JURNAL ECONOMINA
e-ISSN: 2963-1181
Volume 5, Number 8, August 2026
Homepage: ejournal.45mataram.ac.id/index.php/economina

Herding Behavior in Indonesia's LQ45 Index: Systematic or Episodic? Evidence from 2014–2023

Tiar Lina Situngkir[1*], Rahma Ayu Gunawan[2]
[1,2] Department of Management, Faculty of Economics and Business, Universitas Singaperbangsa Karawang, Indonesia

**Corresponding Author: tiarlina.situngkir@fe.unsika.ac.id*

Article History

Received: 03-08-2026
Revised: 14-08-2026
Published: 30-08-2026

ABSTRACT

This study examines herding behavior in the LQ45 index over the period 2014–2023 using non-linear CSAD and CSSD models, while separating bull and bear market phases and incorporating COVID-19 episodes under wide and narrow definitions. The study aims to determine whether herding in Indonesia's most liquid blue-chip segment is systematic, episodic, or absent. Weekly data from 15 consistently listed LQ45 constituents were analyzed using regime-based nonlinear regressions, with market return as the explanatory variable and dispersion measures as the dependent variables. The results show no evidence of systematic herding in the full sample or across the two sub-periods. Herding appears only episodically in 2015 based on the CSAD model, but this signal is not confirmed by the CSSD model, indicating that the episode is indicator-dependent rather than structurally robust. In bull markets, the positive and significant nonlinear coefficient points to anti-herding, suggesting that investors respond in more differentiated ways when market conditions strengthen. No significant herding is found during the COVID-19 period. These findings imply that investor behavior in the LQ45 index is not dominated by a persistent follow-the-crowd tendency, but rather by fundamentally guided and regime-sensitive price formation. The study contributes to the literature by providing long-horizon evidence on herding in an emerging market, showing that the critical distinction is not herding versus non-herding, but systematic versus episodic herding. The findings also suggest that large and liquid equity segments may preserve price efficiency except under specific stress conditions.

Keywords: Herding Behavior; LQ45 Index; Behavioral Finance; CSAD; CSSD

INTRODUCTION

Herding behavior is an important phenomenon in financial markets because it can weaken price efficiency, amplify volatility, and move asset prices away from fundamental values (Chang et al., 2000; Fernández et al., 2011; Păcurar, 2025; Suyadi & Husodo, 2024). In classical finance, investors are assumed to process information rationally, and prices are expected to reflect all available information efficiently. In practice, however, market

participants may imitate others when uncertainty is high, and information is unevenly distributed. This behavior can create mispricing and reduce the informational content of stock prices making herding not only a behavioral issue but an economic one, because it affects market efficiency and capital allocation (Chang et al., 2000).

Empirical evidence on herding remains mixed across markets and periods. Some studies find herding in rising markets or under information asymmetry. In contrast, others report no robust evidence in China, Vietnam, or Indonesia, where return dispersion continues to move in line with market returns and supports rational pricing (Macedoni, 2022; Suyadi & Husodo, 2024). Evidence also varies by asset type, indicating that market composition and trading environment matter in shaping investor behavior (Ah Mand et al., 2023). Studies on the Indonesian capital market produce inconsistent results, with some finding no herding in LQ45 and others identifying herding during high-return or market-stress periods. These findings suggest that herding is a regime dependent phenomenon rather than a uniform market condition.

Indonesia offers a relevant setting for examining this issue because its capital market remains an emerging market with information asymmetry, uneven governance quality, and a growing retail investor base on the Indonesia Stock Exchange (IDX) (Nurmala Suci Lestari & Situngkir, 2025).

These characteristics matter econosmically because they influence price discovery, investor confidence, and market stability. The LQ45 index is especially important because it represents liquid blue-chip stocks that are widely followed by both institutional and retail investors. If herding appears even in this segment, it would indicate that price formation in Indonesia's most visible equities is still vulnerable to collective imitation. This becomes more relevant as retail Single Investor Identification accounts continue to rise, especially during 2020-2021, while social media, trading applications, and FOMO-driven trading increasingly shape investor attention and order flow (Chiu, 2021; Kala et al., 2025; Paredes-Corvalan et al., 2023; Singhania et al., 2025).

