

The Russia-Ukraine War's Impact on Stock Markets in Asia-Pacific, the United States, and Europe

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Abstract

We examine how the outbreak of the Russia-Ukraine war affected specific stock indices in the Asia-Pacific region, the United States, and Europe. Using event study methodology, we find that the event day's abnormal returns indicate that the war's outbreak had a significantly negative impact on most indices. For example, countries like Australia, Germany, Pakistan, India, Singapore, Vietnam, Mongolia, Malaysia, Bangladesh, and the Philippines show significantly negative returns the day after the war's outbreak. All indices continue to have significantly negative returns in the rest of the post-event window, except Australia, Bangladesh, India, and the Philippines. Our analysis enables us to identify which countries in the Asia Pacific region along with selected markets from the Europe region, the counties directly bordering Ukraine were most vulnerable to war news and when the immediate consequences of the war were better than expected, confirming these cross-sectional implications.

Keywords: Russia-Ukraine war; Stock Market Indices; Asia-Pacific region; Event study; panel analysis

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1. Introduction

When a government considers a policy decision, important economic investors and other economic agents struggle to predict its consequences. Typically, the struggle is carried out individually or in small groups, with the outcome visible to economists or policymakers. Experts can disseminate policy estimates, but their professed assessments lack objectivity and may reflect political considerations. Our analysis focused on revealed choices in financial markets in selected countries to understand the impact of the Russia-Ukraine war.

On February 24, 2022, Russia started a "special military operation," signalling the start of the Russia-Ukraine armed confrontation. Although Russian authorities never formally declared war on Ukraine, Russia's invasion of Ukrainian has resulted in massive casualties and Europe's fastest-growing refugee crisis since World War II. It also has severe financial consequences for markets and the global economy (Yousaf et al., 2022).

Military spending affects the economic growth of the countries. An increase in military spending has a negative impact on the economy and there is a negative relationship between military spending and the real growth of the economy (Ajefu, 2015). On the other side, developed countries like the United States and the UK had shown a significant positive relationship between military expenditure and stock market performance. The people of the high-income class and the authorities support the increase in military expenditure against the best interest of society (DiPietro et al., 2008). Defence spending surges during a conflict and negatively affects an economy's other sectors. Armed conflicts also disrupt trading links between war and non-war nations, negatively affecting business production, profitability, cash flows, and share prices. Yousaf et al. (2022) found that the war had a significant impact on equity markets for investors, portfolio managers, and regulators.

The wars and geopolitical situations affect the stock markets significantly. The Russia-Ukraine war has increased the geopolitical risk premium in stock markets (Chitu et al., 2022). The militarized conflict results in economic consequences as sanctions may be imposed and trade restrictions may take place. Russia is one of the biggest exporters of oil in the world and the largest exporter of food and gas to the neighbouring countries and Europe. The markets of the USA, Europe, and Asia-Pacific region are selected as Russia is a trade partner with most of them. This war has increased the geopolitical instabilities and these factors had an impact on the stock indices.

The Russian market is co-integrated with other markets of the world but to a different extent. There are a majority of the developing markets which are positively integrated with the Russian market whereas the developed markets have negative or no integration (Joshi & Joshi, 2021). The stock markets of different countries react

differently to this war situation due to their co-integration. The majority of the indices have a negative impact amid the expected slowdown in the economy.

On 24th February 2022, Russian President Putin announced the military invasion by Russian forces in Ukraine on national television. (Boungou & Yatié, 2022; Yousaf et al., 2022). In order to analyse the impact of the Russia-Ukraine military confrontation, we hypothesize that financial markets would respond to the initial statement anticipating future economic penalties and the likely outbreak of the two nations' armed conflict. As a result, we chose February 24 as an event day for this study and examined the behaviour of Asia-Pacific financial markets and other selected markets before and after that day.

We provide empirical evidence of the financial repercussions of the Russia-Ukraine war that decision-makers can use to make portfolio rebalancing choices, build successful hedging strategies, and make policy decisions during the current military operations.

