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Who Benefits in Times of Strife and Uncertainty?

A study of mining companies in the Democratic Republic of Congo

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Abstract

In this thesis, we show that violence–escalating events lead to an increase in stock prices for mining companies holding concessions in the Democratic Republic of Congo (DRC). The increase in value is higher during the Second Congo War compared to its aftermath. We find little evidence that companies that are headquartered in high–corruption countries, present in tax havens, or operate in the gold industry experience a higher increase in company value. However, we find that unethical companies outperform ethical companies when exposed to violent events. Our results are consistent with the theory that resource war and violent conflicts generate benefits that seems to outweigh the cost of investing money in an unstable political economy.

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1. Introduction

From the diamond mines in Angola to the oil production in Syria and the Amazon Forest in Brazil, huge amount of resources are daily exploited illegally or smuggled out of the country without providing any revenue for the nation. Resource plundering and illegal trade are mainly found in countries that are affected by violent conflicts and civil wars (Nadira, 2007). Our thesis is an attempt to provide evidence that mining companies tend to thrive on war and conflict in resource–abundant countries.

We focus on the Democratic Republic of Congo (DRC) and concentrate on the Second Congo War and its aftermath, in the time period 1998–2017. The DRC is an appropriate case study because the country has abundance of natural resources. The mining industry in the DRC plays a significant role in the world's supply of gold, diamond, copper, and accounts for more than 70% of the global output of cobalt (NS Energy, 2021). The country has an untapped mineral deposit that is worth over $24 trillion (LandLinks, 2018). Despite all this, the DRC has one of the world's lowest GDP per capita and is ranked as the 175th least developed country out of 189 countries (The World Bank, 2021). The country has been cursed by its own natural resource wealth as competition for these resources has contributed to the ongoing armed conflict and strife. In this thesis, we argue that the mining companies in the DRC have benefitted from the war and its aftermath.

The purpose of this thesis is twofold. Firstly, we investigate the impact of historical conflict–related events on stock returns for mining companies. Previous literature focuses on how civil war and violent conflicts facilitate a business environment in which incumbent firms can thrive, most notably in African countries (Guidolin & La Ferrara, 2007). Therefore, we would expect stock returns to increase in correspondence to violence–escalating events (hereinafter referred to as violent events). Likewise, we would expect stock returns to decrease in correspondence to violence–deescalating events. Secondly, we test whether the event returns are influenced by company–specific characteristics. We hypothesize that mining companies headquartered in high–corruption countries, present in tax havens, or operating in the gold industry benefit from violent conflicts to a greater extent. The possible reason for this is that these companies have a lower threshold for conducting unethical and illegal activities which enables them to take greater advantage of the circumstances.

To test our theory, we conduct an event study where we examine whether event returns are consistent with changes in conflict intensity. Next, we detect unethical and ethical companies that will later be used to investigate the effect of company–specific characteristics. Finally, we examine our result based on the assumption that investors are well aware that companies tend to benefit from war–torn economies.

Turning to our main results, we show that an increase in conflict intensity causes an increase in value for mining companies. However, we find little evidence that violence–deescalating events cause a decrease in value for mining companies. Moreover, we find a stronger positive effect on event returns during the war relative to after. Companies during the war obtained on average 4,10 percentage points higher abnormal returns relative to after. For the relationship between event returns and the company–specific characteristic, we find little evidence that high–corruption companies, tax haven companies, or gold mining companies are associated with a higher cumulative average abnormal return (CAAR). Lastly, we find that unethical companies obtain a significantly higher CAAR than ethical companies when exposed to violent events.

Our thesis unravels the dark side of the DRC's vast resource reserves and gives support to the theory of resource curse. We find that investors believe that war and armed conflict have a positive effect on the mining companies' profit. This is because violent conflict causes political instability and low transparency which the mining companies can take great advantage of. In times of strife and uncertainty, companies are able to conduct unethical and illegal activities, pocketing huge profits along the way and draining revenues from the country's mining sector. It is important to draw attention to this fact as it questions the role business interests play in causing and sustaining war and conflict.

1.1 Background

The Second Congo War became one of the largest wars in African history, involving nine African countries and over 25 armed groups. By 2008, the war and its aftermath cost 5,4 million lives, making the Second Congo War the deadliest conflict worldwide since World War II (Bavier, 2008).

The war started in July 1998 when the president of the DRC, Laurent–Désiré Kabila, suddenly ended the alliance with Rwanda and Uganda (Weiss, 2000). This became the trigger of the Second Congo War as Rwanda and Uganda had previously been his supporters in the fight against the former dictator Mobutu and were now suddenly treated as enemies. The conflict escalated rapidly, and Rwanda started to attack the DRC to overthrow the Kabila regime. In addition, prominent rebel groups emerged and contributed to the increased violence. On 18 January 2001, Kabila was assassinated by one of his soldiers. This became a turning point as his son Joseph Kabila was announced as his successor and was committed to finding a peaceful end to the war. On 18 July 2003, the government and the rebel groups finally reached an internationally negotiated peace agreement.

Throughout the war, illegal exploitation of resources became widespread through a combination of poor governance, inadequate monitoring, and bribing to obtain mining licenses (Khama, 2016). A major issue raised was that companies were involved in natural resource exploitation in a way that contributed to funding the war (UN Security Council, 2003). In addition, their business activities involved under–invoicing and tax avoidance which resulted in less revenue to the national economy.

Even though the war is officially over, neither the local nor the regional conflicts in Eastern Congo have really ended (Larmer et al., 2013). Armed groups continue to terrorize communities and control weakly governed areas due to unstable conditions, high corruption, and a fragile government. This occurs particularly in areas where mining sites are located (Council on Foreign Relations, 2021). In addition, riots and regional wars would spread to other parts of the country. Consequently, the business environment for the mining industry has not changed significantly with the peace agreement.

2. Conceptual Framework

2.1 Literature Review

Several studies investigate the impact of war and violent conflict on stock markets and find evidence of strong links between such events and market returns. Abadie & Gardeazabal (2003) examine the economic impact of conflict, using the terrorist conflict in the Basque region as a case study. They show that companies with a significant part of their business in the Basque region experienced a positive stock performance as peace became credible. In addition, Schneider & Troeger (2006) find that violent conflict caused a significant negative abnormal return in the global financial market. They used the conflict between Israel and The Palestinians, the first confrontation of a U.S–led alliance against Iraq, and the wars fought in Ex–Yugoslavia as case studies. Whilst most of the papers find strong evidence of stock markets reacting negatively to conflicts and positively to peace events, little literature has been carried out to assess how some businesses thrive on war. Two closely related papers, DellaVigna & La Ferrara (2010) and Guidolin & La Ferrara (2007) show that there are clear indications that war and conflict lead to circumstances that benefit both investors and companies. Our main contribution is to investigate if this applies to the mining companies that hold concessions in a resource–abundant country. We contribute to the growing literature on resource war by exploring the relationship between the mining companies' involvement in unethical activities and certain company characteristics.

There is evidence that violent conflict may be perceived as beneficial by investors. Guidolin & La Ferrara (2007) describe how diamond mining companies holding concessions in Angola benefited from the civil war. They find that investors perceived the end of the war event as "bad news" causing a negative stock price response to peace for the diamond companies, rather than a positive one. We contribute by focusing on a broader mining industry, and we extend the time period. We add to this literature by showing that companies in a resource–abundant country still thrive on conflict–related events even after a war has ended. In addition, we will further contribute to the literature by investigating whether event returns differ by company–specific characteristics.

DellaVigna & La Ferrara (2010) use an event study methodology to detect companies that are involved in illegal arms trade. By focusing on countries under an arms embargo, they

investigate whether the arms companies obtain a significant abnormal return after an event that suddenly increases or decreases the conflict intensity. We use the same event study methodology to detect unethical companies among the mining companies. In addition, the authors compare companies headquartered in high–corruption countries with companies headquartered in low–corruption countries. We extend the definition of potential companies to companies that have an affiliation in tax havens and companies that operate in the gold industry.

2.2 Resource Curse

Abundant natural resources should work in a country's favor by providing a source of revenue and opportunities for investment (Matti, 2010). However, empirical evidence shows that resource–abundant countries are less economically developed and less competently governed than countries lacking in natural resources (Bjorvatn & Selvik, 2008). This phenomenon is known as the "resource curse". Countries that are affected by resource curse tend to fall victim to civil war and violent conflict more often compared to their non–resource–rich neighbors (Nadira, 2007).

It is evident that the DRC suffers from the resource curse (UN Security Council, 2003). Figure 2.1 demonstrates the interconnectedness between mineral exploitation, conflict, and a weak government that puts a curse on the DRC. It started when the government failed to stabilize a regulatory framework that would ensure exploitation in a sustainable manner. State and non–state actors would therefore fight over exploitation rights and mine sites causing conflicts to flourish (1). However, the Congolese government was unable to defeat these various conflicts which resulted in them losing control over the mine sites. This became the beginning of a fragile and weak government (2). In the absence of a strong, central, and democratically elected government, multinational corporations took advantage of the low transparency to negotiate deals at a minimum cost. In addition, illegal exploitation would arise (3). The vicious cycle continues as illegal exploitation became one of the main sources of funding military activities and has, until the present day, served as the motivation and the fuel for the continued conflicts. Consequently, making it even harder for the government to improve their weak governance and establish a legal framework for this key sector. This has resulted in a curse that the DRC is struggling to break out of.
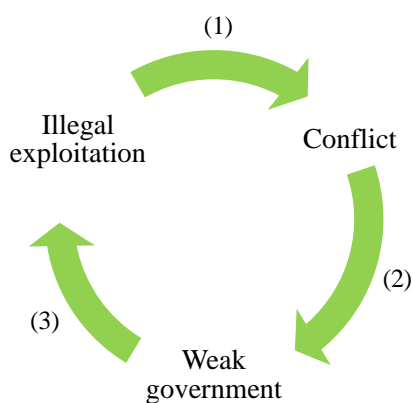
Figure 2.1: The resource curse

In an attempt to break out of this curse, the first mining code was enacted by the Congolese Congress in 2002, replacing outdated mining legislation. This reform created a new legal framework that increased the state revenue from foreign companies. Since then, there have been updates to set a more competitive, fast, and transparent mining legislation (Zongwe, 2008). Even though there has been a positive trend since the war ended, the DRC still struggles to establish a profitable and sustainable sector.

The resource curse is important to consider in our thesis as it facilitates a business environment that the mining companies can take great advantage of. Repeated civil wars and violent conflicts prevent the country from developing democracy, transparency, and property rights. We argue that this lays the fundament for the mining companies to be involved in bribing, corruption, tax avoidance, and other unethical activities which contribute to increasing their company value. This leads us to our first prediction:

PREDICTION 1: *Increase (decrease) in conflict intensity*

    I.   *Results in an increase (decrease) in value for mining companies*

    II.   *Results in a higher increase (decrease) in value for mining companies in war times compared to after the war*

2.3 Investors

We detect whether the mining companies thrive on war based on investors' perceptions. We assume that investors are sufficiently informed about the sources of profit in the companies they invest in. This means that investors know that during a conflict; a) the companies

operating in the country benefit from higher entry barriers for gold, copper, and cobalt producers; b) the companies profit from unofficial dealings as the transparency standard are lower; c) the companies exploit the weak bargaining power of the DRC authorities and the weak law enforcement. Even though these activities are naturally kept secret from the public, the phenomenon of multinational companies benefiting from weak institutions, particularly in African countries, is widely known (Hugo, 2012). Rational investors thereby have an incentive to profit from violent events as this facilitates better terms and conditions for mining companies. On the other hand, war brings uncertainty and loss of fixed capital, which might lead some investors to sell their stocks and contribute to a price drop.

For violence–deescalating events investors would want to sell their stocks as conflict deescalating events make it harder for mining companies to engage and gain from both ethical and legal violations. On the other hand, an opposing mechanism could be that investors appreciate the drop in uncertainty, following a peace agreement. This would lead to an increase in the stock price. Finally, no reaction to an event would be consistent with two opposing mechanisms being at play at the same time, or with the event not being salient enough. In the data section, we describe how we select salient events and make sure to minimize the latter concern.

2.4 Company Characteristics

In this section, we will discuss how company–specific characteristics have an impact on abnormal returns. To unravel the mechanism further we first detect unethical and ethical companies. We define unethical companies as companies being more involved in illegal and unethical activities such as tax avoidance, smuggling, collaborations with rebel groups, etc., and thus taking greater advantage of the increased violence. Likewise, we assume ethical companies to be less involved in such activities. Consequently, we would expect unethical companies to obtain a higher abnormal return for violent events, and a lower abnormal return for violence–deescalating events compared to ethical companies. The detection of these companies is intended to lend validity to the assumption that the difference between the abnormal returns is caused by the company–specific characteristics. This applies to both violent and violence–deescalating events.

Corruption

Businesses originating from illegal and unethical proceeds are encouraged by the existence of corruption (Gounev & Ruggiero, 2012). In such areas, criminal and illicit practices are widespread and highly tolerated. Thus, companies in high–corruption countries tend to incorporate unethical behavior into their practices, routines, and everyday norm.