Despite this relevance, prior research has not yet provided a sufficiently robust long-horizon test of herding in LQ45. Many studies focus on short periods, single market episodes, or a single dispersion proxy, while fewer studies test whether herding differs across bull and bear regimes or whether COVID-19 changed investor behavior in a stable way. The use of both CSAD and CSSD in the same study is also still limited, even though the two measures may produce different conclusions under volatile conditions. This creates an important gap because herding must be evaluated as a market phenomenon that affects efficiency, volatility, and price discovery (Muharam et al., 2021; Ooi et al., 2025; Păcurar, 2025).

To address this gap, the present study examines LQ45 constituents over 2014–2023, separates bull and bear market conditions, and incorporates COVID-19 episodes as crisis dummies under both wide and narrow definitions. By combining regime decomposition with

dual-proxy validation, this study provides a more robust assessment of whether herding in Indonesia's liquid equity segment is systematic, episodic, or absent.

Based on this framework, the study tests three hypotheses: H1, LQ45 does not exhibit systematic herding over the full 2014–2023 period; H2a, herding patterns differ between bull and bear phases; and H2b, the COVID-19 period does not significantly stimulate systematic herding in LQ45 stocks. The study contributes in three ways. First, it provides long-term evidence on herding in Indonesia's LQ45 index across pre-COVID, COVID, and post-COVID periods. Second, it tests whether herding is systematic or episodic by combining regime decomposition with two dispersion-based proxies. Third, it clarifies how model choice affects herding detection in an emerging-market context. Overall, the study shows that collective irrationality in liquid emerging-market stocks is conditional rather than universal, and that market structure plays a central role in shaping price efficiency.

METHODS

This quantitative study utilizes secondary data comprising weekly closing prices of LQ45 constituent stocks over a 10-year horizon, from January 2014 to December 2023, sourced from the Indonesia Stock Exchange (IDX) and Yahoo Finance. A purposive sampling technique was applied to select stocks that maintained consistent index membership and possessed complete weekly price series throughout the observation period, yielding a final sample of 15 firms and, after adjusting for market holidays, 508 unique cross-sectional weekly observations. This 10-year horizon covers the pre-pandemic, pandemic, and post-pandemic periods, ensuring temporal robustness. Weekly returns for individual stocks ($R_{i,t}$) and the LQ45 index return as the market proxy ($R_{m,t}$) are calculated using the logarithmic difference, where $P_{i,t}$ represents the closing price of the stock at week t:

$$R_{i,t} = \ln(P_{i,t}) - \ln(P_{i,t-1})$$

To capture cross sectional return dispersion, this study employs two proxy variables as dependent variables: the Cross Sectional Absolute Deviation (CSAD), calculated as the average absolute deviation of individual stock returns from the market return, and the Cross Sectional Standard Deviation (CSSD), defined as the square root of the average squared deviation:

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

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

Both measures quantify how widely individual stock performances deviate from the market benchmark during specific periods, and using them together allows for triangulation of results, addressing the methodological sensitivity inherent in herding detection.

Data analysis is conducted using non-linear regression models. To test Hypothesis 1 (H1), this study adopts the specification by Chang et al. (2000):

$$\mathrm{CSAD_t} = \alpha + \gamma_1|\mathrm{R_{m,t}}| + \gamma_2\mathrm{R^2_{m,t}} + \epsilon_t$$

in which a significantly negative γ_2 indicates herding, reflecting dispersion convergence during extreme market movements, while a significantly positive γ_2 indicates anti herding, or greater dispersion. This baseline model is estimated for the full sample period (2014–2023) and re estimated for two sub periods (2014–2018 and 2019–2023) to verify temporal robustness. To test Hypothesis 2 (H2), the sample is partitioned into bull markets ($\mathrm{R_{m,t}} > 0$) and bear markets ($\mathrm{R_{m,t}} < 0$) to analyze regime asymmetry, and COVID-19 crisis effects are captured through dummy variables:

$$\mathrm{CSAD_t} = \alpha + \gamma_1|\mathrm{R_{m,t}}| + \gamma_2\mathrm{R^2_{m,t}} + \gamma_3\mathrm{D_{COVID}} \cdot \mathrm{R^2_{m,t}} + \epsilon_t$$

where the wide dummy ($\mathrm{D_{COVID-Wide}}$) equals 1 for January 2020–December 2021 and 0 otherwise, while the narrow dummy ($\mathrm{D_{COVID-Narrow}}$) equals 1 for March 2020–December 2020 and 0 otherwise. The inclusion of interaction terms with COVID dummies isolates the pandemic's specific impact on herding dynamics, controlling for general market movements. Model reliability is formally ensured through a series of diagnostic tests, including the Jarque Bera test for normality, the Variance Inflation Factor (VIF) for multicollinearity, the Glejser test for heteroskedasticity, and the Breusch Godfrey test for autocorrelation (Gujarati & Porter, 2009), with all tests required to yield p-values above 0.05 to confirm that classical linear regression assumptions are satisfied.

