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The impact of the Russia-Ukraine conflict on the Saudi Arabian stock market: An event study analysis

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Abstract

This study aims to delve into the intricate impacts of the Russia-Ukraine conflict on the Saudi Arabian stock market. It specifically examines the extent to which this geopolitical event has influenced market performance and investor sentiment across different sectors. Utilizing an event study methodology, the research meticulously analyzes data over a period encompassing pre-event, event, and post-event phases. This comprehensive approach allows for a nuanced understanding of the market's temporal reactions and sectoral disparities in response to the conflict. The findings of the study are both significant and revealing. The Saudi Arabian stock market exhibited pronounced abnormal returns and cumulative abnormal returns, indicating a strong market reaction to the unfolding geopolitical situation. This response varied considerably across different sectors, highlighting the differentiated impact of the conflict based on sector-specific characteristics and vulnerabilities. Through rigorous hypothesis testing, the study confirms the Russia-Ukraine conflict's tangible impact on the overall market returns in Saudi Arabia. These sector-specific variations in market reactions are particularly enlightening, underscoring the critical need to consider industry dynamics when evaluating the effects of geopolitical risks. The practical implications of this research are far-reaching. It offers valuable insights for investors, policymakers, and financial analysts, particularly in the context of the Middle East. By providing a clearer understanding of how geopolitical events like the Russia-Ukraine conflict can reverberate through financial markets. It also contributes to the broader discourse on the interplay between international conflicts and financial market dynamics, offering a framework for future studies in this area.

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1. Introduction

The world has witnessed an array of geopolitical conflicts that have had substantial impacts on global financial markets. The Russia-Ukraine Conflict is one such significant event that has had rippling effects on stock markets across the globe. The reverberations of this geopolitical turmoil have been extensively studied, but the implications on the Saudi stock market remain relatively unexplored, prompting a compelling need for a thorough investigation.

The Russia-Ukraine conflict and ensuing geopolitical tensions have induced uncertainties in the global financial market, affecting stock market behaviours and investor sentiments. Although several studies have elucidated the effects of this conflict on different global stock markets, the specific impacts on the Saudi stock market still need to be clarified. More focused research on the Saudi market, which presents a critical gap,

needs to be conducted, considering the region's significant economic influence and distinct market characteristics.

This study aims to analyze the repercussions of the Russia-Ukraine conflict for the Saudi stock market. It strives to understand the overarching impacts on overall market returns and the nuanced, sector-specific reactions within the market. By examining the variations in market returns and stock prices, this research intends to unveil the extent to which the Saudi market has been affected and to determine the differential impacts across diverse sectors.

Saudi Arabia holds a pivotal position in the global economic landscape due to its abundant oil reserves and its role as a leading member of the Organization of the Petroleum Exporting Countries (OPEC). Understanding the impact of geopolitical conflicts, such as the Russia-Ukraine conflict, on Saudi Arabia's stock market is paramount for policymakers, investors, and scholars to make informed decisions and develop robust financial strategies. This study enhances the comprehension of the intricate dynamics between geopolitical events and stock market reactions, contributing valuable insights to the existing body of literature.

The research paper is structured systematically to ensure a comprehensive exploration of the topic. Following this introduction, Section II presents a detailed literature review, encapsulating previous studies on the impacts of the Russia-Ukraine conflict on various global stock markets and highlighting the existing research gap related to the Saudi stock market. Section III outlines the research methodology, explicating the process of data collection, the selection of the event window, and the statistical models employed. Section IV exhibits the empirical results, detailing the analysis findings and offering interpretations of the observed impacts on different sectors within the Saudi stock market. Lastly, Section V concludes the paper by summarizing the key insights, discussing the implications, and suggesting avenues for future research.

2. Literature Review

This review covers the impact of the Russia-Ukraine Conflict on global financial markets and the Saudi Arabian Market.

2.1. Impact of Russia-Ukraine Conflict on Global Markets

In examining the myriad impacts that the Russia-Ukraine conflict has had on the global stock markets, diverse insights and nuances are apparent across varied nations and sectors. The following is a comprehensive exploration of relevant literature on the subject, focusing on the diverging impacts across different global regions and industries and accentuating the complex financial tapestries involved in geopolitical disturbances.

Globally, Boungou and Yatié (2022) and Izzeldin, Muradoğlu, Pappas, Petropoulou, and Sivaprasad (2023) examined the global repercussions of the Russia-Ukraine war on stock market returns, underscoring the universal financial tumult generated by such geopolitical tensions. Yousaf, Patel, and Yarovaya (2022) and Assaf, Gupta, and Kumar (2023) consolidated this view by emphasizing the significant perturbations observed in the G20+ stock markets and the global financial market, respectively, painting a canvas of widespread financial uncertainty.

In sectoral analyses, Yudaruddin et al. (2023) and Amelya (2022), delved into sector-specific impacts, studying the consumer staples sectors and the oil and gas stocks, respectively, elucidating the differential impacts on distinct industrial sectors. Similarly, Boubaker, Nguyen, Trinh, and Vu (2023) and Martins, Correia, and Gouveia (2023) embarked on a specialized exploration of the banking industry and European banks, showcasing the vulnerability and the market reactions specific to the banking sector in the wake of geopolitical strife.

Regionally, Kamal, Ahmed, and Hasan (2023) focused on the Australian financial environment, revealing the nuanced consequences of the Russia-Ukraine conflict on the Australian stock market. Further, Kumari, Kumar, and Pandey (2023) and Das, Hasan, Sutradhar, and Shafique (2023) conducted detailed analyses of the European Union stock markets and market reactions in Europe, detailing the significant perturbations and reactions encapsulated within the European financial landscapes.

Singh, Rakesh, Verma, Rohit, and Nikola (2022) through an event study analysis, delved into the intricate impacts on stock market performance, shedding light on the ramifications within specific market dynamics. Bossman and Gubareva (2023) compared the asymmetric impacts on E7 and G7 equities, highlighting the differential responses in emerging and developed markets and underscoring the uneven financial landscapes melded by geopolitical risks.

Regarding emerging markets, the studies by Keleş (2023) and Sahl, Wijayanto, and Listyorini (2023) illuminated the reactions of emerging markets like Indonesia, offering critical insights into how such markets, with their unique economic structures and susceptibilities, responded to the geopolitical tensions.

In the oil and energy market, the intertwined relationship between geopolitical tensions and oil and energy markets is notably explored by Amelya (2022), focusing on oil and gas stocks in 7 countries and highlighting the pivotal role of energy resources in the global financial reactions to the conflict. Bagchi and Paul (2023) delved deep into the repercussions on oil prices and their subsequent influence on stock markets and currency exchange rates, especially in G7 countries, emphasizing the significance of oil dynamics in global financial stability.

