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THE MARKET DYNAMICS OF MILITARY CONFLICT:

FINANCIAL RETURNS AND STRATEGIC CONSIDERATIONS IN THE GLOBAL ARMS INDUSTRY

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Financial Returns and Strategic Considerations in the Global Arms Industry

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The Market Dynamics of Military Conflict:

Financial Returns and Strategic Considerations in the Global Arms Industry

Abstract

Implementing an event study methodology for the February 2022 Russian invasion of Ukraine and for the October 2023 Hamas attack on Israel, we look at the stock returns of the globe's largest arms-producing and military services companies. Our analysis finds that these two recent military actions had sharply different impacts upon financial markets. Arms companies averaged ten percentage points of cumulative abnormal returns (CAR) after the Russian invasion but CAR after the Hamas attack was indistinguishable from zero. Given that the Hamas attack was a surprise to nearly everyone, but the Russian attack was the accumulation of a building tension, the results are even more paradoxical, as the anticipated attack had substantial impacts on financial markets while the surprise attack had no apparent impact. We argue that the results can be explained by the reaction of policymakers.

Keywords: Russia-Ukraine conflict, event methodology, arms-producing and military services companies, cumulative abnormal returns, war economy, Israel-Hamas conflict

I. INTRODUCTION

You know who's going to inherit the Earth? Arms dealers.
Because everyone else is too busy killing each other.
- Yuri Orlov, Lord of War

On Friday, February 18, 2022, a weary President Biden remarked to the press from the White House: "As of this moment, I am convinced [Putin]'s made the decision".[1] It was 6 days before Russian forces began their full-scale invasion of Ukraine. In those six days, every major American[2] and European[3] public figure resonated Biden's statement, commentating in detail the impacts of such invasion for human lives, for its geopolitical importance, for the Russian economy[4], and for the role of the US around the world.

[1] Almost every major news organization in the world reverberated such news. See e.g. BBC News, 2022, Holland (2022), The Economist (2022), Vazquez et al. (2022).

[2] The list here can be never-ending. A selection of some of the key points is presented below.
Blinken says signs suggest Russia will invade Ukraine (Pamuk, 2022); Senate Foreign Relations Chair Bob Menendez says "From all accounts, it seems that Vladimir Putin is headed towards conflict instead of diplomacy." (Ward, 2022); "Last year, Harris warned Europe of Russia's imminent invasion of neighboring Ukraine." (Garamone, 2023); Harris says "Their actions simply do not match their words" and warns of imminent invasion (Sanger, 2022); Blinken believes that Russia is setting the stage to invade. (Herb, 2022); US National Security Adviser Jake Sullivan urged Americans to leave in next 48 hours due to the belief of Russia invading Ukraine. (itv, 2022); Vladimir Putin has launched a full-scale military invasion of Ukraine. (Chan et al., 2022); Missiles rain down around Ukraine. (Zinets and Vasovic, 2022); The Netherlands strongly condemns the Russian attack on Ukraine. (Government of the Netherlands n.d.); Russia Begins Military Operation in Ukraine. (Trofimov et al., 2022).

[3] National TV address by President Macron stating that Russia's actions are a turning point in history and "will have lasting, profound consequences on our lives. They will have consequences on our continent's geopolitics, and we will know how to respond to this together." (Bisserbe, 2022); "The world will hold Russia accountable": Leaders react to "horrific events" in Ukraine. U.S. and world leaders quickly condemned Russia's attack on Ukraine (Morin and Lopez, 2022); UK Prime Minister's address to the nation on the Russian invasion of Ukraine in which he condemns Russia's actions (Johnson, 2022); "Dark day for Europe": World leaders condemn Russia's invasion of Ukraine. (CNBC. com. staff, 2022); Joint statement by European Council and European Commission: "We call on Russia to immediately cease the hostilities." (European Commission, 2022); NATO Secretary General Jens Stoltenberg: "Grave breach of international law" (NATO, 2022); German Chancellor Scholz press statement on the Ukraine attack condemning Russias actions (Die Bundesregierung, 2022); Finland minister and president condemn Russian attack (Laakkonen, 2022).

[4] Harris warns of unprecedented economic costs (Bose, 2022); Canada's prime minister Trudeau declares severe sanctions on Russia for its actions. Further sanctions are implemented in response to the Attack (Tasker, 2022); U.S. President Joe Biden: "The world will hold Russia accountable." In his speech, Biden declares sanctions on Russia that will impose severe costs on the Russian Economy (The White House, 2022); VP Harris says sanctions would absolutely deter Putin, despite saying he made up his mind on invading Ukraine (Aaro, 2022).

The deluge of op-eds, research articles, and social media blogs that followed was unparalleled. Academic scholarship pointed out the (1) negative impact that sanctions would have on the Russian economy (Mancini et al. (2022), Hosoe (2023), Drott et al. (2024), Klose (2024)), (2) what an invaded Ukraine would mean for the economy of the European Union (European Investment Bank (2022), Korosteleva (2022), Huang et al. (2022), Arnold et al. (2022), Tong (2024)), and (3) what role what this invasion play for the economies of emerging powers such as China and India (Romei et al. (2022), Mohan (2022), Bucklet and Bradsher (2022), World Bank (2022), Panda (2022), Hennessy (2023)).

While the world was still digesting the war news out of Ukraine, a shocking surprise attack from Gaza deep into Israel occurred on October 7, 2023. (Ioanes (2023)) The Israeli defense apparatus was taken completely by surprise and the attack was deemed as "one of the broadest invasions of its territory in 50 years" (Kingsley and Kershner (2023)). One of the most shocking discoveries was that the operation had been planned in complete operational security without any leakage of information to alert defenders; indeed, scholars and journalists claimed that the attack had been a complete failure on the part of the Israeli intelligence agencies, which are highly regarded for their expertise. (Bergman and Kingsley, (2023), Ignatius (2023)) News of the attack reverberated around the world, not only for the viciousness of the attack, but also about the expected Israeli response. Israel formally declared war on Hamas (Goldenberg and Shurafa (2023)) with Israeli Prime Minister Benjamin Netanyahu predicting "a long and difficult war" (Gold et al. (2023)).

