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Gender Diversity and Its Effects on Arms Embargo Violations

Prediction Probability of Embargo Violations With Company Board Diversity

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Abstract

The research conducted in this report seeks to uncover the effects diversity in corporate board of directors have on the illegal sales of weapons to countries experiencing U.N arms embargoes. From our analysis and for the companies we investigated, we can determine that gender diversity in a company's board of directors does not influence a company's propensity to engage in illegal arms trading. This is evident from linear regression and various fixed effect regressions performed in our analysis. We postulate that the factors contributing to these actions are more complex than attributing them to one sole factor alone and each company's internal and external dynamics will determine how large of a role gender diversity will have in their propensity to engage in illegal arms trading.

Preface

This master thesis was completed for the fulfilment of requirements needed for graduation from NHH Norwegian School of Economics. It was completed in the spring semester of 2021.

This thesis investigates fields of finance, econometrics, and statistics to examine the relationships between board gender diversity and likelihood of arms embargo violations. The motivation behind this thesis was to investigate the relationship that gender diversity in a company's board of directors had on their propensity to engage in illegal arms trade. By better understanding the factors that influence this behaviour, the UN can create better informed policies to protect the citizens of countries in armed conflicts.

We would like to give a special thanks to out supervisor Evelina Gavrilova-Zoutman for her unwavering support and guidance through our research.

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1 Introduction

In many ways violence and conflict have transformed over the past 100 years. Wars once involving nations from around the world have largely ceased and in their stead have been replaced by civil wars, extremist attacks, and coups. It is also important to note that these violent conflicts disproportionately effect developing nations. For example, eight out of ten of the world's poorest countries are suffering, or have recently suffered, from large scale violent conflict (Stewart, 2002). As of 1970 in an effort to reduce these conflicts, the United Nations began imposing arms embargoes, which seek to prevent the sale of weapons to sanctioned countries (United Nations, 2011). This has been used as a substitute to more general trade embargoes that create lasting negative effects for the victims of these hostilities.

However, companies are willing to risk punitive repercussions of illegal arms trading due to the substantial financial compensation available for providing arms to groups in embargoed countries. It is estimated that the black market for small arms trafficking generates in excess of 1 billion dollars a year globally (Stohl, 2005). By doing so they contribute to making the policy and sanctions imposed by the UN ineffective in deescalating warfare. In order to fulfil the objective of these embargoes it is important to be able to identify the companies engaging in these practices and prevent them from continuing in the future. This begs the question; how can we identify companies engaging in illegal arms trading? By answering this question, we can create more informed policy and prevent these activities from transpiring, however data on illicit activities is not readily available to the public. With this in mind we need to consider factors and attributes of weapons companies that may influence them to engage in these behaviors. Of specific interests to our research efforts is how gender diversity of corporate board of directors influences the illegal arms trade.

Since the end of World War II, changes in societal norms and policy transformations have resulted in substantial improvements in the fight for gender-equality. This has led to an increase in women’s participation in the workforce that has almost reached parity with that of their male counterparts in Canada (Morissette, 2018). At the same time there has been a similar gender convergence in women’s criminal activity, though to a lesser extent (Campaniello, 2019). However, even with the increase in female crime over the past few decades there is still very little data and research associated with this field of study. This is especially true with regards to white-collar crime. At present we see the number of women in upper-level management positions at peak levels and they are only expected to rise (Catalyst, 2020). With

this is mind it is critical to consider if gender diversity in corporate structures has a positive or negative effect on the organizations' propensity to engage in illegal activity.

In recent years, the female representation in large global arms-producing and military service companies has been on an upward trajectory. As of 2019, CEO's of four of the five largest U.S defense contractors: Northrop Grumman, Lockheed Martin, General Dynamics and defense arm of Boeing - were women (Brown & Hellman, 2019). At present, many humanitarian groups and government agencies are concerned about the supply of weapons to countries that are subject to U.N arms embargoes in an effort to quell hostilities. In the past these sanctions have been seemingly effective, however companies have been engaging in illegal arms trading. Is it possible that increased female presence on these boards will reduce the occurrences of these criminal offences? Or conversely, could more female board members result in more nefarious outcomes?

Aim of the Thesis

This research paper seeks to identify companies engaging in illegal arms trading between 2009 and 2020 and the effects that gender diversity in their board structure plays in their propensity to engage in these activities. Our thesis is based on the identification strategy in Della Vinga and La Ferrara (2007) and focuses on events that occurred in 11 countries of interest that experienced U.N arms embargoes between 2009 and 2020. The events investigated can be characterized as increasing or decreasing hostilities. If the event has 50 or more casualties it is considered as increasing hostilities, if the event mentions peace talks or agreements it is considered to be decreasing hostilities and if neither of these criteria are met the event is considered as neutral. We obtain data on corporate board diversity for the top 100 arms manufactures according to Stockholm International Peace Research Institute companies and supplemented by small arms companies corresponding to the SIC codes 3482-3484. Then by accessing publicly available financial data for the aforementioned companies through the Refinitiv database, it is possible to analyze returns data that coincides with events increasing or decreasing hostilities in countries under U.N arms embargoes. Suspiciously high abnormal returns associated with events of interest resulted in the company being flagged. To avoid instances where abnormal returns occurred as a result of external factors, we analyze further only companies with at least three flagged events. The companies and their corresponding gender diversity percentages could then be examined by linear regression to see if gender is a significant factor in determining a company's propensity to engage in illegal arms trading.

Other follow up analysis was performed to investigate how gender diversity of corporate board of directors for weapons companies would affect their engagement in illegal arms dealing.

Structure of Thesis

For the convenience of the reader, we have outlined the remainder of the thesis as follows. Chapter 2 is a literature review, presenting Della Vinga and La Ferrara (2007) and is the basis for our research. Chapter 3 discusses the methodology. Next, in Chapter 4 the results obtained from our analysis are discussed along with their implications. Finally, in chapter 5 we conclude our findings and look toward next steps for this body of research.

2 Literature Review

The research conducted in this report seeks to uncover the effects diversity in corporate board of directors have on the illegal sale of weapons to countries experiencing U.N arms embargoes. The foundation of this research is based on the identification and strategy in Della Vigna and La Ferrara (2007). The initial questions they were trying to answer focused on which countries were the sales of illicit weapon sales originating from and what companies were involved. The research is based on the belief that well-informed investors have knowledge about companies engaging in illegal arms trades and will thus invest in these companies. These investments can then be observed as abnormal returns in publicly available financial data. The researchers also choose to investigate the effects of the corruption and how it impacts illegal arms trading based on where the companies are headquartered. Based on where companies are headquartered, they can face differing punitive and reputational costs for violating an embargo. Therefore, it stands to reason companies in high-corruption and low-cost of violation countries are more likely to engage in illegal arms trading.

The results of the analysis revealed that companies were profiting from engaging in the illegal sale of arms and that companies in higher corruption countries were more likely to violate the arms embargoes. We contribute by looking for illegal arms trading between 2009 and 2020, in the period after the sample of Della Vigna and La Ferrara between 1995 and 2005. A similar detection strategy is used in Guidolin and La Ferrara (2007) and Dube et al. (2011). The authors find that by using publicly available financial data surrounding events of interest, they are able to determine the effects these events have on investors and the societal, political and economic conditions they find most favourable. None of these articles look at board composition, however Dube et al. (2011) used a similar detection strategy. In their paper they look at abnormal returns around events, in this case coup authorizations or actual coup events, for detecting the financial impact on multinational companies that stood to benefit from U.S backed coups. Similarly, our team used stock price data centered around events increasing hostilities in U.N embargoed countries to determine if the companies were engaging in illegal arms trading. Our detection strategy differs from Dube et al. (2011) because we choose to use event chains as opposed to single events for selection criteria to conduct further analysis.

3 Methodology

This section will describe the research question, the techniques used for its exploration, and the data collection and manipulation involved in the process. Section 3.1 focuses on the data collection and data exploration of returns, event, and board data. Section 3.2 introduces the research question and the motives behind its exploration. Section 3.3 outlines the techniques and approaches used to examine the research question.

3.1 Data

To address the question of diversity and its effects on company engagements in illegal activity we use events data from The Armed Conflict Location & Event Data Project (ACLED) at a country level, Returns data from DataStream at a company level, and company information available on DataStream. The combination of company returns data and events data is all inclusive, meaning regardless of company's headquarters on DataStream they are paired with events of interest determined later in the study. The company specific information is joined based on company name.

Event data collected from ACLED is obtained using the platforms built in dashboard configuration (ACLED, 2021). The events selected were in the date range of January 1st, 2009 – April 1, 2020. The region-specific criterion selected events from the following regions: Afghanistan, Iran, Iraq, Liberia, Libya Malawi, Rwanda, Sierra Leone, Somalia, South Sudan, Sudan, Syria, Belarus, Central African Republic, Democratic Republic of Congo, Egypt, Eritrea, Guinea, Ivory Coast, Lebanon, Uzbekistan, Venezuela, Yemen, Zimbabwe. The types of events selected include battles, strategic developments, and riots. ACLED allows for more refined selections within each of these 4 event types but for this analysis all subcategories were selected. Lastly, upon the initial pull of the data all levels of fatality counts were selected and are refined during the analysis to only consist of violent events having 50 or more fatalities. **Table 1** shows the data extracted from ACLED consisted of a total of 534 unique events across all the regions of interest. Of these 534 events 500 were battles, 13 were riots and 21 were strategic developments.

Table 1: Events per country from ACLED from 2009-2020 with peace agreement talks or fatalities over 50.

