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ANALYSIS OF HERDING BEHAVIOR DURING THE COVID-19 PANDEMIC AND RUSSIA'S INVASION OF UKRAINE

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ABSTRACT

The energy sector plays a crucial role in the global economy but is vulnerable to economic crises, pandemics, and geopolitical conflicts that trigger stock price volatility. This study investigates herding behavior among investors during two major crises, namely the COVID-19 pandemic and the Russia-Ukraine invasion, focusing on energy sector stocks listed on the Indonesia Stock Exchange (IDX) from 2018 to 2022. The study aims to identify indications of herding behavior in energy sector stock returns during these crisis periods. A quantitative approach was employed, analyzing daily time series data. The sample consisted of 57 stocks selected using the purposive sampling method based on relevant criteria. Hypothesis testing was conducted to identify differences in herding behavior across the two crisis periods and to evaluate the impact of West Texas Intermediate (WTI) crude oil price fluctuations on herding behavior in the energy sector. The findings reveal indications of herding behavior in energy sector companies during the 2018–2022 period. However, there is no strong evidence to support the occurrence of herding behavior during the COVID-19 pandemic and the Russia-Ukraine invasion. Furthermore, WTI crude oil price fluctuations were not found to significantly influence herding behavior in the energy sector. These findings are expected to serve as a reference for regulators and academics in designing more effective policies to manage market behavior during periods of global uncertainty and to encourage further research exploring other factors influencing herding behavior across various sectors.

KEYWORDS *herding behavior, energy sector, economic crisis, COVID-19, Russian invasion, stock volatility.*

INTRODUCTION

Global economic crises, such as the COVID-19 pandemic in 2020 and Russia's invasion of Ukraine in 2022, have significantly affected financial markets (Malladi et al., 2019; Ren, 2022; Shaik et al., 2023, 2024). The COVID-19 crisis disrupted health systems and economies globally, leading to a social and economic crisis in many countries (D. Carter et al., 2022; D. A. Carter et al., 2021). Following the World Health Organization's pandemic declaration, major global indices experienced sharp declines, with the S&P 500 dropping 9.5% on March 12, 2020.

Similarly, Russia's invasion of Ukraine impacted the global economy, with Russia being a major player in oil and gas exports. This invasion has created uncertainty and challenges for countries reliant on these resources (Agung et al., 2023; Boungou & Yatié, 2022, 2024; Najaf et al., 2023; Paranichandran D & Dr. Maria Evelyn Jucunda M, 2024). Research indicates that ASEAN-5 countries experienced significant economic contraction during the COVID-19 pandemic, with stock market declines more severe than during the 2007–2008 financial crisis.

Increased global connectivity has intensified financial market integration, causing volatility from one region to spread to others. This complexity necessitates a deeper analysis of financial market dynamics. Traditional efficient market theory is challenged by psychological factors influencing investor behavior.

In Indonesia, market capitalization fluctuated significantly, reflecting investor confidence, which can foster herding behavior (Liem et al., 2017). During times of uncertainty, investors often follow the crowd rather than conduct independent analyses, particularly in the energy sector, influenced by market sentiment and commodity prices.

While herding behavior is prevalent, its impact on asset pricing remains debated. It can occur in both upward and downward market trends, influenced by transaction volumes and crises. The Dow Theory highlights how minority investors can sway market decisions, leading others to mimic their actions.

Herding can emerge during major market events, often resulting in mispricing and increased systemic risk. Historical crises, such as the 2007 subprime mortgage collapse, illustrate how herding can lead to broader financial instability.

The energy sector, crucial to the global economy, is particularly sensitive to economic conditions and geopolitical tensions (García & Rambaud, 2023). The COVID-19 pandemic severely impacted energy consumption, while the invasion of Ukraine caused extraordinary price fluctuations in energy markets. As demonstrated, these events underscore the importance of understanding the interplay between market uncertainty and investor behavior, particularly in the energy sector (Shaik et al., 2024).

