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The Economic Shockwaves of the Russia-Ukraine Conflict and Energy Sources Prices – The Impact on International Energy Markets

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Abstract

The Russia-Ukraine conflict has raised concerns regarding the stability of the global energy sector, considering that Russia is a big player in the industry, producing and exporting crude oil and natural gas globally. This study aimed to empirically investigate the impact of the conflict on the prices of energy sources in international markets. The analysis was conducted using secondary data. The data was for prices of various commodity products, including diesel, petroleum, natural gas, and crude oil. The data was collected on multiple international markets for periods from January 1, 2021 to November 30, 2023. The analysis was conducted using trend analysis and event study. The capital asset pricing model (CAPM) was adopted to run the event study analysis. The results indicated that immediately after the Russian invasion of Ukraine, major energy products such as US crude oil, European crude oil, and the global energy index experienced a sharp rise in price, followed by significant price volatility over the following up to seven months. The review of OPEC energy prices also indicated an increase in prices, and volatility was experienced in countries producing and exporting oil products. The event study further revealed that there was a sharp increasing trend immediately after the event date and an upward trend for more than ten months after the event, resulting in the highest prices recorded in the event window. The study suggested three policy implications - conflict should serve as a wake-up call on diversification of energy sources, investment in alternative, sustainable and green sources of energy to reduce the dependence on oil, and promotion of international cooperation on energy security.

Keywords

Russia-Ukraine conflict, energy prices, international market, oil prices, energy consumption.



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Introduction

The conflict between Russia and Ukraine has dramatically changed the global energy landscape. Various regions globally have experienced soaring prices, with negative and harsh effects on both consumers and firms. Due to the world's dependence on fossil fuel consumption as the main source of energy, the fluctuations in prices have raised great concern (Balsalobre-Lorente et al., 2023; Škare et al., 2022; Wang & Kim, 2022). Russia and Ukraine play a big role in the global energy sector by supplying a significant proportion of energy-related products such as oil, gas, and coal. The conflict between the two countries has a global impact, with most of it being the surge of energy prices by 58.3% from December 2021 to June 2022 (Hubacek et al., 2023; Makau & Samoei, 2022; Vochozka et al., 2022). According to the 2020 statistics, Russia produces approximately 10% of the world's total consumed energy and exports about 10% of world oil, 8% of the world's gas, and about 15% of the global coal (Johnson et al., 2023; Makau & Samoei, 2022; Overland & Loginova, 2023).

The negative effects of the Russia-Ukraine conflict are worsened by the fact that the world has been recovering from the negative impact of COVID-19. The disruption of the global energy market made it hard for recovery measures from COVID-19 effects to be effectively implemented and bear the intended outcomes (Allam et al., 2022; Chen et al., 2023; Gong et al., 2023; Martinho, 2022). Considering that Russia is the largest global exporter of natural gas and second-largest export of crude oil (about 10%) and refined products, the disruption of the energy sector supply chain due to the conflict creates a supply gap and a challenge to the global community, considering the global heavy reliance on the oil and gas energy (Ben Hassen & El Bilali, 2021; Li et al., 2022; Liadze et al., 2023; Shindina et al., 2018).

The world heavily relies on fossil fuels as a source of energy consumption. Though few decarbonization policies have been implemented here and there to reduce dependence on fossil fuels, they are too recent to influence the energy mix significantly today. In Europe, the consumption of fossil fuels is approximately 70% of the total final energy consumption in the region; gas comprises 22%, and oil contains 43%. Electricity accounts for about 22% of total energy consumption, which is also generated from fossil fuels (Ari et al., 2022; Besson, 2022; Eurostat, 2023). The critical aspect is that most of the global continents, including America and the European economy, excessively rely on Russia for oil and natural gas. While there is variation in the level of dependence on Russian oil, some countries have 100% of their oil supplied by Russia (Lisin et al., 2016; Perdana et al., 2022; Sokhanvar & Lee, 2023).

The disruption in the supply chain led to an unprecedented increase in the prices of oil, gas, and other fossil fuels. For instance, by July 5, 2022, the oil prices had increased to a tune of \$114.3 per barrel in the Organization of the Petroleum Exporting Countries (OPEC). As countries initiated sanctions against Russia, global gas also increased from US\$ 2.55 in January 2022 to US\$3.27 in July 2022 (Lawler, 2023; Zhang et al., 2023). Considering these unpredictable events, this research aimed to investigate the effects of the Ukraine-Russia conflict on energy source prices and the spillover effect on different regions of the world in international markets. The strategy employed was to evaluate the changes in energy prices in the source countries/regions and the changes in prices in the global markets in different regions of the world. The evaluation was done by comparing conditions both before and after the conflict.

Materials and Methods

Literature review

The Russian invasion of Ukraine was launched on February 24, 2022. However, before the invasion, the world was experiencing a significant level of continued inflation due to the economic shocks of the coronavirus. The pandemic affected society and individual lifestyles from the second quarter of 2020 (Cavallo, 2021; Coulibaly, 2022; DeSilver, 2022; Gourinchas, 2023). Countries were developing and adopting stringent strategies and policies that could boost their economies from the damage of COVID-19. These measures included fiscal expenditure, an adjustment in demand and supply, and an increase in energy prices, which set a global inflationary trend (Hoang et al., 2021; Idzikowski & Cierlicki, 2021; Jiang et al., 2021; Milstein & Wessel, 2024). These inflationary trends have already established an increasing trajectory for energy prices globally. Yagi and Managi (2023) inform that the energy CPI increased by 40.70% in the Organization for Economic Cooperation and Development (OECD) and 39.43% in the G-7 countries.