When it comes to the impact of the Russian-Ukraine conflict on the stock markets, a bourgeoning literature is emerging. Boungou and Yatie (2022) explored the responses of world stock market indices to the Russian-Ukraine conflict, finding more pronounced results for countries bordering the Ukraine and Russia. Boubaker et al. (2022) discover that the Russian-Ukraine conflict led to negative cumulative abnormal returns across worldwide stock market indices, though the effects varied, depending on the magnitude of the globalization of economies. Ahmed et al. (2023) examine the impact of the Russia-Ukraine crisis on the European stock markets, finding that "European stocks incurred a significant negative abnormal return." Kamal et al. (2023) investigate the effect of the conflict on the Australian stock market, finding significantly negative abnormal returns. Yet, to our surprise, there is no study that we could find that explores the impact that the invasion had for arms-producing and military services companies in the world, which one would argue would be the key players in such conflict.

Similarly, the impact of the Hamas attack on financial markets is understudied. Altemur et al (2024) find that the Hamas-Israel conflict had significant impacts on stock market indices of Middle Eastern countries. Goyal and Soni (2024) explore the impact of the Hamas attack on global equity markets, discovering that emerging markets responded negatively to the event, whereas developed markets were relatively resilient to it. Jackson and Mitts (2023) documented the market behavior of short sellers days before the Hamas attack, arguing that unusual short selling behavior was prevalent. Bradley et al. (2024) found, among other things, that diaspora bonds were a reliant source of low-cost financing for Israel even after the Hamas attack. Yet, again, similarly to the scholarship gap with regard to the Russian invasion of Ukraine, we could not find a study that explores the impact that the attack had for arms-producing and military

services companies in the world.

Our research addresses that gap by studying the stock market returns of the world's largest arms-producing and military services companies in the world. Using data from the Stockholm International Peace Research Institute (SIPRI) 100 and Compustat, we trace the stock market returns of the largest publicly traded arms-producing and military services companies in the world. In the case of the Ukraine attacks, and different from all the other studies reporting negative abnormal returns to the broad market of firms, we noticed *positive* abnormal returns among arms companies. These positive abnormal returns steadily grew over the first week of the conflict as it became clearer that the invasion bogged down, and the war would not be short. The cumulative abnormal returns were strongest for European firms: one month after the invasion, European firms had median returns of 0.216 (mean 0.242) while non-European firms had median 0.035 (mean 0.036). But the same arms companies, after the Hamas attacks, showed no unusual returns, despite the fact that Israeli officials predicted that the conflict would remain ongoing.

Implementing an event study methodology, we find that investors reacted to the news from Ukraine and correctly anticipated a surge of military spending. This accords with the efficient capital market hypothesis, which states that the price of publicly traded securities accurately reflects the information of all available information (Fama (1970), (Fama (1991)). In contrast, the surprise attack upon Israel had no perceptible impact. Israel is the world's 15th largest military spender (compared to Russia being 3rd), making just 1% of global military expenditures (3.9% for Russia). (SIPRI (2023)) Converting that small

economy to a wartime footing has minimal impact to the rest of the world. By contrast, many European nations increased military spending as additional countries joined NATO.

There can be a healthy degree of skepticism for a study of this nature, given that there is widespread belief that arms-producing and military services companies benefit during times of conflict. While there is truth to this widespread assumption, there are a few factors to consider. First, arm-production remains an important state monopoly in many ways. Roughly 40 percent of the companies (which represent the largest arms-producing and military services companies) in the SIPRI database are state-owned. This implies a complex and competitive market landscape; it is extremely difficult to accurately predict if publicly traded companies will get a sizable piece of spending in case of new conflicts, as states prioritize national companies in times of heightened security concerns. This complicates the assumption that if you are an arms-producing and military services company you automatically benefit from conflicts. Second, the SIPRI database includes widely diversified companies such as Boeing, Safran, and Rolls Royce, which have business lines throughout the aviation industry, rather than a concentration upon military services. The invasion of Ukraine not only brought increased demand for ammunition, but it also led to significant worries about energy costs, especially in Europe. Hence, the impact of military conflicts on the overall business performance and stock prices can be less straightforward than assumed. In our own analysis in this study, these three companies had raw cumulative returns of -7.4%, -1.3%, and -4.9%, respectively. Lastly, global arms-producing companies face significant regulatory and political risks, which affect their ability to do business around the world. The operations of these companies are often restricted due to international sanctions, embargoes, and changes in defense policies. This,

in turn, contradicts the assumption that military conflict automatically yields benefits for every arms producing company.

Our contribution places well within the existing literature on how financial markets respond to various forms of military conflict ((Cutler, Poterba, and Summers (1989), Kaun (1990), Bittlingmayer (1998), Frey and Kucher (2001), Salisu et al. (2003), Leigh, Wolfers and Zitzewitz (2003). Amihud and Wohl (2004), Rigobon and Sack (2005), Poteshman (2006), Schneider and Troeger (2006), Guidolin and La Ferrara (2007), Zussman, Zussman and Nielsen (2008), Wolfers and Zitzewitz (2009), Choudhry (2010), Chesney et al. (2011), Jackson and Mitts (2023)). Furthermore, our contribution advances the academic debate when it comes to the Russian-Ukraine conflict. (Umar et al. (2022), Federle and Sehn (2022), Boungou and Yatie (2022), Boubaker et al. (2022), Ahmed et al. (2023), Kamal et al. (2023), Izzeldin et al. (2023)). Lastly, our findings can be beneficial to investors and policy makers, as they reveal the market's inability to incorporate adequately complex geopolitical events. This phenomenon underscores the importance of considering alternative investment strategies on a constant basis.

Our paper is organized in the following way. Section 2 provides information on the data and the methodology. Section 3 presents results. Section 4 analyzes such results. Section 5 concludes.

II. DATA AND METHODOLOGY

We use data from the SIPRI Database, which is "the most comprehensive publicly available source of information on international arms transfers."[5] In its main database, the SIPRI publishes a list of the globe's top 100 arms-producing and military services companies ('arms companies').

[5] https://www.sipri.org/databases

A breakdown of the database revealed the presence of state-owned companies and publicly traded ones. We use stock prices of all the publicly traded companies on that list – 64 in total. (A list is in appendix.) These companies are traded on thirteen different exchanges in eleven different currencies. For the purposes of our analysis, we convert all the currencies in US dollars, as per the recommendation of Ghoul et al. (2023).