To our knowledge, a few studies have focused on the volatility spillovers from the current Russia-Ukraine conflict on financial markets in the Asia-Pacific region, G20 nations, the United States, and Europe. (Alam et al., 2022; Yousaf et al., 2022; Köseoğlu et al., 2023; Izzeldin, 2023)

Our analysis contributes to the literature in several ways. First, we attempt to use prediction and financial market data to understand better the consequences of the Russia-Ukraine war.

Second, our analysis may prompt a rethinking of how the news along with other factors such as military spending, trade restrictions, sanctions, etc. can explain stock market movements. Traditional news events explain only a tiny portion of market movements, highlighting the importance of behavioural theories of stock price movements. Cutler et al. (1989) find that first-order political and military developments explain only a small portion of the variance. In contrast, our findings indicate that the conflict explains around 33% of the variation in price indices in Asia-Pacific markets between October 2021 and February 2022. Third, our paper reveals the impact on stock returns as a result of this war. Such information enables investors, portfolio managers, and policymakers to devise appropriate financial strategies.

This paper is organized as follows in the rest of the sections: Section 2 shows the review of related literature, Section 3 discusses the data and methodology, Section 4 summarizes the empirical results of the study and Section 5 includes the conclusion.

2. Literature Review

The academic literature regards war as a “black swan” event, along with financial crises, pandemics, natural disasters, elections, and terrorist attacks. All such events

have a global impact on equities markets (Yousaf et al., 2022). A black swan is an unpredictable event that is beyond normal expectations of a situation and has potentially severe consequences (Desai & Joshi, 2015). Stock volatility is significant during crises, leading to sharply falling stock prices in developed and emerging markets. However, emerging markets experience immediate, steep, and long-lasting consequences (Al-Rjoub & Azzam, 2012). Military conflicts raise investor anxiety about a firm's future profitability, causing stock prices to fluctuate (Yousaf et al., 2022). Academic interest in assessing the financial consequences of black swan occurrences recently intensified due to the unanticipated COVID-19 health crisis, centering on the reaction and recovery of various financial markets (Ganie et al., 2022; He et al., 2020; Kumar et al., 2021; Singh et al., 2020).

Nivorozhkin and Castagneto-Gisse (2016) studied the dynamic relationship between the Russian stock market and global markets after the 2014 Ukrainian crisis. They found that the Russian equities market's co-movement decreased by 30% to 50% relative to global equity returns and Brazil, Russia, India, and China (BRIC) markets, belonging to the same emerging market asset class as Russia. Their evidence shows a high positive association between the cumulative return of the Russian equities index and the Russian market's synchrony with the global index.

Kumar and Gupta (2021) examined the impact of structural breaks on the price discovery efficiency of the Indian equity futures market using significant events like the global financial crisis, change of government, demonetization, and Covid-19. The sample was divided into pre- and post-event periods to study the impact. They concluded that it is observed that there is a significant bi-directional causality between cash and futures markets and the cash market leads the futures market in price discovery. In addition, the global financial crisis triggered volatility in the Indian equity futures market, which reduced its price discovery efficiency, whereas, after the change in Government, bidirectional transmission of information was restored between the cash market and the futures market. Furthermore, the futures market played a leading role in absorbing volatility triggered by demonetization. COVID-19 did not significantly affect the price discovery efficiency of the Indian equity futures market.

Soni and Desai (2021) studied the mediating effect among various types of information available in the market for investors to invest their money into the stock market as a part of different behavioural biases in Gujarat State, India. They used Company History, IPO issues, and Location benefit of the company in their construct for applying SEM technique to check the mediating effect among these three constructs. They concluded that Company information is an indirect construct, the IPO issue is a dependent construct, and the location of the company is a mediating construct which is revealing that there is a significant impact of Company information on the IPO issue done by any corporate in the market.

Boungou and Yatié (2022) found that the armed crisis between Ukraine and Russia severely affected global stock returns. Although tensions between the two countries

persisted, financial market indexes' reactions to the war became more evident with Russia's invasion of Ukraine on February 24, 2022. However, global financial markets reacted less strongly in the weeks after the invasion. Finally, stock market indices performed worse in countries bordering Ukraine and Russia, and those countries requested a halt to Russia's incursion in Ukraine.