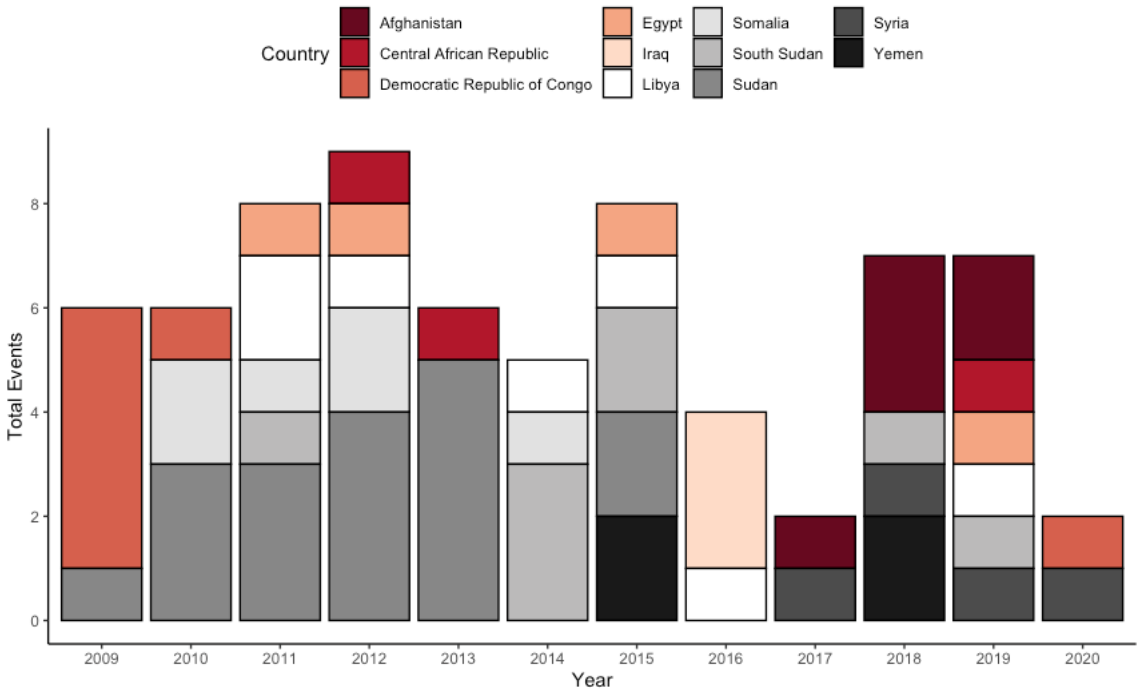
	Battles	Riots	Strategic developments
Afghanistan	73	0	0
Central African Republic	13	0	0
Democratic Republic of Congo	21	0	0
Egypt	8	12	0
Eritrea	1	0	0
Iraq	105	0	0
Lebanon	1	0	0
Libya	17	0	0
Somalia	17	0	20
South Sudan	70	0	0
Sudan	100	1	0
Syria	41	0	1
Yemen	33	0	0

To ensure that events have a low probability of falling within another events event-window the events within **Table 1** that met the above criteria are also subject to a date separation criterion that requires days between events to be greater than or equal to 15 days. To account for events occurring on weekends (non-trading days), all events occurring on Saturdays or Sundays are pushed to the next trading day (Monday). Upon elimination of event crossover, the 534 events from ACLED are condensed to 70 events, 67 of which are hostile. **Table 2** shows the yearly distribution of events from before and after the elimination of crossover events and the distribution of these 70 events across countries of origin are seen in **Figure 1**.

Table 2: Events counts per year from ACLED before event overlap elimination and after elimination.

	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Before	13	14	35	19	50	50	35	83	123	78	31	3
After	6	6	8	9	6	5	8	4	2	7	7	2

Figure 1: Events of interest per country per year to be used in event study analysis with returns data from companies of interest.



The complete event list of the 70 events of interest can be found in the Appendix, containing information about the country, date of occurrence and description of the event.

The returns data that was used in this study was accessed through Refinitiv's database. Companies of interest were selected by their appearance on the Stockholm International Peace Research Institute top 100 arms-producing and military service companies 2019. They were chosen because they constitute the largest arms dealing companies in the world and are publicly traded companies which means they have available financial data. Another important consideration was trying to select companies headquartered in a variety of different countries to account for different societal, economic, and political conditions. The companies could be queried, and the historic daily closing stock price information was obtained. The return data gathered from Refinitiv has a total of 73 companies with data from January 1st, 2009 – December 31st, 2020. Using the adjusted closing prices of each company, company specific returns are calculated with the following equation:

$$R_{i,t} = log\left(\frac{c_{i,t}}{c_{i,t-1}}\right)$$

Where $R_{i,t}$ is the returns of company *i* at time *t*, and c is the closing price of company *i* at time *t*. Company specific returns are used to determine potentially illegal actions regarding violations of arms embargos. The Returns values for each company are joined with each of the 70 chosen events given the event takes place within the available return data range. The returns-event data amalgamation is used to generate all the necessary examination windows needed for event studies. Of the 73 companies from the arms industries of interest for this study 11 do not have significant financial stock data available on DataStream for complete coverage of event date range. On average most companies display 3,000 observations of stock closing price for the study period of 2009-2020.

Based on the same criterion used for selected companies returns data, board information was also obtained for the available companies. This information due to the need for company disclosure is much sparser than the other data used in this study. The data pulled from Refinitiv included a variety of environmental, social, governance, and company controversy information. For the following analysis only information pertaining to board gender diversity was incorporated. Each company had their own year range where information regarding the target variables was reported. However, in general the all-inclusive year range for the entire board data set ranges from 2009-2020. Many companies in the dataset had begun reporting gender diversity information between 2009-2020 when the data became available or when women became board members for the first time. Out of the 73 companies that possess returns data only 64 have listings of board diversity demographics. Of these 64 companies in the year span of 2009-2020, 26% of the observations are missing. Most of the missing observations occur in 2009 & 2020 as seen in **Table 3**.

Table 3: Percent of missing values per year for board diversity data

Year	Total Observations	Percent Missing
2009	71	97
2010	71	54
2011	71	34
2012	71	32
2013	71	32
2014	71	32
2015	71	18
2016	64	8
2017	64	5
2018	71	7
2019	71	8
2020	64	70

3.2 Research Question

The target for this research is to examine the following relationship:

Does the gender diversity of cooperate board structures affect a company's propensity to engage in illegal activities?

This thesis is designed to examine and answer this research question in two stages: determining companies suspected of illegal smuggling and subsequently examining the impact of female diversity on illegal activity. The determination of companies suspected of illegal trading is done with two important social and economic indicators: Events and return data. (McWilliams & Siegel, 1999). The second stage involves using these company indicators of illegal activity to examine the relationship between their presence and the board diversity.

3.3 Empirical Strategy

To investigate the relationship between board diversity and engagement in illegal events a few regression analyses were conducted focusing on the response variable being the binary time and company specific illegal event flag and the explanatory variable being the board diversity. The process is broken down into three separate regression methods, standard OLS, fixed effects and distributed lag models seen in **Equation (1)**, **(2)**, and **(3)** respectively.

$$I_{i,t} = \beta_0 + \beta_1 d_{i,t} + \varepsilon_{i,t} \tag{1}$$

$$I_{i,t} = \beta_1 d_{i,t} + \mu_i + \theta_t + \varepsilon_{i,t} \tag{2}$$

$$I_{i,t} = \sum_{j=-3}^{3} \beta_j d_{i,t}^{j} + \mu_i + \theta_t + \varepsilon_{i,t} \tag{3}$$

Where $I_{i,t}$ is the binary descriptor for illegal events, zero in absence of an event and one in the presence of an illegal flag. $d_{i,t}$ is the board diversity for company *i* at time *t*, and $d_{i,t}^{j}$ is the board diversity for company *i* at time *t* and lag $-3 \leq j \geq 3$. With μ_i and θ_t representing the company unit fixed effects and time fixed effects respectively.

Sections 3.3.1 Financial Event Studies

To determine the suspected presence of illegal activity, an event study using the events data and company financial data is conducted. A financial event study, using the standard methodology for the market model is used for company specific abnormal returns for illegal activity detection. Previous research shows that this method is effective in the detection of illegal event chains (DellaVigna & Ferrara, 2007). The market model, abnormal returns and cumulative abnormal returns used in our market model event study are shown in **Equations (4)**, **(5)** and **(6)** respectively (Zhou & Cui, 2019).

$$E(R)_{i,t} = \alpha_i + \beta R_{m,t} + \mu_{i,t} \tag{4}$$

$$AR_{i,t} = RR_{i,t} - E(R)_{i,t} \tag{5}$$

$$CAR_{i,T} = \sum_{t=1}^{t=3} AR_{i,t} \tag{6}$$

Where $E(R)_{i,t}$ is the expected returns for company *i* at time *t*, $R_{m,t}$ denotes the return of the comprehensive index m of the stock market where the listed company *i* was listed on the *t*th day, α_i and β are the intercept and slope of the market model. $AR_{i,t}$ is the abnormal returns for company *i* at time *t*, and are determined by the difference between company *i* observed returns at time *t* denoted by $RR_{i,t}$ and their expected returns at time *t* determined by equation **(4)**. Cumulative abnormal returns for company *i* during time interval T[1,3] is the summation of abnormal returns over time interval T. Massimo Guidolin and Eliana La Ferrara used this methodology that was first presented by John Y. Campbell, Andrew W. Lo, and Craig A. Mackinlay to discover the relationship between cease conflict in Angola and the decrease in abnormal returns around "Angolan" Company portfolios (Guidolin & Ferrara, 2004; Campbell & Lo, 1997).

Due to a high degree of academic support of this approach as well as the robustness checks done on all levels of the analysis this method was used for the selection of suspected companies. For every company and every event, a pre-event and event-window are defined. Dube *et al* used a prevent window with of two years, three years prior to the event of interest taking place to estimate the firm-specific abnormal returns (Dube & Kaplan, 2011). However, for our analysis a pre-event window of 90-trading days centered around 90 trading days prior to the event and the event-window of 20-trading days centered around the date of the event is

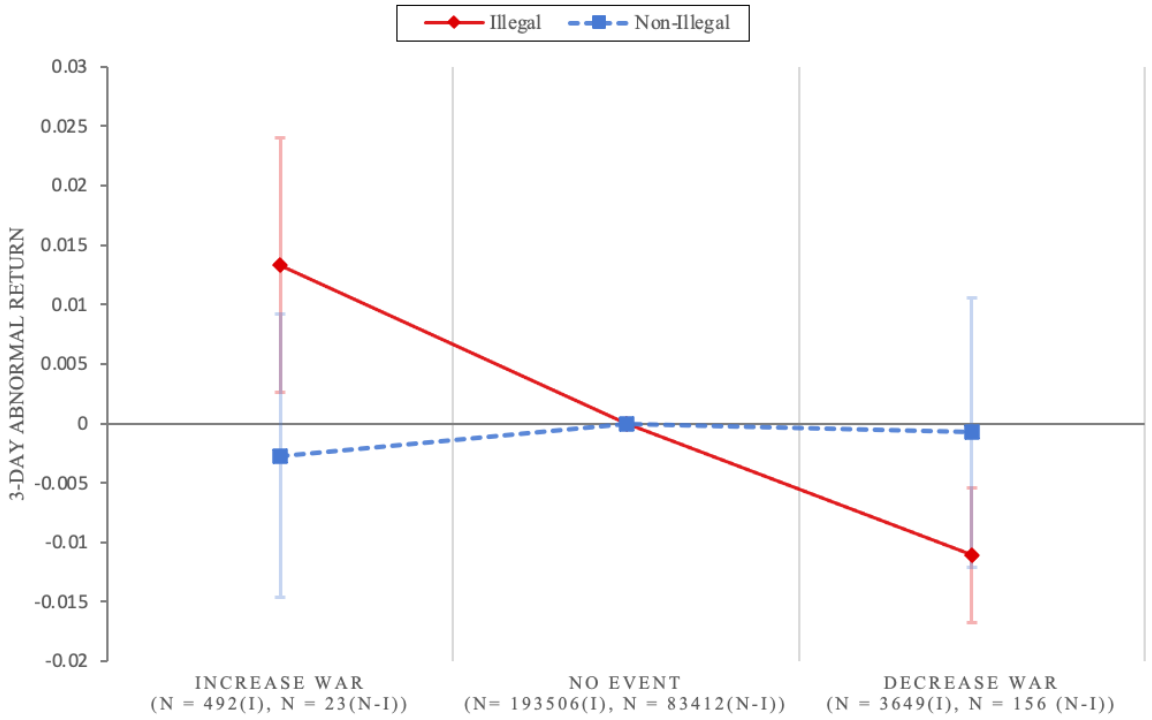
chosen. This specification was made to create a balance between event overlap and capturing current company financial stock standing accurately. The market model in **Equation (4)** is used in conjunction with the pre-event window to train a regression model used to predict expected returns over the 20-day event window. The abnormal returns over this event window is determined with **Equation (5)** and the subsequent cumulative abnormal returns with **Equation (6)**. Lastly, a regression examines the relationship between the cumulative abnormal returns and a three-day event window to determine the presence of a suspected illegal instances. Companies that display a 5% significance level around the event date are flagged for that event.