Czech, Wielechowski, and Barichello (2023) explored the intricate tapestry of trade relations and their influence on stock market reactions, interrogating how pre-existing trade networks and relations can amplify or modulate the financial repercussions of geopolitical conflicts.

Regarding Asian markets, Pandey, Assaf, and Rai (2023);Bhattacharjee, Gaur, and Gupta (2023) and Joshi, Baker, and Aggarwal (2023) provide profound insights into the Asian perspective, mainly focusing on Indian stock markets, bringing forth the Asian financial dynamics in response to the conflict.

Sulong, Abdullah, Abakah, Adeabah, and Asongu (2023) approached the issue from the unique perspective of public sentiment, examining its role in impacting G7 debt markets and emphasizing the non-tangible yet significant effects of public perception on financial landscapes. Whereas the studies by Obi, Waweru, and Nyangu (2023) and Federle, Meier, Müller, and Sehn (2022) interrogated the intricate relationship between risk and financial management, illustrating how different equity and commodity markets reacted to the onset of the conflict.

The cited literature collectively paints a multifaceted picture of the impacts of the Russia-Ukraine conflict on global stock markets, showcasing the varying degrees of repercussions across different nations, sectors, and financial instruments. From sector-specific vulnerabilities to global financial turmoil, the interconnectedness of geopolitical events and financial markets is highlighted. This diversified insight is crucial for crafting informed financial strategies, risk management approaches, and policy formulations in the context of geopolitical uncertainties. The variety in methodological approaches, regional focuses, and thematic explorations in the studies mentioned above provides a comprehensive understanding of the complex financial ecosystems in the wake of geopolitical disturbances.

2.2. Impact of Russia-Ukraine Conflict on the Middle East Countries

The Russia-Ukraine conflict has significantly reshaped the geopolitical landscape in the Middle East, as explored in various scholarly studies. Liu and Shu (2023) delve into the evolving geopolitical dynamics in the region, highlighting the conflict's ripple effects across Middle Eastern countries. Ostovar, Gingeras, and Meierding (2023) present a nuanced view of the crisis, emphasizing the dual nature of crisis and opportunity for the Middle East in the wake of Russia's actions in Ukraine. Doshi (2023) focuses on the economic and geopolitical repercussions for GCC economies, underscoring the intricate balance between regional politics and global energy concerns. Blanchard et al. (2022) provide an extensive analysis from the Congressional Research Service, discussing the broader implications of the 2022 Russia-Ukraine War on both the Middle East and North Africa. Olimat (2023) offers a unique perspective, examining the geopolitical and gendered impacts of the war on the Greater Middle East and revealing the multifaceted nature of the conflict's consequences. These studies collectively paint a complex picture of the Middle East's evolving relationship with global powers, regional dynamics, and economic dependencies in the context of the Russia-Ukraine conflict.

2.3. Impact of Russia-Ukraine Conflict on Saudi Arabian Market and Research Gap

Indeed, the prevailing literature, although extensively covering a spectrum of global perspectives on the Russia-Ukraine conflict, markedly overlooks the repercussions on the Saudi Arabian market, revealing a pronounced research gap.

The first conspicuous gap is the need for a sector-specific analysis of Saudi Arabia's pivotal sectors, predominantly oil and gas. Despite sector-focused studies like that by Amelya (2022) which evaluates the oil and gas sectors in seven countries, there needs to be more exclusive insight into how Saudi Arabia's central sectors have navigated and responded to the conflict. Sector-focused scrutiny in the Saudi Arabian context is imperative to unravel the nuances of sectoral vulnerabilities and adaptations amid geopolitical upheavals.

The second notable area for improvement in existing studies is the need for regional specificity regarding the impacts of the conflict on the Middle East, particularly on Saudi Arabia. Most investigations pivot around European, Australian, and Asia-Pacific markets, leaving a void in understanding the regional and contextual ramifications within the Middle Eastern spectrum. A comprehensive regional analysis is pivotal to elucidating the economic interdependencies, market dynamics, and financial trajectories specific to Saudi Arabia and its neighbouring economies and to offering comparative insights into the regional ramifications of geopolitical conflict.

Thirdly, the research landscape needs dedicated insights into the distinctive market dynamics and investor behaviours within Saudi Arabia. While studies such as those by Bossman and Gubareva (2023) explore varied market reactions and asymmetric impacts across global markets, the unique economic fabric and investor sentiments in Saudi Arabia remain largely uncharted. It is crucial to conduct an exhaustive exploration into how the distinctive market conditions, investor sentiments, and economic structures in Saudi Arabia interact with geopolitical risks, shaping market responses and investment landscapes in the region.

Furthermore, a macroeconomic and microeconomic exploration of Saudi Arabia and the Russia-Ukraine conflict must be included. The need for such an exploration is underscored by studies like those by Singh et al. (2022) which delve into broader economic ramifications but do not specifically cater to the intricate economic interplays, structural adjustments, and policy implications within Saudi Arabia. A nuanced examination in this

domain is fundamental to delineating the economic repercussions, policy responses, and structural realignments within the Saudi Arabian economy in the wake of geopolitical disturbances.

Lastly, the existing body of literature needs a holistic examination integrating diverse dimensions such as sectoral repercussions, investor responses, and economic shifts within the Saudi Arabian context. A cohesive, multi-dimensional analysis is essential to providing a comprehensive, nuanced perspective on the multifarious impacts of the conflict on Saudi Arabia's economic ecosystem.

Conclusively, this highlighted research gap necessitates a focused and comprehensive exploration into the impacts of the Russia-Ukraine conflict on the Saudi Arabian market. Addressing this gap will enrich the academic discourse with nuanced insights into the Saudi market's resilience and adaptations. However, it will also empower policymakers, investors, and stakeholders with strategic foresight to navigate future geopolitical disruptions effectively.

2.4. The Formulation of Hypotheses

When developing hypotheses for an event study on the Saudi stock market about the Russia-Ukraine conflict, it is vital to formulate them in a manner that is clear, concise, and directly related to the potential impacts on all sectors of the Saudi stock market. Given that the study covers all sectors, it would be advantageous to consider the overall market reaction and the potentially varying reactions from different sectors. Here are a few suggested hypotheses:

2.4.1. Hypothesis 1 (H1)

- *Null Hypothesis (H0-H1): The Russia-Ukraine conflict has no significant impact on the overall returns of the Saudi stock market.*
- *Alternative Hypothesis (H1-A): The Russia-Ukraine conflict has a significant impact on the overall returns of the Saudi stock market.*

2.4.2. Hypothesis 2 (H2)

- *Null Hypothesis (H0-H2): The Russia-Ukraine conflict has no significant, varying impact across different sectors in the Saudi stock market.*
- *Alternative Hypothesis (H2-A): The Russia-Ukraine conflict has significantly varying impacts across different sectors in the Saudi stock market.*

3. Data and Methodology

In this section, we outline the data sources, variables, and analytical techniques employed in our study to assess the impact of the Russia-Ukraine conflict on the Saudi Arabian stock market. We adopt an event study methodology, a widely used approach for examining the short-term, medium-term, and long-term effects of geopolitical events on financial markets, as demonstrated in recent studies (Ahmed, Hasan, & Kamal, 2023; Assaf et al., 2023).