We therefore expect companies in high–corruption countries to be more involved in unethical activities. We assume that these companies have a lower threshold to breach ethical conduct and thus take greater advantage of the unstable and weak institution. Consequently, investors would assume that high–corruption companies obtain a higher future cash flow relative to low–corruption countries. This leads us to our second prediction:

PREDICTION 2 *(Compared to low–corruption countries): Mining companies in high–corruption countries obtain a*

I. *Higher abnormal return in correspondence to violent events*
II. *Lower abnormal returns in correspondence to violence–deescalating events*

Tax Havens

Tax havens enable corporations to conceal beneficial ownership, financial reports, and other central corporate information (Fenwick & Vermeulen, 2016). Consequently, it prevents the country of origin to take defensive measures and detect possible illegal financial flows (Schwarz, 2011). This allows companies in tax havens to benefit from tax avoidance, embezzlement, and money laundering. However, Schjelderup (2016) argues that the core aim of tax haven legislation is to provide secrecy. The lack of transparency in tax havens will contribute to a higher likelihood that unethical behavior would go undetected and thus cause less reputational harm to the company (Nujen et al., 2021).

Given the benefits tax havens facilitate, investors might perceive companies present in tax havens as a better investment opportunity in times of war and conflict compared to companies that are not present in tax havens. We therefore predict the following:

PREDICTION 3 *(Compared to other mining companies): Mining companies with a tax haven affiliation obtain a*

    I.   *Higher abnormal return in correspondence to violent events*

    II.   *Lower abnormal returns in correspondence to violence–deescalating events*

Gold

Initiatives such as industry–led certifications, UN sanctions, and legislation against imports of conflict minerals largely fail to affect the gold trade (De Koning, 2011). This contrasts with trade in the other minerals such as copper, cobalt, and diamond that have been largely formalized. Consequently, gold mining companies have little incentive to register transactions and benefit from evading legal taxes and fees. We therefore argue that investors might be more positive about investing in gold companies compared to other mining companies in times of conflict. This leads us to our final prediction:

PREDICTION 4 *(Compared to other mining companies): Mining companies that mine gold obtain a*

    I.   *Higher abnormal return in correspondence to violent events*

    II.   *Lower abnormal returns in correspondence to violence–deescalating events*

3. Data

3.1 Company Selection

We identified the mining companies based on two criteria: a) holding exploration or mining concessions in the DRC; b) continuously traded for at least one year over the sample period.

To collect the companies, we first located the mine sites in the DRC and investigated which companies operate or have been operating in these sites. By doing so, we ensure that the companies have direct commercial ties to the country and bear responsibility. Several of the mine sites are dominated by artisanal mining. Artisanal miners work independently and are not officially employed by the mining companies (Parker & Vadheim, 2017). In addition, we use information from Coakley (2001), Montague (2002), and the UN report's list of Western companies that were accused of looting in the DRC. A large number of the companies identified were private or state–controlled corporations. In addition, 25% of the industrial diamond production in the DRC is government–controlled and the remainder comes from small artisanal operators (Coakley, 2001). We therefore exclude the diamond sector due to the lack of public companies. Consequently, we end up with 25 companies.

Moreover, we performed a data trimming process that involved excluding securities that were defined as penny stocks for 80% of the relevant time period. The final set of publicly traded companies holding concessions in the DRC consisted of 14 companies. Lastly, some of the companies got acquired or publicly listed during the time period. As a result, 8 companies were present during the war and 11 companies after.[1]

3.2 Company Characteristics Selection

Corruption

To identify companies that are headquartered in high–corruption countries we use the *Corruption Perception Index (CPI).* The CPI index ranks countries by their perception of corruption among the public sector and politicians. We collect the CPI score for each country the companies are headquartered in for the years 1998–2017. A high–corruption country is

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[1] Full company list can be found in Appendix A1.

defined as the 50th percentile above the average, and low–corruption country as the 50th percentile below the average. We thus compare the level of corruption relative to the countries we have in the sample.[2] This resulted in three high–corruption countries: South Africa, USA, and Ghana. Hence, we identified four companies headquartered in a high–corruption country.

Table 3.1 displays descriptive statistics for the relevant time period. For the high and low–corruption companies, we observe that the mean of the daily return and the standard deviation is relatively similar for the two groups, corresponding to approximately 0,02% for the daily return and 3.5% for the standard deviation. For companies in high (low) corruption countries, the highest daily return is 43.08% (49.64%), while the lowest daily return is –53,33% (–34,84%), indicating a wider spread for high–corruption companies.

Variable	Obs	Mean	Std.dev	Min	Max
High–corruption	14 878	.0002	.0342	− .5333	.4308
Low–corruption	37 257	.0002	.0362	− .3484	.4964

Table 3.1: Summary statistics of high–corruption and low–corruption companies

Distribution of high–corruption companies
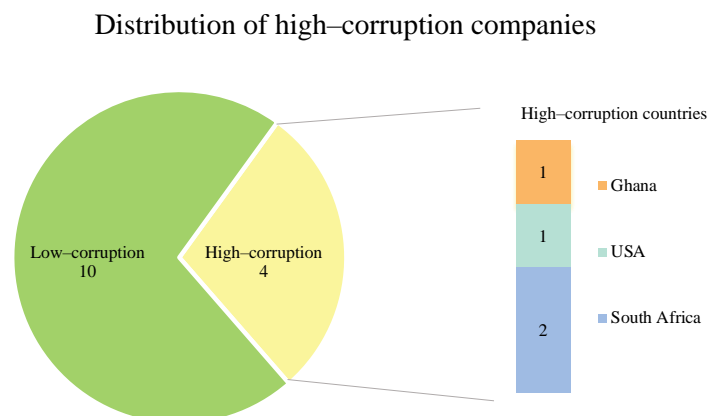
Figure 3.1: Distribution of high-corruption companies

Tax haven

We chose the Corporate Tax Haven Index to identify the companies present in tax havens. The index ranks the world's greatest enablers of global corporate abuse. The tax havens are evaluated based on how aggressively they are complicit in helping multinationals underpay corporate income tax and eroding the tax revenues of other countries (Corporate Tax Haven

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[2] The CPI list can be found in appendix A2.

Index, 2021). The list contains 70 countries; however, we will use the top 10 tax havens for our analysis.[3] We identify five companies that have an affiliation in a tax haven. In addition, three of the five companies have more than one tax haven affiliation and these companies are also identified as a high–corruption company.

From the summary statistics table, we observe that the mean of the daily return is approximately the same for companies present in tax havens and for other companies, ~0,02%. However, the standard deviation for tax haven companies is lower than for other companies. We observe that tax haven companies have a wider spread.

Variable	Obs	Mean	Std.dev	Min	Max
Tax haven	15 493	.0002	.0314	− .5333	.4308
Other companies	36 642	.0002	.0373	− .3473	.4964

Table 3.2: Summary statistics of tax haven companies and other companies

Distribution of tax haven companies
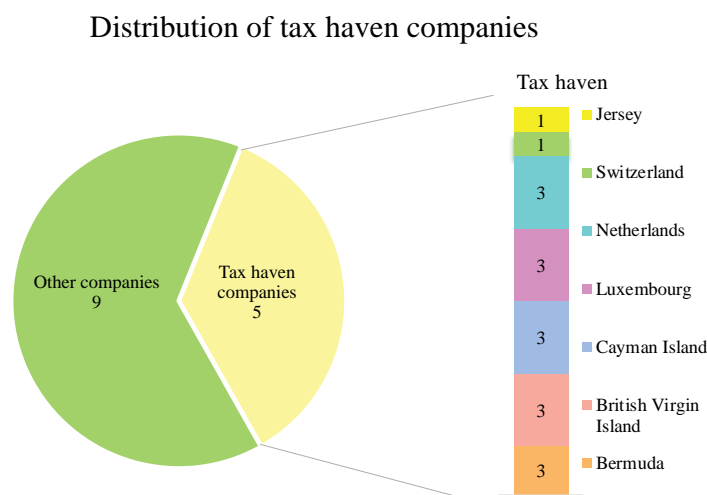
Figure 3.2: Distribution of tax haven companies

Gold

We define gold companies as mining companies that only specialize in gold, although we have companies that mine gold in addition to other minerals. This is to make sure that the difference between the event returns for gold companies and the other companies is caused by the effect of mining gold. Consequently, we end up with four gold companies.

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[3] The list can be found in appendix A3.

We observe from the summary statistics table that the mean of the daily returns ~0,02% and the standard deviations ~3,6% are approximately the same for gold companies and other companies. The spread between the highest and the lowest daily return is wider for gold companies.

Variable	Obs	Mean	Std.dev	Min	Max
Gold companies	13 134	.0002	.0369	− .5333	.0431
Other companies	39 001	.0002	.0352	− .3484	.4964

Table 3.3: Summary statistics of gold companies and other companies

Distribution of gold companies
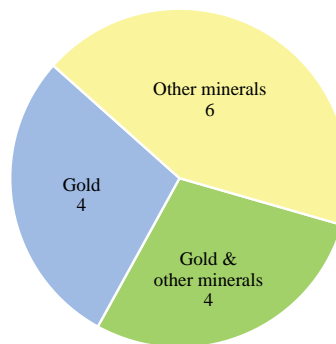
Figure 3.3: Distribution of gold companies

3.3 Event Selection

When searching for events that affected the intensity of the conflict, we followed four criteria; 1) the event is significant enough to attract the interest of investors and get news media coverage; 2) the event is unanticipated; 3) the event needs to increase or decrease the conflict intensity; 4) for violent events the number of fatalities had to be over 50.

To select the events, we combine the qualitative reading of the history with a quantitative evaluation. We performed a search in Lexis–Nexis filtering on the relevant time period and the DRC. In addition, we include relevant keywords such as "deaths", "dead", "killed", "peace", "agreement", "rebel group", "clash", "battle", and "war". We based the decision of whether the event was categorized as a violent event or a violence–deescalating event on a qualitative assessment.

For the quantitative approach, we used the event data from ACLED (ACLED, 2021). This data provides information on internal conflicts in the DRC by date. For violent events, we extracted the events with at least 50 fatalities. For violence–deescalating events, we extracted events that included the term "peace agreement/talks" and "ceasefire" in the description notes. From the ACLED data, we identify several measurement errors in reported conflicts. To make sure that the ACLED events met our requirements we included only the events that were also possible to find in the Lexis–Nexis database. We found 80 events from the ACLED data; however, 60% of these events were not found in Lexis–Nexis and therefore got excluded.

The above–described restriction resulted in 63 events. However, we want to make sure that we avoid multi–day battles and that there is sufficient distance between the events. Consequently, we lost 13 events and ended up with a sample consisting of 33 violent events and 17 violence–deescalating events, totaling 50 events.

Figure 3.4 shows a selection of some of the important events in our sample.[4] The assassination of President Kabila, on 18.01.2001, has been assessed as a violent event. This is because the shooting of the president resulted in chaos and strife the same day, as well as increased uncertainty about the fate of the country's future.
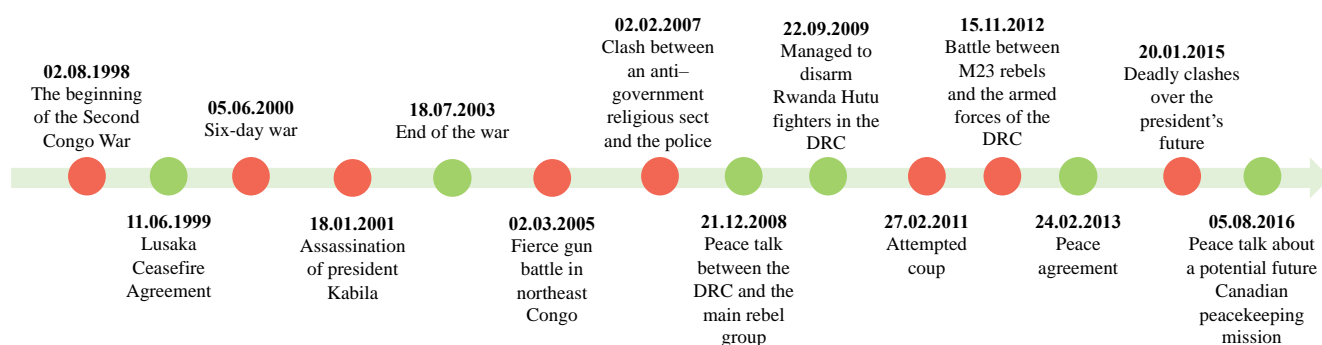
Figure 3.4: Timeline of some of the important events in our sample

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[4] Full event list can be found in Appendix A4.

4. Methodology

4.1 Event Study Methodology

An event study assesses the impact an event has on the value of corporations. The methodology is typically used to measure mergers and acquisitions, earnings announcements, or issues of new debt or equity (MacKinlay, 1997). However, will we use the methodology to detect investors' reactions to conflict–related events. We infer the significance of the event by defining the event and calculating the expected returns, abnormal returns, and cumulative abnormal returns throughout the event. This enables us to measure the individual stock price changes for each company on each event. Since we operate with multiple and similar events, we are also interested in the cumulative average abnormal return (CAAR). CAAR enables us to investigate the average effect a change in conflict intensity has on stock prices for each year and each company category.