The event study methodology is standard[6]: from each stock's returns, construct its abnormal returns as the excess over some measure of expected return,

(1) $$AR_{t,k} = R_{t,k} - E(R)_{t,k}$$

where $R_{t,k}$ is each stock's actual return on the day, $E(R)_{t,k}$ is the expected return based on information about the local index, k, and $AR_{t,k}$ is the abnormal return on that day.

To estimate expected return, $E(R)_{t,k}$, over the kth market return, $MR_{t,k}$, we form a linear regression,

(2) $$E(R)_{t,k} = \alpha + \beta MR_{t,k}$$

using information from the estimation window to estimate α and β.

Each stock's cumulative abnormal return up the time, w, during the event window, is then

(3) $$CAR_{t,k,w} = \sum_{i=1}^{w} AR_{t,k}$$

[6] Both Kothari and Warner (2007) and Ghoul et al. (2023) offer generous overviews of the status of event studies in the field of international finance research. With over 500 event studies published, these overviews are providing a reliable aggregate view of how event studies should be conducted.

In a typical event study of this sort, there are a limited number of modeling choices: the date of the event, the event window, and the estimation window. For the Russian invasion of Ukraine, we date the event to February 24, 2022, the date when Russia initiated a full-scale invasion of Ukraine. This is different from Ahmed et al. (2023), who have 21 February 2022; Kamal et al. (2023), February 22, 2022, the first trading day after Russia recognized the two Ukrainian states as autonomous regions, but it is similar to the event date as Boungou and Yatie (2022). We believe February 24, 2022 is a better event date, because, as reported from the major newspapers, there had been no large-scale military engagements besides eastern Ukraine. In terms of the event window, we use the month before and after as the event window, from January 25 to March 25, 2022, as in Boungou and Yatie (2022). When it comes the estimation window, we use a six-month estimation window, which is different from Boubaker (2023) who use 140 days window. Our estimation window strategy is consistent with Kothari and Warner (2007).[7]

For the Hamas attack from Gaza, the event is October 7, 2023. The event window is the month before and after. The estimation window is six months.

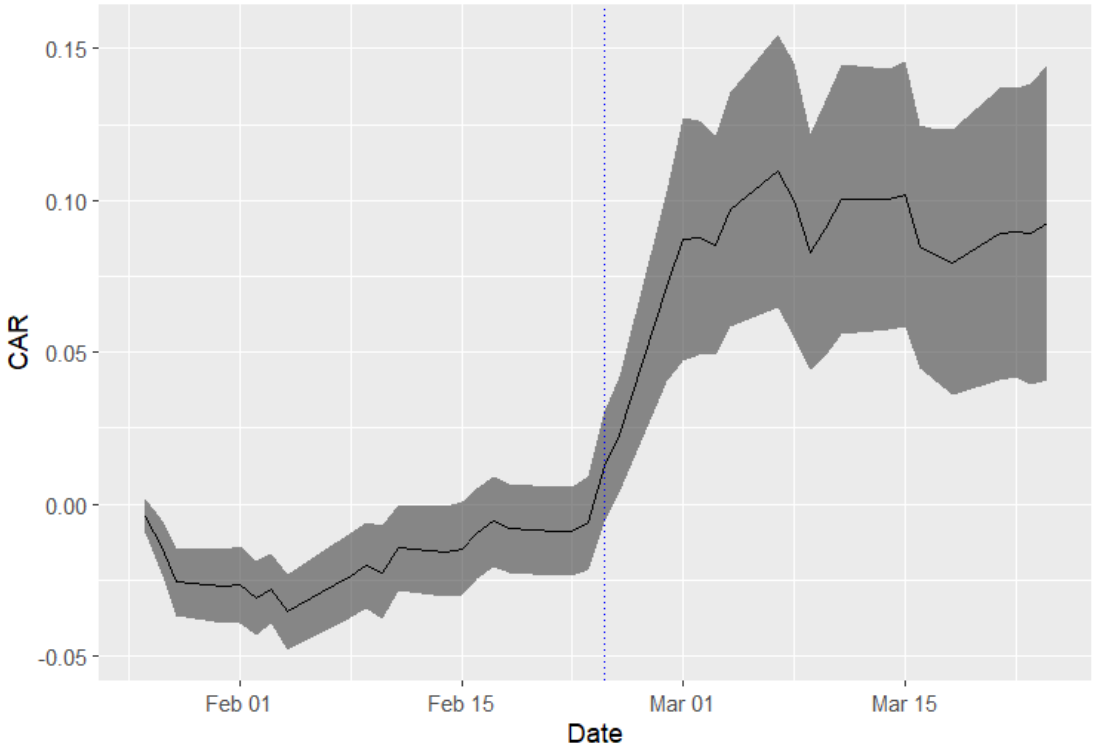
III. RESULTS

a. Main findings for Ukraine

There were significant cumulative abnormal returns from the day before (when Russia announced annexation of Ukrainian territory) and for the next week.

[7] Approximately 200 of the 565 event studies listed in their review study use a maximum window length of 12 months or more.