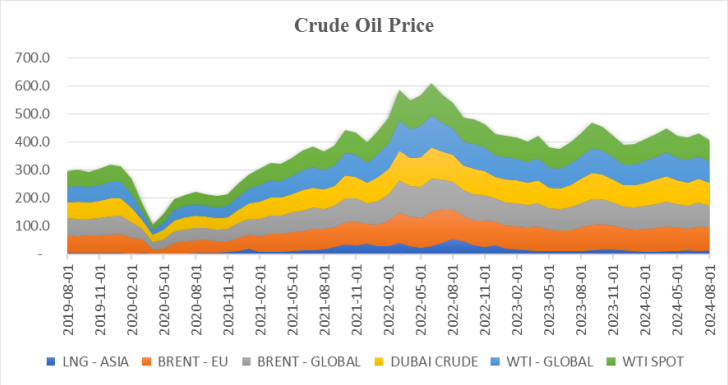

Figure 1. Graph of Changes in the Global Energy Market After the Russian Invasion of Ukraine
(Source: Processed data, 2024)

The invasion triggered a global energy crisis, significantly impacting the energy sector. Although energy prices have gradually decreased, regional variations persist, with high prices negatively affecting economic growth and access to electricity. Russia, a major oil producer, accounts for nearly 11% of global oil supplies. The invasion disrupted supply routes, complicating energy security for oil-dependent countries, including Indonesia.

This conflict pressures global energy markets and is reshaping the energy landscape, pushing countries toward improved energy security and a transition to sustainable energy. The IEA reports a shift towards renewables, with policies post-February 2022 driving increased production capacity.

While the crisis presents opportunities for energy companies, such as Indonesian firms benefiting from rising oil prices, it also poses distribution risks that could impact market performance. The Indonesian Stock Exchange offers a unique setting to study herding behavior in the energy sector, characterized by high volatility and retail investor dominance. Understanding how global crises affect energy stocks in Indonesia can provide insights for risk management and market stability.

The relationship between Indonesian energy markets and global oil prices highlights how price fluctuations impact both fossil fuel and renewable sectors. Factors like the COVID-19

pandemic have similarly influenced energy sector performance, driving investor interest and herding behavior.

Despite the energy sector's importance, research on herding behavior in Indonesia is limited, especially compared to developed markets. This study aims to fill this gap by analyzing herding in Indonesia's energy sector during global uncertainties, focusing on the COVID-19 pandemic and the Ukraine invasion.

Using the Cross-Sectional Absolute Deviation (CSAD) method, this research examines stock price movements and trading volumes from 2018 to 2022. The findings aim to enhance behavioral finance literature in developing countries and provide practical recommendations for investors and policymakers to manage herding risks impacting energy market stability.

RESEARCH METHOD

This study investigated the presence of herding behavior among investors in energy sector stocks listed on the Indonesia Stock Exchange during periods of economic crisis, specifically the COVID-19 pandemic and the crisis resulting from Russia's invasion of Ukraine. Using a quantitative approach, the research analyzed the impact of independent variables on herding behavior by examining daily stock return data from 2018 to 2022.

The sample consisted of energy sector companies selected through purposive sampling based on specific criteria, such as being actively listed and consistently providing complete financial and trading data throughout the study period. The sampling technique used was purposive sampling, a non-probability sampling method where sample selection was based on certain criteria (Sugiyono, 2018). The sample in this study was determined based on two criteria: (1) energy sector shares were always included in the index on the Indonesia Stock Exchange during the 2018–2022 period, and (2) shares were traded before January 1, 2018, and remained listed until December 31, 2022. A summary of the sampling in this study was presented in tabular form. The findings were expected to provide insights into investor behavior during global uncertainties and contribute to risk management strategies and market stability in Indonesia's energy sector.

Table 1. Research Sampling

Information	Amount
Energy shares listed on the Indonesia Stock Exchange in the 2018 -2022 period	87
Shares that were not active before January 1, 2018, and can last until December 31 2022	30
Shares that have never been in the index or have had their trading stopped during the 2018-2022 period	-
Total Research Sample	57

Source: Processed data (2024)

Based on the summary of research sampling above, the list of samples used in this research can be seen at Appendix 2.

RESULT AND DISCUSSION

In this sub-chapter, researchers discuss the results of behavior analysis herding in the energy sector during the specified research period. The discussion is based on two regression models applied to analyze the data over the research period. To provide a more concise picture, the analysis results are summarized in the Research Results Overview Table (Table 17) which is located at the end of the sub-chapter.