We will conduct our analysis with a 21–day event window that spans from 10 trading days prior to the event until 10 trading days after the event. By restricting the event window to 21 trading days we avoid any impact from confounding events. We use an estimation window of 120 trading days, which begins 140 trading days before the event. We use a 10–day buffer between the estimation window and the event window to ensure that the estimation window is not affected by an early leakage of the event (Shaikh, 2018). Based on the estimation window we compute the expected returns during the event window. The illustration from figure 4.1 presents the timeline of our event study:
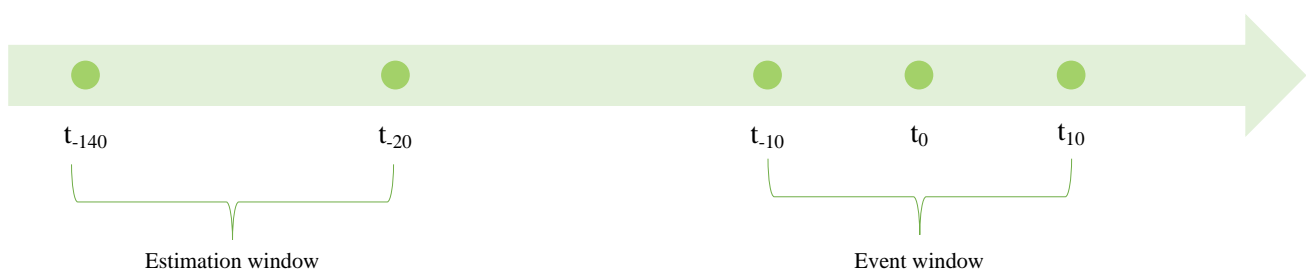
Figure 4.1: Event study timeline

To measure the impact the event has on the company returns we calculate the abnormal returns over the event window. Abnormal return represents the differences between the actual returns and the expected return for company i at time t.

$$AR_{it} = R_{it} - [R_{it}|X_t] + \epsilon_{it} \qquad\qquad 4.1$$

$$AR_{it} = \epsilon_{it} \qquad\qquad 4.2$$

Where:

AR_{it} is the abnormal return for company i at time t

R_{it} is the actual return for company i at time t

X_t is the conditioning information for the expected performance model at time t

$[R_{it}|X_t]$ is the expected return for company i at time t

ϵ_{it} is the error term

The equation is based on that the actual returns are equal to the predicted returns. This means that the abnormal return for company i at time t is the same as the disturbance term, represented by equation 4.2 (MacKinlay, 1997). Positive abnormal returns mean that the actual stock returns are higher than the expected returns, indicating that the stock outperforms itself. Negative abnormal returns indicate the opposite. When interpreting the abnormal returns, we assume that investors have a rational expectation of the changes in the company's expected future earnings. This means that rational investors will sell their stocks if bad news comes out. Consequently, the stock price will drop following the news, resulting in negative abnormal returns. Likewise, if good news comes out this will result in positive abnormal returns.

We use the Fama French 3–factor model as the expected performance model. The model is shown below:

$$R_{it} - R_{ft} = \alpha_{it} + \beta_1\left(R_{Mt} - R_{ft}\right) + \beta_2 SMB_t + \beta_3 HML_t + \epsilon_{it} \qquad\qquad 4.3$$

Where:

α_{it} is the intercept

R_{it} is the total returns of stock i at time t

R_{ft} is the risk–free rate of return at time t

$R_{it} - R_{ft}$ is the expected excess return

R_{Mt} is the total market portfolio return at time t

$R_{Mt} - R_{ft}$ is the excess return on the market portfolio

SMB_t is the size premium

HML_t is the value premium

$\beta_{1,2,3}$ measures the factor coefficients

ϵ_{it} is the error term for company i at time t

We generate estimates of the factors for each company i based on the estimation window. These factor loadings are then used in combination with the Fama French factors during the event window to generate the expected returns. The expected returns generated from equation 4.3 are used in equation 4.1 to calculate abnormal returns.

To draw overall inference for the events of interest we need to calculate the cumulative abnormal return (CAR) for each event (MacKinlay, 1997). We include one day prior to the event as it is difficult to determine the exact day of the incident. In addition, we include one day after the event to capture any effect that might arise after the closing of the stock market. We calculate the CAR by aggregating the three–day abnormal returns through time and across securities for each event. The model is shown below:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it}$$

$$4.4$$

Where:

$CAR_i(t_1, t_2)$ is the cumulative abnormal return for company i from t_1 to t_2

AR_{it} is the abnormal return for company i at time t

t_1 is the first day of the event window

t_2 is the last day of the event window

Turning our attention to the predictions, to test prediction 1i) we conduct the event study and retain the data from the company–event pairs. This enables us to investigate how an event that suddenly increases or decreases conflict intensity effects the CAR for each company. In order to conclude whether the mining companies thrive on war and violent conflicts, we examine if the sign of the return for each company–event pair is consistent with prediction 1i).

Moreover, since our data consists of multiple observations of violent and violence–deescalating events, we calculate the cumulative average abnormal return (CAAR) for each event type. CAAR would provide us insight into the average stock market responses to violent events and violence–deescalating events. We use CAAR to test prediction 1ii), 2), 3), and 4).

The model is shown below:

$$CAAR = \frac{1}{N} \sum_{i=1}^{N} CAR_i(t_1, t_2)$$

4.5

Where:

$CAAR$ is the cumulative average abnormal return

N is the number of company–event pairs

$CAR(t_1, t_2)$ is the cumulative abnormal return for company i from t_1 to t_2

t_1 to t_2 is the first and last day of the event window

As previously mentioned, the violent conflicts and struggles continue in the DRC even though the war officially ended in 2003. We assume that the changes in conflict intensity were higher during the war. This allows us to investigate the relationship between levels of conflict intensity and stock return reactions. This leads us to prediction 1ii) where we examine if we observe any differences in the CAAR during the war compared to after the war. We run a fixed–effect model on all the company–event pairs to test prediction 1ii):

$$CAAR_{year} = \beta_1 d_{year} + \beta_0 + \epsilon_{year}$$

4.6

We want to examine the effect of the event compared to a no event. Therefore, we use absolute values as conflict intensity is affected by both violent events and violence–deescalating events. Turning to our regression, our dependent variable is the three–day CAAR, and d_{year} is a dummy that takes the value one for each year between 1999–2017. β_0 is the intercept and represents the CAAR for the baseline year, 1998. Consequently, β_1 will capture the separate effect of the CAAR for the given year compared to 1998. Finally, ϵ_{year} is the error term. We test H0: if the yearly CAAR is not significantly different from 1998. The war started in 1998 which implies that this year was characterized by violent events, and thus high event returns. A rejection of H0 would imply that the given year is associated with a significantly higher or lower event return. To present the results we conduct a visual inspection by plotting the yearly coefficients.

4.2 Detection method

Next, we detect unethical and ethical companies. As previously mentioned, we define unethical companies as companies being more involved in illegal and unethical activities, and thus taking greater advantage of the business environment that increased violence facilitates. Therefore, ethical companies are companies that are considered to be less involved in such activities.

We construct an event chain where we impose the restriction that CAR needs to have a significant positive sign for violent events, and a significant negative sign for violence–deescalating events. This is defined as an unethical reaction. This means that an ethical reaction will be identified when the opposite is true. To be identified as an unethical company, we require two significant unethical reactions. Consequently, ethical companies are identified as companies that have less than two unethical reactions. The detection of companies will decrease the probability of false–positives and is intended to build a better foundation for the analysis of the company–specific characteristics.

We test predictions 2), 3) and 4) by investigating whether there is any significant difference in the CAAR between the (un)ethical companies characterized by the company characteristics and the (un)ethical companies not characterized by the company characteristics. We plot the CAAR for the (un)ethical companies for each category and conflict intensity, and their confidence intervals. If there is uncertainty regarding the significance of the estimates, we perform an inferential statistic test. We conduct a t–test since the event returns are normally distributed.[5]

When conducting statistical tests, it is important to obtain accurate statistical inferences. One challenge to this is the possibility of errors being correlated within the clusters at the company level (Cameron & Miller, 2015). Failure to cluster the standard errors can lead to an underestimated standard error and thus over–rejecting the null hypothesis. To prevent this problem, we account for the within–cluster correlation by clustering the errors at the company level. Since we have a small cluster size of 14 companies, we correct for the small

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[5] Normality test of data can be found in Appendix A5.

number of clusters through sandwich estimators which will apply a degrees of freedom correction.[6]

5.   Results

In this section, we will present the empirical findings and evaluate the significance of our analysis. The results from our event study are given in section 5.1. Next, we detect the unethical and ethical companies in section 5.2. We present the graphical evidence for prediction 2), 3) and 4) in section 5.3. Lastly, we do a series of robustness checks to verify our results and conclusions in section 5.4.

5.1 Results from the Event Study
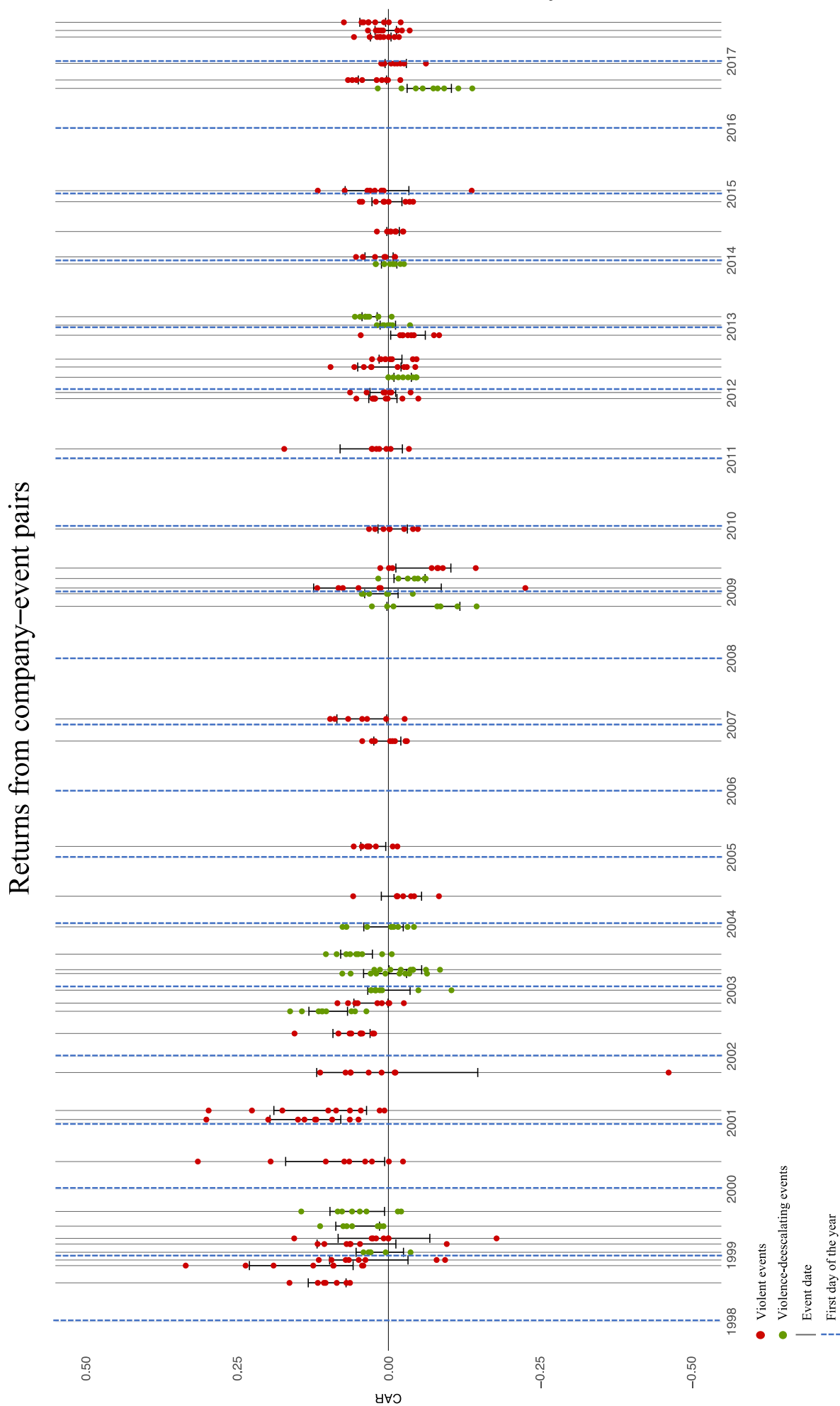
Figure 5.1: Returns from company–event pairs

Notes. The figure plots the distribution of the events and the three–day CAR for each company–event pair, with a 95% confidence interval in black. Each dot represents one company–event pair. This allows us to observe the difference between the company's stock returns when exposed to the same event. The vertical axis represents the effect the conflict–related events have on the company's CAR.