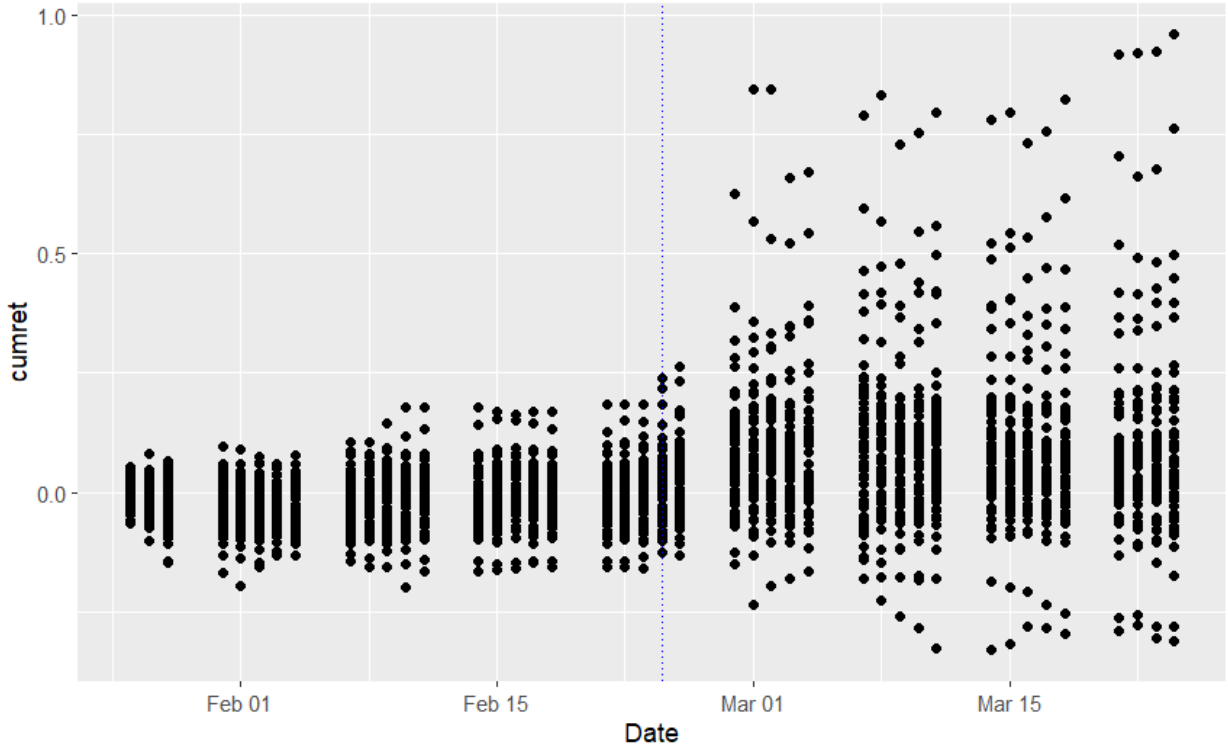
Figure 1: mean CAR of arms companies after Russian invasion of Ukraine, with 95% error bands



As depicted, the graph in Figure 1 presents a clear trend in stock returns surrounding the event day. Prior to the event, stock returns lack significant market movement; after the event date, the returns peak. What is interesting is the fact that the stock returns do not revert to pre-event levels, but rather reflect a sustained impact from the event on investor sentiment. We read the displayed post-event volatility as a sign that the market is seeking to find a new equilibrium, underscoring the importance of the event in influencing market behavior. While the typical window for events is just one month, in this case the CAR was sustained. Six months after the invasion of Ukraine, the average CAR remained over sixteen percentage points.

This next graph (Figure 2) shows all of the returns, demonstrating that the invasion prompted significant revaluations among many arms companies.

Figure 2: all CARs of arms companies after Russian invasion of Ukraine



In Figure 2, each dot represents an individual observation of the cumulative return on a given date, where the gaps are for the weekends.[8] As seen, the distribution of cumulative returns appears tightly clustered around lowered values prior to the event date. We believe such clustering suggests a consistent performance among the stock returns. However, after the event date, there is a visible dispersion of the data points, showing a strong reaction to the event date. The dispersion reflects another key point: some companies gained significantly whereas others may not have been affected as much, or even decreased in value due to the event.

[8] Since these companies trade on different exchanges around the world, there are different holidays, which explains some of the variation.

Table 1 shows some statistics about the CARs at different points after the invasion. The 25th percentile is negative, but the median and mean CARS are 6% to 10% and the 75th percentile is above 15%. The means and medians are all are statistically significantly different from zero, with p-values below one percent.

Table 1: CAR after invasion

CAR as of…	25th percentile	Median	Mean	75th percentile
1 week after	-0.006	0.062	0.087	0.152
2 weeks after	-0.020	0.081	0.100	0.166
3 weeks after	-0.001	0.079	0.102	0.156
1 month after	-0.011	0.067	0.093	0.175

The arms companies with largest CAR include Hensoldt (trading in Frankfurt), Rheinmetall (Frankfurt), Saab (Stockholm), Thales (Paris), Leonardo (Milan) and Dassault Aviation (Paris). Although all of the top arms companies sell their products globally, they have significant ties to their home country and military, which we believe is reflected also in investors' sentiment. Average CAR for European arms companies in this sample after the invasion was 0.187, more than four times higher than CAR for those in other continents, 0.046 (a statistically significant difference). This was widespread, not just a few outliers: more than 70% of the European arms companies had higher returns than the median non-European companies. When it comes to the companies with the lowest CAR, they are V2X (New York), Rolls-Royce (London) and Fujitsu (Tokyo).

Dividing the companies between European and non-European, we can see a substantial difference. Table 2 shows mean and median CARs at a few points after the invasion. The European firms diverged widely from the rest of the world. The median and mean are both displayed, to demonstrate that this is not just about a few outliers bringing up the average.

Table 2: CAR after invasion for European and non-European companies

	European		non-European	
CAR as of…	Median	Mean	Median	Mean
1 week after	0.169	0.201	0.042	0.044
2 weeks after	0.179	0.248	0.040	0.043
3 weeks after	0.168	0.240	0.050	0.049
1 month after	0.216	0.242	0.035	0.036

