Received 4 January 2023
Revised 9 July 2023
16 April 2024
Accepted 6 May 2024

The market reaction of energy companies to the announcement of the Russian–Ukrainian invasion

Rizky Yudaruddin
Department of Management, Faculty of Economy and Business, Mulawarman University, Samarinda, Indonesia, and
Dadang Lesmana
Research and Development Agency East Kutai, Sangatta, Indonesia and Department of Management, Sekolah Tinggi Ilmu Ekonomi Nusantara Sangatta, East Kutai, Indonesia

Abstract

Purpose – This study aims to empirically analyze the market response of energy companies to the Russian-Ukrainian invasion. Additionally, it examines the comparison of market reactions between companies in NATO member countries and non-member countries.

Design/methodology/approach – This study utilizes a sample of 1,511 energy sector companies. To achieve the research objectives, two methods are employed. First, an event study is used to analyze the market reaction using Cumulative Abnormal Return (CAR) to the announcement of Russia's invasion of Ukraine on February 24, 2022 (event day) within an event window of (−30, +30). Second, a cross-sectional analysis is conducted to compare the responses of companies in NATO member countries with those in non-member countries.

Findings – The findings of this study reveal that energy companies worldwide reacted positively both before and after the announcement of the invasion, with significant reactions observed in companies from the Americas, Europe, and Asia & Pacific regions. However, the Middle East and Africa markets did not show significant reactions. Furthermore, the study indicates that most developed and emerging markets responded positively, likely due to the increase in energy commodity prices during the war. Moreover, the market reaction of companies in NATO member countries was stronger compared to other markets.

Originality/value – This study contributes to the existing literature by being the first to examine the impact of the Russian invasion of Ukraine on the energy sector, while categorizing markets as developed, emerging, and frontier. It also specifically explores the market reaction of energy companies in NATO member countries, providing unique insights into the differential responses within the energy sector.

Keywords Russian–Ukraine invasion, Market reaction, Event study, Energy companies

Paper type Research paper

1. Introduction

War has a detrimental impact on the economic sector, affecting countries involved in conflicts and those situated on the border of the global economy (Antonakakis *et al.*, 2017; Christofis *et al.*, 2013; Leigh *et al.*, 2003). Aside from the physical destruction of infrastructure, wars also

The author expresses gratitude to the Faculty of Economics and Business, Mulawarman University, Samarinda, Indonesia, and the Research and Development Agency of East Kutai, Sangatta, Indonesia. Special thanks to the anonymous reviewers for their valuable insights and thorough review of this paper.

European Journal of Management and Business Economics
Vol. 35 No. 2, 2026
pp. 290-306
Emerald Publishing Limited
e-ISSN: 2444-8494
p-ISSN: 2444-8451
DOI 10.1108/EJMBE-01-2023-0006

have repercussions on global financial markets (Choudhry, 2010; Frey and Kucher, 2000; Hudson and Urquhart, 2014; Schneider and Troeger, 2006). These effects are particularly evident in the Middle East and Europe (Hassouneh *et al.*, 2018; Leigh *et al.*, 2003; Schneider and Troeger, 2006). The OECD (2022a) explains that the impact of war can result in increased commodity prices and decreased equity values, leading to economic decline in conflict-affected countries. However, there remains a significant gap in understanding the nuanced effects of conflict on specific industries within affected regions and their interconnectedness with global markets.

Recently, on February 24th, 2022, Russia announced its invasion of Ukraine. Both Russia and Ukraine hold significant roles as major exporters of foodstuffs, minerals, and energy. This conflict between the two countries has sent shockwaves through the global economy and financial markets (OECD, 2022b). The Russian–Ukrainian invasion has introduced uncertainties that can potentially impact global markets, and numerous studies have analyzed the market reaction to this event. Tosun and Eshraghi (2022) and Basnet *et al.* (2022) have found that the invasion has triggered a negative market reaction, leading investors to withdraw from the conflicted region due to the uncertain geopolitical risks. However, it is important to note that these studies primarily focus on the European market. In our paper, we specifically examine the market reaction of energy sector companies to the Russian–Ukrainian invasion. Guenette *et al.* (2022) elaborate on the impact of the Russia–Ukraine war on the global economy, highlighting a sharp increase in oil prices, as evidenced by a 60% rise in coal prices and a 40% increase in European natural gas prices. Additionally, Deng *et al.* (2022) discovered that rising prices in the energy sector can trigger inflation, leading to concerns among investors about significant inflationary pressures and geopolitical risks. Yoon and Ratti (2011) note that high energy price uncertainty results in a decrease in investment responsiveness to sales. In contrast, Gregoriou and Kontonikas (2010) demonstrate a positive relationship between commodity prices and stock prices. Despite these known repercussions, there is a lack of comprehensive studies that delve into the intricacies of how different industries respond to conflict scenarios and how these responses reverberate throughout the global financial system.

Furthermore, there is a growing body of literature discussing market reactions to the war between Russia and Ukraine (Boubaker *et al.*, 2022; Boungou and Yatie, 2022; Yousaf *et al.*, 2022; Abbassi *et al.*, 2023). Boubaker *et al.* (2022) and Boungou and Yatie (2022) found that almost all markets reacted negatively to the Russian invasion of Ukraine, primarily due to investors' concerns about increasing global geopolitical risks. However, the Asian market showed little to no significant reaction, likely because it is geographically distant from the conflict zone. Additionally, Abbassi *et al.* (2023) and Yousaf *et al.* (2022) discovered that the war between Russia and Ukraine negatively impacted both developed and emerging markets. While existing literature highlights the significant impact of conflicts, there is limited research on emerging and frontier markets and their vulnerability to geopolitical tensions. Understanding how emerging markets navigate the challenges posed by war-induced uncertainties is crucial for developing effective risk management strategies on a global scale.

This study aims to examine the market reaction of energy sector companies to the Russian–Ukrainian invasion. To accomplish this objective, we employ an event study methodology to investigate the impact of the invasion on abnormal returns in several regions, including the Americas, Europe, the Middle East & Africa, and Asia & Pacific. Exploring why certain markets exhibit resilience while others experience volatility can shed light on the underlying mechanisms of market integration and investor behavior during times of geopolitical upheaval. The results indicate that energy companies worldwide exhibited a positive market reaction both before and after the announcement of the invasion. Specifically, companies in Europe, the Americas, and Asia & Pacific demonstrated positive reactions. Moreover, we also find that the market reacted positively to the war between Russia and

Ukraine in developed and emerging markets. However, the frontier market did not exhibit a significant reaction. In-depth, we observe that most countries in the frontier market tended to react negatively to the Russian–Ukrainian invasion, whereas most countries in developed and emerging markets displayed a positive reaction.

Furthermore, we also examine market reactions to energy sector companies in NATO member countries compared to non-members, along with the influence of certain company characteristics on these reactions. Our findings reveal that the market reaction in NATO member countries was stronger compared to other countries, starting from the announcement of the invasion and continuing afterward. Additionally, we find that company size has a significant positive effect on market reaction, while board size has a significant negative effect. These results suggest that larger company size and smaller board size contribute to a stronger market reaction.

