAD_{t-1}} + \varepsilon_t \ldots (iv)$$

D is a taken as a dummy variable which is 1 when the returns of market are positive, wherever dummy variable is 0 when the market returns are negative. The coefficients γ_1 and γ_2 depict how $CSAD_t$ and market returns are related. By adding a 1-day lag in our dependent variable, it would improve the regression's power. The negative and significant coefficients would depict asymmetry/misalignment in the bias of herding in up and also the down markets, and thus has a positive impact on herding.

Many studies have examined if the role of investment style has any impact in herding activities. Such as, Lakonishok et al. (1992) studied if the herding intensity is higher when it comes to small as compared to capitalization of large stocks and found higher intensity of herding in small capitalization stocks. Research where Wermers (1999) investigated herding behavior in various investor styles and herd bias is observed in the small capitalization. Whereas, primary goal previously was to determine if herd behavior varies along the investment regime, the primary focus in this is to find out if asymmetric information has any impact on herding.

To assess the information asymmetry, abnormal idiosyncratic volatility is examined during the pre and post-earnings announcement periods. Earnings announcement is used as an information intensive event because firms reveal their profitability in the reports which help investors forecast the future performance of the firm. We will be evaluating risk association with stock idiosyncrasy via SD.

To measure the idiosyncratic volatility for pre-earnings announcement days, we have considered $t-5$ to $t-1$, where t represents quarterly report announcement days. For the post-earning announcement days, we have considered rest of the trading days except for the 11 days around quarterly announcement period. Taking into consideration on the basis of assumption, accounting for 252 days of trading in a particular year:

$$IV_{PEA} = ln \sqrt{\frac{252 \times \sum_{PEA} \varepsilon^2}{n_{PEA} - 1}} \ldots (iv)$$

and $$IV_{NEA} = ln \sqrt{\frac{252 \times \sum_{NEA} \varepsilon^2}{n_{NEA} - 1}} \ldots (v)$$

Where n_{PEA} are the number of days in the pre-earnings period, n_{NEA} are number of days in the non-earnings announcement period. Evaluating impact of asymmetry of information on herding following model will be used:

$$\mathbf{CSAD}_{i,t} = \boldsymbol{\alpha} + \boldsymbol{\beta_1}\,\mathbf{IVOL}_{i,t-1} + \boldsymbol{\beta_2 Z}_{i,t-1} + \cdots (\boldsymbol{vi})$$

Whereas IVOL is the idiosyncratic volatility, and Z_{t-1} represents the volume. All the variables that are available easily on the internet will be used in this equation.

4. Results Findings and Analysis

Referring to the Research models of Chang (2000), Zheng (2010) and Christie (1995), these are used for the investigation of any and all herd behavior in our research. Time series data from the year 2007 till 2023 of Karachi Stock Exchange is used. Data analysis is done through Spreadsheet software. Analysis techniques such as descriptive statistics and regression analysis are used.

Table 4.1: Descriptive Statistics of CSAD and Market Return

Index	CSAD	Market Return
Mean	1.40%	0.04%
Median	1.38%	0.00%
Maximum	16.02%	8.60%
Minimum	0.00%	-6.86%
Standard Deviation	0.66%	1.13%
No. of observations	3929	3929

The daily data from the year 8th October 2007 to 12th October 2023 is taken into account and a total of 3929 observations are considered. Table 1. Shows descriptive statistics of CSAD and market return. The mean value of CSAD is higher than the market return which means there is a higher variation in the market. Moreover, the maximum value is 0.160 in CSAD, and the standard deviation of market return is greater than the CSAD which is 0.011.

