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Concerned by Conflict:
Asset Market Reactions to a UNSC-based Measure of Global Conflict Levels

ABSTRACT

As economic and political interdependencies between countries grow, conflict across the world has an increasing impact on economies, companies, and consumers everywhere. The impact of specific conflict episodes on related financial markets has been extensively researched in case studies. On the contrary, the asset market reactions to time variance in the aggregate level of worldwide conflict has received less attention.

One major challenge to this line of research is the quantification of conflict. Whereas previous studies have used news-based conflict proxies or academic databases, this paper proposes novel proxies for the global level of conflict based on text analysis of resolutions from the United Nations Security Council.

The study analyses 1501 resolutions between 1994-2017 to construct monthly proxies of global conflict. It then assesses the contemporaneous impact of the proxies on returns and volatilities of a large set of assets, including 42 currencies, 21 commodities, 44 national stock indices, and 43 treasury yields. Moreover, the article employs Fama-Macbeth (1973) regressions to test whether asset sensitivity to the global level of conflict is priced by the market in the form of a risk premium.

The paper concludes that in response to a high level of global conflict, a large share of currencies and treasury yields shows increased volatility, and a large share of national stock indices shows decreased volatility. I find no premium for historic sensitivity in asset returns to global conflict, but returns on currencies do depend on historic sensitivity of their volatilities to global conflict. One possible interpretation global conflict drives other established risk factors, such as market volatility and idiosyncratic volatility.

Keywords: conflict; war; Security Council; asset markets; volatility; asset pricing

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1 Introduction

It has been a long time since the interests of developed countries were restricted to their direct geographic neighbourhood. From the 19th century, European nations crafted empires to secure access to resources and trade, and invested extensively in their expansion and protection (Hobsbawm, 1969). With increased economic interests in faraway countries, imperial nations were also increasingly exposed to conflicts in those areas. In the case of the US, the defence of national interests as principle central to foreign policy was first applied by President Harry S. Truman in the aftermath of World War II. In a famous speech, he requested from Congress some 400M dollars to assist Greece and Turkey in keeping chaos at bay. He deemed this contribution necessary to preserve "economic stability and orderly political processes". He pointed out that the US spent 350B dollar to liberate Europe during World War II and should now "safeguard this investment and make sure that it was not in vain.[1]"

Nowadays the Council on Foreign Relations, the foremost foreign policy advisor to the US government, systematically tracks all conflicts across the world and gauges their impact on US interests. For example, whereas the violence in the African Central Republic and the Rohingya Crisis in Myanmar are considered of 'limited' importance, the civil wars in Libya and Yemen are labelled 'significant', and the North Korean nuclear threat and the situation in Afghanistan are said to be 'critical' to US interests[2].

Why is it that the US and other countries consider conflicts far beyond their geographical region as 'critical' to their interests? The world has grown increasingly interconnected, and the consequences of a local conflict could ripple throughout the global system. Two dimensions of globalization play a pivotal role. First, countries are increasingly politically connected (Baylis, Smith & Owens, 2017). Escalation of a conflict in one region is more likely to lead to the involvement of a nation in another part of the world. It is a costly affair to provide financial assistance, weaponry, or boots on the ground. Even if you do not go to the conflict, the conflict might still come to you. Modern warfare is less confined to geographical regions, and political or ideological adversaries from abroad can pose a threat from afar. This is the reason why the US considers the situation in Afghanistan 'critical' to their interests; they fear that the country would become a safe harbour for terrorist organizations such as Al-Qaeda to operate from (Lansford, 2003).

The second manner through which faraway conflicts are able to affect a nation is through economic relations. The historic concerns of 19th-century European powers about the ready supply of resources and stability of export markets are today more pronounced than ever. Within the contemporary global economic landscape, different stages of production processes are performed in different countries

[1] Truman's address to Congress, March 12th, 1947. http://avalon.law.yale.edu/20th_century/trudoc.asp
[2] Global Conflict Tracker, 19-10-2018. https://www.cfr.org/interactives/global-conflict-tracker#!/global-conflict-tracker

across the world, according to global value chains (De Backer & Miroudot, 2014). Global economic interdependencies are therefore at their historical zenith.

