ERASMUS UNIVERSITY ROTTERDAM
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Does Peace pay what War wins?

A Comparative Review on International Conflicts and their Relation with Global Stock Market Indices

ABSTRACT

At first sight it seems apparent that the presence of international conflicts will only bring harm to stock markets worldwide. By using a novel combination of data for international conflicts and global stock market returns and by comparing results from various abnormal return models, this thesis will show that international conflicts may not always be detrimental for global stock markets' returns and that the inclusion of more emerging and developing markets and small-cap stocks leads global stock markets to fare better during international conflicts. More specific, the number of conflicts present in a month does not appear to have any significant relation overall with returns in the same period but tends to be more negative for developed markets and more positive for emerging and developing markets. Besides that, the latter reacts positively on the number of ongoing conflicts in a month whereas the opposite holds for the former. Lastly, abnormal returns following conflict outbreaks and terminations are higher than what was found earlier in related literature, indicating a positive relation with emerging and developing markets and with small-cap stocks.

Keywords: International Conflicts, Stock Markets, Index Returns, Emerging Markets, Small-Cap Indices, Industry differences

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I. Introduction

News flashes regarding conflicts somewhere in the world are nowadays spread by the media almost on a daily basis. Some of these have a very fast and unexpected onset, one of the most notably of which is the invasion of Iraq into Kuwait on August 2, 1990, which initiated the Gulf War. For other conflicts, the time line is less clear, such as the Vietnam War (Brune *et al.*, 2015). Conflicts can occur on a relatively large scale, hereby involving many countries. The Gulf War, for example, involved 34. From first sight its impact on stock markets seems to be larger than the 2014 China-Vietnam oil rig crisis, involving no other countries than China and Vietnam, but of course a conflict's impact on global stock markets depends on numerous other factors as well. To name a few: previous research has shown that industry representation within stock indices matters [e.g., Schneider & Troeger (2006); Brandes (2015); Chesney *et al.* (2011)]. In addition, a conflict's impact on stock market returns depends on underlying indices as small-cap stocks react different compared to mid- and large-cap stocks [e.g., Eun *et al.* (2008)]. Third, differences between more and less developed countries exist as well [e.g., Suleman & Daglish (2015); Chen *et al.* (2014)]. This is just a non-exhaustive enumeration of other influential factors.

Recently, financial market reactions induced by international conflicts have caught substantial interest in finance (Brune *et al.*, 2015). Given their far-reaching consequences, international conflicts have been intensively studied to this date. However, despite its relevance, the issue has received little attention relative to other topics (Gardeazabal, 2012). According to Gardeazabal, the methods used in the literature are diverse, ranging from time series methods to cross-section and panel data methods and are determined by the objective of the study and data availability. The lack of a main research stream makes it complex to distinguish a general line of reasoning regarding the consequences of international conflicts on global stock markets.

Both governments' actions and political events could influence stock market return and volatility. Although stock market movements and politics are frequently discussed topics in the media and everyday conversations, the interplay

between the two is rarely considered (Wisniewski, 2016). This creates a gap in the literature that is currently yet to be filled with clear documentation. To this date, existing evidence concerning the effect of political factors on stock markets is generally mixed (Boutchkova *et al.*, 2012). Most evidence that is available regarding the subject points at a negative relationship between international conflicts and global stock market returns as such political instability involves additional risk to investors [e.g., Chen *et al.* (2014); Berkman *et al.* (2011)]. Therefore, the occurrence of international conflicts is widely considered to be detrimental for global index returns. This may not always hold: emerging markets, for example, are found to face greater political uncertainty on average while at the same time, mean stock returns are higher for those markets as well (Suleman & Daglish, 2015).

This study attempts to make a clarifying distinction and comparison of various approaches to the effect of international conflicts on returns of worldwide stock markets, hereby striving for stimulating the attention received that, according to Gardeazabal (2012), the subject is currently lacking. Moreover, the literature with respect to the effect of political factors in general on stock markets will be provided with additional evidence that aims to mitigate the gap that is currently present as a result of mixed results. This leads to the following research question:

"*Are international conflicts per definition detrimental for global stock markets or is there more like a trade-off in the sense that peace pays what war wins?*"

It is possible that neither or both statements in that sentence are true. For example, there could indeed be a trade-off between conflict onsets and terminations while at the same time the overall relation between international conflicts and global stock market indices is negative.

The reaction of stock markets to an increased conflict likelihood is investigated by using the ICB dataset's definition of a crisis: a perceived change in the probability of a threat (Brecher & Wilkenfeld, 1997). Several kinds of events may qualify for this definition, such as the commencement of a war, a sudden governmental action, *et cetera*. Note that findings in this thesis might be not fully comparable to papers that consider wars or terrorist attacks alone, for example because the definition of international conflicts in this study allows for conflicts other than armed attacks and needs the number of involved countries to be greater than one.

Most of prior studies related to international conflicts and their effect on stock markets reactions measure stock prices with some world stock price index that is based on the Morgan Stanley Capital International (MSCI) world index. This index represents large and mid-cap performance across 23 developed markets countries. Disadvantages are that it limits the scope of the study to developed markets and to large and mid-cap performance alone, and that it does not offer exposure to emerging or developing markets. In this thesis international conflicts and their relation with the return of stock markets is examined in several ways, by using Compustat that includes emerging markets as well as a new source for a world index measure and by combining different measures of (abnormal) stock return applied in earlier works.

The database used in this thesis for stock market prices allows more countries to be included, supported by a greater variety of countries. At the same time, it will be shown that global coverage in terms of both market capitalization and total GDP is at least as high as the MSCI world index. In addition, the stock market data in this thesis allows for inclusion of more local indices. Emerging economies are found to experience larger mean stock returns on average, but at the same time face greater political uncertainty (Suleman & Daglish, 2015). As international instability risk is higher for emerging markets as well compared to developed markets, and international political instability is considered to be a valid pricing factor for international stock markets (Chen *et al*., 2014), one could argue that it is worth investigating whether this higher vulnerability may actually lead to more conflicts on average and, consequently, to which extent mean stock returns are influenced by this.

Results regarding mean returns are in line with what is documented in similar studies that conduct research on stock market consequences of international conflicts. However, when considering the effect of the number of conflicts that are present in a month on stock returns in that month no significant results are detected, while several papers identify a negative relation. The same analysis on country level verifies that in most cases no significant relation is present. However, emerging and developing countries seem to behave differently compared to developed countries: nearly all of the latter have lower monthly returns than the total

average, whereas for the former the opposite holds. In addition, most negative stock market return coefficients for an extra conflict per month appear to be developed countries.

When decomposing this into the number of conflicts that start, already exist, and end in a month, it becomes evident that stock returns indeed react significantly as a result. More specific, a higher number of international conflicts that start or already started in a month has a negative relationship and for the number of international conflicts that end in a month a positive impact is present. While the last coefficient of the three is substantially larger compared with earlier work [e.g., Berkman *et al*. (2011)], in essence the coefficients are similar. The corresponding country-level analysis generally confirms these results. Again, differences between developed and less developed countries are visible. The latter shows lower coefficients for an extra starting conflict per month, while the reversed holds for an extra ongoing conflict per month. This provides evidence that including more emerging markets and small-cap stocks may lead to higher returns on average during conflicts.

As for the characteristics of abnormal returns, no significant differences are found with comparable studies. Looking at the consequences for cumulative abnormal returns during international conflicts, outbreaks seem to cause significant positive cumulative abnormal returns at first sight that decrease in magnitude later on, and after a while mostly negative abnormal returns come in place. Lastly, at conflicts' ending date abnormal returns turn positive again. A comparing test with abnormal return averages provides evidence that abnormal returns during conflicts are more likely to be smaller than in absence of conflicts, and that abnormal returns at start and end dates are more likely to be larger than otherwise. A test on possible overrepresented sectors reveals that there are no concerns regarding that in this sample.

The results imply that international conflicts do not always per definition have a negative impact on stock markets in the first place. On the other hand, the higher returns in this sample do not lead to the statement that international conflicts overall have a significant positive effect on global stock market returns, nor do the higher abnormal returns imply that those are significantly higher overall. More

convincing evidence is present that emerging and developing markets and small-cap stock markets together fare better on average during international conflicts.

This study contributes to and differs from existing literature in several ways. First, while the results do not substantially differ across average abnormal stock return models, they show that it matters to consider more than one model at once to obtain a more comprehensive validation, especially when effects are considered ambiguous (which is not the case in this study). By comparing results from different models eventual concerns of misleading interpretations will be mitigated.

Second, to the best of my knowledge this study is the first in international conflicts literature to combine Compustat stock market data as a world stock index measure with ICB conflict data. Related studies that use the MSCI world index as an indicator for global returns may not take into account the effects of international conflicts on emerging or developing markets and on more local, small-cap indices. These factors cannot be ignored and may cause index returns to behave substantially different compared to the main indices of developed countries that other papers consider.

Finally, a contribution will be made to a fruitful stream of literature that recently has attained substantial interest by researchers but about which still much mixed evidence is present to this date. This study attempts to shed a new light on the relations between international conflicts and global stock markets returns. While many studies point at a negative relation between the two, higher representation of emerging markets and small-cap stocks may lead to other insights. Both are expected to generate higher returns on average during conflicts but also face greater instability and uncertainty and different return-generating mechanisms, respectively. The results will show that it is worthwhile to take these factors into account when further investigating on the subject.

The remainder of the thesis is organized as follows. The next section provides an overview of the current stance of related literature and discusses how this study contributes to existing work. Section III elaborates on the data sources used in this thesis. Empirical models in section IV underly the analysis thereafter. Results are presented in section V, and section VI concludes and gives rise to further research opportunities.

II. Literature Review

In this section the current stance of literature regarding international conflicts and global stock markets returns will be discussed. It starts with broadly defining the former concept, followed by an overview of findings from previous related studies that elaborated on the subject from different angles, which forms the foundation for the subsequent sections.

II.1 Defining international conflicts

One of the difficulties with regard to empirically examining international conflicts is that major disasters rarely come about. Berkman *et al.* (2011) show that, at the country level, a full-scale war occurs on average every 74 years and a war on home territory once every 119 years. However, not only full-scale wars induce an effect on stock markets: even a heightened probability of occurrence for a small conflict has the potential to evoke significant stock market reactions. Therefore, the small sample problem can be avoided because of availability of much more events that qualify for the definition of a conflict. Berkman *et al*. exercise this method to include both large and small conflicts and apply the detailed International Crisis Behavior (ICB) database that defines a crisis as "*a perceived change in the probability of a threat that results in the start or end of an international political crisis"*. Note that this definition of a crisis does not require war likelihood to be high. In addition, the change in a state's environment does not need to come as a surprise. The perceived change is likely to be closely aligned with the news events to which investors might react.