RESULTS AND DISCUSSION

Table 1 shows that the average weekly cross-sectional return dispersion is 0.0316 for CSAD and 0.0357 for CSSD, while the mean absolute market return is 0.0170 (1.7%) and the mean squared market return is extremely low at 0.00069. For all variables, the median values lie strictly below their respective means. Coupled with positive skewness and exceptionally high kurtosis particularly peaking at 224.71159 for the squared market return the data strongly indicate fat-tailed distributions. This statistical pattern suggests that while the LQ45 market experienced moderate movements during most weeks, it was punctuated by a small number of weeks recording extreme volatility and dispersion. In economic terms, these properties confirm that the LQ45 market did not move smoothly across the 2014–2023 sample period,

thereby validating the appropriateness of testing herding behavior under different market regimes (Chang et al., 2000; Suyadi & Husodo, 2024).

Table 1. Descriptive statistics

Statistic	CSAD	CSSD	Rm,t	Rm,t²
Mean	0.0316	0.0357	0.0170	0.00069
Median	0.02812	0.03272	0.01221	0.00015
Std. Deviation	0.01608	0.01589	0.01960	0.00258
Sample Variance	0.00026	0.00025	0.00038	0.00001
Skewness	Positive	Positive	Positive	Positive
Kurtosis	30.96289	18.67475	26.52121	224.71159
Range	0.19213	0.18828	0.21840	0.04771
Minimum	0.01029	0.00243	0.00001	0.00000
Maximum	0.20242	0.19071	0.21841	0.04771
Observation (N)	508	508	508	507

Source: Data processed

Notes: CSAD = Cross-Sectional Absolute Deviation; CSSD = Cross-Sectional Standard Deviation; |Rm,t| = absolute value of market return; Rm,t^2 = squared market return. All statistics are based on weekly data of 15 LQ45 constituent stocks over 2014–2023

Classical assumption tests further verify the reliability of the estimated empirical models. The Jarque-Bera, VIF, Glejser, and Breusch-Godfrey tests all yield acceptable diagnostics, demonstrating that the regression models are free from severe specification issues and are fully suitable for statistical inference. Ensuring stable regression behavior is crucial because the empirical identification of herding relies heavily on the structural integrity of the non-linear framework (Muharam et al., 2021).

As presented in Table 2, the empirical results from the primary CSAD model do not detect systematic herding in the LQ45 index over the full 2014–2023 period. The non-linear market return coefficient is negative but statistically insignificant (γ_2 = -0.359726, p = 0.4177), meaning that cross-sectional dispersion continues to rise during periods of accelerating market movements. In terms of market efficiency, this implies that stock prices within the LQ45 index consistently reflect heterogeneous investor responses to macro information rather than mechanically converging toward a uniform market trend. Consequently, this outcome highlights that the index preserves informational efficiency in price formation rather than being driven purely by psychological compounding (Chang et al., 2000; Cipriani & Guarino, 2014).

Table 2. CSAD regression test results

No	Episode	γ_1 (Rm,t)	γ_2 (Rm,t²)	p-value (γ_2)	Interpretation
1	2014–2023	0.438033	-0.359726	0.4177	No herding
2	2014–2018	0.409299	-1.019309	0.4416	No herding
3	2019–2023	0.525410	-0.705228	0.2218	No herding
4	2015	0.714881	**-4.919820**	**0.0385**	Episodic herding
5	Bull markets	0.028774	**11.725177**	**0.0000**	Anti-herding
6	Bear markets	0.407987	-0.719475	0.1720	No herding
7	COVID-19 (Wide)	0.422644	-0.441958	0.3129	No herding
8	COVID-19 (Narrow)	0.434299	-0.340215	0.4444	No herding

Source: Data processed.

Notes: The model estimated is $CSAD_t = \alpha + \gamma_1|R_{m,t}| + \gamma_2 R_{m,t}^2 + \varepsilon_t$. Bull markets defined as weeks with positive LQ45 returns; bear markets as weeks with negative returns. COVID-19 (Wide) = January 2020–December 2021; COVID-19 (Narrow) = March 2020–December 2020. Bold indicates statistical significance at the 5% level. A negative and significant γ_2 suggests herding; a positive and significant γ_2 suggests anti-herding.