The economic consequences of conflict are not limited to the belligerents, as classical conceptions of warfare would posit, but affect countries, companies, and consumers across the world. This is the main assumption on which the rest of the paper is built: if economies across the world are affected by global conflict, financial assets across the world may be as well. Global conflict in this paper refers to the aggregate cumulative level of inter- or intrastate conflict over a specified time period across the world, and is not restricted to violent conflict only.

Several strands of literature have researched the relationship between conflict and financial markets. Economic historians, for example, used asset market reactions to investigate turning points in major wars. Willard, Guinnane, and Rosen (1996) looked at swings in the value of greenbacks – assets whose gold convertibility depended on the victory of the Unionists – to see which events of the US Civil War were at the time considered significant for the outcome. Frey and Kucher (2000) used a similar approach to evaluate the course of World War II using European sovereign bond prices. Hall (2004) shows that the Swiss exchange rates with currencies of various belligerents during World War I mirror other indicators of the contemporaneous expectations regarding the likely outcome of the war.

Political economists have also drawn on asset market insights to refine the scholarly investigation of the impact of violent conflict on the economy. As Guidolin and La Ferrara (2010) observe, asset market responses are swift and can be attributed to very precise moments, which allows researchers to overcome the endogeneity problem. This problem has always marred the debate, since political theories postulate an interdependent relationship between conflict and economic variables. Political economists thus employed asset market responses to empirically test various theories on the economic costs of war. Schneider and Troeger (2006), for example, test a rational expectations version of commercial liberalism – which posits that war is harmful to economies – by tracing international stock market responses to the Israel-Palestine Conflict, the war in ex-Yugoslavia, and the US-led invasion of Iraq. Similarly, Leigh, Wolfers, and Zitzewitz (2003) investigate asset market reactions to changes in the perceived likelihood of a US invasion in Iraq during this conflict's prologue.

The aforementioned scholars use financial markets as a tool to infer information on phenomena that are essentially beyond the field of finance. Such scholarship relies on a clear understanding of the mechanisms that drive asset market responses to non-economic phenomena. A number of case studies investigate these mechanisms in the context of conflict. Amihud and Wohl (2004), for example, study stock price responses to the US invasion of Iraq. Specifically, they research the role of expectations in stock price responses. Earlier papers, such as for example Frey and Kucher (2000), found that asset market responses to non-economic phenomena are heavily dependent on the market's prior expectations. That is to say, without knowing the expectations it is difficult to interpret the asset market responses. Amihud and Wohl (2004) use the "Saddam security", a contract which paid out in case Saddam fell before a certain date – as a proxy for public perceptions on the likelihood of a US

invasion in Iraq. This allows them to study asset market responses to changes in public perceptions on the likelihood of conflict.

Other examples of papers that study the mechanisms of asset market responses to conflict events include Rigobon and Sack (2005), who use a heteroskedasticity-based estimation model to show that most variance in financial variables leading up to the Iraq War stemmed from war-related news; Chen and Siems (2004), who perform an event study to evaluate the effect of fourteen terrorist attacks since 1915 on US capital markets; and Brune et al (2015), who explore the puzzle that stock markets sometimes respond positively and sometimes negatively to conflict-related news.

A study that is especially relevant to this paper's research interest is Guidolin and La Ferrara (2010). They move away from specific case studies, and try to capture global conflict in an aggregate variable. Using a sample of 101 violent conflict eruptions between 1974-2004, they employ the event study methodology to test if weeks with conflict eruptions are more often associated with abnormal asset returns than peaceful weeks. They find that stock markets are more likely to display positive than negative responses to conflict eruption. Furthermore, they find that investors using a conflict-driven investment strategy would have accrued abnormally high returns.

The line of literature described above begins with one of the most central questions in the field of international relations – namely, when and why do states fight or cooperate? Several theoretical perspectives propose that a major factor in answering this question are the economic gains and costs of conflict (Barbieri & Levy, 2001). Political economists set out to test these gains and costs empirically, but ran into methodological problems, most notably the problem of endogeneity (Guidolin & La Ferrara, 2010). To overcome these problems, they resorted to the field of finance (Schneider & Troeger, 2006). Financial economists then jumped in to open up the black box of financial markets and research the mechanisms that drive their responses to conflict (e.g. Brune et al, 2015).