Table 4.2: Christie & Huang (1995) CSSD Regression Results

	Coefficients	Standard Error	t Stat	P-value
$\boldsymbol{\alpha}$	0.0375	0.0022	16.8075	0.0000
$\boldsymbol{\beta_1^U D_t^U}$	0.0154	0.0023	6.7264	0.0000
$\boldsymbol{\beta_2^L D_2^L}$	-0.0175	0.0023	-7.6255	0.0000

Table 4.2 explains the CSSD regression results. The coefficients show the negative value at the left tail which explains that herding behavior is existent in the market. Whereas the P-values are significant at the level 5% which means that the negative coefficients are not by random chance alone, herding does exist in the market. These results are compared to results who have used the same measure in their study. Mixed results were found in the study of (Khorana, Chang, Cheng, & Joseph, 1999), solid and evident proof of herding wasn't found in the developed markets, however herding existed in the stock exchanges of South Korea and Taiwan which are the emerging and new markets. To this extent, the results found in Karachi Stock Exchange are

consistent to their results. These findings support those conducted in 2010 of Chiang, Li, and in 2008 of Chiang, Mason and Nelling, concluding, herding exists within the markets of China. On the contrary, in 2006 Kutan tried exploring and investigating herding in 375 companies using the daily returns. Furthermore, Demirer & Kutan (2006) by using CSSD and tested eighteen segments of the Chinese exchange along the period 1999-2002 and proved the absence of herding behavior.

It also explains that the investors don't consider the private information they have, rather they just follow the crowd. The possible reasons include the confidence level investing parties possess or acting in line with the other investing individuals. Moreover, the dispersion increases when the market is in stress.

Table 4.3: Chang et al. (2000) CSAD Regression

	Coefficients	**Standard Error**	**t Stat**	**P-value**
$\boldsymbol{\alpha}$	0.0096	0.0001	56.5692	-
$\boldsymbol{\gamma_1 r_{m,t}}$	0.0282	0.0093	3.0078	0.0260
$\boldsymbol{\gamma_2 \lvert r_{m,t} \rvert}$	0.6810	0.0270	25.142	0.0000
$\boldsymbol{\gamma_3 r_{m,t}^2}$	-6.9211	0.7027	-9.8486	0.0000

Table 4.3 shows the regression results of CSAD, which is obtained by Chang et al. (2000). It shows the equation of regression on the entirety of data. Negative is the coefficient, that indicates herd behavioral bias is conspicuously existent in the market and is significant. These outcomes are in opposing Javed who in 2013 tried to locate herd bias in Pakistan Market via the method used by Chang in 2000, hence found no evidence of herding. Khan (2013) used the same method for locating herd bias in PSX, but could not find any evidence. Moreover, Javaira and Hassan (2015) employed the same measures for their study to find the support of herding bias in the Pakistan Exchange but were unable to discover.

These findings support (Hussain and Shah, 2015) theory that in the developed countries, the problem of information asymmetry is severe because of many reasons which includes ownership of insiders, family businesses, and poor corporate governance.

Table 4.4: CSAD Regression Results (Asymmetric Information)

	Coefficients	**Standard Error**	**t Stat**	**P-value**
γ_o	0.0060	0.0002	29.5643	0.0000
$\gamma_1 DR_{m,t}$	0.6025	0.0242	24.9418	0.0000

$\gamma_2(1-\mathrm{D})\mathrm{R}_{\mathrm{m,t}}$	-0.5813	0.0264	-22.0136	0.0000
$\gamma_3\mathrm{D}\mathrm{R}^2_{\mathrm{m,t}}$	-6.1886	0.6962	-8.8889	0.0000
$\gamma_4(1-\mathrm{D})\mathrm{R}^2_{\mathrm{m,t}}$	-6.6432	0.7153	-9.2879	0.0000
$\gamma_5\mathrm{CSAD}_{\mathrm{t-1}}$	0.3048	0.0127	23.9871	0.0000

Table 4.4 examine the impact of asymmetry on herding in both up and down markets, where the coefficients are negative & statistically very significant, therefore we do not reject/neglect the null hypothesis and come to the conclusion there is a positive impact of asymmetry on herding. Moreover, irrationality rises when assumed that investing individuals disregard their private readings and information when they have asymmetrical information about stocks in the market, and investors are prone to align with those who have private knowledge and information. Alevy et al. (2007).

These results support the findings Alhaj-Yaseen & Rao, in which positive impact of information asymmetry on herding was identified, also consistent with the results of previous research by Sias (2004) showed that the herding intensity is influenced by the quality and quantity of the information available. Additionally, these results support Zhou and Lai's (2009) investigation of herd bias in HK (Hong Kong), which found that bias occurs frequently also in marketplaces with greater transparency, mostly as a result of information cascades.