Our paper's main contribution is to provide empirical evidence of the market reaction of sector energy companies to the Russian–Ukrainian invasion. First, we complement the discussion on the impact of war on financial markets (Antonakakis *et al.*, 2017; Gupta *et al.*, 2001; Kollias *et al.*, 2013; Leigh *et al.*, 2013; Christofis *et al.*, 2013; Hassouneh *et al.*, 2018; Hoque and Zaidi, 2020; Boubaker *et al.*, 2022; Boungou and Yatie, 2022; Basnet *et al.*, 2022; Tosun and Eshraghi, 2022; Abbassi *et al.*, 2023; Yousaf *et al.*, 2022; Nerlinger and Utz, 2022; Shaik *et al.*, 2023).

Second, we build upon the existing literature, including studies such as Shaik *et al.* (2023) and Nerlinger and Utz (2022), to enhance our understanding of the impact of war on the market reaction of sector energy companies. Moreover, we go beyond previous research by examining the specific effects of the Russian invasion of Ukraine on the energy sector, categorizing markets as developed, emerging, and frontier. One noteworthy aspect of our study is that we delve into the frontier market, which has been largely overlooked in previous investigations. By analyzing the market reactions of various countries within this category, we gain a more comprehensive understanding of their responses to the Russian–Ukrainian invasion. Our findings highlight a contrasting pattern between developed and developing markets, which demonstrated positive reactions, and the frontier market, which exhibited a different, more negative reaction.

Thirdly, our paper specifically explores the market reaction of energy sector companies in each country worldwide by categorizing markets as developed, emerging, and frontier. Previous studies did not explore every country (Nerlinger and Utz, 2022). Yudaruddin and Lesmana (2023), Yudaruddin *et al.* (2023), and Yudaruddin and Lesmana (2024) conducted closely related research that examined each country, yet the market reaction of energy sector companies in each country remains unexplored.

Fourth, our paper sheds light on the behavior of companies in NATO member countries compared to non-members. We observe that companies in NATO member countries displayed a lower market reaction prior to the invasion announcement, but a stronger reaction afterward, relative to other markets. This distinction offers valuable insights into how geopolitical events can impact the behavior of energy sector companies within different geopolitical contexts. Moreover, we identify the significant influence of company characteristics on investors' decisions to purchase shares. Specifically, we find that company size has a positive effect on market reaction, while board size has a negative effect. These insights highlight the importance of considering company-specific factors when analyzing market reactions during geopolitical crises.

Finally, our paper addresses the limitations of prior studies and contributes to a more comprehensive understanding of the market dynamics surrounding the Russian–Ukrainian invasion. By examining different market categories, considering the behavior of companies in NATO member countries, and exploring the impact of company characteristics, our study provides valuable insights for policymakers, portfolio managers, and investors seeking to navigate and minimize risks during periods of war, particularly sector energy companies.

2. Literature review

Some economic literature discussed the impact of war on the economic sector (Antonakakis *et al.*, 2017; Gupta *et al.*, 2001; Kollias *et al.*, 2013; Leigh *et al.*, 2013). Christofis *et al.* (2013) found that terrorism had a negative influence, especially in the tourism sector. Antonakakis *et al.* (2017) showed that market reactions had a negative impact when geopolitical risks increased, particularly in the energy sector. Increased military and security expenditures incurred costs, triggering corruption that negatively impacted the economy (Gupta *et al.*, 2001). Leigh *et al.* (2013) explained the impact of war on the airline, IT, gold, and energy sectors, especially the long-term decline in oil prices. The OECD (2022b) explained that war could lead to an increase in commodity prices and a decrease in equity, resulting in economic decline in conflict countries. The Institute for Economics and Peace (2012) stated that war had a negative effect on the macroeconomy. For example, a large budget deficit burdened taxpayers, limited consumption and investment, and led to inflationary pressures due to above-trend growth. Thies and Baum (2020) explained that war was a major obstacle for low-income countries due to a decrease in the workforce resulting from high war deaths and low productivity. The European Parliament (2022) explained that the Russia–Ukraine war had a negative impact on the banking sector.

Some financial literature explored the market reaction during wars in various countries, with most studies indicating a negative market response (Choudhry, 2010; Frey and Kucher, 2000; Hudson and Urquhart, 2014; Schneider and Troeger, 2006). Frey and Kucher (2000) analyzed government bond values in five countries and observed a decrease in bond values before the outbreak of World War II. Choudhry (2010) examined the effect of WWII on the Dow Jones index. During times of war, the market reaction was characterized by changes in stock prices and increased return volatility, which generally had a detrimental impact on the stock market. Hudson and Urquhart (2014) supported this finding by demonstrating that the capital market reacted more strongly to negative events than to positive ones during WWII. Schneider and Troeger (2006) similarly found negative market reactions during the Gulf War, conflicts between Israel and the Palestinians, and civil wars in ex-Yugoslavia. Leigh *et al.* (2013) discovered that the Iraq war had an extreme market reaction that affected Turkey, Israel, and European countries. Hassouneh *et al.* (2018) reported that violent conflicts negatively impacted Palestine's capital market. Additionally, Hoque and Zaidi (2020) stated that geopolitical risk affected stock returns in developing countries.

Other literature examined the impact of the Russian–Ukrainian invasion on global financial markets. According to the OECD (2022a), Russia and Ukraine played crucial roles in exporting major foodstuffs, minerals, and energy. The conflict between the two countries caused a shock to the global economy and financial markets. The lifting of sanctions on Russia by Europe affected all sectors of the economy, while Europe imposed limitations on capital inflows (Liadze *et al.*, 2022). The invasion resulted in significant increases in commodity prices and sharp declines in equity prices in global financial markets, particularly in Russian and emerging markets in Europe and Asia. Additionally, corporate and sovereign credit market conditions deteriorated outside of Russia, especially in emerging markets and Europe (OECD, 2022a). Similarly, Sector *et al.* (2022) explained that the Russian–Ukrainian invasion had a negative impact on the Russian economy, leading to high unemployment, inflation, and reduced imports. Basnet *et al.* (2022) examined the invasion's impact on Russian companies, revealing a negative market reaction. Tosun and Eshraghi (2022) analyzed the market reaction to the announcement of the Russian–Ukrainian invasion, finding that trading volumes increased but investors started exerting selling pressure, resulting in decreased company returns. Boungou and Yatié (2020) demonstrated that the invasion significantly impacted global financial markets, particularly in border countries and countries imposing sanctions. Furthermore, Boubaker *et al.* (2022) examined the invasion's impact on market reactions and found that it affected global financial markets but had no

impact on Asian markets. In contrast, Abbassi *et al.* (2023) analyzed the market reaction in G7 countries to the announcement of the Russian invasion, finding that it was considered a negative signal, leading to a negative market reaction, especially in Japan, which was the most affected Asian country. Yousaf *et al.* (2022) also found a negative impact of the Russian–Ukrainian invasion on the G20 market. Meanwhile, Kamal *et al.* (2023) found that the Australian stock market initially reacted negatively to the event date, but the negative impact diminished over time. They also noted that small and medium-sized businesses were affected during the pre-event and event periods. Similarly, Kumari *et al.* (2023) discovered positive post-event cumulative abnormal returns in Portugal, Denmark, and Poland, while some developed countries had minimal involvement in the war events.