Another strand of literature, largely disconnected from the previous one, approaches the problem from the opposite direction. In an attempt to resolve empirical puzzles in asset pricing, researchers have attempted to extend and sophisticate the standard models. One such extension, originally proposed by Rietsz (1988) to explain the equity premium puzzle, and later popularized by Barro (2006), is the rare disaster risk factor. The premise underlying this risk factor is that investors require compensation for market-wide low-probability, high-impact events, such as major depressions, natural disasters, and wars. The high negative impact of rare disasters is amplified by the fact that these disasters also heavily decrease consumption – meaning that they cut down returns when investors need them the most.

One major complication in researching this risk factor is the lack of data, since rare disasters are by definition infrequent. In response to this, researchers have refined ways to measure the perceived disaster probability even in the absence of such disasters. Berkman, Jacobsen, and Lee (2011), for example, build an index of global political crises as a proxy for the likelihood of disastrous war. They investigate whether changes in this index yield a traceable response from stock markets. Their research

shows many similarities with for example the aforementioned paper by Guidolin and La Ferrara (2010), even though the motivation and background is completely different. A key difference is that Berkman, Jacobsen, and Lee do not account for the direct impact of political crises outside of disaster risk. Moreover, the disaster risk literature investigates asset market responses more rigorously, rather than merely interpreting them as proxies for economic effects. Berkman, Jacobsen, and Lee (2011), for example, also test cross-sectionally whether sensitivity of stock returns to conflict is priced in the market. The rare disaster risk factor has been shown to play a significant role in other asset classes as well. Farhi and Gabaix (2016), for example, find that it successfully explains a number of anomalies in exchange rate behaviour.

The research agenda of this paper is to develop an aggregate measure for global conflict, and to explore its impact on a wide variety of asset markets across the world. More specifically, the aim is to test whether a global conflict proxy has explanatory power for the variance in monthly returns and volatilities of exchange rates, commodities, stock indices, and treasury yields, and whether the sensitivity of these assets to this global conflict proxy is priced by the market. The most significant contribution of this research agenda to the literature is threefold.

The first important contribution is the development of a new way to measure conflict across the world. It is not straightforward to quantify this variable. First of all, there exists disagreement on what constitutes conflict. Interstate conflict and protracted civil wars would seem to be firmly within this concept, but other examples are less obvious. What about violence committed by internationals crime organizations and drug cartels? Threatening tweets from Trump about North Korea? Suicide bombings by lone wolf terrorists? Severe price wars? What exactly constitutes a conflict is difficult to determine. The second obstacle to quantifying global conflict is that it requires more than merely tallying conflict events. Other relevant dimensions are for example the intensity and the amount of people affected.

Scholars have approached the measurement of aggregate conflict or conflict in specific cases in two different ways. The first one is by analyzing news reports. A long research tradition has investigated the effect of world news on stock markets (Holsti & North, 1966; Niederhoffer, 1971; Cutler, Poterba & Summers, 1989). Schneider and Troeger (2006) applied Goldstein's (1992) conflict-cooperation scale to King and Lowe's (2003) international conflict dataset, generated by a software program that "reads" news stories, to quantify the amount of conflictive and cooperative events each for a number of conflict episodes. Brune et al (2015) count the number of articles in the daily issues of the New York Times that contain the keywords 'war' and 'Iraq' to measure the likelihood of invasion.

There is a number of well-researched biases in the selection of news coverage of foreign affairs which render the news coverage of global conflict an invalid reflection of conflict across the world. Peterson (1981) discusses a number of pervasive biases within the 'elite press' that scholars rely upon. Examples include inter alia: a bias against complex issues, such as multi-party Middle Eastern conflicts; a bias against news in relatively unknown or distant countries; a bias against news items

which cannot be pinpointed to one specific day; a bias against expected news; a bias against news at odds with popular media narratives – etcetera. The aforementioned biases serve as illustration for the limitations of news-based global conflict proxies, and a full review of them would be beyond the scope of the paper[3]. An additional drawback to a news-based conflict indicator is the abundance of articles that discuss conflict without conflict events having taken place. For example, one conflict event might spiral into weeks of articles on political speeches, expert opinions, and background analyses, even without new developments taking place. Once a story is hyped, the public is hungry for additional information, and the event could get overblown. Alternatively, news media often speculate about conflict events that might occur in the future, but have not yet happened.