Following Berkman *et al.* (2011) and other studies[1], this thesis uses the ICB database as its source for international conflicts from 1985 until 2016. This subsection will explain that a so-called *crisis for a state* by the authors of the database (Brecher & Wilkenfeld, 1997) can be classified as an international conflict as well. According to Brecher and Wilkenfeld, the definition of a crisis for a state needs three conditions deriving from a change in the state's internal or external

[1] Visit the ICB website (https://cidcm.umd.edu/landing/Publications) to view a selection of those studies.

environment to be satisfied: (1) a threat to one or more basic values, (2) awareness of finite time for response to the value threat, and (3) a heightened probability of involvement in military hostilities.

Rahim (2002) conceptualizes conflict as an interactive process manifested in incompatibility, disagreement, or dissonance within or between social entities (i.e., individual, group, organization, *et cetera*). It should be recognized that in order for a conflict to occur, it has to exceed the threshold level of intensity before the parties experience or become aware of any conflict. This definition implies that a specific act, event or situational change should lead decision-makers to perceive a threat to an escalating level of disagreement that is characterized by the existence of conflict behavior in which the beings are actively trying to damage one another (Nicholson, 1992). Nicholson states that an escalation of a disagreement is the common prerequisite of a conflict. The ICB data contain a variable that is defined as a crisis' trigger or precipitating cause, referring to a specific act, event or situational change, whose date is regarded the starting date of the respective crisis. From the above it can be concluded that the definition of crises in the ICB data allows for calling it conflicts as well.

II.2 International instability and stock market reactions

Day after day, asset prices seem to react to news about what governments around the world have done or might do. Practice shows it is of tremendous importance to keep up with that news as an investor. It seems stunning that the pronouncements of politicians from a country whose economy is smaller than that of Michigan (e.g., Argentina) can instantly create or destroy hundreds of billions of dollars of market value around the world (Pástor & Veronesi, 2013).

The subject has attracted attention from academics as well: for example, numerous studies have pointed at the relation of political instability with stock market reactions. Gartzke *et al.* (2001) argue that capital markets are particularly vulnerable to intervention and that political shocks that endanger capital threaten economic prosperity. According to the authors, the more interdependent states become, the greater the effect of small changes in political risk on capital markets. As international capital markets become more integrated and stock market

correlations have risen (Eun *et al.*, 2008), it is not unthinkable that political risk will continue to take in a more prominent spot as a source of stock market return and volatility in the near future.

While the level of a state's interdependence is one aspect that affects the way and degree in which stock markets react to news, another element to consider is the surprise effect of news that comes about. Papers in which no clear distinction is made between surprising and unsurprising conflicts [e.g., Berkman *et al.* (2011); Chen *et al.* (2014)] often find significant negative stock market reactions following conflict outbreaks. Most of these studies conclude that international conflicts cause stock returns to decrease and often report negative returns in those periods. Market efficiency theory implies that those results are solely driven by the surprising conflicts in the sample: according to that theory, prices fully reflect available information (Fama, 1998). Therefore, according to that theory, studies that only consider unsurprising conflicts should not find significant stock market reactions. But what allows a conflict to be called unsurprising in the sense that its onset was fully expected and that this information was incorporated in prices already? Some conflicts follow a period of tension, for example. A conflict may then be unsurprising, while stock markets did not yet fully incorporate this information in prices. Significant effects may then, although less significant than for surprising conflicts, still be expected to appear.

Where most studies consider particular conflicts during (at first glance) peaceful times, Brune *et al.* (2015) focus on stock market reactions on large international military conflicts which follow a period of tension, using a news analysis proxy for the estimated likelihood that a conflict will result in a war. They distinguish two phases, where in the first phase there is an increasing danger of a war and in the second phase the war breaks out. A rather striking finding is that often the reaction of the stock market to the likelihood of a war is different between the two phases, where in the (pre-)war phase market prices (decrease) increase. More specifically, stock prices tend to fall when the probability of a war increases, while the eventual onset of the war will increase stock market prices. When testing conflicts that have a surprising start, Brune *et al.* find in the same paper that stock prices

decrease once those wars break out. Sub-section *II.5* describes a possible explanation the authors describe for their findings.

Whether stock prices decrease or increase following conflict starts thus seems to depend on the surprise element, according to that paper. Market efficiency theory, in turn, requires unsurprising international conflict outbreaks to have no impact on stock prices, as that information should be sufficiently incorporated in prices at that time already. According to Omar *et al.* (2017), however, information related to future outbreaks of violent political conflicts might not be available to investors in advance and thus the degree to which stock prices react to increased war probability could be questioned. This might explain why differences in stock market reactions between conflicts that follow a period of tension and those that start surprisingly may be smaller than is considered by market efficiency theory.

Moreover, even surprising conflict starts could be anticipated upon by investors to a certain degree. As an alternative proxy for international instability, Chen *et al.* (2014) use the growth rate of the global military expenditure to GDP ratio to capture political tensions and international conflicts. The underlying reasoning behind this is that any increase in military expenditure leads to increased destructiveness of a war. Increased military expenditure could, for various reasons other than war intentions, be a very plausible move by governments. Brune *et al.* (2015)'s contrasting results for surprising and unsurprising conflicts indicate that generally seen, surprising conflicts are not really expected. However, as Chen *et al.* find increased military expenditure to be a valid measure for the threat of war and a country's level of military expenditure is often publicly available, it induces the question to what extent surprising conflicts cannot be expected in theory.

Multiple other influential factors that determine international conflicts' relation with global stock market return and volatility could be distinguished. While this sub-chapter mainly focused on characteristics of individual conflicts (i.e., the cause), differences may arise from stock market aspects as well. For example, it is possible that developed markets substantially differ from developing or emerging markets, just as small-cap indices could react in other ways than large- or mid-cap indices would do. More on this will be further discussed in sub-section *II.3*.

The investigation above points out that generally seen, global stock markets react to international instability. Magnitude and signs of the effects are more ambiguous and cannot be interpreted that easily as a result. While greater interdependence of states seemingly increase vulnerability to changes in risk, questions rise what makes a country interdependent. In fact, this varies across policies, countries and time (Schimmelfennig *et al.*, 2015), calling for a thorough investigation of every country that is involved in the dataset. Therefore, interdependence will not be further considered in this thesis and no *ex ante* expectations will be formed as a result.

Regarding conflict characteristics, the overall expectation from what is mentioned earlier is that differences should become visible between conflicts that start surprisingly and those that do not. Studies that do not make this distinction generally find that the occurrence of international conflicts negatively influences stock market returns. Following these papers, no distinction between surprising conflicts and those that follow after a period of tension will be made in this thesis. As a result, both the number of conflicts that will start and the number that is present at a particular point in time should negatively affect stock returns, hereby not considering other possible influential factors.

H1a. *The number of conflicts that are present in any month has a negative relation with stock returns in that same period.*

H1b. *The number of conflicts that break out (end) in any month has a negative (positive) relation with stock returns in that same period.*

II.3 Emerging markets and small-cap indices

Unlike similar literature that often makes use of any world stock price index series measured as the weighted average of general market price indexes of multiple individual countries taken together, this study applies a dataset of stock price indices that come from the same country as the corresponding conflict actor. A disadvantage of using a world index instead is that the selection of countries that can

be made is dictated by the availability of stock market data in that particular index.

While developed markets represent a large part of the global market in terms of economic significance, it is also often the case that conflicts arise in or have an effect on emerging or developing markets. The world is currently dominated by emerging economies in terms of population and geographic size, and emerging markets have grown swiftly, hereby causing a growing interest by researchers in those markets (Fan *et al.*, 2011). Given their critical institutional differences with developed markets as well (Fan *et al.*), emerging economies simply cannot be ignored when investigating *global* stock markets.

With the objective of testing a relationship between political uncertainty and financial market risk, Suleman & Daglish (2015) obtain statistics of excess returns and a political risk index of 57 emerging and developed equity markets, hereby extending previous work of Pástor & Veronesi (2012) who introduced a theoretical model on the subject but only considered the U.S. market. The authors conclude that emerging countries face greater political uncertainty on average. At the same time, mean stock returns are higher for emerging economies as well.

These findings are consistent with those reported by Chen *et al.* (2014), who state that emerging countries have higher exposures to international instability risk than developed countries. The authors exploit a country-specific dataset and find that the international political instability is a valid pricing factor for international stock markets and complement theory from existing global asset pricing models by explaining cross-country return differences.

To the extent that investors diversify internationally, large-cap stocks have received the dominant share of overseas investments for various reasons (Eun *et al.*, 2008). This so-called *large-cap bias* is one of the main causes that the potential role of small-cap stocks in international diversification has received little attention in related streams of literature. However, the argument that emerging economies cannot be ignored when investigating global stock markets holds for small-cap stocks as well, as return-generating mechanisms for large- and small-cap stocks are quite different (Eun *et al.*, 2008): specifically, returns on small-cap stocks are primarily driven by local and idiosyncratic factors, while returns on large-cap

stocks are substantially driven by common global factors. When a local conflict is present, larger indices may be more able to lower their risks because of a greater risk diversification. Drawback of this international diversification is that, as Eun *et al*. (2008) argue, gains arising from it can be modest for large-cap stocks and that those stocks will be more susceptible to global shocks, which implies that low-cap stocks can potentially be an effective vehicle for international diversification. Those stocks, in turn, react stronger to (international) conflicts that involve that country in particular.

Whereas the previous sub-section assumed that both developed and less developed countries are equally represented in the sample, the discussion above reveals that emerging markets may face greater political uncertainty and report higher stock returns on average. In contrast to other studies that only analyze developed markets, this thesis considers developing and emerging markets as well. Consequently, stock returns are generally expected to be higher and abnormal returns should be greater in magnitude in this sample than is found in similar literature that does not consider emerging countries.

Because the datasets used in this thesis contain not solely countries' main indices but smaller indices as well, a similar consideration will be present for small-cap indices: as those seem to have the potential to be an effective vehicle for international diversification, most likely higher returns will be realized during periods of conflicts.

