GEOPOLITICAL SHOCKS AND ASSET PRICING: GLOBAL CROSS-SECTIONAL EVIDENCE FROM DEFENSE AND AEROSPACE FIRMS AMID THE RUSSIA–UKRAINE WAR

ATM Adnan[1]✉, Md Arif Hasan Khan[2], Md Tapan Mahmud[3], Sabira Kumkum[3], Abdullah Al-Mamun[4]

[1] *BGMEA University of Fashion & Technology, Dhaka, Bangladesh*
[2] *Northern University of Business and Technology, Khulna, Bangladesh*
[3] *Bangladesh University of Professionals, Dhaka, Bangladesh*
[4] *University of Wollongong, Australia*

EUROPEAN JOURNAL OF BUSINESS SCIENCE AND TECHNOLOGY

Volume 11 Issue 2
ISSN 2694-7161
www.ejobsat.com

ABSTRACT

This study addresses a critical gap in geopolitical finance by examining the heterogeneous capital market reactions of 370 global defense and aerospace (D&A) firms to the 2022 Russia-Ukraine war. While the impact of geopolitical shocks on financial markets is well-documented, the specific determinants of intra-sectoral returns remain underexplored. Employing an event study methodology, this research quantifies abnormal returns around the invasion date and conducts cross-sectional analyses to test whether these returns are systematically moderated by firms' home country attributes, including geopolitical alignment (G7 vs. non-G7), economic status, and national defense budget levels. The empirical results reveal a profound and statistically significant divergence: firms domiciled in developed, G7, and high-budget nations experienced large positive abnormal returns, while those in other national contexts suffered significant losses. Critically, the analysis finds no evidence of a firm-size "leadership premium," as the performance difference between the industry's largest firms and their smaller counterparts was statistically insignificant. These findings suggest the market's reaction was a sophisticated assessment of sovereign fiscal capacity, where investors priced in a "geopolitical premium" for firms in nations with a credible ability to fund a military buildup, while penalizing those in fiscally constrained countries for perceived macroeconomic risk. This research contributes to the literature by demonstrating that during a systemic geopolitical crisis, a nation's macroeconomic and political attributes can dominate firm-specific characteristics in driving asset valuation.

KEY WORDS

geopolitical shocks, capital markets, event study, investor sentiment, defense and aerospace, Russia–Ukraine war

JEL CODES

G11, G12, G14

ADNAN, ATM, KHAN, Md Arif Hasan, MAHMUD, Md Tapan, KUMKUM, Sabira, and AL-MAMUN, Abdullah. 2025. Geopolitical Shocks and Asset Pricing: Global Cross-Sectional Evidence from Defense and Aerospace Firms amid the Russia–Ukraine War. *European Journal of Business Science and Technology,* 11 (2): 220–249. ISSN 2694-7161, DOI 10.11118/ejobsat.2025.013.

1 INTRODUCTION

The interplay between geopolitical instability and global financial markets represents a critical domain of economic inquiry, as such conflicts introduce significant, non-diversifiable systematic risk that can profoundly reshape asset valuations (Nemat et al., 2025). The full-scale invasion of Ukraine by Russia on February 24, 2022, stands as one of the most consequential geopolitical shocks of the 21st century, triggering a cascade of unprecedented economic sanctions (see Fig. 1), severe commodity price volatility, and a fundamental recalibration of the global security architecture (Auer et al., 2025; Sharma et al., 2024). The weighted Uncertainty Index (WUI) Index (see Fig. 2), a key measure of international tensions, surged to its highest level on record after the covid 19 breakout, signaling a period of extreme uncertainty for investors and policymakers (Ahir et al., 2022).

The immediate economic repercussions were global in scope; Brent crude oil prices surpassed $100 per barrel for the first time since 2014, European natural gas prices soared by over 50% on the day of the invasion, and agricultural markets faced dire disruptions, with wheat prices climbing over 50% in the subsequent months (Patidar et al., 2024). This shockwave rippled through equity markets, causing sharp sell-offs in major indices like the S&P 500 and Germany's DAX, while precipitating a collapse of over 45% in the Russian stock market, forcing its suspension (Izzeldin et al., 2023). The Russia-Ukraine conflict has also triggered a significant shift in global defense spending. In the aftermath of the invasion, nations around the world, particularly those in NATO and the Asia-Pacific region, reassessed their military readiness, leading to an unprecedented increase in military expenditure, which reached $2.24 trillion in 2022, marking a 9% year-on-year increase (Elgin et al., 2022; Swain, 2024). The European Union launched the "Readiness 2030" program, earmarking €800 billion for defense infrastructure, underscoring the growing militarization in response to the crisis (Soare, 2025). As a result, defense and aerospace companies emerged as crucial beneficiaries of this shift, as investor sentiment favored stocks within these industries amid the heightened geopolitical risk.

The performance of the Defense & Aerospace sector is intrinsically linked to geopolitical instability, with its market valuation often reacting predictably to the outbreak of international hostilities (Zhang et al., 2022; Gheorghe and Panazan, 2025). A substantial body of research applying this framework to military conflicts consistently demonstrates that Defense & Aerospace firms, often termed "war stocks" (Hudson and Urquhart, 2015) tend to

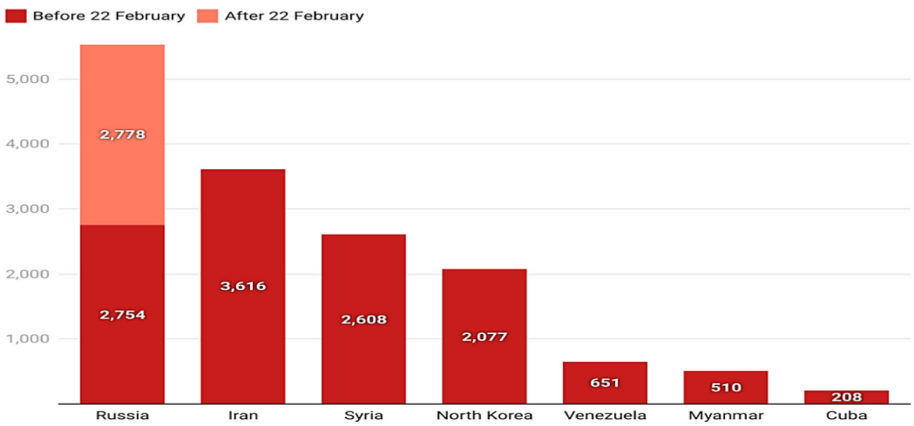


Fig. 1: Number of Sanctions imposed against Russia and other selected Countries since 2014 and after February 22, 2022 (Davydov et al., 2022)

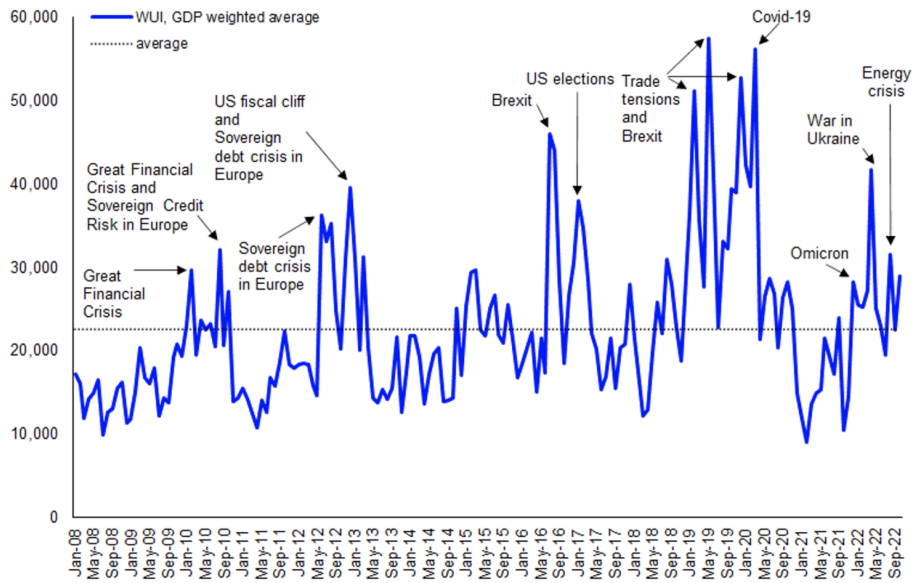


Fig. 2: Weighted Uncertainty Index 2008–2022 (authors compilation from `https://worlduncertaintyindex.com/`)

experience positive abnormal returns due to investor anticipation of increased government procurement and defense spending (Schneider and Tröger, 2004; Yudaruddin and Lesmana, 2024). Studies examining the Russia-Ukraine conflict have largely affirmed this trend, documenting significant positive returns for defense equities and heightened volatility across asset classes in the immediate aftermath of the invasion (Boubaker et al., 2023; Covachev and Fazakas, 2025). These market reactions are heavily influenced by investor sentiment, where fear and risk aversion drive portfolio reallocations toward perceived safe-haven assets and sectors poised to benefit from geopolitical turmoil (Maddodi and Kunte, 2024; Song et al., 2025). The redirection of capital into defense stocks is a clear manifestation of this behavioral shift, reflecting a changed perception of geopolitical risk that extends far beyond the defense industry into energy and technology sectors.

However, despite a growing consensus on the sector's overall positive reaction, the extant literature has largely treated the D&A industry's response as monolithic, creating a significant research gap. While numerous studies have analyzed aggregate market or sectoral impacts of the conflict (Assaf et al., 2023; Mishra et al., 2024), there is a notable absence of granular, firm-level, cross-country analyses that investigate the heterogeneity of this response within the global D&A sector. Prior research has not systematically examined how a firm's geographical domicile, the economic status of its home country, or its nation's geopolitical alignment moderates its valuation impact in a major conflict with distinct international battle lines. The Russia-Ukraine war, which sharply delineated the geopolitical landscape between G7-aligned nations and other global powers, provides an ideal yet underexplored setting to investigate these crucial cross-sectional differences. This knowledge gap constrains a nuanced understanding of how investors price not only event-driven risk but also a firm's specific national and political context during a crisis.

Therefore, the primary objective of this study is to address this critical void by examining the capital market reaction of a comprehensive global sample of 370 publicly listed Defense and Aerospace firms to the Russian invasion on the event date of February 24, 2022. Moving beyond a simple aggregate analysis, this paper employs an event study methodology followed by several cross-sectional analyses to identify the key determinants of differential market

reactions. Specifically, this research seeks to answer whether the abnormal returns are significantly different based on: (1) the firm's geographical location, with a comparison of Asian, European, and North & South American firms; (2) the economic status of the base country, distinguishing between developed and emerging economies; and (3) the geopolitical association of the home country, comparing firms based in G7 versus non-G7 nations. By providing a detailed, firm-level analysis on a global scale, this research offers a novel and granular contribution to the literature on geopolitical risk and asset pricing. It furnishes valuable insights into the financial dynamics of a strategic industry during a period of profound geopolitical instability, informing policymakers, investors, and academics.

The remainder of this paper is organized as follows: Section 2 presents the literature and theoretical framework, Section 3 details the data and methodology, Sections 4 and 5 present and discuss the empirical findings, and Section 6 concludes with policy implications and directions for future research.

2 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Extensive research documents that major geopolitical shocks such as wars, invasions, and political crises tend to trigger negative reactions in global stock markets, eroding investor confidence and increasing volatility (Leigh et al., 2003; Schneider and Troeger, 2006). This phenomenon, first observed in early studies like Niederhoffer (1971), is primarily driven by sudden risk repricing and heightened uncertainty. However, the aggregate market downturn often masks significant heterogeneity. During such crises, investors typically execute a "flight-to-safety," reallocating capital toward safe-haven assets like gold and oil while rotating into defensive equity sectors (Rigobon and Sack, 2005).

The performance of the Defense and Aerospace (D&A) sector, in particular, is intrinsically linked to geopolitical instability (Zhang et al., 2022). Financial literature consistently demonstrates that D&A firms, often termed "war stocks," tend to experience positive abnormal returns following the onset of military conflicts, acting as a "war hedge" (Hudson and Urquhart, 2015; Gheorghe and Panazan, 2024). This reaction is driven by investor anticipation of increased government defense budgets and new military procurement contracts (Schneider and Troeger, 2006). Studies examining the 2022 Russia-Ukraine conflict have largely affirmed this trend, documenting pronounced positive abnormal returns in the defense sector firms in both Europe and North America (Yudaruddin and Lesmana, 2024; Kakhkharov et al., 2024), which contrasted sharply with losses in most other industries (Covachev and Fazakas, 2025). Given this overwhelming and consistent evidence from both foundational and contemporary research, we formulate our primary hypothesis:

H_1: The Russia-Ukraine conflict led to statistically significant positive abnormal returns for global Defense and Aerospace firms.

While an overall positive reaction for the D&A sector is expected, contemporary research on the Russia-Ukraine war has moved beyond this aggregate observation to emphasize the profound heterogeneity of market responses. A growing consensus indicates that the magnitude of these abnormal returns is systematically moderated by a range of country and firm level characteristics. Studies have consistently documented that a firm's geographical proximity to the conflict (Joshipura and Lamba, 2024; Grinius and Baležentis, 2025), the economic status of its home country (Boubaker et al., 2022), and its nation's geopolitical affiliations (Yudaruddin and Lesmana, 2024) are all crucial determinants of investor reaction. Furthermore, evidence suggests a firm-level "flight to quality," where investors disproportionately favor industry leaders perceived as more resilient and

better positioned to secure large government contracts (Gheorghe and Panazan, 2024). This body of evidence provides a compelling rationale for dissecting the aggregate market reaction through a cross-sectional lens. Therefore, to investigate these specific sources of variation, the following hypotheses are proposed.

First, a firm's geographical proximity to a conflict zone is a critical determinant of investor risk perception. The literature identifies a "proximity penalty," where markets closer to a conflict experience greater economic disruption and more severe negative returns (Grinius and Baležentis, 2025). Yousaf et al. (2022), analyzing the 2022 invasion, found that European and Asian markets were hit hardest, while Silva et al. (2023) confirm that within Europe, physical proximity to the war drove the worst losses. This creates a compelling tension for European D&A firms, which are poised to benefit from increased regional defense spending but are simultaneously exposed to greater macroeconomic risks. This leads to our next hypothesis:

H_2: The stock market reaction of D&A firms differs significantly based on their geographical domicile.

Second, a firm's market reaction is expected to be contingent upon the economic status of its home country. The literature traditionally posits that emerging markets exhibit amplified vulnerability to global shocks due to limited fiscal buffers, higher political risk, and greater sensitivity to capital flight, making them inherently riskier during a crisis (IMF, 2025). Interestingly, some recent studies on the Ukraine conflict have nuanced this view, finding that developed markets, due to their high degree of globalization and trade exposure, sometimes suffered deeper aggregate market losses than their emerging market counterparts (Boubaker et al., 2022; Sun et al., 2022). However, this aggregate market logic is unlikely to hold within the specialized D&A sector. During a major military conflict, investors are not just assessing macroeconomic risk but are actively seeking firms best positioned to receive large, stable, and coordinated government defense contracts. These contracts are overwhelmingly awarded to firms in developed economies which possess the requisite scale, established government relationships, and political stability to ramp up production. Therefore, it is reasonable to expect a "flight to quality" within the sector toward firms based in developed nations, which are perceived as more reliable and direct beneficiaries of the ensuing increase in military spending. This distinction leads to the following hypothesis:

H_3: D&A firms domiciled in developed economies experienced significantly higher positive abnormal returns than their counterparts in emerging economies.