Several studies have examined the impact of the Russian–Ukrainian invasion on energy sector companies and how they have responded in the market. Shaik *et al.* (2023) conducted a comprehensive analysis of the influence of geopolitical risk on crude oil, gold, and stock returns, comparing the effects during major disruptive events such as the Global Financial Crisis, COVID-19, and the Russia–Ukraine war. Their research utilized the Geopolitical Risk index, a precise measure that tracks the escalation of geopolitical tensions over time. In a similar vein, Nerlinger and Utz (2022) focused specifically on analyzing the consequences of the conflict on energy firms' stock prices, revealing a notable positive performance of energy companies, particularly in North America, in the immediate aftermath of Russia's invasion. Guenette *et al.* (2022) highlighted the impact on the global economy, including a significant surge in oil prices, with coal prices increasing by 60% and European natural gas prices soaring by 40%. Similarly, Vasileiou (2022) attributed the sharp rise in commodity prices, including energy commodities, to the war between Russia and Ukraine. Deng *et al.* (2022) found that the surge in energy prices within the sector could potentially trigger inflation, which led investors to be cautious and avoid companies involved in the conflict due to heightened geopolitical risks. Conversely, investors also displayed positive responses to the energy transition, depending on energy supplies from Russia. Tosun and Eshraghi (2022) observed that investors tended to divest from companies engaged in the Russia–Ukraine conflict. Furthermore, Hutter and Weber (2022) argued that the energy crisis had significant short-term repercussions on industrial production, exacerbating the global financial markets following the post-COVID-19 period. Finally, Yoon and Ratti (2011) found that elevated uncertainty in energy prices caused a decrease in the investment responsiveness to sales.

Furthermore, some literature examined the influence of company characteristics on market reactions. Yermack (1996) stated that companies with small boards increased market prices because they paid less compensation and improved CEO performance, which investors saw as a positive signal. Similarly, Amalia *et al.* (2022) found that board size had a positive effect on environmental and energy disclosure, adding value to companies in the capital market. In contrast, Orozco *et al.* (2018) stated that companies with large boards improved company performance and reputation, resulting in increased market value. Similarly, Erkens *et al.* (2012) found that companies with an excessive number of boards experienced a decrease in income during periods of global economic uncertainty. Moreover, Hashmi *et al.* (2020) stated that large companies gained the trust of investors compared to small ones.

3. Data and methodology

The data for this study have been taken from the Wall Street Journal database and investing website. This study focuses on 1,511 companies in the energy sector. We utilized the approach to event study proposed by Fama *et al.* (1969). Recent studies on market reactions to the announcement of the Russian invasion of Ukraine also use the event study method (Abbassi *et al.*, 2023; Boubaker *et al.*, 2022; Yousaf *et al.*, 2022; Boungou and Yatie, 2022; Kamal *et al.*, 2023). In calculating the market reaction, three measurements, namely the

normal rate of return, average abnormal rate of return, and cumulative abnormal rate of return were used (Boubaker *et al.*, 2022; Yousaf *et al.*, 2022; Lesmana and Yudaruddin, 2023, 2024) as follows:

Calculation of normal rate of return:

$$R_{i,t} = \alpha_i + \beta_i R_{i,M_{i,t}} \tag{1}$$

Calculation of the average abnormal rate of return:

$$AR_{i,t} = R_{i,t} - \left(\alpha_i + \beta_i R_{i,M_{i,t}}\right) \tag{2}$$

Calculation of cumulative abnormal rate of return:

$$CAR_{i(t_1,t_2)} = \sum_{t_2}^{t=t_1} AR_{i,t} \tag{3}$$

where, $R_{i,t}$ is the actual daily returns of stock i on the trading day [$R_{i,t} = \ln(\text{Price}_{i,t} - \text{Price}_{i\text{-}t})/\text{Price}_{i,\text{-}t}$] and $R_{Mi,t}$ is the market return on day t. We collect the daily closing prices of the leading stock indices of these countries as our proxy for the market index. α_i and β_i are the regression coefficients. The expected normal return of individual stock i can be calculated when α_i and β_i remain stable during the estimation period. Furthermore, $AR_{i,t}$ is the average abnormal return rate of stock i on the trading day t, obtained by subtracting the expected from the actual return, and $CAR_{i(t_1,t_2)}$ is the cumulative abnormal return rate of stock i in the event window period (t_1, t_2).

To perform the event study, we need to define the event, event date and event window. Russia announced the first invasion of Ukraine on February 24th, 2022, and the news caused panic, especially among the two countries playing the role of the energy and food sectors in the world. The event window consists of 60 days from $t-30$ to $t+30$. Windows can lead to biased results when event is too short, and 100 trading days was used to improve forecast accuracy. The study adopts 11 event windows to classify abnormal returns from the effect of the Russia–Ukraine war: pre-event days [−30, −15, −10, −5, −1], event day [0] and post-event days [+1. +5, +10, +15, +30]. Utilizing a 30, 15 and 10-day event window before and after the announcement offers several advantages in analyzing market reactions. Firstly, it allows for the consideration of potential delays and transmission effects that may gradually unfold in financial markets. This extended time frame provides a more comprehensive understanding of how the market responds to the event, capturing both immediate and sustained changes. Secondly, by encompassing a longer period, it helps mitigate the influence of random fluctuations and daily noise, ensuring more reliable and accurate findings. Researchers can distinguish genuine market reactions from short-term volatility. This approach enhances the robustness of the analysis and strengthens the validity of the conclusions drawn. Overall, the 30-day event window provides a more nuanced perspective on market dynamics, enabling a deeper exploration of investor behavior and market trends during and after the announcement. An event window of 30 days before and after the announcement of the Russian–Ukrainian invasion is shown in Figure 1.

Firstly, the market reaction to the Russian–Ukrainian invasion announcement was analyzed. This was measured using Cumulative Abnormal Return (CAR). Secondly, the method developed by Boubaker *et al.* (2022) was employed to investigate the market reaction to the Russian–Ukrainian invasion. Thirdly, the procedure outlined by Xiong *et al.* (2020) was applied to examine the effects of NATO membership and control variables on the market's reaction to the Russian invasion of Ukraine. Following Boubaker *et al.* (2022), Boungou and Yatie (2022), Yousaf *et al.* (2022), and Abbassi *et al.* (2023), several control variables were

considered: (1) SIZE, which is the logarithm of the firm's market capitalization; (2) BSIZE, which represents the Board Size; (3) INF, denoting the inflation rate, i.e. the average consumer price annual percent change; and (4) GDP, referring to the GDP per capita in current prices. These variables are displayed in Table 1. To achieve this objective, the following estimation is provided:

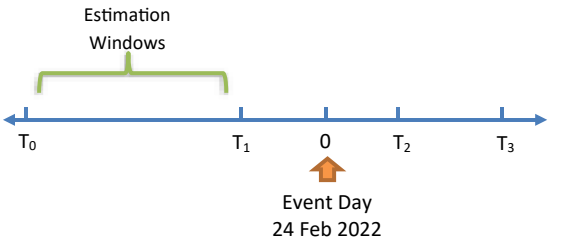
$$CAR_{iw} = \alpha_{iw} + \beta_1 NATO_{iw} + \beta_2 SIZE_{iw} + \beta_3 BSIZE_{iw} + \beta_4 INF_{iw} + \beta_5 GDP_{iw} + \varepsilon_{i,t} \quad (4)$$

where $CAR_{i,t}$ is the cumulative abnormal return of the country i for the event window w. The definitions of the variables are in Table 1. Furthermore, in general, our methodology follows the method of Boubaker *et al.* (2022).