H2. *Including more emerging markets and small-cap stocks leads to higher (cumulative) abnormal returns on average during conflicts.*

Underlying assumption hereby is that this effect is expected to be stronger than the degree to which small-cap stocks are more susceptible to local conflicts. In addition, an important aspect of index returns is the composition of sectors that is present in the indices. *Ex ante*, an overrepresentation of benefiting or harmed industries from conflicts is not expected to be present, but this possible influential factor cannot be ignored. The next sub-section will go over this in more detail.

II.4 Benefiting and harmed industries

As not all industries in an index fare equally well during periods of international conflicts, stock reactions to international conflicts could be influenced by the degree to which different kinds of sectors are represented in that index. Previous research showed that these industry effects are generally smaller than country effects. Heston and Rouwenhorst (1995), for example, present a model to measure country and industry effects in international stock returns, and provide a quantitative framework for analyzing these approaches to portfolio selection. They show that there are three reasons for portfolio managers to pay more attention to the geographical than to the industrial composition of an international portfolio. However, industry effects could still be large enough to influence results. Numerous sectors are widely known as good or bad performers during conflicts.

Weapons, explosives, and defense industries are examples that could fare surprisingly well during conflicts. As Schneider and Troeger (2006) argue, there is a Marxist hypothesis that says the military industrial complex uniformly profits from war. Numerous studies [e.g., Brandes (2015), who shows that stocks of arms manufacturers will typically experience a boost in times of growing tensions] support this result. Well known is the so-called arms industry downturn from the end of the Cold War onwards. Dowdy (1997) mentions it as one of the most dramatic industrial transformations in the modern world, where the providers of military hardware have found themselves competing in a world in which the very nature of competition has changed. Once they were the beneficiaries of the Cold War, according to Dowdy, while worldwide defense spending fell by 35 per cent from 1987 to 1994 and more than two million defense jobs disappeared in the U.S. alone. Gholz and Sapolsky (2000) obtain similar findings and write about major changes in the defense sector at the end of the Cold War as well.

Not only war induces positive effects on defense industry stocks: as mentioned before, other forms of conflicts can also bring this about. Berrebi and Klor (2010), for example, analyze the impact of terrorism on Israeli companies related to the defense, security or anti-terrorism industries, relative to its impact on other companies. They find that terrorism had a significant negative impact of 5% on non-defense-related and a significant positive effect of 7% on defense-related

companies. A study of Chesney *et al*. (2011) is one of the many related studies that also show evidence of negative impact of terrorist attacks on stock markets. The airline industry is mentioned as having the highest susceptibility to terrorism, financial crashes and natural disasters, which shows that some wars may but certainly not all conflicts have a sole positive impact on that sector. Furthermore, Chesney *et al*. advice investors to invest in commodities rather than gold as the gold market reacts more often negatively than positively, and they add to it that the commodity market also shows a short-term negative reaction. These findings are in accordance with those of Schneider and Troeger (2006), who state that the gold and energy sectors are examples of being negatively affected by the prospect of an impending war.

These industries are not the only ones that are harmed more than average. Just as military sectors are one of the most obvious positive examples in terms of reactions on political conflicts, tourism sectors clearly show the opposite pattern. Chesney *et al*. (2011) and several other studies they mention in their paper conclude that the airline, travel, tourism and insurance sectors are particularly sensitive to terrorist events and that avoiding investments in those markets is a possible way to reduce negative exposure to it. While this is evidence related to terrorist events, Neumayer (2004), for example, finds that the number of tourist arrivals is negatively affected by conflicts, human rights violations and other politically motivated violent events. He explains this as natural behaviour of tourists, who are often regarded as sensitive to events of political violence in their holiday destination as such events jeopardize a relaxed and unconcerned holiday. As a consequence, therefore, tourists might choose an alternative destination with similar characteristics, but in a more stable condition. In addition, if the violence becomes more widespread and prolonged, official authorities and tourist operators will take further action. This is accompanied by intra-regional negative spill-over and cross-regional substitution effects, because alternative destinations with similar characteristics and neighboring countries can benefit as long as they are not directly affected by the event themselves.

In most of the cases that international conflicts are present the sectors that will most likely benefit from it are defense-related. Although not expected ex ante,

there is a chance that these industries are overrepresented in this thesis' dataset. Therefore, the data will be checked on this possibility. More on this in sub-section V.3.

II.5 Mean-variance preferences

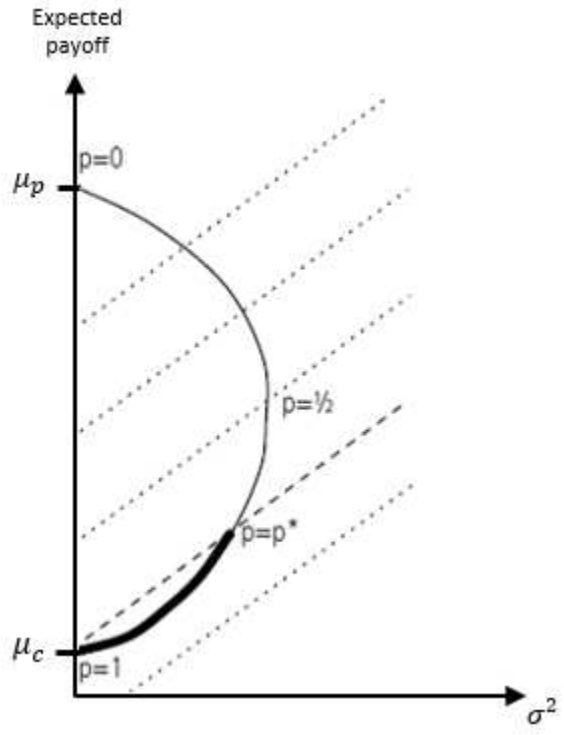
Multiple explanations are discussed by Brune *et al*. (2015) as a possible reason for the phenomenon described in subsection *II.2*, also called a 'war puzzle'. This puzzle arises when the reaction of the stock market to the likelihood of a war is different between the pre-war phase and the ultimate outbreak of a war: where stock prices tend to fall when the probability of a war increases, the eventual onset of the war will increase stock market prices, while intuitively prices are more likely to decrease following the outbreaks of wars. In contrast, when testing conflicts that have a surprising start, Brune *et al.* find stock prices to decrease once those wars break out. In other words: whether stock market prices will increase or decrease following war outbreaks tends to depend on the element of surprise. Several possible explanations for this puzzle are discussed and most of those are rejected. The most likely explanation is the concept of mean-variance preferences. According to the authors, these classical mean-variance-preferences could surprisingly well explain their findings.

Harry Markowitz (1952) was one of the first researchers to describe an efficient mean-variance portfolio that contains the following characteristics: maximum expected return (minimum variance) for a given variance (expected return). This description is based on the assumptions that investors do (or should) (1) maximize discounted expected returns, and (2) consider expected return a desirable thing and variance of return an undesirable thing.

The fact that market prices are sensitive to political and military actions may have important implications for international investors seeking to diversify their portfolios effectively. If international stock markets fall significantly in response to political tensions, one may wonder what steps investors could take to protect themselves against such events (Omar *et al*., 2017). The specific application of mean-variance preferences in international stock markets can provide such a form of protection and will be shortly substantiated hereafter:

Consider two potential outcomes of conflict (μ_c) and peace (μ_c) with respective probabilities p and $1-p$. Given that corresponding variance is $(1-p)^2(\mu_p - \mu_c)^2$, this variance becomes zero if either peace or conflict is sure and is maximal for $p = 1/2$. **Figure 1** visualizes this situation, where the dashed lines mark combinations of mean and variance on which an investor would be indifferent: when the probability p increases slowly from zero to one, at first the situation worsens for the investor, but after a certain point there is indeed a perceived improvement for the investor, explaining the increase in stock prices at the outbreak of a conflict. In other words, according to this theory, a certain conflict is preferred over the points on the thick line [i.e., an uncertain situation with a high conflict probability ($p^* < p < 1$)].

Figure 1



Mean-variance preferences in an international stock market context, based on Brune et al. (2015). When probability of conflict occurrence surpasses p=p, a certain conflict (p=1) is preferred over the points on the thick line, which could explain the increase in stock prices at the outbreak of a conflict.*

In short, many studies could very well explain decreasing or negative returns during conflicts. On the other hand, some authors [e.g., Brune *et al.* (2015); Brandes (2015); Berrebi & Klor (2010)] find convincing evidence for the opposite scenario. This indicates that relations found in related literature to this date generally are not that clear-cut. Results in this thesis are expected to generally follow those in previous studies but will certainly differ to some extent. That is: the methodologies used are not new to this field of literature, but the data are. More specific, (abnormal) returns of different models are expected to differ in magnitude and, conceivably, in sign. The type of countries being included overlap those of world market indices that are based

on developed markets and that large- and mid-cap indices but differ to the extent emerging or developing markets and small-cap indices are included. Based on the discussion above, small-cap stocks are expected to be less vulnerable for stock price declines following international conflict outbreaks. This does not mean that the impact is smaller in magnitude; rather, international conflict onsets (terminations) should have a smaller (greater) negative (positive) impact. Therefore, *ex ante* the stock markets in this thesis are expected to respond in a relatively positive way.

In the next sections of this thesis an empirical analysis is performed, in an attempt to bring more unity to prior works' contrasting results.

III. Data

International conflicts and global stock market data are collected and combined into one database, which contains direct conflict-return observations that allow for a further analysis of underlying relations, if any. All relevant data selection steps are elaborated, and some first descriptive statistics will be shown in order to gain a first understanding of the concerning variables of interest.

III.1 International conflict data

Following other studies, this thesis employs the International Crisis Behavior (ICB, version 12) database as a source of international conflicts. The ICB data cover 1918 to 2015 and consist of 476 crises and 1,052 crisis actors (i.e., countries). The conflict trigger date is defined as the date when the earliest actor in an international conflict perceives a conflict, and a conflict's termination is defined as the date that the respective actor perceives a declining threat, time pressure, and war likelihood. Both the trigger date and the termination date are called *event dates* in this thesis' methodology and empirical analysis.

As mentioned before, the definition of conflicts in the ICB data requires three conditions deriving from a change in the state's internal or external environment to be satisfied: (1) a threat to one or more basic values, (2) awareness of finite time for response to the value threat, and (3) a heightened probability of involvement in military hostilities (Brecher & Wilkenfeld, 1997). For several reasons this is a relatively broad definition of a conflict. First note that the term 'heightened' encompasses all types of upward probability change, from very low to very high. In addition, perception of war likelihood need not to be high but must be *qualitatively higher than the norm*. In some countries this norm is lower than in other countries. Moreover, contrary to Hermann (1969)'s definition of conflicts, Brecher and Wilkenfeld do not include surprise as a necessary condition for a conflict to occur. Another difference with that study is that the former requires response time to be short whereas for the latter a finite response time is satisfactory. Consequently,

more events qualify for the definition of a conflict and therefore more conflict data are available.