Beyond geography and economics, A nation's geopolitical affiliation is a critical source of cross-sectional variation in market reactions to conflict. The literature suggests that investors perceive firms based in countries with strong political and military alliances, such as the G7 or NATO, as more likely to benefit from coordinated increases in defense spending and economic stimulus during a crisis. This is consistent with evidence from Boubaker et al. (2022), who found that markets in NATO member countries experienced less negative, and in some cases even positive, abnormal returns around the Russia-Ukraine event, a phenomenon they attribute to a "military preparedness dividend." Similarly, studies focused on strategic sectors show that firms in NATO countries exhibited stronger positive reactions, as political allegiance is seen as a proxy for anticipated government action and contract allocation (Yudaruddin and Lesmana, 2024). However, the literature also indicates that political alignment alone is not a monolithic determinant, as its effects are often moderated by economic and geographic factors. Nuanced research reveals significant heterogeneity even within politically aligned blocs like the G7. For instance, Abbassi et al. (2023) attribute differing reactions among G7 firms during the Ukraine invasion to varying levels of trade dependence and energy exposure, which in some cases overrode the benefits of their shared political stance. This interplay is further refined by Silva et al. (2023), who demonstrate that while trade exposure to the conflict zone was a key driver of negative

returns outside Europe, physical proximity to the war was the dominant factor within Europe. Collectively, these findings underscore that a firm's market reaction to a geopolitical shock is highly cross-sectional, shaped by a complex interplay of its home country's political affiliations, its economic entanglement with the conflict, and its geographical location. We therefore hypothesize that investors anticipated firms domiciled within G7 nations would be the primary beneficiaries of new defense contracts.

H_4: D&A firms domiciled in G7 countries experienced significantly higher positive abnormal returns than their counterparts in non-G7 countries.

Finally, beyond country-level attributes, firm-specific characteristics, most notably size and market leadership, are expected to play a crucial role. The global defense industry is highly concentrated, with a small number of large, prime contractors receiving the vast majority of government spending on major weapons platforms (Smith, 2022). During geopolitical crises, investors not only rotate into the defense sector but also execute a "flight to quality" within it, favoring established market leaders. These large, dominant firms are perceived as the most direct and certain beneficiaries of increased military budgets due to their production capacity, R&D capabilities, and entrenched government relationships (Gheorghe and Panazan, 2024). Furthermore, such firms are better equipped to navigate the supply chain disruptions and economic volatility that accompany major conflicts, demonstrating greater resilience (Nemat et al., 2025). In contrast, smaller firms, which often act as subcontractors, may see benefits with a significant lag, and their future revenue streams are perceived as less certain. While many studies analyze aggregate sectoral data, the specific role of firm size in moderating these returns remains underexplored, representing a key firm-level nuance. This leads to our final hypothesis:

H_5: The top 100 D&A firms by defense revenue experienced a significantly stronger positive market reaction to the invasion compared to smaller firms in the sector.

The current literature establishes a strong basis for this research, confirming that the Defense and Aerospace (D&A) sector typically experiences positive stock returns during geopolitical crises like the Russia-Ukraine war due to anticipated increases in military spending. However, a comprehensive, firm-level cross-sectional analysis of the global D&A sector's response is largely missing. Specifically, it remains unclear how factors such as a firm's geographical location, its home country's economic status, and its geopolitical affiliation influence these market reactions. This study aims to address this critical gap by providing a detailed examination of these differential responses across 370 firms, offering a more nuanced understanding of how investors price geopolitical risk in this strategic industry.

3 DATA AND METHODOLOGY

Employing a standard event study methodology (MacKinlay, 1997; Brown and Warner, 1980), this research quantifies the impact of the Russia-Ukraine war on the stock returns of global defense and aerospace firms by analyzing abnormal (AR) and cumulative abnormal returns (CAR) around the invasion date. Furthermore, this research conducts cross-sectional analyses to determine if these reactions vary based on firm size, geography, geopolitical association and national defense expenditure. This approach is standard for isolating the financial impact of specific occurrences and has been effectively applied to geopolitical conflicts in prior research, e.g. Yousaf et al. (2022), Memdani and Shenoy (2019), Chen and Siems (2007).

Tab. 1: Firms' distribution by country, geopolitical membership, Economic status & Geo Graphic location, Defense budget & benchmark indices

No.	Country	No. of Firms	G7 Membership	Geographic Position	Economic Status	Defense Budget	Benchmark Indices
1	USA	93	Yes	America	Developed	High	S&P 500
2	China	71	NO	Asia	Developing	Medium	SSEC
3	Germany	38	YES	Europe	Developed	Medium	DAX
4	France	14	YES	Europe	Developed	High	CAC 40
5	UK	22	YES	Europe	Developed	High	FTSE 100
6	Italy	7	YES	Europe	Developed	Medium	FTITLMS
7	Sweeden	8	YES	Europe	Developed	Medium	OMXSPI
8	Canada	17	YES	America	Developed	Medium	S&P/TSX Composite Index
9	Australia	13	NO	Asia	Developed	Medium	ASX All Ordinaries
10	Israel	11	NO	Asia	Developing	High	TA-125 Index
11	Türkiye	2	YES	Asia	Developing	Medium	BIST 100
12	South Korea	26	NO	Asia	Developed	High	KOSPI
13	Brazil	2	NO	America	Developing	Medium	IBRX
14	Japan	15	NO	Asia	Developed	Medium	Nikkei 225
15	India	17	NO	Asia	Developing	High	BSESN
16	Singapore	8	NO	Asia	Developing	High	STI
17	Norway	6	YES	Europe	Developed	Medium	OSEAX

3.1 Data Description

The sample consists of 370 publicly traded defense and aerospace firms listed on 19 stock exchanges across 17 leading arms manufacturing and exporting countries, as identified using the Statista (2025) database. Daily stock price data and corresponding national benchmark indices were sourced from Investing.com and Yahoo Finance. To facilitate the cross-sectional analysis, firms were segmented based on their country of domicile into four distinct categories: (i) geographic region, following the World Bank framework; (ii) geopolitical alignment (G7 vs. non-G7); (iii) economic status (e.g., Developed, Developing) according to WTO; and (iv) national defense budget level in terms of GDP (Thielicke, 2024). (v) market leadership – Top 100 vs. others (Defense News, 2022). A comprehensive description of the sample distribution by country, along with these classifications, is presented in Tab. 1.

3.2 Event Study Methodology

3.2.1 Event Day, Estimation Period and Event Windows

The event date ($t = 0$) is defined as February 24, 2022, marking Russia's full-scale invasion of Ukraine. This selection is consistent with the established literature on this conflict war (Nerlinger and Utz, 2022; Ahmed et al., 2023; Yousaf et al., 2022). To establish a benchmark for normal returns, we use a 250-day estimation window spanning from $t - 265$ to $t - 15$. Following the standard established by Brown and Warner (1985) and MacKinlay (1997), this extended period ensures robust parameter estimates for the market model by mitigating the influence of short-term volatility and reducing the risk of model overfitting, thereby enhancing the accuracy of the abnormal return calculations (Aktas et al., 2007). The market reaction is then measured over a 21-day symmetric event window from $t-10$ to $t+10$, which is designed to capture both anticipatory market movements and subsequent price adjustments.

3.2.2 Return Model

To ensure statistical robustness, daily stock returns were calculated using the natural logarithmic model (Eq. 1). This standard approach yields time-additive returns and, critically, provides a distribution that more closely approximates the normality assumption required for the parametric tests used to assess statistical significance (Armitage, 1995).

$$R_{it} = \ln \frac{P_{it}}{P_{it-1}} \cdot 100, \tag{1}$$

where R_{it} is actual daily return of firm i on day t, P_{it} is the closing stock price of firm i on day t and P_{it-1} is the closing stock price of firm i on day $t-1$.

Expected (normal) returns were estimated using the single-factor market model, with parameters derived via Ordinary Least Squares (OLS). This model is standard in event study literature as it controls for systematic, market-wide movements, thereby reducing the variance of the abnormal return and increasing the statistical power of the test (Cable and Holland, 1999; Dyckman et al., 1984; MacKinlay, 1997). Its empirical validity has been well-established since the foundational work of (Fama et al., 1969). The model's demonstrated robustness across diverse market environments makes it particularly well-suited for this multi-country investigation of the global defense sector (Campbell et al., 2010). The market model is specified as follows:

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

where R_{it} is return of firm i on day t, R_{mt} is the market return on day t, α_i and β_i are the regression parameters for firm i, and ϵ_{it} is the error term. The market return R_{mt} for each firm is calculated based on the respective benchmark indexes where the firm is listed.

3.2.3 Abnormal Returns (AR) and Cumulative Abnormal Returns (CAR)

Once the parameters were estimated, the expected returns R_{it} for each stock during the event window were calculated, and the abnormal return was computed as:

$$\mathrm{AR}_{it} = R_{it} - \hat{R}_{it}, \tag{3}$$

where AR_{it} shows the abnormal return on index i on day t, and R_{it} shows the actual return on the index i on day t.

The Average Abnormal Return (AAR) across N firms for each day t in the event window was then calculated as:

$$\mathrm{AAR}_t = \frac{1}{N} \sum_{i=1}^{n} \mathrm{AR}_{it}, \tag{4}$$

where AAR_t is the Average abnormal return on day t, N is the total number of firms in the sample.

To capture the cumulative effect of the event over multiple days, Cumulative Abnormal Returns (CAR) for a firm i over an event window from day t_1 to day t_2 were computed as:

$$\mathrm{CAR}_{i(t_1,t_2)} = \sum_{t=t_1}^{t_2} \mathrm{AR}_{it}, \tag{5}$$

where $\mathrm{CAR}_{i(t_1\ ,t_2\ )}$ is the cumulative abnormal return for firm i from day t_1 to day t_2.

Finally, this study used AAR to calculate the cumulative average abnormal returns (CAARs) for the event window. The Cumulative Average Abnormal Return (CAAR) for the entire sample over the same period was calculated as:

$$\mathrm{CAAR}_{(t_1,t_2)} = \frac{1}{N} \sum_{i=1}^{N} \mathrm{CAR}_{i(t_1,t_2)}, \tag{6}$$

where $\mathrm{CAAR}_{(t_1,t_2)}$ is the cumulative average abnormal return over the event window t_1 to t_2.

3.3 Significance Testing

To ensure the statistical robustness of the findings, this study employs a suite of both parametric and non-parametric tests. For the significance of abnormal returns, the standardized cross-sectional t-test developed by Boehmer et al. (1991) is used, which accounts for event-induced heteroskedasticity by standardizing abnormal returns by their firm-specific, estimation-period standard deviation. To complement this and ensure robustness to non-normal return distributions and outliers, the non-parametric Wilcoxon signed-rank test

(Wilcoxon, 1945) is also applied. This dual-testing approach aligns with best practices in contemporary event study research, e.g., Nerlinger and Utz (2022), Yousaf et al. (2022). Given that financial return data frequently exhibit non-normality (e.g., fat tails and skewness), which can affect the reliability of parametric tests, the inclusion of the non-parametric Wilcoxon test serves as a crucial robustness check to validate our findings. To test for significant differences between subsample groups, this study uses an independent samples t-test with correction for unequal variances, and its non-parametric equivalent, the Mann-Whitney U test (Mann and Whitney, 1947).

4 FINDINGS, ANALYSIS AND DISCUSSION

4.1 Overall Market Reaction and Sustained Revaluation of the Sector

The empirical results (see Tab. 2 and Fig. 3) provide robust and statistically significant support for our primary hypothesis (H_1). As depicted in the AAR chart, the global Defense and Aerospace (D&A) sector experienced a substantial positive abnormal return of 1.464% on the event day (Day 0), which is highly significant (t-stat = 5.59). This finding is consistent with the established "war stocks" phenomenon, confirming that investors immediately priced in the anticipation of a sharp increase in government defense spending and military procurement following the invasion (Schneider and Troeger, 2006; Hudson and Urquhart, 2015). This "flight-to-arms" reaction aligns with contemporary studies on the Ukraine conflict which document a similar positive revaluation of the D&A sector, positioning it as a hedge against the widespread negative returns that permeated most other industries (Zhang et al., 2022; Covachev and Fazakas, 2025).

Critically, the analysis of cumulative returns reveals that this was not a fleeting, single-day event. The CAAR over the full $[-10, +10]$ event window reached 7.38%, a figure that is both statistically and economically significant (t-stat = 5.11). This sustained accumulation of abnormal returns demonstrates a fundamental and persistent revaluation of the D&A sector over a multi-week period, suggesting that as more information about the conflict's scale and the West's resolve became available, investors continually revised their long-term growth expectations for these firms upward.

A more detailed examination of the daily AARs reveals a sophisticated market response characterized by both anticipation and post-event information processing. The market did not wait for the formal invasion to begin reacting; there was a statistically significant positive AAR of 0.479% on Day -1 (t-stat = 3.04). This provides strong evidence of market anticipation, suggesting that investors were actively processing information regarding troop buildups and escalating political rhetoric, and pricing in the increasing probability of a full-scale military conflict. This finding aligns with the principles of semi-strong market efficiency and is consistent with research showing that markets in close proximity to the conflict began reacting even before the event date (Yousaf et al., 2022).