4. Empirical result and discussion

4.1 Analysis of the impact of the Russian–Ukrainian invasion on the energy companies

Our study aims to examine the market reaction of energy sector companies to the announcement of the Russian–Ukrainian invasion. Following Boubaker *et al.* (2022),



Source(s): Elaborated by the authors

Figure 1.
Event Window selection, T_0–T_1 as estimation window, T_1–T_2 as event window, T_2–T_3 as post event window

Variable	Abbreviation	Description	Data sources
Cumulative abnormal returns	CAR	The cumulative abnormal return over the event window. The abnormal return is computed as the difference between the actual raw returns and the predicted returns based on the market model	the wall street journal database and www.investing.com
NATO members	NATO	A dummy variable that takes one for NATO member countries and 0 otherwise	https://www.nato.int/cps/en/natohq/nato_countries.htm
Size of Company	SIZE	Logarithm of market capitalization	Full Year 2021 Financial Statement
Board Size	BSIZE	Number of Director	Full Year 2021 Financial Statement
Inflation	INF	Inflation rate, average consumer prices, Annual percent change (2021)	https://www.imf.org/external/datamapper/PCPIPCH@WEO/OEMDC/ADVEC/WEOWORLD
Gross domestic product	GDP	GDP per capita, current prices; Purchasing power parity; international dollars per capita (2021)	https://www.imf.org/external/datamapper/PPPPC@WEO/OEMDC/ADVEC/WEOWORLD

Table 1.
Variable definitions

Yousaf *et al.* (2022), and Abbassi *et al.* (2023), we employ the event study method. We analyze a period of 30 days before and after the announcement of the Russian–Ukrainian invasion. Table 2 displays the reaction of energy sector companies to the invasion. Specifically, we focus on Russia, a country with a significant contribution to energy exports. The European sanctions imposed on Russia during the invasion led to retaliatory measures by Russia, such as limiting their energy exports. This restriction triggered a sharp increase in energy prices. Consequently, oil prices rose, resulting in higher returns for energy sector companies and a positive reaction in the global market. These findings align with previous studies conducted by Gregoriou and Kontonikas (2010), which revealed a positive long-term relationship between commodity and stock prices in OECD countries. Furthermore, our results indicates that the impact of the Russian–Ukrainian conflict was significant in both developed and emerging markets, while frontier markets did not experience a substantial impact.

More specifically, the countries were divided into several regions: Americas, Europe, Middle East & Africa, and Asia & Pacific, as shown in Table 2. Firstly, energy companies in Europe exhibited a positive reaction one day before and after the announcement of the Russian–Ukrainian invasion. Secondly, energy companies in Asia displayed a positive reaction in the 30 and 10 days preceding the announcement. Additionally, the market continued to react positively on the event day and subsequent days after the announcement. Thirdly, energy companies in America demonstrated the most significant positive reactions to the Russian–Ukrainian invasion. Lastly, energy companies in the Middle East and Africa region exhibited a positive reaction as well, albeit to a lesser extent. This can be attributed to the fact that the region has less dependency on Russia's energy supply compared to Europe. These findings support Abbassi *et al.* (2023), who stated that countries with trade dependence on Russia and Ukraine are most affected. Moreover, Boubaker *et al.* (2022) mentioned that countries located far from Russia and Ukraine showed no reaction to the war.

We also expanded on the previous findings by examining the reactions in each country categorized as developed markets, developing markets, and frontier markets [1,2]. We discovered that several developed markets, including Canada, France, Germany, Israel, Japan, Netherlands, Sweden, the United Kingdom, and the United States, exhibited a positive reaction to the war between Russia and Ukraine, either before or after the announcement. Furthermore, some markets initially reacted negatively before the announcement but displayed a positive reaction after the announcement. Notably, the energy company market in Russia tended to react negatively to the announcements of the Russian–Ukrainian invasion. These results highlight that energy companies in conflict zones face uncertainty due to geopolitical risks. Investors also tend to withdraw by selling their shares in countries engaged in conflicts. Our findings align with Deng *et al.* (2022), who observed that price increases in the energy sector can trigger inflation spikes due to higher input costs. Consequently, investors fear such inflationary pressures and are driven away from companies involved in conflicts. Similarly, Tosun and Eshraghi (2022) reported that investors tend to divest from companies entangled in the Russia–Ukraine conflict. Additionally, the significant surge in energy commodity prices led investors to perceive it as a positive signal during the war.

Furthermore, we have also documented the reaction of developing markets to Russia's invasion of Ukraine. The findings of this study indicate that several markets, such as China, Greece, Mexico, the Philippines, South Africa, South Korea, Taiwan, and Turkey, exhibited a significant positive reaction both before and after the announcement of the invasion. The Chinese market, in particular, shares similarities with the US market. These findings demonstrate that the movement of Chinese stocks can increase when the US market is used as a model (Ma, 2020; Zhang, 2022). Moreover, most markets displayed a positive reaction in the 30-day period, with the reaction intensifying over time. This outcome suggests that prior to the invasion announcement, the market had already reacted to Russia's military preparations

Table 2.
Cumulative abnormal returns for different sets of markets during the event window

Event window		Global (1,511 companies)	Developed markets (1,068 companies)	Emerging markets (311 companies)	Frontier markets (132 companies)	Americas (463 companies)	Europe (471 companies)	Middle East & Africa (75 companies)	Asia & Pacific (558 companies)
Pre-Event days	(−30, 0)	0.00130***	0.00536***	0.00280*	0.00562	0.00890***	0.00029	−0.00522	0.00468*
		(3.7317)	(3.3551)	(1.8227)	(0.8675)	(4.5532)	(0.1333)	(−0.3159)	(1.9609)
	(−15, 0)	0.00665	0.01002*	0.00262	−0.01109	0.03095***	−0.00271	0.00398	−0.00489
		(1.4440)	(1.7916)	(0.2645)	(−0.8103)	(3.2014)	(−0.3304)	(0.2075)	(−0.7071)
	(−10, 0)	0.01381**	0.01621**	0.01757	−0.01447	0.01478	0.00782	−0.01346	0.01859**
		(2.2826)	(2.1657)	(1.3401)	(−1.1020)	(1.2063)	(0.6852)	(−0.5832)	(2.0045)
	(−5, 0)	0.01975***	0.02698***	0.01022	−0.01628	0.04079***	0.01830	0.01769	0.00781
		(2.8957)	(3.1024)	(0.7924)	(−1.1170)	(2.8715)	(1.5068)	(0.6500)	(0.7462)
	(−1, 0)	0.03577***	0.04659***	0.01881	−0.01190	0.08765***	0.02433*	0.01930	0.00362
		(4.6561)	(4.9346)	(1.1153)	(−0.6942)	(5.3590)	(1.7261)	(0.6331)	(0.3323)
Event days	(0, 0)	0.04792***	0.06002***	0.03479**	−0.01905	0.09944***	0.03423**	0.01930	0.01914*
		(6.1357)	(6.1398)	(2.2772)	(−0.9492)	(6.1990)	(2.3034)	(0.6331)	(1.7128)
Post-Event days	(0, +1)	0.03976***	0.05042***	0.02692*	−0.01615	0.08062***	0.02499*	0.02880	0.01827
		(5.1987)	(5.3183)	(1.6793)	(−0.8880)	(5.1618)	(1.8218)	(0.9613)	(1.5616)
	(0, +5)	0.00913***	0.10309***	0.07507***	0.03465*	0.13118***	0.08499***	0.04715*	0.06915***
		(11.0816)	(10.1172)	(4.2770)	(1.8084)	(7.7491)	(5.8047)	(1.6939)	(5.3952)
	(0, +10)	0.12303***	0.15292***	0.04962***	0.05414	0.20621***	0.13499***	0.02270	0.05845***
		(12.1907)	(11.7110)	(3.0079)	(2.4300)	(9.1497)	(7.2714)	(0.8864)	(4.4358)
	(0, +15)	0.07367***	0.09293***	0.03192	0.01620	0.12681***	0.09176***	0.00569	0.02510*
		(6.9638)	(6.9408)	1.5329	(0.7591)	(5.4295)	(4.9038)	(0.2043)	(1.6664)
	(0, +30)	0.10048***	0.13139***	0.04956*	−0.02963	0.15154***	0.13731***	0.01734	0.04140**
		(8.5606)	(9.1269)	(1.9567)	(−1.1130)	(6.1376)	(6.4971)	(0.4921)	(2.3639)