Downside of this advantage is that the dataset is likely to contain more small-reaction observations, but this does not necessarily need to be true: by using triggers or precipitating causes instead of formal declaration or pronouncements the start and end dates of a conflict are more likely to be closely aligned with the new events to which investors react. In this way chances are lowered that markets are aware of possible escalation (diminishment) and have already incorporated the news before the start- or end-date (Berkman *et al.*, 2011). Another advantage of the ICB dataset that Berkman *et al.* mention is that using events related to international political conflicts are likely to be exogenous.

Consistent with Berkman *et al.* (2011), conflicts for which the database does not specify an explicit end-date in terms of month and year are excluded from the analysis. One conflict has to be excluded as a result. In order to classify a conflict as international, the minimal number of involved countries should be greater than one. Therefore, four additional conflicts that do not meet this criterium are excluded from the analysis.

Table 1 provides an overview of the resulting number of international conflicts for every year in the period 1985-2016 according to the ICB database. Conflict observations from 1918 until 1984 are excluded from the sample because stock market data is available only from 1985 onwards. For each conflict a short background and summary are available in the Data Viewer on their website[2]. The only observation in the year 2016 is the so-called 'Turkey-Russia jet incident', better known as the Russian Sukhoi Su-24 shootdown, that had already started on 24 November 2015 but ended in 2016.

A chronological overview of the conflicts that are included in this database is given in **Table A.1** (Appendix), all given the same names as ICB. Note that 121 conflicts are listed in that table, while Table 1 counts 171 conflict-year observations. This is due to the fact that several conflicts lasted longer than one year or,

[2] Use the drop-down menu at http://www.icb.umd.edu/dataviewer/ for information regarding all conflicts up to and including no. 455. For information concerning conflicts 456 – 476 added in their newest version to date (V12), which is also applied in this thesis, visit https://sites.duke.edu/icbdata/data-collections/.

Table 1

Number of international conflicts per year.

Year	# int. conflicts										
1985	6	1991	10	1997	2	2002	8	2007	6	2012	3
1986	13	1992	8	1998	8	2003	4	2008	4	2013	2
1987	15	1993	4	1999	6	2004	4	2009	3	2014	3
1988	6	1994	5	2000	2	2005	2	2010	3	2015	3
1989	6	1995	6	2001	4	2006	7	2011	5	2016	1
1990	6	1996	6								
										Avg:	**5.34**

like the jet incident mentioned above, lasted less than a year but ended in the year after its start.

III.2 Stock market data

Data with regard to global stock markets are collected from Compustat and thus no MSCI world index or any comparable index is applied, which is in contrast with most of related studies' approaches. Main reason for this decision to be made is to allow a wide variety of countries to be included in the sample.

Table 2 lists descriptive statistics of the full stock market dataset. Aiming to enhance the comparability of results with similar papers, this thesis follows earlier studies in this stream of literature [e.g., Chesney *et al.* (2011); Berkman *et al.* (2011)] by using log returns. This is the reason why minimum monthly return values lower than –100% are possible. For example, Iceland's ICEX Main Index fell with approximately 71.5% ($\ln(1 - 0.715) \cong -125.5\%$) when trading resumed in October 2008 after its government was forced to take control of country's biggest banks Kaupthing, Landsbanki, and Glintnir, followed by a temporary market suspension[3]. The largest relative decrease took place on the Caracas Stock Exchange in Venezuela during the weekend of 6-9 October 2017, when it lost approximately

[3] https://www.telegraph.co.uk/finance/markets/3195296/Icelandic-shares-plummet-as-trading-resumes.html

99.9% of its value[4], which explains the minimum monthly return in the sample ($\ln(1-0.9986) \cong -657.71\%$).

Table 2

Return descriptive statistics.

Panel A *Full dataset*

	Mean (%)	Median (%)	Standard deviation (%)	Minimum (%)	Maximum (%)	# Obs.
Monthly return	0.456	0.829	7.639	– 657.710	247.453	154,109
Daily return	0.024	0.027	0.254	– 3.384	30.073	154,109

Panel B *During conflicts*

Monthly return	0.647	0.815	6.311	– 98.580	92.703	6,837
Daily return	0.028	0.029	0.204	– 2.043	3.669	6,837

The decision of not using the MSCI world index comes at the cost mentioned earlier that stock market data are only available from 1985 onwards. Therefore, the sample period of which data from both datasets are available covers the years 1985 until 2016.

III.3 Ultimate dataset

After taking the selection process described in sections *III.1* and *III.2* into consideration, the two datasets are combined based on variables country and date. Of the 154,109[5] observations that result from combining the datasets a subsample remains, with matched international conflict and global stock market data that contain 6,920 unique observations of 47 conflicts with corresponding periods ranging from years 1985-2016, including 262 indices from 27 countries.

[4] https://countryeconomy.com/stock-exchange/venezuela?dr=2017-10

[5] Containing 121 conflicts with corresponding periods ranging from years 1985-2016, including 578 indices from 128 countries.

Table A.2 (Appendix) lists the countries that are included in the subsample of matched international conflict and global stock market data, compared with the countries that appear in the MSCI world index. The countries that the latter lacks mainly comprises of emerging or developing countries, such as Russia, India, China, and Indonesia, but also developed countries belong to that group. The database used in this thesis, in turn, mainly misses data from developed countries like Switzerland, Norway, Germany, and Sweden. Largest difference between the two lists is that here developed and less developed countries are more equally present. Moreover, in terms of global market capitalization and total global GDP the list in Table A.2 covers a bigger part of the world as a whole, which at least indicates that the term 'world stock markets returns' is not misplaced in this case.

Compared to the full dataset, monthly and daily returns seem to be slightly higher overall during international conflicts. Other studies [e.g., Omar *et al.* (2015); Berkman *et al.* (2011)] obtain similar statistics for monthly and daily returns. Note that the descriptive statistics do not point any statistical significance but will form the basis for the empirical analysis performed in the next section.

IV. Methodology

By applying several commonly used stock return models in international conflict literature, this section describes the empirics that underly the hypotheses-answering results further on.

IV.1 Models on the number of international conflicts and stock returns

The first hypothesis (**H1a**) argues that the number of conflicts that are present in any month has a negative relation with index returns in that same period. This will be tested in several ways, where average or world market returns depend on the number of conflicts in a given month. Based on Berkman *et al.* (2011), first the following model is constructed:

$$R_t = \alpha + \beta_1 C_t + \varepsilon_t, \qquad \text{(a)}$$

where the average or world index' return in month t is R_t, the total number of conflicts in month t is C_t, and ε_t is the error term at time t.

Related literature finds an economically and statistically significant negative relation between world stock market returns and the aggregate number of conflicts in any month (Berkman *et al.*, 2011). If a statistically significant negative coefficient for C_t is found, the first hypothesis cannot be rejected.

Now suppose that, for example, results found for hypothesis H1a are significantly negative only because conflict starts influence world stock market returns in a negative way (i.e., suppose that relation is not found for conflicts that end and/or do not start in that month). One cannot know this and may incorrectly assume the number of conflicts that end in a month has a negative relation with world stock market returns as well. Moreover, it is possible that no significant negative results are found for hypothesis H1a as a result of being driven by large positive returns for conflicts that end in a particular month. The previous model needs to be extended in order to be able to answer the next hypothesis (**H1b**) that states that the number of conflicts that break out (end) in any month has a negative

(positive) relation with stock returns in that same period. This extended model includes three independent variables:

$$R_t = \alpha + \beta_1 C_t^{start} + \beta_2 C_t^{ongoing} + \beta_3 C_t^{end} + \varepsilon_t, \quad \text{(b)}$$

where the average or world index' return in month t is R_t, the total number of conflicts that break out in month t is C_t^{start}, the total number of conflicts that were present in month t already is $C_t^{ongoing}$, the total number of conflicts that end in month t is C_t^{end}, and ε_t is the error term at time t.

As mentioned before, in studies that do not make a distinction between surprising and unsurprising conflicts [e.g., Chen *et al.* (2014)] often significant negative stock market reactions following conflict outbreaks are found. Market efficiency theory argues that these reactions are solely driven by surprising conflicts as prices fully reflect available information (Fama, 1998). While one may assume that unsurprising conflict onsets do not result in significant world stock market reactions, other studies that consider surprising and unsurprising conflicts separately [e.g., Brune *et al.* (2015)] find significant (positive) returns for unsurprising conflicts as well. The review in sub-section *II.2* showed that even surprising conflict onsets could be incorporated into world stock market prices to a certain extent and that unsurprising conflict onsets may not be fully incorporated into world stock market prices.

In short, related literature finds a statistically significant positive (negative) relation between world stock market returns and the aggregate number of conflict terminations (onsets) in any month [e.g., Berkman *et al.* (2011)]. If a statistically significant negative coefficient for C_t^{start} is found, the second hypothesis cannot be rejected. In addition, following the literature a positive coefficient is expected for C_t^{end} and following the expectations for H1a a negative coefficient is expected for $C_t^{ongoing}$. Results for hypotheses H1a and H1b are showed and discussed in sub-section *V.1*.

IV.2 Models on (cumulative) abnormal stock returns during conflicts

The second hypothesis argues that including more emerging markets and small-cap stocks leads to higher (cumulative) abnormal returns on average during conflicts. Several implications follow from this. First, where positive relations are found in previous literature, the results in this study are expected to be larger (smaller) in magnitude for positive (negative) coefficients. Second, the same is expected for negative relations found in previous literature. To test this hypothesis models are needed that measure index returns. The following model contains an individual index's return $R_{i,t}$ and an average return R_t, both being daily returns at time t. A basic approach to study the influence of the average return on an individual index's return is by using a model of the following form:

$$R_{i,t} = \alpha_i + \beta_i R_t + \varepsilon_{i,t}, \tag{1}$$

where $\varepsilon_{i,t}$ is the error term of index i at time t.

