

DRIVERS OF HERDING BEHAVIOUR IN BANKING STOCKS LISTED IN THE LQ45 INDEX: EVIDENCE FROM THE INDONESIA STOCK EXCHANGE

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Abstract

This study aims to empirically examine the determinants of herding behavior, specifically the effect of market returns, market volatility, and trading volume on giant-capitalization banking stocks within the LQ45 index on the Indonesia Stock Exchange during the 2021–2025 period. Utilizing a quantitative approach, the study analyzes 1,205 daily observations. Herding behavior is detected using the Cross-Sectional Absolute Deviation (CSAD) model, estimated through split-sample multiple linear regression across bearish and bullish market regimes. The empirical findings demonstrate that herding behavior exclusively exists during bearish market conditions, as evidenced by a significant reduction in return dispersion during extreme market downturns. Conversely, no herding is detected during bullish trends. Furthermore, both market volatility and Trading Volume Activity (TVA) exhibit a significant negative effect on herding tendency across all market regimes; an increase in these variables actually widens return dispersion. This indicates that heightened market turbulence and trading activity stimulate a divergence of opinion and heterogeneous investment decisions rather than uniform collective actions. In conclusion, herd mentality in major banking stocks is primarily driven by psychological distress during market crashes, whereas high volatility and volume reflect rational, independent analytical strategies.

Keywords: Herding Behaviour, CSAD, Market Volatility, Trading Volume, Banking Stocks

INTRODUCTION

The capital market plays a vital role in the economy as a long-term financing source for corporations and an investment vehicle for the public (Bodie et al., 2011). In recent years, the Indonesian capital market has undergone a significant transformation, particularly in the post-COVID-19 era. Data from the Indonesia Central Securities Depository (KSEI, 2025) reveals a massive surge in the number of capital market investors, skyrocketing from 7.49 million at the end of 2021 to over 20.35 million by the end of 2025. This rapid expansion is primarily driven by retail investors (Rachmawati et al., 2025). This sharp increase in public participation alters market dynamics, as a high concentration of new retail investors with varying degrees of financial literacy may be more susceptible to social influences and psychological biases rather than thorough technical or fundamental analysis (Cahyono et al., 2024). Consequently, collective investment behaviors, such as herding behavior, become a critical phenomenon to investigate, especially amid global economic uncertainty.

In classical finance theory, the Efficient Market Hypothesis posits that stock prices reflect all available information (Fama, 1970). However, empirical anomalies show that stock price volatility often exceeds what economic fundamentals can explain (Shiller, 1981). This discrepancy laid the

groundwork for behavioral finance, which emphasizes the psychological factors influencing investor decision-making. Herding behavior represents a prominent psychological bias in modern financial markets, occurring when investors mimic the actions of the majority or market trends while disregarding their own private information or fundamental values (Afriani & Halmawati, 2019). Theoretically, herding can lead to significant market distortions and asset mispricing because stock prices cease to reflect intrinsic corporate values, moving instead with collective market trends (Rona & Sinarwati, 2021).

The banking sector holds a highly strategic position in the Indonesian economy, serving as the primary financial intermediary (Astohar et al., 2021). Due to its heavily regulated nature and sensitivity to monetary policies, the banking industry serves as an ideal setting for behavioral research.