Doğan (2022) analysed the effect of the Russia-Ukraine war on the stock returns of 209 companies operating on the Borsa Istanbul (BIST). The ARs and CARs were positive on the battle's first day but turned significantly negative days from two days post-event through five days. Furthermore, the day before the conflict had the highest AR, while the second, third, and fourth days had negative ARs and CARs.

Li et al. (2022) found that overall spillovers across global financial markets surged dramatically during the Russia-Ukraine crisis. The directional spillover results revealed that the French and German stock markets were the greatest net volatility transmitters, indicating that these markets drive global market risk. By contrast, the Japanese stock market was the greatest net volatility recipient. Before the conflict, the U.S. stock market was a volatility transmitter, but it became a volatility receiver after the conflict. The role of the Chinese market changed from a volatility receiver to a volatility transmitter due to the war.

Alam et al. (2022) attempted to investigate the impacts of the Russian invasion crisis on the dynamic connectedness among five commodities and the G7 and BRIC (leading stock) markets. They applied the time-varying parameter vector autoregressive (TVP-VAR) method, which reflects the way spillovers are shaped by various crisis periods, and we found extreme connectedness among all commodities and markets (G7 and BRIC). They found that gold and silver (commodities) and the United States, Canada, China, and Brazil (stock markets) are the receivers of the rest of the commodities/market's transmitters of shocks during this invasion crisis.

Yousaf et al. (2022) found that ARs after the news of the 'special military operation' (event day) had a large, unfavourable impact on most markets, with Russia enduring the damage. The aggregate stock market's CARs were negative on the event day and post-event days, showing that the international stock markets responded unfavourably to the Russian-Ukraine war news on the event day and afterward. A country analysis of the CARs revealed that the stock markets in Hungary, Russia, Poland, and Slovakia reacted negatively before and after the event. By contrast, Australia, France, Germany, India, Italy, Japan, Romania, South Africa, Spain, and Turkey reacted negatively after the event. Finally, the regional CAR analysis showed a significantly negative influence on the event day and a few days afterward for the European and Asian countries.

Joshi (2023) used an event study approach to empirically study the effect of Nancy Pelosi's visit to Taiwan on stock indices performance in the Asia-Pacific region. The observed window comprises 10 days post-Nancy Pelosi's visit. He found that the effect of the visit has not been significant on the stock indices except Honk-Kong and

China that too for the very short term. The analysis enabled us to identify how not all the news would be having an impact on stock indices. The investment community and academics can predict stock return behaviour and the dynamics of the first two minutes during crises by observing how stock return behaviour changes in response to financial crises.

Izzeldin et al. (2023) analysed stock market and commodity reaction to the Russian-Ukrainian war. They compared the synchronization, duration, and intensity of the war to other crises. Intensity metrics, show the war to be muted compared to the Global Financial Crisis (GFC) or Covid-19.

Kamal et al. (2023) examined the effect of the Russia–Ukraine crisis on the Australian stock market. The event study shows significantly negative abnormal returns on the event day. The negative stock market reactions mostly disappeared in the post-event period. Small and medium-sized firms were more affected in the pre-event and event periods.

3. Data and Research Methodology

As previously noted, this research investigates the effect of the Russia-Ukraine war on specific stock indices of the Asia-Pacific region along with the United States, selected indices from the Europe region. This section discusses our data sources and research methodology used to accomplish this objective.

3.1. Data Sources

For the purpose of this study, we used February 24, 2022, as the breakout date as Russia started its military operations against Ukraine on that day. Although the Russia-Ukraine conflict affects numerous economies globally, we focus on the impact on stock indices in the Asia-Pacific region and selected stock indices from developed economies like the United States, the United Kingdom, Germany, and France and a few indices of developing economies in European region such as Poland, Hungary, Romania, Baltic, Italy, Greece, and Austria. The Asia-Pacific economies are some of the world's largest economies, including developing and developed countries.

The daily closing prices were collected from the official websites of the stock exchanges starting from 26th July 2021 to 11th March 2022. The markets for which the data was not available from their official website were collected from Bloomberg. The total data was for 171 days for each index having a total of 5130 observations. A list of all the indices is given in Table 1.