5. Conclusion

This study investigates the presence of herding behavior, a phenomenon where individuals mimic others' actions, within the Karachi Stock Exchange (KSE). It specifically examines how information asymmetry, the unequal access to information, influences herding.

Herd bias reflects an individual's tendency to align with the perspectives and actions of others, either rationally or irrationally. If herding behavior is prevalent, it suggests market inefficiency. The study employs established models developed by Christie and Huang (1995), Chang et al. (2000), and Chiang and Zheng (2010) to detect herding. Daily stock and market return data from the KSE-100 index were used for the analysis.

The detailed analysis revealed statistically significant evidence of herding behavior within the KSE-100. This is supported by the negative and significant coefficients obtained. These findings are consistent with other studies that identified herding behavior in certain sectors of the PSX.

However, some studies have yielded contrasting results. Javed (2013) and Javaira and Hassan (2015) using similar measures were unable to detect herding within the PSX. While these findings resonate with research conducted in other countries (e.g., Jlassi et al., 2015), contrasting results were obtained by Ramadan (2015) who identified herding in the Amman stock market, and Lindhe (2012) who observed herding behavior in other markets.

To explore the influence of information asymmetry on herding, the model developed by Chiang and Zheng (2010) was utilized. The analysis revealed a positive relationship, suggesting that information asymmetry can indeed contribute to herding behavior. This aligns with the possibility that investors, lacking complete information, might choose to follow the actions of others perceived to have superior knowledge (Mubeen et al., 2021). Similar findings on the interconnectedness of information asymmetry and herding were reported by Chiang et al. (2011).

Furthermore, Keynes (1930) argued that herding behavior stems from the perception that others possess superior information. He also suggested that uncertainty about information credibility fuels herding behavior, which thrives under conditions of information asymmetry.

5.1 Managerial Implications:

The findings of this study on herding behavior in the Pakistan Stock Exchange (PSX) hold significant implications for various stakeholders within the market.

- **Market Regulators:** The confirmation of herding behavior, particularly its link to information asymmetry, suggests a need for improved market transparency. Regulatory bodies can focus on initiatives that enhance investor access to accurate and timely information. This could include mandating stricter disclosure practices by listed companies, promoting financial literacy programs for individual investors, and encouraging the use of reliable financial news sources.
- **Investment Firms:** Understanding the prevalence of herding can help investment firms tailor their investment strategies. By recognizing herding tendencies, advisors can encourage clients to conduct fundamental analysis and make informed decisions based on their individual risk tolerance and investment goals. Additionally, firms can leverage educational resources to address information asymmetry and promote independent investment decision-making.
- **Listed Companies:** Companies listed on the PSX can benefit from the knowledge of herding behavior by focusing on effective investor communication strategies. Clear and consistent communication regarding company performance, future prospects, and potential risks can mitigate investor reliance on herd behavior and attract more informed investors.

By addressing the factors that contribute to herding, such as information asymmetry, all stakeholders in the PSX can work towards a more efficient and stable market environment. This will ultimately benefit investors by promoting informed decision-making and fostering a level playing field.

5.2 Future Implications and Limitations:

The current study provided some valuable insights but also possessed some limits which future research can use in order to devise more interesting studies. Present study has limitations, which includes the use of secondary data to find out the herding behavior such as market returns. Also, this study has not focused on the reasons behind herding which future researchers can take advantage of and create more valuable insights. Additionally, the current study is limited to examining market-wide herding behavior and institutional herding couldn’t be examined because regulatory authorities have not maintained the required institutional data.

Using primary data, Pakistani researchers in the future will be able to assess herd behavior. Since primary data is based on actual events, and more valuable insights on biased phenomena of herd behavior owing to the real-life experiences. Moreover, researchers can examine herd behavior in different countries and compare (Mubeen, et al, 2021).

Furthermore, studies can be conducted in the future incorporating other factors which might have an adverse impact on the rise of herding behavior in Pakistan such as taking into account economic indicators i.e GDP, interest rates and how they impact the mindset of individuals in Pakistan and adversely lead towards herding behavioral bias.

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