

The Impact Of The Hamas-Israel Conflict On Stock Market Indices in The Middle East And Turkey: An Event Study Analysis

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Abstract: This study examines the impact of political events, wars, and terrorist attacks in the Middle East on financial markets. The Hamas-Israel conflict that began on October 7, 2023, deeply affected the political dynamics in the region. The research aims to understand the effects of this conflict on financial markets by analyzing the stock indices of significant Middle Eastern countries, including the United Arab Emirates, Israel, Qatar, Egypt, Oman, Jordan, and Turkey. Using the event study method, the analysis reveals that on the day of the event, the United Arab Emirates and Israel experienced a negative abnormal return at the 1% significance level, while Qatar and Egypt had negative abnormal returns at the 5% significance level, and Turkey at the 10% significance level. Four days before the event, only Israel had a positive abnormal return at the 10% significance level. Two days after the event, Israel had a negative abnormal return at the 10% significance level. Four days after the event, the United Arab Emirates and Oman had a negative return at the 1% significance level, while Egypt had a positive abnormal return at the 1% significance level. On the fifth day after the event, Egypt showed a positive abnormal return at the 1% significance level. Over the selected 15-day period, the United Arab Emirates and Israel had a negative cumulative abnormal return at the 10% significance level. These findings indicate that the Hamas-Israel conflict had a statistically significant impact on stock indices.

Keywords: Hamas-Israel Conflict; Middle Eastern; Event Study;

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1. Introduction

With the increase of globalization, crises, pandemics, wars, terrorist attacks, and natural disasters have become events that not only affect regional but also global financial markets. Since the end of the Cold War in the 1990s, many political and financial events have had a significant impact on the global economy. One of the most notable among these is the COVID-19 pandemic, declared by the World Health Organization (WHO) at the beginning of 2020. Another recent event that had an impact on financial and economic markets is the Ukraine-Russia war in February 2022. The effects of this war on global markets can be listed as sanctions, disruptions in the supply chain, and increases in commodity prices (Güneysu, 2022). The Gaza-Israel War that started in October 2023 is also one of the significant events globally, both economically and politically.

Gaza is a part of the Palestinian territories, situated on the eastern coast of the Mediterranean Sea. It shares a border with Egypt and has an area of 365 square kilometers, with a population of approximately 2 million. Following Hamas's victory in the 2006 elections, it has faced international isolation, and Gaza is often characterized as the world's largest open-air prison (Ateş, 2009).

On October 7, 2023, Hamas initiated an operation against Israel named "Aqsa Storm." The operation targeted military points, airports, and strategic locations. Numerous Israeli cities, including Tel Aviv, experienced rocket, parachute, and motorcycle attacks. Hamas took several civilians

and military personnel as hostages. In response, Israel launched an operation called "Iron Swords" to target objectives in Gaza. The shift of Israeli attacks towards civilian targets led to a significant humanitarian crisis (NTV 2024).

In this research, we aim to understand the impact of the Hamas-Israel conflict on financial markets by examining the effects on key Middle Eastern countries' stock indices such as the United Arab Emirates, Israel, Qatar, Egypt, Oman, Jordan, and Turkey. The primary focus is on identifying abnormal returns in stock indices since October 7, 2023, and comparing these returns with periods before and after the conflict. The event study method will be employed as a robust tool to analyze the effects of the conflict on stock indices. This analysis goes beyond short-term fluctuations in stock valuations, helping us comprehend the long-term effects of the conflict on financial markets.

This study represents a significant initial step in examining the impact of the Hamas-Israel conflict on Middle Eastern stock indices; however, there are some shortcomings and suggestions for future research. The focus of this study is on abnormal returns in stock indices, delving into the micro-level effects on sectors and individual firms. It is essential to further investigate the impact of the conflict on sectoral and firm performances. Additionally, a combined analysis with other economic indicators before and after the conflict could provide a more comprehensive understanding of financial market reactions.

Another limitation is the focus of the study on a restricted time frame due to the employed methodology. Future research endeavors could explore the long-term financial impacts of the conflict and perhaps assess economic improvements or declines emerging after the conclusion of the conflict. Furthermore, to comprehend the resistance and response capacities of stock indices to similar political events, studies could be conducted over an extended time frame. Lastly, the study solely concentrates on stock indices. Future investigations might delve into the effects on foreign exchange rates and gold prices. Addressing these limitations will contribute to future research achieving a more comprehensive and in-depth understanding.