The second way scholars have approached the measurement of conflict is through academic databases. The most widely used databases include the Correlates of War (CoW) Project and the Uppsala Conflict Data Program (UCDP), but there are dozens of customized sets available (Eck, 2005). The major downside is that academic databases often rely on an inflexible set of rules to classify conflict, and fail to incorporate some major conflictive events. For example, the CoW-dataset requires an event to have caused over a thousand casualties, while the UCDP sets this threshold to 25. This implies that prime examples of international conflict, such as the North Korean nuclear threat or the Cuba Crisis of 1962, fall outside of their scope.

This paper is the first in the literature to not rely on media or academics for the identification of conflict, but on the international institution of the United Nations Security Council (UNSC). This institute is tasked with identifying and combating conflict all over the world. Membership of the UNSC is divided into geographical regions, meaning an equitable representation across the world. Furthermore, the UNSC uses human judgement in their agenda setting, discussing conflict which they believe to pose a threat to peace and stability, regardless of precisely which (quantitative) thresholds have been met. Two obvious drawbacks are a delayed response time, which complicates the analysis; and the politicized nature of the institution, which may prevent it from addressing certain controversial issues. I built a database by performing text analysis on all UNSC resolutions between 1994 and 2017, and used this dataset to derive a number of proxies for global conflict. The paper evaluates this approach to measuring conflict by applying the proxies to a variety of analyses and discussing their strengths and weaknesses.

The second contribution to literature is to test the effects of global conflict on a large sample of assets from different asset classes across the world, using a monthly measurement interval. Most existing research has tested the effect in the context of one asset class only (e.g. Schneider & Troeger, 2006; Brune et al, 2015), or have a strong focus on the US (e.g. Rigobon & Sack, 2005). Guidolin and La Ferrara (2010) use multiple asset classes, but limit their analysis to four commodity futures indices, and only one currency. This paper uses a sizeable, international cross-section within each asset class to

[3] For a more in-depth discussion, see for example Galtung and Ruge (1965), Peterson (1981), and Staab (1990)

evaluate the effects of global conflict. By orienting my methodology away from case studies, and by using a monthly measurement interval, I circumvent a number of mechanisms in stock market responses that obscure the underlying relationship between conflict and financial markets (see section 2.2).

Third, this paper tests whether global conflict risk is priced by the market. Guidolin and La Ferrara (2010) find that a hypothetical investor could have earned a return higher than the market return by betting on conflict, but do not investigate why this abnormal return persists in the market. Berkman, Jacobsen, and Lee (2011) find a premium for crisis risk, but hardly connect their research with literature on conflict and financial markets. This paper investigates whether the higher return stemming from conflict is related to the underlying conflict risk. In other words, I test if investors require a risk premium. The risk premiums are evaluated using the Fama-Macbeth (1973) approach.

Overall, I find a weak indication that global conflict affects global asset returns, and reasonably strong evidence that it affects global asset volatilities. The volatilities of currencies and treasury yields increase in response to conflict, whereas the volatilities of stock indices, surprisingly, decrease. These results are robust and it is improbable that they are due to data mining. When I estimate the next-month returns based on historic sensitivity to risk factors, I do not find a significant risk premium for global conflict in asset returns. When I calculate sensitivities of asset volatilities to global conflict risk, and use these to predict one-month ahead returns, I find a significant effect for currencies. This could be an indication that global conflict is a second order risk factor by driving other established risk factors, such as market volatility and idiosyncratic volatility.