3.2. Methodology

For the purpose of this study using the event study methodology, we attempt to divulge the behaviour of the stock indices amid the Russia-Ukraine war. The event study is one of the most appropriate methodologies for examining the effect of an event on the index returns over the period of an event. Event study methodology

helps in estimating how the indices perform in the context of an event (Anwar et al., 2017).

Many studies recommended that the event study methodology is the most suitable tool to evaluate Abnormal Returns after the announcement of an event (Brown & Warner, 1985; MacKinlay, 1997). According to Bowman (1983), we estimate the abnormal returns using an event study, and it includes decisions over choice of the event of interest, the event window, the estimation window, and the estimation model which are required to be defined properly.

Therefore, we use event study methodology to examine the stock indices' behaviour after the Russia-Ukraine conflict outbreak (Brown & Warner, 1985; MacKinlay, 1997). The 21-day event window was between t_{-10} and t_{+10} . The estimation window was 150 trading days, between t_{-160} to t_{-11} . For an event study using daily data, Anwar et al. (2017) and Lalwani et al. (2019) suggest an estimation window of 150 days is sufficient for providing a standard for normal returns.

We calculated the expected returns of the indices using the market model (Dyckmen et al., 1984) and the daily expected return for the estimation window using equation 1.

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (1)$$

where $E(R_{it})$ is the index's expected return on day t , and R_{mt} is the MSCI All Country World Index's return on day t . We calculated the index's actual return using the natural log of returns using equation 2.

$$R_t = \ln\left(\frac{P_t}{P_{t-1}}\right) 100 \quad (2)$$

where P_t is the index's price on the event day t and P_{t-1} is the index's price on the day before the event day t .

We calculated the ARs as the difference between an index's actual and expected returns using equation 3.

$$AR_t = R_t - E(R_t) \quad (3)$$

where AR_t is an index's abnormal return on day t , and R_{it} is the index's actual return on day t . We calculated an index's CARs over a window from t_0 to t_{+1} using equation 4.

$$CAR_i(t_0, t_1) = \sum_{t=0}^1 AR_{i,t} \quad (4)$$

To understand the event's overall impact on the behaviour of the stock indices, we calculated the average abnormal returns (AARs). To understand the event's accumulated impact, we calculated the cumulative average abnormal returns (CAARs) for the event window using Equations 5 and 6.

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{i,t} \quad (5)$$

$$CAAR_t(t_0, t_1) = \sum_{t=0}^1 AAR_t \quad (6)$$

4. Results and Discussion

Table 1 shows the ARs and their respective statistical significance for the sample indices for the event day. In the Asia-Pacific region, the highest ARs are for the Pakistan stock index (-6.473%), followed by Vietnam (-5.451%), India (-4.336%), Mongolia (-3.911%), Singapore (-3.598%), Hong Kong (-2.607%), Malaysia (-2.471%), Sri Lanka (-2.432%), South Korea (-2.313%), Thailand (-2.104%), Bangladesh (-1.862%), China (-1.611%), Indonesia (-1.441%), Philippines (-1.413%) and Taiwan (-0.051%). Jakarta (0.491) and Laos (0.699) are the only developing countries with insignificantly positive returns on the event day. The AR of the Hong Kong index (-2.607) is negative but insignificant at normal levels.

Table 1. ARs on the Event Day (t_0)

Indices	ARs on the Event Day	t-statistic
Asia-Pacific		
ASX 200 (Australia)	-2.701	-3.006*
DSE (Bangladesh)	-1.862	-1.881***
Shanghai (China)	-1.611	-2.037**
Hang Seng (Hong Kong)	-2.607	-1.223
Nifty 50 (India)	-4.336	-5.010*
Indonesia	-1.441	-2.163**
Nikkei 225 (Japan)	-3.105	-2.827*
Laos (Laos)	0.699	1.217
FTSE Malaysia	-2.471	-2.503**
MSE 20 (Mongolia)	-3.911	-4.653*
NZX 50 (New Zealand)	0.553	1.168
KSE 30 (Pakistan)	-6.473	-9.125*
PSEi (Philippines)	-1.413	-1.401
Straits (Singapore)	-3.598	-3.893*
KOSPI (South Korea)	-2.313	-2.114**
CSE (Sri Lanka)	-2.432	-2.461**
Taiwan	-0.051	-0.040
THAI SET 50 (Thailand)	-2.104	-2.704*
HNX (Vietnam)	-5.451	-8.931*
Non-Asia-Pacific		
DAX (Germany)	-3.447	-3.971*
DJIA (The United States)	2.229	6.159*
FTSE 100 (UK)	-3.651	-5.171*
CAC 40 (France)	-3.336	-3.921*
WIG (Poland)	-1.558	-1.894**
BUX (Hungary)	-2.306	-2.571*
BET (Romania)	-2.918	-3.015*
Nasdaq Tallinn (Baltic)	-2.116	-2.312*
FTSE MIB (Italy)	-0.653	-0.964
ASE (Greece)	-0.531	-0.556
ATX (Austria)	-0.898	-0.932