For the year 2022 onwards, the rise in energy prices was linked to the Russian invasion of Ukraine, which was launched in February 2022 (Mercer, 2022; Nerlinger & Utz, 2022; Zinets & Vasovic, 2022). The major reason the conflict had a significant influence on the energy sector is that Russia is one of the global leaders in the energy sector, while Ukraine is also a substantial contributor in the oil and gas sector with huge reserves and also plays important roles in energy distribution across Europe (Al-Saidi, 2023; Xing et al., 2023; Zhang et al., 2024).

The Russian invasion resulted in a significant global economic impact, which acted like a microeconomic shock to the worldwide supply chain. According to the observation made by the International Monetary Fund (IMF) on the world economic outlook, they reported an immediate decrease in economic growth by 1.2%. The initial global economic forecast before the conflict started was an economic growth of 4.4% in January 2022.

However, the economic growth actually declined by 3,2% in July 2022, which was primarily associated with the invasion and its effects (Garver, 2024; Itskhoki & Mukhin, 2022; Mirewska, 2015). After the invasion, energy prices increased by approximately 20% in the following five months between February and July 2022 (Ari et al., 2022; Yagi & Managi, 2022). On the day of the invasion, Russian crude oil was trading at \$92.77 per barrel (February 24, 2022) but increased to a tune of 123.64 per barrel by March 8 (Bagchi & Paul, 2023; Yagi & Managi, 2022), which was recorded as the highest since 2007, when the world experienced an oil shock (Hamilton, 2009) (see Fig. 1). The increase in oil prices was reflected in the inflation rates, where, according to the IMF, energy CPI increased by 18% in the OECD countries, while in the G-7 countries, it increased by 8.9% (Azhgaliyeva et al., 2023; The Geneva Association, 2023; Yagi & Managi, 2022).

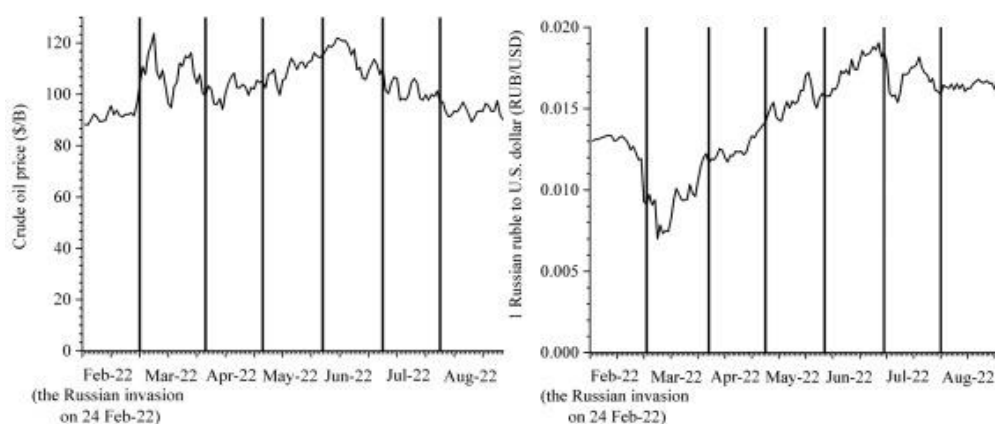


Fig. 1. Fluctuations in energy prices after the Russian invasion. Source: Itskhoki and Mukhin, 2022

Sanctions and their effect on energy prices

After Russia invaded Ukraine, various countries, including the European Union (EU), the United States, and the UK, introduced sanctions on Russia. These sanctions were adopted as measures to discourage the invasion by having a negative effect on the Russian economy and to halt their capacity to wage war against Ukraine (Antoshevska et al., 2024; Bown, 2023; Hosoe, 2023; Lawrence, 2022; Meng & Yu, 2023). The first sanctions directly affected the Russian and global energy markets; for instance, on March 8, the United States banned the import of Russian oil, liquefied natural gas, and coal (Shear, 2022; Tocci, 2023; White House, 2022). Additionally, the European Union adopted and implemented its sixth package of sanctions against Russia. The sanctions entailed bans on imports of Russian crude oil (from December 5, 2022) and petroleum products (from February 5, 2023) (European Union, 2022; Kaniecki et al., 2023; Northam, 2023).

Further, the G-7 introduced a price cap on Russian oil ranging from \$40 to \$60 per barrel. These sanctions resulted in a significant increase in oil prices, which averaged \$106.96 per barrel, which was 15% higher (Iordachi, 2023; Strupczewski et al., 2023). However, the sustained rise in prices was not maintained because Russia circumvented the ban by selling its energy products to other countries, such as China and India (Cook & Sheppard, 2023; Yagi & Managi, 2023). From an economic perspective, the increase in oil prices has little effect on the real GDP because GDP is an added value, and energy is considered an intermediate input in the traditional GDP-determining model. However, rising energy prices have had a significant influence on people's welfare, both consumers and firms, which in turn has slowed the rate of economic growth.

Based on the GDP deflator changes, these energy sanctions have contributed significantly to the increase in the cost of energy in the international market, especially in the European Union member states, leading to higher levels of inflation. The reason for this is that the EU majorly relies on energy products imported from Russia, especially natural gas. The sanctions left a massive gap in energy supply to other parts of the world, which resulted in an enormous increase in energy prices and the cost of production for the energy-reliant industries. Additionally, the war significantly disrupted the energy products supply chain, which interrupted the smooth flow of energy products from Russia to the rest of the world. This resulted in reduced supply. Given the constant demand, the prices of energy products increased in the global international markets. Based on the above critical review of the literature, this research is geared towards answering the following research questions:

1. What has been the immediate and short-term impact of the Russia-Ukraine conflict on international market prices for major energy commodities such as crude oil, natural gas, diesel, and petroleum?
2. How does the volatility in energy prices due to the Russia-Ukraine conflict compare across different global markets and regions?