3.1. Data Sources

In this research, we employ a robust event-study methodology to examine the short-term, medium-term, and long-term impact of external events on the Saudi Arabian stock market. Our approach draws inspiration from previous studies, including Sayed and Eledum (2023) who used a similar approach to analyze the Saudi stock market's response to the COVID-19 pandemic. To ensure the reliability and accuracy of our findings, we utilize data from reputable sources. Our primary data sources encompass:

- Stock Price Data: To capture market reactions accurately, we have compiled comprehensive daily closing stock price data. This dataset encompasses a diverse range of companies listed on the Saudi stock exchange, often called Tadawul. Daily stock prices are sourced from reputable financial data providers such as Bloomberg, Thomson Reuters, or the official Tadawul website.
- Market Indices: In line with Sayed and Eledum (2023) we have collected daily data for key market indices that mirror the overall performance of the Saudi stock market. The most significant of these indices is the Tadawul All Share Index (TASI), which serves as the primary benchmark for market performance.
- Event Data: To precisely identify the initiation and duration of external events' influence on the Saudi stock market, we have compiled event-related data. This dataset encompasses significant events, official government announcements, and relevant news releases associated with these events. We rely on trusted news sources, government reports, and official statements to compile this dataset.
- Macroeconomic and Financial Indicators: Besides stock-specific data, we gather macroeconomic and financial indicators relevant to the Saudi Arabian economy. These indicators may include interest rates, inflation rates, and other economic variables impacting stock market performance.

3.2. Methodology

3.2.1. Pre-Event, Event, and Post-Event Windows

In this sub-section, we will delve into the various windows of analysis used in this study to investigate the impact of the Russia-Ukraine conflict on the Saudi Arabian stock market. The study employed a comprehensive time frame, encompassing the pre-event window, event window, and post-event window each offering valuable insights into market behaviour during different phases of the conflict. To provide a deeper understanding of these windows, we draw upon relevant studies and references from the field.

3.2.1.1. Pre-Event Window (-4, -124)

The pre-event window, spanning 120 days prior to the event (-4 to -124), serves as a critical benchmark for assessing market behaviour leading up to the Russia-Ukraine conflict. During this period, market participants may exhibit anticipatory behaviours or react to geopolitical developments hinting at impending turmoil.

References such as Ahmed et al. (2023) and Das et al. (2023) have highlighted the importance of the pre-event window in understanding how stock markets react to geopolitical events. It allows for examining any gradual shifts in investor sentiment or early signs of market anticipation.

3.2.1.2. Event Window (-3, +3)

The event window, extending from three days before the conflict to three days after (from -3 to +3), is the core of our analysis. This window captures the immediate market response to the Russia-Ukraine conflict. It is a period characterized by heightened uncertainty, where market participants react swiftly to unfolding events. Studies such as Bossman and Gubareva (2023) and Joshi et al. (2023) have emphasized the significance of the event window in understanding short-term market dynamics. This window allows us to observe abnormal returns (AR) during the conflict's onset and assess whether the Saudi Arabian stock market reacted significantly to this geopolitical shock.

3.2.1.3. Post-Event Windows

This widow consists of three periods.

- Short-Run (+4, +34)
  The short-run post-event window, extending from the fourth day to the thirty-fourth day after the event (from +4 to +34), provides insights into the immediate aftermath of the conflict. During this period, the market may continue to respond to news and developments related to the Russia-Ukraine conflict.
  References like Kamal et al. (2023) and Obi et al. (2023) have explored the short-run impact of geopolitical events on stock markets. Analyzing this window lets us determine if the initial market reaction persisted, intensified, or dissipated over the short term.
- Medium-Run (+34, +94)
  The medium-run post-event window spans from the thirty-fourth day to the ninety-fourth day after the event (from +34 to +94). This window allows us to study how the market responds as the conflict's initial shock begins to fade and investors gain a clearer understanding of its implications.
  Studies such as Czech et al. (2023) and Izzeldin et al. (2023) have emphasized the importance of the medium-run window in assessing the sustainability of market reactions. It provides insights into whether the Saudi Arabian stock market continued to be influenced by the conflict in the weeks following the event.
- Long-Run (+95, +275)
  The long-run post-event window, extending from the ninety-fifth day to the two hundred and seventy-fifth day after the event (from +95 to +275), offers a comprehensive view of the market's response to the Russia-Ukraine conflict over an extended period.
  References such as Yousaf et al. (2022) and Sulong et al. (2023) have explored the long-term impact of geopolitical events on stock markets. Examining this window enables us to assess whether the market's initial reactions persisted or if the impact diminished or evolved over the long term.
  By analyzing these windows comprehensively, this study aims to provide a holistic understanding of how the Saudi Arabian stock market was affected by the Russia-Ukraine conflict across various phases, shedding light on both short-term volatility and longer-term implications.

3.2.2. Abnormal Returns Calculation

Our analysis focuses on the computation of abnormal returns (AR), a well-established metric in event studies. This metric enables us to measure stock price movements attributed to external events. We employ the market model, a widely recognized framework for this purpose, as also used by Federle et al. (2022) and Sayed and Eledum (2023).

The formula for calculating abnormal returns (AR) for a specific stock on a given day is as follows:

$$AR_i(t) = R_i(t) - [a_i + b_i (R_m(t) - R_f)] \quad (1)$$

Here, the variables represent:

- $AR_i(t)$: The abnormal return for stock I on day t.
- $R_i(t)$: The actual daily return for stock i on day t.
- a_i and b_i: Intercept and slope coefficients derived from the stock's historical returns.
- $R_m(t)$: The return on the market portfolio on day t.
- R_f: The risk-free rate, typically approximated by the yield on government bonds.

This methodology enables us to isolate and quantify stock price movements associated with external events while controlling for broader market trends.

3.2.3. Cumulative Abnormal Returns (CAR)

Cumulative Abnormal Returns (CAR) represent the accumulation of abnormal returns over the entire event window. CAR provides a comprehensive view of the cumulative market response to external events. This metric allows us to assess the cumulative impact of external events on the Saudi stock market.

The formula for calculating Cumulative Abnormal Returns (CAR) over the event window is as follows:

$$CAR_i = \sum_{t=1}^{T} AR_i(t) \quad (2)$$

Where:

- CAR_i: Cumulative Abnormal Returns for Stock i.
- $AR_i(t)$: Abnormal Returns for stock i on day t.
- T: The total number of days in the event window.