Intriguingly, the single largest abnormal return did not occur on the event day itself, but on Day +2, with an AAR of 2.426% (t-stat = 8.74). This delayed, yet more pronounced, reaction can be critically interpreted in several ways. First, it suggests that while the invasion itself was anticipated, its full implications including the speed and severity of the Western response, the announcement of unprecedented sanctions, and commitments to substantial military aid were not fully priced in on Day 0. The spike on Day +2 likely reflects the market's absorption of this new information, which clarified the immense scale of future demand for military hardware and technology. Second, this pattern suggests that the initial reaction on Day 0 may have been an underestimation of the conflict's likely duration and intensity. As the reality of a prolonged and major European war set in, investors drastically revised their expectations upward, leading to a second and

Tab. 2: Average Abnormal Returns (AAR) and Cumulative AAR (CAAR) around the event date with parametric and non-parametric significance tests

Event Day	AAR	Cross Sectional T Test	Wilcoxon Signed-Rank Test	Event Day	AAR	Cross Sectional T Test	Wilcoxon Signed-Rank Test
Average Abnormal Return (AAR)							
−10	0.048%	0.35	0.347	1	0.025%	0.11	0.11
−9	−0.212%	−1.21	−1.18	2	2.426%	8.74***	8.54***
−8	0.566%	3.25***	3.18***	3	1.436%	5.01***	4.89***
−7	−0.102%	−0.66	−0.64	4	0.040%	0.20	0.19
−6	0.334%	1.63**	1.59	5	0.068%	0.28	0.27
−5	0.396%	3.03***	2.96***	6	0.454%	1.84*	1.80*
−4	−0.046%	−0.29	−0.28	7	0.694%	2.92***	2.84***
−3	−0.166%	−0.89*	−0.87	8	−0.576%	−1.58	−1.54
−2	0.083%	0.52	0.51	9	−0.793%	−0.72	−0.71
−1	0.479%	3.04***	2.96***	10	0.590%	3.02***	2.94***
0	1.464%	5.59***	5.46***				
Cumulative Average Abnormal Return (CAAR)							
$[-1, 0]$	1.94%	6.85***	−6.90***	$[-2, +2]$	4.47%	9.75***	−9.87***
$[0, 0]$	1.46%	5.59***	−5.44***	$[-3, +3]$	5.74%	8.73***	−9.92***
$[0, +1]$	1.48%	5.04***	−5.68***	$[-5, +5]$	6.20%	8.07***	−9.16***
$[-1, +1]$	1.96%	6.43***	−7.37***	$[-10, +10]$	7.20%	5.11***	−6.41***

Note: This table reports the Average Abnormal Returns (AAR) for each event day ($t - 10$ to $t + 10$) and the Cumulative Average Abnormal Returns (CAAR) for various event windows for the global sample of 370 firms. For both the daily AARs and the cumulative CAARs, the provided cross-sectional t-test and Wilcoxon signed-rank test are used to evaluate the null hypothesis that the abnormal return is equal to zero. All AAR and CAAR values are presented in percent, with Day 0 representing the invasion date and significance levels denoted by asterisks: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

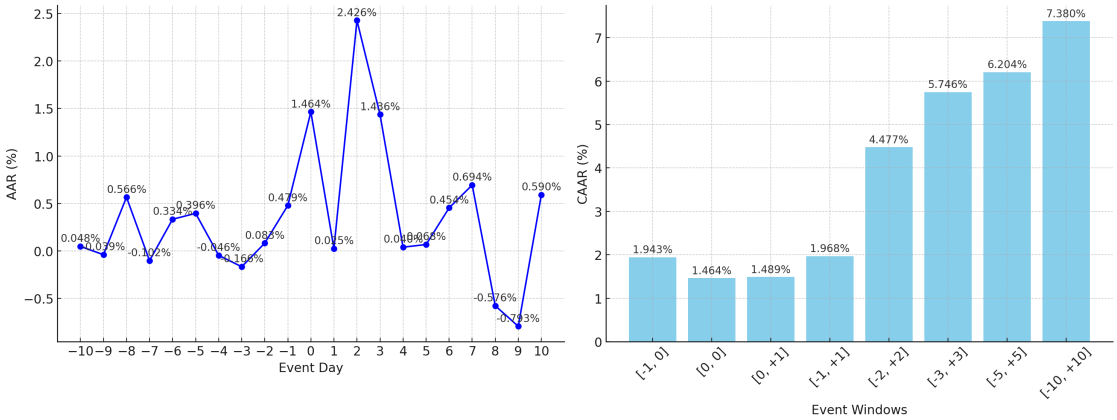


Fig. 3: Abnormal Returns: AAR Over Event Days and CAAR Across Event Windows

more powerful wave of capital rotation into the sector. The subsequent positive AARs on days +3, +6, and +7 further reinforce this narrative of sustained positive sentiment as the new geopolitical reality was digested by the market.

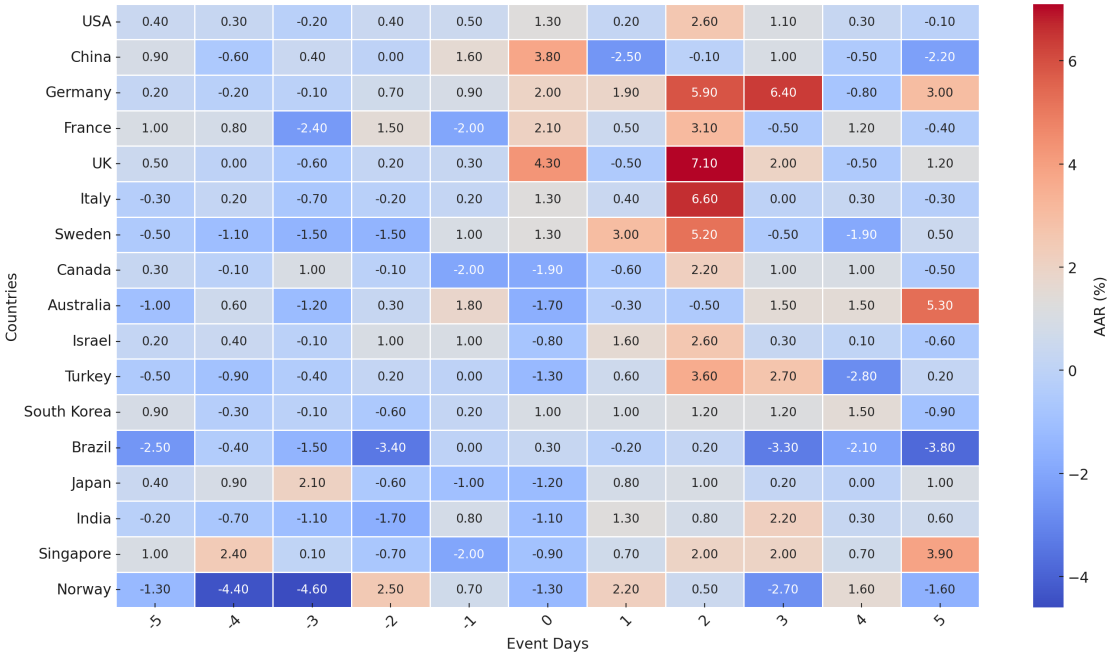
4.2 Firms Domicile-Wise Market Reaction Analysis

A granular, country-level analysis (see Tab. 3 and Fig. 4) of abnormal returns reveals a stark and theoretically significant divergence in market reactions, primarily driven by a nation's geopolitical alignment and geographical proximity to the conflict. The most powerful positive reaction was concentrated in European nations central to the NATO alliance and the United States. Firms in Germany, the United Kingdom, Italy, and Sweden experienced exceptionally large and statistically significant positive abnormal returns, with the most pronounced gains occurring not on the event day itself but in the immediate aftermath. For instance, German firms posted a staggering AAR of 5.90% on Day +2 and 6.40% on Day +3, while UK firms saw a massive AAR of 7.10% on Day +2. This powerful, synchronized surge critically reframes the "proximity penalty" discussed in the literature (Grinius and Baležentis, 2025); for the D&A sector, geographic closeness to the conflict transformed a regional macroeconomic risk into a powerful sectoral boon. This provides robust support for the "military preparedness dividend" theory, where investors priced in an imminent regional threat that would necessitate immediate and substantial budgetary reallocations across the continent (Boubaker et al., 2022).

Conversely, this bullish sentiment was largely absent in nations geographically distant from the conflict, even among politically aligned, developed economies. Firms in Canada, Australia, and Japan exhibited ambivalent or even negative returns, such as Canada's −1.90% AAR on Day 0. This divergence suggests that for these countries, the negative macroeconomic externalities of the war such as supply chain disruptions and heightened global risk aversion (Nemat et al., 2025) tempered or neutralized the positive sector-specific sentiment. The negative effect was even more pronounced in non-aligned emerging markets like Brazil and India, which posted significant negative AARs of −3.40% (Day −2) and −1.10% (Day 0) respectively. For these nations, a general "flight from emerging market risk" appears to have dominated investor decisions, a phenomenon well-documented during global crises (Mohamad, 2022; Keleş, 2023).

The unique cases of strategically positioned allies and non-aligned major powers further highlight the sophistication of the market's response. Israel, a leading defense exporter, and Turkey, a critical NATO member, saw strong positive AARs of 2.60% and 3.60% respectively on Day +2, indicating that investors were also rewarding firms for their combat-proven technology and strategic importance. Perhaps most revealing is the volatile reaction of Chinese firms: a sharp positive AAR of 3.80% on Day 0 was immediately erased by a significant negative reversal of −2.50% on Day +1. This sharp gyration likely reflects a rapid repricing of risk as initial speculation gave way to sophisticated investor fears of secondary sanctions and escalating geopolitical tensions with the West (Yang et al., 2023; Wang and Su, 2023). Collectively, these divergent trajectories demonstrate a highly rational market response, where the primary driver of positive returns was not simply the existence of conflict, but a firm's location within the political and geographic nexus of the Western alliance poised to respond to it.

The analysis of Cumulative Average Abnormal Returns (CAAR; see Tab. 4 and Fig. 5) moves beyond the immediate shocks to reveal the sustained and fundamental nature of this market revaluation. The powerful, upward-trending CAARs for firms in key European nations confirm that the positive daily AARs were not temporary spikes but compounded into a significant and lasting repricing of the sector. For instance, the massive daily returns for German firms on Day +2 and +3 accumulated into a remarkable CAAR of 19.92% over the $[-5, +5]$ window. This persistent accumulation,



Note: The heatmap displays Average Abnormal Returns (AAR) for different countries across event days (−5 to +5). The color intensity represents the magnitude of AAR values, with blue indicating negative values and red indicating positive values. This allows for easy comparison of market reactions before, during, and after the event across different countries. Countries with more red show positive AAR, while those with blue show negative or neutral responses.

Fig. 4: Heatmap of Average Abnormal Returns (AAR) Across Event Days for Different Countries

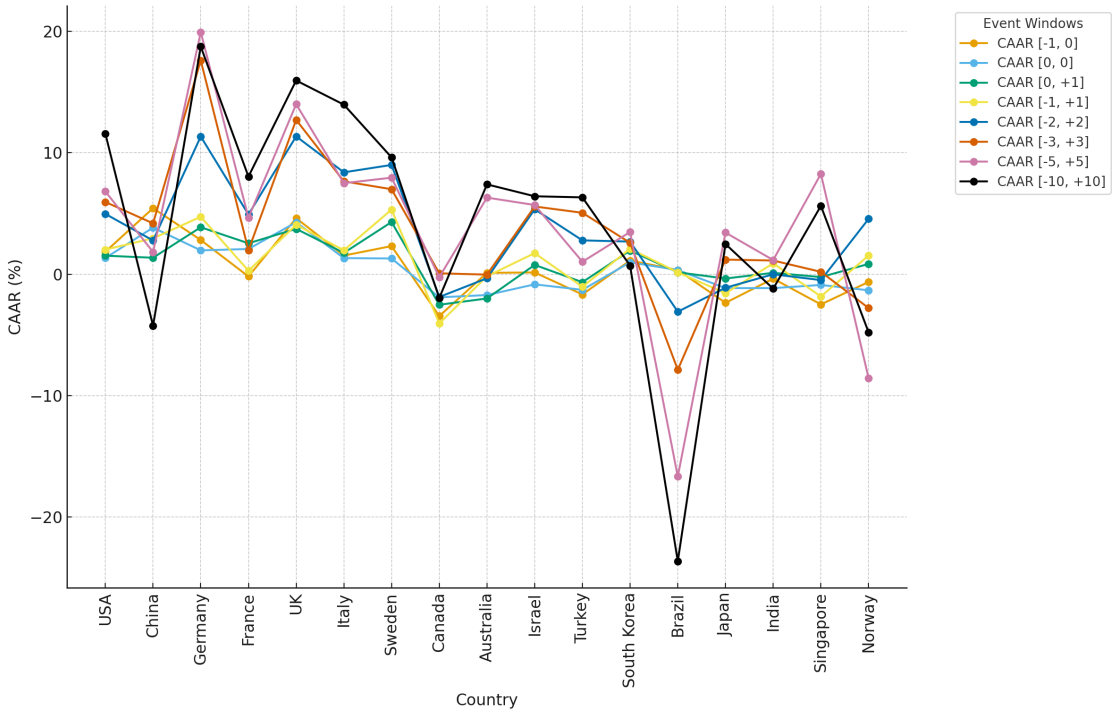


Fig. 5: Cumulative Abnormal Returns (CAAR) Across Countries for Different Event Windows

Tab. 3: Defense & Aerospace Firms' Country Specific Market Reaction (AAR)