3. What are the implications of the Russia-Ukraine conflict on the long-term strategies of energy diversification and investment in alternative, sustainable energy sources?
4. How effective can international cooperation be in mitigating the impact of geopolitical conflicts on global energy security and market stability?

Methodology

This study attempts an empirical analysis to examine the impact of the Russia-Ukraine conflict on energy source prices. The analysis is based on a comparative examination of global international market prices. The deconstruction analyzes the changes in the oil prices in source countries, such as Russia, and changes in the rest of the world, including the OECD, G-7, and the United States, among other regions. The research adopted the quantitative methodology, which involved the analysis of quantitative data using statistical techniques and tests.

Different secondary data was collected for this study from various sources. The first data collected was with regard to the prices of energy products, which included gas, crude oil, fuel, coal, etc. The data was obtained from different sources, including the World Bank data repository, the European Commission, OECD, and the Organization of the Petroleum Exporting Countries (OPEC), among others. Data sources were as follows. Diesel and petrol prices were obtained from Independent Statistics and Analysis (IEA, 2023). Data on OPEC oil prices were retrieved from the Annual Statistics Bulletin (Annual Statistics Bulletin, 2023). Europe crude oil prices were obtained from Fred Economic Data (Fred, 2023a). The global price of Energy index was obtained from Fred Economic Data (Fred, 2023b). The international price of Natural gas in the EU was obtained from Fred Economic Data (Fred, 2023c). The data of interest were those before the Russian invasion of Ukraine and after the invasion to evaluate the changes in prices. Various data intervals were considered necessary, including daily, weekly, and monthly data prices. The data used for the analysis ranged between January 2021 and November 2023.

The data was analyzed using various techniques. The first analysis was cleaning the data and making sure that missing values and outliers were well-checked and necessary adjustments made. Considering that the study evaluated the changes in prices resulting from an event (the Russian invasion of Ukraine on February 24, 2022), the other analysis that was conducted was the trend analysis. This evaluated the fluctuations in prices within the event of interest. The comparison analysis was also shown to assess the differences and similarities in energy prices in the different international markets considered.

Another analysis conducted was the event study. An event study is a statistical method used to analyze the impact of a specific event on the value of a financial asset or the overall market. The abnormal prices within the event window were calculated to determine the effect of the event. The Capital Asset Pricing Model (CAPM) was adopted to estimate expected returns during the event window. Abnormal returns were calculated by subtracting the expected return from the actual return for each day in the event window. The following formula was applied:

$$AR_i = R_{i,t} - [R_f + \beta_i \times (R_{m,t} - R_f)]$$

Where:

- AR_i is the abnormal return for asset i on day t ,
- $R_{i,t}$ is the actual return for asset i on day t ,
- $R_{m,t}$ is the actual return on the market on day t ,
- R_f is the risk-free rate.

The cumulative abnormal returns were calculated by summing the abnormal returns over the event window to obtain the Cumulative Abnormal Return (CAR) for prices. The following formula was used:

$$CAR_i = \sum_{t=-k}^k AR_{i,t}$$

The event window used in calculating the CAR was 15 months before and 15 months after the event (November 2020 – May 2023).

Results and Discussion

Trend analysis

The first investigation conducted was the immediate and short-term impact of the Russia-Ukraine conflict on international market prices for major energy commodities, analyzing the trend analysis of prices of different energy commodities in various international markets to see the changes in prices before, during and after the Russian invasion of Ukraine. The first trend analysis was conducted on Europe's crude oil – Brent spot price. The data was collected in terms of US\$ per barrel. The overall trend indicated that the prices gradually increased between January 2021 and November 2023 (data covered). The data (Fig. 2) suggests that the highest prices were recorded between February 2022 and June 2022. This period is directly connected to the Ukraine-Russia conflict, which started on February 24, 2022, followed by sanctions against the import of oil products from Russia by world-developed countries -including the United Kingdom, the United States and Australia. The peak/highest price was

recorded on March 8, 2022, when the price was \$133.18 per barrel. The second highest price was recorded on June 13, 2022, at \$128.47 per barrel. This hike in prices could be associated with a limited supply of oil to the EU due to the first round of sanctions against Russian oil. For instance, the restrictions on Russia's access to the EU's capital and financial markets and services were implemented in February.

