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Research Article

The impact of the U.S.-Israel-Iran war on BIST transportation and defense stocks: An event study approach

ABD-İsrail-İran savaşının BİST ulaştırma ve savunma hisseleri üzerindeki etkisi: Olay çalışması yaklaşımı

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Abstract

On February 28, 2026, with U.S. involvement in the Israel-Iran tensions, the process took on a broader geopolitical character as the U.S.-Israel-Iran war. Such geopolitical developments may increase uncertainty in financial markets and generate sector-specific effects on stock returns. In this study, the short-term pricing behavior of the shares of transportation and defense companies traded on Borsa Istanbul around the first trading day, accepted as the beginning of the war, is examined using the event study methodology. For this purpose, using the daily closing prices of the relevant stocks, average abnormal returns (AAR) around the event day and cumulative average abnormal returns (CAAR) across different event windows were calculated, and their statistical significance was analyzed. The AAR findings for transportation stocks indicate that positive effects were observed on some days before the event date, while negative effects were observed on others. The strong negative effect on the event date shifted to positive pricing, reflecting rebound buying on the first trading day following the event. The CAAR findings reveal that although daily effects varied in direction, the negative effect on transportation stocks accumulated within asymmetric windows spanning the event date and preceding days. In defense stocks, while positive pricing behavior stood out on the event date and the day before it, negative effects were also observed on some days before and after the event date. The cumulative results indicate that the positive effect accumulated particularly in asymmetric windows covering the event date and the preceding days, as well as in narrow symmetric windows close to the event. The overall picture shows that the same geopolitical shock generated short-term negative pricing in transportation stocks through the cost channel and short-term positive pricing in defense stocks through defense and security spending expectations, but that the post-event effect weakened in both groups.

Keywords: U.S.-Israel-Iran War, Borsa Istanbul, Event Study

JEL Codes: F51, G14, G15

Öz

28 Şubat 2026'da ABD'nin İsrail-İran gerilimine dâhil olmasıyla süreç, ABD-İsrail-İran savaşı olarak daha geniş bir jeopolitik nitelik kazanmıştır. Bu tür jeopolitik gelişmeler, finansal piyasalarda belirsizliği artırarak hisse senedi getirileri üzerinde sektörlere göre farklılaşan etkiler ortaya çıkarabilmektedir. Bu çalışmada, Borsa İstanbul'da işlem gören ulaştırma şirketleri ile savunma sanayii şirketleri hisselerinin, savaşın başladığı gün olarak kabul edilen ilk işlem günü etrafındaki kısa vadeli fiyatlama davranışları olay çalışması metodolojisiyle incelenmiştir. Bu amaçla, ilgili hisse senetlerinin günlük kapanış fiyatları kullanılarak olay günü etrafındaki ortalama anormal getiriler (AAR) ile farklı olay pencerelerindeki kümülatif ortalama anormal getiriler (CAAR) hesaplanmış; istatistiksel anlamlılıkları analiz edilmiştir. Ulaştırma hisselerine ilişkin AAR bulguları, olay tarihinden önceki bazı günlerde pozitif, bazı günlerde ise negatif etkilerin görüldüğünü ortaya koymaktadır. Olay tarihindeki güçlü negatif etki, izleyen ilk işlem gününde tepki alımını yansıtan pozitif fiyatlamaya dönüşmüştür. CAAR bulguları ise günlük etkiler farklı yönlerde olsa da ulaştırma hisselerindeki negatif etkinin olay tarihi ve öncesini kapsayan asimetrik pencerelerde biriktiğini göstermektedir. Savunma hisselerinde ise, olay tarihi ve öncesindeki gün pozitif fiyatlama davranışı öne çıkarken, olay tarihi öncesindeki ve sonrasındaki bazı günlerde negatif etkiler de görülmüştür. Kümülatif sonuçlar ise pozitif etkinin özellikle olay tarihi ve öncesini kapsayan asimetrik pencereler ile olaya yakın dar simetrik pencerelerde biriktiğini göstermektedir. Genel görünüm, aynı jeopolitik şokun ulaştırma hisselerinde maliyet kanalıyla kısa vadeli olumsuz, savunma hisselerinde ise savunma ve güvenlik harcaması beklentileriyle kısa vadeli olumlu fiyatlama yarattığını, ancak her iki grupta da olay sonrası etkinin zayıfladığını göstermektedir.

Anahtar Kelimeler: ABD-İsrail-İran Savaşı, Borsa İstanbul, Olay Çalışması

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Introduction

Geopolitical events, particularly wars, military conflicts, and regional tensions, are critical dynamics that transcend national borders and affect global relations, economies, and industries. Such developments, which increase uncertainty in financial markets, are especially influential on investor behavior. As various studies have also shown, market volatility increases, and asset prices are affected during this process. These effects are observed not only in the countries at the center of the event but also in global financial markets (Nguyen & Phan, 2025, p. 3; Fan, 2026, p. 114). From a financial-theory perspective, the impact of geopolitical developments on financial markets is primarily explained by the Efficient Market Hypothesis developed by Fama (1970) and the Behavioral Finance approach based on the studies of Kahneman and Tversky (1979). According to the Efficient Market Hypothesis, newly disclosed information is rapidly reflected in prices by investors, and unexpected geopolitical developments may cause abnormal changes in stock prices. In contrast, the Behavioral Finance approach argues that, during periods of uncertainty, changes in investors' risk perceptions, loss aversion, and the search for safe-haven assets may influence investment decisions and cause market reactions to deviate from rational expectations. This may lead investors to rebalance their portfolios, withdraw from risky assets, or shift toward sectors with defensive characteristics during periods of geopolitical uncertainty. Therefore, the impact of geopolitical shocks on financial markets is shaped not only by the reflection of new information in prices but also by investors' behavioral responses to uncertainty. In this context, it is noted that the impact of geopolitical events on financial markets may be short-term or persistent, depending on the nature of the event (Klement, 2021).

The tension between Iran and Israel is not limited solely to short-term military developments. This tension, shaped within the framework of Iran's nuclear program, military capacity, and the perceived threat it poses to Israel and regional security, is considered the outcome of a long-standing geopolitical rivalry. Accordingly, the increase in security threats between the parties over time paved the way for the escalation of regional tensions. Although a more limited conflict known as the "12-Day War" took place between Iran and Israel in 2025, the United States also became directly involved in the process in 2026 as the perceived threat regarding Iran's nuclear and military capacity increased. Thus, a large-scale rupture occurred in Middle Eastern geopolitics (Goldman Sachs, 2026, pp. 3–6). This trilateral war process began on February 28, 2026, with U.S. and Israeli airstrikes against military and strategic targets in Iran. It intensified through mutual military interventions and retaliations, increasing the severity of the conflict and deepening regional instability (Ali et al., 2026, p. 771).

The war seriously disrupted maritime traffic in the Strait of Hormuz, a critical route for global energy supply, thereby increasing uncertainty in energy markets. Approximately 20% of global oil and liquefied natural gas flows came under risk, and it is reported that daily oil exports from the region decreased by at least 60% compared to the pre-war period (Reuters, 2026). In addition, while the 21% decline in regional oil production deepened the supply shock, Brent oil prices also rose significantly. The Brent oil price averaged USD 103 per barrel in March 2026, USD 32 above the February average. These early-war findings show that the attacks on Kharg Island, which represents approximately 90% of Iran's oil export capacity, were a determining factor in rising supply-side pressure (Shah et al., 2026, pp. 1728–1729; U.S. Energy Information Administration [EIA], 2026).

Due to the interconnected structure of the global economy, this disruption in energy supply affects not only energy markets but also international transportation and trade activities (Khatawkar, 2026). Since oil prices are a major determinant of the transportation sector's cost structure, these macroeconomic effects are more pronounced in this highly energy-intensive sector. As this cost factor puts pressure on profitability, it is argued that changes in company performance will also significantly affect stock returns (Tsai & Chen, 2018, pp. 244–247; Bogeh & Bozcuk, 2021, p. 139).

On the other hand, geopolitical risks may create a different pricing dynamic for defense industry companies. During such periods, investors may turn to defense industry stocks for hedging and portfolio diversification purposes (Gheorghe & Panazan, 2024, p. 1). Therefore, these stocks may serve as a "war hedge" against general market declines during periods of geopolitical crisis. In this context, defense industry stocks are also evaluated in the literature as "war stocks" and are considered among investment instruments with the potential to generate positive abnormal returns through expectations of increased defense spending (Adnan et al., 2025, p. 223). Indeed, the increase in security priorities may shift the composition of public expenditures in favor of defense (Durucan, 2026, p. 100). Supporting this, global military expenditures increased by 41% during the 2016–2025 period. Recent increases in military expenditures in Europe are reported to have played a significant role in this global trend and to be largely associated with the Russia–Ukraine War and rising geopolitical instability. Türkiye's military expenditures reached USD 30 billion in 2025, an increase of 94% from 2016 (Liang et al., 2026). In this context, rising risks and tensions, especially in the Middle East, have contributed to increased military expenditures in Türkiye and to initiatives to strengthen domestic defense production (Reuters, 2025).