We observe a higher tendency where the company–event pair returns for violent events are relatively more symmetric during the war compared to the aftermath. Symmetric returns are defined by equal signs for the change in conflict intensity and event returns. This is in accordance with predictions 1i) and 1ii). As can be seen, the confidence interval around the event returns is wider during the war compared to after. This is because the distribution of the company–event pair returns is greater during the war. This provides evidence for prediction 1ii). Moreover, this pattern can also be observed in 2008–2009. The rapid variation indicates that investors continue to react to conflict–related events even after the war has ended. This supports prediction 1i). Lastly, we observe smaller variations from 2010, suggesting that that the mining industry is moving towards a more formalized industry, and consequently limiting the event returns for the companies.

Distribution of the event returns
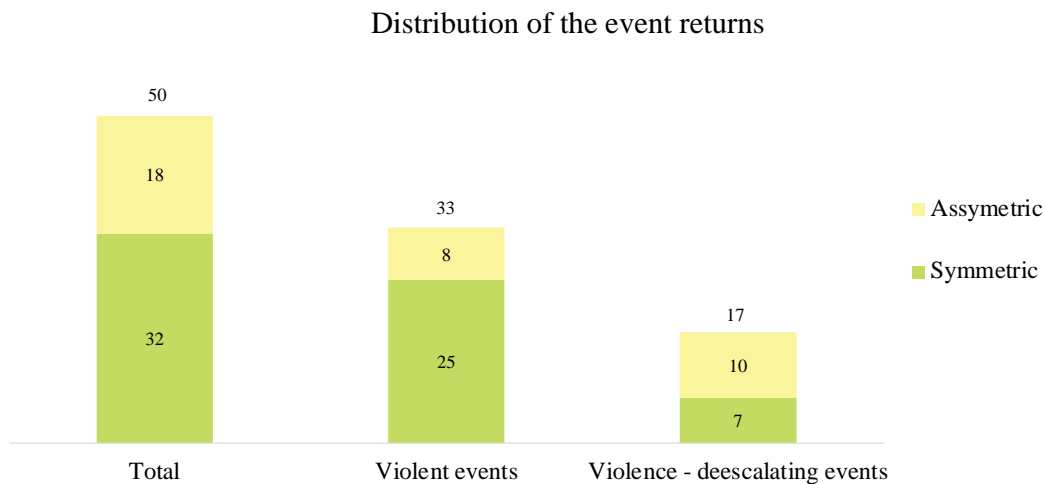
Figure 5.2: Distribution of the event returns

Turning our attention to the signs of the returns we see that 32 out of 50 events have symmetric returns which are consistent with prediction 1i). For the violent events, we observe that 76% of the events have symmetric returns. On the other hand, for the violence–deescalating events, we find that only 41% of the events have symmetric returns. Consequently, most of the event returns for violence–deescalating events are not consistent with prediction 1i). We will further explain possible reasons for this observation in the discussion section.

Yearly absolute CAAR
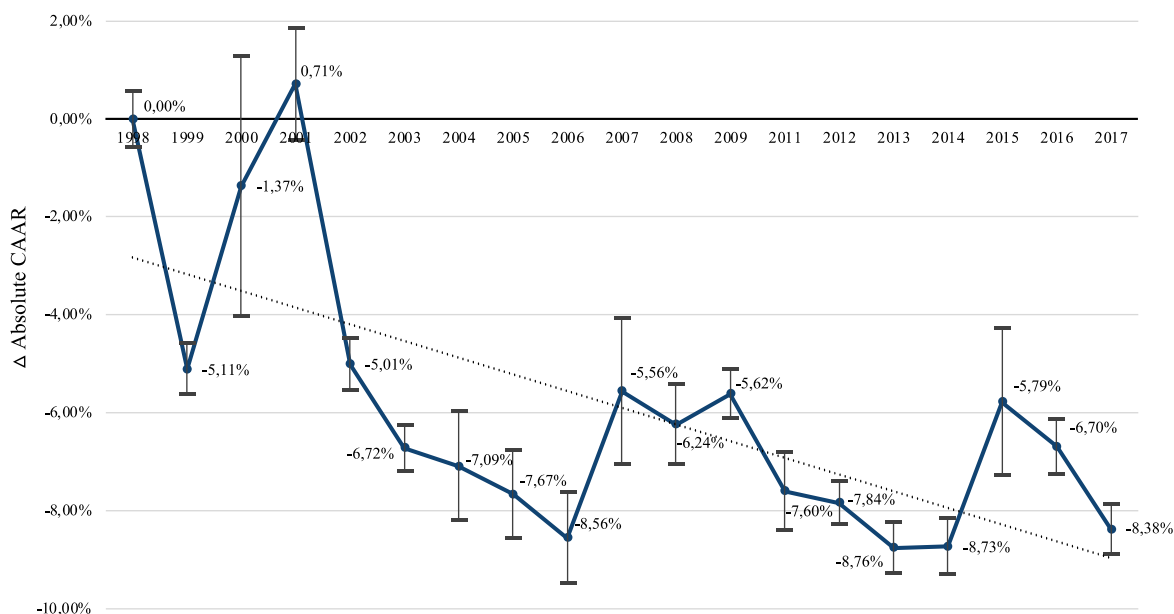
Figure 5.3: Yearly absolute CAAR

Notes. The figure shows the evolution over time of the yearly absolute CAAR for both violent events and violence–deescalating events each year. We compare the event returns with a no event day. We assume that on the remaining trading days, returns are market–corrected and therefore event returns are zero. The coefficients are obtained from regression 4.6. The corresponding drop line represents the 95% confidence interval. We test the H_0 if the yearly CAAR is not significantly different from the excluded variable; the 1998 CAAR. In 1998 the CAAR is 10,71%.[7]

The figure shows a downward trend after the year 2001 to the end of the war, 18th July 2003. The evolution of the CAAR seems to stabilize after the war. We identify a few outliers; 1999, 2007–2009, and 2015. 1999 is the most extreme observation during the war and is significantly lower compared to 1998. After the war, 2007–2009 and 2015 are the most extreme observations as it contrasts with the observed trend in the aftermath. We will further attempt to explain these outliers in the discussion section.

It is noteworthy that the events during the war are associated with a substantially higher CAAR compared to the aftermath. In regression A6 we test whether this effect is significant.[8] The coefficient predicts that the absolute CAAR is 4,10 percentage points higher during the war compared to after. The result is significant at a 1% level. This pattern is consistent with prediction 1ii) and implies that the investors react to conflict–related events to a greater extent during the war compared to after the war.

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[7] The result from the regression is displayed in Appendix A10.
[8] The result from the regression is displayed in Appendix A6.

5.2 Detection of unethical and ethical companies

Of the 419 company–event pairs obtained; 58 were categorized as unethical reactions and 51 were categorized as ethical reactions. As previously mentioned, we require at least two unethical reactions to be identified as an unethical company. Consequently, the companies that do not fulfill this requirement will be identified as an ethical company. This resulted in 12 unethical companies and two ethical companies.
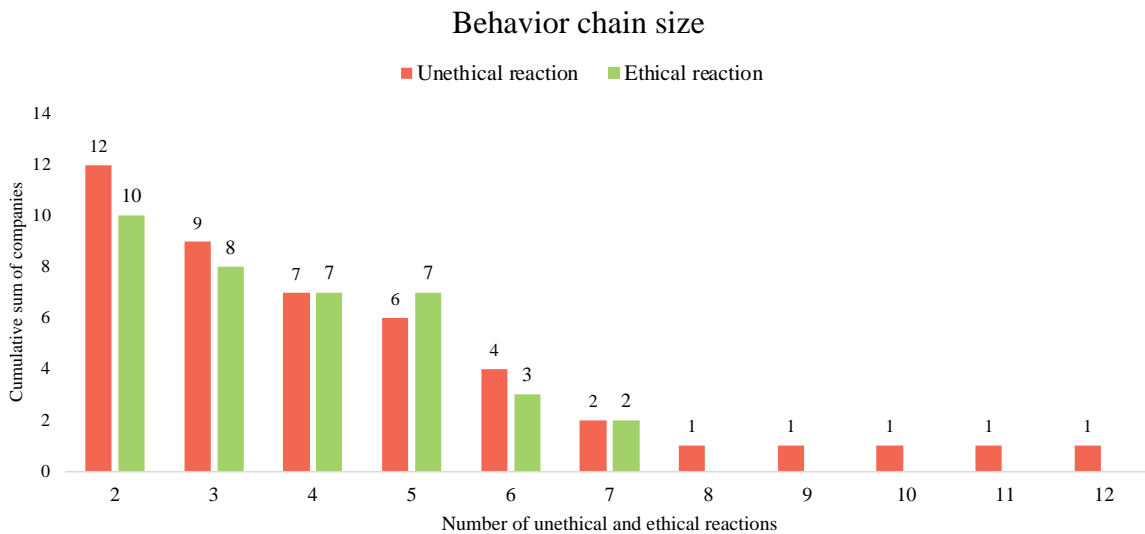
Figure 5.4: Behavior chain size

Notes. The figure plots the behavior chain size. The vertical axis shows the cumulative sum of companies while the horizontal axis shows the number of unethical and ethical reactions.

We observe that 12 companies have more than one unethical reaction, while the highest chain of reaction is 12, corresponding to one company. Turning to the ethical reactions, 10 companies have more than one ethical reaction, while there are no companies that have more than seven ethical reactions. We observe that the cumulative sum of companies decreases as the number of unethical and ethical reactions increases. In addition, we see that the number of unethical reactions is always higher or equal to the number of ethical reactions, except for one case. This indicates that a large part of our sample is engaged in unethical activities which further supports prediction 1i). Lastly, we assume that the higher chain of reaction a company has, the more likely the company is in profiting from war and conflict through unethical activities.

5.3 Graphical evidence

Figures 5.5 to 5.7 show whether the CAAR is influenced by company–specific characteristics. We plot the CAAR for the different company groups when exposed to both violent events and violence–deescalating events. Lastly, we refer to "other companies" for the companies that do not have the characteristics.

5.3.1 High–corruption companies vs. low–corruption companies

Figure 5.5: Average returns for events: Corruption

Notes: The figure plots the three–day CAAR and the 95% confidence interval for days with violence–deescalating events, no event and, violent events. The figures also report the number of company–day observations over which the return is computed.

For violence–deescalating events, we find that none of the estimates are statistically different from each other. In addition, we observe that violence–deescalating events have no significant impact on the companies' CAAR as the estimates are not significantly different from zero. Consequently, these findings provide no evidence for prediction 2ii).

Turning our attention to violent events, we observe that the unethical high–corruption companies are associated with a 1,78 percentage points higher CAAR compared to unethical

low–corruption companies. This is in line with prediction 2i). However, the confidence band to the estimates overlap. Consequently, the estimates are not significantly different from each other, and we cannot confirm this pattern. On the other hand, we find that the unethical high–corruption companies obtain a 3,99 percentage points higher CAAR when exposed to violent events compared to violence–deescalating events. A t–test shows that this effect is significant and provides support for prediction 1i).[9]

As we would expect, none of the ethical companies are headquartered in a high–corruption country. We observe a trend where ethical companies obtain a positive CAAR for violence–deescalating events and a negative CAAR for violent events, but because of the wide confidence band, we cannot confirm this pattern. However, we find that ethical companies have a significantly lower CAAR compared to unethical companies for violent events. This indicates that ethical companies are less involved in illegal and unethical activities.

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[9] Result from the t–test can be found in Appendix A7.