The paper is structured as follows: Chapter 2 provides an overview of the theoretical framework, surveying the literature on the effects of conflict on the economy, and subsequently hypothesizing the effect of conflict on the various asset classes. Thereafter, Chapter 3 discusses the proxies for global conflict based on the UNSC resolutions. Chapter 4 then evaluates the contemporaneous impact of these proxies on asset markets using a variety of specifications. Chapter 5 tests whether historic sensitivity to conflict is priced by the market. Finally, Chapter 6 draws the main conclusions, discusses the performance of the UNSC conflict proxies, and presents some suggestions for further research.

2 Theoretical framework

2.1 Conflict and the economy

"The most successful war seldom pays for its losses." – Thomas Jefferson[4]

To understand asset market responses to global conflict, it is essential to first understand how conflict affects the economy. The relationship between conflict and the economy has been studied extensively by political economists, especially in the context of interstate wars. Reviewing the arguments on the economic consequences of interstate wars is a useful way to illustrate the economic consequences of conflict in general, as interstate war is a severe type of conflict with strong implications for economic activity[5].

In the scholarship on economic consequences of interstate wars, two major ways in which war harms the economy have been identified. The first major harm involves the destruction and misallocation of resources. In their extensive study of the economic consequences of World War I, Broadberry and Harrison (2005) discuss Bogart's (1920) war cost calculations. These cost calculations are based on several categories of resource destruction and misallocation. One category is the destruction of physical capital, such as factories, ships, and farms. Another category is the loss of human capital. The premature death of a human requires society to educate and train another one, which is costly. Furthermore, it increases the scarcity of labour, which drives up costs of production. The largest category in Bogart's calculations is the loss of production caused by a reallocation of manpower to war activities.

There has been discussion in the literature on how costly resource destruction is, because destruction of resources also has indirect costs, especially in an internationally competitive environment (Milward, 1984). Many authors claim that the biggest economic cost of World War I to Europe was losing its hegemony to the US, whereas others argue that this development would have occurred regardless of the war (Broadberry, 1998). The difficulty with these questions is the absence of a counterfactual: the impact of conflicts in general and the World Wars specifically is so immense that it is difficult to construct an image of what the world would have looked like without them, and compare particular isolated differences.

The second major harm of war which has given rise to an extensive strand of literature is the disruptive effect of war on international trade. McMillan (1997) and Barbieri and Levy (1999; 2001)

[4] Thomas Jefferson to Edmund Randolph, 1785. The Writings of Thomas Jefferson, ME 5:140, Papers 8:538

[5] For studies on the economic consequences of other types of conflict, see for example Collier (1999) on civil wars and Sandler and Enders (2008) on terrorism.

survey several perspectives in their discussion. Conventional wisdom says two belligerent parties do not trade with one another. This is a central assumption of classical liberal theories (Oneal & Russett, 1997). In realist literature, this assertion is less obvious. Some authors have argued that belligerent countries may continue to trade if it increases their relative power vis-à-vis the rest of the world (Liberman, 1996). The consensus, however, is that at least one of the belligerents will cease trade, because the relative gains for the enemy are greater than their own (Huntington, 1993). Furthermore, as argued by Gowa (1994), by exporting any type of good to the enemy they allow them to use it as substitute for their own production, and consequently to reallocate the freed-up human and physical capital to the war effort.

Barbieri and Levy (2001) find anomalous evidence that bilateral trade between adversaries need not be impeded by armed conflict. They propose a number of arguments for 'sleeping with the enemy', including the possibility of mutual dependence, and of private actors within the countries that are reluctant to give up private benefits from trade. These private actors might have sufficient political leverage to keep the government from installing embargoes.

Prior to Barbieri and Levy (2001), the only empirical evidence on this topic was of an indirect nature. Whereas Mansfield (1994), for example, focuses on system-wide trade reductions in times of war, rather than on bilateral trade, Pollins (1989a; 1989b) finds that cooperative political relations benefis trade, but does not consider the effects of war specifically. Mansfield and Bronson (1997) argue that political alliances benefit trade if there is also an institutionalized economic alliance. Morrow, Siverson, and Tabares (1998) find that political alliances do not increase trade flows.