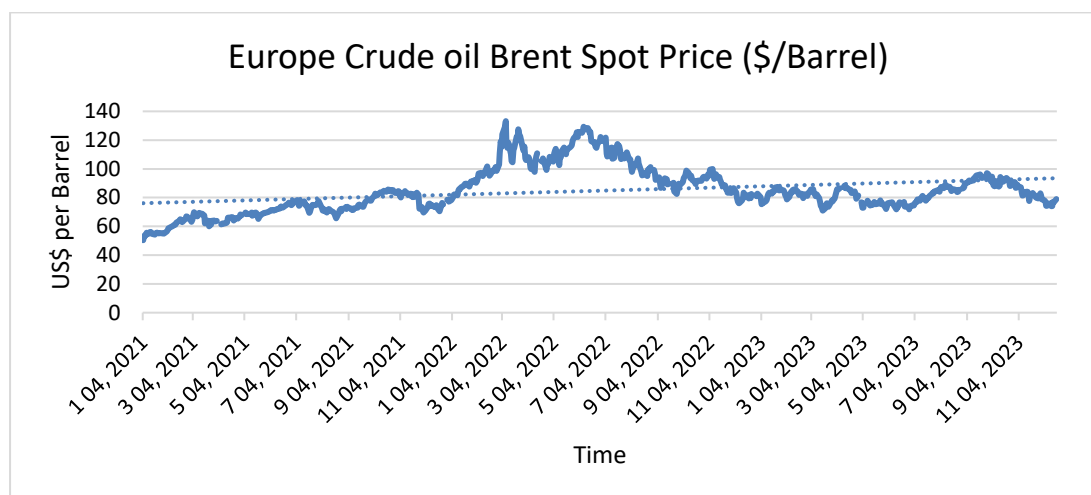


Fig. 2. Europe crude oil Brent spot prices. Source: Authors analysis

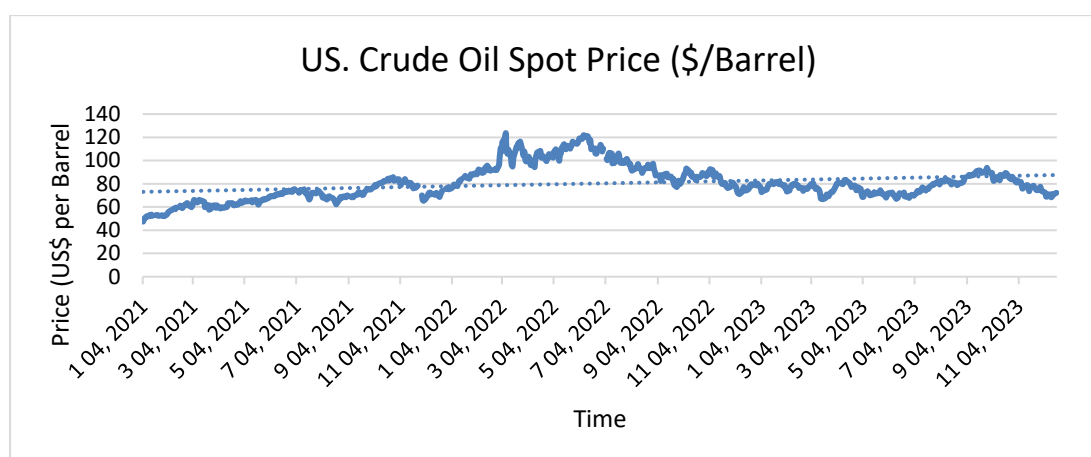


Fig. 3. US crude oil spot prices. Source: Authors analysis

The second analysis was for the crude oil spot prices in the United States in terms of US\$ per barrel. The data used was between January 2021 and November 2023. There was an overall increasing trend in crude oil prices in the United States. As observed in the case of Europe, the highest prices were observed a few months after the onset of the Russia-Ukraine conflict. The highest price was recorded on March 8, 2022, when the price was \$123.64 per barrel (see Fig. 3). This price remained high until June 8, 2022, when the second-highest price was recorded. The price then decreases slowly from then. It is evident from these statistics that though the conflict is still ongoing at the moment of carrying out this research, the hike in prices was experienced a few months after the onset of the conflict.

Another important analysis unearthed by this investigation was the fluctuation in the global price of energy index, which represents the prices of energy commodities (petroleum, coal, natural gas) of period averages in nominal U.S. dollars. These price indices are representatives of the global market prices. The statistics indicate that from February 1, 2022, the price index started increasing significantly up to August 2022, when the highest price index was recorded. The highest price was reached in August 2022, when the price was \$376, while the second highest peak was in March 2022, when the price was \$332. Just as was observed with crude oil in the U.S. and E.U., the highest price index was observed after the Russia-Ukraine conflict started.

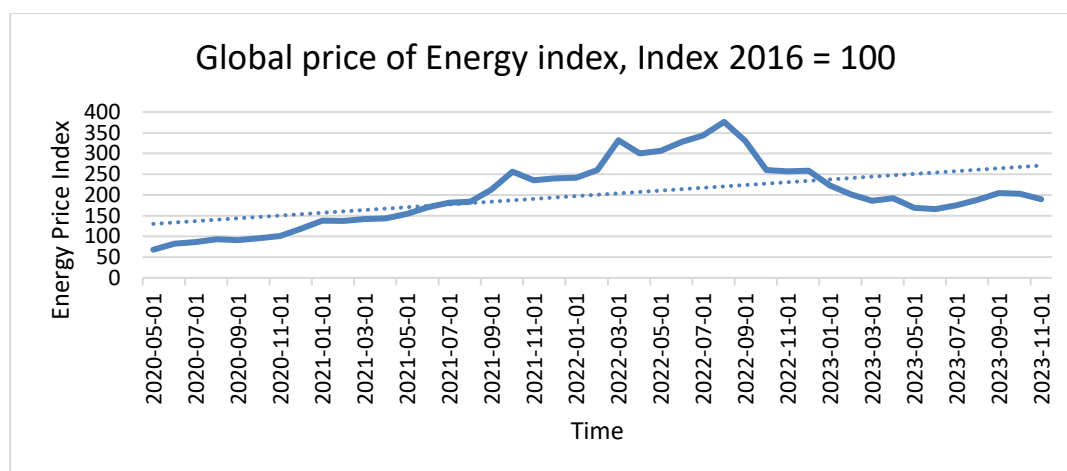


Fig. 4. Global prices of energy index. Source: Authors analysis

Oil prices in source countries

OPEC oil prices

The other analysis that was conducted was to evaluate the effect of the Russia-Ukraine conflict on oil-producing countries. The data explored the changes in oil prices in the Organization of the Petroleum Exporting Countries (OPEC) to evaluate the effect on the source market. The results are presented in Fig. 5. The analysis (event analysis) was evaluated ten months before and after the conflict. The results indicate that after the event period (February 2022), where the price was \$93.95, the price shot up significantly in the following month (March 2022) to \$113.48, then reduced a bit in April 2022 (\$105.64) and then continued to increase for May and June to reach an all-time peak of \$117.72 before starting decreasing gradually for the rest of the months. Therefore, it is evident that the period following the event (Russia's invasion of Ukraine) increased crude oil prices in OPEC countries.