In this study, considering the determining role of the increase in energy prices in the cost structure and the different expectation channels that may arise for defense industry companies, the short-term effects of the U.S.–Israel–Iran war on transportation and defense sector stocks traded on Borsa Istanbul (BIST) are examined using the event study methodology. Within this scope, the main research question of the study is whether the U.S.–Israel–Iran war has a significant effect on the short-term abnormal returns of transportation and defense sector stocks traded on BIST and whether this effect differs across sectors. The literature indicates that the effects of geopolitical risks on financial markets may differ depending on the geographical location of the geopolitical event, the characteristics of the countries concerned, the economic structure of the sectors, and their sensitivity to geopolitical shocks (Yılmazkuday, 2024; Choi, 2024). Türkiye's proximity to the conflict zone, dependence on energy imports, and inclusion of both a developed transportation sector and a growing defense industry within the same financial market make BIST a suitable setting for examining the opposing effects of geopolitical shocks on these two sectors. Accordingly, BIST constitutes a suitable market for observing the reflections of geopolitical developments on investor expectations and stock returns. However, sectors such as energy, banking, and petrochemicals are also affected by geopolitical developments. Still, this effect is more complex and uncertain because it may emerge in different directions depending on firms' operating structures, input costs, pricing power, and financial conditions. In contrast, the negative effect of rising energy costs in the transportation sector and the positive effect of increasing defense expenditures and demand expectations in the defense sector can be observed more directly. Therefore, the study is limited to the transportation and defense sectors to compare two opposing and more distinct transmission channels of the same geopolitical shock.

Although numerous studies in the literature examine the effects of geopolitical risks on financial markets, studies that comparatively address the effects of the same geopolitical event on the transportation and defense sectors in the Turkish market are limited. Therefore, the event study methodology was preferred. The event study methodology is considered the most appropriate design for this research problem because it measures the short-term effects of a specific event on stock returns through abnormal returns and isolates these effects from other market movements. It also directly reveals investors' reactions to new information and enables comparison of the differing effects of a geopolitical shock across sectors. In this respect, the study aims to contribute to a better understanding of sector-based pricing behavior in emerging markets by comparatively examining the responses of the transportation and defense sectors to geopolitical risks in the context of the Turkish market.

Literature

The event study method is widely used in the finance literature to examine the market effects of a wide range of events, including stock splits, dividend announcements, mergers and acquisitions, index inclusion or exclusion decisions, macroeconomic announcements, financial crises, pandemics, and natural disasters. Since the event examined in this study constitutes a geopolitical risk related to war, the literature review is structured particularly around studies investigating the effects of wars, interstate tensions, regional conflicts, and geopolitical crises on financial markets.

Hudson and Urquhart (2015) examine the effects of major developments during the Second World War on the British stock market. The study used daily closing prices of the FT30 Index for 1939–1945 and analyzed 22 pre-determined war events using the event study method. It also investigated the possible causes of large price movements. In addition, the Zivot–Andrews structural break test was applied to the relevant data to identify structural changes that might have fallen outside the predetermined events. The findings revealed limited evidence of a strong relationship between war-related events and stock returns. Nevertheless, supporting evidence showed that investors reacted more strongly to negative news.

Bae et al. (2017) examined the effects of conflicts in the Middle East on oil companies' returns, based on 20 conflicts that occurred during the 1990–2013 period. In the study, the event study method was applied to data from 33 oil companies, which were classified as national or international. The conflicts were divided into three types: international, interstate, and internal conflicts. The findings reveal that conflicts generated stronger and more positive effects on national oil companies. In contrast, the effects of international and internal conflicts on international oil companies were not statistically significant. In interstate conflicts, however, the post-event cumulative abnormal returns of national companies were higher than those of international companies.

Çelik and Koç (2019) examined how the aircraft crisis between Türkiye and Russia on November 24, 2015, was reflected in the stock returns of tourism and energy companies traded on Borsa Istanbul. Accordingly, using data covering the June 2015–February 2016 period for 7 tourism and 7 energy companies traded on BIST, abnormal and cumulative abnormal returns were calculated across different event windows through the event study method. According to the study's general evaluation, no statistically significant results were identified in the analyzed day intervals for the energy sector. In the tourism sector, however, positive cumulative abnormal returns were observed after the event, particularly in the (-5, +5) event window; yet this effect did not persist across other event windows.

Buigut and Kapar (2020) examined the impact of the diplomatic and economic blockade imposed on Qatar on the stock markets of Gulf Cooperation Council (GCC) countries using the event study method. Within this scope, seven stock exchange indices operating in the six member countries, the sector indices of these exchanges, and the S&P GCC Composite Index for the period from May 12, 2016, to July 24, 2017, were included in the analysis. The findings from calculating abnormal and cumulative abnormal returns across different event windows show that the crisis had pronounced negative effects, particularly on the Qatar stock exchange in the short term; however, this effect weakened over time, and the market partially recovered. In addition, it was determined that the consumer goods and services, real estate, and transportation sectors in Qatar exhibited the strongest negative reactions, whereas the banking and financial services sector was not significantly affected by the crisis. On the other hand, positive abnormal returns were observed in some sectors of the main blockading countries, including banking in Saudi Arabia, real estate in Dubai, and energy in Abu Dhabi.

Güneysu (2022) examined the effects of the Russia–Ukraine war on food and beverage sector stocks in Türkiye using companies listed on the BIST Food and Beverage Index for which complete data were available. In the study, which applied the event study method to data from 25 companies, February 24, 2022, was taken as the event date, and the event window was set to the (-20, +20) day interval. As a result of the analysis, it was found that the average abnormal return obtained on the event day was not statistically significant, but significant average abnormal returns emerged on some days before and after the event. In addition, the observation of negative and significant cumulative average abnormal returns in the (0, +5) and (0, +15) event windows indicates that the war had a negative short-term effect on the sector.

In the study by Yousaf et al. (2022), the effects of the Russia–Ukraine war on global stock markets were examined using an event study, focusing on the G20 countries and selected other economies. Using daily returns for stock indices from 26 countries, abnormal returns, cumulative abnormal returns, and cumulative average abnormal returns were calculated within a (-5, +5) event window. The findings show that the outbreak of the war generated significant and negative effects in most country stock markets, with this effect being much stronger, particularly in the Russian market. Country-level analyses indicate that some markets, including Hungary, Poland, Slovakia, and Russia, reacted negatively even before the event due to expectations regarding the war. In contrast, many other markets were found to have been adversely affected, particularly in the post-event period. In addition, regional analyses show that European and Asian markets were significantly and negatively affected by this geopolitical shock.

Konak et al. (2024), who examined the impact of the Hamas–Israel war that began in 2023 on financial markets, analyzed this effect through the stock returns of companies included in the BIST 100 Index. Within this scope, the first trading day was treated as the event day for the war that began on October 7, 2023, and the market reactions of the firms in the index were examined using the event study method. In the study, daily average abnormal returns were evaluated over the (-20, +20) day interval. In addition, cumulative average abnormal returns were also calculated for different event windows. The findings showed that although the positive average abnormal return on the event day was not statistically significant, significant market reactions emerged on some days before and after the event. Moreover, the presence of both positive and negative significant cumulative average abnormal returns across different event windows indicates that the war generated short-term market reactions among BIST 100 companies.

In the study conducted by Abedin et al. (2024), the impact of Iran's drone and missile attack on Israel on April 13, 2024, on the stock returns of global energy companies was analyzed. Within this scope, data from the 10 global energy companies with the highest market capitalization were used, and the first trading day following the event was accepted as the event day. The study examined abnormal returns over the 10 days before and after the event and found that energy stocks generally experienced negative abnormal returns on the event day. British Petroleum recorded the highest negative abnormal return, while PetroChina differed from the other energy companies by generating a positive abnormal return.

In addition, the observation of heterogeneous performance among energy companies in the pre- and post-event periods revealed that the uncertainty arising from the long-standing tension between Israel and Iran was reflected in financial and energy markets.

Pandey (2025), in his study, addressed the Israel–Iran conflict within the scope of Iran's drone and missile attacks on Israel. The effects of this event on global stock markets and exchange rate parities were examined using an event study. In the study, data from 73 stock indices and 34 exchange rate parities for the U.S. dollar, euro, pound sterling, and Japanese yen were analyzed within the (-5, +5) event window. The findings revealed that the conflict generally generated adverse effects on global stock markets. In addition, the emergence of positive abnormal returns in U.S. dollar-based exchange rates indicated that investors sought the dollar as a safe haven. However, the impact of the conflict varied by market type, with "frontier" and "standalone" markets experiencing the strongest adverse effects. From a regional perspective, more pronounced reactions were identified in Pan-American markets.

K et al. (2025), who examined the impact of the Red Sea crisis on sustainable economy-oriented stocks, analyzed this event through the S&P BSE Carbonex Index in India. In the study, the event date of October 19, 2023, was taken as the basis, and the relevant index data were used for the 20-day pre-event and 15-day post-event periods. The calculations and significance tests conducted using the event study method showed that, although abnormal returns changed in the post-event period, there was no statistically significant difference between pre-event and post-event average abnormal returns. Accordingly, it was concluded that the Red Sea crisis did not have a significant effect on the S&P BSE Carbonex Index. This finding was stated to indicate that sustainable economy-based stocks may be relatively more resilient to geopolitical shocks.