Much of the related literature [e.g., Essaddam & Karagianis (2014); Berkman *et al.* (2011)] base global stock price index R_t on the MSCI world index, which represents equity performance across 23 developed markets countries. This index does not offer exposure to emerging markets[6] and therefore the extent to which it captures actual world returns is limited. In this thesis more small-cap indices will be included as a measure of a world stock price index, with the purpose of better representing the world as a whole. Moreover, small-cap stocks can potentially be an effective vehicle for international diversification as large-cap stocks are more susceptible to global shocks (Eun *et al.*, 2008). Based on equation (1), the expected daily index return should be as follows (Kollias *et al.*, 2011):

$$E(R_{i,t}) = \alpha_i + \beta_i \mathrm{E}(R_t). \tag{1.1}$$

This study makes a distinction and comparison of various approaches applied in earlier research to investigate the effect of international conflicts on abnormal returns of worldwide stock market indices. One reason for this is that it allows to

[6] https://www.msci.com/world

make more precise inferences regarding answering the hypotheses. In addition, it serves as a check whether methodology choices across different related studies may lead to different interpretations and, therefore, whether it matters to consider more of these models at once to obtain a more comprehensive validation.

The next constant mean return model [based on, e.g., Omar *et al.* (2017)] to consider differs from model (1) as now individual returns in a specific time frame solely depend on their own overall mean return and the error term, and thus depend less on global returns in that period. As mentioned before, this dataset includes a wider variety of countries (i.e., more emerging and developing markets). Consequently, models that make use of data based on 'MSCI countries' cannot be included in this thesis because the empirical analysis would then basically be based on the one half of the data and exclude the other half. As previous literature indicates that emerging markets face greater uncertainty and instability but experience greater returns as well, return differences among countries are expected to form a more important factor in this study compared to other papers that put more weight on developed markets alone. This leads to the following model:

$$R_{i,t} = \alpha_i + \varepsilon_{i,t}, \tag{2}$$

where t denotes the underlying daily intervals, a_i is the mean return of index i, and $R_{i,t}$ is the return of index i in a specific daily interval t.

Besides global and industry factors, large country differences are present for stock returns as well. To control for all of these a model based on one described in Boutchkova *et al.* (2012) is added, that not only considers global returns but counts for country-wide returns as well. Note that the qualification *country returns* may not be fully applicable in this case as not all of a country's indices are included in the sample. One should interpret this as 'returns per country'. The model is specified as follows:

$$R_{i,t} = \alpha_i + \beta_1 R_t + \beta_2 R_{j,t} + \varepsilon_{i,t}, \tag{3}$$

where $R_{j,t}$ stands for the return in country j where index i is part of.

Abnormal returns are needed for testing hypothesis H2. These are collected from the returns that were calculated in the previous models. Following other

studies [e.g., Kollias *et al.* (2011)], abnormal returns are obtained by subtracting the mean of an index' returns in an estimation period ($t = -190, -10$) from the actual observed rate of return for this index. In other words, daily abnormal returns are measured by the difference of actual minus expected return:

$$AR_{i,t} = R_{i,t} - \mathrm{E}(R_{i,t}). \tag{4}$$

Lastly, summing up the abnormal returns in a particular period will result in the cumulative abnormal returns. As mentioned before in section *III.1*, a conflict's onset and termination date are both considered to be event dates. These are the dates on which abnormal returns are measured. In addition to event day abnormal returns on the date of a conflict's onset and its termination date, two longer event windows are examined by estimating cumulative average abnormal returns (CARs), approximately the first and second half month after a conflict's start, in the following way:

$$CAR_{i,t} = \sum_{t=0}^{t=T} AR_{i,t}, \tag{5}$$

where t is a conflict's start date or fifteen days after its start, and T is fifteen or 30 days after its start. The *event window* is defined as $t = T$ and $t = 0$ plus the days that lie in between. Thus, whereas events denote the days on which international conflicts break out or end, event windows include a particular date t and T – 1 days thereafter.

The empirical set-up constructed above is carried out hereafter. Following the same structure as in this section, the results are visualized and exemplified in the next, with ultimately the hypotheses being provided with an answer.

V. Results

This section produces results that provide information regarding the occurrence of international conflicts and subsequent consequences for stock indices around the world and give rise to several opportunities for future research.

V.1 Impact of international conflicts' occurrence

From section *III* it became clear that, while using different world stock market data and a more recent conflict dataset, basic characteristics of monthly global stock returns are quite similar to those applied in comparable literature before. In this section various widely-used (abnormal) stock return models will be tested, allowing for a comparison of those methods.

The first hypothesis (H1a) argues that the number of conflicts that are present in any month has a negative relation with index returns in that same period. To test this, the impact of the total number of conflicts in a month on global stock market returns in that same month is considered. Berkman *et al.* (2011) find a statistically significant negative relation between those two. **Table 3** shows a simple regression that measures the impact of the total number of international conflicts in a month on global stock market returns in that same month.

Table 3

The impact of the total number of conflicts in month t on world stock market returns in month t.

Variable	Coefficient (%)
Constant	0.440
# conflicts per *month*	0.009

*p<0.05; **p<0.01; ***p<0.001

The coefficient implies a positive but statistically insignificant effect. An economic interpretation is that one more conflict in a month increases monthly

returns by 0.01% on average. The sign is thus positive, although insignificant, while other studies [e.g., Berkman *et al.* (2011)] report a significant negative relation between global stock market returns and the aggregate number of conflicts in any month. The average number of conflicts per month during conflicts in this sample, 1.94, implies that returns on average increase by 0.46% (5.50%) per month (year), which is higher than Berkman *et al.*'s estimates of 0.38% (4.53%).

For various reasons one could imagine why the results differ. First, the average number of conflicts per month is higher in their sample (2.47 compared to 1.94): the number of international conflicts per month is higher than two on average before 1985 and declined noticeably from 1995 onwards with the United States as the only remaining superpower (Berkman *et al.*, 2011). Berkman *et al.* do not take into account the years 2007 – 2016, while this thesis does not consider the years before 1985. This is also a reason why severe conflicts such as wars occurred more often and at a larger scale during Berkman *et al.*'s sample period, causing more negative stock market reactions overall. Second, in this thesis a wider variety of countries and stock indices is included, which could bring other characteristics to this sample. Evidence for this last possibility can be found in other studies as well. Frijns *et al.* (2012), for example, investigate the role of political crises in explaining the degree of stock market integration in nineteen emerging markets and find that for the number of crises that take place in any month, ten out of those nineteen markets show positive coefficients. No significant effects are found overall. Therefore, it could be worthwhile to perform this analysis for each of the 27 countries listed in Table A.2 that is included in this database. Results are visualized in **Table 3.2**, sorted by monthly returns during conflicts from low to high. Countries that occur in the MSCI world index as well are made bold and are italicized.

First note that almost all countries that have lower monthly returns than the average of 0.46% in this dataset are developed markets that are included in the MSCI index. This provides evidence that developing and emerging markets may generate higher returns on average, as is found in earlier literature [e.g., Suleman & Daglish (2015); Frijns *et al.* (2012)]. Emerging economies seem to face greater

Table 3.2

The impact of the total number of conflicts in month t on world stock market returns in month t (country level).

Country	Constant (%)	Number of conflicts per month (%)	Total monthly returns (%)	Country	Constant (%)	Number of conflicts per month (%)	Total monthly returns (%)
Cyprus	−1.996	0.957	−0.14	***United States***	***0.608***	***−0.002***	***0.60***
Italy	***−0.292***	***0.139***	***−0.02***	China	0.565	0.048	0.66
Japan	***0.283***	***−0.123***	***0.04***	***France***	***1.415***	***−0.389****	***0.66***
Spain	***0.101***	***−0.020***	***0.06***	Thailand	−0.138	0.421	0.68
Ireland	***0.153***	***0.051***	***0.25***	Indonesia	0.063	0.368	0.78
Portugal	***0.378***	***−0.035***	***0.31***	***Israel***	***0.554***	***0.134***	***0.81***
Denmark	***0.983***	***−0.325****	***0.35***	Peru	0.808	0.040	0.89
United Kingdom	***0.361***	***0.010***	***0.38***	South Africa	0.805	0.061	0.92
Taiwan	0.252	0.089	0.42	Philippines	−0.195	0.580***	0.93
Canada	***0.304***	***0.079***	***0.46***	India	0.499	0.232	0.95
Australia	***0.114***	***0.188*****	***0.48***	Nigeria	0.602	0.381	1.34
Belgium	***0.686***	***−0.096***	***0.50***	Russia	2.507	−0.592	1.36
South Korea	−0.358	0.454**	0.52	Turkey	1.285	0.497	2.25
Pakistan	0.984	−0.197	0.60				

*p<0.05; **p<0.01; ***p<0.001

political uncertainty as well, according to those studies. This statement finds small support here as the magnitude of monthly returns per additional conflict is greater for non-MSCI countries: 0.24% compared to –0.03%. This may also indicate that emerging markets fare better during conflicts, as returns of both groups are more equal in absence of conflicts (0.41% and 0.43%, respectively). However, coefficients are not found to be statistically significant in most cases, which is consistent with Table 3. Only five countries denote any significance, of whom three are positive and two are negative. These results support the finding in Table 3 that the occurrence of conflicts does not seem to influence stock market returns to a significant extent. Contrasting with Berkman *et al*. (2011) is that they find a significant negative relation for their sample. From Table 3.2 it becomes clear that most countries have a positive coefficient for the aggregate number of conflicts in any month: eighteen compared to nine negative coefficients. Worth mentioning is that seven out of the nine countries that report negative coefficients occur in the MSCI world index as well. Of the eighteen countries that have positive coefficients, in turn, only six occur in the MSCI world index. This means that twelve of the fourteen non-MSCI countries in this dataset show positive coefficients. The results could very well explain why Berkman *et al*. (2011) find a negative relation between global stock market returns and the aggregate number of conflicts in any month.

In short, contrary to *ex ante* expectations, the number of conflicts that are present in any month has no significant negative relation with index returns in that same period. More specific, the sign is positive in fact but does not denote any significant relation between international conflicts and global stock market returns at all. Therefore, hypothesis H1a is rejected.

In the previous section it was already mentioned it is possible that, for example, no significant negative results are found for hypothesis H1a because results are possibly driven by large positive returns for conflicts that end in a month. The extended model described thereafter investigates the second hypothesis (H1b), which states that the number of conflicts that break out (end) in any month has a negative (positive) relation with stock returns in that same period.

Some more detail concerning those effects is provided in **Table 4**. From the table it becomes clear that the number of international conflicts starts may

negatively influence world stock markets returns in that same month. The same sign is present for the number of ongoing conflicts in a month, and conflict terminations are likely to positively influence world stock market returns. All of these effects are in accordance with *ex ante* expectations and with Berkman *et al*. (2011)'s findings. One difference with the latter is that in that paper the absolute coefficient for conflict starts is larger than the coefficient for conflict terminations.