5.3.2 Tax haven companies vs. other companies
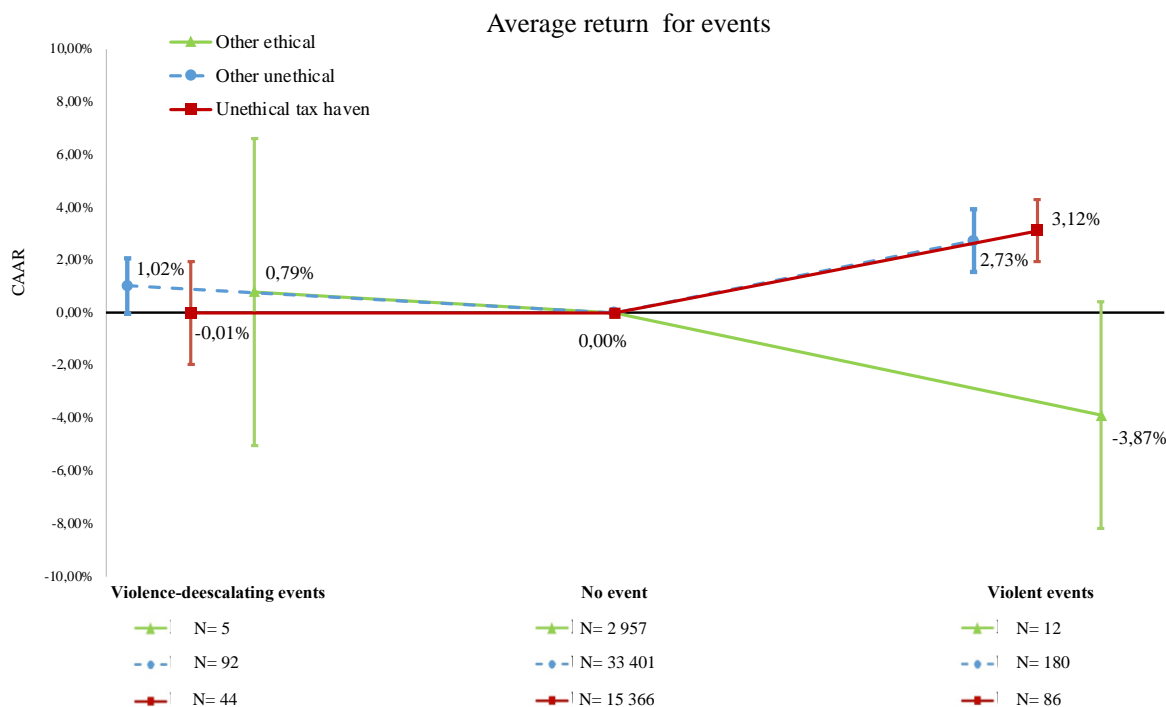
Figure 5.6: Average returns for events: Tax haven

Notes. The figure plots the three–day CAAR and the 95% confidence interval for days with violence–deescalating events, no event and, violent events. The figures also report the number of company–day observations over which the return is computed.

For violence–deescalating events, we observe similar findings as in figure 5.5. Hence, the same interpretation applies. For violent events, we observe that the unethical tax haven companies are associated with a 0,39 percentage points increase in CAAR compared to other unethical companies. Since the estimates are not significantly different from each other we cannot state that the increase is caused by the effect of having affiliation in a tax haven. This is not in line with prediction 3i). However, we find that unethical tax haven companies obtain a 3,13 percentage points higher CAAR for violent events than for violence–deescalating events. A t–test shows that this difference is significant at a 5% level.[10] This is consistent with prediction 1i). Lastly, none of the ethical companies have affiliations in tax havens. However, we observe that the estimate for ethical companies is significantly different from unethical companies when exposed to violent events.

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[10] Result from the t–test can be found in Appendix A8.

5.3.3 Gold companies vs. other companies
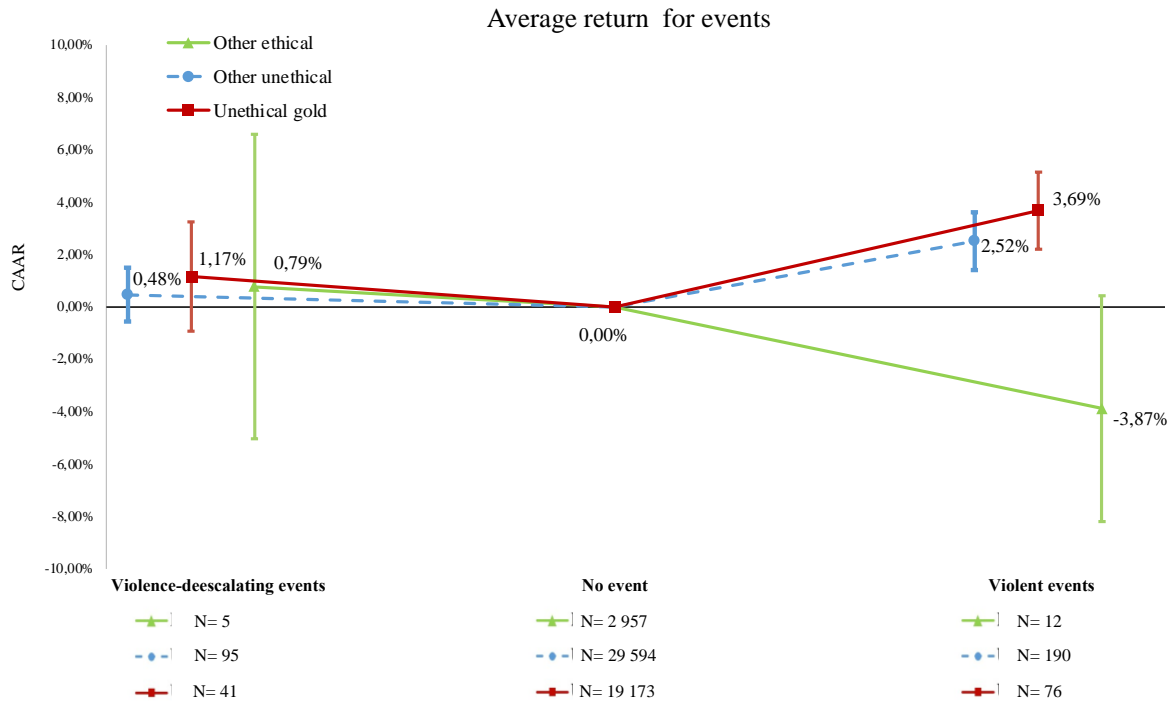
Figure 5.7: Average returns for events: Gold

Notes. The figure plots the three–day CAAR and the 95% confidence interval for days with violence–deescalating events, no event and, violent events. The figures also report the number of company–day observations over which the return is computed.

For violence–deescalating events, we find that none of the estimates are statistically different from each other and therefore provide no evidence for prediction 4ii). Turning to violent events, we observe that gold companies are associated with a 1,17 percentage points higher CAAR than other unethical companies. However, the estimates are not significantly different from each other and we cannot with certainty confirm this trend. Moreover, we observe that the confidence band for unethical gold companies when exposed to violence–deescalating events and violent events overlap. This suggests that gold companies do not obtain a significantly higher CAAR when exposed to violent events. This contrasts with previous results from tax haven and high–corruption companies. Lastly, none of the ethical companies were gold companies, and we see that ethical companies obtain a significantly lower CAAR compared to unethical companies when exposed to violent events.

5.4 Robustness Checks

Prediction 1)

In table A10 in the Appendix, we present a variety of robustness checks for prediction 1). First, we reduce the event window to the event day and one day after the event [0, 1] to investigate whether the signs of the event returns are consistent. We reduce the event window to subtract the potential influence of Day -1, which could add noise to the dependent variable. Second, we include different measures of returns for the dependent variable in regression 4.6. We include abnormal returns and raw returns. In each of these specifications, the results are of similar magnitude to our main findings. The number of symmetric and asymmetric event returns does not change. In addition, the coefficients from regression 4.6 vary slightly between the different return measures. However, our main conclusion for prediction 1i) and 1ii) still holds. Therefore, we are confident that our results accurately present the impact of a conflict–related event in the time period and sample chosen for this study.

Detection of unethical companies

For the detection of unethical companies, we relate these detection results to an external source for further validation. We compare our results with the UN report that was published in 2003. This report contains a list of companies that were accused of being involved in plundering and illegal exploitation of natural resources in the DRC. Using our methodology, we detect the same companies that the UN has listed among those who are publicly traded. This corresponds to five companies. In addition, our results suggest three companies beyond the list UN provided. However, we cannot with certainty know if they were directly involved in unethical activities as our study does not provide any concrete evidence. Lastly, of the five companies which are on both lists, four are headquartered in a high–corruption country, five have affiliation in tax havens and three are gold companies. This supports the observed relationship between the company–specific characteristics and unethical behavior.

Prediction 2), 3), and 4)

In table A11 in the Appendix, we present the robustness check for prediction 2), 3), and 4). We perform a robustness check where the estimation window expands from 120 to 180 trading days. We use a longer estimation window to increase the precision of the predicted returns. This would minimize the effect of the events included in the estimation window as we obtain

a larger sample of returns. In addition, Bose and Leung (2013) argue that a longer estimation window builds a better foundation for the forecast's accuracy.

Turning to the results, for all the predictions, the difference between unethical and ethical companies remains significant for violent events. In addition, we observe that the relationship between the company–specific characteristics and the CAAR remains similar to our main findings. Further, we observe that one company does no longer qualify as an unethical company. Consequently, we have an ethical company present in tax havens. For violent events, we observe that the CAAR for the ethical tax haven company is significantly lower than unethical tax haven companies. This further substantiates our results that ethical companies are associated with a lower CAAR for violent events.

6. Discussion

6.1 The relationship between company value and conflict intensity

For prediction 1i), the findings indicate that violent events result in an increase in value for mining companies. This is in line with previous literature, e.g. DellaVigna & La Ferrara (2010) who find that arms companies, with low cost of embargo violation, profit from violent events. The positive event returns substantiate the fact that during times of strife and uncertainty mining companies benefit from higher entry barriers, lower transparency, and weak law enforcement. This further suggests that mining companies might try to facilitate circumstances that make it easier for conflict and violence to unfold. Such an interpretation is in line with the findings from Berman et al. (2017). They show that the mining activity in Africa increases the incidence of conflicts at the local level due to the company's propensity to finance rebel groups that control these mines.

Turing our attention to event returns for violence–deescalating events, our result contrast with prediction 1i) and previous literature e.g. DellaVigna & La Ferrara (2010) and Guidolin & La Ferrara (2007). These authors find negative event returns for violence–deescalating events, while we find differential responses for the event returns. A possible explanation for this might be that the investor's appreciation of violence–deescalating events overweights the fact that these events might prevent companies to benefit from unethical activities. This is because violence–deescalating events tend to reduce investment uncertainty and therefore cause existing investors to hold these stocks, or prompt new investors to buy these stocks. This is found to be the case in the paper by Abadie & Gardeazabal (2003). They find that companies, with business activities in the Basque region, showed a positive stock response to a ceasefire announcement that was intended to end the terrorist conflict.

Another possible explanation could be that ceasefires and peace agreements had little impact on the investors due to their weak effect of decreasing the violence. One of the first significant ceasefire agreements that took place during the war was the Lusaka Ceasefire Agreement which was signed in July 1999 (Tatiana, 2009). Six African countries and several rebel groups involved in the war decided to sign. This became a milestone as it attempted to end the Second

Congo War. However, violence continued behind the ceasefire and the agreement failed. Following the implementation of a series of peace accords and ceasefire agreements, the DRC still suffers from violence indicating that these agreements have failed to build sustainable peace in the country (Ahere, 2012).

For our event study on the war and its aftermath, the results are in line with prediction 1ii). The first explanation for what might cause the CAAR to fall after the war is increased competition by the entry of new companies. War increases risk and uncertainty which discourage companies from operating in conflict economies (Nelson, 2000). One could therefore assume that after the war the barrier to enter the DRC would be lower, causing new companies to acquire new concessions. The entry of new companies would shrink the profit margins of the companies already holding concessions in the DRC, resulting in lower CAAR.

Another possible explanation for the observed trend is that the stock markets have become more liquid over time. Liquidity in public stock markets has improved in the recent four decades following numerous regulatory reforms, technological improvements, and an increase in trading activity (Ben–Rephael et al., 2015). During the Second Congo War the stock market was less liquid and had fewer markets participants who traded infrequently. This might cause a wider spread between actual returns and predicted returns. In addition, news sharing has become more efficient over time. Therefore, investors would receive fewer and more extensive news during the war, and information about the conflict–related events would have a greater impact.

The third reason might be the greater extent of government control over the mining sector in the past years. After the Second Congo War, a new mining code was introduced to ensure conflict–free minerals and prevent rent–seeking behavior. Further, an interest largely driven by western buyers has put pressure on these mining companies requiring traceability and certifications down the supply chain (De Koning, 2011). This makes it harder for the mining companies to be involved in illegal exploitation and other unethical activities. Consequently, the companies will experience a decrease in their value. In addition, in 2003 UN imposed an embargo on arms supply and other military assistance to armed groups due to the continued violence (SIPRI, 2021). This would increase the cost of obtaining weapons. Since armed groups control several of the mine sites, the licensing cost for the mining companies would

increase as this remains an important source of financing (Schouten, 2019). Therefore, the mining companies would be less profitable causing a decrease in the company value.

In addition to describing the general trend, we attempt to explain the outliers. In 1999 we find a substantial decrease in the CAAR. We observe that 1999 was dominated by violence–deescalating events. Therefore, one possible reason for this decrease in CAAR is the differential responses investors have to violence–deescalating events. As previously argued, violence–deescalating events reduce uncertainty, while at the same time causing certain disadvantages for the mining companies. We argue that the two opposing mechanisms came into play during 1999, resulting in lower abnormal returns.

Moreover, the increased CAAR during 2007–2009 can be explained by the internal conflict in the eastern provinces of North and South Kivu, combined with the conflict in the western province of Bas–Congo (Stearns, 2012). These conflicts are characterized as the most violent and deadliest conflicts after the war. In addition, the cobalt industry experienced a significant increase in demand the same year, with cobalt prices doubling (Looney, 2020). This might have contributed to the increase in the CAAR. Lastly, the 2015 outlier can be explained by the protests about the proposed law that would allow President Kabila to remain in power until a national consensus was conducted. An interesting factor about this event is that the mining companies have gained several advantages from the president through bribery and corruption (Taylor, 2003). Therefore, it is not surprising that we observe a substantial increase in the 2015 CAAR.