2. Literature Review

The Hamas-Israel conflict is a consequence of a longstanding dispute and tension in the region. Studies examining the impact of this conflict on financial markets are limited. This literature review aims to identify existing knowledge gaps regarding the effects of the Hamas-Israel conflict on stock indices by summarizing previous research that employed a similar methodology, focusing on the recent Russian invasion of Ukraine and the COVID-19 pandemic. The goal is to outline the current gaps in understanding the impact of the Hamas-Israel conflict on stock market indices.

Chen & Thomas, (2006) utilized event study methodology to assess the impacts of terrorism on global capital markets. They examined the response of the United States capital market to 14 terrorist/military attacks dating back to 1915. Additionally, they investigated the reactions of global capital markets to two recent events: Iraq's invasion of Kuwait in 1990 and the terrorist attacks on September 11, 2001. The findings indicate that the United States capital markets exhibit greater resilience compared to the past and recover more swiftly from terrorist attacks than other global capital markets.

Guidolin & Eliana, (2010) applied the event study methodology to examine 101 instances of intra and interstate conflicts between 1974 and 2004. They found that a significant portion of these events had a substantial impact on stock indices, exchange rates, and commodity prices. On average, national stock markets were more likely to exhibit positive responses to the onset of conflicts than negative reactions. The authors also identified that most events occurred in the Asia and Middle East regions.

Kollias, Stephanos, & Apostolos, (2011) focused on the analysis of the impact of two terrorist attacks, the March 11, 2004, Madrid bombings, and the July 7, 2005, London bombings, on stock markets using Event Study and GARCH methods. It revealed significant negative abnormal returns in most sectors in Spain, while London markets did not show a similar pattern. The study indicated that the recovery in the Spanish market was slower compared to the London market. The overall findings suggested a temporary impact on returns and volatility, rather than a prolonged effect.

Mnasri & Salem, (2016) employed an event study method and a developed bootstrap test to evaluate the impact of terrorist attacks on the volatility of stock markets in 12 MENA countries. The results indicated that the impact of terrorist attacks on financial markets lasted for approximately 20 days, longer than in advanced markets. The study emphasized the need to consider regional specifics in understanding the aftermath of terrorist events.

Güneysu, (2022) investigated the impact of Russia's military operation against Ukraine on the stock returns of companies listed in the BIST Food Index using the event study method. The positive abnormal returns observed on the day of the event (February 24, 2022) were deemed insignificant. However, both positive and negative abnormal returns obtained before and after the event were found to be significant. The presence of abnormal returns in the BIST Food Index suggested that the market was not semi-strong form efficient.

Yousaf, Patel, & Yarovaya, (2022) examined the impact of the conflict between Russia and Ukraine on G20 countries and selected other country stock markets using the event study method. The analysis of abnormal returns before and after the event date (February 24, 2022) indicated strong negative effects, especially on stock prices. Hungary, Russia, Poland, and Slovakia were among the first markets to exhibit negative responses before the event, while Germany, India, Italy, Japan, Romania, South Africa, Spain, and Turkey were negatively affected after the event. Regionally, both Europe and Asia were negatively impacted by the invasion.

Sun, Song, & Zhang, (2022) aimed to measure the response of stock markets to the Russian invasion using the event study method. The study documented the differential impact on markets depending on the severity of the conflict on countries' industries. In European Union countries, firms experienced substantial cumulative abnormal returns after the event, with a gradual reduction as distance from the conflict increased. The financial and services sectors in EU countries were most negatively affected, while the manufacturing sector also experienced negative effects. Notably, Russian oil and gas firms were adversely affected, contributing to the perception that the crisis could exert pressure for a swift resolution.

Yudaruddin et al., (2023) examined 2376 companies operating on the Fast-Moving Consumer Goods (FMCG) sector investigating the impact of Russia's invasion of Ukraine. The invasion significantly affected the global FMCG market negatively. Measurements of the sector's negative reactions were taken both before and after the event, with the beverage and home products sectors experiencing the most severe consequences. NATO member countries shifted from soft reactions before the invasion to strong responses after the invasion commenced.

Charkasov, Ari, & Sarikovanlik, (2023) focused on the comprehensive operation initiated by Russia against Ukraine, using the event study method and designating the start date of the operation, February 24, 2022, as the event day. The impact on selected investment instruments, including gold, crude oil, Euro/Dollar exchange rate, and the MSCI ACWI index representing world stock markets, was examined. While gold and crude oil prices exhibited positive responses, the Euro/Dollar exchange rate and the MSCI ACWI index showed negative reactions. Particularly, gold prices demonstrated stronger reactions, supporting the view that gold is considered a safe haven during crisis periods. The study concluded that the examined variables' significant abnormal returns suggested that the financial markets where these variables traded were not semi-strong form efficient.