Two important explanations behind the above analysis are warranted to enhance and select companies suspected of illegal activities that will later be used in the diversity studies. The first being the effects of hostile events on a company's business and financial standings. For arms dealing companies, the presence of conflict is always a double-edged sword. On one hand conflict increases the demand for weapons and therefore increases and arms companies overall financial standpoint. But on the other hand, an increase in conflict either moves countries to be put under arms embargos or extends a current arms embargo which would decrease the ability to sell arms and therefore decrease financial standing. With this in mind and the assumption of insider trading that are stated in the research concluded by DellaVigna & Ferrara a hostile event is good for a company who is engaging in illegal trading and therefore will see a spike in returns around these events. Versus a company not engaging in illegal trading will experience little to no fluctuation around them due to the absence of insider trading and financial gain of the company.

The second important notion behind listing a company as being suspected of illegal activity is the importance of illegal event chains vs just illegal events. Illegal event chains are the summation of all suspected illegal events for company *i* in country *c*. The importance of using illegal event chains over illegal events is that it reduces the probability of false positives created in the event study. In the event of a company being flagged for an illegal event, they are assigned a tag for that event. If a company reached or exceed three tags, meaning they have been flagged for 3 separate events within a given country they are selected as a company suspected of illegal activity. These companies are then assigned illegal activity indicators for all the years that the events indicating illegal activity occurred in. If a company is flagged, all years that they do not have illegal event flags from the event study are set to 0. For companies where event chains are less than three, all years or set to 0.

The event study procedure was then conducted on the 67 events over the 73 companies of interest from 2009-2020. Yielding 36 event chains that are greater than or equal to three. Within these findings there are three companies who have event chains greater than three in multiple countries including: Amphenol Corp., Kratos Defense Solutions, and Leidos. Appendix C depicts all company-country interactions and their corresponding event chains, companies with event chains greater than or equal to three will be formally suspected embargo violating companies in the board analysis study. **Figure 2** depicts the mean 3-day abnormal returns for company-country pairings that are suspected and not suspected of illegal activities for events that increase conflict, decrease conflict and on days where no event occurred. The figure demonstrates the relationship discussed in DellaVigna & Ferrara research around events that increase or decrease conflict and their corresponding influence on 3-day abnormal returns.

Figure 2: Average 3-day abnormal returns for around events increasing conflict, decreasing conflict and no events for both companies suspected of illegal activities and those not suspected with 95% confidence intervals.



For company-country pairing that were flagged for illegal activity through the financial event study it is evident that they show higher abnormal returns than companies-country pairings not flagged. Demonstrating that events that increase conflict are resulting in higher-than-expected stock prices for these flagged companies suspected of not maintaining arms embargo

sanctions. Whereas companies not suspected are showing a decrease in financial standing due to the increase in conflict and inability to sell arms.

Section 3.3.2 Distributed-lag models

When examining the relationship of interest, it is reasonable to use a fixed effects model with binned endpoints. A standardized time and company unit fixed effects regression to estimate the presence of illegal activity given by $I_{i,t}$ is shown in **Equation (7)** (Schmidheiny & Seigloch, 2020):

$$I_{i,t} = \sum_{j=-3}^{3} \beta_j b_{i,t}^{j} + \mu_i + \theta_t + \varepsilon_{i,t} \tag{7}$$

$$b_{i,t}^{j} = \begin{cases} \sum_{s=-\infty}^{\underline{j}} d_{i,t-s} & if\ j = \underline{j} \\ d_{i,t-j} & if\ \underline{j} < j < \overline{j} \\ \sum_{s=\overline{j}}^{\infty} d_{i,t-s} & if\ \ j = \overline{j} \end{cases}$$

Where the company fixed effects are denoted by μ_i and yearly fixed effects by θ_t. The parameter β_j is the treatment effect j time periods before or after the event, $j \leq 0$ or $j \geq 0$ respectively. $b_{i,t}^{j}$ is the indicators for the event and binned event endpoints factoring in designed 3 year leads and lags. $d_{i,t}$ is the indicator for the event year, taking the value of 1 in the year of event treatment and 0 otherwise. For normalization purposes the event indicator for β_{-1} is set to 0. Restricting the effect window to leads $\overline{j}$, and lags $\underline{j}$ equal to 3 implies that the treatment effect before or after j=3 remain constant.

The purpose of this method is to determine the relationship between gender diversity not only during an event period itself but also the effect diversity has leading up to and event and into the future. Findings of the following fixed effects distributed-lag models will aim to address these relationships and uncover more information behind their possible causality. Gasparrini *et al.* uses this the DLM model to account for complex non-linear and delayed associations to describe exposure lag-response associations between public health interventions (Gasparrini & Leone, 2014). This research dives deeper into the method described by Scmediheiny and Seigloch as well as discussing the attributable risk behind such methodologies. Another study conducted by Gasparrini *et al.* used distributed lag non-linear models to examine the

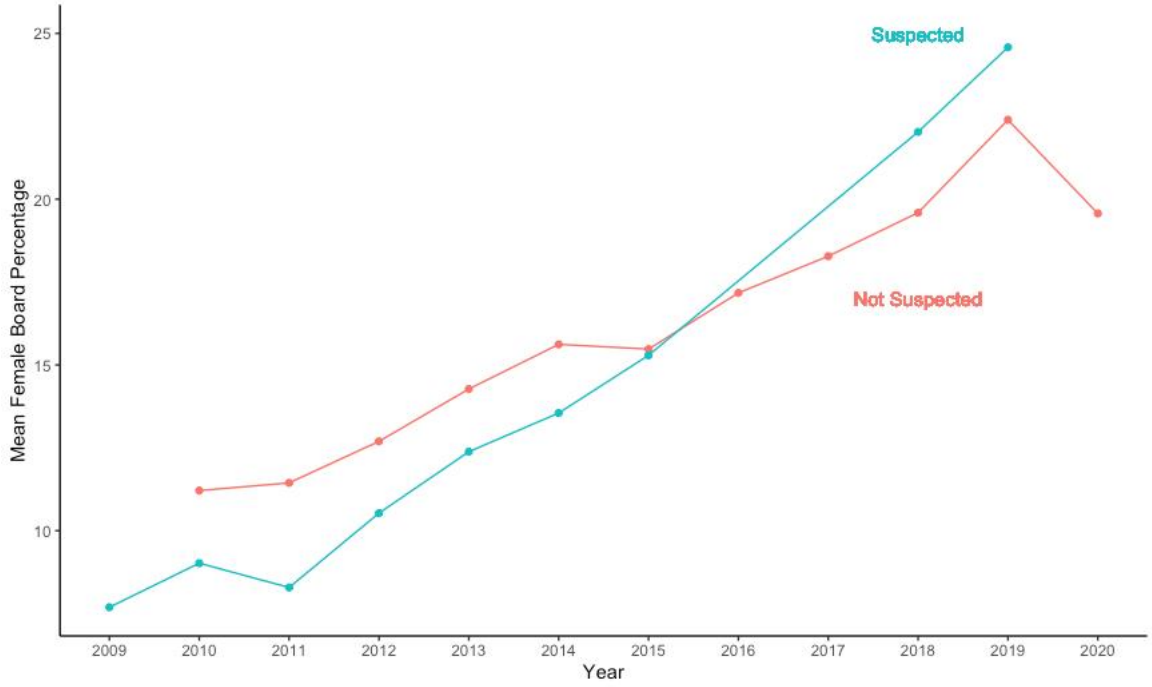
relationships behind temperature and mortality to determine the delayed effects of temperature on mortality rates (Gasparrini & Armstrong, 2010). Using DLM models we will examine the delayed and future effects of illegal activities on board gender diversity.

4 Results

The following section presents the results of the board analysis event study on the 73 companies of interest. Explaining the findings for the relationships between board diversity and suggested potential of engaging in illegal activities.

Using the list of suspected vs not suspected companies generated from the financial event study, a high-level overview of board diversity differentiation of suspected vs not suspected companies is shown in **Figure 3**. The figure depicts the mean board diversity in each year for suspected and not suspected companies. Intuitively the board diversity percentage is increasing for both groups due to cooperate equality measures, but interestingly suspected companies show a more accelerated increase in mean board diversity parentage than non-suspected companies.

Figure 3: The yearly mean board diversity for suspected companies (determined from event studies) & yearly board diversity for companies not suspected of illegal activities.



The following analysis focuses on the relationships between suspected intracompany illegal instances generated from the event studies and their corresponding board diversities at time of suspicion. The analysis first looks at the simple linear relationship and progresses into more advanced forms of fixed effects regression and distributed-lag models.

Before performing more in-depth analysis regarding the leading and lagging effects of diversity on illegal activity, simple OLS and fixed effects regressions are completed. The purpose of this portion of the study is to analyze the direct relationship between diversity and illegal activities and if these are significant and directional. **Table 4** shows the standard OLS regression of illegal instances vs diversity (1), the company fixed effects regression (2), and the company and year fixed effects regression (3).

Table 4: Regression summary for OLS (1), company fixed effects (2), company and year fixed effects (3) for illegal event vs diversity with standard errors clusters on company.