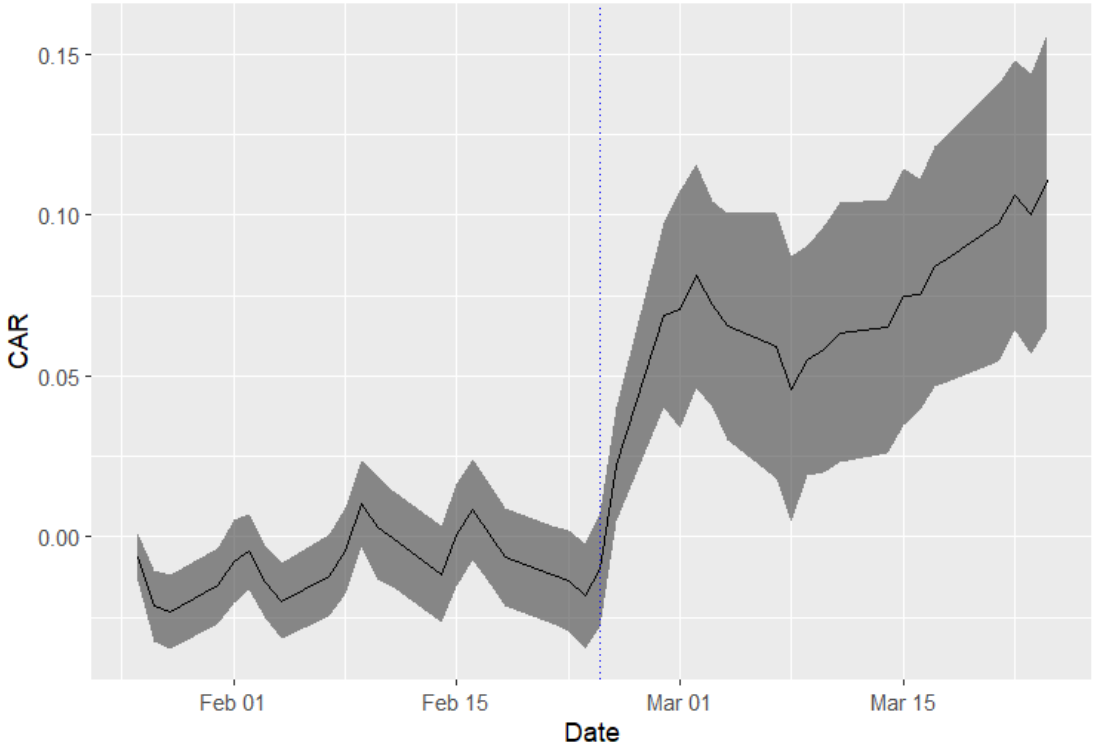
The differences are all statistically significant below 1% level.

b. Robustness checks for Ukraine

In estimating CAR, we might worry that there could be differences created by the estimation of alpha and beta, the sensitivity of each company's returns to the market.

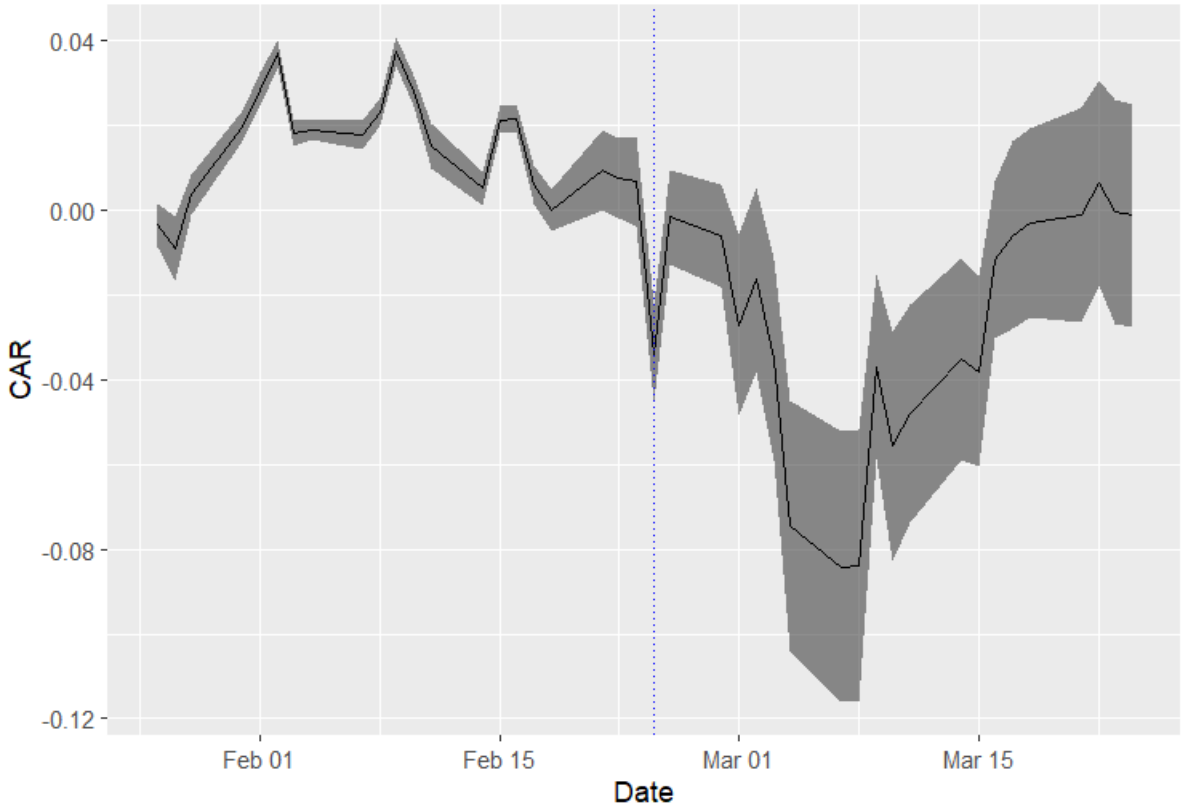
Figure 3 displays the cumulative raw returns of each company, without any modeling or consideration of the index.

Figure 3: Cumulative raw returns for arms companies after Russian invasion



There was clearly a sharp jump in stock prices upon the event date. However, when comparing it with the trend of the indexes, as depicted in Figure 4, one notices that the indexes did not react nearly as strongly. We believe this to be due to the pressing concerns about energy prices and worries that a wide array of companies would face slumping sales.