Sahl, Wijayanto, & Listyorini, (2023) investigated the impact of the escalation of tension between Ukraine and Russia, turning into a conflict on February 24, 2022, on the coal and gold sectors of the Indonesian capital market, using the event date as the focal point. Following the event, the activity volume in Indonesia's coal subsectors notably increased. The market volatility in shares within the coal and gold sectors experienced significant changes after the event.

Obi, Waweru, & Nyangu, (2023) used the EGARCH model and event study methods to examine stock markets in African and G7 countries, the event date of the Ukraine-Russia conflicts starting on February 24, 2022, as the key date. The analysis explored the impact of the conflict on stock markets in terms of political and economic connections. G7 countries strongly opposed Russia's invasion of Ukraine, resulting in significant and lasting abnormal losses in the early stages of the conflict. This contradicted the perception that developed markets were more efficient. The EGARCH results indicated the presence of volatility, with leverage effects observed only in Canadian and U.S. markets. A sharp rise in commodity prices, particularly in grains and fuel, caused significant adverse effects on countries dependent on the dollar and imports. The study provided insights into mitigating the impact of shocks on currency and commodity prices in dollar-dependent and import-dependent countries.

Pandey, Kumari, Palma, & Goodel, (2024) aimed to assess whether happier countries are more or less concerned about tragic events affecting others by measuring the impact of the Hamas-Israel conflict on the markets of happy countries. Using the event study method with 71 global stock indices, the study found that the conflict had an immediate impact on markets, emphasizing the importance of happiness levels and socio-economic well-being in market resilience. The research highlighted the need for governments to focus on comprehensive measures to increase societal well-being and contribute to more market stability and resilience in the face of geopolitical conditions.

3. Methodology

Event study, which has a long history in the financial literature, is generally an ideal method for analyzing abnormal changes in the prices of financial assets in the sample after a certain event has occurred. Event study has three important assumptions. The first assumption is related to the efficient markets hypothesis, which is one of the most important pillars of the event study. The efficient markets hypothesis is based on the assumption that securities reflect all information in the market (Fama, 1991). Fama (1970) explains the efficiency of markets in three forms: weak form efficient market, semi-strong form efficient market and strong form efficient market. All

information reflected in the prices of financial assets in a weak-form efficient market is historical data. Therefore, in a weak-form efficient market, investors cannot generate abnormal returns using historical information. In a semi-strong form efficient market, all publicly available information as well as historical information is reflected in the prices of financial assets. The information in this form reflects not only historical data, but also information such as dividend announcements, monthly and annual reports, information in the press, and sustainability reports. Therefore, market participants can earn above-average returns from all kinds of information disclosed to the public by having prior knowledge. In a strong-form efficient market, it is assumed that all information about financial assets is reflected in prices. Therefore, market participants cannot earn abnormal returns in such a market.

In the event study, the effect of new information on the price of financial assets is tested. Therefore, event study assume that markets are efficient in a semi-strong form (McWilliams and Siegel, 1997; Ang, 2015).

The second assumption is that the event should be unexpected by market participants and represent new information for investors. In the event study, abnormal returns can be assumed to be a reaction to new information in the market. The third assumption is based on the claim that a researcher isolates the effect of one event from the effects of other events. This is perhaps the most critical assumption of the methodology (McWilliams and Siegel, 1997).

Event study generally consists of seven steps (Campbell et al., 1997): Event definition, choice of selection criteria, measuring normal and abnormal returns, choice of estimation procedure, testing procedure, empirical results, and interpretation of results.

In this study, October 7, 2023, the date when the Israeli-Palestinian war started, is taken as the event date for the analysis.