	Dependent variable:		
	illegal		
	OLS	*felm*	
	(1)	(2)	(3)
diversity	-0.005***	-0.010***	-0.003
	(0.001)	(0.002)	(0.002)
Constant	0.192***		
	(0.023)		
Company fixed effects	No	Yes	Yes
Year fixed effects	No	No	Yes
Observations	554	554	554
R^2	0.034	0.224	0.340
Adjusted R^2	0.032	0.122	0.236
Residual Std. Error	0.308 (df = 552)	0.294 (df = 489)	0.274 (df = 478)
F Statistic	19.518*** (df = 1; 552)		
Note:			*p<0.1; **p<0.05; ***p<0.01

Regarding the OLS regression seen in column (1) the diversity is significant in relationship to the presence (or absence) of an illegal instance determined from the financial event study. Without any unit or time-based fixed effects, a reduced diversity by 0.005% is expected in the presence of an illegal instance. To account for company and year based cofounding factors a fixed effects analysis is conducted. Looking at the relationship between the illegal event predictor variable and the diversity outcome variable within each company. Because of the company specific characteristics that may or may not be influencing the predictor, eliminating these will allow for a more precise determination of the relationship of interest. Two variants of fixed effects regression are examined, both of which look at the relationship between diversity and illegal events and have standard errors clustered on a company level. The difference between the two is that the first examines only company fixed effects where the second examines both year and company fixed effects. The company fixed effects regression

also shows a diversity coefficient that is significant and portrays a 0.010% decrease in diversity in the presence of an illegal event. However, when incorporating both company and yearly fixed effects, the diversity coefficient is no longer significant and shows a coefficient of 0.003% which is much smaller than the previous company based fixed effects regression. This 0.007% difference implies that the 0.010 coefficient in the company fixed effects regression is driven by the year specific effect. The reduction in beta estimation with regards to the illegal parameter along with the lack of statistical significance implies that when company and year based fixed effects are incorporated into a model diversity percentage does not have a strong relationship with the presence of suspected illegal activity.

The purpose behind the following Distributed lag models are to examine the relationship and effect that diversity has on the illegal activities prior or post to an illegal event itself. The regression output in **Table 5** represents the regression of illegal activity flags determined from the event study against diversity zero, one, two, and three years both ahead and behind the illegal event. For the purpose of normalization discussed earlier the year prior to the illegal instance is left out of the regression. Output (1) corresponds to running the regression on the overall board diversity percentages and output (2) is the same technique run on the raw number of females on the board with board size as the control variable.

Table 5: Regression output for Distributed-lag models on diversity percentage (1) and female board members (2).

	Dependent variable:	
	illegal	
	(1)	(2)
diversity	-0.003	-0.013
	(0.005)	(0.041)
diversity2P	0.005	-0.001
	(0.005)	(0.035)
diversity3P	0.004	0.028
	(0.004)	(0.041)
diversity1F	0.010	0.063
	(0.007)	(0.049)
diversity2F	-0.008	-0.038
	(0.006)	(0.049)
diversity3F	0.002	0.018
	(0.003)	(0.031)
board_size		-0.008
		(0.017)
Company fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	198	198
R^2	0.439	0.429
Adjusted R^2	0.200	0.178
Residual Std. Error	0.287 (df = 138)	0.291 (df = 137)
Note:	*p<0.1; **p<0.05; ***p<0.01	

When analyzing the distributed-lag model on diversity percentage the degree of diversity is not significant. The coefficient still depicts a negative relationship like all previous models and has the same magnitude as the company and year fixed effects regression in columns (3) of **Table 4**. The lagged diversity percentage variables, denoted by the coefficient ending in "P" show no significance as well as the leading diversity variables denoted by "F" at the end of the coefficient in **Table 5**. Interestingly all leading and lagging values except for 2 leads post illegal event all have positive coefficients. Indicating that as diversity percentage increases there is an increase for illegal activity in the future as well as if an illegal event occurs there is likely to be high gender diversity in the future. The model in column (2) of **Table 5** uses the same methodology but with raw female board members instead of board diversity and uses board size as a control variable. The results are almost identical with the difference being the magnitude of coefficients due to the measurement unit magnitude

differences. Surprisingly the board size control variable shows a negative coefficient (although not significant), introducing some questions into whether board size regardless of diversity may affect probability of engaging in illegal activities. The distributed lag model indicates that there is a smaller board size in the presence of illegal events.

5 Discussion

From our analysis and for the companies we investigated, we can determine that gender diversity in a company's board of directors does not influence a company's propensity to engage in illegal arms trading. This is evident from linear regression and fixed effect regression performed in our analysis. When performing a simple linear regression between the illegal event chains and the gender diversity of the companies at that point in time we observe gender diversity as a significant variable. The same effects are observed when fixed effects at the company level are removed. However, when incorporating both company and year fixed effects the influence of illegal arms trading is less impactful on-board diversity and appears as if the significance found in the company fixed effects analysis is attributed to year based confounding effects. This leads us to believe that gender diversity alone is a poor indicator in determining a company's likelihood of illegal arms dealing. This is because there are likely many factors attributing to a company's decision to engage in illegal weapons sales that vary in degree of impact. This makes it difficult to isolate one characteristic of a company that will indicate its willingness to engage in illegal weapons dealing. Analyzing one of many variables associated with the operations of a company leaves a large room for error and cofounding effects.

Though it is worthwhile to try and understand gender diversity's role in a company's likelihood of engaging in illegal arms trading, it should be noted that the factors contributing to these actions are more complex than attributing them to one sole factor alone. Removing company variability through the fixed effects regression has demonstrated that gender diversity likely plays a larger role at the individual company level. Each company's internal and external dynamics will determine how large of a role gender diversity will have in their propensity to engage in illegal arms trading.

The analysis conducted so far is solely observational, and the examination from of the relationship between illegal activity and diversity is not causal. To examine the causational relationship between these metrics the assumption that companies that are willing to violate arms embargos are not fluctuating the diversity of the board because of the presence of illegal activities must be proven. Confirming this assumption would indicate that the hiring practices around board composition is random with respect to illegal activities and therefore causal estimates from the regression analysis can be concluded. The analysis conducted, including the above regression analyses, does not address this possible relationship between hiring

practices and illegal activities. First to address the pitfalls of the above analysis without the above assumption validation we must examine the econometric assumptions and correlations behind the coefficient estimates of the fixed effects and distributed lag models. In particular, the estimation of β in the above models are made under the assumption that error term of the regression model is uncorrelated with the regressor x (University of Leicester, 2020). In the context of econometrics, in which this study is heavily sectioned in, this assumption is difficult to ensure. In most cases the disturbance term is likely to be compounded from the variable omitted from the regression of y in terms of x (Pearson, 1896). If this is the case the coefficient generated from the regression to limit the disturbance term will result in an estimator that is biased due to the model attributing the relationships of missing variables to the variables present (Hanck, 2020). With respect to our analysis this inhibits the uncovering of the true β estimation for diversity and limits the conclusion of diversity directly affecting illegal activities and not some unlisted variables.

While we recognize the weaknesses of our regression model's ability to predict, our model also has a causal interpretation. It may be expected that increasing gender diversity by one standard deviation would reduce the probability that a company would commit a crime. This is due to the perception that female presence will improve moral judgment, resulting in the company having a lower propensity to engage in illegal arms transactions. This would only be true if gender diversity were exogenous to crime. Conversely, if gender diversity were endogenous to crime, we would observe an increase in gender diversity correlated to an increase in crime. This would suggest that companies are hiring more women in their board of directors in an attempt to improve their image and mask their illicit activities. Our team has observed no significant results, meaning that either there is no relationship between illegal arms trading and gender diversity or that relationship is being masked by causal effects of increased gender diversity on a company's board of directors. We believe it is possible that companies in our dataset are embracing the more nuanced hiring practices of increased gender diversity in their board of directors in an effort to disguise their illegal activity and improve public perception. This results in a positive correlation and endogenous relationship between crime and gender diversity. However, it is also possible that for companies in the dataset their hiring practices are exogenous with respect to crime. This could imply a negative correlation between crime and gender diversity such that as more women are hired to the board of directors' crime is reduced. These negative and positive relationships occurring

simultaneously may be the reason we are observing close to zero significance in our regressions.

To ensure we are observing a true causal effect of gender diversity on crime, we need to demonstrate that gender diversity is exogenous. To achieve this, we need to find a reform that impacts gender diversity but does not have any influence on crime. For this, our team decided to look at companies in our dataset that are headquartered in countries that have instituted gender quotas for publicly and state owned companies. These countries include Italy, France, Australia, India, Israel, and Germany. This would mean that the gender diversity of companies located in these countries would be random with respect to crime. As a result, we would be observing gender diversity being influenced by societal and political factors and can assume it is exogenous. Using companies headquartered in these countries we can then determine a causal link between gender diversity and illegal weapons trading.

However, for our dataset we have some limitations that will lead to inconclusive results. Firstly, of the companies in our dataset very few are headquartered in countries that have instituted gender quotas, leaving our team with a small sample size. Another limitation is that many of the countries have only recently legislated gender quotas and have only recached compliance as early as 2019. This leaves our team with very little data to perform an analysis with as well as uncertainty as to when individual companies have met legislation requirements.

Legislation such as gender quotas have obvious benefits such as increased representation of women in largely male dominated boards. For example, prior to gender quotas being instituted in Italy, the average share of women on the boards of directors of publicly listed companies in 2009 was 7%, one of the lowest in Europe (Ferrari, 2016). There are also positive trickle-down effects observed as a result of gender quotas. One such effect is positive stock price reaction to the appointment of a female director in U.S companies (Rosenstein and Wyatt, 1990). Another benefit of increased female representation on board of director's due to gender quotas has been associated with a lower variability of stock market prices (Ferrari 2016). It should also be noted that gender quotas can produce some inadvertently negative effects. It has been observed that when females are appointed to boards of directors voluntarily, there are positive stock price reactions. However, when boards are mandated, negative stock price reactions are observed. This demonstrates that policy related to gender diversity has man inherent benefits but must be wielded in a responsible and measured manner to ensure positive results and perceptions.

6 Conclusion

The aim of this thesis was to investigate the relationship between gender diversity on the boards of weapons companies and violating arms embargos. Using an events study approach designed by Stefano Della Vinga and Eliana La Ferrara and data from ACLED and DataStream companies suspected of violating arms embargos were determined through abnormal returns and a constant mean model. The analysis yielded 36 company-country specific instances where three or more abnormal returns around event dates were found to be significant. Of these 36 instances there 33 unique companies.

Using companies flagged through the event study analysis, board diversity relationships were examined. Using company specific social, governance, and environmental data also captured on DataStream and fixed effects regression studies the relationship between board gender diversity and suspected arms embargo violations is examined.