Note(s): CAR stands for cumulative abnormal return. The ordinate represents the event window. ***, **, and * are significant at 1%, 5%, and 10% confidence levels, respectively

Source(s): Elaborated by the authors

in the border areas, resulting in a gradual increase in oil prices due to declining energy supplies. The reaction grew stronger as tensions between the US and Russia escalated, with reciprocal sanctions being imposed. Eventually, Russia began to limit its energy supply to hostile countries, leading to a surge in oil and energy prices, which in turn drove up stock prices in the energy sector. These results align with the study by Gregoriou and Kontonikas (2010), which found a positive relationship between commodity prices and stock prices. On the other hand, several developing markets, such as India, Indonesia, and Thailand, reacted negatively to the invasion. This negative reaction indicates that the war between Russia and Ukraine created geopolitical risks that prompted investors to withdraw from the capital market. These findings are consistent with the studies by Boubaker *et al.* (2022), Boungou and Yatie (2022), Basnet *et al.* (2022), Tosun and Eshraghi (2022), Abbassi *et al.* (2023), Yousaf *et al.* (2022), and Hoque and Zaidi (2020), which highlight the negative impact of geopolitical risks on the capital market.

Additionally, we also examined the market reaction to the Russian–Ukrainian invasion in frontier markets. The reaction in frontier markets differs from that of emerging and advanced markets to the invasion. Most frontier markets exhibited a negative reaction both before and after the announcement, including Bangladesh, Czech Republic, Morocco, Namibia, Romania, and Russia. However, there were two frontier markets, namely Argentina and Vietnam, that displayed a positive reaction to the invasion. These results indicate that investors in frontier markets tend to be more concerned about the increased geopolitical risks arising from the war between Russia and Ukraine. The increase in energy commodity prices was not perceived as a positive signal by investors during the war. This finding is supported by Hoque and Zaidi (2020), which suggests that geopolitical risks have a negative impact on stock returns in developing countries.

4.2 Cross sectional analysis

Table 3 presents a summary of various variables based on a sample size of 1,511 companies. Variables such as NATO, SIZE, BSIZE, INF, and GDP show relatively lower skewness and

Variables	Mean	p25	Median	p75	Std dev	Skewness	Kurtosis
CAR (−30, 0)	0.0035	−0.0117	0.0050	0.0178	0.0282	0.3460	3.1927
CAR (−15, 0)	0.0016	−0.0661	0.0010	0.0677	0.1221	0.0362	2.9598
CAR (−10, 0)	0.0045	−0.0726	0.0066	0.0768	0.1392	0.1805	3.1364
CAR (−5, 0)	0.0136	−0.0791	0.0086	0.0966	0.1670	0.2602	3.0856
CAR (−1, 0)	0.0279	−0.0805	0.0168	0.1367	0.1909	0.1559	2.9263
CAR (0, 0)	0.0389	−0.0729	0.0332	0.1520	0.2035	0.0260	2.8460
CAR (0, +1)	0.0300	−0.0779	0.0215	0.1350	0.1939	0.1338	2.8730
CAR (0, +5)	0.0824	−0.0527	0.0690	0.2104	0.2219	0.1934	2.7969
CAR (0, +10)	0.1060	−0.0554	0.0857	0.2519	0.2539	0.2842	2.6550
CAR (0, +15)	0.0555	−0.0984	0.0373	0.2007	0.2520	0.2673	2.7778
CAR (0, +30)	0.0840	−0.1093	0.0641	0.2520	0.3075	0.2854	2.7557
NATO	0.5103	0.0000	1.0000	1.0000	0.5001	−0.0410	1.0016
SIZE	21.823	19.241	21.500	24.171	3.2148	0.2997	2.2148
BSIZE	8.2012	5.0000	7.0000	10.000	3.5028	3.5028	3.1888
INF	3.2186	2.3000	3.2000	4.7000	1.4596	0.8054	2.6651
GDP	47.935	32.350	52.980	66.060	19.449	0.5118	2.8560

Note(s): CAR = Cumulative abnormal returns. NATO = A dummy variable that takes one for NATO member countries and 0 otherwise. SIZE = Logarithm of market capitalization. BSIZE = Number of Director. INF = Inflation rate. GDP = GDP per capita
Source(s): Elaborated by the authors

Table 3. Summary statistics of variables (N = 1,511)

kurtosis values, indicating a distribution that approximates normality. Meanwhile, Table 4 provides information on the presence of multicollinearity among the variables listed. Overall, there is no issue of multicollinearity between independent variables.

Moving forward, Table 5 presents a comprehensive analysis of the cumulative abnormal returns (CAR) using cross-sectional regression. The study aims to investigate the impact of NATO membership on market reactions surrounding the Russian–Ukrainian invasion. Geopolitical events have been known to have significant implications for financial markets, including the energy sector. Therefore, this analysis delves into the specific market reactions of energy companies in NATO member countries compared to non-member countries.

The findings reveal interesting patterns in market reactions. Ten days before the announcement of the invasion, energy companies in NATO member countries displayed a weaker market reaction compared to non-members. However, from one day before the announcement to thirty days after, the market reaction among NATO member energy companies was significantly stronger. This indicates that NATO membership plays a significant role in shaping market reactions of energy companies during geopolitical events.

Moreover, the analysis incorporates control variables to provide a more nuanced understanding of the factors influencing market reactions. The size of the company, represented by the SIZE variable, exhibits a positive influence on CAR during certain periods, suggesting that larger energy companies tend to have more favorable market reactions. These results align with the study conducted by Hashmi *et al.* (2020), which found that companies with larger sizes tend to gain more trust from investors. Conversely, the BSIZE variable, representing the size of the board of directors, has a negative impact on CAR in several periods, implying that energy companies with larger boards of directors tend to have less favorable market reactions. This finding is supported by Yermack (1996), who found that companies with smaller boards and lower compensation payments tend to be viewed as a positive signal by investors.