Barbieri and Levy (2001) tested the effect of war on trade directly, which generated response from other scholars. By problematizing the liberal assumption that war impedes valuable trade, which would dissuade politicians from engaging in conflict, they also undermine the thesis that greater international interdependence reduces conflict, which is central to interdependence liberalism's vindication of globalisation (Keohane, 2002). Amongst the first respondents were Anderton and Carter (2001), who tested the effect of conflict on war for a different dyadic dataset, and found reasonably strong evidence, in contrary to Barbieri and Levy (2001), that such a relationship does exist. It is difficult to compare the various empirical studies, because they differ along multiple dimensions, such as the conceptual definition of conflict, unit of observation, and sample period (Glick & Taylor, 2010). Furthermore, studies of the relation between trade and war are often convoluted by issues of endogeneity (Collier & Hoeffler, 1998). It is difficult to ascertain whether the increasing tension forces down trade, or whether the decreasing levels of trade makes it less costly for countries to engage in conflict.

The impact of war on trade has not only been studied by political scientists and international relations scholars, but also by economists (Blomberg, Hess & Orphanides, 2004; Martin, Mayer & Theunig, 2008). More recently, Glick and Taylor (2010) have researched the economic costs of war arising from the destruction of trade, and state that "econometric analysis suggests that these costs are

quantitatively large, statistically significant, and highly persistent.[6]" The widely agreed upon intuition that war disrupts trade in most cases seems to be correct.

Wars are costly because they destroy and misallocate resources, and because they disrupt trade. Arguably, war has economic benefits as well. Plenty of anecdotal evidence suggests that wartime defence expenditures facilitate a subsequent surge in technological progress and economic growth (McNeill, 1982; Smith, 1985). Despite the many case studies where this relationship was demonstrated, most scholars contest that such an effect exists. In his discussion on this topic, Ruttan (2006) argues that many of these technological advancements are best attributed to underlying scientific discoveries in the years preceding conflict outbreaks, not to innovations made in defence departments. Other scholars have also argued that defence-related R&D investment crowds out other types of technological innovation (Lichtenberg, 1989). Broadberry and Harrison (2005) find little evidence for positive technology spill-over effects in World War I, proposing that "if war was followed by recovery and accelerated development, this was usually no more than a making good of wartime delays and losses. If wartime activity had promoted new forms of technology or economic organisation that turned out to have peacetime applications too, then there would always have been some cheaper way of achieving the same result.[7]" Caplan (2002) explains how the perspective of beneficial warfare is based on an overemphasis on the positive effects of World War I and II for US interests. In these wars, the US fought strictly on foreign soil, and the war would have occurred regardless of their participation, meaning that no capital goods were at risk and trade with Europe would have fallen regardless. Therefore, concludes Caplan, the case of the US has little external validity. Kang and Meernik (2004) empirically test the debate between what they dub the 'war renewal' and the 'war ruin' schools of thought, and find that wars generally have a negative effect on economic fundamentals and economic growth.

A second reason why war might benefit the economy is that conflict is often aimed at replacing a corrupt or ineffective government. Gyimah-Brempong (2002) is one of the many empirical studies which finds that corruption hinders economic growth. Asongu (2012) shows that corruption negatively affects stock market performance. If corruption and ineffective governance are detrimental to the performance of the economy, then replacing them might improve economic performance. The US invasion of Panama in 1989 shows a clear example where this tendency played out. The invasion was directly aimed at capturing and deposing the famously corrupt military leader Manuel Noriega. In the year before Noriega was deposed from power, Panamaian GDP growth was minus 13.4%, compared to a positive 1.6% in the year after. In the decade after the invasion, annual economic growth was on average nearly twice that of the preceding decade[8].

[6] The quote is found on page number 125 of *The Review of Economics and Statistics*, Vol. 92, no. 1

[7] The quote is found on page 1 and 2 of the book.

[8] The data is taken from the World Bank, available here: https://data.worldbank.org/

Deposing ineffective regimes from power is not always economically beneficial. The downside risk of forceful regime change is that a country could succumb to a power vacuum, or that the conqueror fails to rebuild an effective state (Cramer & Goodhand, 2002). Arguably, Iraq and Afghanistan have fallen into this pit. Secondly, while this type of conflict might benefit the country which is being invaded, it can be extremely costly to the 'aggressor'. Nordhaus (2002) warned that occupation, humanitarian assistance, reconstruction, and nation-building in Iraq could, together with increased oil prices, cost the US between 0.1 and 1.9 trillion US dollars. In hindsight, Stiglitz (2008) estimates that the real number has been 3 trillion. He argues that the US occupation of Iraq directly caused the economic slowdown on the home front.