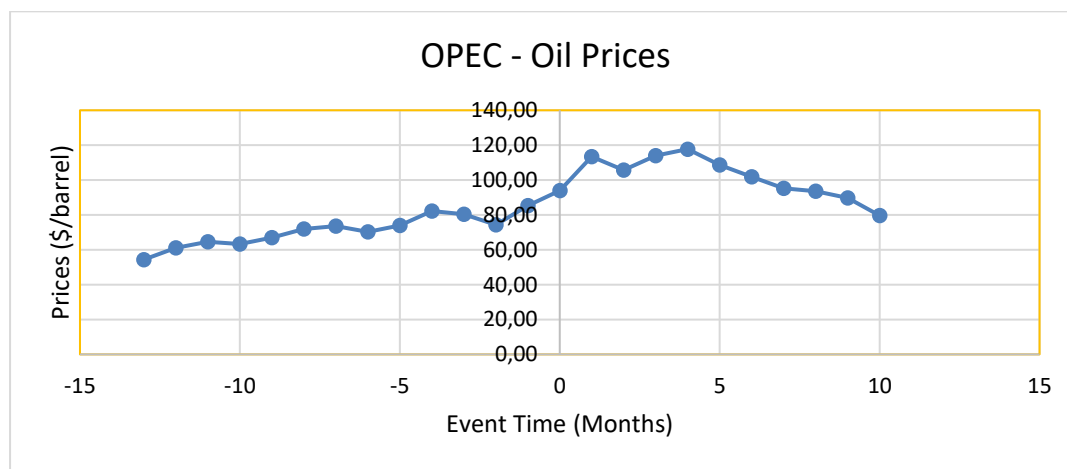


Fig. 5. OPEC oil prices over time. Source: Authors analysis

Energy prices in international markets

This section aimed to analyze the trend in oil prices in various international markets and develop a comparison to see if there was a congruent trend. The markets evaluated include prices in the United States, United Kingdom, Asia, and Africa. Different energy products -natural gas, coal, Brent crude oil, and crude oil- were analyzed for other regions based on the availability of the data. The first analysis was the trend for diesel prices in the United States. Considering the trend results in the first graph in Fig. 6, the results show that prices were maintained above the trend line between February 21, 2022, and January 2023. There was a sharp rise in diesel prices in the U.S. between February and March 2022, which is the period during which Russia launched and intensified its attack on Ukraine. The prices continually increased until June 2022, when they started declining. Two things are noted when comparing the prices before and after the event (second graph). First, the prices after the event are all higher than the prices after the event. Secondly, there was a sharp increase in diesel prices in the

U.S. immediately after the event, which had stayed the same as their initial prices after the event for the 20 weeks considered before and after the event.