These findings have important implications for policymakers and energy companies within NATO member countries. The stronger market reactions observed among NATO member energy companies highlight the economic consequences of geopolitical conflicts and the need for policymakers to adopt measures to mitigate negative impacts on the energy sector. Additionally, the influence of company characteristics, such as size and board size, on market reactions underscores the significance of effective corporate governance practices within the energy industry during times of geopolitical uncertainty. Policymakers should encourage energy companies to adopt transparent and robust governance structures to enhance market confidence and stability.

This analysis contributes to the existing body of knowledge on the economic and financial implications of war and geopolitical tensions, specifically within the energy sector of NATO member countries. It sheds light on how NATO membership influences market responses of

Variables	NATO	SIZE	BSIZE	INF	GDP	Variance inflation factor (VIF)
NATO	1.0000					1.37
SIZE	−0.2685***	1.0000				1.47
BSIZE	−0.1275***	0.4509***	1.0000			1.26
INF	0.1017***	0.0106	0.0332	1.0000		1.03
GDP	0.4969***	−0.4286***	−0.2327***	−0.0749***	1.0000	1.55

Note(s): NATO = A dummy variable that takes one for NATO member countries and 0 otherwise. SIZE = Logarithm of market capitalization. BSIZE = Number of Director. INF = Inflation rate. GDP = GDP per capita. ***, **, and * are significant at 1%, 5%, and 10% confidence levels, respectively
Source(s): Elaborated by the authors

Table 4.
Pearson's correlation and Variance Inflation Factor

Variables	(−30, 0)	(−15, 0)	Pre-event days (−10, 0)	(−5, 0)	(−1, 0)	Event days (0, 0)	(0, +1)	(0, +5)	Post-event days (0, +10)	(0, +15)	(0, +30)
NATO	0.00190	0.00306	−0.02991*	0.00680	0.03064	0.03862**	0.01978	0.02555	0.09467***	0.05943**	0.08055***
	(0.57)	(0.28)	(−1.95)	(0.39)	(1.64)	(2.06)	(1.03)	(1.25)	(4.31)	(2.36)	(2.89)
SIZE	−0.00011	0.00349**	0.00152	0.00407	0.00453	0.00526*	0.00378	0.00523*	0.00105	−0.00122	−0.00283
	(−0.26)	(2.11)	(0.65)	(1.50)	(1.49)	(1.72)	(1.27)	(1.68)	(0.29)	(−0.30)	(−0.61)
BSIZE	0.00017	−0.00291**	−0.00274*	−0.00330**	−0.00337*	−0.00245	−0.00420**	−0.00244	−0.00458**	−0.00617***	−0.00557**
	(0.51)	(−2.51)	(−1.94)	(−2.05)	(−1.92)	(−1.35)	(−2.40)	(−1.31)	(−2.12)	(−2.79)	(−2.09)
INF	0.00029	0.00411**	0.00250	0.00287*	0.00401*	0.00167	0.00205	0.00172	0.00460**	0.00488**	0.00321
	(0.72)	(2.44)	(1.39)	(1.70)	(1.89)	(0.90)	(1.13)	(0.87)	(2.10)	(2.01)	(1.16)
GDP	0.00002	0.00030	0.00061	0.00065	0.00081*	0.00085*	0.00078*	0.00122**	0.00135***	0.00080	0.00115
	(0.54)	(1.23)	(1.59)	(1.49)	(1.74)	(1.96)	(1.67)	(2.42)	(2.71)	(1.26)	(1.59)
Constant	0.00261	−0.07630*	−0.02010	−0.08703	−0.10451	−0.11418	−0.06351	−0.08160	0.00793	0.06538	0.10013
	(0.23)	(−1.74)	(−0.31)	(−1.18)	(−1.26)	(−1.41)	(−0.79)	(−0.97)	(0.08)	(0.59)	(0.80)
Obs.	1,511	1,511	1,511	1,511	1,511	1,511	1,511	1,511	1,511	1,511	1,511
R Square	0.0012	0.0092	0.0056	0.0058	0.0108	0.0109	0.0083	0.0105	0.0339	0.0183	0.0240

Note(s): CAR = cumulative abnormal return. NATO = a dummy variable that takes one for NATO member countries and 0 otherwise. SIZE = Logarithm of market capitalization. BSIZE = Number of Director. INF = Inflation rate. GDP = GDP per capita. The ordinate represents the event window. ***, **, and * are significant at 1%, 5%, and 10% confidence levels, respectively. The model uses the ordinary least squares (OLS) estimation technique with robust standard errors

Source(s): Elaborated by the authors

Table 5.
Cross-sectional regression analysis of cumulative abnormal returns

energy companies during geopolitical events and underscores the importance of considering company-specific factors in understanding market reactions. These insights provide policymakers, investors, and researchers with a deeper understanding of the dynamics at play in the energy sector of global financial markets during times of geopolitical conflicts.

5. Conclusion

This study examines the market reaction of energy sector companies to the Russian–Ukrainian invasion. To achieve this goal, an event study method was used to explore the impact of the Russian–Ukrainian invasion on abnormal returns in several countries, including Europe, America, the Middle East & Africa, and Asia & the Pacific. The energy companies worldwide market reacted positively before and after the announcement of the invasion, with companies in the Americas, Europe, and Asia & the Pacific showing significant reactions. However, the Middle East and Africa market did not react significantly. Additionally, we find that most developed and emerging markets reacted positively due to the increase in energy commodity prices during the war. Conversely, the frontier market experienced negative impacts as a result of the invasion. Furthermore, the reaction of NATO members was stronger compared to other markets, and firm characteristics can have implications for market reactions during invasions. Overall, this study demonstrates that the conflict between the two countries has triggered an increase in global commodity prices, particularly in the energy sector. Investors perceive the sharp rise in energy prices as a positive signal for energy companies in the future, excluding companies located in war zones. However, numerous studies have found war to be a negative signal for investors. This study also highlights the increase in commodity prices during wars as a positive signal for investors.

The implications of these findings highlight the need for more precise risk mitigation strategies, particularly for companies in frontier markets vulnerable to geopolitical uncertainties. The contribution of this research lies in the in-depth analysis of market reactions in the energy sector and financial markets' response to geopolitical conflicts, particularly focusing on the Russian–Ukrainian invasion. By offering a nuanced analysis of market reactions across different regions, market categories, and company characteristics, our research provides valuable guidance for policymakers, investors, and portfolio managers in navigating and mitigating risks during periods of geopolitical uncertainty. Therefore, policymakers should focus on addressing the vulnerabilities of frontier markets to geopolitical tensions, recognizing their unique challenges and potential for negative impacts during conflicts. Future research could delve deeper into understanding the specific factors contributing to the negative market reactions observed in frontier markets, such as structural weaknesses, reliance on imports, or limited access to global financial networks. Moreover, given the stronger market reaction observed in NATO member countries, policymakers should explore the implications of geopolitical alliances and security frameworks on market behaviors during crises. Future studies could investigate how these alliances influence investor perceptions, risk assessments, and capital flows, contributing to a more comprehensive understanding of geopolitical risk management in financial markets.