Adnan et al. (2025) examined the heterogeneous effects of the Russia–Ukraine War on 370 global defense and aerospace firms using the event study method. The study used cross-sectional analyses to test whether abnormal returns differed according to the geopolitical position of firms' home countries, G7 membership, level of economic development, and defense budget. The findings show that positive abnormal returns emerged across the sector; however, this effect differed markedly according to firms' country-level characteristics. While firms located in developed countries, G7 member countries, and countries with high defense budgets generated strong positive abnormal returns, losses were observed among firms in other country groups. In addition, the positive pricing of proximity to the conflict zone for the defense sector was captured by the concept of a "proximity premium."

Covachev and Fazakas (2025) analyzed the reactions of the stocks of 30 firms in the European defense sector to both the Russia–Ukraine War and the Wagner Group's coup attempt using the event-study method. In the study, expected returns were estimated using the CAPM, the four-factor model, and the six-factor model. The findings showed positive cumulative average abnormal returns of up to 12% in European defense stocks in the days following the war. They also revealed notable expectation-based pricing before the war. In contrast, following the Wagner Group's coup attempt on June 23, 2023, an average negative effect of approximately 1% was observed on defense stocks on the first trading day. In line with these findings, the study states that defense sector stocks serve as a "barometer" of changes in regional tensions.

Korkmaz et al. (2025) analyzed the short-term effects of the event, frequently referred to in the literature as the Israel–Hamas war, on the stock market indices of Türkiye and 12 Middle Eastern countries. Within this scope, the closing prices of indices belonging to Palestine, Israel, Egypt, Qatar, the United Arab Emirates, Saudi Arabia, Kuwait, Jordan, Oman, Bahrain, Lebanon, and Türkiye were used, and the event study method was applied. The findings showed that daily abnormal returns remained statistically weak, whereas cumulative abnormal returns were positive and significant. This indicated that the market reaction was reflected gradually in prices rather than as an immediate shock. In addition, the study found that Türkiye, Lebanon, Egypt, and the United Arab Emirates were relatively more sensitive to the event, while the market reaction remained limited in Kuwait and Oman.

In a study by Marobhe et al. (2025), the impact of geopolitical events arising during the Israel–Hamas conflict on the stock returns of maritime transportation companies was analyzed using the event-study method. The study examined 32 international maritime transportation companies operating in the container, tanker, and dry bulk shipping subsectors. Within this scope, seven different events were considered. Expected returns were estimated using the Fama–French three-factor model. Abnormal returns were calculated for each event, and the reactions of companies within the event windows were also evaluated through cumulative abnormal returns. The findings show that maritime transportation companies generally reacted negatively to conflict-related news, with stronger effects among container and tanker shipping companies. On the other hand, the dry bulk shipping subsector was found to have been relatively less affected by the conflict. In addition, the limited market reaction to positive developments, such as ceasefires, suggests that negative news had a stronger effect.

In his study, Naji (2025) examines the impact of the short-term war between Iran and Israel, referred to as the "12-Day War," on the return and volatility dynamics of the Iraq Stock Exchange. Within this scope, daily data from the ISX60 Index, Brent oil prices, and the IQD/USD exchange rate series were used. In the study, abnormal returns and cumulative abnormal returns were calculated using the event study method, while changes in market volatility were analyzed through ARCH/GARCH models. Negative, significant cumulative abnormal returns emerged in the medium-term event window. However, the findings show that the most pronounced effect occurred through the volatility channel rather than through price direction. In particular, the 377.5% increase in volatility during the war period indicates that the geopolitical shock strongly increased market uncertainty.

In his study, Saad (2025) comparatively analyzes the effects of the Israel–Hamas war on selected international and regional stock markets. Return and volatility dynamics were examined through autoregressive conditional heteroskedasticity models, while abnormal returns around the event days were analyzed using the event study method. The robustness of the results was assessed using quantile regression. The findings show that the war had significant effects on the returns and volatility structures of the selected markets. According to the cumulative abnormal return results, notable declines were identified, particularly in the (+2, +11) event window. Nevertheless, positive reactions were observed in many stock markets in the post-war period. The quantile regression results indicate that international stock markets did not show a strong reaction to the war, whereas regional markets exhibited significant, positive effects.

Wahyono et al. (2025), who examined the effects of the Israel–Hamas war on stock markets in the MENA region, used daily data from 13 stock market indices belonging to Bahrain, Egypt, Israel, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, the United Arab Emirates, Morocco, and Tunisia. Using the event study method, the study evaluated cumulative abnormal returns separately across windows covering the event day, the pre-event period, the post-event period, and the period extending from before to after the event. The findings show that the war led to significant negative reactions in stock markets across the region, with the effect more pronounced in countries with lower oil reserves. In addition, a separate event study of government bonds was conducted to evaluate investors' safe-haven tendency, and it was found that investors turned to such assets in an environment of increasing uncertainty.

In the study by Osei-Bonsu et al. (2026), the effects of two distinct Iran-related geopolitical shocks on the stocks of five major international oil companies and on Brent and WTI crude oil prices are compared. These two events are the 12-Day War in June 2025 and the U.S.–Israel–Iran war that began in February 2026, respectively. For both events, the event study method was applied to measure abnormal returns, while the EGARCH model was used to analyze volatility effects in Brent and WTI prices. The findings show that both events elicited similar market reactions among the selected companies in the first few days. However, from the fifth day onward, this reaction clearly began to diverge. In particular, while the U.S.–Israel–Iran war generated persistent, high cumulative average abnormal returns in stocks, the effect of the 12-Day War reverted to the mean within a short period. Similarly, WTI volatility was found to increase with a delay compared to Brent, but more strongly.

The literature generally shows that geopolitical conflicts generate short-term effects in financial markets that are heterogeneous in terms of their direction and magnitude. A considerable proportion of studies examining global and regional stock markets have identified negative abnormal returns and increased market uncertainty (Yousaf et al., 2022; Pandey, 2025; Wahyono et al., 2025). However, these effects do not emerge in the same manner across all events and markets. While Hudson and Urquhart (2015) identified a limited relationship between war-related events and returns, Çelik and Koç (2019) found no significant effect in the energy sector, and K et al. (2025) found no significant effect on stocks focused on the sustainable economy. In some studies, the reaction on the event day remained insignificant, but the effect became evident on subsequent days or in cumulative returns. This indicates that the market response may occur in a delayed or gradual manner (Güneysu, 2022; Konak et al., 2024; Korkmaz et al., 2025). The findings also differ across sectors. While transportation and maritime shipping companies generally react negatively to conflicts (Buigut & Kapar, 2020; Marobhe et al., 2025), positive abnormal returns associated with expectations of increased defense expenditures have been observed among defense companies (Adnan et al., 2025; Covachev & Fazakas, 2025). In contrast, the negative reaction of defense stocks to the Wagner Group's attempted coup indicates that this sector is sensitive not only to the existence of conflict but also to expectations regarding the future course of tensions and defense expenditures (Covachev & Fazakas, 2025). Similarly, differing responses among companies within the same sector, depending on conflict type, country characteristics, and geographical location, demonstrate that geopolitical effects are not homogeneous even within sectors (Bae et al., 2017; Abedin et al., 2024; Adnan et al., 2025). Moreover, the impact of geopolitical risk is not limited to stock returns but also occurs through different channels, such as increased volatility and shifts toward safe-haven assets (Naji, 2025; Pandey, 2025; Saad, 2025; Wahyono et al., 2025).

Therefore, the differing and occasionally contradictory findings in the literature may be associated with the characteristics of the country and sector examined, the scope and intensity of the conflict, the length of the event window, the model used to estimate expected returns, and whether the analysis focuses on returns or volatility. Nevertheless, most existing studies examine general market indices or a single sector. Comparative evidence on the pricing behavior generated by the same geopolitical shock in sectors expected to be affected in opposite directions through different economic transmission mechanisms remains limited. Osei-Bonsu et al. (2026), who examined the U.S.–Israel–Iran War, focused on international oil companies and Brent and WTI prices and did not assess the repercussions of the war across different sectors in an emerging stock market. Therefore, no study has been identified that compares, within the same analytical framework, the effects of the current U.S.–Israel–Iran War on transportation and defense companies traded on Borsa Istanbul. By jointly examining the energy and cost channel in the transportation sector and the defense expenditure and demand expectations channel in the defense sector, this study aims to fill this gap. It also aims to determine whether the same geopolitical shock generates different or even opposing pricing behavior across sectors in an emerging market.