Country (Firms)	Event Days	−5	−4	−3	−2	−1	0	1	2	3	4	5
USA	AAR	0.400%	0.300%	−0.200%	0.400%	0.500%	1.300%	0.200%	2.600%	1.100%	0.300%	−0.100%
(93)	CSect T	1.218	0.976	−0.335	1.124	1.722	2.967***	0.611	5.785***	2.885***	0.982	−0.319
	Wilcoxon	2.099**	1.801*	0.399	1.601	1.993*	3.099***	0.899	5.200***	2.701**	1.205	0.499
China	AAR	0.900%	−0.600%	0.400%	0.000%	1.600%	3.800%	−2.500%	−0.100%	1.000%	−0.500%	−2.200%
(71)	CSect T	3.167***	−1.113	1.469	−0.165	6.330***	6.506***	−11.970***	−0.737	4.506***	−1.673	−10.300***
	Wilcoxon	2.902**	1.703*	0.500	0.204	3.302***	3.504***	0.191	4.798***	2.794***	1.402	0.104
Germany	AAR	0.200%	−0.200%	−0.100%	0.700%	0.900%	2.000%	1.900%	5.900%	6.400%	−0.800%	3.000%
(38)	CSect T	0.777	−0.389	−0.217	1.460	1.840*	2.667***	1.528	4.516***	3.398***	−0.890	2.426**
	Wilcoxon	1.503	1.202	0.604	1.691	2.299	2.997***	1.799*	4.499***	3.409***	1.199	0.404
France	AAR	1.000%	0.800%	−2.400%	1.500%	−2.000%	2.100%	0.500%	3.100%	−0.500%	1.200%	−0.400%
(14)	CSect T	0.976	0.578	−1.329	1.049	−1.160	1.127	0.233	1.574	−0.190	0.547	−0.244
	Wilcoxon	1.295	0.993	1.795*	1.192	0.801	1.394	0.206	2.009	0.395	0.993	0.208
UK	AAR	0.500%	0.000%	−0.600%	0.200%	0.300%	4.300%	−0.500%	7.100%	2.000%	−0.500%	1.200%
(22)	CSect T	1.905*	−0.144	−2.070*	0.541	1.495	4.190***	−1.469	5.127***	1.633	−0.649	2.020*
	Wilcoxon	2.114**	0.805	1.394	0.998	2.297**	2.995**	1.501	4.602***	1.991*	0.897	1.106
Italy	AAR	−0.300%	0.200%	−0.700%	−0.200%	0.200%	1.300%	0.400%	6.600%	0.000%	0.300%	−0.300%
(7)	CSect T	−0.515	0.736	−1.409	−0.363	0.361	0.606	0.368	2.028*	−0.036	0.223	−0.269
	Wilcoxon	0.706	0.898	0.291	0.596	0.906	1.197	0.395	2.092*	0.303	0.809	0.405
Sweden	AAR	−0.500%	−1.100%	−1.500%	−1.500%	1.000%	1.300%	3.000%	5.200%	−0.500%	−1.900%	0.500%
(8)	CSect T	−0.347	−1.382	−1.812	−2.397**	0.587	0.576	1.201	1.648	−0.470	−1.215	0.308
	Wilcoxon	0.993	0.795	1.001	2.197***	0.998	1.395	1.298	2.799***	0.494	0.901	0.292
Canada	AAR	0.300%	−0.100%	1.000%	−0.100%	−2.000%	−1.900%	−0.600%	2.200%	1.000%	1.000%	−0.500%
(17)	CSect T	0.345	−0.187	1.246	−0.057	−1.830	−1.080	−1.029	1.741	0.750	−0.041	−0.413
	Wilcoxon	0.594	0.396	1.107	0.797	1.492	1.205	1.397	2.396**	1.201	0.319	0.506
Australia	AAR	−1.000%	0.600%	−1.200%	0.300%	1.800%	−1.700%	−0.300%	−0.500%	1.500%	1.500%	5.300%
(11)	CSect T	−1.819*	0.816	−1.486	0.119	1.809	−0.831	−0.107	−0.166	1.984*	0.505	1.414
	Wilcoxon	0.891	1.199	0.492	0.893	1.105	0.705	1.001	1.498	2.109**	1.306	0.605
Israel	AAR	0.200%	0.400%	−0.100%	1.000%	1.000%	−0.800%	1.600%	2.600%	0.300%	0.100%	−0.600%
(11)	CSect T	0.601	1.187	−0.278	1.386	1.473	−0.930	1.754	2.497**	0.825	0.101	−0.863
	Wilcoxon	0.301	1.199	0.296	0.996	1.192	0.797	1.299	2.199**	1.101	0.501	0.299
Türkiye	AAR	−0.500%	−0.900%	−0.400%	0.200%	0.000%	−1.300%	0.600%	3.600%	2.700%	−2.800%	0.200%
(2)	CSect T	−1.462	−2.994*	−5.083**	0.305	−0.210	−1.302	0.433	0.744	0.754	−1.167	0.124
	Wilcoxon	1.092	0.691	1.303	2.003*	1.498	0.796	1.101	1.492	1.195	1.003	0.897
South Korea	AAR	0.900%	−0.300%	−0.100%	−0.600%	0.200%	1.000%	1.000%	1.200%	1.200%	1.500%	−0.900%
	CSect T	2.190*	−1.033	−0.252	−1.706	0.784	0.879	1.159	2.748**	−0.449	2.236**	−1.837
(26)	Wilcoxon	1.797	1.008	0.504	0.999	2.299	2.199	2.091	4.394***	0.697	2.193**	1.711
Brazil	AAR	−2.500%	−0.400%	−1.500%	−3.400%	0.000%	0.300%	−0.200%	0.200%	−3.300%	−2.100%	−3.800%
(2)	CSect T	−12.800***	−1.948	−0.729	−1.094	−0.001	0.197	−0.165	0.083	−2.375	−1.891	−7.959**
	Wilcoxon	3.001***	1.203	−0.199	0.903	0.109	1.501	0.807	0.994	2.007	1.807	−8.159**
Japan	AAR	0.400%	0.900%	2.100%	−0.600%	−1.000%	−1.200%	0.800%	1.000%	0.200%	0.000%	1.000%
(15)	CSect T	0.715	1.452	1.515	−1.307	−1.860	−2.055*	0.863	2.627**	0.471	−0.066	1.302
	Wilcoxon	1.193	1.904	1.003	0.892	1.803	1.993*	1.201	2.505**	0.508	0.909	1.004
India	AAR	−0.200%	−0.700%	−1.100%	−1.700%	0.800%	−1.100%	1.300%	0.800%	2.200%	0.300%	0.600%
(17)	CSect T	−0.362	−2.113**	−1.815*	−3.620***	1.429	−2.549**	1.888*	1.435	2.014*	0.563	1.181
	Wilcoxon	1.501	3.895***	1.801*	2.092**	1.197	0.991	1.991	2.393	1.791	1.207	0.991
Singapore	AAR	1.000%	2.400%	0.100%	−0.700%	−2.000%	−0.900%	0.700%	2.000%	2.000%	0.700%	3.900%
(6)	CSect T	0.640	1.964	0.480	−1.227	−0.540	−1.130	1.234	1.006	0.435	0.542	1.920
	Wilcoxon	0.407	0.797	0.494	1.205	0.808	0.893	1.198	1.597	1.108	1.007	2.309*
Norway	AAR	−1.300%	−4.400%	−4.600%	2.500%	0.700%	−1.300%	2.200%	0.500%	−2.700%	1.600%	−1.600%
(4)	CSect T	−1.609	−1.310	−2.283	1.343	0.321	−1.670	2.487*	0.166	−0.861	1.356	−0.794
	Wilcoxon	1.297	0.991	−0.844	2.001	1.199	−1.906	1.106	0.492	−1.797	1.101	−1.493

Note: This table reports the Average Abnormal Returns (AAR) for each event day ($t-10$ to $t+10$) and the Cumulative Average Abnormal Returns (CAAR) for various event windows for the full global sample of 370 firms. For both the daily AARs and the cumulative CAARs, the provided cross-sectional t-test and Wilcoxon signed-rank test evaluate if the abnormal return is statistically different from zero. All return values are in percent. Day 0 is the invasion date. Significance levels are denoted by asterisks: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

also seen in the UK (15.94%) and Italy (13.95%) over the full event window, demonstrates that investors' positive sentiment grew stronger over time as the paradigm shift in European security policy became more evident. Conversely, the CAAR results confirm the enduring negative sentiment for firms outside the Western alliance. The negative daily returns observed for Brazilian firms compounded into a catastrophic CAAR of −23.63% in the $[-10, +10]$ window, indicating that the initial negative reaction was not an overreaction but the start of a sustained flight of capital. Perhaps most tellingly, the CAAR for Chinese firms illustrates a complete

Tab. 4: Country Specific CAAR

Country (Firms)	Event Windows	[−1, 0]	[0, 0]	[0, +1]	[−1, +1]	[−2, +2]	[−3, +3]	[−5, +5]	[−10, +10]
USA	CAAR	1.840%	1.330%	1.520%	2.020%	4.960%	5.940%	6.810%	11.570%
(93)	CSect T	4.030***	3.000***	3.040***	4.220***	7.020***	5.300***	6.430***	5.530***
	Wilcoxon	4.278***	2.931***	3.364***	4.982***	6.903***	5.183***	7.220***	5.914***
China	CAAR	5.430%	3.830%	1.350%	2.950%	2.770%	4.180%	1.820%	−4.240%
(71)	CSect T	10.170***	6.590***	2.680***	6.280***	5.170***	5.650***	−4.240***	−8.120***
	Wilcoxon	9.935***	6.861***	2.448**	6.047***	5.291***	4.693***	−5.102***	−8.401***
Germany	CAAR	2.810%	1.960%	3.860%	4.720%	11.330%	17.590%	19.920%	18.730%
(38)	CSect T	3.453***	2.667***	3.298***	3.807***	5.243***	5.024***	4.230***	3.942***
	Wilcoxon	2.947***	2.824***	2.844***	3.101***	5.976***	4.911***	4.264***	3.230***
France	CAAR	−0.190%	2.070%	2.540%	0.280%	4.910%	1.970%	4.640%	8.030%
(14)	CSect T	−0.281	3.057***	3.751***	0.414	7.252***	2.910***	6.853***	11.860***
	Wilcoxon	−0.250	2.663***	2.981***	0.350	3.899***	2.173***	3.521***	4.200***
UK	CAAR	4.610%	4.270%	3.730%	4.070%	11.340%	12.700%	13.990%	15.940%
(22)	CSect T	4.114***	4.190***	2.956***	2.996***	4.584***	3.769***	4.255***	4.639**
	Wilcoxon	4.107***	3.661***	3.367***	2.386**	3.988***	2.789***	3.591***	3.737***
Italy	CAAR	1.530%	1.320%	1.750%	1.960%	8.380%	7.640%	7.490%	13.950%
(7)	CSect T	0.588	0.606	1.047	1.039	2.994***	2.659**	3.548***	3.879***
	Wilcoxon	0.957	0.692	0.989	0.888	2.254**	2.299**	3.318***	3.408***
Sweden	CAAR	2.310%	1.290%	4.290%	5.310%	8.990%	6.990%	7.940%	9.610%
(8)	CSect T	0.723	0.576	2.182**	2.113**	3.150***	2.450**	2.893***	3.050***
	Wilcoxon	0.895	−0.306	1.944*	2.058**	2.850***	2.250**	2.674***	2.800***
Canada	CAAR	−3.450%	−1.910%	−2.520%	−4.060%	−1.880%	0.070%	−0.250%	−1.960%
(17)	CSect T	−1.912*	−1.080	−1.339	−3.819**	−2.574**	0.258	−0.850	−2.416**
	Wilcoxon	−2.332*	−1.235	−1.173	−3.450**	−2.306**	0.218	−0.754	−2.292**
Australia	CAAR	0.110%	−1.720%	−2.000%	−0.170%	−0.340%	−0.040%	6.300%	7.390%
(11)	CSect T	0.066	−0.831	−0.657	0.804	−1.805	−2.101*	−0.895	−1.203
	Wilcoxon	0.472	−0.153	−0.693	0.756	−1.602	−1.900*	−0.804	−1.105
Israel	CAAR	0.140%	−0.840%	0.760%	1.730%	5.340%	5.570%	5.690%	6.410%
(11)	CSect T	0.098	−0.930	0.592	0.973	2.851***	2.837***	2.341***	2.158***
	Wilcoxon	0.080	−0.148	−0.718	1.384	2.895***	2.687***	2.387**	1.164
Türkiye	CAAR	−1.670%	−1.290%	−0.660%	−1.040%	2.780%	5.050%	1.020%	6.320%
(2)	CSect T	−2.100	−1.302	−0.272	−1.587	0.452	0.517	0.553	0.659
	Wilcoxon	−2.210	−1.123	0.467	−1.846	0.048	0.266	1.011	0.823
South Korea	CAAR	1.120%	0.970%	1.940%	2.090%	2.680%	2.580%	3.470%	0.700%
	CSect T	0.864	0.639	2.201**	2.457**	2.662**	2.446**	2.236**	0.217
(26)	Wilcoxon	0.599	0.896	2.250**	2.941***	2.311**	2.282**	2.040**	−0.515
Brazil	CAAR	0.340%	0.340%	0.150%	0.150%	−3.090%	−7.870%	−16.660%	−23.630%
(2)	CSect T	4.147*	0.197	0.257	0.123	−0.489	−0.809	−0.968	−0.845
	Wilcoxon	4.295*	0.328	0.260	0.006	−1.197	−1.019	−1.139	−1.246
Japan	CAAR	−2.360%	−1.150%	−0.360%	−1.570%	−1.120%	1.200%	3.420%	2.480%
(15)	CSect T	−2.044**	−2.055**	−0.579	−2.468**	−1.161	0.875	1.710	0.659
	Wilcoxon	−2.125**	−1.853*	0.364	−2.381**	−1.032	0.838	0.751	0.646
India	CAAR	−0.370%	−1.150%	0.110%	0.890%	−0.010%	1.120%	1.160%	−1.200%
(17)	CSect T	−0.500	−2.549**	0.139	0.927	−0.010	0.617	4.272***	3.866***
	Wilcoxon	−0.470	−1.317	0.043	1.078	−0.027	0.033	4.843***	4.242***
Singapore	CAAR	−2.490%	−0.890%	−0.240%	−1.840%	−0.490%	0.190%	8.250%	5.620%
(6)	CSect T	−0.793	−1.130	−0.264	−0.549	−0.277	0.066	2.531***	3.165**
	Wilcoxon	−0.397	−1.585	0.437	−1.250	0.016	1.161	2.036**	2.882***
Norway	CAAR	−0.640%	−1.330%	0.840%	1.530%	4.550%	−2.790%	−8.570%	−4.790%
(4)	CSect T	−0.319	−1.670	1.894	0.740	1.515	−0.521	0.366	0.708
	Wilcoxon	−0.269	−1.922*	1.119	0.774	0.984	−0.284	−0.094	1.483

Note: This table reports the country-specific Cumulative Average Abnormal Returns (CAAR) for various event windows. For each country and event window, the provided cross-sectional t-test (CSect T) and Wilcoxon signed-rank test evaluate if the CAAR is statistically different from zero. All CAAR values are in percent. Day 0 is the invasion date. Significance levels are denoted by asterisks:
* ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

reversal of initial sentiment; the strong positive reaction around Day 0 was entirely erased over the subsequent days, resulting in a negative CAAR of −4.24% for the full window. In essence, the CAAR analysis confirms that the daily reactions identified in the AAR data were not isolated events but were part of a persistent, multi-week re-evaluation where investors systematically rewarded firms within the core Western alliance while punishing or divesting from those perceived to be on the outside of it.

4.3 Cross-Regional Analysis of Market Reactions

The analysis of market reactions on a geographic regional basis reveals a profound and statistically significant heterogeneity between the three major domiciles: Europe, the Americas, and Asia (see Tab. 5 and Fig. 6) confirmed by both ANOVA (F-stat = 2.99, p = 0.052) and Kruskal-Wallis tests (H-stat = 7.60, p = 0.022). The most powerful positive reaction was concentrated in Europe, which posted a remarkable CAAR of 17.76% over the full event window. This finding critically inverts the "proximity penalty"; while broader European markets suffered due to their high trade and energy dependence (Demir and Duan, 2018; Grinius and Baležentis, 2025), for D&A firms, this same proximity acted as a powerful positive catalyst. The largest gains occurred on Day +2, suggesting the market was reacting to major policy shifts like Germany's Zeitenwende, rather than the invasion itself, a finding consistent with studies documenting the outperformance of European defense stocks post-invasion (Covachev and Fazakas, 2025; Licht, 2023). North American firms also saw a robust positive CAAR of 8.96%, though the lesser magnitude suggests investors priced in the most urgent budgetary increases occurring on the continent directly facing the threat. In stark contrast, the reaction of Asian firms was negative overall (CAAR of −0.38%), demonstrating that for these distant nations, adverse macroeconomic consequences like inflationary pressures and volatility spillovers overwhelmed any speculative sectoral benefit (Fang and Shao, 2022). This aligns with the "risk-off" sentiment that often triggers capital outflows from emerging markets during global uncertainty (Zehri et al., 2025).

4.4 Cross-Sectional Analysis by Economic Status

Stratifying by firms' home-country income status reveals a large, statistically significant asymmetry in market reactions, consistent with H_3 (see Tab. 6 and Fig. 7). Firms headquartered in developed economies exhibit a pronounced and durable positive response, with CAAR cumulating to 10.91% over the full $[-10, +10]$ window. This trend accelerated in the days following the invasion, reflecting a pronounced "flight to quality" within the sector as investors favored the stability and strategic positioning of these firms. Investors disproportionately rewarded firms in developed nations, likely perceiving them as the most reliable and direct beneficiaries of the large, coordinated government defense contracts that followed the invasion (Gaio et al., 2022). These firms benefit from stable political systems, established procurement relationships with Western governments, and the industrial capacity to scale production, making them a safer bet during a period of extreme uncertainty. This confirms that while a geopolitical shock may briefly lift all boats in a sector, enduring value is ascribed only to those firms in developed economies perceived as having the institutional and political resilience to truly capitalize on the new geopolitical landscape (Assaf et al., 2023; Joshi et al., 2023).