Notes: * and ** indicate statistical significance at the 0.05 and 0.01 levels.

Source: Authors' Calculations from E-Views

Among the developed markets in the Asia-Pacific region, Japan (-3.105%) and Australia (-2.701%) have significantly negative ARs. New Zealand (0.553) has a positive but insignificant return on the event day. These results are in line with the previous studies (Frey and Kucher, 2003; Hudson and Urquhart, 2015, 2022; Goel et al. 2017; Yousaf et al. 2022 Richard et al. 2022). These results show that the Asia-Pacific markets are more sensitive to the Russia – Ukraine war. The market returns were negative as a 'shock' which led to an expected slowdown in the economic growth. The returns were negative as the war was anticipated to have worse effects on the economies such as crippling of the global supply chain, food shortage at the global level, and an increase in the inflation rates of the countries. The markets in Europe – the United Kingdom (-3.651%), Germany (-3.447%), France (-3.336%), Romania (-2.918), Hungary (-2.306), Baltic (-2.116) and Poland (-1.558), – have significantly negative ARs. Italy, Greece, and Austria have negative but insignificant returns on the day of the event. By contrast, the United States has a significantly positive return on the event date, which may result from several factors. Some market participants may believe that the Russia-Ukraine war's impact may be less severe for the United States than for other countries. The results of the United Kingdom are in line with the results of Ahmed et al. (2022) which have found significantly negative returns in the European stock market on the day of the event. The study had shown that the companies in the UK experience positive and significant AARs on the day of the event, but the returns of the index were significantly negative.

Table 2 shows the AARs and CAARs of all the sample indices combined for the event over the event window. The AARs are significantly negative on t_{-3} and t_0 and significantly positive on t_{+1} . The CAARs of all indices are significantly negative between t_0 and t_{+10} . These results are unsurprising given that Russia is a prominent trade member with many Asia-Pacific countries. The subsequent economic restrictions and sanctions on Russia severely affected the performance of the stock indices and the economies.

Table 3 presents the CARs of each stock index individually using the pre- and post-event periods t_{-10} , t_{-5} , t_{-1} , t_{+1} , t_{+5} , and t_{+10} . The results indicate that no country has a significant CAR for t_{-10} . For t_{-5} , Indonesia has a significantly positive CAR, whereas Malaysia, Pakistan, and Vietnam have significantly negative CARs. For t_{-1} , the CARs for China, Hong Kong, India, Indonesia, and South Korea are significantly positive but significantly negative for Bangladesh, Malaysia, Pakistan, and Vietnam. Thus, Table 3 shows that various countries' indices responded differently to the news of Russia's invasion of Ukraine based on the expected impact on their respective economies. Table 3 also reveals that the CARs of the majority of indices are negative in the days after the event (i.e., t_{+1} , t_{+5} , and t_{+10}). Australia, Bangladesh, Germany, India, Malaysia, Mongolia, Pakistan, the Philippines, Singapore, and Vietnam have significantly negative index returns on t_{+1} . Their CARs on t_{-5} and t_{-10} remain significantly negative for all these countries except Australia, Bangladesh, India, and the Philippines.