Table 4

Start, during, and end effects of conflicts in month t on world stock market returns in month t.

Variable	Coefficient (%)
Constant	0.541
# conflicts *starting*	– 0.468***
# conflicts *ongoing*	– 0.112***
# conflicts *ending*	0.799***

*p<0.05; **p<0.01; ***p<0.001

Next, the analysis for Table 4 is reperformed in the same way as is done for Table 3. Again, countries that occur in the MSCI world index as well are made bold and are italicized. The resulting outcome is visible in **Table 4.2**, with countries sorted in the same order as in Table 3.2.

At first sight the numbers seem to confirm more or less what was found in Table 4: for most countries the number of starting or ongoing conflicts in any month has a negative relation with returns, whereas a positive relation is in place for the number of ending conflicts in any month. This all is in line with previous results. When making a distinction between countries that appear in both this dataset and in the MSCI dataset and countries that do not, some underlying differences seem to be evident. The explanation of these differences hereafter is substantiated by a visualization in the lower part of Table 4.2. First, return coefficients for the number of conflicts that break out in any month are negative for non-MSCI countries more

Table 4.2

Start, during, and end effects of conflicts in month t on world stock market returns in month t (country level).

Country	Constant (%)	Number of conflicts *starting* (%)	Number of conflicts *ongoing* (%)	Number of conflicts *ending* (%)	Country	Constant (%)	Number of conflicts *starting* (%)	Number of conflicts *ongoing* (%)	Number of conflicts *ending* (%)
Cyprus	−1.431	0.907	0.026	3.229*	***United States***	***0.754***	***0.349***	***−0.394****	***0.856****
Italy	***0.015***	***−0.509****	***−0.086***	***0.890*****	China	0.652	−1.686**	0.530*	−0.903
Japan	***0.346***	***0.078***	***−0.234*****	***−0.016***	***France***	***1.429***	***−1.072*****	***−0.423*****	***0.650*****
Spain	***0.327***	***−0.821*****	***−0.335*****	***1.483*****	Thailand	−0.102	−0.566	0.428	1.345*
Ireland	***0.310***	***−0.455***	***−0.205***	***1.437*****	Indonesia	0.172	−0.650	0.419	0.760
Portugal	***0.614***	***−0.351***	***−0.274***	***0.561***	***Israel***	***0.641***	***0.206***	***−0.036***	***0.592***
Denmark	***1.088***	***−0.704****	***−0.474****	***0.627****	Peru	0.844	−0.107	0.190	−0.735
United Kingd.	***0.401***	***−0.295*****	***−0.144*****	***1.002*****	South Africa	0.885	−0.660	0.130	0.262
Taiwan	0.388	−1.203*	0.060	1.312*	Philippines	−0.256	0.409	0.670***	0.359
Canada	***0.309***	***0.020***	***0.038***	***0.311***	India	0.753	−0.452	0.162	0.245
Australia	***0.189***	***0.030***	***0.046***	***0.732*****	Nigeria	0.718	−0.277	0.388	0.513
Belgium	***0.857***	***−0.288***	***−0.365*****	***0.868*****	Russia	2.464	−2.530*	−0.338	0.712
South Korea	−0.473	−0.523	0.509*	1.670***	Turkey	1.874	−0.114	0.209	0.012
Pakistan	0.842	−2.119**	0.249	0.451					

*p<0.05; **p<0.01; ***p<0.001

	Conflict start # coefficients			Conflict ongoing # coefficients			Conflict end # coefficients		
	MSCI	NON-MSCI	diff.	MSCI	NON-MSCI	diff.	MSCI	NON-MSCI	diff.
+	5	2	3	2	13	−11	12	12	0
−	8	12	−4	11	1	10	1	2	−1
Avg. (%)	−0.293	−0.684		−0.222	0.212		0.769	0.659	

often and are lower on average. For the number of ongoing conflicts, in turn, MSCI countries' returns are mostly negative, whereas nearly all non-MSCI economies show positive coefficients and the average is positive as well. It thus seems that the emerging markets in this dataset rebound quicker when conflicts are in place. Lastly, more statistically significant effects are found for MSCI countries, which could mean that these markets react stronger to conflicts on average. A possible explanation for the findings is that emerging markets contain relatively more small-cap indices, as small-cap stocks are less susceptible to global shocks than large-cap stocks and can potentially be an effective vehicle for international diversification (Eun *et al.*, 2008). However, the effect could also arise from other differences [e.g., interdependency (Schimmelfennig *et al.*, 2015)].

Taken together, the results indicate that including more emerging markets and small-cap stocks may lead to higher returns on average during conflicts. Most importantly, a significant negative relation between the number of conflicts that break out or were already present in any month and global stock returns, and a significant positive relation between the number of conflicts that end in any month and global stock returns is found. Therefore, hypothesis H1b cannot be rejected.

The results of tables 3 and 4 imply that generally seen, world stock market returns are not really affected by the occurrence of international conflicts overall but tend to be lower when present and higher at their termination. While the latter was expected, the former finding could be devoted to multiple causes. In the first place it is possible that the conflicts included in this sample are unsurprising relatively often, causing a less negative stock market reaction at its onset. This is closely linked to market efficiency theory which states that prices fully reflect available information (Fama, 1998). The review in sub-section *II.2*, however, already placed some doubts by the extent to which unsurprising conflicts are always fully incorporated in prices at their outbreak. This information might not be available to investors in advance, for example (Omar *et al.*, 2017). It is not unthinkable that this is true to some extent, which also implicates that a sample that includes relatively more unsurprising conflicts experiences less negative global stock market reactions as those conflicts are more incorporated in prices before and more information is available to investors in advance. Other theories mentioned before

could explain the dependency of global stock returns on the surprise element of international conflicts as well [e.g., mean-variance preferences of investors (Brune *et al.*, 2015)].

A second possibility is that either market and stock characteristics cause returns to be higher on average than reported in previous literature. The inclusion of relatively more emerging and developing markets and local indices might cause this difference. As said before, mean stock returns are higher for emerging economies (Suleman & Daglish, 2015) and small-cap stocks (Eun *et al.*, 2008) in international conflict context. In addition, several sectors are widely considered as well-performing during conflicts. Despite a smaller industry effect than country effect in general (Heston & Rouwenhorst, 1995), the effect could still be of sufficient influence on global stock market prices. The data will be tested for this in sub-section *V.3*.

V.2 (cumulative) abnormal stock returns during conflicts

This study makes a distinction and comparison of various approaches applied in earlier research to investigate the effect of international conflicts on abnormal returns of global stock market indices. The second hypothesis argues that including more emerging markets and small-cap stocks leads to higher (cumulative) abnormal returns on average during conflicts. As the same conflict database but different stock market data than in previous literature [e.g., Berkman *et al.* (2011)] are used, differences between the two analyses are most likely to arise from country, index, or industry differences. This sub-section will focus on the first two.

Elaborating on the foregoing, global stock markets' abnormal returns are analyzed using models (1) until (3) as basis. For simplicity and comparability reasons all three models' results will be tabulated at once and can be distinguished from each other by classification of their respective (x)-forms. In **Table 5** descriptive statistics of daily abnormal returns are listed. The data seem to be slightly lower and less volatile on average during conflicts compared to the overall dataset. Mean abnormal returns are quite comparable to those in related literature [e.g., Chen *et al.*

(2014)][7], which is important to be able to compare for relations of international conflicts with average (cumulative) abnormal returns as well. Based on Table 5, model (2) abnormal returns are expected to be the highest of the three when further analyzing them.

Table 5

Abnormal returns.

Panel A *Full dataset*

	Mean (%)	Median (%)	Standard deviation (%)	Minimum (%)	Maximum (%)	# Obs.
(1)	0.000	− 0.001	0.221	− 3.292	35.112	154,109
(2)	0.087	0.091	0.260	− 3.264	35.148	154,109
(3)	− 0.024	− 0.035	0.260	− 3.704	35.067	154,109

Panel B *During conflicts*

(1)	− 0.007	− 0.009	0.173	− 1.949	3.442	6,837
(2)	0.092	0.093	0.204	− 1.959	3.800	6,837
(3)	− 0.037	− 0.046	0.231	− 1.868	3.156	6,837

Results in Panel A of **Table 6** suggest in general that abnormal returns at conflict start-dates (i.e., when $t = 0$ and thus the event window is one day) react positive but become negative later on, causing cumulative abnormal returns to decrease and turn negative. This pattern is largely in line with previous literature [e.g., Beckaert & Harvey (2002); Brune *et al*. (2015); Omar *et al*. (2015) and Kollias *et al*. (2011)]. Numerous papers find evidence for negative abnormal returns during a longer time period. Omar *et al*. (2015), for example, report statistically significant negative cumulative abnormal global stock returns (MSCI world index) for the 50 days following international crises outbreaks. More controversial at first sight is the finding that cumulative abnormal returns appear to be mainly positive for

[7] In their paper, equity market excess returns for two aggregate indices (MSCI World Index 1970-2009 and Emerging Markets Index 1988-2009) are obtained by subtracting U.S. risk-free rates from the indices. When both indices are equally weighted, average daily abnormal returns become 0.030% based on 365 days per year.

short event windows starting from a conflict's start, but also this result finds support in previous studies, of which a few will be mentioned hereafter.

In line with previous statements made regarding comparing emerging and developed markets, Beckaert & Harvey (2002) argue that many emerging markets do not behave like developed markets. One example is that emerging markets adjust slower to current information, which does not imply that bad news will reach those markets much later but certainly stock prices on the event day could be influenced for this reason. Moreover, Brune *et al.* (2015), who study large military conflicts that follow a period of tension find that an increase in the war likelihood tends to decrease stock prices, but prices increase at the ultimate outbreak. These effects do not hold when military conflicts start surprisingly, because then stock prices seem to decrease. Therefore, a possible explanation for the coefficients in Panel A of Table 6 is that the conflicts in the sample mainly have a relatively unsurprising onset. If Brune *et al.*'s view hold, then abnormal returns during periods of tension prior to the conflicts included in this thesis should show a decreasing or negative pattern.