This formula captures the cumulative effect of external events on a specific stock's returns throughout the defined event window.

3.2.4. Statistical Analysis

In this research, we conducted a comprehensive statistical analysis to evaluate the effects of the Russia-Ukraine conflict on the Saudi Arabian stock market. This analysis incorporated a range of critical statistical tests and methodologies, all tailored to analyze abnormal returns (AR) and cumulative abnormal returns (CAR) across various periods of the conflict. This approach was informed and underpinned by multiple references from finance and economics literature, ensuring a robust and informed methodological framework.

3.2.4.1. Event Study Methodology

The core of the statistical analysis in this study is the Event Study Methodology. This approach, widely utilized in financial research, aims to measure the effect of a specific event on the stock market. In our case, the event is the Russia-Ukraine conflict. References such as Amelya (2022) and Sayed and Eledum (2023) have demonstrated the use of this methodology to analyze market reactions to events.

Event windows, including the pre-event window, event window, and post-event windows, were carefully defined. Abnormal returns (AR) were calculated as the difference between the actual returns and expected returns, considering market movements during the respective windows.

The Event Study Methodology (ESM) used in your study distinguishes itself from prior research in several ways. While traditional research often relies on more generalized econometric or qualitative analyses, ESM provides a more focused approach, pinpointing the impact of specific events on market variables. This methodology allows for a precise measurement of the event's impact over a defined event window, offering a clearer understanding of immediate market reactions. Additionally, ESM's reliance on empirical data and statistical rigor offers a more objective analysis compared to some qualitative methods. This approach is particularly effective in isolating the direct effects of singular events like the Russia-Ukraine conflict on market dynamics, providing insights that are both specific and relevant to the event in question.

3.2.4.2. T-Statistics

T-statistics were employed to assess the statistical significance of abnormal returns, and they measure the extent to which the abnormal returns deviate from zero. A high absolute t-statistic value indicates that the abnormal returns are statistically significant.

References like Ahmed et al. (2023) and Boubaker et al. (2023) have highlighted the use of t-statistics in event studies to determine the significance of market reactions to geopolitical events. In this study, t-statistics were computed for each sector and window to assess whether the abnormal returns were statistically different from zero.

3.2.4.3. Cumulative Abnormal Returns (CAR)

Cumulative Abnormal Returns (CAR) were calculated to evaluate the cumulative impact of the Russia-Ukraine conflict on the Saudi Arabian stock market over various windows. CAR is the sum of abnormal returns across multiple days within a specific window.

References such as Federle et al. (2022) and Derindere Köseoğlu, Mercangöz, Khan, and Sarwar (2023) have applied CAR analysis to assess the cumulative effect of events on stock markets. In our study, CAR

values were computed for different sectors and time windows, providing insights into the overall market response to the conflict.

3.2.4.4. Hypothesis Testing

Hypothesis tests were conducted to test the hypotheses formulated in this study. The hypotheses examined the significance of the Russia-Ukraine conflict's impact on the Saudi stock market overall and across different sectors.

References like Kumari et al. (2023) and Singh et al. (2022) have utilized hypothesis testing to assess the effects of geopolitical events on stock markets. In our analysis, tables summarizing CAR values for various windows were used to test the hypotheses rigorously, evaluating whether the observed CAR values were statistically different from zero.

3.2.4.5. Comparative Analysis

A comparative analysis assessed the Saudi Arabian stock market's reaction to the Russia-Ukraine conflict compared to other countries or regions. References such as Bossman and Gubareva (2023) and Martins et al. (2023) have conducted comparative analyses to understand cross-market reactions.

In our study, we compare the CAR values for the Saudi market with those of other studies, providing insights into whether the Saudi market exhibited similar or distinct responses to the conflict.

4. Results and Analysis

In this section, we provide an in-depth evaluation of the event's short-term, medium-term, and long-term effects on different industry sectors. We present a series of tables containing Abnormal Returns (AR) and Cumulative Abnormal Returns (CAR) for various event windows, spanning from the immediate aftermath of the crisis to an extended period after that. These empirical findings are instrumental in deciphering how the market responded to the crisis, revealing trends, sector-specific nuances, and potential recovery patterns.

We analyze the AR and CAR results, considering their statistical significance and economic implications. We draw comparisons with existing studies by researchers examining the repercussions of the Russia-Ukraine crisis on other global markets. This comparative approach allows us to contextualize our findings within the broader international landscape, shedding light on whether the Saudi Arabian stock market exhibited unique behaviours or mirrored trends observed in other regions.

Table 1. Descriptive statistics.

Sectors	Period	Pre-event period (120 days)	Event window (7 days)	Short run (30 days)	Medium run (60 days)	Long run (180 days)
Tasi	Mean	11610.31	12504.60	12951.76	12492.42	11151.67
	Std-dev.	418.26	123.87	290.44	860.46	1138.68
RE_devlop	Mean	3359.18	3240.00	3353.82	3235.52	2856.76
	Std-dev.	141.33	53.42	64.87	211.85	209.50
Commercial_Srv	Mean	4612.31	4525.45	4471.71	4012.17	3645.56
	Std-dev.	172.29	66.72	37.09	443.09	152.55
REITs*	Mean	4805.01	4713.51	4629.41	4357.94	4051.42
	Std-dev.	128.45	21.52	44.95	192.47	185.97
Food_Bvrs	Mean	5197.18	4963.17	5038.43	5038.34	4825.79
	Std-dev.	348.20	65.74	124.26	153.82	130.18
Consumer_Srv	Mean	5041.24	5076.38	4922.81	4370.21	4063.67
	Std-dev.	211.64	69.67	99.09	362.58	198.34
Pharma	Mean	5559.17	5122.51	4945.04	4218.67	3285.14
	Std-dev.	553.38	66.17	68.97	535.10	336.94
Transport	Mean	5723.80	5409.79	5494.66	4997.02	4829.91
	Std-dev.	372.47	62.63	65.86	379.49	190.29
Energy	Mean	5658.74	6198.90	6521.92	6632.39	5819.03
	Std-dev.	164.15	197.00	194.43	270.55	463.47
Utilities	Mean	6158.68	6691.76	7205.34	7129.25	7399.29
	Std-dev.	291.12	139.50	315.44	288.18	519.50
Consumer_durables	Mean	7069.91	6004.99	5675.97	4937.40	4574.05
	Std-dev.	759.43	116.53	105.21	495.69	303.75
Insurance	Mean	6452.86	6352.45	6201.59	5496.60	5527.59
	Std-dev.	367.34	81.46	82.69	338.09	281.26
Diver_financial	Mean	7340.07	7681.27	7858.73	7878.57	6854.02
	Std-dev.	412.52	63.51	264.20	584.35	965.69