Figure 4: Cumulative returns for market indexes after Russian invasion

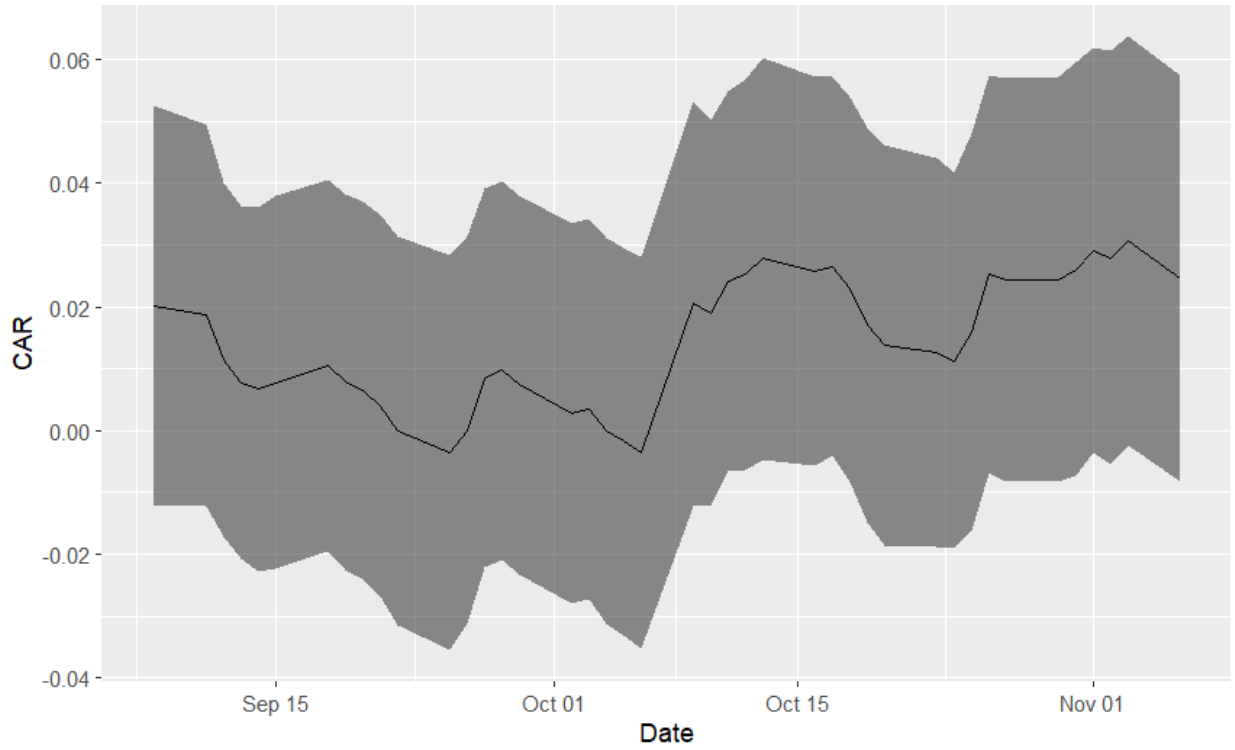


There remains a statistically significant positive impact from the event even if we use alternate estimation windows (for example, 12 months estimation window), or if, instead of using OLS, we estimate alpha and beta with Least Absolute Deviations to form an estimate of the median instead of average.

c. Main findings for Israel

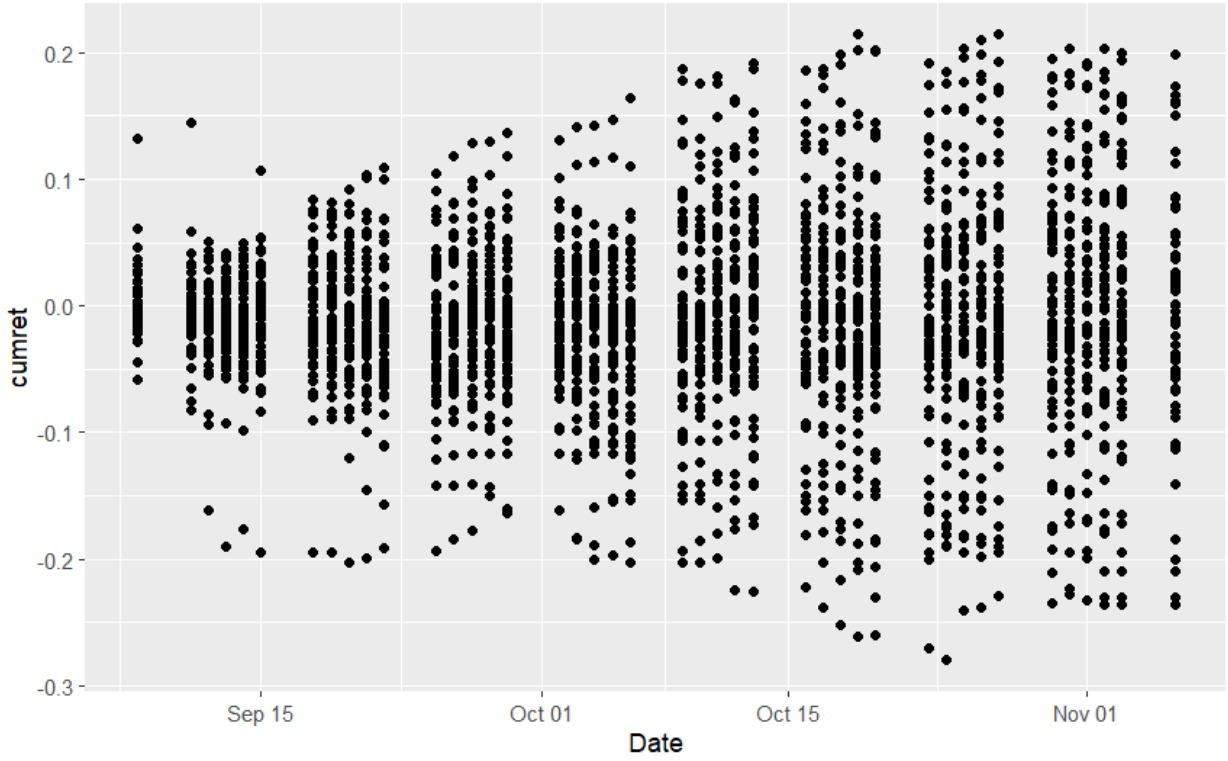
The surprise attack by Hamas upon Israel on October 7, 2023 provides a different occasion to look at CARs among these arms companies. But with this event there is no significant impact. The median arms company had CAR of 0.015 (mean was 0.025); both insignificantly different from zero.

Figure 5: CAR for arms companies after Oct 7, 2023, Hamas attack on Israel



Looking at all of the returns, we see a similar lack of systematic movement. There were a few high returns, such as L3Harris Technologies (New York), Northrop Grumman (New York), and Melrose Industries (London); but also, losers including Boeing (New York), Ball (New York), and Serco Group (London).