Methodology

Data and sample

Within the scope of the research, the stocks of 12 transportation companies and 8 defense industry companies traded on Borsa Istanbul were included in the analysis. Although the transportation companies are classified under the transportation and storage sector on the Public Disclosure Platform (KAP), they consist of the companies included in the BIST Transportation Index as of the event date. Defense industry companies were not limited to the existing four companies directly classified under the defense category in the KAP sector classification. The companies' activity disclosures on KAP, annual reports, official websites, and the records of the Presidency of Defense Industries (SSB) and other authorized institutions were also examined. An indirect relationship with the defense sector was not considered sufficient for inclusion in the sample; the development of products, systems, technologies, or services for the defense industry or direct involvement in defense projects was adopted as the main criterion. Katmerciler was among the companies with commitments to the SSB and served as a solution partner in SSB-coordinated unmanned ground vehicle projects (SSB, 2021). Its KAP records also list the manufacture of all types of vehicle-mounted equipment and armored vehicles for the defense industry as its actual field of activity. It was found that Otokar's armored and tactical land vehicles were included in the SSB Defense Industry Product Catalog, that the company received the defense industry export leadership award in the land vehicles product group, and that it was among the registered vendors of the United Nations Secretariat (Otokar, 2025; SSB, 2026; UN, 2015). In addition, the Defense and Aerospace Industry Manufacturers Association (SASAD) lists Papilon Savunma among its official members (Papilon Savunma, 2019). Regarding Pasifik Teknoloji, its subsidiary, TİTRA Teknoloji A.Ş., signed the "Rotary-Wing Cargo UAV Project" agreement with the SSB, covering the supply of various numbers of uncrewed helicopters. The company's annual reports also listed the development and production of unmanned aerial systems for the defense industry, particularly the ALPİN uncrewed helicopter, among its activities (KAP, 2024; Pasifik Teknoloji, 2024). Following official verification that these companies also met the relevant criteria, they were included in the sample, increasing the defense industry sample to eight companies.

In the analyses, the daily closing prices of the companies' stocks were used for the period from April 8, 2025, to March 16, 2026. The daily closing prices of the BIST 100 Index for the same period were also included in the analysis to represent the market portfolio. The data in question were obtained using the Investing data provider. Since the study is based solely on publicly available secondary data and does not involve human participants, ethical approval is not required. The ticker symbols and company names of the companies in question are presented in Table 1.

Table 1: BIST Companies Included in the Study

	Ticker Symbol	Company Name
BIST Transportation Index (XULAS) Companies	BEYAZ	Beyaz Filo Oto Kiralama A.Ş.
	CLEBI	Çelebi Hava Servisi A.Ş.
	GSDDE	GSD Denizcilik Gayrimenkul İnşaat Sanayi ve Ticaret A.Ş.
	GRSEL	Gür-Sel Turizm Taşımacılık ve Servis Ticaret A.Ş.
	HRKET	Hareket Proje Taşımacılığı ve Yük Mühendisliği A.Ş.
	HOROZ	Horoz Lojistik Kargo Hizmetleri ve Ticaret A.Ş.
	PASEU	Pasifik Eurasia Lojistik Dış Ticaret A.Ş.
	PGSUS	Pegasus Hava Taşımacılığı A.Ş.
	RYSAS	Reysaş Taşımacılık ve Lojistik Ticaret A.Ş.
	TLMAN	Trabzon Liman İşletmeciliği A.Ş.
	TUREX	Tureks Turizm Taşımacılık A.Ş.
	THYAO	Türk Hava Yolları A.O.
Defence Industry Companies	ALTNY	Altınay Savunma Teknolojileri A.Ş.
	ASELS	Aselsan Elektronik Sanayi ve Ticaret A.Ş.
	KATMR	Katmerciler Araç Üstü Ekipman Sanayi ve Ticaret A.Ş.
	ONRYT	Onur Yüksek Teknoloji A.Ş.
	OTKAR	Otokar Otomotiv ve Savunma Sanayi A.Ş.
	PAPIL	Papilon Savunma Teknoloji ve Ticaret A.Ş.
	PATEK	Pasifik Teknoloji A.Ş.
	SDTTR	SDT Uzay ve Savunma Teknolojileri A.Ş.

Source: https://kap.org.tr

Event study

The event study dates back to Dolley's (1933) study, which examined the effects of stock splits. The modern form of the method was developed by Ball and Brown (1968) and became widespread in the finance literature following Fama et al. (1969). The event study method is based on the Efficient Market Hypothesis, which Fama (1970) systematically addressed. Within the framework of this hypothesis, which assumes that all available information is reflected in prices, market efficiency is classified into three forms: weak, semi-strong, and strong. The event study is frequently used in the literature, particularly to test the validity of semi-strong form efficiency, in which prices reflect both publicly disclosed and all historical information. In this context, the main purpose of the method is to determine whether a particular event or announcement leads to abnormal price movements in financial markets (Benninga, 2008, p. 371). In other words, since the method focuses on abnormal returns, positive abnormal returns are expected when investors react positively to the event, whereas negative abnormal returns are expected when they react negatively (Chen & Siems, 2004, p. 351).

Accordingly, in an event study, it is first necessary to define the event to be examined and to determine the time interval over which the security prices of the firms included in this event will be analyzed, that is, the event window (Campbell et al., 1997, p. 151). In this process, since February 28, 2026, the date on which the event occurred, coincided with a day when Borsa Istanbul was closed, the market could not react to this geopolitical development through prices on the same day. In event study methodology, the event date is determined as the trading day on which new information can first be reflected by investors in their trading decisions and in stock prices. Therefore, after information regarding the outbreak of the war reached the public over the weekend and was evaluated by investors, March 2, 2026, the date on which the market's initial pricing reaction could be observed, was accepted as the event day (t = 0). Thus, in determining the event date, the first trading day on which the relevant information shock could actually be priced in Borsa Istanbul was taken as the basis rather than the calendar date on which the war began. This approach is also consistent with event study applications in which events occurring on days when the market is closed are associated with the first subsequent trading day (Campbell et al., 1997; Demirel, 2024; Abedin et al., 2024). The literature includes many applications using windows of 3, 5, 10, 15, and 20 days before and after the event day (t = 0). In this study, the event window was set at 21 trading days, covering the interval from −10 to +10 days. This preference is based on not keeping the event window too wide in order to limit the influence of news flows other than the event on stock prices (Bouteska, 2019, p. 6). In addition, various sub-windows were also taken into account in order to evaluate not only the daily effect of the event but also its cumulative effect across different time intervals.

Another key time interval, in addition to the event window, is the estimation window. The estimation window is used to determine the normal behavior of a stock's return relative to the market or sector index; in other words, its expected return (Benninga, 2008, p. 373). In studies using daily data, it is emphasized in the literature that it is appropriate to select an estimation window with a length of 100–300 days (Peterson, 1989, p. 38). In this study, similar to Diaz-Rainey et al. (2021), the estimation window was determined as a total of 200 trading days, covering the interval from −225 to −26 days. In addition, both in the relevant study and in the literature, it is observed that a gap is used between the estimation and event windows in order to minimize the effects of information leakage (Kurek, 2020, p. 249). Accordingly, this gap was preferred as 15 trading days. In the following stage, the calculation process used in the study follows the logical sequence of the event study method. The formulas included in this process are expressed within a common notation framework, consistent with their use in the literature and with symbol consistency maintained throughout the text.

First, the price series used in the study are transformed into daily return series. Within this scope, logarithmic returns were preferred in line with the advantages stated in the literature. The realized daily returns of the stocks examined and the BIST 100 Index were calculated using Equation 1 (Hudson & Gregoriou, 2015, p. 152; Miskolczi, 2017):

$$R_{it} = ln\left(\frac{P_{it}}{P_{i(t-1)}}\right) \tag{1}$$

Here, R_{it} denotes the logarithmic return of the asset i in period t; P_{it} denotes its price on day t; and $P_{i(t-1)}$denotes its price on the previous day.

In their study using different models, Dyckman et al. (1984) stated that the market model developed by Sharpe (1963) produced better estimates of the expected returns that would have been observed if the event had not occurred. The market model is expressed in Equation 2, and the variables related to the model are explained within this framework (Campbell et al., 1997, p. 155; Brenner, 1979, p. 917; Brown & Warner, 1980, pp. 252–253; Brown & Warner, 1985, p. 7):

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{2}$$

Here, R_{it} and R_{mt} denote the returns of security i and the market portfolio (BIST 100) in period t, respectively. α_i and β_i are the parameters of the market model and represent the coefficients obtained from the estimation window using the ordinary least squares method. In the equation, the expression $\alpha_i + \beta_i R_{mt}$ denotes the expected return (ER_{it}), while ε_{it} denotes the error term with a mean of zero. The error term, or residual, is used to test market efficiency. In other words, the market model residual for a given security represents the abnormal performance measure of that security, namely its abnormal return. As part of the robustness analysis, the market-adjusted model was also used to test whether the main findings were preserved under an alternative expected return approach. In this model, without estimating the alpha and beta coefficients, the expected return is assumed to be directly equal to the market return and is calculated as $ER_{it} = R_{mt}$.