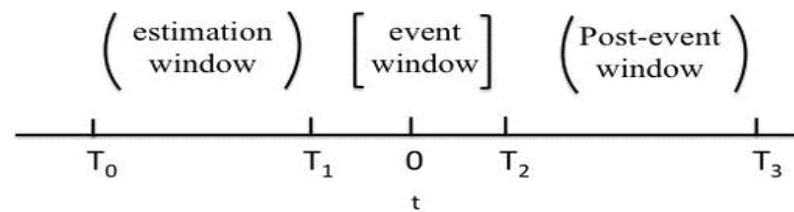


Figure-1: Event Study Timeline

In the study, the estimation window is determined as 120 days with T_{-130} and T_{-10} (Benninga, 2014). In Figure 1, the estimation window represents the period between T_0 and T_1 . In Figure 1, the pre-event period is between T_1 and t ; event day t ; the post-event period represents the periods between t and T_3 . In the second step, the event windows must be determined. In the study, abnormal returns (AR) are calculated in the $(-7...+7)$ window for a total of 15 days. Additionally, cumulative abnormal returns (CAR) are calculated in the $(-7...+7)$ event window.

There are many different methods of applying the event study method. Dyckman et al. (1984) stated that the Least Squares market model produced better results in their studies with different models. Accordingly, in the market model, normal returns are calculated with the following formula:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \quad (1)$$

where $R_{i,t} = \ln(p_{i,t}/p_{i,t-1})$ is the daily return of the index in t period (dependent variable); α_i constant term; β_i represents the systematic risk that measures the sensitivity of the index return ($R_{i,t}$) to the market index (MSCI All-Country World Equity Index). $R_{m,t} = \ln(p_{m,t}/p_{m,t-1})$ represents the return on day t of the relevant market index. $\varepsilon_{i,t}$ represents the error term of the model. Accordingly, the expected return of a index is calculated as in the following equation:

$$E(R_{i,t}) = \alpha + \beta(R_{m,t}) \quad (2)$$

where α and β show the constant and slope coefficients of the regression model. RM_{mt} represents the rate of return of the benchmark index (MSCI All-Country World Equity Index) on day t . The α and β coefficients are calculated with (T_{-130} and T_{-10}) 120-day estimation data. Accordingly, abnormal returns are calculated as in the following equation:

$$AR_{it} = R_{it} - ER_{it} \quad (3)$$

where AR_{it} represents the abnormal return of i index on day t . R_{it} represents the realized return of i index on day t and ER_{it} represents the normal return of i index on day t .

The abnormal returns (AR) and average abnormal returns for each day in the event window period are calculated as in the following equations:

$$AR_t = \frac{1}{N} \sum_{i=1}^N AR_{it} \quad (4)$$

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AAR_{it} \quad (5)$$

where AR_t is the abnormal return on day t and N is the total number of indices. The cumulative abnormal returns and cumulative average abnormal returns for the event window period are calculated as in the following equations:

$$CAR_{(t_1, t_2)} = \frac{1}{N} \sum_{i=1}^N AR_{(t_1, t_2)} \quad (6)$$

$$CAAR_{(t_1, t_2)} = \frac{1}{N} \sum_{i=1}^N AAR_{(t_1, t_2)} \quad (7)$$

where cumulative abnormal returns (CAR) and cumulative average abnormal returns (CAAR), shows the start of the t_1 event window and the date when the t_2 event window ends. This means that the cumulative abnormal return (CAR) and cumulative average abnormal returns (CAAR) are the sum of all abnormal returns during the event window.

The Materials and Methods should be described with sufficient details to allow others to replicate and build on the published results. Please note that the publication of your manuscript implicates that you must make all materials, data, computer code, and protocols associated with the publication available to readers. Please disclose at the submission stage any restrictions on the availability of materials or information. New methods and protocols should be described in detail while well-established methods can be briefly described and appropriately cited.

Research manuscripts reporting large datasets that are deposited in a publicly available database should specify where the data have been deposited and provide the relevant accession numbers. If the accession numbers have not yet been obtained at the time of submission, please state that they will be provided during review. They must be provided prior to publication.

Interventionary studies involving animals or humans, and other studies that require ethical approval, must list the authority that provided approval and the corresponding ethical approval code.

4. Data Series and Application

This study aims to examine the effects of the Hamas-Israel conflict on the key stock market indices of Middle Eastern countries and Turkey, starting from October 7, 2023. For this purpose, the fundamental stock market index prices of seven countries, namely the United Arab Emirates, Israel, Qatar, Egypt, Oman, Jordan, and Turkey, as shown in Table 1, have been utilized.