Many other studies [e.g., Chen & Siems (2004)] support the view that international conflicts with a surprising start cause a stronger decreasing stock price reaction. Chen and Siems observe 33 global capital markets after the September 11th terrorist attacks against the United States. All of those experienced negative abnormal returns the day investors in those markets first learned of the attacks. For the most part, the markets rebounded fairly quickly. Kollias *et al.* (2011) mention that various sectoral indices react different to events, where some show positive abnormal returns on the event day which possibly implies that investors tend to perceive these as safer in periods of turbulence. Moreover, their results document negative albeit statistically insignificant abnormal returns for major indices on the event day, becoming significant later when cumulative abnormal returns are calculated.

The results in Panel A of Table 6 complement previous findings from this thesis and helps interpreting them. From first sight, one could state based on Table 4 that international conflicts solely have a negative impact on global stock markets returns, because the more conflicts are present in a given month, the more negative

Table 6

Panel A *(cumulative) abnormal return during conflicts.*

Model (1)			Model (2)			Model (3)		
Event window	**CAR (%)**	**Sign**						
Start	0.050*	+						
(0,15)	0.281***	↗						
(15,30)	– 0.046**	↘–						
End	0.099*	+						
			Start	0.133***	+			
			(0,15)	0.039***	↘			
			(15,30)	– 0.001	↘–			
			End	0.252**	+			
						Start	– 0.002	–
						(0,15)	0.169	↗+
						(15,30)	– 0.057***	↘–
						End	0.018	+

*p<0.05; **p<0.01; ***p<0.001

Panel B *Comparison with averages. The first comparison measures the difference between average abnormal returns during conflicts versus in absence of conflicts. The second comparison measures the difference between average abnormal returns during the event window versus outside the event window. (1), (2) and (3) denote models one until three, respectively.*

	During conflicts	**During events (conflict start)**	**During events (conflict end)**
	Diff. (%)	**Diff. (%)**	**Diff. (%)**
(1)	– 0.008**	0.030*	0.099
(2)	0.005	0.046*	0.164
(3)	– 0.014***	0.022	0.042

*p<0.05; **p<0.01; ***p<0.001

returns become. The increase in abnormal returns at termination of conflicts in all three models support this view. However, the other coefficients demonstrate that international conflicts may not always have a negative impact in the first place.

In Panel B of Table 6 average abnormal returns during conflicts are compared to those not during conflicts, and abnormal returns on the event dates are compared to those not on event dates. The three models show mixed evidence in the degree to which average abnormal returns during conflicts or on conflict start- or end-dates are considered lower or higher than otherwise. First, abnormal returns during conflicts are more likely to be smaller than in absence of conflicts. This could mean that in the end abnormal returns are negatively affected by international conflicts, despite the positive reactions found in Panel A. Second, abnormal returns at start- and end-dates are more likely to be larger than otherwise. Although not that significant, the signs indicate some evidence of positive abnormal returns at start- and end-dates of conflicts.

V.3 Robustness check on represented industries

As mentioned before, inferences made about the influence of international conflict occurrence on stock markets could be influenced by overrepresented industries that fare very good or bad in those circumstances. To mitigate this concern, the dataset will be examined by identifying which Standard Industrial Classification (SIC) codes[8] are more represented than others, on average.

The investigation starts with a comparison of two-digit codes. Underrepresented sectors are not considered to influence the results, but overrepresented sectors are. Therefore, the latter industries belong to the group to look out for. As 71 major two-digit groups are represented in the sample, an industry is considered to be overrepresented when its occurrence is at least twice as large as $1/71 : \frac{2}{71} \cong 2.817\%$. **Table 7** shows an overview of codes and their respective occurrence in the data, with codes larger than 2.817% (nine in total) visible in italics and bold and with an asterix attached to it.

First note that some of the overrepresented sectors are quite concentrated. Specifically, five out of those nine lie within ten codes from each other (range 28-

[8] SIC codes are four-digit numerical codes for business establishments to identify the primary business of the establishment. The classification covers all economic activities. For more information, visit https://sic-code.com/page/what-is-a-sic-code.

37). These nine will be inspected more closely by splitting them up in four-digit codes. Consistent with the method applied for two-digit codes just before, a particular four-digit code will be marked as overrepresented when its relative occurrence within that two-digit code is at least as high as a factor $(53.25/x)$[9] that corrects for the number of four-digit codes (x) that is present in the sample. For code 73, for example, twenty underlying four-digit codes exist in the sample. The underlying criterion then becomes $\frac{53.25}{20} * 2.817\% = 7.5\%$. Two out of those twenty qualify for this threshold. In **Table A.3**, all fourteen corresponding four-digit codes and underlying descriptions[10] are tabulated.

Table 7

Relative occurrence of two-digit SIC codes in the dataset.

Code	%						
1	0.20	26	0.98	45	0.55	64	0.11
2	0.01	27	1.50	47	0.77	65	2.24
7	0.02	28	***8.25****	48	2.36	67	1.60
8	0.01	29	1.01	49	2.52	70	0.72
9	0.05	30	1.32	50	***3.07****	72	0.19
10	0.43	31	0.39	51	1.43	73	***9.17****
12	0.02	32	2.03	52	0.61	75	0.14
13	0.59	33	***3.21****	53	1.25	76	0.04
14	0.10	34	1.16	54	1.40	78	0.64
15	1.51	35	***5.84****	55	0.24	79	0.84
16	1.76	36	***5.95****	56	0.63	80	0.27
17	0.66	37	***4.60****	57	0.59	82	0.33
20	***4.69****	38	2.69	58	1.43	83	0.05
21	0.33	39	0.97	59	1.57	86	0.01
22	0.96	40	0.24	60	***4.06****	87	1.41
23	0.91	41	0.30	61	0.76	89	0.15
24	0.33	42	0.80	62	1.24	99	0.87
25	0.34	44	0.86	63	1.72		

[9] This factor is based on the following reasoning: consider the example that four four-digit codes are present in the dataset for a certain two-digit code (the smallest number among the nine two-digit codes that are found to be overrepresented in this sample before). Their relative occurrence within that two-digit code is then expected to be 25%. Therefore, the corresponding formula must satisfy $\frac{y}{4} * 2.817\% = 25\%$. As a code is now considered to be overrepresented when its relative occurrence exceeds 1.5 times the expected number, the threshold becomes $\frac{y}{4} * 2.817\% = (1.5 * 25\%)$. Solving for y, one obtains 53.25.

[10] Source: https://siccode.com/search-sic/.

The fourteen categories show no possible direct link with international conflicts. That is, they are not considered to be affected in an extreme positive or negative way. It is theoretically possible that, for example, a special industry machinery firm or an electronic communication firm produces goods that could be used during wars. However, separate codes for aircrafts, weapons, or other defense-related equipment exist as well and those are not found here. If one of the codes in Table A.3 would include such a firm, still the large majority of the firms belonging to that code will engage in 'regular' activities.

As a last test to further enhance robustness of results, the dataset will be tested for the occurrence of SIC-codes corresponding to sectors that benefit from or are harmed by international conflicts. From the literature review it became clear that industries concerning tourism, airlines, travel, and insurance perform relatively bad during conflicts, whereas weapons, explosives, and defense sectors fare well. While assessing their relative occurrence in the dataset, an inspection of SIC-codes[11] reveals that not all codes are present. More specific, only observations related to air transportation, lodging places, and insurance (two-digit codes 45, 70, 63 and 64) are found, all belonging to the harmed industries. As can be seen from Table 7 they make up 3.1% of the data, of which almost sixty percent is insurance related. The representation of these sectors in the dataset thus is fairly normal.

Two remarks can be made regarding the robustness tests. First, sectors being harmed by international conflicts seem to occur more often in this dataset than benefiting sectors. Moreover, the influence of both groups is considered minimal to nihil in this study.

[11] The following SIC-codes are considered: 4724-4725 (travel agencies and tour operators), 70xx (hotels, rooming houses, camps, and other lodging places), 45xx (transportation by air), 63xx (insurance carriers), 64xx (insurance agents, brokers and service), 3482-3484 (small arms and small arms ammunition), 3795 (tanks and tank components), 2892 (explosives), and 97xx (national security and international affairs).

VI. Conclusions

This section summarizes the motivation of this study and the most important results that are found, sums up subsequent implications regarding the subject, answers the underlying research question, and ultimately provides recommendations for further research.

VI.1 Conclusion

Within the research field of (international) conflicts still much uncertainty exists regarding the pros and cons of changes in perceived likelihood of occurrence, instability, or uncertainty, and its corresponding consequences for global stock market returns. The objective of this thesis is to clear some of the fog that is currently in place around the subject by answering the question whether international conflicts are detrimental per definition for global stock markets or a sort of trade-off exists in the sense that peace pays what war wins.

To investigate this a new dataset for global stock market data is introduced, which comprises more less-developed (i.e., developing and emerging) countries compared to previous works that mainly base their results on the MSCI world index as a global stock market source. In addition, where most of the studies only include main indices in their datasets, the database in this thesis consists of more local (i.e., small-cap) indices as well. The global stock market dataset used in this thesis has a coverage in terms of total GDP and in total market capitalization that is as least as high as the MSCI world index. Besides that, multiple abnormal stock return measures applied in earlier research are used and compared to each other.

Results show that, for the sample in this study, returns increase more on average than what was found in similar literature. At the same time, the sign of stock market returns for an extra conflict per month is positive but does not denote any statistical significance. The same analysis on country level verifies that in most cases no significant relation is present. However, emerging and developing countries seem to behave differently compared to developed countries. Nearly all of the

latter have lower monthly returns than the total average, whereas for the former the opposite holds. In addition, most negative stock market return coefficients for an extra conflict per month appear to be developed countries. Altogether, the number of conflicts that are present in any month does not seem to have a significant relation with stock returns in that same period, while previous literature often finds a negative relation.

Dividing conflicts into start, during and end periods makes clear that the relation between international conflicts and global stock market returns is significantly negative for the number of conflicts that start or were already present in a month and significantly positive for the number of conflicts that end in that month. The corresponding country-level analysis generally confirms these results. Again, differences between developed and less developed countries are visible. The latter shows lower coefficients for an extra starting conflict per month, while the reversed holds for an extra ongoing conflict per month. This provides evidence that including more emerging markets and small-cap stocks may lead to higher returns on average during conflicts. In short, global stock markets do not seem to be really affected by the occurrence of international conflicts overall but tend to be lower when present and higher at their end.

Descriptive statistics of abnormal returns show numbers that are comparable to those from previous studies. This also holds for international conflicts' effects on abnormal stock returns: while reacting positively at conflict outbreaks, abnormal returns turn negative later on, causing cumulative abnormal returns to decrease and turn negative. A positive effect is found again at conflict terminations.