6.2 Corruption

Figure 5.5 shows that unethical high–corruption companies obtain a significantly higher abnormal return when exposed to violent events compared to violence–deescalating events. This lends further supports to 1i). In addition, we observe that for violent events, the CAAR for unethical high–corruption companies is higher than the CAAR for low–corruption companies. This is in line with prediction 2i). A potential explanation for these results is that low–corruption companies might have a higher legal and reputational cost of being associated with illegal activities compared to high–corruption companies. Being involved in illegal activities comes with a huge reputational risk and is likely to cause a drawback to a company's image (Kim & Aguilera, 2016). Even though the mining companies operate in a

high–corruption country, companies will be held more accountable when involved in corruption activities such as bribery, lobbying, and embezzlement (Nujen et al., 2021). This indicates that reputational costs might impact the companies' choice towards conducting illegal operations to gain from the violent conflicts. Further, our results are in line with DellaVigna & La Ferrara (2010) who find positive event returns, in correspondence to a violent event, for companies headquartered in high–corruption countries. They argue that the reason for this is that being in a high–corruption country lowers the cost of illegal activities such as bribery and illicit arms trade.

At the same time, the estimates for unethical high–corruption companies are not significantly different from unethical low–corruption companies. Therefore, we cannot conclude that being a high–corruption company has a positive effect on abnormal returns for violent events. A potential reason might be that high–corruption companies tend to perform less well than low–corruption companies. Such an interpretation is supported by Gaviria (2002). He investigated the impact of corruption on the economic prospects of firms and find that corruption reduces firm competitiveness and is unlikely to have any positive effects. Lastly, it is important to emphasize that we compare the level of corruption relative to the countries in our sample and not based on the world's general perception. Consequently, this affects the results.

6.3 Tax haven

Our result shows tax haven companies obtain a significantly higher CAAR for violent events compared to violence–deescalating events. This supports prediction 1i). In addition, we find that unethical tax haven companies are associated with a higher CAAR than other companies when exposed to a violent event. This is consistent with prediction 3i). Our findings are in line with a study conducted by Johannesen & Larsen (2016). They find that the recent European legislation requiring oil, gas, and mining companies to disclose their tax payments on a country–by–country basis was associated with significant decreases in company value. This implies that tax avoidance creates rents for companies in extractive industries, and that disclosure rules have the potential to reduce these rents. In addition, Christensen (2011) finds that the prominent features of tax haven create a criminogenic environment in the global capital markets. Consequently, illicit financial flows will be easily disguised and hidden amongst legitimate commercial transactions.

On the other hand, the estimates for unethical tax haven companies are not significantly different from those of other unethical companies. Therefore, we cannot confirm that having a tax haven affiliation has a positive effect on abnormal returns for violent events. A possible explanation would be that investors assume that all mining companies operating in the DRC are involved in breaking the law and benefit, to a certain extent, equally from the weak regulatory environment. Hence, having an affiliation in a tax haven may not give them any competitive advantage. This interpretation might also explain the insignificant difference between unethical high–corruption and unethical low–corruption companies.

6.4 Gold

Our results show that unethical gold mining companies obtain a higher CAAR than other companies for violent events and are thus in line with prediction 4i). This is supported by evidence from Mthembu–Salter (2014). He finds that most of the domestic gold leaves the DRC unrecorded without generating any tax revenue to the country. In addition, Spiegel (2009) argues that the gold companies obtain all the profits as the resource policies and legal framework have failed in ensuring a mutual flow of benefits to the miners, government, and the community. Consequently, this might encourage investors to trade their money in gold mining companies in the days of conflict events.

However, the estimates for unethical gold companies are not significantly different from other unethical companies, and we cannot confirm this trend. A potential reason for this might be that the initiatives and sector formalizations developed in the other mining sectors have not been effective solutions. De Koning (2011) find that the trade intervention in the overall mining industry has so far had limited positive impact. This indicates that other mining sectors might also gain huge profits due to the inefficient solutions implemented.

6.5 The interaction between unethical and ethical companies

Overall, the results from figures 5.5–5.7 provide little evidence for predictions 2–4 as the estimates for *unethical companies* are not significantly different from *unethical companies having the company characteristics*. This also implies that corruption, tax haven, and

operating in the gold industry are not the relevant margins of difference between ethical and unethical companies. It is however the fact that they are characterized as an unethical company that causes a significant increase in the CAAR when exposed to violent events. This lends further support to our definition of unethical companies and the proposed method for detecting unethical companies based on investors' knowledge.

A possible explanation for the significant difference between unethical and ethical companies for violent events might be that investors to unethical companies have access to inside information, and are thus more informed than investors to ethical companies. It is plausible that unethical companies have poor corporate compliance which suggests that it is easier for investors to be involved in inside trading (Hess, 2019). Consequently, these investors might be more informed about the company's illegal dealings and activities and therefore have a strong incentive to trade in the days of violent events.

On the other hand, our result contrasts with previous research about unethical business behavior and stock performance. Long et al. (2016) find that firms that were involved in unethical conduct, involving bribery, illegal payments, and insider trading, underperforms significantly relative to their respective industry portfolio after the announcement of ethical violations. However, we find that unethical companies outperform ethical companies in the days of violent events. The main difference between their study and ours lies in the business environment under consideration. An analysis of the DRC requires that the resource curse is taken into considerations that may explain why we find opposite results. Consequently, the result further substantiates our assumption that war and violent conflict provide circumstances that certain companies can profit from.

6.6 The Anglo American Case Study

"Since our founding almost 90 years ago, we have established a proud tradition of not only delivering market–beating returns for our shareholders, but of benefiting the broader communities in countries in which we operate."

– *Anglo American Report to Society 2006*

"We are cursed because of our gold. All we do is suffer. There is no benefit to us."

– *Congolese gold miner*

Anglo American is one of the largest mining companies in the world with headquarters in London. The company has been operating in the DRC since 1996 and prides itself as a responsible actor. They have been rated as the top mining company for corporate social responsibility three times in a row and rewarded for their contribution towards the achievement of the Millennium Development Goals (Anglo American, 2009). Anglo American's corporate value states that the company strives to re–image mining to improve people's lives and protect the communities. However, Anglo American's activities in the DRC tell a different story.

The company's mines have been associated with human rights abuses, forced removal of people, pollution of water along with increasing cases of diseases. For decades, Anglo American has been profiting from the violent conflict in the DRC. In 2005, Human Rights Watch accused Anglo American of making payments to the Nationalist and Integrationist Front (FNI) (Human Rights Watch, 2005). FNI is one of the most murderous rebel groups in the country. They have used forced labor and killed thousands of civilians to gain control of the mine sites (Prosansky, 2006). However, the company's relationship with the FNI resulted in mutual benefits. FNI would receive financial and material support from Anglo American which would be used to resist the efforts by the government, the UN, or other actors to end human rights abuses, conflict, and violence. In return, Anglo American would gain access to gold–rich mine sites and assurance of security.

The company has stated that they had no relationship with the FNI and that all payments made to the FNI were made under duress and protest (Human Rights Watch, 2005). However, Human Rights Watch has documented several meetings between the two groups where they have discussed each other business interests. In addition, after the DRC was imposed an arms

embargo in 2003, the company has been accused by the UN security of being an embargo violator due to their assistance and direct payment to the FNI, an embargoed party.

There is no doubt that the company has benefitted from the country's instability and gained huge profits from the war. The company has been listed on the UN report as one of the companies looting the DRC. In addition, we find results that substantiate these accusations against Anglo American. Firstly, Anglo American has the highest chain of reaction among our companies, corresponding to 12 unethical reactions. Secondly, we find that the company obtains a negative CAR at the end of the war event. Lastly, we find that war and violent conflict appears to have generated positive event returns.
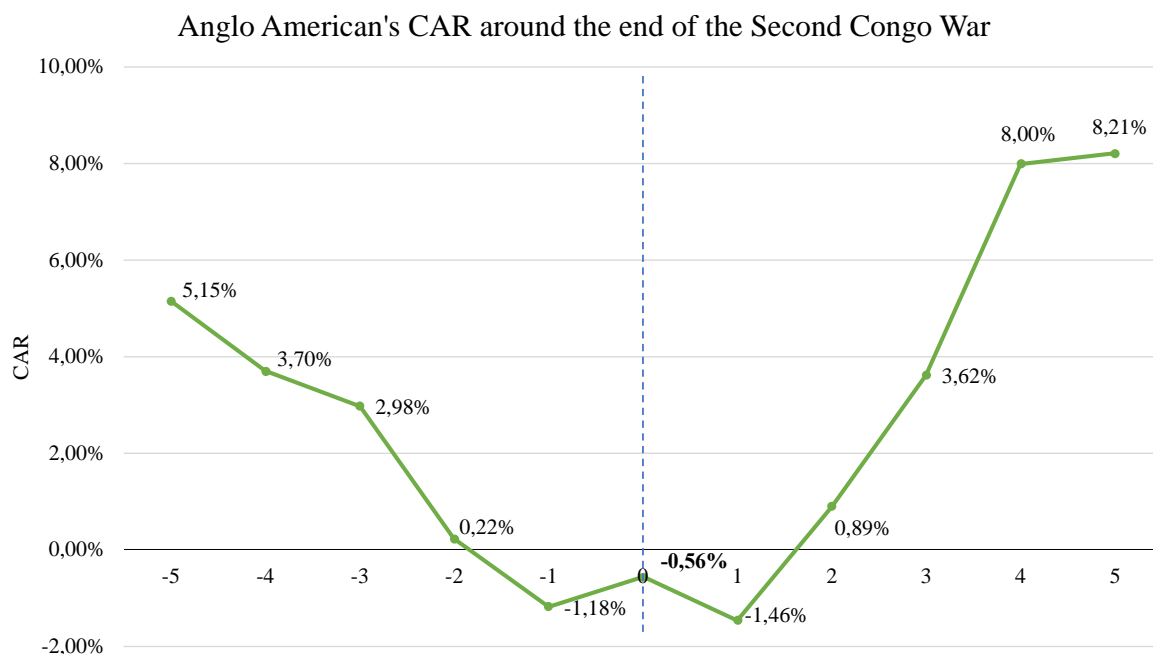
Figure 6.1: Anglo American's CAR around the end of the Second Congo War

Notes. The figure plots Anglo American's CAR around the end of the war event. We have displayed the CAR five days prior to and five days after the event. The vertical axis represents the size of the effect of the event on the company's CAR.

We observe that the CAR starts to fall five days prior to the event. A possible explanation for this might be that an end of a war event is easier for investors to anticipate as it tends to come news about the negotiations and peace process prior to the event. Therefore, such events are more likely to be priced in by the time the event takes place. Moreover, on the event, Anglo American obtain a significant CAR of –0,56%. This event fulfills the event chain restrictions and is considered an unethical reaction. We observe that one day after the event the CAR

continued to drop to –1,46%. This further indicates that the investors perceived the end of the war event as bad news. This observed pattern is in line with prediction 1i) and substantiate particularly the study from Guidolin & La Ferrara (2007).
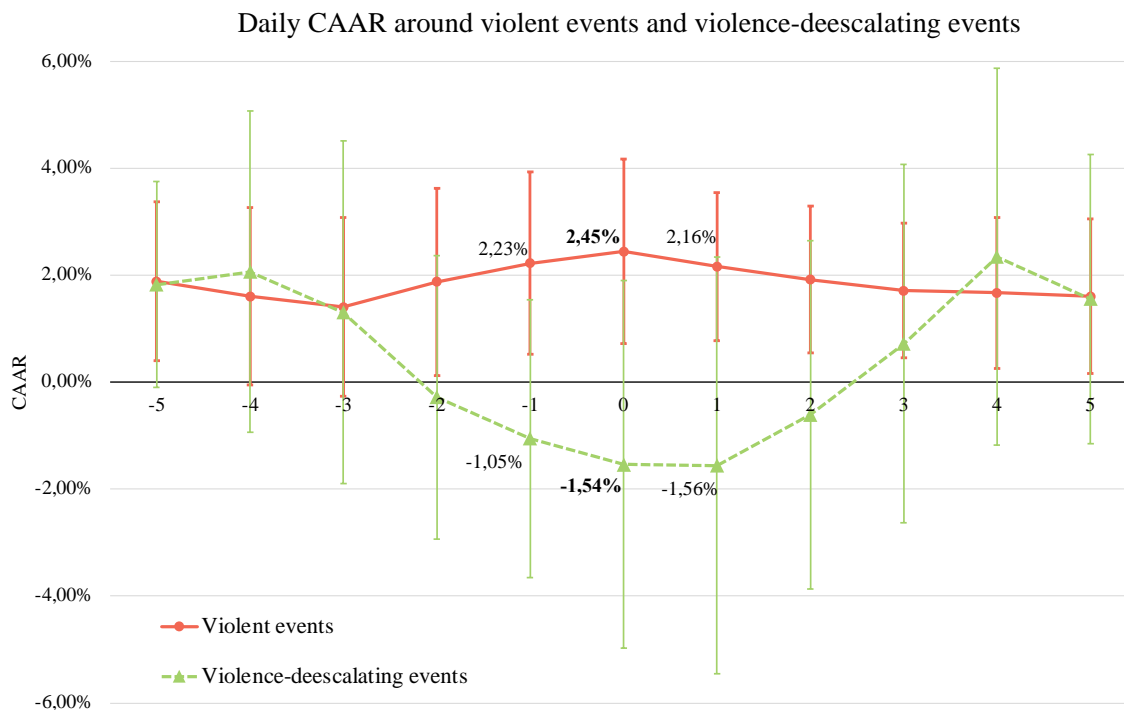
Figure 6.2: Daily CAAR around violent events and violence-deescalating events

Notes. The figure plots Anglo American's CAAR around the event for all the violent events and violence-deescalating events. The corresponding drop lines represent the 95% confidence interval. We have displayed the CAAR five days prior to and five days after the event. The vertical axis represents the size of the effect of the conflict–related events on the company's CAAR.