Table 2. AARs and CAARs for the Sample Indices during the Event Window

Day	AARs	AARs t-statistic	CAARs	CAARs t-statistic
t ₋₁₀	-0.033	-0.097	-0.035	-0.061
t ₋₉	-0.032	-0.097	-0.038	-0.058
t ₋₈	-0.035	-0.101	-0.042	-0.057
t ₋₇	-0.037	-0.102	-0.044	-0.054
t ₋₆	-0.040	-0.104	-0.044	-0.053
t ₋₅	-0.045	-0.108	-0.046	-0.051
t ₋₄	-0.057	-0.140	-0.108	-0.118
t ₋₃	-0.969	-2.421**	-1.121	-1.436
t ₋₂	0.315	0.726	-0.769	-1.328
t ₋₁	0.372	0.889	-0.447	-0.971
t ₀	-4.131	-9.455*	-4.326	-10.221*
t ₊₁	1.629	3.896*	-2.684	-6.396*
t ₊₂	0.181	0.423	-2.518	-4.224*
t ₊₃	-0.559	-1.332	-3.172	-4.219*
t ₊₄	-0.156	-0.363	-3.260	-3.812*
t ₊₅	-0.418	-0.993	-3.645	-3.796*
t ₊₆	-0.472	-1.113	-3.693	-3.713*
t ₊₇	-0.509	-1.122	-3.729	-3.678*
t ₊₈	-0.496	-1.120	-3.702	-3.584*
t ₊₉	-0.490	-1.112	-3.653	-3.501*
t ₊₁₀	-0.486	-1.114	-3.603	-3.417*

Notes: * and ** indicate statistical significance at the 0.05 and 0.01 levels.

Source: Authors' Calculations from E-Views

Only Indonesia has a significantly positive CAR on t₊₁, t₊₅, and t₊₁₀. Outside the Asia-Pacific region, European countries, like Poland, Romania, Baltic, and Hungary, which are the neighbouring countries with Ukraine affected the most. Germany and France are the most aggrieved markets because Russia is a prominent trading partner with these countries. Additionally, the war affected their trade arrangements, resulting from sanctions and restrictions.

We further examine the Russia-Ukraine war's effect on various stock indices based on the region and development levels. We investigate the event's impact by dividing the sample into panels: Panel A Asia-Pacific markets, Panel B indices from the developed markets, and Panel C indices from U.S. and European markets. Table 4 shows the AARs on t₀ are significantly negative for Asia-Pacific and developed markets but significantly positive for U.S. and European markets. However, the AARs changed signs on T₊₂ and became significantly positive for Asia-Pacific and developed markets. The CAARs of the Asia-Pacific and developed indices are significantly negative on the event day and post-event days but significantly positive on U.S. and European markets.