The analyses show that there is some relationship between board diversity and arms embargo violations. A simple OLS regression that is unable to account for confounding effects concludes that there is a significant relationship between board diversity and embargo violations. Showing a 0.005% decrease in board diversity in the presence of an illegal instance. When eliminating the confounding effects company specific variation, the relationship still holds true, showing a significance relationship between diversity and illegal events. With a 0.010% decrease in board gender diversity in the presence of an event study illegal instance. However, when incorporating year based confounding effects in addition to company specific variations the relationship between the two variables does not hold significance. Displaying a non-significant coefficient of -0.003% or a decrease in diversity percentage by 0.003% in the presence of an illegal flag. This implies that the significance and magnitude of the company fixed effects model is being driven by the year specific confounding effects. When looking at the leading and lagging effects of board diversity we also see a non-significant relationships between three leads/lags around the illegal event.

This thesis makes a helpful contribution in demonstrating the importance and relevance behind analyzing company characteristics to aid in the otherwise manual review process for arms embargo violations. Event and relational studies provide a means to narrow down companies of suspicion to aid in regulators ability to enforce arms embargos and detect violations. Advance in this field of research will hopefully provide the ability to flag and review

companies of suspicion and reduce overall manpower needed to properly enforce such crucial laws.

Although the results only focus on board diversity it is clear that more metrics are needed to better understand an organization's ability and likelihood to participate in illegal weapons trading. This idea is the one of the main drawbacks of this approach, looking at gender diversity exclusively doesn't allow for more advance mapping of company-based descriptors that may also be playing a role. A second drawback to the approach sued in this thesis is the need for companies to both be publicly traded as well as having sufficient information pertaining to board structure. If both these conditions are not met it become hard to extract relational meaning and subsequently use findings to aid in the detection and apprehension of companies violating arms embargos.

Moving forward to try and combat some of the shortfalls of this thesis we urge future research to focus on a more inclusive focus on a company's organizational culture. Trying to identify key performance metrics that may capture a company's viewpoint illegal trading and incorporating them all into relational model. It would also be worthwhile to investigate the presence of a causal relationship between crime and gender diversity.

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Appendix

Appendix I: List of analyzed companies.

Company
AECOM
Aerojet Rocketdyne
Airbus Group
Amphenol Corp
ASELSAN ELEKTRONIK SANAYI
Austal
Babcock International Group
BAE Systems
Ball Corp
Bharat Electronics
Boeing
Booz Allen Hamilton
BWX Technologies
CACI International
CAE
Curtiss-Wright Corp
Dassault Aviation
Elbit Systems
Fincantieri

Fluor Corp
Fujitsu
General Dynamics Corp
General Electric
Hanwha Aerospace
Hensoldt
Hindustan Aeronautics
Honeywell International
Huntington Ingalls Industries
IHI Corp
Jacobs Engineering Group
Kawasaki Heavy Industries
KBR
Korea Aerospace Industries
KRATOS DEFENSE AND SECURITY SOLUTIONS
L3 Technologies
L3HARRIS TECHNOLOGIES INC
Leidos
Leonardo
LIG Nex1
Lockheed Martin Corp
ManTech International Corp

Meggitt
Melrose Industries
Mitsubishi Electric Corp
Mitsubishi Heavy Industries
Moog
NEC Corp
Northrop Grumman Corp
ODK-SATURN
Oshkosh Corp
QinetiQ
Rafael
Raytheon
Rheinmetall
Rolls-Royce
ROSTVERTOL PAO
Saab
Safran
Science Applications International Corp
Serco Group
SMITH & WESSON BRANDS
ST Engineering
STURM RUGER & COMPANY
Team SA

Teledyne Technologies
Textron
Thales
ThyssenKrupp
TransDigm Group
Vectrus
ViaSat
WOOSU AMS CO LTD

Appendix II: Descriptions of chosen events along with their corresponding dates and location of occurrence.

Date	**Country**	**Event**
5/25/2009	Sudan	Army base town Umm Baru has fallen under JEM control. Umm Baru about 100 km from frontier with Chad (unable to find on Fallingrain).
7/13/2009	Democratic Republic of Congo	A government attack on a rebel position displaces civilians.
8/19/2009	Democratic Republic of Congo	The Democratic Republic of Congo military said Saturday it had killed or captured more than 500 Rwandan Hutu rebels in the country's east since launching an offensive

		against them six weeks ago. Fatalities broken up with previous events.
11/20/2009	Democratic Republic of Congo	Over 100 killed in clashes among ethnic groups. 8,000 displaced.
12/14/2009	Democratic Republic of Congo	Democratic Republic of Congo forces have retaken control of Dongo in the countrys north-west where recent tribal clashes erupted in between the Lobala (or Enyele) tribe and the Bomboma people. The town was taken back from an army of Enyele led by an animist priest named Udjani.
12/31/2009	Democratic Republic of Congo	157 insurgents and one soldier from the Congolese army, known as the FARDC, were killed in and around the town of Inyele between Dec. 31 and Jan 1 when the two groups clashed.
1/25/2010	Somalia	Peace agreement/talks: Sheikh Hassan Turki of HI in Baidoa for unity talks with AS. O1/HI vs.

2/10/2010	Sudan	SLM repels attacking government troops. No rebel fatality number available.
3/10/2010	Democratic Republic of Congo	FARDC have killed 90 Rwandan Hutu rebels since launching a new offensive late last month. UN troops are backing the DR Congo army in the operation dubbed "Amani Leo" ("Peace Now" in Swahili).
4/23/2010	Sudan	Clashes somewhere on the border between Darfur and Bahr al Ghazal. Rizaiqat report unconfirmed. SPLA claims it fought SAF. Unclear how many killed on each side. 80 wounded.
5/13/2010	Sudan	Army convoy attacked and taken.
11/1/2010	Somalia	Peace agreement/talks: Reconciliation meeting between SSC militia/group and Somaliland government started in Widh-widh.
1/28/2011	Egypt	On January 28, tens of thousands of demonstrators took to the streets of Alexandria, Suez, and Cairo, the capital. Police responded

		with tear gas, water cannons, rubber bullets, and live ammunition in an effort to prevent protesters from advancing towards the central squares of those cities. The Ministry of Health said 846 persons died during the protests in January and February. Most of these were killed on January 28 and 29.
2/28/2011	Sudan	Fighting between rival rebel groups kills 92 and injures 164. Twelve civilians were killed in the crossfire.
3/28/2011	Libya	Three Gaddafi fighter killed during fighting, bringing the total of dead to 117 dead and 1,300 wounded after a week of fighting.
4/20/2011	Sudan	Rebels from the newly formed SSLM/A of Peter Gadet in south Sudans oil-rich Unity state continued for a second day of aggravated conflict.
7/29/2011	Libya	Libyan government spokesman claims Gaddafi forces have killed 190 rebels

		in three days. Positions not reported.
8/18/2011	South Sudan	Cattle raiders of the Murle ethnic group crossed the border from Sudan, raided and looted five unincorporated entites and clashed with government forces.
9/22/2011	Sudan	The SPLA reports that 30 of their soldiers were killed and 60 members of the Sudanese military were killed during clashes. The SPLA were eventually forced to retreat from the location.
10/20/2011	Somalia	Al Shabaab 20 Oct claimed to have killed over 70 AU troops.
2/1/2012	Egypt	On 1 February 2012, a massive riot occurred at Port Said Stadium in Port Said, Egypt, following an Egyptian Premier League football match between El Masry and El Ahly. 74 people were killed and more than 500 were injured after thousands of El Masry spectators stormed the stadium stands and the pitch. El Ahly ultras

		claim that they were specifically targeted given their vocal highly televised calls for the SCAF to step down, as well as their open mockery of the previous regime and the SCAF. The ultras were one of the largest organized bodies of resistance in street protests after the absence of the Muslim Brotherhood following parliamentary elections.
2/27/2012	Sudan	Southern forces launch an attack on government forces near al Aabyad, breaking the armistice agreement. 150 Sudanese killed.
4/18/2012	Central African Republic	Tripartite CAR/Sudan/Chad force attacked by Sudanese SLM/A Minnawi rebels on their base in Am-Dafok in a cross-border ambush. At least 78 people were killed, including 11 CAR and 65 Sudanese soldiers. Two Sudanese soldiers were also abducted.
6/18/2012	Libya	Medical sources at Gharyan hospital announced the

		killing of 62 persons and the injury of 137 others in the wake of the continuing clashes.
8/14/2012	Somalia	Kenya Defence Forces (KDF) who are battling in southern Somalia have killed 73 Al Shabaab militants and recovered 40 wounded.
9/10/2012	Sudan	The Sudanese Revolutionary Front (SRF) announced defeating government forces and militias in Fanga area, East Jebel.
10/17/2012	Sudan	SRF announces the killing of dozens of pro-government militia and claims control of Abu-Delek area.
11/2/2012	Sudan	70 government troops are killed and 150 injured in a battle initiated in village of Del Daako , Dalko area, NE of Kadugli. 6 SPLM-N soldiers are also killed. Rebels keep hold of territory.
12/3/2012	Somalia	Peace agreement/talks: Al Shabaab brokers peace between warring Saleban and Duduble clans in Galguduud. Under the peace deal, the

		clans agreed to end hostilities and to compensate each other using diya (blood money) system.
4/15/2013	Sudan	Sudan Liberation Movement faction led by Minni Minnawi (SLM-MM) claimed on Sunday killing 43 Sudanese soldiers and the capture of a new area in South Darfur, "strategic" area of Donki Draissa located on the road near the capital Nyala.
6/26/2013	Sudan	Renewed violence between Abbala and Beni Hussein tribesmen left "dozens" dead and injured on Wednesday in North Darfur.
7/29/2013	Sudan	Fighting between rival Arab tribes in Sudans Darfur region spread on Monday, after clashes last week left scores dead, a leader of one of the tribes said.
9/25/2013	Sudan	The director of Omdurman hospital Osama Mortada told the BBCs Arabic Service that 21 people sent to his hospital had died as a result of police use of violence to dispurse

		rioters, and that about 80 were injured. Later reports state that in Omdurman at least 79 people were fatally hit by bullets in the head and the chest.
10/28/2013	Sudan	At least 75 people were reportedly killed and dozens wounded in renewed violent clashes between the Misseriya and Salamat tribes, 3km west of Mukjar in Central Darfur.
12/5/2013	Central African Republic	Anti-Balaka, accompanied by ex-FACA, coordinated attacks in PK12, Kasai and the Boy Rabe neighbourhood in Bangui, sparking clashes with ex-Seleka. Fighting then spread across Bangui, resulting in the deaths of at least 394 people between the 5th and 7th of December.
4/17/2014	South Sudan	Cattle rustling by attackers wearing SPLM-IO uniforms in Alabek, Tonj left 113 people dead (85 attackers and 28 civilians). Police fought with the cattle raiders.
8/15/2014	South Sudan	Government and rebel forces clashed in Ayod, Jonglei

		state. The army reported that the rebels attacked government positions, and that 120 rebels and 6 soldiers were killed.
9/22/2014	Libya	Brigades from Gharyan shelled the Bir Ghanem camp, a stronghold of Zintan affiliated brigades of al-Qaqa and al-Sawaeiq. Al-Aziziyah was the site of heavy fighting, with the Bin Ghanam Camp sustaining heavy shelling. According to an announcement made by Libya Dawn on social media, the town itself is now considered a military zone and all residents have been urged to leave. According to the Libya Observer at least 180 fighters were killed in two days of fighting and 12 others injured.
10/7/2014	Somalia	Kenyan AMISOM forces kill a reported 60 members of al Shabaab and recovered five vehicles during a battle in Buulo Gaduud. The operation included a series of air strikes. The AMISOM effort was launched to

		liberate the area, which was ultimately successful.
10/27/2014	South Sudan	The Unity state goverment announced rebel forces have captured Kilo 30 (Sikasik) after launching an attack on government forces near Bentiu.
1/5/2015	Libya	Petroleum Facilities Guards (PFG) claimed that 77 members of Libya Dawns Operation Sunrise were killed in fighting at Wadi Ikhila, east of Bin-Jawad. The main Sunrise forces were forced to pull back into central Bin-Jawad.
3/13/2015	Sudan	SLM/A-Nur claimed to have captured Rokerro, destroying the SAF garrison in the area and killing 68 soldiers.
4/22/2015	Yemen	In Marib, Houthi-Saleh forces took control of the strategic camp of Kawfal, headquarters of the mutinied 312th Armored Brigade. This came after violent clashes with the mutinied Brigade led by Colonel Abdo Rabbo al-Shadadi, loyal to the fled Maj. Gen. Ali Mohsin al-