Table 1: Countries and Indices Included in the Analysis

Countries	Indices	Event Date
United Arab Emirates	DMF	7.10.2023
Israel	TA35	7.10.2023
Qatar	QE	7.10.2023
Egypt	EGX30	7.10.2023
Oman	MSM30	7.10.2023
Jordan	SE	7.10.2023
Turkey	BIST100	7.10.2023

The data for the study were generated using the daily closing prices of stock market indices for seven selected countries between .../.../2022 and October 14, 2023. As per the structure of the Event Study, the MSCI-ACWI index was chosen as the comparison index. The data used in the study were obtained from the Yahoo Finance website. Abnormal Returns (AR) values and t-values for the selected country indices, designated as the event date on October 7, 2023, are presented in Table 2a and Table 2b.

Table 2a. Abnormal Returns 7 Days Before and After the Event Day

AR	UAE (DFM)	t-value	Israel (TA 35)	t-value	Qatar (QE)	t-value	Egypt (EGX 30)	t-value
-7	- 0.0063	0.2874	- 0.0064	0.4877	0.0072	0.498	0.0205	0.1767
-6	0.0007	0.9057	0.006	0.5153	- 0.0053	0.6178	0.0112	0.4594
-5	0.0041	0.4882	- 0.0017	0.8537	- 0.0012	0.91	0.0056	0.7113
-4	0.0051	0.3888	0.0177	0.0563*	0.0014	0.8951	-0.01	0.5088
-3	- 0.0038	0.5205	- 0.0003	0.974	0.0034	0.7488	-0.015	0.3221
-2	- 0.0132	0.0268**	- 0.0108	0.2423	- 0.0082	0.4404	- 0.0051	0.736
-1	0.0027	0.6479	- 0.0057	0.5365	-0.012	0.2594	0.0058	0.7015
0	- 0.0278	0.0000***	- 0.0628	0.000***	- 0.0235	0.0281**	- 0.0324	0.0335**
1	- 0.0037	0.5315	0.0071	0.4415	0.001	0.925	0.0099	0.5131
2	0.0058	0.3272	- 0.0157	0.09*	0.0173	0.1048	- 0.0075	0.6201
3	- 0.0068	0.251	- 0.0049	0.5951	0.0105	0.3235	0.018	0.2351
4	- 0.0228	0.0002***	- 0.0111	0.2295	- 0.0068	0.5222	0.0505	0.001***
5	- 0.0075	0.2057	- 0.0022	0.8113	- 0.0009	0.9325	0.0472	0.0021***
6	- 0.0029	0.6238	0.0133	0.1504	- 0.0062	0.5595	0.006	0.6917
7	- 0.0134	0.0246	- 0.0131	0.1566	-0.014	0.1886	- 0.0197	0.194
CAR	- 0.0898	0.0001***	- 0.0906	0.012***	- 0.0373	0.3651	0.085	0.1482

The symbols *, **, and *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, using a two-sided test.

With the impact of the Hamas-Israel conflict that started on October 7, 2023, the market values of some examined countries' stock indices declined on the day of the event. To determine that these declines were not statistically random, we examined the p-values. The smaller the p-value, the more

significant the decline. It is observed that there is a significant decline at the 1% level in the market values of the selected indices for the United Arab Emirates and Israel, a significant decline at the 5% level for Qatar and Egypt, and a significant decline at the 10% level for Turkey. The p-values are provided in parentheses.

Table 2b. Abnormal Returns 7 Days Before and After the Event Day

AR	Oman (MSM 30)	t-value	Jordan (SE)	t-value	Türkiye (BIST100)	t-value
-7	-0.0043	0.4271	0.0005	0.9314	-0.0033	0.8759
-6	-0.0025	0.6441	0.0015	0.7963	0.0107	0.6128
-5	0.0005	0.9264	0.0013	0.823	0.0153	0.4695
-4	0.0144	0.0085***	0.0077	0.1864	0.0013	0.951
-3	0.0004	0.9411	0.0051	0.3807	-0.0249	0.2399
-2	-0.001	0.8533	0.0054	0.3534	0.0149	0.4812
-1	0.0006	0.9117	0.0076	0.1921	-0.0073	0.7299
0	0.0044	0.4165	-0.0061	0.2946	-0.036	0.0901*
1	0.0042	0.4379	-0.0075	0.198	0.0258	0.2234
2	0.0026	0.6309	-0.0084	0.1497	-0.0173	0.4136
3	0.0016	0.7674	0.006	0.3026	-0.0115	0.5866
4	-0.0148	0.0069***	-0.0014	0.8096	-0.0202	0.34
5	0.0022	0.6843	0.0043	0.4596	-0.0263	0.2146
6	-0.0045	0.406	-0.0084	0.1497	0.0191	0.3668
7	-0.0051	0.3465	0.0045	0.4391	-0.0356	0.0937
CAR(-7...+7)	-0.0013	0.9505	0.0121	0.5909	-0.0953	0.2454

The symbols *, **, and *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, using a two-sided test.