From figure 6.2 we observe that for the violent events, the company obtains a CAAR of 2,45% on the event and the estimate is significantly different from zero.[11] This pattern is in line with prediction 1i) which further indicates that the investors perceive violent events as good news. However, it is noteworthy that the increase around the event is not substantial. Turning our attention to violence–deescalating events we observe that the CAAR falls gradually four days prior to the event. On the event, the company obtains a negative CAAR of –1,54%. The observed pattern is consistent with prediction 1i). However, the estimate is not statistically different from zero due to the high confidence band and thus we cannot with

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[11] T-test can be found in Appendix A9.

certainty state this. As expected, the largest difference between the two event returns occurs on the event, but the estimates are not significantly different from each other.

As a leading global mining company, Anglo American has the power to prevent the widespread human rights abuses associated with the sector and take concrete action to support peace. However, it fails to do so as the company place profit over ethics, making it even harder for the DRC to break out from the resource curse.

6.7 Limitations

The main limitation of our event study is that our results are based on a small sample of mining companies. The selected companies represent a relatively small share of all the mining companies in the DRC as most of them are private or state–owned. Consequently, a small sample size makes it difficult to yield precise or reliable estimates as false–positive results might occur (Hackshaw, 2008). This suggests that the incentives of the private sector to end war and violent conflict may need further examination. However, the event chain analysis is geared towards reducing the risk of false–positive and we still find that 12 companies exhibit unethical behavior.

Another limitation is the companies' involvement in other conflict zones. Several of the mining companies hold concessions in other resource–abundant countries that have experienced civil wars and violent conflicts during the same time period. Contemporaneous presence in these conflict countries may reduce the impact of the DRC's conflict–related event. In addition, the companies that specialize in conflict environments may have a comparative advantage in profiting from resource–abundant countries.

Lastly, we acknowledge the limitation considering the selection of events. When selecting the events, we have used a combination of a qualitative and a quantitative approach. Regarding the qualitative approach, selection bias might arise due to our objective assessment of choosing the events. In addition, we have used online news articles as our primary source when selecting the events. However, this may limit the event sample as TV, radio, and newspapers were the most used communication channel during the beginning of our time period. Lastly, identifying the most important events during the war was difficult as the whole war consisted of constant intense fighting. This implies that there could be false–positives and

false–negatives in the event selection and in the pre–event window. Again, the event–chain analysis alleviates these concerns.

7. Conclusion

In this study, we provide evidence that war and violent conflicts facilitate a business environment in which some companies may thrive. We focus on the DRC and estimate stock returns for mining companies holding concessions in the country. Using an event study methodology, we find that violent events increase the company's value. This effect is stronger during the Second Congo War compared to the aftermath. However, we find limited evidence of violence–deescalating events causing a decrease in the company value. Moreover, we explore how company–specific characteristics influence the event returns. We find no strong evidence that corruption, tax haven, or operating in the gold industry has an effect on abnormal returns. On the other hand, we find that unethical companies experience a higher increase in company value in correspondence to violent events compared to ethical companies. We interpret our results in the light of resource war and the curse of natural resources. We argue that the political instability, created by war and violent conflicts, facilitates benefits that mining companies can thrive from in a resource–abundant country such as the DRC.

There are three important caveats to this study. First, we acknowledge that our findings are based on a small sample of companies, leaving many private and state–owned mining companies out of the analysis. Second, we select most of our events based on qualitative readings. This has might led to bias selection, omitting some important events or including insignificant events. Third, some of the companies in our sample hold concessions in other war–torn economies in Africa. This might weaken the isolated effect the DRC conflict–related event has on the company's stock return. To alleviate these concerns, we detect unethical companies in an event chain analysis where we ensure that these companies have at least two significant event returns that are symmetric. In addition, we provide external validation where we find that five of the companies we have detected are also on the UN's list of companies that have been accused of illegal exploitation and looting in the DRC.

Our research is relevant given that corporate social responsibility (CSR) is becoming more important to stakeholders and companies. Our thesis sheds light on the weak incentives the mining companies and investors might have to improve the conditions in developing countries. We offer a number of interesting results that suggest that the mining companies benefit from civil war and violent conflicts. Consequently, this may affect their incentives to

take part in the work towards preventing or stopping the ongoing conflicts. Thus, we suspect that the mining companies still have a long way in taking active steps on their CSR agenda. The international community should address this problem to ensure a sustainable mining sector where companies are uninvolved in illegal or unethical activities. Only then can the DRC turn its resources from a curse to a blessing.

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Appendix

A1. Mining companies in the sample

Company name	Number of observations	Country	Type of resource mined in the DRC
Adastra Minerals	649	United Kingdom	Copper and cobalt
Anglo Gold	1652	South Africa	Gold
Anglo American	5651	United Kingdom and South Africa	Gold and copper
Ashanti Gold	1585	South Africa	Gold
Barrick Gold	6202	Canada	Gold and copper
BHP	6204	Australia	Copper
ENCR	1277	United Kingdom	Copper and cobalt
First Quantum Minerals	2346	Canada	Gold, copper and cobalt
Freeport-McMoran	5994	USA	Copper and cobalt
Glencore	2697	Switzerland	Copper and cobalt
Ivanhoe Mines	2327	Canada	Gold
Kinross Gold	5988	Canada	Gold
Lundin Mining	5664	Canada	Gold and copper
Randgold Resources	3913	Jersey	Gold and copper

Table A1: Mining companies in the sample

A2. List of the Corruption Perception Index

Year	South Africa	Canada	Switzerland	UK	USA	Ghana
1998	5,2	9,2	8,9	8,7	7,5	3,3
1999	5	9,2	8,9	8,6	7,5	3,3
2000	5	9,2	8,6	8,7	7,8	3,5
2001	4,8	8,9	8,4	8,3	7,6	3,4
2002	4,8	9	8,5	8,7	7,7	3,9
2003	4,4	8,7	8,8	8,7	7,5	3,3
2004	4,6	8,5	9,1	8,6	7,5	3,6
2005	4,5	8,4	9,1	8,6	7,6	3,5
2006	4,6	8,5	9,1	8,6	7,3	3,3
2007	5,1	8,7	9	8,4	7,2	3,7
2008	4,9	8,7	9	7,7	7,3	3,9
2009	4,7	8,7	9	7,7	7,5	3,9
2010	4,5	8,9	8,7	7,6	7,1	4,1
2011	4,1	8,7	8,8	7,8	7,1	3,9
2012	4,3	8,4	8,6	7,4	7,3	4,5
2013	4,2	8,1	8,5	7,6	7,3	4,6
2014	4,4	8,1	8,6	7,8	7,4	4,8
2015	4,4	8,3	8,6	8,1	7,6	4,7
2016	4,5	8,2	8,6	8,1	7,4	4,3
Average	**4,63**	**8,65**	**8,78**	**8,19**	**7,43**	**3,87**

Table A2: List of the Corruption Perception Index

A3. Top 10 tax havens

Rank	Tax Haven
1	British Virgin Island
2	Bermuda
3	Cayman Island
4	Netherlands
5	Switzerland
6	Luxembourg
7	Jersey
8	Singapore
9	Bahamas
10	Hong Kong

Table A3: Top 10 Tax havens

A4. Full event list

Date	Type of event	Event description	Effect on conflict intensity
02.08.1998	Clash	Rwanda and Uganda started attacking the DRC. This marked the beginning of the Second Congo War.	Increase
06.11.1998	Clash	CDC rebels clash with Kabila's forces in the east of the country. At least 70 people were killed.	Increase
07.12.1998	Attack	Looting and killing were perpetrated in Sud Kivu. Soldiers looted and killed about 100 Christians.	Increase
18.01.1999	Ceasefire	Rwanda, Uganda, Angola, Namibia and Zimbabwe agreed on a ceasefire.	Decrease
04.02.1999	Peace talk	Zambian President Frederick Chiluba visit the DRC to discuss ceasefire efforts for the country with President Laurent-Desire Kabila.	Decrease
05.03.1999	Attack	100 were killed in reprisal killings perpetrated by the RCD rebels.	Increase
05.04.1999	Clash	Tension within the RCD about the dominance of the Banyamulenge reached a peak	Increase
18.04.1999	Ceasefire	Museveni of Uganda and Kabila signed a ceasefire accord.	Decrease
11.06.1999	Ceasefire	Lusaka Ceasefire attempted to end the Second Congo War. Angola, the DRC, Namibia, Rwanda, Uganda, Zambia, and Zimbabwe signed the agreement.	Decrease
31.08.1999	Peace talk	The leader of one of the rebel factions has said his forces will stop fighting and prepare for ceasefire.	Decrease

01.06.2000	Clash	Fighting between the armies of Rwanda and Uganda.	Increase
05.06.2000	Clash	6 – day war was a series of armed confrontations between Ugandan and Rwandan forces.	Increase
18.01.2001	Assassination	Assassination of President Kabila.	Increase
21.01.2001	Peace talk	UN chief voices optimism over congo peace talks.	Decrease
23.01.2001	Peace talk	Allies push to end Congo war.	Decrease
09.03.2001	Clash	MLC clash with government forces killing 126 government soldiers.	Increase
04.10.2001	Clash	Clashes in the south of Sud-Kivu Province and going towards Tanzania.	Increase
07.05.2002	Clash	Fighting erupts between the Hema and Lendu ethnic groups.	Increase
06.09.2002	Peace agreement	The Luanda Agreement formalized peace between Congo and Uganda.	Decrease
21.10.2002	Clash	Fighting breaking out between government troops and Mai-Mai militias in Katanga province.	Increase
31.12.2002	Ceasefire	Three rebel groups supported by Uganda, the MLC, RCD-N and RCD-ML, signed a ceasefire, the Gbadolite Agreement.	Decrease
06.01.2003	Peace talk	Belgian foreign minister visits Angola for talks on DR Congo.	Decrease

02.04.2003	Peace agreement	The Sun City Agreement was an agreement that was signed between some of the warring parties in the Second Congo War.	Decrease
23.04.2003	Peace agreement	The government, the official opposition and rebel leaders signed a final peace accord.	Decrease
18.07.2003	End of the war	Formalized an agreement by the former belligerents to create a government of national unity, ending the Second Congo War.	Decrease
13.12.2003	Peace agreement	The DRC government and M23 rebels have signed a peace agreement.	Decrease
01.06.2004	Clash	A week of clashes. The violence jeopardizes the fragile peace process.	Increase
02.03.2005	Clash	UN Congo force kills 50 in clash with militia.	Increase
03.10.2006	Clash	Clashes between military	Increase
02.02.2007	Clash	At least 90 people have been killed in clashes between an anti-government religious sect in western Democratic Republic of Congo and the police.	Increase
14.10.2008	Peace talk	The United Nations refugee agency announcing efforts to boost relief aid.	Decrease
06.11.2008	Peace talk	Nkunda, General in the Armed Forces of the Democratic Republic of Congo, declared a unilateral ceasefire.	Decrease
10.11.2008	Peace agreement	The Southern African Development Community (SADC) Assists Congo and sends peacekeepers	Decrease
21.12.2008	Peace talk	Peace talks between the government of the DRC and a main rebel group, aimed at finding a peaceful resolution to the strife-ridden country's brutal armed conflict.	Decrease
23.01.2009	Clash	Clashes between the Congolese-Rwandan forces and the rebels in Eastern Congo lasting over two days.	Increase
13.05.2009	Attack	Dozens of people were killed in attacks over the weekend in the east of the DRC.	Increase
22.09.2009	Peace talk	Rwandan leader predicts peace in Congo conflict as major problems have been resolved.	Decrease
14.12.2009	Attack	LRA attacks Congolese villagers, killings civilians.	Increase
27.02.2011	Coup	Coup bid against Kabila.	Increase
02.12.2011	Attack	Killing ahead of Monday's election.	Increase