The sub-period analyses corroborate this baseline finding. The non-linear coefficients for both the 2014–2018 sub-sample (γ_2 = -1.019309, p = 0.4416) and the 2019–2023 sub-sample (γ_2 = -0.705228, p = 0.2218) are statistically insignificant. This consistency confirms that the absence of systematic herding is a structural feature of the market rather than an artifact driven by a specific temporal sub-sample. From a price-discovery perspective, the LQ45 market appears fundamentally capable of processing information in a differentiated, asset-specific manner across varying macro-financial environments (Muharam et al., 2021; Păcurar, 2025).

Conversely, the significant herding signal captured exclusively in the year 2015 must be interpreted with caution. Although the CSAD non-linear coefficient for 2015 is negative and statistically significant (γ_2 = -4.919820, p = 0.0385), this pattern is entirely unconfirmed by the CSSD robustness check in Table 3 (γ_2 = -1.616697, p = 0.5210). Because the finding is indicator-dependent, it is better characterized as a temporary, short-lived disturbance in price discovery rather than evidence of a structural or regime-wide herding episode. Accordingly, the 2015 anomaly should not be overstated as the central empirical takeaway of this study.

The macro-regime analysis reveals that market behavior during asymmetric states yields highly distinct dynamics, particularly under bullish conditions. The non-linear coefficient during bull markets is positive and highly significant (γ_2 = 11.725177, p = 0.0000), providing robust empirical evidence of anti-herding behavior. This indicates that cross-sectional dispersion widens dramatically when the market advances, pointing to active stock picking, sector rotation, and idiosyncratic portfolio rebalancing among market participants. Rather than producing uniform imitation, market optimism in the LQ45 index amplifies divergent investor strategies and heterogeneous beliefs (Asteriou et al., 2026; Hariyanto et al., 2024).

During bear markets, however, the herding pressure dissipates statistically; the non-linear coefficient turns negative but fails to reach significance (γ_2 = -0.719475, p = 0.1720). This demonstrates that market downturns do not automatically trigger panic-driven, collective crowd behavior in the LQ45 index. Investors continue to act in fragmented ways under stress, suggesting that rational price discovery mechanisms remain functional even amid market contractions (Muharam et al., 2021; Ooi et al., 2025).

The market's resilience is further highlighted by the COVID-19 pandemic analysis. Both the wide macro-window (γ_2 = -0.441958, p = 0.3129) and the narrow crisis-window (γ_2 = -0.340215, p = 0.4444) generate negative but statistically insignificant non-linear coefficients. Despite the unprecedented uncertainty and severe volatility shocks induced by the pandemic, the dispersion-return relationship did not collapse into systematic imitation. This indicates that the LQ45 index retained sufficient information-processing capacity and institutional liquidity to sustain price differentiation under extreme systemic crisis conditions (Asteriou et al., 2026; Kabir & Shakur, 2018; Varshney et al., 2025).

Table 3. CSSD regression test (robustness check)

No	Episode	γ_1 (Rm,t)	γ_2 (Rm,t²)	p-value (γ_2)	Interpretation
1	2014–2023	0.043038	-0.444602	0.3761	No herding
2	2014–2018	0.039384	0.325752	0.8170	No herding
3	2019–2023	-0.002955	-0.316407	0.6390	No herding
4	2015	0.241261	-1.616697	0.5210	No herding
5	Bull markets	0.022873	0.085889	0.9601	No herding
6	Bear markets	0.407987	-0.719475	0.1720	No herding
7	COVID-19 (Wide)	0.019648	-0.562127	0.2513	No herding
8	COVID-19 (Narrow)	0.005993	-0.251103	0.6032	No herding

Source: Data processed.

Notes: The model estimated is $CSSD_t = \alpha + \gamma_1|R_{m,t}| + \gamma_2 R_{m,t}^2 + \varepsilon_t$. *CSSD = Cross-Sectional Standard Deviation, used as a robustness check for CSAD results. Bull and bear market and COVID-19 definitions follow Table 2. All* γ_2 *coefficients are statistically insignificant, confirming the absence of systematic herding.*

Finally, Table 3 reinforces these insights through the alternative CSSD robustness check. Except for the bull market regime where the anti-herding behavior disappears, all other non-linear parameters remain statistically insignificant across the full sample, temporal sub-periods, bear markets, and specific pandemic windows. This lack of significant negative coefficients across both proxies provides strong methodological validation for the primary findings, confirming that the absence of systematic herding is robust and not an artifact of a single measurement method (Muharam et al., 2021; Păcurar, 2025).