Figure 6: all CARs of arms companies after Hamas attack



d. Robustness checks for Israel

We display similar results as previously: the raw returns (without any modeling) and index returns.

Figure 7: Cumulative raw returns for arms companies after Hamas attack

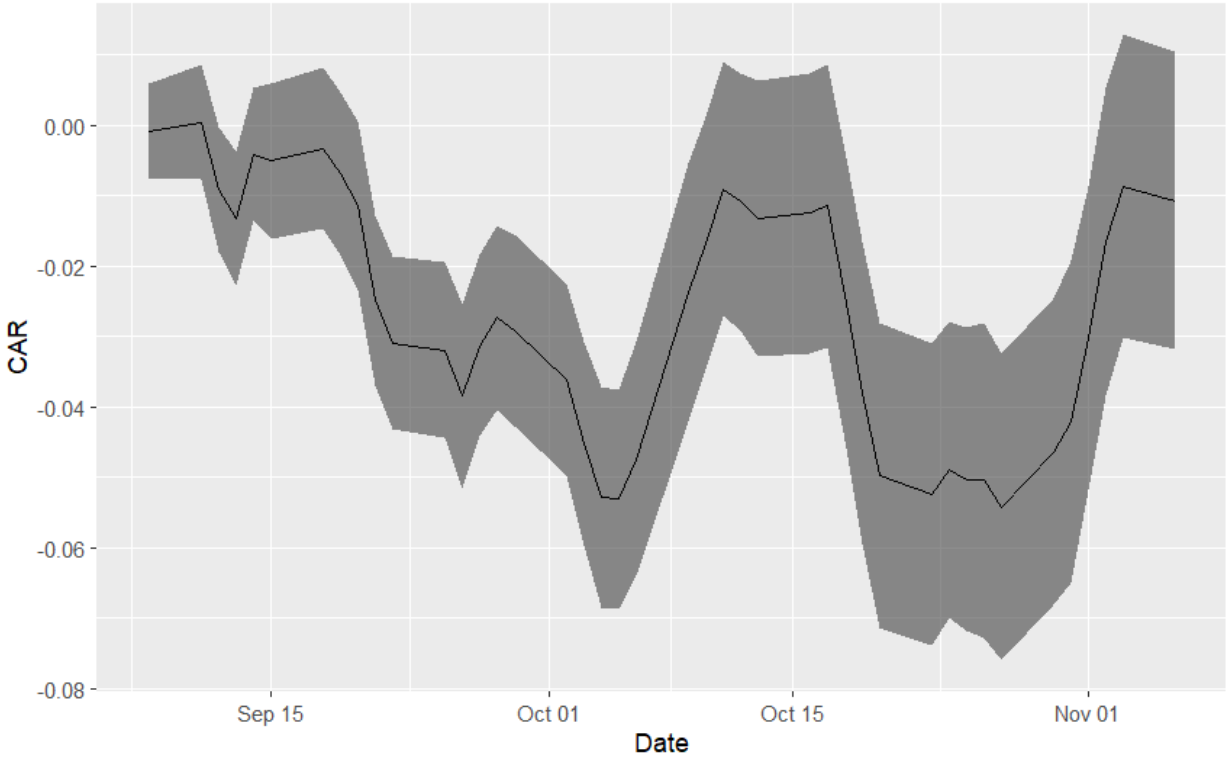
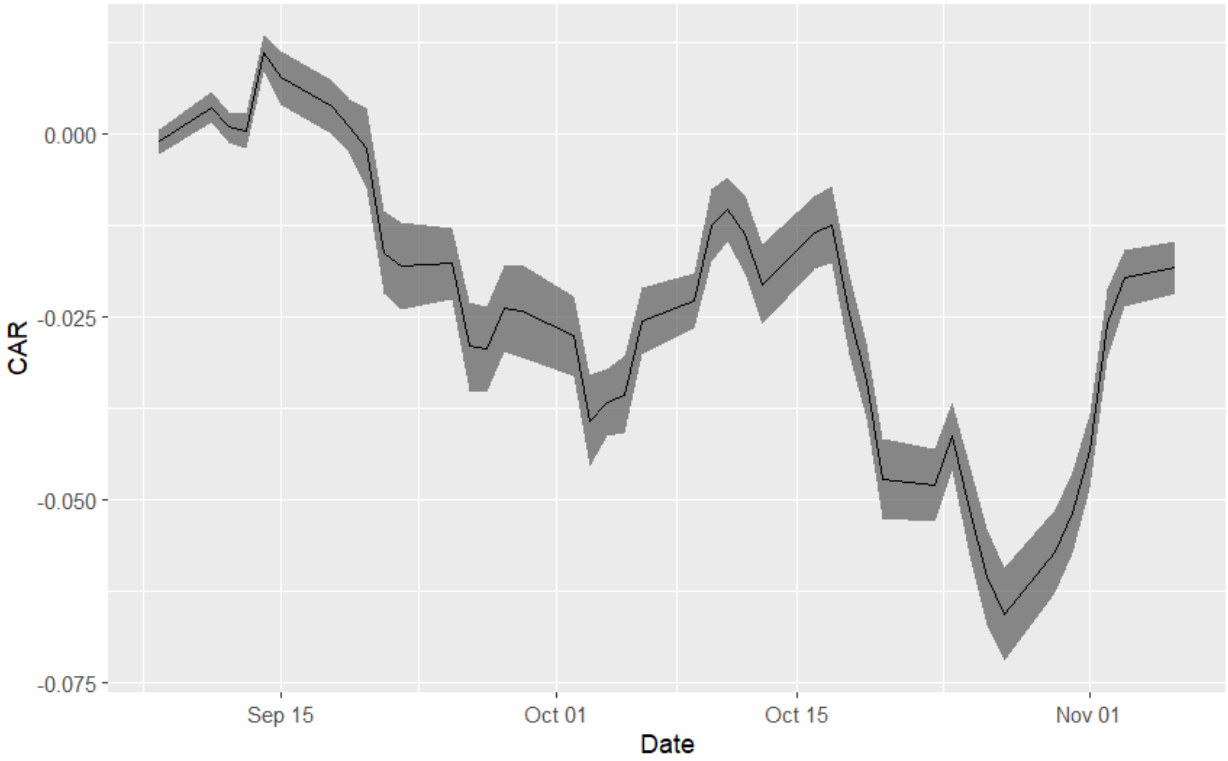


Figure 8: Cumulative returns for market indexes after Hamas attack



IV. DISCUSSION

The contrast between these two events shows very clearly: it is not so much that war is good for business for arms companies; rather that events which trigger strategic reevaluations can be good for business. The differences in the magnitudes of these signals is remarkable. In fact, looking over the entire 5-year period from Jan 2018 to Dec 2023, the month of returns after the Russian invasion is the largest shift in arms company stock prices, apart from pandemic disruptions of 2020. In contrast, the tragic events during and after October 7, the atrocities and loss of life, the military expenditures by the multitude of actors, did not show up in these financial returns of arms companies.