Abnormal returns were obtained by subtracting the expected returns for the relevant day from the realized returns for each day in the event window of the stocks. The general calculation of abnormal returns is presented in Equation 3, while its model-specific formulation is presented in Equation 4 for the market model and in Equation 5 for the market-adjusted model (MacKinlay, 1997; Campbell et al., 1997, p. 151):(AR_{it})

$$AR_{it} = R_{it} - ER_{it} \tag{3}$$

$$AR_{it(market\ model)} = R_{it} - (\alpha_i + \beta_i R_{mt}) \tag{4}$$

$$AR_{it(market-adjusted\ model)} = R_{it} - R_{mt} \tag{5}$$

To evaluate the overall effect of abnormal returns, the average abnormal return was calculated for each day in the event window. Accordingly, as shown in Equation 6, for each day , the sum of the abnormal returns of the firms was divided by the total number of stocks examined in the study , thereby obtaining the average abnormal return (Binder, 1998, p. 113; Abedin et al., 2024, p. 3):$(AAR_t)t(N)$

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \tag{6}$$

To apply window-based significance tests, cumulative abnormal returns (CARs) were calculated for each firm. Within this scope, , whose calculation is given in Equation 7, denotes the sum of the daily abnormal returns obtained by the firm between , the starting day of the specified event window, and , the ending day of that window (MacKinlay, 1997, p. 21):$CAR_i(t_1, t_2)it_1t_2$

$$CAR_{i(t_1,t_2)} = \sum_{t=t_1}^{t_2} AR_{it} \tag{7}$$

As shown in Equation 8, cumulative average abnormal returns , calculated to evaluate the cumulative average effect of the event across different windows, denote the sum of the daily average abnormal returns between and . However, the same value can also be obtained, as shown in Equation 9, by taking the average of the values calculated on a firm basis for the relevant event window (Binder, 1998, p. 113; Serra, 2004, p. 3; Wolf et al., 2014):$(CAAR_{(t_1,t_2)})t_1 t_2 CAR_i(t_1,t_2)$

$$CAAR_{(t_1,t_2)} = \sum_{t=t_1}^{t_2} AAR_t \tag{8}$$

$$CAAR_{(t_1,t_2)} = \frac{1}{N}\sum_{i=1}^{N} CAR_{i(t_1,t_2)} \tag{9}$$

To evaluate the statistical significance of the AAR and CAAR values, the cross-sectional t-test, Patell Z test, and BMP test were applied jointly. The cross-sectional t-test examines whether the cross-sectional mean of abnormal returns differs significantly from zero and may provide greater test power and more robust results against event-induced increases in variance compared with time-series-based tests (Brown & Warner, 1980; 1985). The Patell Z test reduces the effect of differing volatility levels across firms by standardizing each abnormal return by its standard deviation, taking the estimation error into account (Patell, 1976). The BMP test, developed by Boehmer et al. (1991), accounts for the increase in variance that the event may induce by rescaling standardized abnormal returns according to the cross-sectional standard deviation during the event period. Accordingly, the Patell Z and BMP tests were used to assess whether the findings obtained from the cross-sectional t-test were preserved under different statistical approaches and to test the robustness of the results. Within this scope, the null and alternative hypotheses to be tested separately based on AAR and CAAR values for transportation stocks and defense stocks are as follows:

$$H_0: AAR_t = 0 \qquad H_1: AAR_t \neq 0$$

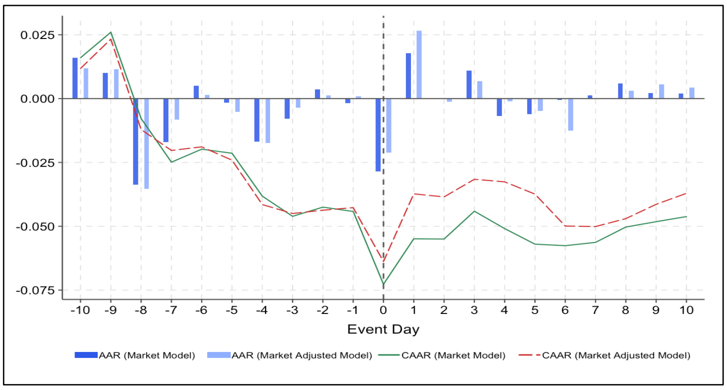
$$H_0: CAAR_{(t_1,t_2)} = 0 \qquad H_1: CAAR_{(t_1,t_2)} \neq 0$$

The null hypothesis states that the U.S.–Israel–Iran war has no statistically significant effect on stock returns as of the relevant day or event window. The alternative hypothesis indicates that the war has a statistically significant effect on stock returns as of the relevant day or event window. The statistical significance of the probability values corresponding to the calculated test statistics was evaluated at the 10%, 5%, and 1% levels.

Findings

In this section, the findings regarding the impact of the geopolitical development defined as the U.S.–Israel–Iran war on the stock returns of the companies examined within the scope of the study are presented in the form of graphs and tables. In presenting the findings, transportation stocks are addressed first; daily AAR values and CAAR series accumulated over the days are graphically presented for the main event window of (-10, +10) using the market model and the market-adjusted model. By presenting the AAR and CAAR values daily in the graphs, the course of the change around the event and the development of the cumulative effect over time are made visible. Subsequently, the AAR results are evaluated daily within the same event window. In contrast, the CAAR results are evaluated across different event windows in tables, together with their statistical significance levels. Thereafter, the findings regarding defense stocks are addressed in the same order and scope, and the main results for the two stock groups are presented together in the summary findings table.

Figure 1 shows that, for transportation stocks, the AAR and CAAR series obtained using the market model and the market-adjusted model exhibit a similar pattern. The graph shows that while negative AAR values were observed on some days before the event day, the CAAR series reached their lowest levels on the event day. On day +1 following the event, positive AAR values were obtained under both models, and an increase was observed in the CAAR series; however, CAAR values remained negative until the end of the event window.



When the AAR values calculated using the market model in Table 2 are examined, positive and statistically significant AAR values of 0.0160 on day -10 and 0.0100 on day -9 were obtained. While all three tests supported the significance finding for day -10, the significance finding for day -9 was supported by the cross-sectional t-test and the BMP test but was not supported by the Patell Z test. On day -7, when a negative AAR value was obtained, the AAR calculated as -0.0171 was statistically significant at the 5% level according to the cross-sectional t-test and the Patell Z test and at the 1% level according to the BMP test. Similarly, the negative AAR value of -0.0338 on day -8 was significant at the 1% level according to all three tests used. The negative AAR value of -0.0168 on day -4 was found to be statistically significant at the 1% level according to the cross-sectional t-test and the BMP test and at the 5% level according to the Patell Z test. The negative AAR value of -0.0285 at t = 0, defined as the event day, and the positive AAR value of 0.0178 on day +1 following the event were statistically significant at the 1% level according to all three tests used. Under the market-adjusted model, the AAR values of 0.0118 on day -10, 0.0115 on day -9, and -0.0354 on day -8 were in the same direction as the market model results. While the significance of the positive AAR values on days -10 and -9 was supported by the cross-sectional t-test and the BMP test, it was not supported by the Patell Z test. The negative AAR value on day -8 was found to be significant at the 1% level according to all three tests used. In addition, the negative AAR value of -0.0174 on day -4, the negative AAR value of -0.0211 on the event day, and the positive AAR value of 0.0265 on day +1 were supported by all three tests at different significance levels. In both models, the negative AAR value on day -8 and the positive AAR value on day +1 were statistically significant at the 1% level according to all applied significance tests. Likewise, when both models and the tests applied are evaluated together, no statistically significant AAR value was observed on any day after day +1.

Table 2: AARs and Significance Test Results (Transportation)

Day	AAR (market model)	Cross t	Patell Z	BMP	AAR (market-adjusted model)	Cross t	Patell Z	BMP
-10	0.0160	3.5491***	2.0596**	2.9064**	0.0118	2.7050**	1.5185	2.1855*
-9	0.0100	2.3089**	1.2711	2.5468**	0.0115	2.2538**	1.3360	2.3678**
-8	-0.0338	-3.5914***	-5.0881***	-3.5014***	-0.0354	-3.8310***	-5.2496***	-3.5870***
-7	-0.0171	-2.4534**	-2.3428**	-3.2858***	-0.0082	-0.9070	-1.4865	-1.6168
-6	0.0051	1.3117	0.8241	1.3981	0.0014	0.3717	0.3646	0.6351
-5	-0.0016	-0.2054	-0.6897	-0.6453	-0.0052	-0.6978	-1.1411	-1.1138
-4	-0.0168	-5.2664***	-2.3559**	-5.2415***	-0.0174	-6.6289***	-2.4492**	-5.4629***
-3	-0.0079	-1.1422	-0.6902	-0.7369	-0.0035	-0.6336	-0.2670	-0.3543
-2	0.0036	0.3807	0.5311	0.4490	0.0013	0.1336	0.2417	0.2108
-1	-0.0017	-0.2972	-0.2236	-0.3146	0.0010	0.1784	-0.0058	-0.0078
0	**-0.0285**	**-5.4369*** **	**-4.1693*** **	**-5.3899*** **	**-0.0211**	**-2.9500** **	**-3.4358*** **	**-3.3858*** **
1	0.0178	3.3908***	2.6673***	3.3563***	0.0265	4.5375***	3.4534***	5.1899***
2	-0.0001	-0.0090	0.1852	0.2111	-0.0012	-0.1521	0.0195	0.0241
3	0.0109	1.5640	1.1194	1.0063	0.0069	1.0182	0.6187	0.5643
4	-0.0068	-1.1523	-0.7388	-0.9736	-0.0010	-0.1748	-0.1897	-0.2599
5	-0.0061	-0.5176	-0.7067	-0.4585	-0.0048	-0.4005	-0.6116	-0.4145
6	-0.0006	-0.0693	0.2851	0.3221	-0.0125	-1.2721	-0.9684	-0.9788
7	0.0013	0.1520	-0.1738	-0.1772	-0.0002	-0.0195	-0.3957	-0.4165
8	0.0060	0.4946	0.0849	0.0600	0.0031	0.2720	-0.2858	-0.2058
9	0.0021	0.3818	0.6651	0.9284	0.0056	1.2631	0.9782	1.5941
10	0.0020	0.2494	0.0849	0.0853	0.0043	0.5511	0.2698	0.2920

Note: *, **, and *** show significance at the 10%, 5%, and 1% levels, respectively.