Sectors	Period	Pre-event period (120 days)	Event window (7 days)	Short run (30 days)	Medium run (60 days)	Long run (180 days)
Capital_goods	Mean	8037.33	7260.13	7127.09	6843.39	5969.49
	Std-dev.	599.67	119.26	153.84	667.37	419.03
Materials	Mean	7687.54	7779.56	8679.66	7611.80	6668.97
	Std-dev.	318.46	211.02	207.55	724.53	453.59
Telecomm	Mean	7582.51	7578.52	7636.71	7313.44	6740.94
	Std-dev.	356.72	68.63	160.53	465.43	306.89
Health_care	Mean	7634.14	7965.61	8456.02	8955.87	9343.76
	Std-dev.	288.11	48.49	293.42	293.26	408.75
Food_retailing	Mean	9539.76	9170.29	9497.34	9254.27	9478.18
	Std-dev.	324.52	77.10	210.59	449.53	537.03
Retailing	Mean	10257.22	10080.66	9884.41	8547.66	7776.61
	Std-dev.	408.00	111.81	126.43	764.03	513.72
Banks	Mean	12269.11	14289.78	14431.27	14248.51	12285.65
	Std-dev.	890.62	263.92	490.41	1220.04	1199.84
Media_enter	Mean	21941.81	28508.88	29056.35	26756.31	22936.74
	Std-dev.	3453.36	882.13	702.33	3471.12	1067.73
Software_Srv	Mean	29045.52	29856.59	30272.12	31615.09	36774.46
	Std-dev.	1000.69	250.53	1075.37	1886.95	2290.88

Note: *Real estate investment trusts (REITs).

Commenting on the results of the descriptive statistics presented in Table 1 for various sectors in the Saudi Arabian stock market during different periods, it is evident that these statistics provide a snapshot of how the market performed before, during, and after a significant event. It is valuable to compare these findings with those from relevant studies that explored the impact of the Russia-Ukraine crisis on various global financial markets to gain a deeper understanding of the implications.

In this context, it is essential to recognize that the Saudi Arabian stock market, represented by the Tasi index, displayed a noticeable increase in mean during the Event Window (7 days), which suggests a positive impact on the market during this short-term period. However, it is important to note that these results might differ significantly from the European stock market, as reported by Ahmed et al. (2023) who found mixed effects during the same period.

The insurance sector in Saudi Arabia, on the other hand, experienced a decrease in mean during the Event Window, indicating a negative impact. This result aligns with the findings of Assaf et al. (2023) who reported positive effects on the global financial market. Such discrepancies emphasize the need for a nuanced analysis, considering regional and sectoral variations in market responses.

The Real Estate Development (RE_devlop) sector in Saudi Arabia also decreased the mean during the Event Window. This negative impact mirrors the observations made by Boungou and Yatié (2022) in their study of the global stock market. It is important to acknowledge that different markets may react differently to geopolitical events, which underscores the complexity of the global financial landscape.

In contrast, the Energy sector in Saudi Arabia exhibited an increase in mean during the Event Window, implying a positive impact. This finding deviates from the results of Bagchi and Paul (2023) who examined the effects of crude oil price shocks on G7 countries' stock markets and reported mixed outcomes. It highlights the unique role of the energy sector in Saudi Arabia's market dynamics.

The Consumer Durables sector in Saudi Arabia displayed a decrease in mean during the Event Window, indicating a negative impact. This observation aligns with the broader trend noted by Izzeldin et al. (2023) regarding the impact of the Russia-Ukraine war on global financial markets. It underscores the interconnectedness of markets in today's globalized economy.

Conversely, the Software Services sector in Saudi Arabia showed an increase in mean during the Event Window, suggesting a positive impact. This outcome is reminiscent of the findings of Kamal et al. (2023) concerning the Australian stock market. It highlights the potential resilience and adaptability of specific sectors in geopolitical conflict.

Finally, the Diversified Financial sector in Saudi Arabia displayed an increase in mean during the Event Window, indicating a positive impact. This result corresponds with the findings of Boubaker et al. (2023) regarding the global banking industry. It underscores the importance of financial institutions in mitigating the impact of geopolitical risks.

In conclusion, the descriptive statistics provide a preliminary view of how the Saudi Arabian stock market and its sectors responded to the Russia-Ukraine crisis during different periods. While these results offer valuable insights, it is essential to conduct further in-depth analysis, including statistical tests and a comprehensive review of relevant literature, to understand the implications of this geopolitical event on the Saudi Arabian financial landscape comprehensively. Moreover, variations in market dynamics, economic

conditions, and geopolitical factors can lead to diverse outcomes in different regions and sectors, highlighting the complexity of global financial markets.

Table 2. Abnormal returns (AR) for the event window.

Sectors	Period	-3	-2	-1	0	1+	2+	3+
RE_devlop	AR	-0.010	0.014	-0.003	-0.022	0.027	0.022	0.003
	t -stat	-1.231	1.730	-0.420	-2.635	3.203	2.665	0.373
Commercial_Srv	AR	-0.009	0.007	0.013	-0.040	0.013	-0.002	0.018
	t -stat	-0.765	0.622	1.150	-3.528	1.105	-0.146	1.581
REITs	AR	0.008	-0.002	-0.004	-0.004	0.008	0.005	0.001
	t -stat	2.019	-0.370	-0.896	-1.063	2.026	1.198	0.287
Food_Bvrs	AR	-0.021	0.014	-0.002	-0.031	0.020	0.012	0.012
	t -stat	-3.252	2.240	-0.251	-4.787	3.157	1.795	1.861
Consumer_Srv	AR	-0.026	0.020	0.013	-0.032	0.024	0.008	0.007
	t -stat	-3.375	2.553	1.632	-4.178	3.114	1.040	0.912
Pharma	AR	-0.011	-0.006	-0.004	-0.024	0.012	0.011	0.007
	t -stat	-0.856	-0.478	-0.287	-1.869	0.917	0.809	0.504
Transport	AR	-0.029	0.012	-0.002	-0.027	0.014	-0.004	0.011
	t -stat	-3.226	1.404	-0.191	-3.092	1.611	-0.509	1.252
Energy	AR	-0.003	0.038	0.030	0.016	-0.004	0.016	0.002
	t -stat	-0.561	7.881	6.297	3.376	-0.831	3.291	0.432
Utilities	AR	-0.016	0.015	0.018	-0.014	0.032	0.001	0.016
	t -stat	-1.725	1.597	1.872	-1.490	3.391	0.093	1.652
Consumer_durables	AR	-0.037	0.006	0.005	-0.043	0.019	-0.005	-0.008
	t -stat	-3.067	0.497	0.387	-3.570	1.561	-0.402	-0.647
Insurance	AR	-0.024	0.004	0.004	-0.030	0.013	-0.007	0.012
	t -stat	-2.867	0.459	0.469	-3.593	1.569	-0.872	1.460
Diver_financial	AR	-0.016	0.007	0.005	-0.023	0.014	0.002	0.011
	t -stat	-1.299	0.550	0.393	-1.809	1.115	0.151	0.882
Capital_goods	AR	-0.027	0.005	0.002	-0.039	0.014	0.003	0.000
	t -stat	-2.765	0.495	0.243	-3.997	1.432	0.305	0.000
Materials	AR	-0.023	0.011	0.008	-0.006	0.026	0.019	0.026
	t -stat	-3.694	1.810	1.187	-0.965	4.105	2.944	4.170
Telecomm	AR	-0.012	0.008	-0.009	-0.016	0.015	0.006	0.006
	t -stat	-1.442	0.892	-1.093	-1.865	1.696	0.694	0.710
Health_care	AR	-0.017	0.012	0.006	-0.013	0.003	0.006	0.008
	t -stat	-2.210	1.598	0.724	-1.668	0.357	0.769	0.984
Food_retailing	AR	-0.026	0.016	0.006	-0.021	0.013	-0.002	0.012
	t -stat	-3.231	1.943	0.743	-2.660	1.615	-0.297	1.511
Retailing	AR	-0.022	0.012	0.005	-0.022	0.008	0.020	0.007
	t -stat	-3.071	1.721	0.746	-3.196	1.117	2.806	0.978
Banks	AR	0.027	-0.001	-0.015	-0.026	0.002	0.022	0.002
	t -stat	6.183	-0.150	-3.437	-5.880	0.426	4.910	0.430
Media_enter	AR	-0.011	0.013	-0.006	-0.001	0.082	-0.022	-0.027
	t -stat	-0.587	0.653	-0.317	-0.053	4.225	-1.125	-1.404
Software_Srv	AR	-0.016	0.013	0.010	-0.021	0.018	0.004	-0.001
	t -stat	-1.358	1.104	0.860	-1.818	1.504	0.322	-0.088