Table 3. CARs for the Country Indices during the Event Window

	t ₋₁₀		t ₋₅		t ₋₁		t ₊₁		t ₊₅		t ₊₁₀	
	CAR	t-value	CAR	t-value	CAR	t-value	CAR	t-value	CAR	t-value	CAR	t-value
Australia	0.903	0.462	0.651	0.425	1.332	1.504	-2.463	-2.791*	-0.333	-0.216	0.301	0.140
Bangladesh	-0.252	-0.148	-0.553	-0.471	-1.153	-1.698***	-1.440	-2.001**	-1.003	-0.841	-3.910	-2.568**
China	0.390	0.227	1.339	0.961	1.758	2.218**	0.368	0.473	1.791	1.299	1.551	0.856
France	1.002	0.459	-0.330	0.188	1.332	1.372	-0.670	-0.702	-4.843	-2.903*	-5.494	-2.537**
Germany	0.612	0.283	-1.922	-1.130	-0.786	-0.832	-2.651	-2.761*	-6.017	-3.615*	-7.773	-3.628*
Hong Kong	0.516	0.141	1.271	0.439	4.273	2.661**	-1.603	-0.919	3.342	1.169	-1.286	-0.348
India	0.811	0.389	1.211	0.758	1.803	1.971**	-1.759	-1.921*	1.517	-0.972	-3.862	-1.894**
Indonesia	-1.005	-0.550	4.019	3.247*	2.699	1.983*	4.157	4.017*	4.121	3.518*	4.213	5.224*
Japan	0.132	0.054	-0.280	-0.150	1.113	1.084	-1.583	-1.546	0.753	0.421	-0.433	-0.191
Laos	-0.049	-0.032	0.621	0.397	0.444	0.491	0.563	0.627	1.081	0.702	2.080	1.031
Malaysia	-2.227	-0.777	-15.003	-6.509*	-13.129	-10.017*	-27.744	-21.359*	-30.476	-22.149*	-29.527	-21.487*
Mongolia	-0.751	-0.392	-1.577	-1.053	1.011	1.201	-2.430	-2.734*	-5.119	-3.367*	-9.012	-4.702*
New Zealand	0.159	0.092	1.031	0.759	0.551	0.693	0.758	0.990	1.321	0.973	2.143	1.245
Pakistan	-0.207	-0.096	-5.311	-3.148*	-5.819	-5.992*	-10.264	-10.545*	-26.001	-15.103*	-19.317	-8.443*
Philippines	0.402	0.191	0.171	0.105	0.63	0.623	-1.902	-1.995*	-3.034	1.822***	2.917	1.410
Singapore	0.162	0.066	-1.206	-0.684	0.236	0.236	-2.130	2.119**	-6.415	-3.722*	-8.612	-3.816*
South Korea	1.214	0.555	1.883	1.112	2.031	2.105**	0.015	0.014	1.788	1.051	2.272	1.037
Sri Lanka	0.290	0.125	-1.005	-0.595	-0.117	-0.110	-0.721	-0.743	-3.324	-2.017***	-5.612	-2.573**
Taiwan	-0.649	-0.252	-1.613	-0.870	-0.241	-0.201	-0.222	-0.194	2.321	1.180	-0.943	-0.410
Thailand	0.394	0.181	-1.381	-0.851	0.364	0.373	-1.259	-1.336	-1.911	-1.180	-3.282	-1.562
The United Kingdom	-0.221	-0.118	-0.471	-0.342	0.614	0.748	-0.387	-0.520	-1.955	-1.412	-3.450	-1.620
The United States	-0.451	-0.226	0.891	0.581	-0.334	-0.372	1.303	1.481	1.091	0.697	2.107	1.019
Vietnam	-0.906	-0.387	-5.142	-2.811*	-5.244	-5.011*	-8.612	-8.200*	-7.688	-4.219*	-5.882	-2.513**
Poland	-0.802	-0.357	-4.631	-2.647*	-4.712	-4.839*	-9.309	-8.961*	-6.671	-5.013*	-4.733	-4.016*
Hungary	0.963	0.802	-2.815	-1.383	-3.357	-3.411*	-5.523	-4.981*	-5.471	-5.001*	-2.003	-1.773
Romania	0.785	0.742	1.013	0.993	-2.463	-2.013*	-3.012	-2.864*	-0.948	-0.895	-0.663	-0.632
Baltic	-0.093	-0.089	0.133	0.127	-1.032	-1.008	-2.337	-2.189*	-2.017	-1.865*	-0.982	-0.952
Italy	0.381	0.296	0.961	0.894	-1.114	-0.999	-2.148	-2.073*	-3.238	-3.019*	-1.058	-1.011
Greece	0.465	0.449	0.888	0.837	-0.951	-0.907	-1.031	-1.008	-2.147	-2.004*	-1.159	-1.132
Austria	0.513	0.498	0.327	0.309	-1.073	-0.988	-1.964	-1.392	-2.003	-1.972*	-1.141	-1.096

Notes: * and ** indicate statistical significance at the 0.05 and 0.01 levels. Source: Authors' Calculations from E-View

Table 4. Panel-wise AARs and CAARs based on Regions and the Development of Markets