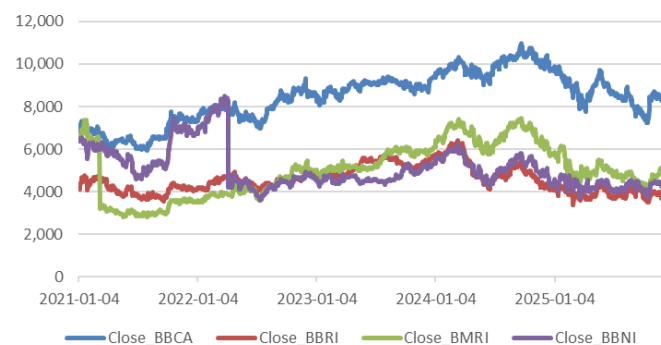


Figure 1. stock performance chart

In the Indonesian stock market, the "Big Four" banks: PT Bank Central Asia Tbk (BBCA), PT Bank Rakyat Indonesia (Persero) Tbk (BBRI), PT Bank Mandiri (Persero) Tbk (BMRI), and PT Bank Negara Indonesia (Persero) Tbk (BBNI) consistently dominate the liquid LQ45 index. By December 2025, these four institutions collectively accounted for Rp 2,167.25 trillion, representing an absolute dominance of 71.78% of the total LQ45 market capitalization (Rp 3,019.26 trillion), with an annual transaction volume reaching Rp 857.24 trillion. This extreme capital concentration and massive liquidity create a powerful magnet for capital flows during both bullish and bearish periods. Interestingly, historical data indicates a uniform movement pattern among these four banking stocks, moving in tandem regardless of firm-specific fundamental shifts. This visual synchronization suggests a low cross-sectional absolute deviation (CSAD), which is a key indicator of herding behavior.

The explicit novelty of this research lies in its specific focus on the highly concentrated banking sector within the liquid LQ45 index during the dynamic post-pandemic window of 2021–2025. While herding behavior has been widely documented, most prior empirical studies in Indonesia analyze the market under an aggregate lens (such as the IHSG) without industry-specific segregation. Such aggregate methods frequently fail to detect herding because opposing price movements across diverse sectors tend to offset one another. Furthermore, prior literature presents inconsistent findings regarding the effects of market returns, volatility, and trading volume on herding, indicating a profound research gap. This study addresses these gaps by evaluating herding dynamics across distinct post-pandemic phases: the initial recovery and sentiment shift in 2021; the heightened volatility induced by global tapering off and domestic interest rate hikes in 2022–2023; and the market stabilization and adaptation phase in 2024–2025.

Consequently, this study aims to examine the empirical determinants of herding behavior specifically market returns, market volatility, and trading volume in the LQ45 banking sector using the Cross-Sectional Absolute Deviation (CSAD) model pioneered by Chang et al. (2000) and expanded by (Chiang & Zheng, 2010). To prevent estimation bias resulting from shifting market regimes, this study incorporates market conditions (bullish and bearish states) as a control variable (Ah Mand et al., 2023).

Theoretically, this research enriches behavioral finance literature by providing empirical evidence on conditional herding within highly concentrated emerging markets. Practically, it offers vital insights for retail and institutional investors to mitigate panic-driven decisions, assists banking management in formulating corporate actions amidst systemic sentiment shifts, and provides empirical foundations for regulators to implement policies that safeguard market efficiency and stability.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

The conceptual paradigm of capital markets traditionally relies on the Efficient Market Hypothesis (EMH), which posits that asset prices fully reflect all available and relevant information (Fama, 1970). Under this classical framework, investors are assumed to be rational agents who process market signals instantaneously, thereby preventing any systematic opportunities for abnormal returns (Husna & Aryati, 2024). However, empirical realities frequently diverge from these assumptions, as stock market volatility often displays fluctuations far more severe than shifts in underlying economic fundamentals can justify (Shiller, 1981). This systemic gap led to the emergence of behavioral finance, a field that integrates cognitive psychology with financial economics to evaluate how individuals interpret, misinterpret, and react to market data (Bodie et al., 2011). Behavioral finance establishes that subjective investor sentiment, psychological biases, and informational constraints frequently override rational calculation, particularly during highly volatile phases or periods of severe macroeconomic adjustments (Shefrin, 2007).

A prominent manifestation of these psychological distortions is herding behavior, a phenomenon wherein investors intentionally suppress their private assessments to align their trading decisions with the aggregate actions of the market collective (Bikhchandani et al., 2001). To capture and quantify the intensity of this collective behavior, empirical studies utilize the Cross-Sectional Absolute Deviation (CSAD) methodology pioneered by Chang et al. (2000). The CSAD framework operates on the premise that rational asset pricing models dictate a linear increase in equity return dispersion as market returns fluctuate. Conversely, when herding behavior is present, the return dispersion among individual equities suppresses and moves in tandem with the broader market index, yielding a non-linear relationship (Chiang & Zheng, 2010). Mathematically, the standard measure of dispersion is formulated as follows:

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

Where $CSAD_t$ represents the cross-sectional absolute deviation at period t ; $R_{i,t}$ denotes the individual return of stock i at period t ; $R_{m,t}$ signifies the aggregate market return at period t ; and N represents the total number of banking equities included in the active research sample.