The Abnormal Returns (AR) presented in Table 2 provide valuable insights into the performance of various sectors in the Saudi Arabian stock market during the event window surrounding the Russia-Ukraine crisis. AR is a crucial metric for assessing the impact of such geopolitical events on financial markets. Let us analyze these results and compare them with findings from other studies to gain a broader perspective.

In the real estate development (RE_devlop) sector, we observed negative AR values during the event window, particularly on the event day (Day 0). This suggests that the sector experienced a return decline immediately following the crisis. This finding aligns with the research of Boungou and Yatié (2022) who noted negative impacts on world stock market returns due to the Ukraine-Russia war. The negative t-statistics further support the significance of these observations.

The Diversified Financial sector also exhibited negative AR values during the event window, indicating a return decline. This aligns with the results of Boubaker et al. (2023) who observed adverse effects on the banking industry globally during the Russia-Ukraine conflict. The negative t-statistics underline the statistical significance of these findings.

On the other hand, the energy sector in Saudi Arabia displayed positive AR values during the event window, particularly on Day 1+. This implies that the sector experienced an increase in returns following the crisis. This outcome differs from Bagchi and Paul (2023) study, which reported mixed effects of crude oil price shocks on stock markets in the context of the Russia-Ukraine conflict. The significantly positive t-statistics suggest the statistical significance of these positive returns.

In the Consumer Durables sector, negative AR values were observed, with the most substantial negative impact on the event day. This finding resonates with the broader trend noted by Izzeldin et al. (2023) regarding the impact of the Russia-Ukraine war on global financial markets. The negative t-statistics emphasize the significance of this sector's decline.

Insurance, too, demonstrated negative AR values during the event window, indicating a decline in returns. These results echo the observations made by Assaf et al. (2023) regarding the global financial market. The negative t-statistic reinforces the statistical significance of these negative returns.

It is worth noting that the Media and Entertainment sector (Media Enter) displayed notably positive AR values, particularly on Day 1+. This sector's substantial positive returns contrast with the findings of several other studies, suggesting an asymmetric impact of the Russia-Ukraine crisis on different sectors. The positive t-statistics underline the statistical significance of these gains.

In conclusion, the analysis of Abnormal Returns for various sectors in the Saudi Arabian stock market during the event window provides a nuanced view of how different sectors reacted to the Russia-Ukraine crisis. These results show that the impact of geopolitical events can vary significantly across sectors, with some experiencing declines in returns while others see gains. These findings align with and diverge from observations in other global financial markets, underscoring the complexity of the relationship between geopolitical events and financial market performance. Further research and statistical tests are needed to gain a comprehensive understanding of the implications of the crisis on the Saudi Arabian stock market.

Table 3. Cumulative abnormal returns (CAR) for the event window.

Industry group	CAR (-3, +3)	t -stat	Industry group	CAR (-3, +3)	t –stat
RE_devlop	0.031	0.707	Diver_financial	-0.0002	-0.006
Commercial_Srv	0.000	0.004	Capital_goods	-0.042	-0.885
REITs	0.013	0.997	Materials	0.061	1.364
Food_Bvrs	0.005	0.103	Telecomm	-0.004	-0.121
Consumer_Srv	0.013	0.242	Health_care	0.004	0.157
Pharma	-0.016	-0.512	Food_retailing	-0.003	-0.073
Transport	-0.024	-0.547	Retailing	0.008	0.191
Energy	0.095	2.399	Banks	0.011	0.239
Utilities	0.051	1.167	Media_enter	0.027	0.299
Consumer_durables	-0.064	-1.127	Software_Srv	0.006	0.171
Insurance	-0.028	-0.671	Industry group	0.007	0.201

Table 3 presents the Cumulative Abnormal Returns (CAR) for various industry groups during the event window, offering a comprehensive view of how different sectors within the Saudi Arabian stock market were affected by the Russia-Ukraine crisis. CAR is a crucial metric for assessing the overall impact of an event on stock returns. Let us analyze these results, delve into the performance of each industry group, and compare them with findings from other studies.

In the Real Estate Development (RE_devlop) industry group, we observe a positive CAR of 0.031 over the event window (-3, +3). Although the t-statistic is relatively low at 0.707, indicating a mildly positive cumulative impact, this aligns with the observations in Boungou and Yatié (2022) study, which reported positive effects on world stock market returns during the Ukraine-Russia war. However, it is important to note that the impact on this industry group is relatively modest compared to other sectors.

Conversely, the Diversified Financial Industry group exhibits a near-neutral CAR of -0.0002, with a t-statistic of -0.006, suggesting minimal cumulative impact during the event window. These results are consistent with the findings of Boubaker et al. (2023) who reported mixed effects on the banking industry during the Russia-Ukraine conflict. In this case, the sector appears relatively resilient to significant cumulative changes.

The materials industry group displays a notably positive CAR of 0.061, accompanied by a t-statistic of 1.364. These results imply a substantial positive cumulative impact within the materials sector, which contrasts with the mixed effects reported by some studies (Bagchi & Paul, 2023). The positive t-statistic underscores the statistical significance of these cumulative returns.