1. Behavioral Indications Herding on Companies in the Energy Sector Listed on the Indonesia Stock Exchange in the 2018 – 2022 period

Model 1 - Behavior Herding in the Energy Sector

Based on the regression results using model 1, variable R2m (γ3) which represents behavior herding in the energy sector it has a negative coefficient. This negative coefficient value indicates the existence of behavior herding in the energy sector during the research period, where return stocks in this sector tend to move closer to the market average when large market fluctuations occur. Significance at the 5% level supports the hypothesis that behavior herding indeed occurred during the period 2018 to 2022 in energy sector companies listed on the Indonesian Stock Exchange.

These findings are consistent with previous studies showing that herding is more likely to occur during periods of market uncertainty and high volatility, as found by Chiang & Zheng (2010). Behavior herding this tends to occur in times of high market uncertainty or volatility, where investors in the energy sector tend to follow collective market movements without paying attention to individual information. This phenomenon is also supported by the findings of Cvii & Banerjee (1992) who stated that herding often arises when market participants ignore private information and rely more on collective decisions.

Model 2 - Behavior Herding in the Energy Sector of the WTI Crude Oil Market

Variable R2oil (γ4), which represents squared return of WTI crude oil prices, has a positive coefficient. These results indicate that fluctuations in WTI crude oil prices do not have a significant influence on behavior herding energy sector companies. In other words, despite behavior herding occurs in the energy sector, this behavior appears to be more influenced by internal factors in the energy market than fluctuations in crude oil prices themselves, as found in a study by Demirer & Kutan (2006), which states that internal factors often play a more important role in encouraging herding in certain sectors.

Behavioral Indications Herding During the Period of Normal Conditions or Before the Crisis in Energy Sector Companies Listed on the Indonesian Stock Exchange

a. Model 1 - Behavior Herding in the Energy Sector

The regression results show that the variables R2m (γ3) has a negative coefficient, but is not statistically significant. This insignificance indicates that there is no strong evidence that it exists herding behavior in the energy sector during normal periods. Thus, investors in the energy sector do not consistently follow collective market movements in more stable market conditions, as stated in previous theory.

b. Model 2 - Behavior Herding in the Energy Sector of the WTI Crude Oil Market

Meanwhile, variables R2oil (γ4) which represents squared return of the WTI crude oil market, has a positive coefficient. This shows that WTI crude oil market fluctuations do not have a significant influence on behavior herding energy sector companies. This positive coefficient indicates that crude oil price volatility causes greater variations in return shares in the energy sector, but does not indicate behavior herding.

Behavioral Indications Herding During the COVID-19 Pandemic Period in Energy Sector Companies Listed on the Indonesian Stock Exchange

a. Model 1 - Behavior Herding in the Energy Sector

The regression results show that the variables R2m (γ3) has a negative coefficient but is not statistically significant, so it cannot be used as strong evidence to conclude the existence of behavior herding. However, the negative coefficient still provides an initial indication that

during the COVID-19 pandemic, investors in the energy sector tended to follow collective market movements, especially when there were large fluctuations in return energy market. These findings are consistent with the main characteristics of the behavior herding, as explained by Chang et al. (2000).

The nonsignificance of these results requires careful interpretation. Previous research, as reported by Chiang & Zheng (2010), shows that behavior herding may occur during periods of crisis or high volatility even if the results are not statistically significant. In the context of the COVID-19 pandemic, which is characterized by very high levels of market volatility, behavior herding may occur but is difficult to detect statistically due to high market uncertainty. Therefore, even though the regression results are not significant, the negative coefficient is still relevant as an indication of potential herding during this period of crisis.

b. Model 2 - Behavior Herding in the Energy Sector of the WTI Crude Oil Market

Variable R2oil (c4) who represents squared return of WTI crude oil prices, has a positive γ4 coefficient of 0,00006, with a significance level of 0,9183. These results indicate that fluctuations in crude oil prices do not have a significant influence on herding behavior in the energy sector during the pandemic. Thus, oil market volatility does not trigger herding behavior in the energy sector, even though this sector is facing a high level of uncertainty due to the pandemic.