A comparison of average abnormal returns during conflicts, at the start date and at the end date reveals mixed evidence. First, abnormal returns during conflicts are more likely to be smaller than in absence of conflicts. This could mean that in the end abnormal returns are negatively affected by international conflicts, despite the early positive reaction that was found. Second, abnormal returns at start and end dates are more likely to be larger than otherwise. Although not that significant, the signs indicate some evidence of positive abnormal returns at start- and end-dates of conflicts. Lastly, the results are found to be robust to potential overrepresented industries in the sample.

Several implications follow from the analysis. Most importantly, international conflicts of the kind in this dataset (occurring in relatively peaceful years in a historical perspective) do not seem to be detrimental per definition for global stock market returns. In this sample, both normal and (cumulative) abnormal returns during conflicts are higher than what is reported in previous studies. Mean-variance preferences of investors could explain the increase in stock prices at the outbreak of a conflict: when probability of conflict occurrence surpasses a specific level, a certain conflict would be preferred over a probability between that level and certainty. The higher returns in this sample do not lead to the statement that international conflicts overall have a significant positive effect on global stock market returns, nor do the higher abnormal returns imply that those are significantly higher overall. Therefore, the results give no clear indication that a so-called trade-off where peace pays what war wins is present. On the other hand, there is evidence that emerging and developing markets and small-cap stocks together fare better on average during international conflicts.

VI.2 Further research

This study shows that either emerging or developing countries earn higher excess returns on average during international conflicts than developed countries. Besides that, it provides evidence that small-cap indices report higher excess returns on average during international conflicts than mid- or large-cap indices. Their individual effects are not further considered in this thesis. Additional analysis on this subject in future studies is recommended.

In addition, no investigation has been undertaken regarding the existence of eventual pre-conflict periods of tension like those in Brune *et al.* (2015)'s sample. If their view holds, abnormal returns during periods of tension prior to international conflicts should show a decreasing or negative pattern for datasets similar to this study as investors would prefer a certain conflict over a somewhat less certain conflict. Therefore, this aspect remains a research possibility worth further investigation and a path to tread on in the future.

The dataset applied in this thesis includes relatively more developing and emerging countries compared to earlier studies that apply a world index with mainly developed countries. Consequently, models that include data from those countries and are often applied in international conflict context when investigating stock returns [e.g., the Fama and French three-factor model (Fama & French, 1992)] cannot be used for this study due to lack of data availability for more than half of the countries and, therefore, incomparability concerns. An interesting question to examine would be whether combining well-known models that are not used here with a database comparable to the one in this study leads to similar results.

Lastly, assessing why exactly higher (cumulative) abnormal returns are reported in the first days after international conflicts arise lies beyond the scope of this thesis. An interesting avenue for future research would be to investigate this further.

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Appendix

Table A.1

List of international conflicts from 1985 to 2016, according to the ICB database. "No." is the crisis number ICB has given to them. Visit their website for more background information concerning the conflicts (footnote 2).

No.	Name
355	BOTSWANA RAID
356	EXPULSION-TUNISIANS
357	AL-BIQA MISSILES II
358	EGYPT AIR HIJACKING
359	BURKINA FASO/MALI BDR
360	S. AFRICA RAID ON LESOTHO
361	CAPTURE OF AL-FAW
362	CHAD/LIBYA VII
363	GULF OF SYRTE II
364	AL-DIBAL INCIDENT
365	S. AFRICA CROSS BORDER RAID
366	REBEL ATTACK ON UGANDA
367	MOZAMBIQUE ULTIMATUM
368	ATTEMPTED COUP-TOGO
369	CONTRAS II
370	CHAD/LIBYA VIII
371	SINO/VIETNAM BORDER
372	PUNJAB WAR SCARE II
373	TODGHERE INCIDENT
374	SYRIAN INT./LEBANON
375	SAND WALL
376	AEGEAN SEA III
377	CAMEROON/NIGERIA II
378	INDIA INT./SRI LANKA
379	MECCA PILGRIMAGE
380	S. AFRICA INTERVENTION IN ANGOLA
381	THREE VILLAGE BDR. II
382	KENYA/UGANDA BORDER
383	CONTRAS III
384	SPRATLY ISLANDS
385	IRAQ RECAPTURE-AL-FAW
386	LIBYAN JETS
387	MAURITANIA/SENEGAL
388	CAMBODIA PEACE CONF.
389	CONTRAS IV
390	GALTAT ZEMMOUR II
391	INVASION OF PANAMA
392	KASHMIR III-NUCLEAR
393	GULF WAR
394	RWANDA/UGANDA
395	LIBERIA/SIERRA LEONE
396	GHANA/TOGO BORDER II
397	YUGOSLAVIA I: CROATIA-SLOVENIA
398	BUBIYAN
399	FOREIGN INTERV.-ZAIRE
400	ECUADOR/PERUBDR. IV
401	NAGORNYY-KARABAKH
402	EGYPT/SUDAN BDR. II
403	YUGOSLAVIA II: BOSNIA
404	PAPUA/SOLOMON
405	SLEEPING DOG HILL
406	IRAQ NO-FLY ZONE
407	GEORGIA/ABKHAZIA
408	N. KOREA NUCLEAR I
409	OPTN. ACCOUNTABILITY
410	CAMEROON/NIGERIA III
411	HAITI MIL. REGIME
412	IRAQ DEPLOY./KUWAIT
413	ECUADOR/PERU V
414	SPRATLY ISLANDS
415	TAIWAN STRAIT IV
416	RED SEA ISLANDS
417	AEGEAN SEA IV
418	OPRN GRAPES OF WRATH
419	DESERT STRIKE
420	N. KOREAN SUBMARINE
421	ZAIRE CIVILWAR
422	UNSCOM I
423	CYPRUS/TURKEY MISSILE
424	ETHIOPIA-ERITREA I
425	INDIA/PAKISTAN NUCLEAR TESTS
426	DRC CIVIL WAR
427	US EMBASSY BOMBINGS
428	SYRIA/TURKEY
429	UNSCOM II
430	KOSOVO
431	KARGIL
432	EAST TIMOR II
433	CASPIAN SEA
434	AFGHANISTAN/US
435	INDIA PARLIAMENT ATTACK
436	KALUCHAK
437	MYANMAR-THAILAND
438	PARSLEY ISLAND
439	PANKISI GORGE
440	IRAQ REGIME CHANGE
441	N. KOREA NUCLEAR II
442	IRAN NUCLEAR I
443	HAIFA SUICIDE BOMBING
444	DRC/RWANDA
445	S. OSSETIA/ABKHAZIA
446	ETHIOPIA-ERITREA II
447	CHAD-SUDAN I
448	IRAN NUCLEAR II
449	CHAD-SUDAN II
450	N. KOREA NUCLEAR I
451	ISRAEL LEBANON WA
452	ETHIOPIA INVASION
453	CHAD-SUDAN III
454	ETHIOPIA-ERITREA II
455	CHAD-SUDAN IV
456	DJIBOUTI-ERITREA
457	PREAH VIHEAR TEMI
458	RUSSO-GEORGIAN WA
459	N. KOREA NUCLEAR I LAUNCH
460	CHAD-SUDAN V
461	CHEONAN SINKING
462	YEONPYEONG ISLAN
463	PREAH VIHEAR TEMI
464	LIBYAN CIVILWAR
465	COTE D'IVOIRE PRESI CRISIS
466	SUDAN-SOUTH SUDA
467	SCARBOROUGH SHOA
468	SYRIA-TURKEY BORD INCIDENTS
469	N. KOREA NUCLEAR V
470	SYRIA CHEMICAL WE
471	CRIMEA-DONBASS
472	CHINESE OIL RIG
473	INDIA-PAKISTAN BOI
475	KOREAN LAND MINE
476	TURKEY-RUSSIA JET

Table A.2

Comparison of MSCI world index and stock market data used for this thesis: country's percentage of total world market capitalization and Gross domestic product based on purchasing-power-parity share of world total in 2016 (sources: Bloomberg Market Cap Indices, World Bank World Development Indicators (WDI), and World Economic Outlook database of the International Monetary Fund (IMF)).

Country	Capitalization (%)	GDP (%)			
*Australia**	0.995	1.72	*Spain**	1.405	0.94
Pakistan	0.819	0.14	Taiwan	0.941	1.48
*Belgium**	0.424	0.54	Thailand	0.969	0.65
*Canada**	1.402	2.81	*France**	2.272	3.23
Russia	3.221	0.70	*Japan**	4.356	7.59
Philippines	0.670	0.33	China	17.688	7.51
*Portugal**	0.249	0.09	Cyprus	0.025	0.004
*Denmark**	0.229	0.57	*Italy**	1.859	0.84
India	7.232	2.83	Indonesia	2.519	0.58
*Ireland**	0.270	0.18	*Israel**	0.250	0.22
Nigeria	0.906	0.05	Austria*	0.349	0.19
South Africa	0.617	0.62	Peru	0.338	0.12
New Zealand*	0.149	0.12	Finland*	0.193	0.35
Netherlands*	0.725	0.79	Norway*	0.305	0.42
Switzerland*	0.418	2.03	Germany*	3.320	2.91
*United States**	15.473	40.01	Singapore*	0.415	0.64
Hong Kong*	0.358	6.51	Sweden*	0.415	0.97
South Korea	1.606	1.97	Turkey	1.657	0.26
*United Kingdom**	2.336	4.49			
		Total this database	=	71.09%	80.47%
		Total MSCI world index	=	37.65%	78.16%

* MSCI world index countries (countries that exist in both databases are in italics)

Table A.3

Overrepresented sectors in the dataset.

2084	Wines, brandy, and brandy spirits
2834	Pharmaceutical preparations (mainly tablets, capsules, *et cetera*)
3312	Steel works, blast furnaces, and rolling mills
3357	Drawing and insulating of nonferrous wire
3531	Construction machinery and equipment
3559	Special industry machinery (e.g., stone working, shoe making, clay working)
3577	Computer peripheral equipment (e.g., printers, plotters, graphic displays)
3674	Semiconductors and related devices
3711	Motor vehicles and passenger car bodies
3714	Motor vehicle parts and accessories
5063	Electrical apparatus, equipment wiring supplies and construction materials
5065	Electronic parts and equipment (e.g., electronic communications equipment)
7372	Prepackaged software (mainly operating, utility, and application programs)
7373	Computer integrated systems design (mainly developing or modifying software and packaging or bundling it with hardware)