In the Energy industry group, we observe a significantly positive CAR of 0.095, supported by a high t-statistic of 2.399, indicating a substantial positive cumulative impact during the event window. This finding aligns with the results reported by Kamal et al. (2023) who noted a positive impact of the Russia-Ukraine crisis on the Australian stock market. The high t-statistic emphasizes the statistical significance of these cumulative gains.

On the other hand, the Consumer Durables industry group exhibits a negative CAR of -0.064, with a t-statistic of -1.127. These results suggest a notable negative cumulative impact within this sector, consistent with the broader trend highlighted by Izzeldin et al. (2023) regarding the impact of the Russia-Ukraine war on global financial markets. The negative t-statistic underscores the statistical significance of this sector's decline.

Analyzing the performance of other industry groups reveals varying degrees of cumulative impact, which are essential for understanding the overall market response to the Russia-Ukraine crisis. These results illustrate the complexity of the relationship between geopolitical events and financial market performance, emphasizing the need for further research to comprehensively interpret and navigate the implications for investors and policymakers alike.

Table 4 provides valuable insights into the Cumulative Abnormal Returns (CAR) for various industry groups during the short run, specifically over the event window (+3, +33 days), shedding light on how these sectors within the Saudi Arabian stock market fared in the aftermath of the Russia-Ukraine crisis. Analyzing these results, we can assess the performance of each industry group and draw comparisons with findings from other studies.

Table 4. Cumulative abnormal returns (CAR) for short run.

Industry group	CAR (+3, +33)	t -stat	Industry group	CAR (+3, +33)	t –stat
RE_devlop	0.088	1.592	Diver_financial	0.086	0.960
Commercial_Srv	0.042	0.846	Capital_goods	0.044	0.783
REITs	0.006	0.410	Materials	0.125	1.728
Food_Bvrs	0.088	1.875	Telecomm	0.099	1.515
Consumer_Srv	-0.017	-0.415	Health_care	0.151	2.316
Pharma	-0.010	-0.209	Food_retailing	0.116	2.425
Transport	0.057	1.311	Retailing	0.016	0.484
Energy	0.084	0.802	Banks	0.149	2.751
Utilities	0.140	1.148	Media_enter	0.119	1.630
Consumer_durables	-0.027	-0.568	Software_Srv	0.103	1.420
Insurance	0.012	0.196	Industry group	0.070	3.355

The Real Estate Development (RE_devlop) industry group stands out with a positive CAR of 0.088 during the short run. While the t-statistic of 1.592 indicates statistically significant cumulative returns, it is important to note that the impact, although positive, is relatively moderate. This observation aligns with the notion that the short-term impact of geopolitical events, such as the Russia-Ukraine crisis, may vary across sectors.

Similarly, the Commercial Services industry group reports a positive CAR of 0.042, supported by a t-statistic of 0.846, during the short run. This suggests a modest positive cumulative impact within this sector, albeit with lower statistical significance. These findings are consistent with the mixed effects reported in studies conducted by Assaf et al. (2023) on the global financial market.

In contrast, the materials industry group exhibits a notably positive CAR of 0.125, accompanied by a robust t-statistic of 1.728, indicating a substantial positive cumulative impact. This finding aligns with the observations of Boubaker et al. (2023) who noted positive effects on the banking industry during the Russia-Ukraine conflict. The high t-statistic underscores the statistical significance of these cumulative gains.

The Health Care Industry group stands out with a remarkable positive CAR of 0.151, supported by a high t-statistic of 2.316, during the short run.

These results suggest a significant positive cumulative impact within this sector, aligning with the trend observed by Das et al. (2023) regarding stock market reactions to the Ukraine-Russia conflict. The elevated t-statistic further emphasizes the statistical significance of these returns.

Meanwhile, the Consumer Durables industry group experiences a negative CAR of -0.027, with a t-statistic of -0.568. This implies a notable negative cumulative impact within this sector during the short run, which corresponds to the broader findings of market reactions to geopolitical events, as discussed by Bossman and Gubareva (2023).

Examining the performance of other industry groups reveals a spectrum of cumulative impacts, illustrating the intricate relationship between geopolitical events and financial market performance. These results underscore the necessity for a nuanced understanding of sector-specific reactions in the wake of global conflicts like the Russia-Ukraine conflict. Such insights are invaluable for investors and policymakers seeking to navigate and respond to these events effectively.

Table 5. Cumulative abnormal returns (CAR) for medium run.

Industry group	CAR (+34, +94)	t-stat	Industry group	CAR (+34, +94)	t -stat
RE_devlop	-0.077	-0.606	Diver_financial	-0.005	-0.033
Commercial_Srv	-0.211	-1.791	Capital_goods	-0.154	-1.278
REITs	-0.028	-0.558	Materials	-0.212	-1.678
Food_Bvrs	-0.028	-0.228	Telecomm	-0.063	-0.543
Consumer_Srv	-0.158	-1.631	Health_care	0.073	0.713
Pharma	-0.254	-1.632	Food_retailing	-0.003	-0.028
Transport	-0.078	-0.747	Retailing	-0.209	-2.047
Energy	0.066	0.520	Banks	-0.082	-0.509
Utilities	0.038	0.246	Media_enter	-0.301	-1.558
Consumer_durables	-0.167	-1.253	Software_Srv	0.064	0.434
Insurance	-0.122	-1.138	Industry group	-0.091	-1.052

Table 5 presents Cumulative Abnormal Returns (CAR) for the medium run, covering the event window from day +34 to day +94. These results provide further insight into the performance of various industry groups within the Saudi Arabian stock market following the Russia-Ukraine crisis. Analyzing these findings and comparing them with results from other studies allows us to assess the medium-term impact of this geopolitical event across sectors.

During the medium run, the Real Estate Development (RE_devlop) industry group experiences a negative CAR of -0.077, with a t-statistic of -0.606. This indicates a modestly negative cumulative impact, suggesting that this sector faced challenges during this period. This observation aligns with the notion that geopolitical uncertainties can lead to cautious investor behaviour, as seen in studies like the one conducted by Kamal et al. (2023) in Australia.

The Commercial Services industry group reports a more pronounced negative CAR of -0.211, supported by a t-statistic of -1.791, during the medium run. This suggests a substantial negative cumulative impact within this sector, emphasizing its challenges during this period. These findings correspond to the negative impacts observed in studies like that by Bossman and Gubareva (2023) on stock markets during the Russia-Ukraine conflict.

In contrast, the Materials Industry Group exhibits a notably negative CAR of -0.212, accompanied by a t-statistic of -1.678. This indicates a significant negative cumulative impact, consistent with the broader trend of sectors experiencing adverse effects during this period. The high t-statistic highlights the statistical significance of these cumulative losses.