Conversely, firms in developing economies followed a starkly different trajectory. An initially stronger positive reaction around the event day, with a CAAR of 4.11% in the $[-1, 0]$ window, rapidly and dramatically reversed in the post-event period. This initial speculative surge was completely erased, with the CAAR plummeting to a final, statistically significant −3.87% over the full event window. As discussed previously, this reversal strongly suggests that the adverse macroeconomic consequences of the conflict

Tab. 5: AAR, CAAR, and Variance analysis Across Different Regions

Event	North & South America (115)			Europe (95)			Asia (160)		
Day	AAR	CSect T	Wilcoxon	AAR	CSect T	Wilcoxon	AAR	CSect T	Wilcoxon
−10	0.53%	2.145**	1.501	0.51%	1.521	1.065	−0.57%	−3.597***	−2.518**
−9	0.01%	0.021	0.015	0.17%	0.708	0.496	−0.60%	−3.362***	−2.353**
−8	0.76%	2.282**	1.597	0.63%	2.414**	1.690*	0.39%	1.364	0.955
−7	0.02%	0.060	0.042	−0.48%	−1.362	−0.953	0.04%	0.189	0.132
−6	1.27%	2.887***	2.021**	0.75%	2.050**	1.435	−0.59%	−2.234**	−1.564
−5	0.30%	1.082	0.757	0.24%	0.995	0.697	0.56%	3.160***	2.212**
−4	0.23%	0.838	0.587	−0.24%	−0.792	−0.554	−0.12%	−0.492	−0.344
−3	−0.02%	−0.046	−0.032	−0.92%	−2.555**	−1.789*	0.18%	0.863	0.604
−2	0.24%	0.779	0.545	0.52%	1.651	1.156	−0.29%	−1.311	−0.918
−1	0.19%	0.680	0.476	0.22%	0.567	0.397	0.84%	4.164***	2.915***
0	0.84%	1.812*	1.268	2.20%	4.249***	2.974***	1.47%	3.666***	2.566***
1	0.06%	0.227	0.159	1.11%	1.775*	1.243	−0.65%	−2.193**	−1.535
2	2.48%	5.993***	4.195***	5.49%	7.191***	5.034***	0.54%	2.181**	1.527
3	1.04%	2.724	1.907	2.86%	2.987***	2.091***	0.87%	4.865***	3.406***
4	0.23%	0.754	0.528	−0.36%	−0.697	−0.488	0.15%	0.572	0.400
5	−0.23%	−0.689	−0.482	1.41%	2.338**	1.637	−0.53%	−1.556	−1.089
6	0.24%	0.673	0.471	2.18%	2.820***	1.974*	−0.43%	−2.342***	−1.639*
7	1.05%	1.769*	1.238	0.58%	1.206	0.844	0.50%	2.488***	1.742*
8	0.35%	0.717	0.502	0.17%	0.138	0.097	−1.69%	−6.794***	−4.760***
9	−0.27%	−0.795	−0.557	−1.01%	−0.241	−0.169	−1.04%	−5.251***	−3.680***
10	−0.36%	−1.054	−0.738	1.76%	3.174***	2.222**	0.57%	3.439***	2.407***
Window	**CAAR**	**CSect T**	**Wilcoxon**	**CAAR**	**CSect T**	**Wilcoxon**	**CAAR**	**CSect T**	**Wilcoxon**
$[-1, 0]$	1.03%	2.094	1.466	2.41%	4.191	2.934	2.32%	5.352	3.746
$[0, 0]$	0.84%	1.812	1.268	2.20%	4.249	2.974	1.47%	3.666	2.566
$[0, +1]$	0.90%	1.743	1.220	3.30%	4.495	3.147	0.83%	2.331	1.632
$[-1, +1]$	1.09%	2.066	1.446	3.52%	4.630	3.241	0.91%	1.853	1.297
$[-2, +2]$	3.81%	5.083	3.558	9.53%	7.973	5.581	1.92%	4.274	2.992
$[-3, +3]$	4.83%	4.601	3.221	11.47%	5.965	4.175	2.97%	5.589	3.912
$[-5, +5]$	5.36%	4.223	2.956	12.51%	5.750	4.025	3.03%	4.442	3.109
$[-10, +10]$	8.96%	4.584	3.209	17.76%	3.955	2.769	−0.38%	−0.423	−0.296

Analysis of Variance Test	**Statistics**	***p*-value**
ANOVA (F Statistic)	2.9979*	0.0524
Kruskal-Wallis (H Statistic)	7.5973**	0.0224

Note: This table reports the Average Abnormal Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) for firms segmented by geographic region (North & South America, Europe, and Asia). For both the daily AARs and the cumulative CAARs within each region, the provided cross-sectional t-test (CSect T) and Wilcoxon signed-rank test evaluate if the abnormal return is statistically different from zero. All return values are in percent. The 'Analysis of Variance' section tests for significant differences between the regions. Day 0 is the invasion date. Significance levels are denoted by asterisks: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Tab. 6: AAR & CAAR for D&A Firms in Developed and Developing Economies

	Developed			Developing		
Event Day	**AAR**	**CSect T**	**Wilcoxon**	**AAR**	**CSect T**	**Wilcoxon**
−10	0.44%	2.7242***	−2.564**	−1.13%	−5.441***	−2.518**
−9	0.16%	0.7452**	2.606**	−1.34%	−7.622***	−2.353**
−8	0.22%	1.0499	1.170	1.59%	6.464***	0.955
−7	−0.18%	−0.9631	0.373	0.14%	0.580	0.132
−6	0.84%	3.6511***	−1.435	−1.17%	−2.882**	−1.564
−5	0.33%	2.1458**	1.082	0.58%	2.472**	2.212**
−4	0.14%	0.8463	0.838	−0.60%	−1.518	−0.344
−3	−0.24%	−1.0383	−0.046	0.06%	0.255	0.604
−2	0.25%	1.2856	0.779	−0.42%	−1.835	−0.918
−1	0.18%	0.9266	0.685	1.37%	6.081***	2.915***
0	1.04%	3.4451***	1.812*	2.73%	5.371***	2.566***
1	0.60%	2.1465**	0.227	−1.68%	−6.627***	−3.535
2	3.19%	9.0626***	5.993***	0.13%	0.628	1.527
3	1.52%	4.1005***	2.724***	1.18%	4.212***	3.406***
4	0.19%	0.7610	0.754	−0.41%	−1.686	0.400
5	0.65%	2.1267**	−1.689	−1.66%	−7.327***	−4.089***
6	0.89%	2.7924***	2.173**	−0.84%	−3.996***	−1.639*
7	0.74%	2.4070**	1.969*	0.57%	2.191**	1.742*
8	−0.01%	−0.0133	0.717	−2.28%	−6.087***	−4.760***
9	−0.56%	−0.3886	−0.795	−1.48%	−7.902***	−3.680***
10	0.53%	2.1050**	−1.054	0.77%	3.656***	2.407***
Event Window	**CAAR**	**TSTAT**	**Wilcoxon**	**CAAR**	**TSTAT**	**Wilcoxon**
$[-1, 0]$	1.22%	3.7190***	2.352**	4.11%	8.085***	3.286***
$[0, 0]$	1.04%	3.4450***	2.103**	2.73%	5.371***	2.162**
$[0, +1]$	1.64%	4.4230***	3.754***	1.05%	2.578***	1.032
$[-1, +1]$	1.81%	4.7250***	3.104***	2.43%	5.847***	2.389**
$[-2, +2]$	5.26%	9.0270***	6.653***	2.14%	4.256***	1.726*
$[-3, +3]$	6.54%	7.7790***	4.905***	3.38%	4.684***	1.935*
$[-5, +5]$	7.85%	8.0780***	6.207***	1.29%	1.599	0.680
$[-10, +10]$	10.91%	6.0940***	5.658***	−3.87%	−3.343***	−1.372

Analysis of Variance Test	**Statistics**	***p*-value**
Independent Sample T test (t Score)	3.111***	0.002
Mann-Whitney U test (z Score)	2.908***	0.004

Note: This table reports the Average Abnormal Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) for firms segmented by their home country's economic status (Developed vs. Developing). The TSTAT and Wilcoxon tests assess the statistical significance of the daily AARs and cumulative CAARs within each group. The 'Analysis of Variance' section at the bottom reports the results of an Independent Sample t-test and a Mann-Whitney U test, which evaluate if the difference in returns between the two groups is statistically significant. All return values are in percent. Significance levels are denoted by asterisks: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$)

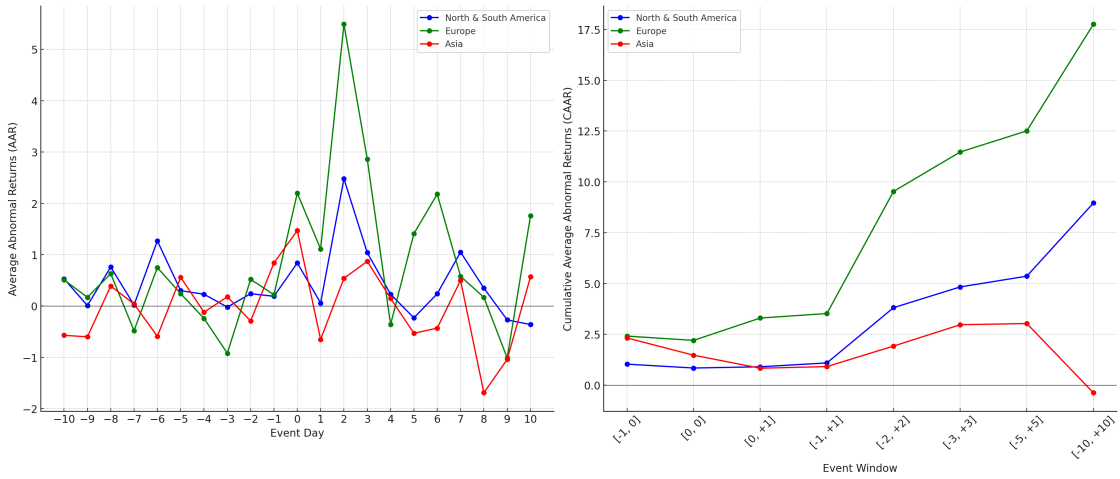


Fig. 6: AAR and CAAR for different regions over event windows

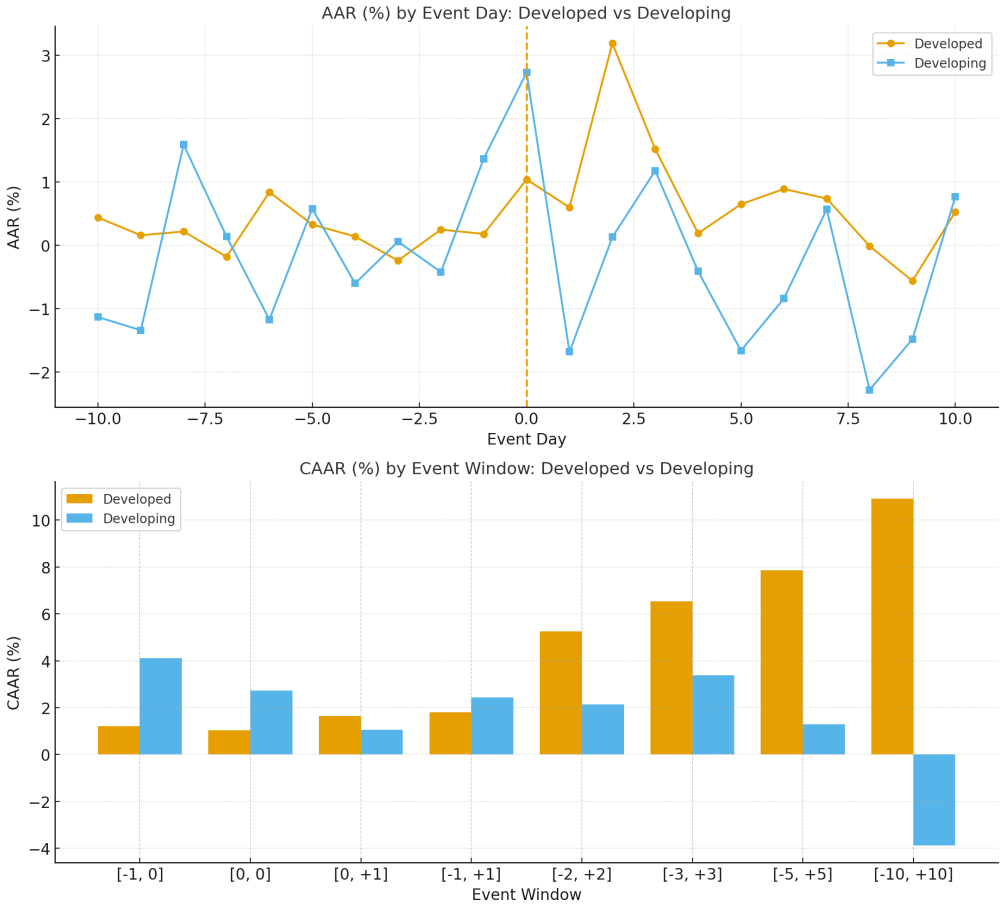


Fig. 7: AAR and CAAR Comparison of Defense & Aerospace Firms: Developed vs. Developing Countries

and a general flight from emerging market risk ultimately overwhelmed any initial positive sentiment for these firms (Keleş, 2023). This is consistent with the broader literature highlighting the amplified vulnerability of emerging markets to global shocks (Zehri et al., 2025; Nasouri, 2025). While some studies have noted that developed markets can suffer deeper aggregate market losses due to high trade exposure (Chowdhury and Khan, 2024), our findings reveal that within the D&A sector, the opposite is true: investors ultimately favored the stability and strategic positioning of firms in developed economies (Gaio et al., 2022; Obi et al., 2023). This confirms H_3 and demonstrates that while a geopolitical shock may briefly lift all boats in a sector, enduring value is ascribed only to those firms perceived as having the institutional and political resilience to truly capitalize on the new geopolitical landscape.

The statistical significance of this observed heterogeneity is also confirmed by the analysis of variance. Both the Independent Sample T-test (t-score $= 3.11$, $p = 0.002$) and the non-parametric Mann-Whitney U test (z-score $= 2.91$, $p = 0.004$) indicate that the difference between the two groups.

4.5 Cross-Sectional Analysis by Geopolitical Status

A cross-sectional analysis of the event study results provides robust empirical support for the hypothesis that defense and aerospace (D&A) firms in G7 nations experienced a significantly more favorable market reaction than their non-G7 counterparts (see Tab. 7 and Fig. 8). While firms in both groups saw positive abnormal returns on the event day, the G7 cohort's returns were substantially larger and more persistent. This is most evident in the Cumulative Abnormal Average Returns (CAAR) over the 11-day $[-5, +5]$ event window, where G7 firms registered a gain of 9.06%, nearly four times the 2.47% return for non-G7 firms. The statistical significance of this divergence is confirmed by a Mann-Whitney U test ($p = 0.0226$), definitively indicating that the superior performance of the G7 firms was not due to random chance.