HYPOTHESIS DEVELOPMENT

Market returns serve as an essential macro indicator reflecting the collective response of market participants to incoming information cascades (Jogiyanto, 2016). Behavioral finance suggests that when market returns experience extreme upward shifts, investors face psychological pressure to conform to the prevailing momentum to avoid missing out on profitable trends (Shefrin, 2007). Empirically, Rachmawati et al. (2025) detected substantial herding patterns within liquid LQ45 portfolios during periods characterized by high market returns. This acceleration of herding intensity conditional on aggregate returns is further substantiated in broader sectoral studies by Ukpogon et al. (2021) and specifically within banking clusters during bullish regimes (Mishra & Mishra, 2021). Thus, a strong positive market trajectory acts as a catalyst for informational cascades among bank stock investors. Based on these arguments, the first hypothesis is formulated as follows:

H1: Market returns has a positive effect on herding behavior in LQ45 banking stocks.

Market volatility serves as a direct proxy for systematic risk and environmental uncertainty within trading ecosystems (Tandelilin, 2017). When volatility escalates, individual data analysis becomes less reliable, driving investors to seek psychological safety by imitating the consensus of the institutional crowd (Bodie et al., 2011). Empirical evaluations demonstrate that elevated market volatility significantly amplifies herding tendencies across various emerging market indices (Yang & Chuang, 2023). Within the banking sector, heightened volatility frequently triggers panic-driven synchronizations, forcing market participants to follow macro trends rather than stock-specific metrics (Mishra & Mishra, 2021; Ay & Yağcilar, 2024). Consequently, higher volatility diminishes individual rational divergence. Hence, the second hypothesis is proposed:

H2: Market volatility has a positive effect on herding behavior in LQ45 banking stocks.

Trading volume reflects the intensity of investor participation and the rate of information dissemination within the market (Nofsinger, 2001; Wicaksono & Adyaksana, 2020). In behavioral frameworks, a surge in Trading Volume Activity (TVA) is often interpreted by retail investors as a signal that institutional traders possess superior asymmetric information, thereby triggering a wave of mimetic trading (Shefrin, 2007). Empirical studies confirm that incorporating transactional volume significantly enhances the detection of herding dynamics in liquid segments like the LQ45 index (Komalasari, 2024). This positive relationship between high trading intensity and herding is consistently observed in high-liquidity stock segments where rapid volume changes indicate mass capital reallocations (Ukpong et al., 2021). Given the highly liquid nature of the Indonesian banking sector, a rise in transaction volume likely fosters localized herd formations. Accordingly, the third hypothesis is presented:

H3: Trading volume has a positive effect on herding behavior in LQ45 banking stocks.

RESEARCH METHODS

Research Design

This section outlines the systematic approach employed to investigate herding behavior within the Indonesian capital market. The research adopts a quantitative associative design to empirically examine the influence of market returns, market volatility, and trading volume on the formation of collective investor mimicry. By focusing on distinct psychological market conditions, the design is structured to capture non-linear behavioral dynamics that traditional linear asset pricing models might overlook.

Population and Sample

The target population encompasses all banking sector companies listed on the Indonesia Stock Exchange (IDX). To ensure the robustness and relevance of the findings, a purposive sampling technique was applied based on three stringent criteria: (1) consecutive inclusion in the highly liquid LQ45 index during the 2021–2025 observation period; (2) classification under Core Capital Group 4 (KBMI 4), which represents giant-capitalized banks with core capital exceeding Rp 70 trillion acting as primary market movers; and (3) the availability of continuous daily trading data devoid of extreme corporate actions, such as mergers or delistings. Consequently, the final sample comprises four dominant banking institutions: PT Bank Central Asia Tbk (BBCA), PT Bank Rakyat Indonesia (Persero) Tbk (BBRI), PT Bank Mandiri (Persero) Tbk (BMRI), and PT Bank Negara Indonesia (Persero) Tbk (BBNI).

Data Collection Techniques

Data collection relies on secondary daily time-series datasets spanning from 2021 to 2025. The required data points specifically daily closing stock prices, the Composite Stock Price Index (IHSG) as the market proxy, and daily trading volumes were systematically extracted from verified public financial databases, including Yahoo Finance and Investing.com. To operationalize the instruments for analysis, market volatility is calculated using the moving standard deviation of market returns. Meanwhile, trading volume is measured using the Trading Volume Activity (TVA)

ratio, which standardizes the data by dividing the daily traded shares by the total outstanding shares, thereby neutralizing potential biases arising from disparities in firm size.