As shown in Table 3, statistically significant CAAR values were obtained in asymmetric windows covering the event date and the pre-event period. According to the results calculated using the market model, the negative CAAR values calculated for the (-1, 0), (-3, 0), and (-5, 0) windows were -0.0302, -0.0344, and -0.0528, respectively, and were statistically significant according to all of the cross-sectional t, Patell Z, and BMP tests. The CAAR value obtained for the (-10, 0) window was also negative at -0.0726; however, the significance finding for this window was supported only by the cross-sectional t and Patell Z tests and was not supported by the BMP test. In the asymmetric windows covering the event day and the post-event period, the CAAR values calculated for the (0, +1), (0, +3), (0, +5), and (0, +10) windows were -0.0107, 0.0002, -0.0127, and -0.0020, respectively, and were not statistically significant according to any of the tests applied. When the symmetric windows are examined, the CAAR values calculated for the (-10, +10) and (-5, +5) windows were -0.0460 and -0.0370, respectively, and were statistically significant at the 10% level only according to the BMP test. In contrast, the CAAR values obtained for the (-3, +3) and (-1, +1) windows were -0.0057 and -0.0123, respectively, and were not statistically significant. When the results calculated according to the market-adjusted model are examined, the negative CAAR values obtained for the (-1, 0), (-3, 0), (-5, 0), and (-10, 0) windows were -0.0201, -0.0223, -0.0449, and -0.0638, respectively, and were statistically significant according to all of the cross-sectional t, Patell Z, and BMP tests. Among the symmetric windows, only the negative CAAR value of -0.0370 for the (-10, +10) window was statistically significant at the 10% level according to the Patell Z and BMP tests. The CAAR values for the (-5, +5), (-3, +3), and (-1, +1) windows were -0.0186, 0.0099, and 0.0064, respectively, and were not statistically significant. The negative CAAR values calculated for the (-5, 0) window were statistically significant at the 1% level according to all significance tests applied under both models. In the asymmetric windows covering the event day and the post-event period, no statistically significant CAAR value was observed when both models and all tests applied were evaluated together.

Table 3: CAARs and Significance Test Results (Transportation)

	Window	CAAR (market model)	Cross t	Patell Z	BMP	CAAR (market-adjusted model)	Cross t	Patell Z	BMP
Symmetric	[-1, +1]	-0.0123	-1.4735	-0.9862	-1.6779	0.0064	0.5261	0.0067	0.0082
	[-3, +3]	-0.0057	-0.3309	-0.2170	-0.2687	0.0099	0.8842	0.2338	0.3963
	[-5, +5]	-0.0370	-1.7426	-1.5135	-1.8982*	-0.0186	-1.3773	-1.1244	-1.7498
	[-10, +10]	-0.0460	-1.2545	-1.5987	-1.8027*	-0.0370	-1.6068	-1.6604*	-2.0870*
Asymmetric (Event Date and Pre-Event)	[-1, 0]	-0.0302	-7.1635***	-3.0748***	-5.7081***	-0.0201	-2.7361**	-2.4092**	-2.8351**
	[-3, 0]	-0.0344	-2.6930**	-2.2530**	-2.8465**	-0.0223	-1.9711*	-1.7161*	-2.4783**
	[-5, 0]	-0.0528	-3.2369***	-3.0703***	-3.7987***	-0.0449	-3.2238***	-2.8523***	-3.4539***
	[-10, 0]	-0.0726	-4.4372***	-2.2090**	-1.7260	-0.0638	-3.6997***	-2.2942**	-1.9981*
Asymmetric (Event Date and Post-Event)	[0, +1]	-0.0107	-1.1805	-1.0513	-1.4158	0.0054	0.4499	0.0123	0.0136
	[0, +3]	0.0002	0.0181	-0.0977	-0.1241	0.0111	1.0477	0.3246	0.3939
	[0, +5]	-0.0127	-0.8374	-0.6639	-0.8202	0.0053	0.3465	-0.0588	-0.0768
	[0, +10]	-0.0020	-0.0703	-0.2079	-0.2291	0.0057	0.2725	-0.1634	-0.2336

Note: *, **, and *** show significance at the 10%, 5%, and 1% levels, respectively.

Figure 2 shows that, for defense stocks, the AAR and CAAR series calculated using the market model and the market-adjusted model moved in similar directions throughout the period. The graph shows that while positive AAR values were observed in the days immediately preceding the event, the CAAR series reached their highest levels on the event day. On day +1 following the event, negative AAR values were obtained, and a decline was observed in the CAAR series. CAAR values remained positive during the first days after the event, but declined in the following days and entered negative territory toward the end of the event window.

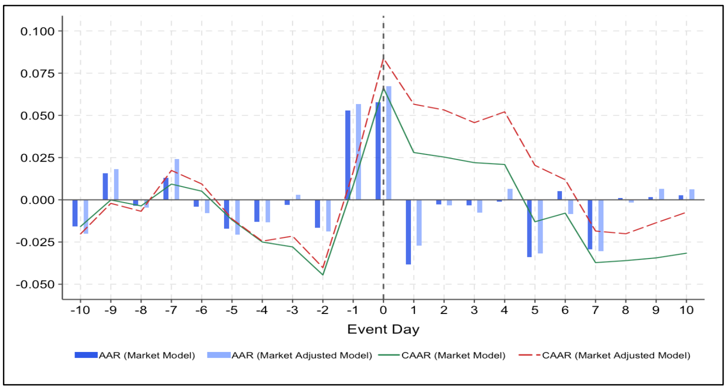


Figure 2: AAR and CAAR Trends in Defense Stocks

When the AAR values calculated using the market model in Table 4 are examined, a negative AAR of -0.0158 was obtained on day -10, and this value was statistically significant at the 10% level only according to the Patell Z test. The positive AAR value of 0.0157 on day -9 was significant at the 5% level according to the cross-sectional t and BMP tests. The negative AAR values of -0.0170 and -0.0131 on days -5 and -4, respectively, were supported by the cross-sectional t and BMP tests but were not significant according to the Patell Z test. In addition, the negative AAR value of -0.0166 on day -2 was statistically significant at the 10% level according to the cross-sectional t and BMP tests. Positive AAR values of 0.0529 and 0.0578 were obtained on day -1 before the event and on the event day, t = 0, respectively. In contrast, negative AAR values of -0.0382 and -0.0339 were obtained on days +1 and +5 following the event, respectively. These values were statistically significant at the 1% level according to the cross-sectional t, Patell Z, and BMP tests. The negative AAR value of -0.0293 on day +7 was significant at the 1% level according to the cross-sectional t and Patell Z tests and at the 5% level according to the BMP test. In the results calculated according to the market-adjusted model, the negative AAR value of -0.0202 on day -10 was found to be significant at the 5% level only according to the Patell Z test. In comparison, the positive AAR value of 0.0181 on day -9 was statistically significant at the 5% level according to the cross-sectional t and BMP tests. Negative AAR values of -0.0207 and -0.0132 were obtained on days -5 and -4, respectively. The AAR value on day -5 was significant at the 1% level according to the cross-sectional t and BMP tests and at the 10% level according to the Patell Z test. In comparison, the AAR value on day -4 was significant at the 5% level according to the cross-sectional t and BMP tests. The AAR values calculated on days -1, 0, +1, +5, and +7 were 0.0567, 0.0673, -0.0272, -0.0317, and -0.0304, respectively, and their directions were the same as those in the market model.

However, the negative AAR value on day +1 was significant at the 5% level according to all three tests used in the market-adjusted model, whereas it was significant at the 1% level according to all three tests in the market model. In addition, the negative AAR value of -0.0187 on day -2 was statistically significant at the 5% level according to the cross-sectional t and BMP tests. In comparison, the positive AAR value of 0.0242 on day -7 was statistically significant at the 5% level only according to the Patell Z test.