Behavioral Indications Herding During the Period of the Russian Invasion of Ukraine in Energy Sector Companies Listed on the Indonesian Stock Exchange

a. Model 1 - Behavior Herding in the Energy Sector

The regression results show that the variables R2m (γ3) has a negative coefficient but is not statistically significant, so it cannot be used as strong evidence to conclude the existence of behavior herding. However, this negative value provides an initial signal that investors in the energy sector tend to follow collective market movements during times of crisis (Chiang & Zheng, 2010). Behavior herding it often arises in situations of crisis or high volatility, such as during the Russian invasion of Ukraine, when market uncertainty causes investors to lose confidence in their individual judgments and tend to follow market movements.

b. Model 2 - Behavior Herding in the Energy Sector of the WTI Crude Oil Market

Variable R2oil (γ4) which represents squared return of WTI crude oil prices has a positive γ4 coefficient. This shows that fluctuations in crude oil prices have no influence on behavior herding in energy sector companies. As a complement, the Results Summary Table below is presented to provide a brief overview of the main findings of this research:

Table 2. Summary table of research results

Research Period	Model	Analysis Results and Research Findings
2018-2022	1	Behavioral indications occur *herding* in energy sector companies in Indonesia in the 2018-022 period.
	2	Behavior *herding* energy sector companies in Indonesia are not influenced by WTI crude oil market volatility.
Normal or Pre-Crisis Conditions	1	There is no indication of behavior *herding* in energy sector companies in Indonesia in the normal period or before the crisis because it is not statistically significant.
	2	Behavior *herding* energy sector companies in Indonesia are not influenced by WTI crude oil market volatility.

COVID-19 Pandemic	1	There is no indication of behavior *herding* on energy sector companies in Indonesia during the COVID-19 pandemic because it was not statistically significant.
	2	Behavior *herding* energy sector companies in Indonesia are not influenced by WTI crude oil market volatility.
Russia's invasion of Ukraine	1	There is no indication of behavior *herding* on energy sector companies in Indonesia during the Russian invasion of Ukraine because it was not statistically significant.
	2	Behavior *herding* energy sector companies in Indonesia are not influenced by WTI crude oil market volatility.

Overall, there are behavioral indications herding in energy sector companies in Indonesia. However, during the period of the COVID-19 pandemic and Russia's invasion of Ukraine, statistical results show that behavior herding not statistically significant. Previous research supports these findings, stating that herding behavior often appears in global crisis conditions, although it is not always detected significantly due to market complexity and instability. Geopolitical uncertainty often makes investors ignore individual information and prefer to follow collective market trends.

On the other hand, the crude oil market West Texas Intermediate (WTI) does not affect behavior herding energy sector companies in Indonesia during the research period. Crude oil price volatility WTI has a significant influence on fluctuations return energy sector shares during Russia's invasion of Ukraine, but this effect reflected increased market volatility rather than a trigger herding. Kilian (2009) explain that shocks in the supply of oil during a geopolitical crisis can significantly influence global economic activity, but their impact on corporate cash flows takes time to directly influence market behavior.

Because herding is a short-term phenomenon, transmitting the impact of oil prices on behavior herding also takes time, especially during times of crisis. Thus, although oil prices contribute to volatility in the energy sector, their influence represents overall market fluctuations rather than behavior herding specific (Bouri et al., 2020)

CONCLUSION

This study investigated indications of herding behavior in energy sector companies listed on the Indonesian Stock Exchange and examined whether the West Texas Intermediate (WTI) crude oil market influenced this behavior. Regression analysis revealed evidence of herding behavior during the 2018–2022 period, as indicated by a significant negative R^2mt coefficient, suggesting that investors tended to follow collective market movements. However, no strong evidence of herding was found during normal periods, the COVID-19 pandemic, or Russia's invasion of Ukraine, and WTI price volatility was not shown to directly influence herding behavior. These findings highlight the critical role of market volatility in shaping investor actions during crises, supporting prior research that investors are more likely to act collectively under highly volatile conditions. Future research is recommended to explore other factors, such as investor sentiment or regulatory changes, that may influence herding behavior in different market sectors or during various types of global uncertainty.

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