Data Analysis Techniques

The data analysis fundamentally revolves around the Cross-Sectional Absolute Deviation (CSAD) model to quantify the dependent variable, herding behavior (Chang et al., 2000). To accurately assess the impact of the independent variables while controlling for market conditions, a split-sample multiple regression analysis is executed. Observations are segregated into a Bullish regime and a Bearish regime. The resulting econometric models are defined as:

Model 1: Bullish Regime ($R_{m,t} \geq 0$).

$$CSAD_{t,bullish} = \alpha + \beta_1 |R_{m,t}| + \beta_2 R_{m,t}^2 + \beta_3 VOL_t + \beta_4 TVA_t + \varepsilon_t \dots \dots \dots (2)$$

Model 2: Bearish Regime ($R_{m,t} < 0$).

$$CSAD_{t,bearish} = \alpha + \beta_1 |R_{m,t}| + \beta_2 R_{m,t}^2 + \beta_3 VOL_t + \beta_4 TVA_t + \varepsilon_t \dots \dots \dots (3)$$

Prior to hypothesis evaluation, the models are subjected to classical assumption tests—comprising the Kolmogorov-Smirnov test for normality, Tolerance and VIF metrics for multicollinearity, scatterplot inspection for heteroscedasticity, and the Durbin-Watson test for autocorrelation—to ensure adherence to the Best Linear Unbiased Estimator (BLUE) criteria. The presence of herding behavior is explicitly confirmed if the regression coefficient for the squared market return is negative and statistically significant (p-value < 0.05), indicating that cross-sectional dispersion narrows during extreme market fluctuations due to collective investor conformity.

RESULTS AND DISCUSSION

Descriptive Statistics and Classical Assumption Tests

This study utilizes 1,205 daily observations divided into two market regimes: bearish conditions (644 observations) and bullish conditions (561 observations). Based on the descriptive statistical analysis, the average CSAD value in bearish conditions (0.0111) is slightly higher than in bullish conditions (0.0103). This provides an initial indication that the return dispersion of banking stocks tends to widen during market downturns. Meanwhile, the volatility level and trading volume (TVA) show relatively balanced averages across both market conditions, indicating consistently high liquidity in KBMI 4 banking sector stocks.

Prior to model estimation, a series of classical assumption tests were fulfilled for each subsample. The test results confirm that both regression models are free from multicollinearity symptoms (Tolerance value > 0.10 and VIF < 10), heteroscedasticity (randomly dispersed scatterplot patterns), and autocorrelation (Durbin-Watson values of 1.995 and 1.967, respectively). Although the Kolmogorov-Smirnov normality test shows a significance below 0.05, the model estimation remains valid and unbiased by referring to the Central Limit Theorem, given the large sample size in this study (N > 500 observations).

Multiple Linear Regression Analysis Results

Hypothesis testing to detect herding behavior is analyzed through Cross-Sectional Absolute Deviation (CSAD) regression. A summary of the multiple regression results using the split-sample approach is presented in Table 1 below:

Table 1. Summary of CSAD Model Regression Analysis Results

Independent Variable	Coefficient (Bearish)	Sig. (Bearish)	Coefficient (Bullish)	Sig. (Bullish)
Constant	0.001	0.589	0.004	0.000*
ABS_Return	0.113	0.157	0.269	0.009*
Squared_Return	-8.337	0.020*	-2.996	0.073
Volatility (VOL)	0.364	0.000*	0.294	0.002*

Volume (TVA)	5.865	0.000*	3.27	0.000*
R-Square	0.244	-	0.122	-
F-Sig	< 0.001*	-	< 0.001*	-

Source: data proceed, SPSS

Note: The asterisk (*) indicates the significance level at alpha = 0.05\$.*

Based on Table 1, the regression models in both market conditions are declared fit (the F-test for model fitness shows a sig. value < 0.001). The coefficient of determination (R^2) in the bearish regime (24.4%) exhibits stronger explanatory power compared to the bullish regime (12.2%). The mathematical regression equations formed from these estimation results are as follows:

$$CSAD_{t,bearish} = 0.001 + 0.269 | R_{m,t} | - 8.337R_{m,t}^2 + 0.364VOL_t + 5.865TVA_t + \varepsilon_t$$

$$CSAD_{t,bullish} = 0.004 + 0.113 | R_{m,t} | - 2.996R_{m,t}^2 + 0.294VOL_t + 3.270TVA_t + \varepsilon_t$$