Overall, these empirical findings demonstrate that herding in the Indonesian LQ45 index is strictly episodic rather than a persistent, systematic market feature. The index does not display chronic collective imitation, and price formation remains tied to fundamental factors across most periods. Ultimately, these dynamics support the overarching conclusion that the LQ45 index behaves as a relatively informationally efficient market prone to temporary volatility shocks rather than a market governed by irrational behavioral convergence (Ooi et al., 2025; Păcurar, 2025; Suyadi & Husodo, 2024).

CONCLUSION AND SUGGESTIONS

This study demonstrates that herding behavior within the LQ45 index is strictly episodic rather than a persistent, systematic feature over the 2014–2023 period. The empirical evidence from both the CSAD and CSSD models indicates that investor behavior in this blue-chip segment is generally guided by fundamental economic indicators and differentiated information processing rather than by a mechanical, follow-the-crowd pattern. The only isolated herding signal appears in the year 2015; however, this occurrence is highly indicator-dependent, fails to survive the robustness check, and should thus be interpreted as a temporary structural disturbance rather than a systemic herding episode. Conversely, bullish market conditions generate statistically robust evidence of anti-herding, demonstrating that price dispersion widens as investors adopt highly heterogeneous strategies during market expansions. Furthermore, the market's behavioral resilience is highlighted during the COVID-19 pandemic windows, where no significant herding is detected, proving that even unprecedented external macro-shocks failed to collapse the price differentiation capacity of the LQ45 index.

These findings sharpen the overarching empirical conclusion: the critical academic question is not merely whether herding exists, but whether it operates as a systematic or a conditional phenomenon. In the context of the Indonesian capital market, the empirical reality heavily favors the latter. The integration of a long-horizon research design, the strict separation of asymmetric market regimes, and a dual-proxy methodological approach collectively demonstrate that any observed crowding behavior is temporary and highly sensitive to both macroeconomic states and proxy choices. Argumentatively, this multi-faceted behavior explains the fragmented and mixed conclusions found in previous Indonesian literature. It strongly reinforces the theoretical standpoint that large, highly liquid equity segments in emerging markets can successfully preserve a high degree of informational efficiency and price discovery, except under highly specific, short-lived stress conditions.

In terms of practical and policy implications, these insights suggest that financial regulators, such as the Financial Services Authority (OJK), should shift from a constant alarm approach to a highly targeted, macroprudential surveillance strategy concentrated strictly on periods of elevated systemic stress. For institutional market practitioners, the documented absence of systematic herding implies that classical valuation discipline, idiosyncratic asset

allocation, and fundamental analysis remain highly effective tools for LQ45 portfolio construction. For retail investors, these dynamics serve as an empirical warning that relying heavily on social-media sentiment or generalized market trends carries substantial risk, given that the underlying stocks do not move in behavioral lockstep.

Despite these contributions, this study is inherently constrained by certain limitations in its underlying framework. Methodologically, the reliance on weekly data may obscure higher-frequency behavioral dynamics that occur at shorter intervals. The sample is also strictly limited to 15 LQ45 constituent stocks that maintained continuous listings throughout the decade, which may introduce a survivorship bias and limit the broad generalizability of the results across the wider Indonesia Stock Exchange (IDX). Theoretically, the models assume that herding is driven primarily by absolute return deviations, omitting the potential influence of qualitative behavioral factors.

To address these limitations, future research should expand the empirical scope by employing daily or intraday high-frequency data to capture rapid intraday shifts in sentiment. Future studies are also encouraged to incorporate explicit investor sentiment proxies or social media text-mining variables into the non-linear framework. Finally, extending this comparative methodology to broader, less liquid indices (such as the IDX80 or Kompas100) and other asset classes will provide a more comprehensive assessment of whether episodic herding is a unique characteristic of prime blue-chip equities or a widespread structural phenomenon across the broader Indonesian capital market.

REFERENCES

Ah Mand, A., Janor, H., Abdul Rahim, R., & Sarmidi, T. (2023). Herding behavior and stock market conditions. *PSU Research Review*, *7*(2), 105–116. https://doi.org/10.1108/PRR-10-2020-0033

Asteriou, D., Katsiampa, P., Pilbeam, K., & Tziamalis, A. (2026). Herding and Anti-Herding Behaviour in the UK, French and German Stock Markets Before and During the Covid Pandemic. *International Journal of Finance & Economics*, *31*, 1780–1804.