		Ahmar, and allied Islah and Al Qaeda militants. At least 75 people were killed in Marib that day. 18 reported fatalities at Mas Military Camp coded in another event. Remaining 57 fataltiies coded here.
5/27/2015	South Sudan	Following the discovery of the bodies of two Dinka soldiers, 60 are killed in clashes between Dinka herders and Moru and Jur locals.
6/12/2015	Sudan	Clashes between SPLM-N and military. Rebels capture Wad Abakr for a few hours before withdrawing. 57 soldiers killed.
7/1/2015	Egypt	At least 205 suspected State of Sinai militants have been killed by security forces between Jul.1-3, following the coordinated attacks the group carried out on Jul.1 (144 coded in other events).
8/3/2015	Yemen	On August 3, coalition-backed Southern Resistance forces recaptured the Al Anad airbase after fierce clashes with Houthi forces.

		3,000 ground troops, including Saudi and Emirati special forces, participated in the battle. The clashes killed 40 pro-Houthi soldiers and 24 Southern Resistance soldiers, and injured 24 others including 1 Saudi soldier. **Other reports say that up to 70 pro-Houthi forces were killed.
9/14/2015	South Sudan	Clashes between military and SPLA/M-IO in Duar. 12 soldiers killed, 28 wounded, and 50 rebels killed.
1/7/2016	Iraq	On January 7, Iraqi forces killed 75 Islamic State militants west of the Al-Thurthar district in Anbar province (coded at provincial capital).
10/3/2016	Libya	Between 55-80 Islamic State militants were killed in Sirte on 2 October. 8 Bunyan Marsous soldiers (Operation Solid Structure)were killed, 57 wounded and a Dutch photojournalist was also killed after being shot through the chest by an Islamic State (IS) sniper.

10/24/2016	Iraq	On Oct 24, the joint Iraqi forces from the army, police, and peshmerga renewed operations along several axes in Mosul and attacked IS positions, and recaptured 9 villages northeast of Mosul, and killed at least 299 militants and destroyed 20 vehicles bombs and 45 bombs (79 fatalities coded in other events). This included the Peshmerga forces capturing three villages (Ibrahim al-Khalil, Al-Adalah and Kani Harami) near Mosul where they killed 51 militants, and destroyed three vehicles and 23 explosive devices.
11/14/2016	Iraq	On 12 November 2016, Peshmerga forces, supported by Yazidi militias, had recaptured Bashiqah from ISIL elements in cooperation with Global coalition forces who backed Peshmerga forces with helicopter aircraft. 100 ISIL elements have been reportedly killed in the liberation phase of

		Bashiqah (22 fatalities coded in previous events).
7/24/2017	Afghanistan	74 anti-government militias (suspected Taliban members) were killed in operations conducted by Afghan security troops in different parts of Faryab province.
11/6/2017	Syria	Clashes took place between Syrian Democratic Forces, supported by Coalition airstrikes, against Islamic State fighters in areas of the northern and northeastern countryside of Deir-ez-Zor city, where QSD forces advanced to control at least 4, and possibly up to 6, new villages under the cover of shelling. At least 75 individuals died during the clashes in the governorate.
1/9/2018	Afghanistan	Security officials reported on January 13, 2018 (coded over the previous week), that 132 Taliban fighters had been killed (53 coded in separate events) and 80 wounded in joint Afghan and NATO operations in Tarinkot city, Urozgan Province.

2/5/2018	Afghanistan	On February 4th, 80 Taliban militants were killed, and 30 more wounded, during joint Afghan air and ground operations to retake control of Gormach district, Faryab province. However, by the end of the operation, Taliban retained controlled of the district.
4/26/2018	Syria	Clashes took place between regime and allied militias against IS fighters in areas on the southern outskirts of Damascus city, killing at least 74 regime and allied militia forces and 59 IS fighters.
7/6/2018	South Sudan	On 6th July, raiders from the Murle ethnic group attacked members of the Jieh ethnic group, in Jubel Bum county in Boma state (Jonglei). According to the Boma state minister for local government, 86 people were killed (across both sides), whilst 14 Jieh and 9 Murle were injured. He also stated that 42,000 heads of cattle were stolen, and that

		allegedly military generals were involved.
10/8/2018	Afghanistan	As reported on Oct 8, joint Afghan and NATO military forces conducted ground and air raids against the Taliban in Shirin Tagab district, Faryab province and Charbolak district, Balkh province. 113 militants were killed. 11 were arrested, and 9 were wounded. Taliban sources claimed 1 Afghan soldier was killed in the clashes. 114 fatalities coded across two events.
11/5/2018	Yemen	National Resistance forces, with coalition air support, took control of Al Matahen junction and the Red Sea Four Mills at al Mataheen in Al Hali district, Al Hudaydah governorate after clashes with Houthi forces. Reports said that 53 Houthi fighters and 13 anti-Houthi fighters were killed on the 5 November 2018 as anti-Houthi fighters took control of Madinat Amal and the Red Sea Mills factory.

12/17/2018	Yemen	Anti-Houthi Giants Brigade forces and local Zaraniq tribesmen claimed to have thwarted an attack of as many as 300 pro-Houthi fighters east of Durayhimi, south of Hodeidah city in western Yemen, killing 50 fighters and injuring 60 others. 8 anti-Houthi fighters were also reported killed.
3/15/2019	Afghanistan	As reported on March 16th, over 24 hours, Afghan military forces conducted operations against suspected Taliban and/or IS militants in Murghab district, Badghis province. 51 militants were killed and tens of weapons were destroyed.
5/16/2019	Egypt	On May 16, Military Forces announced that 47 suspected IS militants and five soldiers were killed and 4 wounded during clashes in Sinai. 300 explosives were defused and many weapons seized during the operations. Military Air Forces reportedly claimed the destruction of 30 hideouts. (location of clashes

		unknown- coded as Al Arish geoprecision 3).
6/26/2019	Libya	On June 26, GNA forces backed by airstrikes fully recaptured the town of Gharyan from the LNA, the town functioned as the main forward operating base and harbored the central operations room. Nine GNA fighters were killed in the process of recapturing Gharyan while GNA forces arrested 150 LNA militiamen and mercenaries, and seized advanced weaponry, vehicles, drones, and other equipment. A number of wounded LNA militiamen were said to have been executed at the Gharyan Hospital and LNA acknolwedged that it lost 43 fighters.
8/19/2019	Syria	On 18 August, 2019, clashes took place between regime and pro-regime militia forces including the Tiger forces against opposition and Islamist factions in the northwestern outskirts of Khan Shaykun in southern

		Idleb countryside amid Syrian and Russian airstrikes and an exchange of shelling barrages between both sides. As clashes continued, HTS detonated a SVBIED and regime forces and their allied forces achieved some advances and entered the city. As a result of the clashes, 62 opposition and Islamist fighters and 35 regime and allied fighters were killed. 2 civilians were also killed by a Russian airstrike. Total fatalities coded to 100 to account for the HTS suicide operative.
10/24/2019	Afghanistan	As reported on October 25 2019, over the past 24 hours, 62-63 Taliban militants were killed and 13-15 were wounded by Afghan and NATO forces attacks and airstrikes in Chishti Sharif district, Herat.
11/29/2019	South Sudan	On 29 November 2019, the Gak and Manuer sections of the Pakam Dinka clan clashed once again in or near Maper (Lakes state). Reports indicate at least 56 were

		killed (some of whom may have died of injuries from the previous clash on 27 November), and that over 100 were injured between this clash and the clash on 27 November. UN peacekeepers have been deployed to Mapel from Rumbek.
12/18/2019	Central African Republic	On 18 December 2019, armed clashes took place between MLCJ and FPRC in Bihera, close from Birao (12 km). At least 59 figthers were killed and 12 others injured, mainly from the MLCJ.
1/9/2020	Democratic Republic of Congo	On 9 January 2020, FARDC took back Madina (Beni) from the ADF. 40 fighters and 30 FARDC were killed during these clashes 70 other soldiers were injured .
2/27/2020	Syria	On 27 February 2020, opposition and Islamist factions and Turkish forces captured Saraqab and the nearby Shapur Farm in Idleb following clashes with regime and pro-regime militia forces amid Russian airstrikes and Turkish

		shelling. During the clashes, 25 opposition and Islamist fighters were killed while regime and loyal forces suffered 36 fatalities. Total fatalities coded to 61.

Appendix III: Company reactions corresponding to events in embargoed countries.