Discussion

1. Market Conditions and Herding Behavior

The research results indicate that market returns affect herding behavior in bearish market conditions, but this is not proven in bullish market conditions. In bearish conditions, the squared market return variable ($R_{m,t}^2$) has a negative coefficient of -8.337 with a significance value of 0.009. This result indicates that when market movements become extreme during a bearish phase, the return dispersion of stocks (CSAD) actually decreases. A decrease in the return dispersion value implies that individual stock return movements become more uniform, thereby indicating the presence of herding behavior. Conversely, in bullish conditions, the $R_{m,t}^2$ variable has a negative coefficient of -2.996, but it is not significant as the significance value is 0.157. This shows that the study has not been able to prove the existence of herding behavior in bullish market conditions.

These results suggest that herding behavior tends to be stronger when the market is in a bearish state. This condition can occur because, during a market downturn, investors tend to face greater psychological pressure due to heightened uncertainty and fear of potential losses. In such conditions, investors are more easily influenced by market sentiment and tend to follow the majority's decisions to mitigate risks.

This aligns with Behavioral Finance theory, which explains that investors' investment decisions are not always based on rational considerations but are also influenced by psychological factors such as fear, panic, and market sentiment (Shefrin, 2007). When the market is under pressure, investors tend to ignore personal analysis and follow the majority's actions because it is perceived as safer. For LQ45 banking stocks, this condition may also be influenced by the high level of investor attention given to large-cap banking stocks, which act as market movers. When banking stock prices face downward pressure, investors may react simultaneously out of fear that the decline will continue, leading to more uniform investment decisions.

This finding is in line with the study by Chiang and Zheng (2010), which found that herding behavior is stronger during market downturns compared to market upturns. Studies by Sadewo & Cahyaningdyah (2022), (Adnan, 2023), and (Medhioub, 2025) also demonstrate that bearish market conditions can trigger herding behavior as investors become more susceptible to negative market sentiments.

2. The Effect of Market Volatility on Herding Behavior

The research results show that market volatility has a negative effect on herding behavior in both bearish and bullish market conditions. In bearish conditions, market volatility has a coefficient of 0.364 with a significance value of < 0.001, whereas in bullish conditions, it has a coefficient of 0.294 with a significance value of 0.002. This result indicates that when market volatility increases, the CSAD value also increases. In the CSAD method, an increase in the CSAD value means that individual stock returns become more dispersed and do not move uniformly with the market. In

other words, when market volatility increases, investor behavior actually becomes more diverse, causing the tendency for herding behavior to weaken. This result occurs because market volatility reflects high uncertainty in the capital market.

In volatile market conditions, investors do not always make the same decisions. Some investors choose to sell stocks to reduce risk, some choose to hold their stocks while waiting for market conditions to improve, while others view the volatility as an opportunity to buy stocks. This aligns with Behavioral Finance theory, which explains that every investor has a different risk perception and risk tolerance level (Shefrin, 2007). As the market becomes more volatile, investors will respond to these conditions according to their respective strategies and considerations. These varying responses cause investor behavior to become non-uniform.

For LQ45 banking stocks, this condition can also be influenced by the characteristics of banking stocks, which possess high liquidity and are heavily traded by various types of investors, both retail and institutional. When volatility increases, each investor can make different decisions according to their investment objectives, resulting in increasingly diverse stock return movements.

This research finding is in line with the studies by Suhendro (2025), Zuhelfi & Novianty (2024), and Pranata et al. (2024), which show that high market volatility does not always strengthen herding behavior; rather, it causes investor behavior to become more diverse as each investor responds to risk differently. Thus, this study shows that while market volatility does affect CSAD, the direction of the effect indicates that an increase in market volatility actually makes investor behavior more heterogeneous, not more uniform.

3. The Effect of Trading Volume on Herding Behavior

The research results reveal that trading volume, measured using Trading Volume Activity (TVA), has a negative effect on herding behavior in both bearish and bullish market conditions. In bearish conditions, TVA has a coefficient of 5.865 with a significance value of < 0.001 , while in bullish conditions, it has a coefficient of 3.270 with a significance value of < 0.001 . This result demonstrates that when trading volume increases, the CSAD value also increases. An increase in the CSAD value implies that individual stock returns become more dispersed and do not move uniformly with the market. This means that an increase in trading volume actually indicates that investor behavior is becoming more diverse, thereby weakening the tendency for herding behavior.