This pronounced disparity reflects the market's efficient pricing of a "geopolitical premium" associated with the G7 bloc. Investors appear to have anticipated that the powerful, economically-aligned G7 nations would engage in larger, more coordinated, and more certain increases in defense and aerospace investment following the event. This interpretation aligns with existing literature demonstrating that membership in strong geopolitical alliances is a critical determinant of market responses to conflict (Yudaruddin and Lesmana, 2024; Boubaker et al., 2022). The weaker, less uniform reaction of non-G7 firms can be attributed to their heterogeneity in political allegiances and economic capacity (Bossman and Gubareva, 2023; Hu et al., 2025), which created a more ambiguous and less compelling investment signal. Ultimately, the analysis confirms that a firm's domicile within a dominant geopolitical alliance is a primary mediating factor in how capital markets price the financial implications of major international events.

4.6 Cross-Sectional Heterogeneity: The Macroeconomic Constraint of Defense Budgets

The cross-sectional analysis reveals a profound heterogeneity in market reactions, contingent on the domicile country's pre-existing defense expenditure as a percentage of GDP (see Tab. 8 and Fig. 9). The empirical evidence provides strong support for the hypothesis that firms in high defense budget nations significantly outperform those in low budget nations. This divergence is most starkly illustrated in the Cumulative Abnormal Returns (CAR). While firms in high-budget countries accrued a statistically significant CAR of 6.49% over the $[-5, +5]$ window, firms in low-budget countries experienced a dramatic value destruction, posting a CAR of -6.30% over the same period. The statistical significance of this divergence is positively confirmed by both the independent sample T-test ($t = 3.200$, $p < 0.01$) and the non-parametric Mann-Whitney U test ($z = 2.829$, $p < 0.01$), which reject the null hypothesis of identical return distributions. This

Tab. 7: Firms Reaction on basis of Geopolitical Status

	G7			Non-G7		
Event Day	**AAR**	**TSTAT**	**Wilcoxon**	**AAR**	**TSTAT**	**Wilcoxon**
−10	0.60%	2.968***	2.523**	−0.67%	−4.287***	−3.858***
−9	0.18%	0.642	0.385	−0.72%	−4.019***	−3.617***
−8	0.73%	3.493***	3.144***	0.35%	1.201	0.720
−7	−0.29%	−1.285	−0.771	0.14%	0.700	0.420
−6	1.03%	3.566***	3.210***	−0.57%	−2.105**	−1.789*
−5	0.38%	2.079**	1.767*	0.42%	2.255**	1.917*
−4	0.21%	1.091	0.654	−0.38%	−1.459	−0.875
−3	−0.12%	−0.392	−0.235	−0.23%	−1.265	−0.759
−2	0.37%	1.712*	1.027	−0.29%	−1.256	−0.753
−1	0.07%	0.302	0.181	1.01%	4.873***	4.385***
0	1.37%	3.981***	3.583***	1.59%	3.915***	3.524***
1	0.44%	1.393	0.836	−0.51%	−1.640	0.984
2	3.70%	9.006***	8.105***	0.76%	2.503***	2.127**
3	1.97%	4.105***	3.694***	0.74%	3.657***	3.291***
4	0.05%	0.161	0.096	0.03%	0.120	0.072
5	0.64%	1.927*	1.156	−0.67%	−1.980*	−1.188
6	1.15%	2.840***	2.414**	−0.45%	−2.360**	−2.006**
7	0.70%	1.784*	1.070	0.69%	3.335***	3.002***
8	0.08%	0.139	0.083	−1.44%	−5.229***	−4.706***
9	−2.33%	−6.554***	−5.899***	1.22%	0.493	0.296
10	0.56%	1.752*	1.051	0.63%	3.570***	3.213***
CAR Windows	**CAAR**	**TSTAT**	**Wilcoxon**	**AAR**	**TSTAT**	**Wilcoxon**
$[-1, 0]$	1.43%	3.830***	3.447***	2.61%	6.043***	5.437***
$[0, 0]$	1.37%	3.981***	3.582***	1.59%	3.915***	3.522***
$[0, +1]$	1.80%	4.196***	3.776***	1.08%	2.797***	2.371**
$[-1, +1]$	1.87%	4.381***	3.943***	2.10%	4.819***	4.337***
$[-2, +2]$	5.94%	8.493***	7.643***	2.57%	5.109***	4.598***
$[-3, +3]$	7.79%	7.434***	6.690***	3.08%	5.099***	4.589***
$[-5, +5]$	9.06%	7.597***	6.837***	2.48%	3.255***	2.929***
$[-10, +10]$	11.45%	7.952***	7.157***	1.67%	0.640	0.384

Analysis of Variance Test	**Statistics**	***p*-value**
Independent Sample T test (t Score)	1.846*	0.0673
Mann-Whitney U test (z Score)	2.284**	0.0226

Note: This table reports the Average Abnormal Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) for firms segmented by their home country's geopolitical status (G7 vs. Non-G7). The TSTAT and Wilcoxon tests assess the statistical significance of the daily AARs and cumulative CAARs within each group. The 'Analysis of Variance' section reports the results of an Independent Sample T-test and a Mann-Whitney U test, which evaluate if the difference in returns between the two groups is statistically significant. All return values are in percent. Significance levels are denoted by asterisks: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

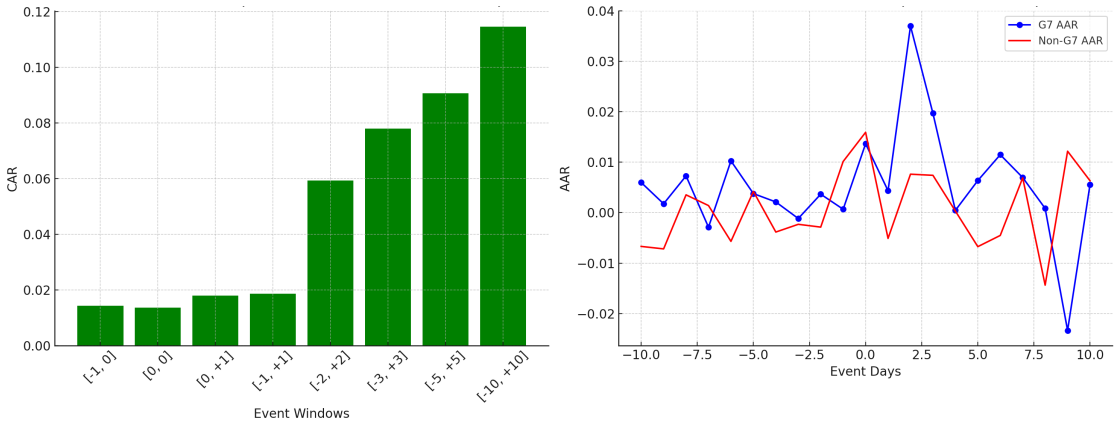


Fig. 8: Comparison of Cumulative Abnormal Returns (CAR) and Average Abnormal Returns (AAR) Across Event Windows.

finding extends the established literature on regional disparities (Auer et al., 2025; Joshipura and Lamba, 2024) by identifying a nation's fiscal commitment to defense as a critical explanatory variable for market performance during geopolitical shocks.

This valuation asymmetry can be rationalized as the market's forward-looking assessment of macroeconomic stability versus fiscal constraint. For the high-budget cohort, investors credibly anticipate that new expenditures can be sustainably funded, leading to positive re-pricing consistent with research on well-supported defense sectors (Martins et al., 2025). Conversely, the strong negative reaction for the low-budget cohort indicates that the market is pricing in a severe "crowding-out" effect, where the systemic risk of macroeconomic instability from forced spending outweighs any potential firm-specific contract gains (Karaki and Safieddine, 2023; Olejnik and Kuna, 2025). The market, therefore, differentiates not merely on the opportunity for new revenue, but on the sovereign capacity to capitalize on that opportunity without inducing fiscal distress.

4.7 The Firm Size Effect in the Defense & Aerospace Sector During Geopolitical Shocks

A cross-sectional analysis based on firm size, operationalized by segmenting the sample into "Top 100" global defense firms by revenue and "The Rest," reveals a nuanced market reaction to the geopolitical shock (see Tab. 9 and Fig. 10). The primary finding is that the event acted as a powerful, sector-wide catalyst, precipitating a positive and statistically significant revaluation for defense firms irrespective of their market leadership. This is evidenced by the robustly positive and significant Cumulative Abnormal Returns (CAR) for both cohorts in the critical $[-1, +1]$ event window (Top 100: 3.16%; The Rest: 1.61%). This sector-wide uplift suggests that investors anticipated a broad-based increase in defense expenditures and military procurement, a finding consistent with recent studies indicating that major geopolitical conflicts provide a valuation boost to the defense sector as a whole, not merely its largest players (Martins, 2024).

However, the analysis did not find statistically significant proof that the largest defense companies performed better than the rest. While the stock prices for the Top 100 firms did rise by a larger amount on paper (for example, 10.04% vs. 5.03% in one timeframe), statistical tests showed this difference was not large enough to be meaningful and could have been due to random chance. This lack of a clear "leadership advantage" is a critical finding. It suggests that investors did not believe the benefits of the conflict would be captured only by the main, big contractors. Instead, investors seem to have wisely recognized that the defense industry is a deeply interconnected

Tab. 8: Cross-Sectional Analysis of Abnormal Returns: High vs. Low Defense Budget Nations

	High Defense (195)			Moderate to Low (175)		
Event Day	**AAR**	**TSTAT**	**Wilcoxon**	**AAR**	**TSTAT**	**Wilcoxon**
−10	0.17%	0.836	1.988**	−0.57%	−2.944***	−1.909*
−9	0.18%	0.590	2.568***	0.13%	0.783	−0.817
−8	0.34%	1.486	2.600***	−0.74%	−3.561***	2.886***
−7	−0.38%	−1.660	−1.794*	1.73%	9.184***	2.146**
−6	0.64%	2.683***	3.036***	1.04%	2.895***	2.576***
−5	0.48%	2.567***	4.094***	−1.32%	−6.924***	2.055**
−4	0.21%	1.101	2.357***	−4.37%	−16.014***	−3.479***
−3	−0.41%	−1.457	−3.177***	−4.63%	−19.449***	−11.380***
−2	0.12%	0.546	−0.399	2.52%	12.709***	7.475***
−1	0.22%	0.950	4.015***	0.69%	3.122***	4.179***
0	1.28%	3.782***	2.625***	−1.33%	−3.248***	5.214***
1	0.40%	1.613	2.611***	2.16%	5.815***	3.070***
2	2.75%	8.113***	8.189***	0.50%	1.134	0.629
3	0.98%	3.028***	4.193***	−2.71%	−5.288***	5.040***
4	0.41%	1.601	2.017**	1.57%	5.871***	3.307***
5	0.06%	0.265	0.670	−1.65%	−4.316***	−3.261***
6	0.82%	2.035**	1.775*	2.27%	8.388***	4.443***
7	1.21%	3.482***	4.267***	−0.23%	−0.708	0.374
8	0.33%	0.572	−1.080	−0.83%	−1.992*	−4.540***
9	−1.23%	−4.160***	−4.554***	−1.05%	−0.435	−0.771
10	0.18%	0.670	2.810***	2.03%	7.304***	5.432***
CAR Windows	**CAAR**	**TSTAT**	**Wilcoxon**	**AAR**	**TSTAT**	**Wilcoxon**
$[-1, 0]$	1.49%	4.255***	3.914***	−0.64%	−1.353	5.877***
$[0, 0]$	1.28%	3.782***	2.625***	−1.33%	−3.248***	5.214***
$[0, +1]$	1.68%	4.464***	4.446***	0.84%	1.850*	4.037***
$[-1, +1]$	1.90%	5.271***	5.373***	1.53%	2.986***	5.285***
$[-2, +2]$	4.76%	8.680***	7.961***	4.55%	5.982***	6.480***
$[-3, +3]$	5.33%	6.560***	7.309***	−2.79%	−2.555***	7.036***
$[-5, +5]$	6.49%	7.034***	7.587***	−6.30%	−4.586***	4.408***
$[-10, +10]$	8.76%	6.715***	6.860***	−4.79%	−1.752*	1.688

Analysis of Variance Test	**Statistics**	***p*-value**
Independent Sample T test (t Score)	3.200***	0.0064
Mann-Whitney U test (z Score)	2.829***	0.0047

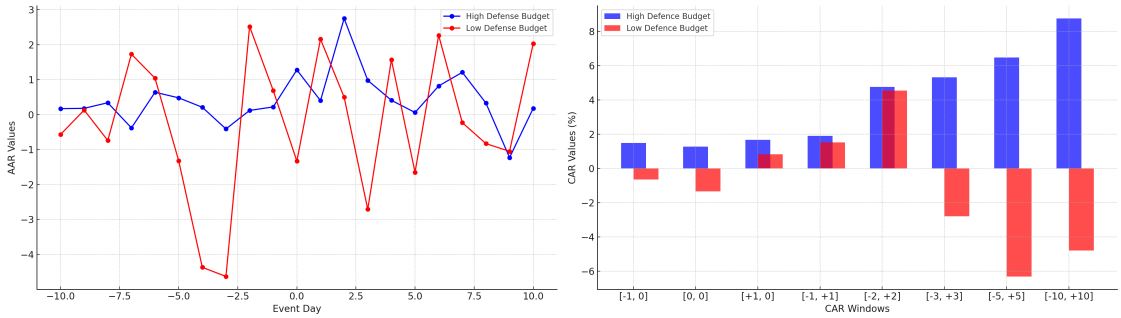
Note: This table reports the Average Abnormal Returns (AAR) and Cumulative Abnormal Returns (CAAR) for firms segmented by their home country's defense budget level (High Defense vs. Moderate to Low). The TSTAT and Wilcoxon tests assess the statistical significance of the daily AARs and cumulative CAARs within each group. The 'Analysis of Variance' section reports the results of an Independent Sample T-test and a Mann-Whitney U test, which evaluate if the difference in returns between the two groups is statistically significant. All return values are in percent. Significance levels are denoted by asterisks: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Tab. 9: AAR of Top 100 Defense firms vs Rest of the Defense & Aerospace Firms