Notes

1. Market classification through the web: https://www.msci.com/oursolutions/indexes/marketclassification
2. We do not present the results of the cumulative abnormal returns for before-event, the event day, and post-event windows in developed markets, emerging markets, and frontier markets in each country in this paper because we are limited to the maximum number of words for each figure and table, but the results are available on request to the authors.

References

Abbassi, W., Kumari, V. and Pandey, D.K. (2023), "What makes firms vulnerable to the Russia–Ukraine crisis?", *Journal of Risk Finance*, Vol. 24 No. 1, pp. 24-39, doi: 10.1108/JRF-05-2022-0108.

Abbassi, W., Kumari, V. and Pandey, D.K. (2023), "What makes firms vulnerable to the Russia–Ukraine crisis?", *Journal of Risk Finance*, Vol. 24 No. 1, pp. 24-39, doi: 10.1108/JRF-05-2022-0108.

Amalia, S., Lesmana, D., Yudaruddin, Y.A. and Yudaruddin, R. (2022), "The impact of board structure on voluntary environmental and energy disclosure in an emerging market", *International Journal of Energy Economics and Policy*, Vol. 12 No. 4, pp. 430-438, doi: 10.32479/ijeep.13154.

Antonakakis, N., Gupta, R., Kollias, C. and Papadamou, S. (2017), "Geopolitical risks and the oil-stock nexus over 1899–2016", *Finance Research Letters*, Vol. 23, pp. 165-173, doi: 10.1016/j.frl.2017.07.017.

Basnet, A., Blomkvist, M. and Galariotis, E. (2022), "The role of ESG in the decision to stay or leave the market of an invading country: the case of Russia", *Economics Letters*, Vol. 216, 110636, doi: 10.1016/j.econlet.2022.110636.

Boubaker, S., Goodell, J.W., Pandey, D.K. and Kumari, V. (2022), "Heterogeneous impacts of wars on global equity markets: evidence from the invasion of Ukraine", *Finance Research Letters*, Vol. 48, 102934, doi: 10.1016/j.frl.2022.102934.

Boungou, W. and Yatĭe, A. (2022), "The impact of the Ukraine-Russia war on world stock market returns", *Economic Letter*, Vol. 215, 110516, doi: 10.1016/j.econlet.2022.110516.

Boungou, W. and Yatié, A. (2020), "The impact of the Ukraine–Russia war on world stock market returns", *Economics Letters*, Vol. 215, 110516, doi: 10.1016/j.econlet.2022.110516.

Choudhry, T. (2010), "World War II events and the Dow Jones industrial index", *Journal of Banking and Finance*, Vol. 34 No. 5, pp. 1022-1031, doi: 10.1016/j.jbankfin.2009.11.004.

Christofis, N., Kollias, C., Papadamou, S. and Stagiannis, A. (2013), "Istanbul stock market's reaction to terrorist attacks", *Doğuş Üniversitesi Dergisi*, Vol. 2 No. 14, pp. 153-164, doi: 10.31671/dogus.2018.103.

Deng, T., Xu, T. and Lee, Y.J. (2022), "Policy responses to COVID-19 and stock market reactions - an international evidence", *Journal of Economics and Business*, Vol. 119, 106043, doi: 10.1016/j.jeconbus.2021.106043.

Erkens, D.H., Hung, M. and Matos, P. (2012), "Corporate governance in the 2007–2008 financial crisis: evidence from financial institutions worldwide", *Journal of Corporate Finance*, Vol. 18 No. 2, pp. 389-411, doi: 10.1016/j.jcorpfin.2012.01.005.

European Parliament (2022), "Economic repercussions of Russia's war on Ukraine", *Weekly Digest*, No. March, available at: https://www.europarl.europa.eu/RegData/etudes/IDAN/2022/699542/IPOL_IDA(2022)699542_EN.pdf.

Fama, E., Fisher, L., Jensen, M. and Roll, R. (1969), "The adjustment of stock prices to new information", *International Economic Review*, Vol. 10 No. 1, pp. 1-21, doi: 10.2307/2525569.

Frey, B.S. and Kucher, M. (2000), "World War II as reflected on capital markets", *Economics Letters*, Vol. 69 No. 2, pp. 187-191, doi: 10.1016/s0165-1765(00)00269-x.

Gregoriou, A. and Kontonikas, A. (2010), "The long-run relationship between stock prices and goods prices: new evidence from panel cointegration", *Journal of International Financial Markets, Institutions and Money*, Vol. 20 No. 2, pp. 166-176, doi: 10.1016/j.intfin.2009.12.002.

Guenette, J.D., Kenworthy, P.G. and Wheeler, C.M. (2022), *Implications of the War in Ukraine for the Global Economy*, World Bank EFI Policy Notes, April 2022, Washington, DC, doi: 10.1596/37372.

Gupta, S., De Mello, L. and Sharan, R. (2001), "Corruption and military spending", *European Journal of Political Economy*, Vol. 17 No. 4, pp. 749-777, doi: 10.1016/S0176-2680(01)00054-4.

Hashmi, S.D., Gulzar, S., Ghafoor, Z. and Naz, I. (2020), "Sensitivity of firm size measures to practices of corporate finance: evidence from BRICS", *Future Business Journal*, Vol. 6 No. 9, pp. 1-19, doi: 10.1186/s43093-020-00015-y.

Hassouneh, I., Couleau, A., Serra, T. and Al-Sharif, I. (2018), "The effect of conflict on Palestine, Israel, and Jordan stock markets", *International Review of Economics and Finance*, Vol. 56, pp. 258-266, doi: 10.1016/j.iref.2017.10.028.

Hoque, M.E. and Zaidi, M.A.S. (2020), "Global and country-specific geopolitical risk uncertainty and stock return of fragile emerging economies", *Borsa Istanbul Review*, Vol. 20 No. 3, pp. 197-213, doi: 10.1016/j.bir.2020.05.001.

Hudson, R. and Urquhart, A. (2014), "War and stock markets: the effect of World War Two on the British stock market", *International Review of Financial Analysis*, Vol. 40, pp. 166-177, doi: 10.1016/J.IRFA.2015.05.015.

Hutter, C. and Weber, E. (2022), "Russia-Ukraine war: short-run production and labour market effects of the energy crisis", (IAB-Discussion Paper 10/2022), Nürnberg, 18 S, doi: 10.48720/IAB.DP.2210.

Institute for Economics and Peace (2012), *Economic Consequences of War on the U.S. Economy*, Institute for Economics and Peace, Sydney, available at: https://www.economicsandpeace.org/wp-content/uploads/2015/06/The-Economic-Consequences-of-War-on-US-Economy_0.pdf.

Kamal, M.R., Ahmed, S. and Hasan, M.M. (2023), "The impact of the Russia-Ukraine crisis on the stock market: evidence from Australia", *Pacific-Basin Finance Journal*, Vol. 79, 102036, doi: 10.1016/j.pacfin.2023.102036.

Kollias, C., Papadamou, S. and Arvanitis, V. (2013), "Does terrorism affect the stockbond covariance? Evidence from European countries", *Southern Economic Journal*, Vol. 79 No. 4, pp. 832-548.