05.01.2012	Clash	The violence is among the worst carried out by the FDLR and attacks by a Rwandan militia group in the eastern DRC.	Increase
28.03.2012	Peace talk	The Security Council voted for UN Resolution 2098, which demonstrates the Council's solidarity and wish to work for peace and security in the Great Lake Regions (Rwanda, Burundi, and the eastern DRC) .	Decrease
24.05.2012	Attack	Unidentified group, suspected to be ex-CNDP led by Ntaganda or M23 movement attacked civilians in Katchanga killing around 100 people and injuring and raping many.	Increase
06.07.2012	Clash	Clashes with rebels who have seized a border town.	Increase

23.11.2012	Peace talk	Congo rebels advance as regional leaders seek ceasefire	Decrease
09.01.2013	Peace talk	M23 Rebels Declare Ceasefire.	Decrease
24.02.2013	Peace agreement	Regional African leaders have signed an UN-brokered accord which aims to bring peace to the troubled eastern region of the Democratic Republic of Congo.	Decrease
12.12.2013	Peace agreement	The Democratic Republic of Congo government and M23 rebels have signed a peace agreement in the Kenyan capital of Nairobi.	Decrease
30.12.2013	Attack	Armed men in Kinshasha attacked FARDC members at their General Office.	Increase
20.01.2014	Attack	FNL rebels attack civilians in their fields in Mushule, Uvira.	Increase
07.06.2014	Attack	Inter-ethnic attack on a village in the South Kivu region of the DRC.	Increase
20.11.2014	Attack	Attack allegedly by the ADF-NALU between Mbau and Beni. The victims were killed using 'crude weapons' over about 5 hours.	Increase
20.01.2015	Protests	Protests in Congo over president's future	Increase
05.08.2016	Peace talk	Peace talk about a potential future Canadian peacekeeping mission.	Decrease
09.08.2016	Peace talk	Defence Minister Harjit Sajjan visit the DRC to collect information for a potential future peacekeeping mission.	Decrease
20.09.2016	Clash	Clashes in Kinshasa.	Increase
20.12.2016	Clash	Dozens die in Democratic Republic of Congo as violence spreads amid political instability. President Joseph Kabila's refusal to step down.	Increase
15.05.2017	Prison break	Members of Bunda Dia Kongo stormed a prison in Kinshasa to free the leader of their movement, Ne Mwanda Nsemi. Up to 600 other prisoners escaped and 50 people were killed.	Increase
20.06.2017	Clash	DR Congo Kasai conflict: Thousands dead in violence. The deaths are the result of clashes between the army and a rebel group, but civilians have also been caught up in the violence.	Increase
04.08.2017	Clash	55 people were killed in clashes between Batwa and Bantu groups in Lambo Kilela.	Increase

Table A4: Event list

A5. Normality test of data

	Shapiro-Wilk normality test
p value	4,01e⁻¹⁶
Alternative hypothesis	The data is normally distributed

Table A5: Normality test of data

A6. Regression model for prediction 1ii)

	CAAR [-1,1]
Event during the war	0.041***
	(0.005)
Constant	0.033***
	(0.002)
SE clustered by company	Yes
N	419
Adjusted R^2	0.136

Notes. The model is a fixed–effect regression with absolute CAAR for all the company–event pairs as the dependent variable. *Event during the war* is a dummy which takes value one if it is during the war, and zero otherwise. The excluded category is thus the absolute CAAR after the war. *Event during the war* will measure the difference in variation in the absolute CAAR between during the war and after the war. Standard error in parenthesis is clustered at the company level.
Asterisk denote: ***p < 0,01, **p < 0,05, *p < 0,1

Table A6: Regression model for prediction 1ii)

A7. T-tests prediction 2)

	t
Test statistic	3,28
DF	127
p value	0,15%
Alternative hypothesis	True difference in mean is not equal to 0

Notes. Paired t-test for unethical high-corruption companies: CAAR$violence_deescalating vs. CAAR$violent_events

Table A7: T-test prediction 2)

A8. T-tests prediction 3)

	t
Test statistic	2,75
DF	128
p value	0,75%
Alternative hypothesis	True difference in mean is not equal to 0

Notes. Paired t-test for unethical tax haven companies: CAAR$violence_deescalating vs. CAAR$violent_events

Table A8: T-test prediction 3)

A9. T-tests Anglo American Case Study

Event day	CAAR %	T-stat
-5	1,89 %	2,59**
-4	1,61 %	1,99*
-3	1,41 %	1,73*
-2	1,88 %	2,19**
-1	2,23 %	2,67**
0	2,45 %	**2,92***
1	2,16 %	**3,21***
2	1,92 %	**2,87***
3	1,71 %	**2,79***
4	1,67 %	2,43**
5	1,61 %	2,29**

Notes. This table presents CAAR and the t-stat of the *violent events* for Anglo American. Asterisks denote: ***p < 0,01, **p < 0,05, *p < 0,1

Table A9: T-stat of the violent events for the Anglo American Case Study

A10. Robustness Checks for predictions 1i) and 1ii)

	Dependent variable:			
	(1)	(2)	(3)	(4)
	CAAR [-1,1]	CAAR [0,1]	Abnormal Return	Raw Return
year1999	-0.051***	-0.014**	-0.003	0.002
	(0.016)	(0.007)	(0.006)	(0.008)
year2000	-0.014	0.031	0.020	0.016
	(0.041)	(0.029)	(0.025)	(0.024)
year2001	0.007	0.014	0.017	0.020
	(0.030)	(0.013)	(0.015)	(0.016)
year2002	-0.050***	-0.019**	-0.013***	-0.008*
	(0.017)	(0.008)	(0.003)	(0.005)
year2003	-0.067***	-0.037***	-0.020***	-0.010*
	(0.014)	(0.004)	(0.004)	(0.006)
year2004	-0.071***	-0.024**	-0.013*	-0.009*
	(0.016)	(0.010)	(0.007)	(0.006)
year2005	-0.077***	-0.032***	-0.008	-0.007
	(0.013)	(0.010)	(0.008)	(0.007)
year2006	-0.086***	-0.027***	-0.005	0.025***
	(0.013)	(0.007)	(0.008)	(0.009)
year2007	-0.056***	-0.025***	-0.019***	-0.012
	(0.020)	(0.008)	(0.005)	(0.008)
year2008	-0.062***	-0.004	0.014	0.023
	(0.015)	(0.019)	(0.012)	(0.016)
year2009	-0.056***	-0.015*	-0.003	0.011
	(0.014)	(0.008)	(0.009)	(0.011)
year2011	-0.076***	-0.032***	-0.012	-0.003
	(0.017)	(0.011)	(0.009)	(0.011)
year2012	-0.078***	-0.044***	-0.020***	-0.007
	(0.015)	(0.005)	(0.004)	(0.005)
year2013	-0.088***	-0.044***	-0.018***	-0.012**
	(0.014)	(0.007)	(0.004)	(0.005)
year2014	-0.087***	-0.043***	-0.020***	-0.013**
	(0.015)	(0.006)	(0.004)	(0.006)
year2015	-0.058**	-0.005	0.008	0.010
	(0.023)	(0.024)	(0.012)	(0.014)
year2016	-0.067***	-0.029***	-0.014***	-0.009
	(0.015)	(0.008)	(0.004)	(0.006)
year2017	-0.084***	-0.042***	-0.017***	-0.008
	(0.014)	(0.005)	(0.004)	(0.006)
Constant	0.107***	0.062***	0.034***	0.027***
	(0.014)	(0.005)	(0.003)	(0.005)

SE clustered by company	Yes	Yes	Yes	Yes
Observations	419	419	419	419
Adjusted R^2	0.233	0.171	0.095	0.074

Notes. This graph model shows the robustness checks for prediction 1i) and 1ii). Column (1) shows our initial results and column (2), (3), and (4) show our robustness checks. In column (2) the dependent variable is CAAR but we change the event window to [0,1]. The purpose is to subtract potential noise from day -1. In column (3) we have abnormal return as the dependent variable, and in column (4) we have raw return as the dependent variable. The purpose is to verify that our initial results does not change when using different returns measures. Standard error in parenthesis is clustered at the company level. Asterisk denote: $^{***}p < 0,01$, $^{**}p < 0,05$, $^{*}p < 0,1$

Table A10: Robustness checks for predictions 1i) and 1ii)

A11. Robustness Checks for predictions 2), 3) and 4)

Prediction 2)

Effect on conflict intensity	Company type	CAAR % Estimation window 120 days	CAAR % Estimation window 180 days	Confidence interval Estimation window 120 days	Confidence interval Estimation window 180 days
⬇	—■— Unethical high-corruption	1,00%	0,17%	[-1,88 %, 2,09 %]	[-1,68 %, 2,02 %] [1]
⬆	—■— Unethical high-corruption	4,09%	3,98% [3]	[2,67 %, 5,50 %]	[2,67 %, 5,29 %] [1]
⬇	– ● – Unethical low-corruption	0,79%	1,08%	[0,00 %, 2,00 %]	[0,08 %, 2,05 %]
⬆	– ● – Unethical low-corruption	2,31%	2,47% [3]	[1,19 %, 3,43 %]	[1,34 %, 3,59 %]
⬇	—▲— Ethical low-corruption	0,79%	0,58%	[-5,03 %, 6,61 %]	[-2,18 %, 3,37 %]
⬆	—▲— Ethical low-corruption	-3,87%	-1,34% [2]	[-8,17 %, 0,43 %]	[-3,39 %, 0,73 %]

Notes. This table presents the robustness checks for prediction 2). It shows the CAAR % & confidence interval for 120 days (*our initial results*) and CAAR % & confidence interval for 180 days (*robustness check*).
1) The confidence bound do not overlap each other, and thus the estimates are significantly different from each other
2) The CAAR % is significantly different from the other estimates that are exposed to a violent event 3)
3) Other estimates that are exposed to a violent event

Table A11: Robustness check for prediction 2)

Prediction 3)

Effect on conflict intensity	Company type	CAAR % Estimation window 120 days	CAAR % Estimation window 180 days	Confidence interval Estimation window 120 days	Confidence interval Estimation window 180 days
⬇	━■━ Unethical tax haven	-0,01%	0,05%	[-1,97 %, 1,95 %]	[-2,02 %, 2,12 %] [1]
⬆	━■━ Unethical tax haven	3,12%	3,56% [3]	[1,94 %, 4,30 %]	[2,28 %, 4,85 %] [1]
⬇	─●─ Other unethical	1,02%	1,05%	[-0,02 %, 2,07 %]	[0,08 %, 2,02 %]
⬆	─●─ Other unethical	2,73%	2,72% [3]	[1,54 %, 3,93 %]	[1,61 %, 3,83 %]
⬇	─▲─ Other ethical	0,79%	1,33%	[-5,03 %, 6,61 %]	[-4,51 %, 7,17 %]
⬆	─▲─ Other ethical	-3,87%	-3,52% [2]	[-8,17 %, 0,43 %]	[-7,55 %, 0,52 %]
⬇	Ethical tax haven [4]		-0,17%		[-4,12 %, 3,78 %]
⬆	Ethical tax haven [4],[5]		0,54%		[-7,55 %, -0,011 %]

Notes. This table presents the robustness checks for prediction 3). It shows the CAAR % & confidence interval for 120 days (*our initial results*) and CAAR % & confidence interval for 180 days (*robustness check*).
1) The confidence bound do not overlap each other, and thus the estimates are significantly different from each other
2) The CAAR % is significantly different from the other estimates that are exposed to a violent event 3)
3) Other estimates that are exposed to a violent event
4) In the robustness check we find that one of the unethical tax haven companies becomes an ethical tax haven company
5) The CAAR % is significantly different from the estimate to unethical tax haven companies

Table A12: Robustness check for prediction 3)

Prediction 4)

Effect on conflict intensity	Company type	CAAR % Estimation window 120 days	CAAR % Estimation window 180 days	Confidence interval Estimation window 120 days	Confidence interval Estimation window 180 days
⬇	━■━ Unethical gold	1,17%	1,07%	[-0,92 %, 3,25 %]	[-0,93 %, 3,07 %]
⬆	━■━ Unethical gold	3,69%	3,67% [3]	[2,23 %, 5,15 %]	[2,30 %, 5,03 %]
⬇	─●─ Other unethical	0,48%	0,61%	[-0,54 %, 1,50 %]	[-0,38 %, 1,59 %]
⬆	─●─ Other unethical	2,52%	2,66% [3]	[1,42 %, 3,63 %]	[1,56 %, 3,76 %]
⬇	─▲─ Other ethical	0,79%	0,58%	[-5,03 %, 6,61 %]	[-2,18 %, 3,37 %]
⬆	─▲─ Other ethical	-3,87%	-1,34% [2]	[-8,17 %, 0,43 %]	[-3,39 %, 0,73 %]

Notes. This table presents the robustness checks for prediction 4). It shows the CAAR % & confidence interval for 120 days (*our initial results*) and CAAR % & confidence interval for 180 days (*robustness check*).
2) The CAAR % is significantly different from the other estimates that are exposed to a violent event 3)
3) Other estimates that are exposed to a violent event

Table A13: Robustness check for prediction 4)