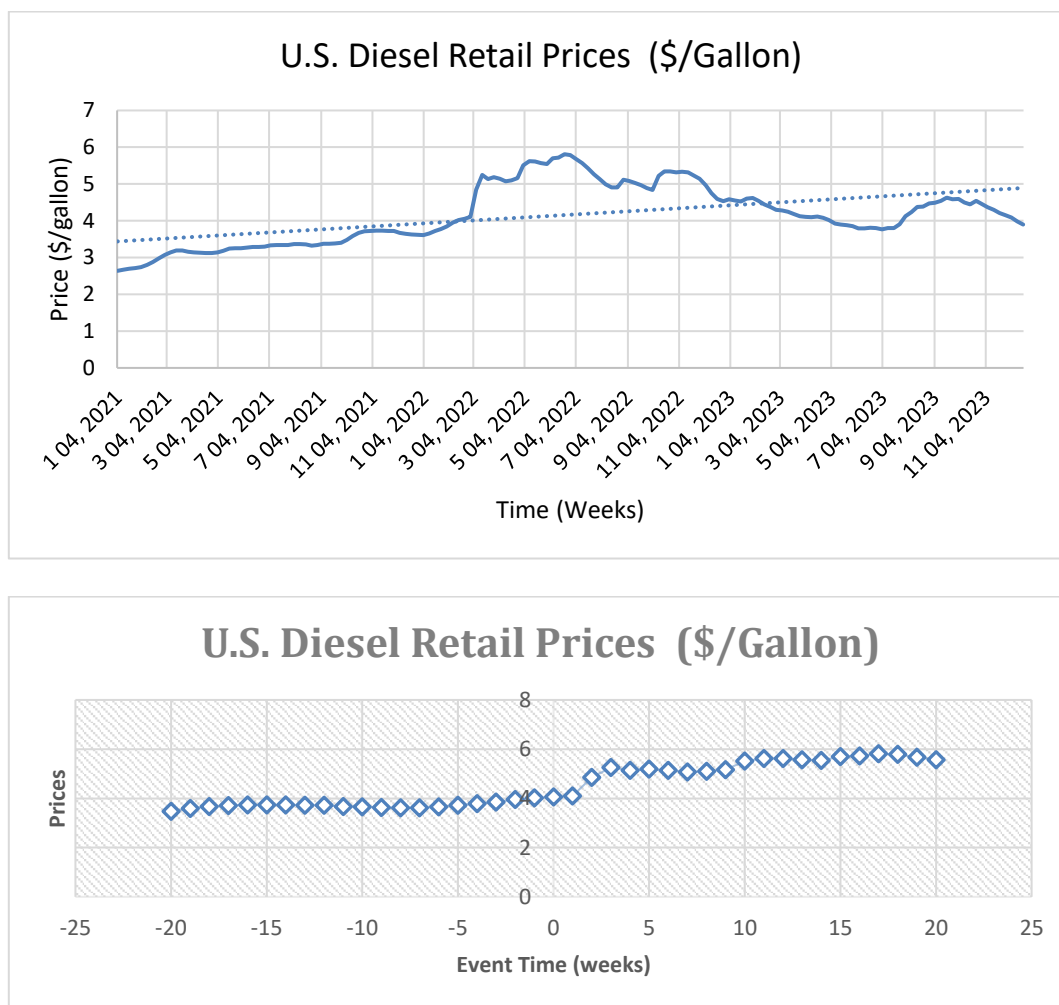


Fig. 6. US diesel retail prices over time. Source: Authors analysis

The research also investigated natural gas prices in Europe and the United States. The intention was to see the trend of the prices of this commodity around the event of the Russian attack on Ukraine. The data used was monthly natural gas prices from January 2020 to November 2023. The analysis of the actual data movement indicates that in March 2022, the prices rose sharply from \$27.0 to \$37.4. The prices later dropped for April and May but rose sharply from May 2022 to August 2022. The highest price was recorded in August 2022, at \$70.0 per million metric British thermal units.

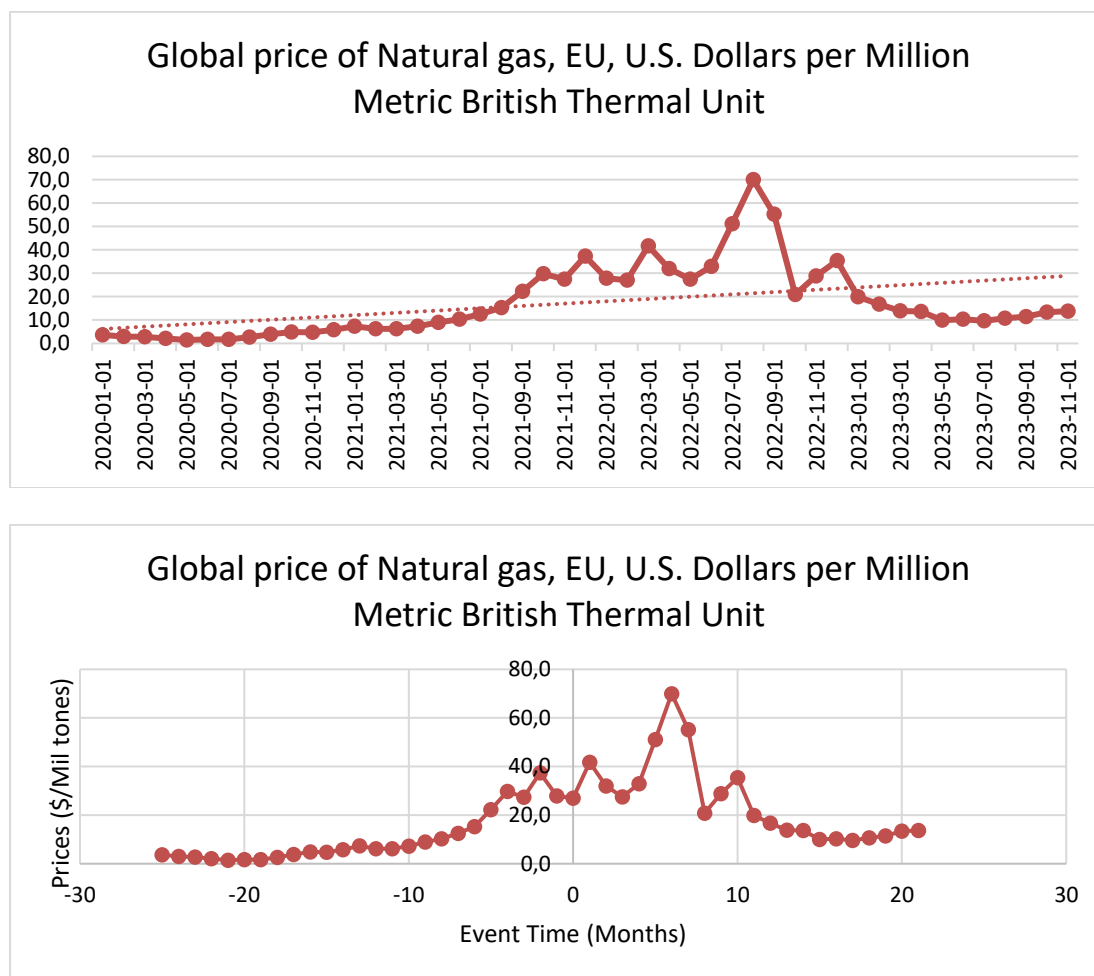


Fig. 7. Global price of natural gas in EU and U.S. Source: Authors Analysis

The results indicate that prices were above the trend line between September 2021 and the end of December 2023. The prices before and after the month of the event were also compared, and the results indicate that before the events, there was a gradual increase in the prices of natural gas. After the event (February 2022), there were significant fluctuations and volatility of prices, recording the highest prices in August 2022 before experiencing some stability in January 2023.