Country	**Name**	**Reactions**
Sudan	Kawasaki Heavy Industries	5
Sudan	L3HARRIS TECHNOLOGIES INC	5
Sudan	ThyssenKrupp	5
Sudan	Amphenol Corp.	4
Sudan	Leidos	4
Sudan	Meggitt	4
Sudan	Melrose Industries	4
Sudan	Mitsubishi Electric Corp.	4
Sudan	Mitsubishi Heavy Industries	4
Sudan	Rolls-Royce	4
Sudan	ST Engineering	4
Sudan	WOOSU AMS CO LTD	4

Democratic Republic of Congo	KRATOS DEFENSE AND SECURITY SOLUTIONS	3
Democratic Republic of Congo	Leidos	3
Democratic Republic of Congo	Northrop Grumman Corp.	3
Egypt	Thales	3
Libya	IHI Corp.	3
Libya	KRATOS DEFENSE AND SECURITY SOLUTIONS	3
South Sudan	Amphenol Corp.	3
South Sudan	KBR	3
South Sudan	Oshkosh Corp.	3
Sudan	AECOM	3
Sudan	Airbus Group	3
Sudan	Bharat Electronics	3
Sudan	CACI International	3
Sudan	Dassault Aviation	3
Sudan	Fujitsu	3
Sudan	Honeywell International	3
Sudan	Jacobs Engineering Group	3

Sudan	KRATOS DEFENSE AND SECURITY SOLUTIONS	3
Sudan	L3 Technologies	3
Sudan	QinetiQ	3
Sudan	Raytheon	3
Sudan	Rheinmetall	3
Sudan	Serco Group	3
Sudan	ViaSat	3
Afghanistan	BAE Systems	2
Afghanistan	L3 Technologies	2
Afghanistan	Leonardo	2
Afghanistan	Meggitt	2
Afghanistan	Mitsubishi Heavy Industries	2
Afghanistan	Saab	2
Afghanistan	Teledyne Technologies	2
Democratic Republic of Congo	AECOM	2
Democratic Republic of Congo	Austal	2
Democratic Republic of Congo	General Dynamics Corp.	2

Democratic Republic of Congo	Jacobs Engineering Group	2
Democratic Republic of Congo	L3 Technologies	2
Democratic Republic of Congo	Lockheed Martin Corp.	2
Democratic Republic of Congo	Melrose Industries	2
Democratic Republic of Congo	NEC Corp.	2
Democratic Republic of Congo	Raytheon	2
Democratic Republic of Congo	Rolls-Royce	2
Democratic Republic of Congo	Thales	2
Egypt	Airbus Group	2
Egypt	Boeing	2
Egypt	Curtiss-Wright Corp.	2
Egypt	Hanwha Aerospace	2
Egypt	Honeywell International	2
Egypt	Leidos	2
Egypt	Raytheon	2
Egypt	Rolls-Royce	2

Egypt	Safran	2
Egypt	Serco Group	2
Iraq	ManTech International Corp.	2
Libya	BAE Systems	2
Libya	Safran	2
Libya	ThyssenKrupp	2
Somalia	Aerojet Rocketdyne	2
Somalia	IHI Corp.	2
Somalia	Mitsubishi Heavy Industries	2
Somalia	Serco Group	2
Somalia	ST Engineering	2
South Sudan	ASELSAN	2
South Sudan	ASELSAN ELEKTRONIK SANAYI	2
South Sudan	Ball Corp.	2
South Sudan	Fluor Corp.	2
South Sudan	General Electric	2
South Sudan	Honeywell International	2
South Sudan	Huntington Ingalls Industries	2
South Sudan	IHI Corp.	2
South Sudan	Jacobs Engineering Group	2

South Sudan	KRATOS DEFENSE AND SECURITY SOLUTIONS	2
South Sudan	Leonardo	2
South Sudan	Raytheon	2
South Sudan	ViaSat	2
Sudan	Aerojet Rocketdyne	2
Sudan	Austal	2
Sudan	Babcock International Group	2
Sudan	BAE Systems	2
Sudan	Ball Corp.	2
Sudan	CAE	2
Sudan	Curtiss-Wright Corp.	2
Sudan	Fluor Corp.	2
Sudan	General Dynamics Corp.	2
Sudan	Hanwha Aerospace	2
Sudan	KBR	2
Sudan	Moog	2
Sudan	NEC Corp.	2
Sudan	Oshkosh Corp.	2
Sudan	Safran	2
Sudan	Thales	2

Sudan	TransDigm Group	2
Yemen	Airbus Group	2
Yemen	Hanwha Aerospace	2
Yemen	Honeywell International	2
Yemen	Huntington Ingalls Industries	2
Yemen	Lockheed Martin Corp.	2
Yemen	Moog	2
Yemen	NEC Corp.	2
Yemen	Rolls-Royce	2
Afghanistan	Amphenol Corp.	1
Afghanistan	ASELSAN	1
Afghanistan	ASELSAN ELEKTRONIK SANAYI	1
Afghanistan	Babcock International Group	1
Afghanistan	Boeing	1
Afghanistan	BWX Technologies	1
Afghanistan	Fincantieri	1
Afghanistan	Hanwha Aerospace	1
Afghanistan	Korea Aerospace Industries	1
Afghanistan	L3HARRIS TECHNOLOGIES INC	1

Afghanistan	Leidos	1
Afghanistan	Melrose Industries	1
Afghanistan	Mitsubishi Electric Corp.	1
Afghanistan	NEC Corp.	1
Afghanistan	QinetiQ	1
Afghanistan	Raytheon	1
Afghanistan	Rolls-Royce	1
Afghanistan	Safran	1
Afghanistan	SMITH WESSON BRANDS	1
Afghanistan	Thales	1
Afghanistan	ThyssenKrupp	1
Afghanistan	TransDigm Group	1
Afghanistan	ViaSat	1
Central African Republic	Austal	1
Central African Republic	Babcock International Group	1
Central African Republic	Ball Corp.	1
Central African Republic	Bharat Electronics	1
Central African Republic	CACI International	1
Central African Republic	Dassault Aviation	1
Central African Republic	Elbit Systems	1
Central African Republic	Fujitsu	1

Central African Republic	IHI Corp.	1
Central African Republic	Kawasaki Heavy Industries	1
Central African Republic	L3HARRIS TECHNOLOGIES INC	1
Central African Republic	Leidos	1
Central African Republic	Meggitt	1
Central African Republic	Mitsubishi Electric Corp.	1
Central African Republic	Mitsubishi Heavy Industries	1
Central African Republic	Oshkosh Corp.	1
Central African Republic	Rheinmetall	1
Central African Republic	Serco Group	1
Central African Republic	SMITH WESSON BRANDS	1
Central African Republic	Thales	1
Central African Republic	ThyssenKrupp	1
Democratic Republic of Congo	Aerojet Rocketdyne	1
Democratic Republic of Congo	Amphenol Corp.	1
Democratic Republic of Congo	ASELSAN	1
Democratic Republic of Congo	ASELSAN ELEKTRONIK SANAYI	1

Democratic Republic of Congo	Babcock International Group	1
Democratic Republic of Congo	Ball Corp.	1
Democratic Republic of Congo	Booz Allen Hamilton	1
Democratic Republic of Congo	CACI International	1
Democratic Republic of Congo	Elbit Systems	1
Democratic Republic of Congo	Fluor Corp.	1
Democratic Republic of Congo	Fujitsu	1
Democratic Republic of Congo	General Electric	1
Democratic Republic of Congo	Honeywell International	1
Democratic Republic of Congo	IHI Corp.	1
Democratic Republic of Congo	KBR	1
Democratic Republic of Congo	Leonardo	1

Democratic Republic of Congo	Meggitt	1
Democratic Republic of Congo	QinetiQ	1
Democratic Republic of Congo	Rheinmetall	1
Democratic Republic of Congo	Saab	1
Democratic Republic of Congo	Science Applications International Corp.	1
Democratic Republic of Congo	SMITH WESSON BRANDS	1
Democratic Republic of Congo	Teledyne Technologies	1
Democratic Republic of Congo	TransDigm Group	1
Democratic Republic of Congo	WOOSU AMS CO LTD	1
Egypt	Aerojet Rocketdyne	1
Egypt	Austal	1
Egypt	Babcock International Group	1
Egypt	BAE Systems	1
Egypt	BWX Technologies	1
Egypt	Dassault Aviation	1

Egypt	Elbit Systems	1
Egypt	Fluor Corp.	1
Egypt	Huntington Ingalls Industries	1
Egypt	Jacobs Engineering Group	1
Egypt	KBR	1
Egypt	KRATOS DEFENSE AND SECURITY SOLUTIONS	1
Egypt	L3HARRIS TECHNOLOGIES INC	1
Egypt	Leonardo	1
Egypt	LIG Nex1	1
Egypt	ManTech International Corp.	1
Egypt	Moog	1
Egypt	Northrop Grumman Corp.	1
Egypt	Oshkosh Corp.	1
Egypt	QinetiQ	1
Egypt	Rheinmetall	1
Egypt	Saab	1
Egypt	Science Applications International Corp.	1
Egypt	Teledyne Technologies	1
Egypt	Vectrus	1

Egypt	ViaSat	1
Iraq	AECOM	1
Iraq	BAE Systems	1
Iraq	Boeing	1
Iraq	Fujitsu	1
Iraq	General Dynamics Corp.	1
Iraq	Lockheed Martin Corp.	1
Iraq	Mitsubishi Electric Corp.	1
Iraq	Mitsubishi Heavy Industries	1
Iraq	NEC Corp.	1
Iraq	Raytheon	1
Iraq	Science Applications International Corp.	1
Iraq	TransDigm Group	1
Libya	Airbus Group	1
Libya	ASELSAN	1
Libya	ASELSAN ELEKTRONIK SANAYI	1
Libya	Austal	1
Libya	Dassault Aviation	1
Libya	Fluor Corp.	1

Libya	Honeywell International	1
Libya	Huntington Ingalls Industries	1
Libya	Kawasaki Heavy Industries	1
Libya	Leonardo	1
Libya	Meggitt	1
Libya	Mitsubishi Heavy Industries	1
Libya	Moog	1
Libya	QinetiQ	1
Libya	Rheinmetall	1
Libya	Rolls-Royce	1
Libya	Serco Group	1
Libya	ST Engineering	1
Libya	STURM RUGER COMPANY	1
Libya	WOOSU AMS CO LTD	1
Somalia	Airbus Group	1
Somalia	Amphenol Corp.	1
Somalia	BAE Systems	1
Somalia	Ball Corp.	1
Somalia	Bharat Electronics	1
Somalia	BWX Technologies	1

Somalia	Fujitsu	1
Somalia	General Electric	1
Somalia	Hanwha Aerospace	1
Somalia	Honeywell International	1
Somalia	Huntington Ingalls Industries	1
Somalia	Jacobs Engineering Group	1
Somalia	L3 Technologies	1
Somalia	Leidos	1
Somalia	Lockheed Martin Corp.	1
Somalia	ManTech International Corp.	1
Somalia	Moog	1
Somalia	NEC Corp.	1
Somalia	Rolls-Royce	1
Somalia	Saab	1
Somalia	Textron	1
Somalia	ViaSat	1
South Sudan	AECOM	1
South Sudan	Airbus Group	1
South Sudan	Babcock International Group	1
South Sudan	Bharat Electronics	1
South Sudan	Boeing	1