Table 4: AARs and Significance Test Results (Defense)

Day	AAR (market model)	Cross t	Patell Z	BMP	AAR (market-adjusted model)	Cross t	Patell Z	BMP
-10	-0.0158	-1.2021	-1.8989*	-1.2899	-0.0202	-1.6212	-2.2662**	-1.5801
-9	0.0157	2.6444**	1.3785	2.6163**	0.0181	3.0197**	1.5734	3.0980**
-8	-0.0035	-0.2686	-0.1725	-0.1409	-0.0047	-0.3638	-0.2813	-0.2304
-7	0.0129	0.8470	1.3186	1.0004	0.0242	1.5024	2.2564**	1.6573
-6	-0.0042	-1.0446	-0.4334	-1.0210	-0.0080	-1.8588	-0.7518	-1.6667
-5	-0.0170	-5.9737***	-1.5774	-5.7147***	-0.0207	-6.9374***	-1.8635*	-6.4910***
-4	-0.0131	-3.1072**	-1.1758	-3.5792***	-0.0132	-2.9602**	-1.1556	-3.4405**
-3	-0.0029	-0.3588	-0.2932	-0.4095	0.0030	0.3345	0.2077	0.2644
-2	-0.0166	-2.3587*	-1.4056	-2.2320*	-0.0187	-2.5334**	-1.5591	-2.3922**
-1	0.0529	5.5707***	4.6252***	5.6778***	0.0567	5.6200***	4.8787***	5.6893***
0	**0.0578**	**4.2494*** **	**5.0585*** **	**3.9615*** **	**0.0673**	**4.4771*** **	**5.7831*** **	**4.1774*** **
1	-0.0382	-3.7073***	-3.2190***	-3.7285***	-0.0272	-2.8536**	-2.2186**	-2.9202**
2	-0.0027	-0.3599	-0.0815	-0.1137	-0.0034	-0.4184	-0.1211	-0.1622
3	-0.0033	-0.4756	-0.1282	-0.2068	-0.0075	-0.9372	-0.4770	-0.7038
4	-0.0011	-0.1643	-0.0548	-0.0845	0.0064	0.8939	0.6010	0.9573
5	-0.0339	-4.2914***	-3.1193***	-4.1429***	-0.0317	-4.2388***	-2.8603***	-4.2012***
6	0.0051	1.4266	0.5336	1.3958	-0.0085	-1.3987	-0.6200	-1.0840
7	-0.0293	-3.6104***	-2.6597***	-3.4267**	-0.0304	-3.5885***	-2.6871***	-3.4392**
8	0.0012	0.1484	-0.0553	-0.0798	-0.0016	-0.1889	-0.2780	-0.3935
9	0.0016	0.4001	0.1002	0.2602	0.0065	1.6150	0.5290	1.4651
10	0.0028	0.4813	0.3200	0.5997	0.0062	1.1640	0.6239	1.3387

Note: *, **, and *** show significance at the 10%, 5%, and 1% levels, respectively.

When the CAAR values calculated using the market model in Table 5 are examined, positive and statistically significant results were obtained for the narrow symmetric event windows of (-1, +1) and (-3, +3). The CAAR values calculated for these windows were 0.0726 and 0.0471, respectively. The positive CAAR value in the (-1, +1) window was significant at the 1% level according to the Patell Z test, while the positive CAAR value in the (-3, +3) window was statistically significant at the 10% level according to the cross-sectional t, Patell Z, and BMP tests. When the asymmetric windows covering the event date and the pre-event period are examined, the positive CAAR values calculated for the (-1, 0), (-3, 0), and (-5, 0) windows were obtained as 0.1108, 0.0913, and 0.0612, respectively. The CAAR values calculated for the (-1, 0) and (-3, 0) windows were statistically significant at the 1% level according to all tests used. In contrast, the CAAR value in the (-5, 0) window was statistically significant at the 5% level according to all tests. In contrast, the positive CAAR value of 0.0664 calculated for the (-10, 0) window was not statistically significant. In the asymmetric windows covering the event date and the post-event period, the CAAR values calculated for the (0, +1), (0, +3), (0, +5), and (0, +10) windows were 0.0197, 0.0136, -0.0214, and -0.0400, respectively, and no statistically significant finding was observed. In the market-adjusted model, positive and statistically significant CAAR values were also obtained in the narrow symmetric windows of (-1, +1) and (-3, +3). The CAAR values calculated for these windows were 0.0968 and 0.0702, respectively. In addition, the positive CAAR values obtained for the (-1, 0), (-3, 0), and (-5, 0) asymmetric windows were 0.1240, 0.1083, and 0.0744, respectively, and the significance levels in these windows were the same as those in the market model. In contrast, the CAAR value of 0.0839 calculated for the (-10, 0) window was not statistically significant. Unlike the market model, a positive and statistically significant CAAR value of 0.0401 was obtained only for the (0, +1) window among the asymmetric windows covering the event date and the post-event period. This finding was supported at the 5% level according to all tests used. Apart from this, the CAAR values calculated for the (0, +3), (0, +5), and (0, +10) windows were 0.0292, 0.0039, and -0.0237, respectively, and were not statistically significant.

Table 5: CAARs and Significance Test Results (Defense)

	Window	CAAR (market model)	Cross t	Patell Z	BMP	CAAR (market-adjusted model)	Cross t	Patell Z	BMP
Symmetric	[-1, +1]	0.0726	3.3102**	3.6947***	3.2474*	0.0968	3.8982***	4.8260***	3.7995***
	[-3, +3]	0.0471	2.3473*	1.7047*	2.2316*	0.0702	2.7893**	2.4299**	2.5244**
	[-5, +5]	-0.0180	-1.1772	-0.4092	-1.0071	0.0110	0.5189	0.3628	0.5960
	[-10, +10]	-0.0315	-0.9105	-0.6351	-0.8900	-0.0071	-0.1660	-0.1483	-0.1626
Asymmetric (Event Date and Pre-Event)	[-1, 0]	0.1108	5.2198***	6.7783***	4.9508*	0.1240	5.3270***	7.4637***	5.0395***
	[-3, 0]	0.0913	3.8517***	3.9521***	3.5331*	0.1083	4.0595***	4.6087***	3.6628***
	[-5, 0]	0.0612	2.8190**	2.1143**	2.4858*	0.0744	3.0734**	2.5427**	2.6229**
	[-10, 0]	0.0664	1.2969	-0.8775	-0.8900	0.0839	1.5344	-0.2049	-0.1626
Asymmetric (Event Date and Post-Event)	[0, +1]	0.0197	1.3390	1.2876	1.3868	0.0401	2.4091**	2.4953**	2.4112**
	[0, +3]	0.0136	0.9401	0.8067	1.1648	0.0292	1.7593	1.4684	1.8086
	[0, +5]	-0.0214	-1.5780	-0.6241	-1.3485	0.0039	0.2667	0.2858	0.5472
	[0, +10]	-0.0400	-1.7024	-0.9866	-1.5901	-0.0237	-0.9570	-0.5150	-0.8236

Note: *, **, and *** show significance at the 10%, 5%, and 1% levels, respectively.

The findings regarding the stock groups of the two sectors are summarized in two panels in Table 6. Panel A presents the main findings based on the market model, while Panel B presents the robustness findings based on the market-adjusted model. The market-adjusted model results show the same signs and similar significance patterns for most of the significant AAR and CAAR findings obtained with the market model. While both positive and negative reactions were observed across days at the AAR level, all significant CAAR findings were negative for transportation stocks and positive for defense stocks.

Table 6: Summary of the Results for the Transportation and Defense Stocks

Stock Group	Event-Day AAR	Significant AAR Days	Significant CAAR Windows
Panel A. Main Results Based on the Market Model			
Transportation	−0.0285	Positive: −10, −9, +1; Negative: −8, −7, −4, 0	Negative: (−1, 0), (−3, 0), (−5, 0), (−10, 0), (-5, +5), (-10 +10)
Defense	0.0578	Positive: −9, −1, 0; Negative: -10, −5, −4, −2, +1, +5, +7	Positive: (−1, 0), (−3, 0), (−5, 0), (−1, +1), (−3, +3)
Panel B. Robustness Results Based on the Market-Adjusted Model			
Transportation	−0.0211	Positive: −10, −9, +1; Negative: −8, −4, 0	Negative: (−1, 0), (−3, 0), (−5, 0), (−10, 0), (-10, +10)
Defense	0.0673	Positive: −9, -7 −1, 0; Negative: -10,−5, −4, −2, +1, +5, +7	Positive: (−1, 0), (−3, 0), (−5, 0), (−1, +1), (−3, +3), (0, +1)

Note: For both panels, AAR days and CAAR windows are reported if they are significant at the 10% level or better in at least one of the cross-sectional t, Patell Z, or BMP tests.

Discussion, conclusion and recommendations

The U.S.–Israel–Iran war is considered a major development that may affect sector-based pricing behavior in financial markets. While the increase in oil prices and the rise in transportation costs created negative pressure, particularly on transportation stocks, the growing need for security and the increase in defense expenditures created a different expectation channel for defense stocks. In this context, the short-term impact of the U.S.–Israel–Iran war on transportation and defense stocks traded on Borsa Istanbul was examined using the event-study methodology.

The findings regarding transportation stocks indicate that the impact of the geopolitical development on the sector was primarily priced in before the war actually began. The largely parallel results of the market model and the market-adjusted model indicate that these findings for transportation stocks are also consistent across different calculation approaches. This is consistent with the semi-strong form of the Efficient Market Hypothesis, which predicts that new information and expectations are rapidly reflected in prices. As the likelihood of war increased, risks such as disruptions to energy supply, increases in oil prices, airspace closures, longer routes, and rising insurance costs appear to have been incorporated into investors' assessments in advance. The significant share of fuel costs in the operating expenses of transportation companies may have strengthened expectations that a potential increase in oil prices would place pressure on profit margins and future cash flows. Therefore, the negative pricing observed in transportation stocks stems not only from the war's increase in overall market risk but also from economic channels that could directly affect the sector's cost structure. The limited positive response observed after the event day indicates that the initial selling pressure may have partially corrected and that the market may have moved toward a new equilibrium. Nevertheless, post-event cumulative returns did not remain persistently significant. This shows that the market did not price in a continuously deepening effect on the transportation sector and that a new equilibrium emerged following the initial uncertainty shock.