Event study

The event study was used to evaluate the impact of the Russian invasion of Ukraine on energy commodity prices. To capture a comprehensive effect of this event (February 24, 2022) on the commodity prices, two commodities were evaluated - the daily prices of the global price of Brent Crude in U.S. dollars per barrel and the Global price of Energy index, Index 2016 = 100. Monthly data from January 2021 to November 2023 was used. The event window that was selected was 15 months before and 15 months after the event (November 2020 – May 2023). This event window was used to calculate the cumulative abnormal return (CAR). The results are summarized in Fig. 8. The first graph shows the general trend of global crude oil prices and the global price of energy index. The trend indicates a significant rise in prices of both commodities immediately after Russia attacked Ukraine.

Considering the event study results, the same trend was observed for the global price of energy index and the international price of Brent crude oil. The results show that the cumulative abnormal return was slightly constant before the event, with a little increase. During the month of the event, the CAR trend increased. However, after the event (Russia's attack on Ukraine), the cumulative abnormal return increased significantly. In the case of the energy price index, CAR moved from -1243.30 in February 2022 to 47.01 in February 2023. For the case of Brent crude oil, the CAR moved from -368.74 on February 2022 to -63.26 on February 2023. These results clearly indicate that the event significantly influences the energy commodity prices evaluated.

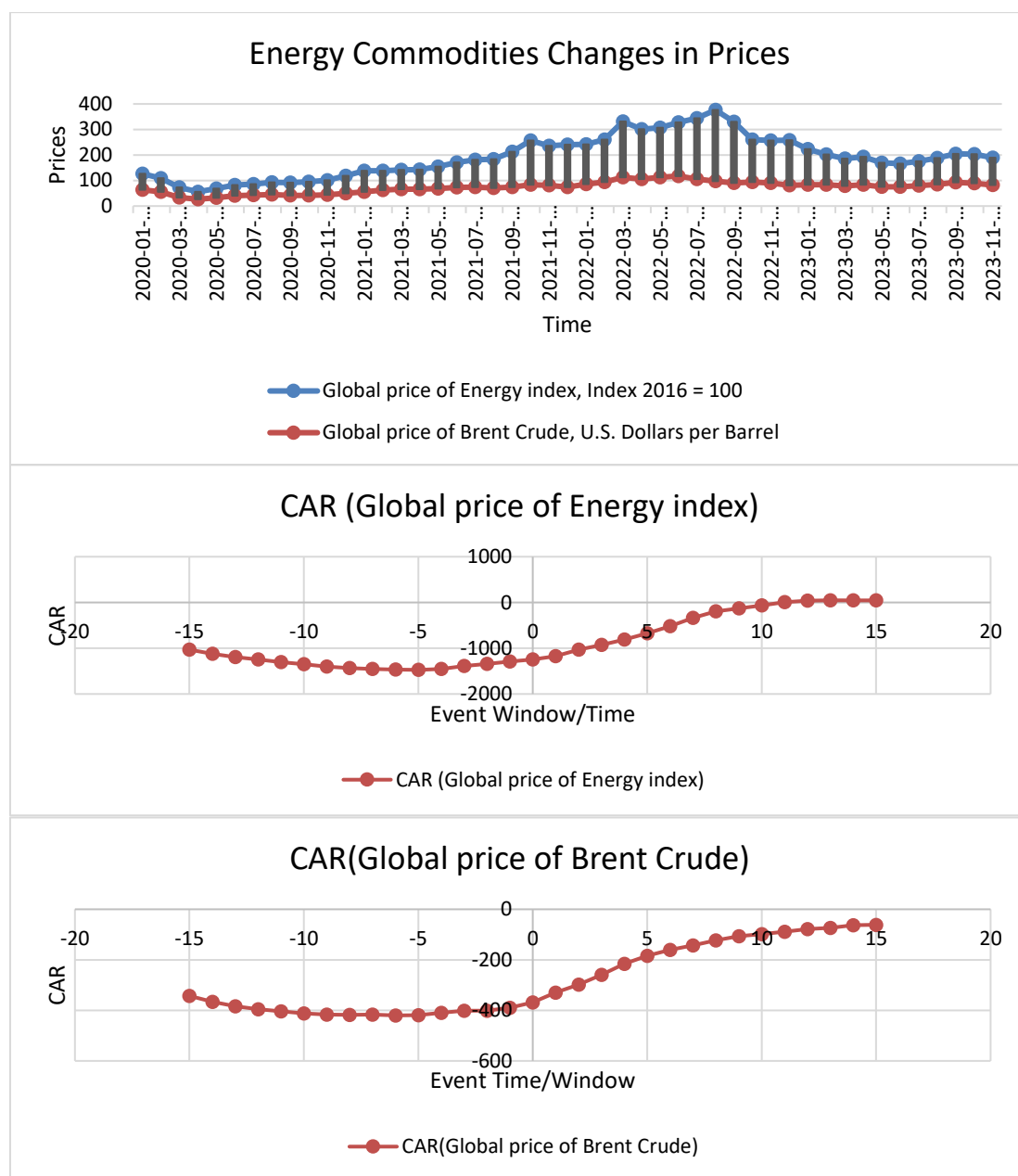


Fig. 8. Event study of energy commodities. Source: Authors analysis

Interesting results were obtained from the analysis of the effect of the Russia-Ukraine conflict, and vital discussions could be developed from them. It is evident that the conflict between the two countries had economic and political effects, but the most influential impact experienced around the globe was on the energy sector (Rizaldi, Idris & Nurbaiti, 2023). The reason is that Russia is among the three largest producers of oil, along with America and Saudi Arabia. After the crisis, Russia sold its oil in rubles, which resulted in an oil crisis in those regions and countries that relied largely on Russian oil, especially the European countries. This was worsened by the European Union adopting measures and sanctions against Russia, including the one that blocked the member countries from importing oil and gas from Russia. This is confirmed by the results of this study, where the European crude oil Brent spot prices are seen to experience a significant increase immediately after Russia attacked Ukraine. For instance, the highest prices were recorded between February 2022 and June 2022. This period is directly connected to the Ukraine-Russia conflict, which started on February 24, 2022, followed by Sanctions against the import of oil products from Russia by world-developed countries -including the United Kingdom, the United States and Australia. The same behaviour is observed in the United States crude oil spot price, which shows a significant fluctuation in prices after the attack, recording the highest price of \$123.64. This clearly indicates that the conflict and the resultant actions by the concerned global organizations and countries set the prices of various commodities on an upward trajectory (Enescu & Szeles, 2023; Maftei, 2012).