Kumari, V., Kumar, G. and Pandey, D.K. (2023), "Are the European Union stock markets vulnerable to the Russia–Ukraine war?", *Journal of Behavioral and Experimental Finance*, Vol. 37, 100793, doi: 10.1016/j.jbef.2023.100793.

Leigh, A., Wolfers, J. and Zitzewitz, E. (2013), "What do financial markets think of war in Iraq?", in *NBER Working Paper Series*, available at: http://www.nber.org/papers/w9587.

Leigh, A., Wolfers, J. and Zitzewitz, E. (2003), "*What do financial markets think of war in Iraq?*", NBER Working Paper No. 9587.

Lesmana, D. and Yudaruddin, R. (2023), "The impact of the Russia-Ukraine invasion on market reaction across various industries: an event study on the ASEAN market", *Afro-Asian Journal of Finance and Accounting*, Forthcoming, Vol. 1 No. 1, doi: 10.1504/AAJFA.2023.10057770.

Lesmana, D. and Yudaruddin, R. (2024), "Market reaction to COVID-19 and policy response across different sectors: an event study on ASEAN stock market", *Finance: Theory and Practice*, Vol. 28 No. 1, pp. 30-42, doi: 10.26794/2587-5671-2024-28-1-30-42.

Liadze, I., Macchiarelli, C., Mortimer-lee, P. and Juanino, P.S. (2022), "The economic costs of the Russia-Ukraine conflict", *NIESR Policy Paper*, available at: https://www.niesr.ac.uk/wp-content/uploads/2022/03/PP32-Economic-Costs-Russia-Ukraine.pdf.

Ma, L. (2020), "What is the relationship between the Chinese and US stock markets? Bivariate analysis", in *Quantitative Investing*, Springer, Cham, doi: 10.1007/978-3-030-47202-3_3.

Nerlinger, M. and Utz, S. (2022), "The impact of the Russia-Ukraine conflict on energy firms: a capital market perspective", *Finance Research Letters*, Vol. 50, 103243, doi: 10.1016/j.frl.2022.103243.

OECD (2022a), "Economic and social impacts and policy implications of the war in Ukraine", in *OECD Economic Outlook*, OECD Publishing, Paris, pp. 1-13, doi: 10.1787/4181d61b-en.March

OECD (2022b), "Impacts of the Russian invasion of Ukraine on financial market conditions and resilience", in *Assessment of Global Financial Markets*, OECD Publishing, Paris, doi: 10.1787/879c9322-en.

Orozco, L.A., Vargas, J. and Galindo-Dorado, R. (2018), "Trends on the relationship between board size and financial and reputational corporate performance: the Colombian case", *European Journal of Management and Business Economics*, Vol. 27 No. 2, pp. 183-197, doi: 10.1108/EJMBE-02-2018-0029.

Schneider, G. and Troeger, V.E. (2006), "War and the world economy: stock market reactions to international conflicts", *Journal of Conflict Resolution*, Vol. 50 No. 5, pp. 623-645, doi: 10.1177/0022002706290430.

Sector, F., Interbank, W. and Telecommunications, F. (2022), "Russia's war on Ukraine: the economic impact of sanctions impact on Russia's economy", available at: https://crsreports.congress.gov.

Shaik, M., Jamil, S.A., Hawaldar, I.T., Sahabuddin, M., Rabbani, M.R. and Atif, M. (2023), "Impact of geo-political risk on stocks, oil, and gold returns during GFC, COVID-19, and Russian – Ukraine War", *Cogent Economics and Finance*, Vol. 11 No. 1, 2190213, doi: 10.1080/23322039.2023.2190213.

Thies, C.F. and Baum, C.F. (2020), "The effect of war on economic growth", *Cato Journal*, Vol. 40 No. 1, pp. 199-212, doi: 10.36009/CJ40.1.10.

Tosun, O.K. and Eshraghi, A. (2022), "Corporate decisions in times of war: evidence from the Russia-Ukraine conflict", *Finance Research Letters*, Vol. 48, 102920, doi: 10.1016/j.frl.2022.102920.

Vasileiou, E. (2022), "Abnormal returns and anti-leverage effect in the time of Russo-Ukrainian War 2022: evidence from oil, wheat and natural gas markets", *Journal of Economic Studies*, Vol. 50 No. 5, pp. 1063-1072, doi: 10.1108/JES-04-2022-0235.

Xiong, J., Lipsitz, O., Nasri, F., Lui, L.M., Gill, H., Phan, L., Chen-Li, D., Iacobucci, M., Ho, R., Majeed, A. and McIntyre, R.S. (2020), "Impact of Covid-19 pandemic on mental health in the general population: a systematic review", *Journal of Affective Disorders*, Vol. 277, pp. 55-64, doi: 10.1016/j.jad.2020.08.001.

Yermack, D. (1996), "High market valuation of companies with a small board of directors", *Journal of Financial Economics*, Vol. 40 No. 2, pp. 185-211, doi: 10.1016/0304-405X(95)00844-5.

Yoon, K.H. and Ratti, R.A. (2011), "Energy price uncertainty, energy intensity and firm investment", *Energy Economics*, Vol. 33 No. 1, pp. 67-78, doi: 10.1016/j.eneco.2010.04.011.

Yousaf, I., Patel, R.K. and Yarovaya, L. (2022), "The reaction of G20+ stock markets to the Russia-Ukraine conflict "black-swan" event: evidence from event study approach", *Journal of Behavioral and Experimental Finance*, Vol. 35, 100723, doi: 10.1016/j.jbef.2022.100723.

Yudaruddin, R. and Lesmana, D. (2023), "Banking sector reaction during the Russian invasion of Ukraine: who reacted the most?", *Journal of Economic Studies*, Forthcoming, doi: 10.1108/JES-04-2023-0206

Yudaruddin, R. and Lesmana, D. (2024), "The market reaction of real estate companies to the announcement of the Russian–Ukrainian invasion", *Journal of European Real Estate Research*, Vol. 17 No. 1, pp. 102-122, doi: 10.1108/JERER-12-2022-0038.

Yudaruddin, R., Fitriansyah, Lesmana, L., Bintoro, R.F.A., Purnomo, A.H., Nugroho, B.A. and Santi, E.N. (2023), "Does invasion Russia-Ukraine affect to global financial market? Evidence from consumers' staples sectors", *Journal of Open Innovation: Technology, Market, and Complexity*, Vol. 9 No. 3, 100086, doi: 10.1016/j.joitmc.2023.100086.

Zhang, Z. (2022), "Relationship between Chinese stock market and US stock market", in Li, X., Yuan, C. and Kent, J. (Eds), *Proceedings of the 5th International Conference on Economic Management and Green Development. Applied Economics and Policy Studies*, Springer, Singapore, doi: 10.1007/978-981-19-0564-3_73.

About the authors

Rizky Yudaruddin is an Assistant Professor at the Faculty of Economics and Business, Mulawarman University, Samarinda, Indonesia. He is also Head of the Laboratory in the Department of Management. His research interests include behavioral finance, corporate finance, and the financial market. Rizky Yudaruddin is the corresponding author and can be contacted at: rizky.yudaruddin@feb.unmul.ac.id

Dadang Lesmana is a junior researcher at Research and Development Agency, East Kutai, Indonesia. His research interest includes the monetary economy, financial market, small and medium enterprise, and regional government.