	t-10	t-8	t-6	t-4	t-2	t0	t+2	t+4	t+6	t+8	t+10
Panel A. Asia-Pacific Markets											
AAR	-0.023	0.111	-1.243	-0.312	0.921	-6.903	2.794	0.406	0.806	-0.282	0.138
AAR _t	-0.039	0.193	-2.250**	-0.539	1.651	-12.51*	5.138*	0.729	1.491	-0.509	0.251
statistic											
CAAR	-0.022	0.087	-1.159	-1.482	-0.533	-7.397	-4.601	-4.157	-3.411	-3.577	-3.529
CAAR _t	-0.018	0.081	-1.189	-1.786***	-0.978	-13.29*	-8.186*	-5.18*	-3.39*	-3.196*	-2.828*
t-statistic											
Panel B. Developed Markets											
AAR	0.014	-0.248	-1.472	0.641	0.212	-3.783	1.914	-0.703	-2.287	0.119	-0.846
AAR _t	0.023	-0.434	-2.681*	1.166	0.384	-6.911*	3.478*	-1.282	-4.177*	0.223	-1.541
statistic											
CAAR	0.013	-0.243	-1.711	-1.073	-0.855	-4.636	-2.743	-3.443	-5.715	-5.615	-6.441
CAAR _t	0.010	-0.226	-1.840***	-1.378	-1.571	-8.477*	-5.011*	-4.447*	-6.031*	-5.109*	-5.267*
statistic											
Panel C. U.S. and European Markets											
AAR	-0.139	0.031	1.063	-0.663	-0.193	1.367	-0.444	-0.036	0.211	0.606	0.287
AAR _t	-0.528	0.122	3.993*	-2.517**	-0.705	5.093*	-1.643	-0.142	0.791	2.249**	1.051
statistic											
CAAR	-0.141	-0.115	0.972	0.312	0.111	1.475	1.042	0.987	1.211	1.786	2.086
CAAR _t	-0.246	-0.207	2.081**	0.796	0.398	5.507*	3.874*	2.623*	2.597*	3.369*	3.483*
statistic											

Notes: * and ** indicate statistical significance at the 0.05 and 0.01 levels.

Source: Authors' Calculations from E-Views

5. Summary and Conclusions

We use event study methodology to examine the impact of the Russia-Ukraine war on selected stock indices in the Asia-Pacific region, the United States, and Europe region. As Table 1 shows, the ARs on the event day demonstrate that the commencement of the war had a significantly negative impact on most of the sample indices. A major exception was the United States with a significantly positive market response. Table 2 indicates that the CAARs of all combined indices were also significantly negative on the event day and subsequent days, indicating the detrimental impact of this event. However, the CAARs moderated each day after the event day through t-10. Table 3 reveals that the Asia-Pacific countries experiencing significantly negative CARs of their indexes on t+1, t+5, and t+10 were Malaysia, Mongolia, Pakistan, Singapore, and Vietnam. Only Indonesia experience significantly positive CARs for these three periods. Outside the Asia-Pacific area, European countries such as Poland, Greece, Italy, Austria, Germany, and France had the most distressed markets given that Russia had a major trading relationship with these countries. Table 4 shows the AARs of the Asia-Pacific and developed nation indices were significantly negative, but significantly positive for U.S. and European markets.

6. Implications and Limitations

Our results may interest policymakers and researchers concerning the changing aspects of investor sentiments during the Russia-Ukraine war and their impact on equity markets. The findings may help policymakers regulate and mitigate the impact and intensity of investor anxiety on financial markets. For example, policymakers may take actions to ensure financial stability and monitor the impact of rising geopolitical concerns on commodity prices and, as a result, inflation dynamics.

Our results may also interest investors, equity analysts, and portfolio managers interested in developing hedging strategies to deal with the market responses to such an event which are extraordinary. Extraordinary events are those the probability of which happening is very less and it suddenly hits the economy of the countries like geopolitical uncertainty, pandemic, natural calamity, etc. In this paper, we have discussed the Russia-Ukraine war event which is a geopolitical uncertainty. A continuing conflict increases the stock market volatility spillovers. Thus, understanding the drivers of volatility spillovers is critical to managing the impact of geopolitical uncertainty on the riskiness of portfolios.

Our study has several limitations. For example, it examines selected equity indices of the Asia-Pacific region, the United States, and Europe. Researchers can extend this topic to other stock indices and markets. Using other methodologies, they can also study the impact of similar conflicts to measure the cointegration, correlation, and impact of returns. This study analyses the impact of the Russia-Ukraine war on select indices. Future researchers can also make comparisons to understand how different events had had an impact on indices in the past and if it differs from the present results and the reason for the difference.

The studies done till now have discussed how this war had an impact on various countries' stock indices so researchers can also discuss the impact on the policies framed by the countries to deal with the situation. This would be an interesting study that can be done in the future to understand the policy formulations of different countries.

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