The findings regarding defense stocks show that geopolitical tension did not create a unidirectional and uninterrupted pricing pattern in the sector and that investor reactions changed across different stages of the event. The overall consistency between the results obtained from both models supports the consistency of the findings for defense stocks. Some negative reactions before the event may be explained by positive expectations for the defense sector remaining uncertain, general market risk aversion, and temporary pressure on sector stocks due to uncertainty about the war's economic consequences. In contrast, the strong positive reaction that emerged on the day immediately preceding the event, when the likelihood of conflict became more evident, and on the event date indicates that investors rapidly priced in expectations of increased defense expenditures, new orders, and improvements in firms' future revenues and cash flows. In this respect, the findings are consistent with approaches suggesting that defense companies may be perceived as "war stocks" during periods of geopolitical tension and may provide limited protection against geopolitical risk within portfolios. Nevertheless, the re-emergence of negative reactions after the event indicates that the initial positive pricing may not have developed into a persistent upward trend. This may be associated with uncertainty about the duration and scope of the war, the extent and timing of the reflection of expected defense expenditures in company revenues, rising input costs, and profit-taking following the initial price increases. The fact that the cumulative findings are positive, particularly in periods close to the event day and covering the pre-event period, indicates that positive expectations regarding defense stocks accumulated before the war began and that new information and expectations were reflected in prices. In contrast, the weakening of the effect over longer periods indicates that investors reassessed their initially optimistic expectations in light of new information.

The findings obtained show similarities with the literature in some respects, while differing from it in others. Although studies examining the effects of geopolitical shocks on transportation stocks using the event study method are limited, Marobhe et al. (2025) did not find a significant firm-level cumulative effect in the (-10, +10) window for the container shipping subsector during the Israel–Hamas war. This finding partially overlaps with the results for BIST transportation stocks, where the CAAR in the same window received only limited statistical support across the applied tests. In contrast, Marobhe et al. (2025) observed significant effects in some asymmetric windows covering the event day and the following days, as well as for some specific firms. This divergence indicates that firm-level results and the sector average may not reflect the same response and that transportation companies may differ according to their fields of activity. The temporary negative response identified by Buigut and Kapar (2020) in the transportation sector is generally consistent with the current findings. Covachev and Fazakas (2025) identified negative effects of the Russia–Ukraine War and the Wagner Group coup attempt on European defense stocks on the event day and in the (-10, -1) and (-3, -1) windows. In addition, positive effects were also observed in the (0, +3), (0, +5), and (0, +10) windows. The effect of the U.S.–Israel–Iran war on defense stocks traded on the BIST differs significantly from the results reported here. Nevertheless, defense stocks reacted in different directions depending on the nature and timing of the geopolitical development in both studies. This indicates that positive pricing in the sector is neither automatic nor persistent. Adnan et al. (2025), within the scope of the Russia–Ukraine War, identified positive cumulative effects in defense and aerospace firms not only in narrow symmetric windows such as (-1, +1) and (-3, +3), but also in wider symmetric windows such as (-5, +5) and (-10, +10). Although similar results were obtained in narrow, symmetric windows for BIST defense stocks, the loss of significance in wider symmetric windows suggests that the positive reaction in these stocks was more short-term in an emerging market such as Türkiye. Accordingly, demonstrating that these effects differ according to country characteristics also supports the view that this divergence may be associated with the level of market development and defense capacity. A comparison with Osei-Bonsu et al. (2026), who examined the same war, shows that oil, transportation, and defense stocks reacted in different directions and over different durations. This reveals that the geopolitical shock was transmitted to these sectors through different channels. These differences may be influenced by the fact that, although the U.S.–Israel–Iran war is evaluated as a geopolitical event similar to those in the compared studies, it has a distinct conflict character, distinct news flow, and a different timing structure. Therefore, it should be noted that not every war may generate pricing effects in financial markets in the same direction or with the same persistence.

When the findings are evaluated as a whole, it is observed that the same geopolitical shock did not produce a uniform effect on the stocks of the two sectors examined on Borsa Istanbul. Particularly on and before the event date, transportation stocks predominantly priced the war negatively through risks related to the Strait of Hormuz, higher oil prices, and the transportation cost channel, whereas defense stocks positively diverged in line with expectations for security and defense expenditures. The fact that the main findings are largely in the same direction as the robustness analysis results indicates that the observed differences between the sectors are not specific to the model used. Therefore, with respect to the study's main research question, it is concluded that the war generated a short-term abnormal return effect on the examined stock groups and that this effect differed markedly across sectors. In terms of hypothesis evaluation, the presence of significant AAR values on certain days and significant negative CAAR values in windows covering the pre-event period for transportation stocks indicates that H_0 is rejected and H_1 is supported for the relevant days and windows. Similarly, the presence of significant AAR values on certain days and significant positive CAAR values in windows covering the event day and the pre-event period for defense stocks indicates that H_0 can be rejected for the relevant days and windows. The original contribution of the study emerges in four respects. First, the study examines the short-term effects of the U.S.–Israel–Iran war, a current geopolitical conflict, on financial markets. Second, by focusing on Borsa Istanbul, an emerging market, it contributes to the literature on the effects of geopolitical shocks outside developed markets. Third, by comparing the transportation and defense sectors under the same market conditions, it demonstrates that the same geopolitical shock may be priced in different directions across different sectors. Finally, the study reveals that geopolitical risks may affect financial markets through multiple transmission mechanisms rather than a single channel, including energy costs, logistical risks, and operational uncertainties in the transportation sector, as well as security expenditures and demand expectations in the defense sector.

Nevertheless, certain limitations of the study should also be taken into consideration. First, since the study covers only transportation and defense sector stocks traded on Borsa Istanbul, the findings may not be directly generalizable to different sectors or different national markets. Second, the analysis was based on a single event date corresponding to the outbreak of the U.S.–Israel–Iran war. The market effects of subsequent developments and news flows during the war were not included in the evaluation. Finally, the short-term market reactions of stocks were analyzed using the event study methodology. In contrast, the long-term effects of geopolitical shocks and market dynamics such as volatility, trading volume, and liquidity were excluded from the scope of the study. Moreover, companies operating within the same sector may not engage in the same activities. Their scale, revenue sources, the relative weight of their defense or transportation activities, and their levels of exposure to geopolitical developments may differ. Therefore, the AAR and CAAR calculated for the sector may dilute the strong reactions of some companies or make the reactions of some companies appear more general than they actually are. Accordingly, it would be appropriate to evaluate the findings within the framework of these limitations.

In future studies, different event dates may be selected, and the analysis may be expanded to account for news flows regarding the subsequent course of the U.S.–Israel–Iran war. In addition, the effects of the same geopolitical shock on stocks across sectors on Borsa Istanbul can be examined, enabling more comprehensive intersectoral comparisons. Comparative analyses may be conducted across different developed and emerging financial markets without limiting the scope to Borsa Istanbul. Testing the findings from abnormal return analyses using different significance tests may help evaluate the statistical robustness of the results. In addition to abnormal return analyses, other dimensions of market reaction may also be examined using different methodological approaches. For example, volatility effects may be evaluated using GARCH models, while changes in trading volume and liquidity may be assessed through panel data analysis.

In addition, investors should not base their portfolio decisions during periods of geopolitical risk solely on short-term price movements; rather, they should prioritize portfolio diversification by considering sectors' differing sensitivities to geopolitical developments. In particular, when investing in companies operating in sectors sensitive to energy costs, commodity prices, developments concerning energy supply, and geopolitical news flows should be evaluated together. In contrast, in sectors such as defense that have the potential to be positively affected by geopolitical developments, risk management and profit-taking strategies should also be incorporated into investment decisions, considering that short-term price increases may not be persistent. In this context, financial institutions and portfolio management companies should systematically incorporate geopolitical risks into their portfolio management processes and regularly update sector-based risk analyses. For example, portfolio weights may be reassessed by conducting stress tests that jointly monitor changes in oil prices, exchange rates, and geopolitical risk indicators. Publicly traded companies, meanwhile, may help preserve market confidence during periods of uncertainty by strengthening their corporate risk management practices regarding geopolitical risks. They may also assess potential effects on their supply chains and cost structures through scenario analyses and communicate transparently with investors. Accordingly, regulatory authorities may strengthen companies' public disclosure processes by developing regulations that encourage or require timely disclosures on the KAP concerning significant geopolitical risks and developments. Policymakers should strengthen early warning and risk-monitoring mechanisms, develop policies supporting energy supply security, and prioritize regulations that increase the resilience of strategic sectors to external shocks. These measures may help mitigate the effects of geopolitical risks on financial markets. Within this framework, strengthening strategic reserves against the risk of energy supply disruptions, establishing alternative supply channels, and introducing temporary support mechanisms for critical sectors may be considered concrete policy instruments. Sector managers' integration of scenario analyses concerning supply chain continuity, energy costs, and financial risk management into decision-making processes may help mitigate the adverse effects of geopolitical shocks on businesses.

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