Another interesting point of discussion is that the energy prices were affected even in their source countries. Considering the prices of The Organization of the Petroleum Exporting Countries (OPEC), there was an increase in the average prices immediately after the Russian invasion of Ukraine. Actually, the price of oil jumped from \$93.95 in February 2022 to \$113.48 in March 2022. This increase could be associated with an increasing demand for oil from other oil-producing countries. Applying the law of supply and demand, an increase in demand is related to a rise in price, which justifies the increased prices of energy products around the international markets (Fang & Shao, 2022).

The conflict has led to the degradation of the multilateral relationship between Russia and most of the global countries, including Europe, Australia, the United States and other world economies. In an effort to discourage Russia from advancing its attack on Ukraine, various countries adopted a series of packages of economic sanctions against it. The sections are aimed at reducing Russia's ability to finance the war, as well as penalizing the economic and political representatives that are advancing the war (Chen et al., 2023). The effects of these sanctions and soaring trade relationships have caused increased energy product prices across the international markets. These views are in line with the findings of this study. For instance, the research analyzed the changes in the retail prices of diesel in the United States and found a general increasing trend. However, within the period slightly before and after the attack, the prices remained above the trend line. The same trend was observed in the case of natural gas prices in the United States and the United Kingdom. The interesting part is that after the invasion, there was significant price volatility for the following few months.

The event study findings confirmed that the Russia-Ukraine conflict significantly impacts energy prices in the source countries and international markets. The analysis indicated the presence of negative abnormal prices. The cumulative abnormal prices (CAR) significantly increased immediately after the CAR depicted two behaviors – a sharp increasing trend immediately after the event date and an upward trend for more than ten months after the event, resulting in the highest prices recorded in the event window. These results are supported by Johannesson and Clowes (2022), who argue that the conflict has short-term, medium-term, and long-term negative effects on the global energy sector. These effects would have an economic decline and instability due to the deterioration of trade and investment that results from imposed sanctions and poor global supply chain (Lo et al., 2022).

Conclusion and policy implications

Various policy implications could be advocated from this study regarding the effect of the Russia-Ukraine conflict and the resultant impact on the global energy market. The first policy implication is that the global economic performance is at the mercy of oil-producing and exporting countries. If these countries experience war, conflict, financial hardship, or natural calamities, then the whole world will experience the effect. In this case, the stability of the global energy market is pegged to the stability of the Russian energy market and the associated political, environmental, etc. atmospheres. This study advises that the effects of the Russia-Ukraine conflict should serve as a wake-up call for the diversification of energy sources. Global economies, both developed and developing, should invest in alternative, sustainable and green energy sources to reduce their dependence on oil. This should be coupled with developing and implementing strategies that promote energy efficiency and conservation measures to reduce the overall demand for energy.

As investment is being implemented towards renewable sources of energy, this research recommends diversification of energy supply as the foremost important policy that the world economies should consider. This is because the realization of full dependence on renewable energy sources might take quite a long time. Energy sufficiency strategies such as strategic reserves and import source diversification need to be considered (Mukhtarov et al., 2023; Wall et al., 2021). For instance, Europe has a heavy reliance on Russia's natural gas. Diversification could include the development of new gas pipelines from other countries, such as the Southern Gas Corridor and the European Commission's initiative toward the development of a new gas pipeline from the Middle East and Caspian.

Another policy recommendation is the promotion of international cooperation on energy security. This could involve the establishment of frameworks and the creation of alliances and agreements whose goal would be to have stable and reliable access to energy resources. The reason for this is that only some countries would be able to achieve self-sufficiency as far as all energy products are concerned. Therefore, bilateral and multilateral energy agreements would provide a cooperative framework, which would pave the way for mutual assistance during periods of energy supply disruptions. Further, establishing international energy forums, such as the International Energy Agency (IEA), would facilitate dialogues and collaboration among nations during periods of conflict.

This research conducted an empirical investigation on the impact of the Russia-Ukraine conflict on the energy prices in the source markets as well as the international markets. The study analyzed the trend in prices of several energy commodities in various markets. The data used was mainly around the time Russia invaded Ukraine to evaluate the price changes before and after the invasion. The event study was conducted employing the capital asset pricing model (CAPM) technique. The results indicated a general gradual upward trend in prices of various energy commodities over time. However, immediately after the Russian invasion of Ukraine, major energy

products such as US crude oil, European crude oil, and the global energy index experienced a sharp rise in price, followed by significant price volatility over the following up to seven months. The highest prices over more than the last five years were recorded.

Additionally, the review on OPEC energy prices also indicated an increase in prices and volatility experienced in countries producing and exporting oil products, which was linked to the increased demand for energy products from producers other than Russia. The event study further revealed that there was a sharp increasing trend immediately after the event date and an upward trend for more than ten months after the event, resulting in the highest prices recorded in the event window. This research recommends that future research could extend this research by investigating the effects of the various sanctions adopted by multiple countries on energy prices across various international markets. Future research could also explore the volatility of the energy commodity prices by adopting different techniques other than event study, such as GARCH models.

Declarations

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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