Before the event day, only Israel showed a significant increase of 10% in the market value of the selected index on the 4th day. However, following the event day, a significant decrease of 10% in the market value of Israel's selected index was observed on the 2nd day. On the 4th day, the United Arab Emirates and Oman experienced a significant decline of 1% in the market values of their selected indices, while Egypt showed a significant increase of 1% in the market values of its selected index. On the 5th day, only Egypt exhibited a significant increase of 1% in the market values of its selected index. This trend is more clearly depicted in Graph 1.

Over the observation period (15 days), when examining cumulative abnormal returns, significant negative returns at the 1% level were observed for the United Arab Emirates (-0.0898) and Israel (-0.0906). However, no significant value was obtained for other countries.

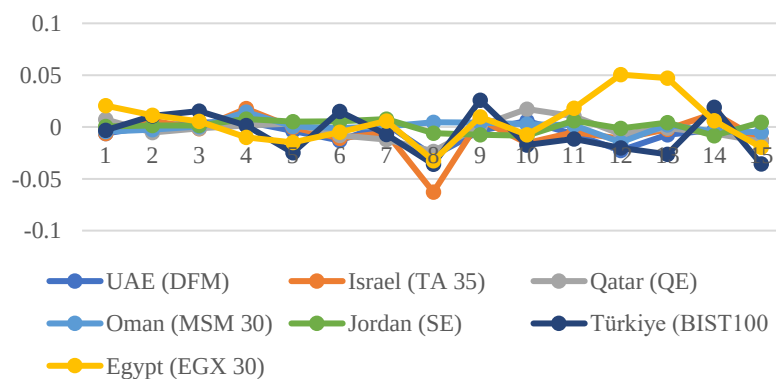


Figure 2. (-7...+7) Abnormal Returns (AR)

The graph clearly illustrates the return losses for the United Arab Emirates, Israel, Qatar, Egypt, and Turkey on the event day. Subsequently, abnormal returns in Egypt are distinctly visible after the event day.

5. Results

This study aims to examine the impact of the Hamas-Israel conflict, which began on October 7, 2023, on the stock market indices of the United Arab Emirates, Israel, Qatar, Egypt, Oman, Jordan, and Turkey. For this purpose, the performance of selected stock market indices was analyzed using the Event Study method for the 7 days before and after the day the conflict started.

On the day of the event, the United Arab Emirates (-0.0278) and Israel (-0.0628) experienced negative abnormal returns at the 1% significance level, while Qatar (-0.0235) and Egypt (-0.0324) at the 5% significance level, and Turkey (-0.036) at the 10% significance level. Four days before the event, only Israel (0.0177) obtained a positive abnormal return at the 10% significance level, while two days after the event, Israel experienced a negative abnormal return at the 10% significance level. Four days after the event, the United Arab Emirates and Oman obtained negative returns at the 1% significance level, while Egypt obtained a positive abnormal return at the 1% significance level. On the 5th day after the event, Egypt obtained a positive abnormal return at the 1% significance level. Looking at the entire selected 15-day period, both the United Arab Emirates and Israel obtained negative cumulative abnormal returns at the 10% significance level. These findings indicate that the Hamas-Israel conflict had a statistically significant impact on stock market indices.

In the analysis conducted using the event study method, examining the relationship between the MSCI-ACWI index and the stock market indices of Middle Eastern countries (United Arab Emirates, Israel, Qatar, Egypt, Oman, Jordan) and Turkey, this study found that negative and positive abnormal returns could be obtained before and after the event within the index scope. This suggests that even in a semi-strong form, the market is not efficiently operating. This study focuses on abnormal returns in stock indices and examines the effects at the micro level, including sectoral and firm-level impacts. Additionally, it is necessary to further investigate the effects of the conflict on sectoral and firm performances. Moreover, a combined analysis with other economic indicators before and after the conflict could provide a more comprehensive understanding of financial market reactions. The findings in this study align with similar studies by Yudaruddin et al. (2023), Güneysu (2022), and Sahl, Wijayanto, & Listyorini (2023). The subject of this study is the impact of a war that occurred in the Middle East and Turkey's financial markets approximately 4 months ago, and no similar study on this event has been found in the literature within such a short period.

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