While it is true that geopolitical risk and stock market volatility intertwine (Salisu et al. (2022)), our results, we believe, showcase a surprising outcome, particularly given the sensitive nature of these geopolitical events.

On the one hand, the invasion of Ukraine seems to have been a signal not just that there would be more orders for ammunition but rather a comprehensive shift of the continent's strategic priorities. European NATO members had been promising for years that they would increase defense spending and NATO welcomed new members. The invasion sharpened priorities for European geostrategies. Commentators had remarked that the defiant European response was a surprise to Putin; it seems to have also surprised the financial markets as well. This study demonstrates the financial markets' response to the sudden hardening of European prioritization of defense.

While the magnitude of the 2022 events might be surprising, the Russian-Ukraine conflict was not a novel event. European Union expansion towards Eastern Europe, along with (potential) NATO enlargement in the eastern flank (either former territories of the Soviet Union or countries where Russia yielded a lot of political influence) set the stage for heightened military action. (Mearsheimer (2014)) In 2014, Russia annexed Crimea[9], and, since then, has also supported separatists movements in Donbas, a territory within eastern Ukraine. Western leaders condemned both events, vouching staunch support for an independent Ukraine and increased military support for NATO.

In academic literature, the idea that financial markets "do not simply evaluate the cost of war today, but also incorporate the effect of this war on the number and intensity of future conflicts" is pervasive. (Leight at al. (2003)). Given this, our results are a bit puzzling, considering that for almost a decade, there has been a consistent push for NATO countries to spend more on their military budgets. (von Nahmen (2023)) Indeed, there has been a firm commitment of NATO countries that they plan to increase their military spending to amount to 2% of their respective gross domestic products, which, in theory, would result to an additional tens/hundreds of billions of dollars more being spent. (Leonhardt (2023)) One possible explanation on why investors mispriced the securities of arms-producing and military services companies for this long can be due to the fact that they didn't find the commitments credible due to free-riding efforts among NATO member countries in Europe (George and Sandler (2018)); the full-scale nature of the Russian invasion of Ukraine (along with the idea of a prolonged military conflict in the

[9] https://www.nytimes.com/2014/03/19/world/europe/ukraine.html

European continent) arguably changed their minds. (Gramer and Detsch (2022), Gramer, Mackinnon and Detsch (2023)).

The Israel-Hamas conflict, on the other hand, has been going for decades, with both parties vowing to destroy one another. (Byman (2010)) Skirmishes between the parties have occurred consistently over the years, as the root causes of the conflict vary from territorial disputes to religious tensions. Offers for reconciliation between the parties, although initiated on a consistent basis, have failed. Such is the disappointment from these attempts that many commentators often state that the problem sadly cannot be resolved. It pains us to conclude that, perhaps, investors have also embraced such view and they experienced the October 7th attack as the new normal: just another battle in an ongoing conflict that will probably not end anytime soon.

V. CONCLUSION

We have shown in this article the contrasts in financial impact on arms-producing and military services companies, for two large military events: the Russian invasion of Ukraine and the Hamas attacks on Israel. By analyzing stock market returns of the world's largest publicly traded companies in this sector, we have identified a notable divergence from the expected trend of negative abnormal returns.

The efficient capital market hypothesis has been a cornerstone of financial research for decades. As new information is randomly distributed, re-evaluation of certain assets becomes paramount. We believe that the discrepancy uncovered by our event study does not diminish the merits of the efficient capital market hypothesis, but rather highlights the complexities of market dynamics in response to geopolitical conflicts. In an uncertain and

unstable geopolitical climate era, investors also remain unsure about their pricing of securities. Comparing the Russian invasion of Ukraine with the October 7th Hamas attack on Israel, we notice that the pattern is not exclusive: war does not necessarily mean good news for arms companies. What it means is complex; certain military conflicts call for strategic reevaluation of entire industries.

Ongoing research is needed to better understand future dynamics.

Appendix Table 1: Arms Companies in this study

Airbus	Kongsberg Gruppen
Amphenol Corp.	Korea Aerospace Industries
ASELSAN	L3Harris Technologies
Austal	Leidos
Babcock International Group	Leonardo
BAE Systems	LIG Nex1
Ball Corp.	Lockheed Martin Corp.
Bharat Electronics	Mazagon Dock Shipbuilders
Boeing	Melrose Industries
Booz Allen Hamilton	Mercury Systems
BWX Technologies	Mitsubishi Heavy Industries
CACI International	Moog
CAE	Northrop Grumman Corp.
Curtiss-Wright Corp.	Oshkosh Corp.
Dassault Aviation Group	Parker-Hannifin Corp.
Eaton	Parsons Corp.
Elbit Systems	QinetiQ
Fincantieri	Raytheon Technologies
Fujitsu	Rheinmetall
General Dynamics Corp.	Rolls-Royce
General Electric	Saab
Hanwha Aerospace	Safran
HEICO Corp.	Science Applications International Corp.
Hensoldt	Serco Group
HII	ST Engineering
Hindustan Aeronautics	Teledyne Technologies
Honeywell International	Textron
Howmet Aerospace	Thales
IHI Corp.	ThyssenKrupp
Jacobs Engineering Group	TransDigm Group
Kawasaki Heavy Industries	TTM Technologies
KBR	V2X

VI. REFERENCE LIST

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