This result occurs because high trading volume does not necessarily mean that investors are moving in the same direction. High trading volume can instead indicate that more investors are actively transacting with varying objectives. Some investors buy stocks because they see profit opportunities, some sell to avoid risks, while others execute transactions to adjust their investment strategies.

This aligns with Behavioral Finance, which explains that investors do not always interpret market information in the same way. The same information can be perceived differently by each investor, leading to different investment decisions (Shefrin, 2007). Consequently, high trading activity does not always reflect collective behavior but may indicate the presence of divergent investment decisions among investors. For LQ45 banking stocks, high trading volume can also be influenced by the high investor interest in these highly liquid stocks. When trading activity increases, not all investors transact with the same goal. Some investors buy out of optimism for the stock's prospects, some sell to realize profits, and some institutional investors make portfolio adjustments. These differences in transaction objectives cause investor behavior to become increasingly diverse.

This finding is in line with the research by Ukpong et al. (2021), Rompotis (2018), and Youssef (2022), which shows that an increase in trading volume does not always strengthen herding behavior; instead, it reflects increasingly diverse investment decisions among market participants. Therefore, this study demonstrates that trading volume does affect CSAD, but the direction of the effect indicates that an increase in trading volume actually makes investor behavior more heterogeneous, not more uniform.

CONCLUSION

Based on the empirical analysis regarding the determinants of herding behavior in banking sector stocks within the LQ45 index for the 2021–2025 period, several conclusions are drawn. First, market returns have a proven positive effect on herding behavior exclusively during bearish market conditions. The significant negative coefficient of the squared market return indicates that extreme downward market movements reduce individual stock return dispersion, prompting investors to act uniformly with the market trend. Conversely, no evidence of herding is found during bullish conditions. Second, market volatility exhibits a negative effect on herding behavior across both bullish and bearish regimes. Increased market turbulence actually causes investor behavior to become more diverse, as market participants make independent decisions based on their distinct risk preferences and analytical strategies; thus, the second hypothesis is rejected. Third, trading volume, measured by Trading Volume Activity (TVA), also demonstrates a negative effect on herding behavior in both market conditions. A surge in trading activity reflects a wide array of independent investment decisions rather than uniform collective actions, leading to the rejection of the third hypothesis.

Implications

The findings of this study offer practical implications for various capital market stakeholders. For investors, extra caution is required during bearish markets to prevent panic-driven or herd-following decisions; relying on objective fundamental and technical analyses remains crucial. Additionally, both market volatility and trading volume can serve as vital indicators of market dynamics; since they stimulate heterogeneous behavior, traders can utilize these metrics to formulate adaptive risk-management strategies rather than assuming a market consensus. For banking corporations, maintaining transparent information disclosure and consistent performance is essential to facilitate rational decision-making and minimize sentiment-driven trading. Finally, for capital market regulators, intensified market surveillance and the preservation of investor trust are highly recommended during market downturns, as bearish phases are significantly more susceptible to triggering irrational collective behavior.

Limitations

This study acknowledges several limitations that should be considered. First, the sample is restricted to highly liquid banking stocks within the LQ45 index, meaning the findings primarily reflect the characteristics of this specific sector. Second, the current model only incorporates market return, volatility, and trading volume, excluding other potential behavioral or macroeconomic determinants. Third, the detection of herding relies entirely on the Cross-Sectional Absolute Deviation (CSAD) proxy. Fourth, the split-sample methodology (bearish versus bullish) results in an unequal number of observations across market phases, which may influence the stability of the estimation. Lastly, the coefficient of determination indicates the presence of unobserved variables outside the model that also affect investor behavior.

Suggestions for Future Research

To address the aforementioned limitations, future researchers are suggested to conduct comparative analyses involving different industrial sectors to capture a broader perspective of herding behavior in the Indonesian capital market. It is also recommended to incorporate additional behavioral finance and macroeconomic variables—such as investor sentiment, interest rates, or inflation—to construct a more comprehensive model. Furthermore, future studies should consider employing alternative measurement techniques, such as the Cross-Sectional Standard Deviation (CSSD), to validate and compare the herding detection results. Finally, utilizing extended observation periods or alternative analytical frameworks is suggested to enhance the model's explanatory power and ensure greater data stability across various market phases.

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