	Top 100			The Rest		
Event Day	**AAR**	**TSTAT**	**Wilcoxon**	**AAR**	**TSTAT**	**Wilcoxon**
−10	0.29%	1.930*	1.904*	−0.03%	−0.167	−0.210
−9	−0.16%	−0.530	0.111	−0.24%	−1.149	−1.706*
−8	0.97%	4.770***	4.405***	0.45%	2.080**	4.169
−7	0.17%	0.865	0.356	−0.18%	−0.971	−0.056
−6	−0.04%	−0.231	−0.596	0.43%	1.671	1.346
−5	0.45%	2.813***	2.482***	0.38%	2.350***	3.210***
−4	0.45%	2.875***	2.930***	−0.19%	−0.976	−2.124**
−3	−0.14%	−0.893	−1.710*	−0.18%	−0.760	−1.251
−2	0.15%	0.639	0.332	0.06%	0.309	−0.999
−1	0.70%	3.294***	3.458***	0.44%	2.262***	4.934***
0	1.74%	4.730***	4.650***	1.33%	4.197***	3.947***
1	0.73%	3.258***	3.083***	−0.16%	−0.576	−1.753*
2	4.58%	6.347***	6.744***	1.78%	6.363***	6.530***
3	1.64%	3.175***	3.439***	1.36%	4.020***	5.984***
4	−0.14%	−0.459	−0.037	0.08%	0.326	−0.900
5	−0.11%	−0.315	−0.013	0.13%	0.453	−1.470
6	0.99%	3.156***	2.986***	0.31%	1.028	−0.354
7	1.09%	2.909***	2.866***	0.52%	1.804*	2.374***
8	−0.91%	−2.442***	−2.343***	−0.54%	−1.181	−3.851***
9	−1.84%	−4.262***	−4.562***	−0.50%	−0.360	−7.370***
10	0.88%	3.186***	3.236***	0.51%	2.124***	4.912***
CAR Windows	**CAAR**	**TSTAT**	**Wilcoxon**	**AAR**	**TSTAT**	**Wilcoxon**
$[-1, 0]$	2.43%	5.451***	5.455***	1.77%	5.187***	5.209***
$[0, 0]$	1.74%	4.730***	4.650***	1.33%	4.197***	3.947***
$[0, +1]$	2.46%	5.656***	5.307***	1.17%	3.298***	3.603***
$[-1, +1]$	3.16%	6.393***	6.134***	1.61%	4.412***	5.157***
$[-2, +2]$	7.89%	6.793***	6.800***	3.45%	7.291***	7.296***
$[-3, +3]$	9.38%	6.024***	6.314***	4.63%	6.542***	7.674***
$[-5, +5]$	10.04%	6.862***	6.569***	5.03%	5.689***	6.662***
$[-10, +10]$	11.46%	5.945***	5.834***	5.75%	3.346***	3.746***

Analysis of Variance Test	**Statistics**	***p*-value**
Independent Sample T test (t Score)	0.802	0.424
Mann-Whitney U test (z Score)	1.157	0.246

Note: This table reports the Average Abnormal Returns (AAR) and Cumulative Abnormal Returns (CAAR) for firms segmented by size (Top 100 vs. The Rest). The TSTAT and Wilcoxon tests assess the statistical significance of the daily AARs and cumulative CAARs within each group. The 'Analysis of Variance' section reports the results of an Independent Sample T-test and a Mann-Whitney U test, which evaluate if the difference in returns between the two groups is statistically significant. All return values are in percent. Significance levels are denoted by asterisks:
* ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).



Note: Figure compares the Cumulative Abnormal Returns (CAR) and Average Abnormal Returns (AAR) for defense companies with high and low defense budgets. The data is visualized across various event windows, highlighting the performance differences and market reactions based on the budget allocation. The first chart shows the CAR for both categories, while the second chart illustrates the daily AAR fluctuations in response to defense budget changes.

Fig. 9: Comparison of Cumulative Abnormal Returns (CAR) and Average Abnormal Returns (AAR) for High and Low Defense Budget

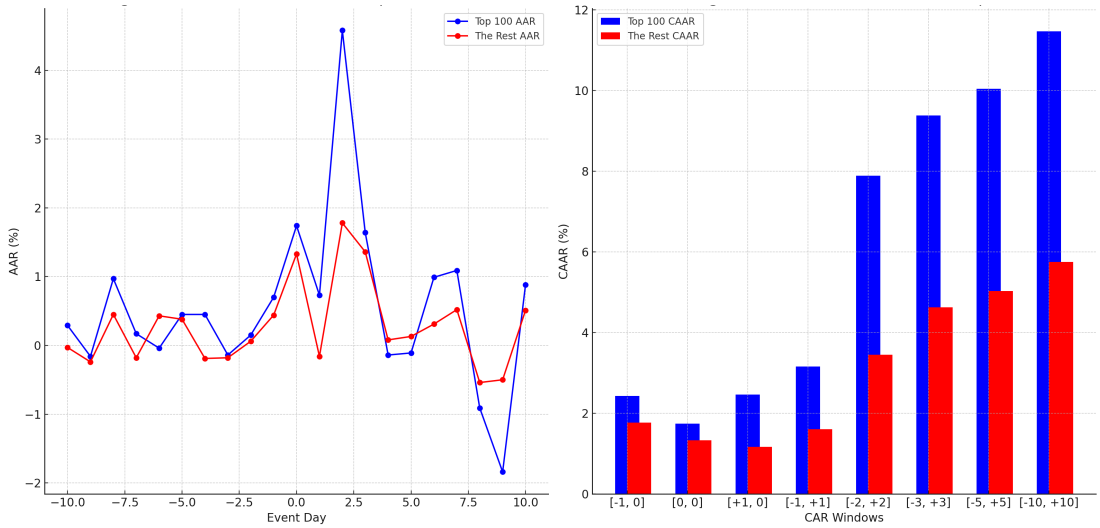


Fig. 10: AAR and CAAR for Top 100 vs The Rest Across Event Days and CAR Windows

supply chain. They understood that a surge in demand for the Top 100 firms would require those companies to place more orders with the vast network of smaller, specialized suppliers. In other words, a rising tide lifts all boats. While the more famous Top 100 stocks may have seen more trading activity right after the event, causing their prices to jump around more, the core investment idea, that the whole sector would benefit quickly spread. Therefore, investors didn't just rush to the "safest" big companies. Instead, they re-evaluated the entire defense industry as more valuable, anticipating a new era of higher government spending.

5 DISCUSSION

The empirical results of this study contribute to the literature on geopolitical finance by both reinforcing and refining existing frameworks. In line with foundational research on "war stocks," the findings first confirm that the Russia-Ukraine conflict triggered significant positive abnormal returns for the global D&A sector, validating the "flight-to-arms" hypothesis (H_1) also documented in contemporary studies (Schneider and Troeger, 2006; Covachev and Fazakas, 2025; Zhang et al., 2022). However, the central contribution of this paper moves beyond this aggregate effect to dissect the profound heterogeneity of these returns, demonstrating that country-level attributes overwhelmingly dominated firm-specific characteristics. The outperformance of firms domiciled in G7, developed, and high-budget nations (H_2, H_3, H_4) aligns with literature identifying a "military preparedness dividend" for geopolitically aligned blocs like NATO, where investors anticipate coordinated increases in defense spending (Boubaker et al., 2022). Critically, this research refines the "proximity penalty" concept, which posits that markets closer to a conflict suffer greater losses (Grinius and Baležentis, 2025; Yousaf et al., 2022). For the strategically vital D&A sector, this study finds the opposite: geographic proximity to the conflict transformed a regional macroeconomic risk into a powerful "proximity premium," particularly for European firms. Furthermore, the analysis challenges a simple firm-level "flight to quality" narrative by finding no statistically significant "leadership premium" for the industry's largest firms (H_5). This suggests the market reaction was not a narrow rotation into a few prime contractors but a systemic, sector-wide revaluation of the entire defense industrial base and its interconnected supply chain. Finally, the starkly negative returns for firms in low-budget and emerging economies support the notion of a macroeconomic "crowding-out" effect, where investors price in the systemic risk of fiscal instability, outweighing any potential for new contracts (Solarin and Sahu, 2015; Karaki and Safieddine, 2023). This indicates a sophisticated market mechanism that assesses not just the opportunity for new revenue but, more importantly, the sovereign fiscal capacity to sustainably fund a military buildup.

6 CONCLUSION

This study sought to dissect the capital market reaction of the global defense and aerospace (D&A) sector to the 2022 Russia-Ukraine war, moving beyond aggregate analysis to investigate the firm- and country-level determinants of what we find to be a profoundly heterogeneous response. The primary objective was to test whether returns were systematically moderated by a firm's geopolitical alignment, national economic status, fiscal capacity for defense spending, and market leadership.

Our empirical results first confirm a statistically significant and sustained positive abnormal return for the global D&A sector as a whole, validating the "war stocks" hypothesis (H_1). However, this aggregate effect masks critical cross-sectional divergences that constitute the core of our findings. We find that a firm's market reaction was overwhelmingly dictated by its country of domicile. Firms in G7 nations (H_4), developed economies (H_3), and European countries (H_2) particularly those domiciled in nations with high pre-existing defense budgets experienced significantly larger and more persistent positive abnormal returns than their counterparts. Conversely, the hypothesis of a firm-level "flight to quality" (H_5) was not supported; the performance difference between the top 100 industry leaders and smaller firms was statistically insignificant. This suggests that investors priced in a systemic, sector-wide revaluation of the entire defense ecosystem rather than concentrating value in market leaders.

The interpretation of these results reveals a sophisticated market mechanism. The outperformance of firms in G7 and high-budget nations reflects a "geopolitical premium," where investors favored firms in countries perceived to have both the political will and, crucially, the fiscal capacity to fund a sustained increase in military expenditure. The starkly negative returns for firms in low-budget and non-aligned emerging markets indicate that investors priced in a severe macroeconomic "crowding-out" effect, where the systemic risks of fiscal instability outweighed any potential for new contracts. The lack of a firm-size effect suggests the market rationally priced in the deep interdependencies of the defense industrial base, anticipating that a surge in prime contractor demand would inevitably flow through the entire supply chain.

Theoretically, these findings make several contributions to the literature on geopolitical risk. First, they critically refine the "proximity penalty" concept (Grinius and Baležentis, 2025), demonstrating that for a strategically aligned sector like defense, geographic proximity to a conflict can transform into a powerful "proximity premium." Second, our results challenge the simple application of a "flight to quality" heuristic at the firm level, showing that during a systemic geopolitical shock, the market's focus shifts to country-level credibility. From a practical standpoint, the implications are clear. For investors, our findings underscore that in this sector, a nation's geopolitical and macroeconomic attributes can be more potent drivers of returns than traditional firm-specific metrics. For policymakers, the market's adverse reaction in fiscally constrained nations serves as a powerful signal about the perceived risks of unfunded defense mandates.

This study's limitations present clear avenues for future research. Our analysis is centered on a single, albeit momentous, geopolitical event, and future work should test whether these fiscal and geopolitical mechanisms hold across different types of conflicts. Furthermore, our cross-sectional variables are country-level proxies; future research could employ granular, firm-level data on government contracts and supply chain dependencies to more directly test the ecosystem revaluation hypothesis.

In conclusion, this research demonstrates that the market's reaction to the Ukraine war was not merely a flight to "war stocks," but a sophisticated and rapid pricing of a new geopolitical reality. In this new paradigm, investors look beyond a firm's balance sheet to that of its sovereign domicile, where a nation's strategic alignment and, critically, its fiscal capacity to act, are the ultimate determinants of value.

7 REFERENCES

Abbassi, W., Kumari, V. and Pandey, D. K. 2023. What Makes Firms Vulnerable to the Russia–Ukraine Crisis? *The Journal of Risk Finance*, 24 (1), 24–39. DOI: 10.1108/JRF-05-2022-0108.

Ahir, H., Bloom, N. and Furceri, D. 2022. *The World Uncertainty Index*. NBER Working Paper No. 29763.

Ahmed, S., Hasan, M. M. and Kamal, M. R. 2023. Russia–Ukraine Crisis: The Effects on the European Stock Market. *European Financial Management*, 29 (4), 1078–1118. DOI: 10.1111/eufm.12386.

Aktas, N., de Bodt, E. and Cousin, J.-G. 2007. Event Studies with a Contaminated Estimation Period. *Journal of Corporate Finance*, 13 (1), 129–145. DOI: 10.1016/j.jcorpfin.2006.09.001.

Armitage, S. 1995. Event Study Methods and Evidence on Their Performance. *Journal of Economic Surveys*, 9 (1), 25–52. DOI: 10.1111/j.1467-6419.1995.tb00109.x.

Assaf, R., Gupta, D. and Kumar, R. 2023. The Price of War: Effect of the Russia-Ukraine War on the Global Financial Market. *The Journal of Economic Asymmetries*, 28, e00328. DOI: 10.1016/j.jeca.2023.e00328.

Auer, C., Bosello, F., Bressan, G., Delpiazzo, E., Monasterolo, I., Otto, C., Parrado, R. and Reyer, C. P. O. 2025. Cascading Socio-Economic and Financial Impacts of the Russia-Ukraine War Differ Across Sectors and Regions. *Communications Earth & Environment*, 6, 194. DOI: 10.1038/s43247-025-02119-1.

Boehmer, E., Masumeci, J. and Poulsen, A. B. 1991. Event-Study Methodology under Conditions of Event-Induced Variance. *Journal of Financial Economics*, 30 (2), 253–272. DOI: 10.1016/0304-405X(91)90032-F.

Bossman, A. and Gubareva, M. 2023. Asymmetric Impacts of Geopolitical Risk on Stock Markets: A Comparative Analysis of the E7 and G7 Equities during the Russian-Ukrainian Conflict. *Heliyon*, 9 (2), e13626. DOI: 10.1016/j.heliyon.2023.e13626.

Boubaker, S., Goodell, J. W., Pandey, D. K. and Kumari, V. 2022. Heterogeneous Impacts of Wars on Global Equity Markets: Evidence from the Invasion of Ukraine. *Finance Research Letters*, 48, 102934. DOI: 10.1016/j.frl.2022.102934.

Boubaker, S., Nguyen, N., Trinh, V. Q. and Vu, T. 2023. Market Reaction to the Russian Ukrainian War: A Global Analysis of the Banking Industry. *Review of Accounting and Finance*, 22 (1), 123–153. DOI: 10.1108/RAF-10-2022-0294.

Brown, S. J. and Warner, J. B. 1980. Measuring Security Price Performance. *Journal of Financial Economics*, 8 (3), 205–258. DOI: 10.1016/0304-405X(80)90002-1.

Brown, S. J. and Warner, J. B. 1985. Using Daily Stock Returns: The Case of Event Studies. *Journal of Financial Economics*, 14 (1), 3–31. DOI: 10.1016/0304-405X(85)90042-X.

Cable, J. and Holland, K. 1999. Modelling Normal Returns in Event Studies: A Model-Selection Approach and Pilot Study. *The European Journal of Finance*, 5 (4), 331–341. DOI: 10.1080/135184799336993.

Campbell, C. J., Cowan, A. R. and Salotti, V. 2010. Multi-Country Event-Study Methods. *Journal of Banking & Finance*, 34 (12), 3078–3090. DOI: 10.1016/j.jbankfin.2010.07.016.

Chen, A. H. and Siems, T. F. 2007. The Effects of Terrorism on Global Capital Markets. In Brück, T. (ed.). *The Economic Analysis of Terrorism*. 1st ed. Routledge. DOI: 10.4324/9780203016633.

Chowdhury, E. K. and Khan, I. I. 2024. Reactions of Global Stock Markets to the Russia–Ukraine War: An Empirical Evidence. *Asia-Pacific Financial Markets*, 31 (3), 755–778. DOI: 10.1007/s10690-023-09429-4.

Covachev, S. and Fazakas, G. 2025. The Effects of the Russia–Ukraine War and the Wagner Group Coup on Defense Stocks in Europe: An Event Study Analysis. *Studies in Economics and Finance*, 42 (1), 31–42. DOI: 10.1108/SEF-11-2023-0675.

Davydov, D., Sihvonen, J. and Solanko, L. 2022. Who Cares About Sanctions? Observations from Annual Reports of European Firms. *Post-Soviet Affairs*, 38 (3), 222–249. DOI: 10.1080/1060586X.2022.2049563.