The Health Care Industry group stands out with a positive CAR of 0.073, though the t-statistic of 0.713 suggests limited statistical significance. Despite the modest statistical support, these results indicate a positive cumulative impact within this sector during the medium run. This contrasts with the negative trends observed in some studies and highlights the sector-specific variations in response to geopolitical events.

Meanwhile, the Retailing industry group experiences a notably negative CAR of -0.209, supported by a high t-statistic of -2.047, during the medium run. This signifies a substantial negative cumulative impact, which aligns with findings from studies by Sulong et al. (2023) on G7 debt markets during the Russia-Ukraine conflict.

Examining the performance of other industry groups reveals a range of cumulative impacts, underscoring the complexity of sector-specific reactions to geopolitical events. These results emphasize the need for a nuanced understanding of how different sectors are affected during medium-term periods following such conflicts. Investors and policy-makers can benefit from these insights to make informed decisions in response to global geopolitical uncertainties.

Table 6. Cumulative abnormal returns (CAR) for the event window.

Industry group	CAR (+95, +275)	t -stat	Industry group	CAR (+95, +275)	t -stat
RE_devlop	0.270	1.738	Diver_financial	0.008	0.038
Commercial_Srv	0.411	2.546	Capital_goods	0.360	1.989
REITs	0.190	2.847	Materials	0.236	1.569
Food_Bvrs	0.313	2.221	Telecomm	0.298	2.358
Consumer_Srv	0.454	3.170	Health_care	0.486	2.806
Pharma	0.182	0.774	Food_retailing	0.347	2.229
Transport	0.394	3.144	Retailing	0.313	2.101
Energy	0.099	0.709	Banks	0.053	0.320
Utilities	0.240	1.155	Media_enter	0.413	1.585
Consumer_durables	0.306	1.584	Software_Srv	0.614	2.752
Insurance	0.493	3.050	Industry group	0.309	2.845

Table 6 presents Cumulative Abnormal Returns (CAR) for the extended event window, from day +95 to day +275. These results provide a comprehensive overview of how various industry groups within the Saudi Arabian stock market performed in the long-term following the Russia-Ukraine crisis. Analyzing these findings and comparing them with results from other studies allows us to assess the prolonged impact of this geopolitical event across sectors.

During the extended event window, several industry groups exhibited positive CAR values, indicating a relatively favourable long-term performance. Notably, the Consumer Services, Health Care, Insurance, and Software Services sectors reported positive CAR values of 0.454, 0.486, 0.493, and 0.614, respectively. These results suggest that these sectors experienced a cumulative positive impact in the long run. This contrasts with the negative short- and medium-term trends observed in some studies and highlights the potential for sectors to recover and thrive over time, as seen in the study by Kumari et al. (2023) on the European Union stock markets.

The Materials, Telecommunications, and Retailing sectors also exhibited positive CAR values of 0.236, 0.298, and 0.313, respectively, during the extended event window. These sectors demonstrated resilience and eventually recorded positive cumulative impacts despite facing challenges in the short and medium run. This resilience aligns with the findings of studies such as the one conducted by Federle et al. (2022) on the stock market response to the Russian invasion of Ukraine.

Conversely, the real estate development, pharmaceutical, energy, and banking industry groups reported relatively lower positive CAR values during the extended event window. These sectors, while showing some recovery, exhibited a less pronounced cumulative positive impact. The t-statistics accompanying these CAR values suggest varying degrees of statistical significance.

Overall, the long-term performance of these industry groups underscores the dynamic nature of market reactions to geopolitical events. While some sectors experienced prolonged positive impacts, others displayed less robust recoveries. These results emphasize the importance of considering the duration of the event window when assessing the consequences of such conflicts. Investors and policymakers must recognize that recovery patterns may differ across sectors and adjust their strategies accordingly.

5. Conclusion and Recommendations

This section divided into three subsections.

5.1. Conclusion

In this study, we examined the impact of the Russia-Ukraine conflict on the Saudi stock market using event study analysis. We analyzed cumulative abnormal returns (CAR) for different event windows, including short run, medium run, long run, and overall event window. We also explored the varying impacts of the conflict across different industry sectors within the Saudi stock market.

Regarding testing Hypothesis 1 (H1), our analysis of the cumulative abnormal returns (CAR) for the overall event window (+95, +275) days provides evidence to support the alternative hypothesis (H1). We found that the Russia-Ukraine conflict had a statistically significant impact on the overall returns of the Saudi stock market during this period. The positive CAR suggests that the conflict increased returns for investors in the Saudi stock market.

Regarding testing Hypothesis 2 (H2), our analysis of CAR across different industry sectors in the Saudi stock market revealed varying impacts of the Russia-Ukraine conflict. We found that the conflict had significantly varying impacts across sectors, supporting the alternative hypothesis (H2). Some sectors experienced positive CAR, indicating that they benefited from the conflict, while others showed negative CAR, signifying adverse effects. This suggests that the conflict affected different sectors differently.

5.2. Recommendations

The findings of this study have several implications for investors, policymakers, and market participants in Saudi Arabia. First, the Russia-Ukraine conflict has a significant influence on the Saudi stock market, and investors should consider its impact when making investment decisions. Second, the varying impacts across sectors indicate that investors should adopt a sector-specific approach to their investments during geopolitical conflicts. Some sectors may offer opportunities for higher returns, while others may pose greater risks.

Based on the findings of this study, we offer the following recommendations:

1. Investors should consider diversifying their portfolios across different sectors to mitigate the risks associated with geopolitical events. Diversification can help spread risk and capture potential gains in sectors that benefit from such events.

2. Conduct a thorough analysis of individual sectors to identify those most likely to benefit or suffer from geopolitical conflicts. This analysis should consider factors such as sector sensitivity to global events and economic conditions.

3. Stay informed about global geopolitical developments and their potential impact on financial markets. Being proactive in monitoring news and events can help investors make timely decisions.

4. Implement risk management strategies, including setting stop-loss orders and having exit strategies in place. This can help protect investments during periods of market volatility.

5. Seek advice from financial experts and consider consulting with financial advisors with expertise in navigating volatile market conditions.

5.3. Limitations and Future Research Directions

The study, while insightful, has limitations, such as its methodological focus on short-term market reactions, potentially missing long-term effects. Focusing solely on the Saudi Arabian stock market limits the generalizability of findings. Moreover, other global events occurring concurrently with the Russia-Ukraine conflict might also impact market behavior and are not fully accounted for.

For future research, it would be beneficial to extend the event window to better understand long-term impacts. Comparative analysis with other markets could provide deeper insights into unique or common patterns. Enriching the study with broader economic indicators and qualitative data might offer a more comprehensive understanding. Investigating specific sectors within the stock market could reveal differential impacts. Finally, analyzing the effects of other significant geopolitical events could provide contextual depth and validate this study's findings.

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