Chang, E. C., Cheng, J. W., & Khorana, A. (2000). An examination of herd behavior in equity markets: An international perspective. *Journal of Banking & Finance*, *24*(10), 1651–1679. https://doi.org/10.1016/S0378-4266(99)00096-5

Chiu, I. H.-Y. (2021). *Social Disruptions in Securities Markets – What Regulatory Response Do We Need? 28*(1).

Cipriani, M., & Guarino, A. (2014). Estimating a Structural Model of Herd Behavior in Financial Markets. *American Economic Review*, *104*(1), 224–251.

Fernández, B., Garcia-Merino, T., Mayoral, R., Santos, V., & Vallelado, E. (2011). Herding, Information Uncertainty and Investors' Cognitive ProfileHerding, Information Uncertainty and Investors' Cognitive Profile. *Qualitative Research in Financial Markets*, *3*(1), 7–33.

Gujarati, D. N. ., & Porter, D. C. . (2009). *Basic econometrics* (5th ed.). McGraw-Hill Irwin.

Hariyanto, D., Brahmana, R. K., & Wendy. (2024). Sectoral Herding During Global Rare Events: Evidence from the Indonesian Capital Market. *Jurnal Manajemen Bisnis*, *15*(1), 99–116. https://doi.org/10.18196/mb.v15i1.21601

Kabir, M. H., & Shakur, S. (2018). Regime-Dependent Herding Behavior in Asian and Latin American Stock Markets. *Pacific-Basin Finance Journal*, *47*, 60–78.

Kala, D., Chaubey, D. S., & Al-Adwan, A. S. (2025). Cryptocurrency investment behaviour of young Indians: mediating role of fear of missing out. *Global Knowledge, Memory and Communication*, *74*(5–6), 2047–2068. https://doi.org/10.1108/GKMC-07-2023-0237

Macedoni, L. (2022). Asymmetric information, quality, and regulations. *Review of International Economics*, *30*(4), 1180–1198.

Muharam, H., Dharmawan, A., Najmudin, & Robiyanto. (2021). Herding Behavior: Evidence from Southeast Asian Stock Markets. In *Recent Developments in Asian Economics International Symposia in Economic Theory and Econometrics* (Vol. 28, pp. 207–220). Emerald Publishing Limited. https://doi.org/10.1108/S1571-038620210000028012

Nurmala Suci Lestari, & Situngkir, T. L. (2025). Overconfidence Bias Pada Indeks LQ45 di Bursa Efek Indonesia. *Al-Kharaj: Jurnal Ekonomi, Keuangan & Bisnis Syariah*, *7*(1), 18–40. https://doi.org/10.47467/alkharaj.v7i1.3975

Ooi, K. L., Binti Ab Aziz, N., & Lau, W. Y. (2025). Types of Herding Behaviour. In *Following the Crowd: Psychological Drivers of Herding and Market Overreaction* (pp. 69–82). Springer Nature Singapore. https://doi.org/10.1007/978-981-95-0792-4_5

Păcurar, D.-B. (2025). Herding behaviour under Extreme Market Conditions. New Evidence in Developed Capital Markets. *Studia Universitatis Babes-Bolyai Oeconomica*, *70*(2), 21–37. https://doi.org/10.2478/subboec-2025-0008

Paredes-Corvalan, D., Pezoa-Fuentes, C., Silva-Rojas, G., Valenzuela Rojas, I., & Castillo-Vergara, M. (2023). Engagement of the e-commerce industry in the US, according to Twitter in the period of the COVID-19 pandemic. *Heliyon*, *9*(7), e16881. https://doi.org/10.1016/j.heliyon.2023.e16881

Singhania, S., Kumar, S., Sinha, R. K., & Raut, R. K. (2025). Synchronized sentiments: dynamic herding behavior in leading stock markets. *Review of Behavioral Finance*, *17*(4), 664–683. https://doi.org/10.1108/RBF-12-2024-0365

Suyadi, N. P., & Husodo, Z. A. (2024). Worldwide Recessions and Herding Behaviour: A Comparative Analysis of Three Countries. *Eduvest - Journal of Universal Studies*, *4*(10), 8604–8613. https://doi.org/10.59188/eduvest.v4i10.40134

Varshney, A. K., Srimathi, T., Singh, A., Gaurav, R., Pandit, A., & Lodha, D. H. (2025). Investor Herding Behaviour During Financial Crises: A Comparative Study. *Advances in Consumer Research*, *2*, 4568–4577.