Defence News. 2022. *Top 100 | Defense News, News About Defense Programs, Business, and Technology* [online]. Available at: `https://people.defensenews.com/top-100/`. [Accessed 2024, April 19].

Demir, F. and Duan, Y. 2018. Bilateral FDI Flows, Productivity Growth, and Convergence: The North vs. the South. *World Development*, 101 (C), 235–249. DOI: 10.1016/j.worlddev.2017.08.006.

Dyckman, T., Philbrick, D. and Stephan, J. 1984. A Comparison of Event Study Methodologies Using Daily Stock Returns: A Simulation Approach. *Journal of Accounting Research*, 22, 1–30. DOI: 10.2307/2490855.

Elgin, C., Elveren, A. Y., Özgür, G. and Dertli, G. 2022. Military Spending and Sustainable Development. Review of Development Economics, 26 (3), 1466–1490. DOI: 10.1111/rode.12893.

Fama, E. F., Fisher, L., Jensen, M. C. and Roll, R. 1969. The Adjustment of Stock Prices to New Information. *International Economic Review*, 10 (1), 1–21. DOI: 10.2307/2525569.

Fang, Y. and Shao, Z. 2022. The Russia-Ukraine Conflict and Volatility Risk of Commodity Markets. *Finance Research Letters*, 50 (C), 103264. DOI: 10.1016/j.frl.2022.103264.

Gaio, L. E., Stefanelli, N. O., Pimenta, T., Bonacim, C. A. G. and Gatsios, R. C. 2022. The Impact of the Russia-Ukraine Conflict on Market Efficiency: Evidence for the Developed Stock Market. *Finance Research Letters*, 50 (C), 103302. DOI: 10.1016/j.frl.2022.103302.

Gheorghe, C. and Panazan, O. 2024. Investigating the Effect of Geopolitical Risk on Defense Companies' Stock Returns. *Heliyon*, 10 (24), e40974. DOI: 10.1016/j.heliyon.2024.e40974.

Gheorghe, C. and Panazan, O. 2025. Geopolitical Risk Contagion Across Strategic Sectors: Nonlinear Evidence from Defense, Cybersecurity, Energy, and Raw Materials. *PLoS One*, 20 (9), e0330557. DOI: 10.1371/journal.pone.0330557.

Grinius, M. and Baležentis, T. 2025. Impact of Geopolitical Turmoil in the Developing European Stock Markets vs. the Global Benchmark Indices: An Event Study Analysis of the Russo-Ukrainian War. *Contemporary Economics*, 19 (1), 121–131. DOI: 10.5709/ce.1897-9254.557.

Hu, Y., Corbet, S., Hou, Y., Lang, C. and Oxley, L. 2025. Tail Risk Connectedness during Geopolitical Shocks: Assessing the impact of Russian-Ukraine Conflict on G7 Stock Markets. *Applied Economics*, 57 (47), 7705–7733. DOI: 10.1080/00036846.2024.2393893.

Hudson, R. and Urquhart, A. 2015. War and Stock Markets: The Effect of World War Two on the British Stock Market. *International Review of Financial Analysis*, 40 (C), 166–177. DOI: 10.1016/j.irfa.2015.05.015.

IMF (International Monetary Fund). 2025. *Global Financial Stability Report: Shifting Ground Beneath the Calm (October 2025)* [online]. Available at: `https://www.imf.org/publications/GFSR`

Izzeldin, M., Muradoğlu, Y. G., Pappas, V., Petropoulou, A. and Sivaprasad, S. 2023. The Impact of the Russian-Ukrainian War on Global Financial Markets. *International Review of Financial Analysis*, 87 (C), 102598. DOI: 10.1016/j.irfa.2023.102598.

Joshi, N. A., Baker, H. K. and Aggarwal, A. 2023. The Russia-Ukraine War's Impact on Stock Markets in Asia-Pacific, the United States, and Europe. *Eurasian Journal of Business and Economics*, 16 (31), 39–53. DOI: 10.17015/ejbe.2023.031.03.

Joshipura, M. and Lamba, A. 2024. Asymmetric Impact of Russia–Ukraine War on Global Stock Markets. *The Journal of Prediction Markets*, 18 (1), 65–84. DOI: 10.5750/jpm.v18i1.2115.

Kakhkharov, J., Onur, I., Yalcin, E. and Zhu, R. 2024. Global Evidence on the Russia–Ukraine Conflict and Energy Stock Returns. *International Review of Economics & Finance*, 93 (B), 413–435. DOI: 10.1016/j.iref.2024.03.063.

Karaki, M. B. and Safieddine, H. 2023. Do Defense News Crowd Out Private Investment? *Economics Letters*, 233 (C), 111421. DOI: 10.1016/j.econlet.2023.111421.

Keleş, E. 2023. Stock Market Response to the Russia-Ukraine War: Evidence from an Emerging Market. *Journal of East-West Business*, 29 (3), 307–322. DOI: 10.1080/10669868.2023.2210121.

Leigh, A., Wolfers, J. and Zitzewitz, E. 2003. *What Do Financial Markets Think of War in Iraq?* NBER Working Paper No. w9587.

Licht, A. N. 2023. The Little Market That Could: Facilitating Cross-Listing through Unilateral Regulatory Recognition. In Chiu, I. H.-Y. and MacNeil, I. (eds.). *Research Handbook on Global Capital Markets Law*, Chapter 25, pp. 400–415. DOI: 10.4337/9781800379305.00036.

MacKinlay, A. C. 1997. Event Studies in Economics and Finance. *Journal of Economic Literature*, 35 (1), 13–39.

Maddodi, S. and Kunte, S. R. 2024. Market Resilience in Turbulent Times: A Proactive Approach to Predicting Stock Market Responses during Geopolitical Tensions. *Journal of Capital Markets Studies*, 8 (2), 173–194. DOI: 10.1108/JCMS-12-2023-0049.

Mann, H. B. and Whitney, D. R. 1947. On a Test of Whether One of Two Random Variables is Stochastically Larger than the Other. *The Annals of Mathematical Statistics*, 18 (1), 50–60. DOI: 10.1214/aoms/1177730491.

Martins, A. M. 2024. Stock Market Effects of Military Conflicts on Defence Industry. *International Journal of Islamic and Middle Eastern Finance and Management*, 17 (5), 1014–1026. DOI: 10.1108/IMEFM-01-2024-0019.

Martins, A. M., Correia, P. and Gouveia, R. 2025. War! Good News for Defense Firms? Analysis of the Impact of Russia–Ukraine Conflict. *Journal of Economic Studies*, 52 (2), 303–321. DOI: 10.1108/JES-11-2023-0667.

Memdani, L. and Shenoy, G. 2019. Impact of Terrorism on Stock Markets across the World and Stock Returns: An Event Study of Taj Attack in India. *Journal of Financial Crime*, 26 (3), 793–807. DOI: 10.1108/JFC-09-2018-0093.

Mishra, A. K., Ansari, Y., Bansal, R. and Maurya, P. K. 2024. Regional and Periodic Asymmetries in the Effect of Russia-Ukraine War on Global Stock Markets. *Heliyon*, 10 (7), e28362. DOI: 10.1016/j.heliyon.2024.e28362.

Mohamad, A. 2022. Safe Flight to Which Haven when Russia Invades Ukraine? A 48-Hour Story. *Economics Letters*, 216, 110558. DOI: 10.1016/j.econlet.2022.110558.

Nasouri, A. 2025. The Impact of Geopolitical Risks on Equity Markets and Financial Stress: A Comparative Analysis of Emerging and Advanced Economies. *International Journal of Economics and Business Administration* 13 (1), 30–41. DOI: 10.35808/ijeba/873.

Nemat, M., Rahat, B., Rossi, M. and Salloum, C. 2025. Global Trade and Finance Turmoil: The Ukraine–Russia War's Impact. *The Journal of Risk Finance*, 26 (3), 516–529. DOI: 10.1108/JRF-02-2025-0091.

Nerlinger, M. and Utz, S. 2022. The Impact of the Russia-Ukraine Conflict on Energy Firms: A Capital Market Perspective. *Finance Research Letters*, 50, 103243. DOI: 10.1016/j.frl.2022.103243.

Niederhoffer, V. 1971. The Analysis of World Events and Stock Prices. *The Journal of Business*, 44 (2), 193–219. DOI: 10.1086/295352.

Obi, P., Waweru, F. and Nyangu, M. 2023. An Event Study on the Reaction of Equity and Commodity Markets to the Onset of the Russia–Ukraine Conflict. *Journal of Risk and Financial Management*, 16 (5), 256. DOI: 10.3390/jrfm16050256.

Olejnik, Ł. W. and Kuna, J. 2025. Military Expenditures As a Part of Endogenous Fiscal Policy in 21 EU-NATO Countries: The Fiscal Consequences of Rising Defence Budgets. *Defence and Peace Economics*, in press. DOI: 10.1080/10242694.2025.2553245.

Patidar, A. K., Jain, P., Dhasmana, P. and Choudhury, T. 2024. Impact of Global Events on Crude Oil Economy: A Comprehensive Review of the Geopolitics of Energy and Economic Polarization. *GeoJournal*, 89 (2), 50. DOI: 10.1007/s10708-024-11054-1.

Rigobon, R. and Sack, B. 2005. The Effects of War Risk on US Financial Markets. *Journal of Banking & Finance*, 29 (7), 1769–1789. DOI: 10.1016/j.jbankfin.2004.06.040.

Schneider, G. and Troeger, V. E. 2006. War and the World Economy: Stock Market Reactions to International Conflicts. *Journal of Conflict Resolution*, 50 (5), 623–645. DOI: 10.1177/0022002706290430.

Schneider, G. and Tröger, V. E. 2004. *The Winners and Losers of War: Stock Market Effects of Armed Conflict, 1990–2000*. Estudio Working Paper No. 2004/205.

Sharma, K., Aulja, A., Mittal, K. and Kondle, R. 2024. The Russia-Ukraine Conflict: Implications for Global Food Security, Trade, and Economic Stability. *Food and Agri Economics Review*, 4 (2), 39–45. DOI: 10.26480/faer.02.2024.39.45.

Silva, T. C., Wilhelm, P. V. B. and Tabak, B. M. 2023. Trade Matters Except to War Neighbors: The International Stock Market Reaction to 2022 Russia's Invasion of Ukraine. *Research in International Business and Finance*, 65 (C), 101935. DOI: 10.1016/j.ribaf.2023.101935.

Smith, R. P. 2022. *Defence Acquisition and Procurement: How (Not) to Buy Weapons*. Elements in Defence Economics Series. Cambridge University Press. DOI: 10.1017/9781009189644.

Soare, D. 2025. European Defense and Current Hybrid Threats. In *Redefining Community in Intercultural Context*, 12 (1), 50–54.

Solarin, S. A. and Sahu, P. K. 2015. The Effect of Military Expenditure on Stock Market Development: Panel Evidence from System GMM Estimates. *Defence and Peace Economics*, 26 (3), 271–287. DOI: 10.1080/10242694.2014.898384.

Song, X. Y., Su, C. W. and Qin, M. 2025. Geopolitical Storm Approaches: Can Defence Stocks Serve As a Safe Haven? *Defence and Peace Economics*, in press. DOI: 10.1080/10242694.2025.2573012.

Statista. 2025. *Market Share of the Leading Exporters of Major Weapons 2020–2024* [online]. Available at: `https://www.statista.com/statistics/267131/market-share-of-the-leadings-exporters-of-conventional-weapons/?srsltid=AfmBOoqPhVKLSdQwuSYK7WC1G5tMuy3TFMKqrpIhrh869fclLAJcijfN`. [Accessed 2025, November 19].

Sun, M., Song, H. and Zhang, C. 2022. The Effects of 2022 Russian Invasion of Ukraine on Global Stock Markets: An Event Study Approach. *SSRN Electronic Journal*. DOI: 10.2139/ssrn.4051987.

Swain, A. 2024. *Climate Security*. 1st ed. SAGE Publications. ISBN 978-1-5296-7084-4.

Thielicke, H. 2024. *SIPRI Yearbook 2024: Armaments, Disarmament and International Security* [online]. Available at: `https://reliefweb.int/report/world/sipri-yearbook-2024-armaments-disarmament-and-international-security-summary-enarruzhukfajpkrsvnlca`

Wang, M. and Su, Y. 2023. How Russian-Ukrainian Geopolitical Risks Affect Chinese Commodity and Financial Markets? *Finance Research Letters*, 56, 104179. DOI: 10.1016/j.frl.2023.104179.

Wilcoxon, F. 1945. Individual Comparisons by Ranking Methods. *Biometrics Bulletin*, 1 (6), 80–83. DOI: 10.2307/3001968.

Yang, R., Zhang, Y., Teng, X. and Sun, Z. 2023. The Impact of Russia-Ukraine Conflict and Shanghai Lockdown on Chinese Stock Market. In *Proceedings of the 2nd International Conference on Business and Policy Studies*, pp. 1555–1568. DOI: 10.1007/978-981-99-6441-3_139.

Yousaf, I., Patel, R. and Yarovaya, L. 2022. The Reaction of G20+ Stock Markets to the Russia–Ukraine Conflict "Black-Swan" Event: Evidence from Event Study Approach. *Journal of Behavioral and Experimental Finance*, 35, 100723. DOI: 10.1016/j.jbef.2022.100723.

Yudaruddin, R. and Lesmana, D. 2024. The Market Reaction of Energy Companies to the Announcement of the Russian–Ukrainian Invasion. *European Journal of Management and Business Economics*, in press. DOI: 10.1108/EJMBE-01-2023-0006.

Zehri, C., ben Ammar, L. S. and Youssef, W. A. B. 2025. Geopolitical Risks and Global Capital Flows: Divergent Vulnerabilities in Emerging and Advanced Economies. *Eurasian Economic Review*, 15 (4), 1135–1165. DOI: 10.1007/s40822-025-00326-x.

Zhang, Z., Bouri, E., Klein, T. and Jalkh, N. 2022. Geopolitical Risk and the Returns and Volatility of Global Defense Companies: A New Race to Arms? *International Review of Financial Analysis*, 83, 102327. DOI: 10.1016/j.irfa.2022.102327.

AUTHOR'S ADDRESS

ATM Adnan, Faculty of Business Studies, BGMEA University of Fashion & Technology, Dhaka 1230, Bangladesh, e-mail: atmadnan@buft.edu.bd (corresponding author)

Md Arif Hasan Khan, Department of Business Administration, Northern University of Business and Technology, Khulna, Bangladesh, e-mail: arifhasan.bangor.uk@gmail.com

Md Tapan Mahmud, Department of Accounting and Information Systems, Bangladesh University of Professionals, Dhaka 1216, Bangladesh, e-mail: mahmud.tapan@bup.edu.bd

Sabira Kumkum, Faculty of Business Studies, Bangladesh University of Professionals, Dhaka 1216, Bangladesh, e-mail: sabira.kumkum@gmail.com

Abdullah Al-Mamun, School of Business, University of Wollongong, North Fields Ave, Wollongong, Australia, e-mail: abdullah_mamun@uow.edu.au, ORCID: 0000-0003-1939-2393