South Sudan	Curtiss-Wright Corp.	1
South Sudan	Fujitsu	1
South Sudan	Hanwha Aerospace	1
South Sudan	Kawasaki Heavy Industries	1
South Sudan	Korea Aerospace Industries	1
South Sudan	L3HARRIS TECHNOLOGIES INC	1
South Sudan	LIG Nex1	1
South Sudan	ManTech International Corp.	1
South Sudan	Meggitt	1
South Sudan	Mitsubishi Heavy Industries	1
South Sudan	Moog	1
South Sudan	NEC Corp.	1
South Sudan	Northrop Grumman Corp.	1
South Sudan	QinetiQ	1
South Sudan	Rheinmetall	1
South Sudan	Rolls-Royce	1
South Sudan	Safran	1
South Sudan	Science Applications International Corp.	1
South Sudan	STURM RUGER COMPANY	1

South Sudan	Teledyne Technologies	1
South Sudan	Textron	1
South Sudan	ThyssenKrupp	1
South Sudan	TransDigm Group	1
South Sudan	Vectrus	1
Sudan	Boeing	1
Sudan	BWX Technologies	1
Sudan	Elbit Systems	1
Sudan	General Electric	1
Sudan	Huntington Ingalls Industries	1
Sudan	IHI Corp.	1
Sudan	Korea Aerospace Industries	1
Sudan	Leonardo	1
Sudan	Lockheed Martin Corp.	1
Sudan	ManTech International Corp.	1
Sudan	Northrop Grumman Corp.	1
Sudan	SMITH WESSON BRANDS	1
Sudan	STURM RUGER COMPANY	1
Sudan	Textron	1
Syria	AECOM	1

Syria	Airbus Group	1
Syria	Amphenol Corp.	1
Syria	Boeing	1
Syria	CAE	1
Syria	Curtiss-Wright Corp.	1
Syria	Fincantieri	1
Syria	Fluor Corp.	1
Syria	General Dynamics Corp.	1
Syria	General Electric	1
Syria	Honeywell International	1
Syria	Huntington Ingalls Industries	1
Syria	IHI Corp.	1
Syria	Jacobs Engineering Group	1
Syria	L3HARRIS TECHNOLOGIES INC	1
Syria	LIG Nex1	1
Syria	Lockheed Martin Corp.	1
Syria	Mitsubishi Heavy Industries	1
Syria	Moog	1
Syria	Rheinmetall	1
Syria	Safran	1

Syria	Teledyne Technologies	1
Syria	Textron	1
Syria	Thales	1
Syria	ViaSat	1
Yemen	AECOM	1
Yemen	Aerojet Rocketdyne	1
Yemen	Austal	1
Yemen	CACI International	1
Yemen	Dassault Aviation	1
Yemen	Fluor Corp.	1
Yemen	Hindustan Aeronautics	1
Yemen	IHI Corp.	1
Yemen	Jacobs Engineering Group	1
Yemen	Kawasaki Heavy Industries	1
Yemen	Korea Aerospace Industries	1
Yemen	L3 Technologies	1
Yemen	L3HARRIS TECHNOLOGIES INC	1
Yemen	Leidos	1
Yemen	Leonardo	1
Yemen	LIG Nex1	1

Yemen	Meggitt	1
Yemen	Mitsubishi Electric Corp.	1
Yemen	Mitsubishi Heavy Industries	1
Yemen	Northrop Grumman Corp.	1
Yemen	QinetiQ	1
Yemen	Rheinmetall	1
Yemen	Science Applications International Corp.	1
Yemen	ThyssenKrupp	1
Yemen	TransDigm Group	1
Afghanistan	AECOM	<
Afghanistan	Austal	<
Afghanistan	Bharat Electronics	<
Afghanistan	Booz Allen Hamilton	<
Afghanistan	CACI International	<
Afghanistan	Curtiss-Wright Corp.	<
Afghanistan	Dassault Aviation	<
Afghanistan	Elbit Systems	<
Afghanistan	Fluor Corp.	<
Afghanistan	Fujitsu	<
Afghanistan	General Dynamics Corp.	<

Afghanistan	General Electric	<
Afghanistan	Honeywell International	<
Afghanistan	Huntington Ingalls Industries	<
Afghanistan	Jacobs Engineering Group	<
Afghanistan	Kawasaki Heavy Industries	<
Afghanistan	KBR	<
Afghanistan	KRATOS DEFENSE AND SECURITY SOLUTIONS	<
Afghanistan	LIG Nex1	<
Afghanistan	Lockheed Martin Corp.	<
Afghanistan	ManTech International Corp.	<
Afghanistan	Moog	<
Afghanistan	Northrop Grumman Corp.	<
Afghanistan	Oshkosh Corp.	<
Afghanistan	Rheinmetall	<
Afghanistan	Science Applications International Corp.	<
Afghanistan	Serco Group	<
Afghanistan	ST Engineering	<
Afghanistan	Textron	<
Afghanistan	Vectrus	<

Afghanistan	WOOSU AMS CO LTD	<
Central African Republic	Airbus Group	<
Central African Republic	Amphenol Corp.	<
Central African Republic	ASELSAN	<
Central African Republic	ASELSAN ELEKTRONIK SANAYI	<
Central African Republic	General Electric	<
Central African Republic	Hanwha Aerospace	<
Central African Republic	Hindustan Aeronautics	<
Central African Republic	Honeywell International	<
Central African Republic	Lockheed Martin Corp.	<
Central African Republic	Melrose Industries	<
Central African Republic	Rafael	<
Central African Republic	ST Engineering	<
Central African Republic	Teledyne Technologies	<
Democratic Republic of Congo	Airbus Group	<
Democratic Republic of Congo	BAE Systems	<
Democratic Republic of Congo	Bharat Electronics	<

Democratic Republic of Congo	Dassault Aviation	<
Democratic Republic of Congo	Hanwha Aerospace	<
Democratic Republic of Congo	Kawasaki Heavy Industries	<
Democratic Republic of Congo	LIG Nex1	<
Democratic Republic of Congo	ManTech International Corp.	<
Democratic Republic of Congo	Mitsubishi Heavy Industries	<
Democratic Republic of Congo	Oshkosh Corp.	<
Democratic Republic of Congo	STURM RUGER COMPANY	<
Democratic Republic of Congo	ViaSat	<
Egypt	ASELSAN	<
Egypt	ASELSAN ELEKTRONIK SANAYI	<
Egypt	Fujitsu	<
Egypt	L3 Technologies	<
Egypt	NEC Corp.	<

Egypt	STURM RUGER COMPANY	<
Egypt	Textron	<
Iraq	Aerojet Rocketdyne	<
Iraq	Amphenol Corp.	<
Iraq	Ball Corp.	<
Iraq	Fincantieri	<
Iraq	Fluor Corp.	<
Iraq	General Electric	<
Iraq	Hanwha Aerospace	<
Iraq	Honeywell International	<
Iraq	IHI Corp.	<
Iraq	Jacobs Engineering Group	<
Iraq	Kawasaki Heavy Industries	<
Iraq	KBR	<
Iraq	Korea Aerospace Industries	<
Iraq	KRATOS DEFENSE AND SECURITY SOLUTIONS	<
Iraq	Meggitt	<
Iraq	Oshkosh Corp.	<
Iraq	QinetiQ	<

Iraq	Rheinmetall	<
Iraq	ST Engineering	<
Iraq	STURM RUGER COMPANY	<
Iraq	Textron	<
Iraq	ThyssenKrupp	<
Libya	AECOM	<
Libya	Aerojet Rocketdyne	<
Libya	Amphenol Corp.	<
Libya	Ball Corp.	<
Libya	Boeing	<
Libya	Booz Allen Hamilton	<
Libya	CACI International	<
Libya	Curtiss-Wright Corp.	<
Libya	Elbit Systems	<
Libya	Fincantieri	<
Libya	General Dynamics Corp.	<
Libya	General Electric	<
Libya	Hanwha Aerospace	<
Libya	Jacobs Engineering Group	<
Libya	L3 Technologies	<

Libya	L3HARRIS TECHNOLOGIES INC	<
Libya	Leidos	<
Libya	Lockheed Martin Corp.	<
Libya	ManTech International Corp.	<
Libya	Melrose Industries	<
Libya	Mitsubishi Electric Corp.	<
Libya	NEC Corp.	<
Libya	Northrop Grumman Corp.	<
Libya	Raytheon	<
Libya	Teledyne Technologies	<
Libya	Textron	<
Libya	TransDigm Group	<
Libya	Vectrus	<
Libya	ViaSat	<
Somalia	AECOM	<
Somalia	CAE	<
Somalia	Dassault Aviation	<
Somalia	Elbit Systems	<
Somalia	Kawasaki Heavy Industries	<
Somalia	Melrose Industries	<

Somalia	Mitsubishi Electric Corp.	<
Somalia	Northrop Grumman Corp.	<
Somalia	QinetiQ	<
Somalia	Raytheon	<
Somalia	Rheinmetall	<
Somalia	Safran	<
Somalia	SMITH WESSON BRANDS	<
Somalia	Thales	<
South Sudan	Aerojet Rocketdyne	<
South Sudan	BAE Systems	<
South Sudan	BWX Technologies	<
South Sudan	CACI International	<
South Sudan	Dassault Aviation	<
South Sudan	Elbit Systems	<
South Sudan	Fincantieri	<
South Sudan	General Dynamics Corp.	<
South Sudan	L3 Technologies	<
South Sudan	Leidos	<
South Sudan	Lockheed Martin Corp.	<
South Sudan	Melrose Industries	<
South Sudan	Mitsubishi Electric Corp.	<

South Sudan	Saab	<
South Sudan	SMITH WESSON BRANDS	<
South Sudan	ST Engineering	<
South Sudan	Thales	<
South Sudan	WOOSU AMS CO LTD	<
Sudan	ASELSAN	<
Sudan	ASELSAN ELEKTRONIK SANAYI	<
Sudan	Booz Allen Hamilton	<
Sudan	Saab	<
Sudan	Teledyne Technologies	<
Syria	Ball Corp.	<
Syria	Bharat Electronics	<
Syria	Booz Allen Hamilton	<
Syria	BWX Technologies	<
Syria	Dassault Aviation	<
Syria	Fujitsu	<
Syria	KRATOS DEFENSE AND SECURITY SOLUTIONS	<
Syria	Leonardo	<
Syria	Mitsubishi Electric Corp.	<

Syria	NEC Corp.	<
Syria	Northrop Grumman Corp.	<
Syria	Oshkosh Corp.	<
Syria	QinetiQ	<
Syria	Saab	<
Syria	Science Applications International Corp.	<
Syria	SMITH WESSON BRANDS	<
Syria	STURM RUGER COMPANY	<
Syria	ThyssenKrupp	<
Syria	TransDigm Group	<
Yemen	Amphenol Corp.	<
Yemen	Babcock International Group	<
Yemen	Fincantieri	<
Yemen	Rafael	<
Yemen	Serco Group	<