War definitely destroys and misallocates resources, most likely impedes trade, and probably does not lead to long-term technological advancement. In specific circumstances, it might benefit an economy by replacing corrupt or ineffective governments, but it is generally uncertain whether this will be successful, and it requires exorbitant investment on part of the state initiating invasion. The bottom line is that war is a negative-sum game which is harmful to the economy.

2.2 Conflict, asset returns, and volatility

Conflict has a negative effect on the economy, but how does it affect the four asset classes investigated in this paper? In case of stock indices, the effect will be negative as well. According to the fundamental theory of stock valuation, the price of a stock is equivalent to the present value of all expected future dividend payments (Campbell & Shiller, 1988), and the expected future dividend payments in turn depend upon the company's expected performance. The value of an index is therefore driven by the common denominator in the expected performance of its listed companies: the economy. If conflict cripples the economy, stock indices will also be harmed.

For currencies, the situation is slightly more complicated. If one country is affected by a conflict event, the effect is straightforward: the economy tanks, production is severed, real prices go up, and the real exchange rate goes down. Alternatively, an economy in recession is likely to be salvaged by a low interest rate, and furthermore, the country will offer fewer attractive investment opportunities, which both cause foreign capital to leave the country, again bringing the exchange rate down. The problem is that, based on the expectation of how global conflict affects economies, the measure for aggregate global conflict will affect all currencies simultaneously. Since an exchange rate is a relative denomination (in the case of this paper against the US dollar), it becomes unclear how any specific exchange rate will be affected by conflict. The hypothesized effect of conflict on exchange rate returns is therefore ambiguous.

The return on holding a commodity future is dependent on the expected price movements of the underlying commodity. If the price of the commodity increases in the period between the purchase and expiration of your futures contract, you can buy the commodity at the predetermined 'cheap' price, and sell it on the market at a profit. Consequently, the return on commodity futures depends on the expected relative supply and demand changes in the near future. Global conflict could theoretically affect both: a decreasing economy means production of commodities is less attractive and supply will fall, but simultaneously the industries that process commodities might also reduce their demand. Nevertheless, the supply of commodities is generally perceived to fall harder, as international turmoil has often increased scarcity and the price of commodities in historic cases (Giot & Laurent, 2003). An explanation could be that poor countries are often net exporters of commodities (Gereffi & Korzeniewicz, 1994), and poor countries are also more often impacted by conflict (Collier & Hoeffler, 1998). On top of the spurious correlation between commodity exports and conflict via poverty, Collier and Hoeffler (2003) draw two causal links between commodity exports and conflict. First, commodity production and export provide easy opportunities for extortions, which make it more feasible to finance rebellions. Second, commodity dependence might decrease governance quality, generating stronger grievances against the government.

In conclusion, a rise in global conflict is expected to drive commodity prices upwards, increasing the return on commodity futures. Moreover, commodity futures function as hedges against risks in the commodity markets. Global conflict increases the uncertainty in commodity markets, thereby increasing the value of such a hedge, which means the value of a futures contract increases as well. The hypothesized effect of global conflict on commodity futures is that it leads to an increase in returns.

Treasury yields are the interest rates governments pay on their sovereign debt. As with any debt, the interest rate paid on the sovereign debt is made up of the risk-free rate and a risk premium, which partially depends on the debtor's perceived ability to pay back the loan: sovereign credit risk. An economy in recession leads to an increased sovereign credit risk (Cantor & Packer, 1996). Amongst the many reasons are decreasing tax income and an increase in unemployment benefits. As a consequence, global conflict is hypothesized to increase treasury yields. Of course, the underlying asset is not the treasury yield but the sovereign bond. The price of a bond is inversely related to changes in the yield. If the treasury yield goes up, new bond issues will pay a higher coupon rate. Supply and demand force the total yield on old bonds to be equal to the total yield on the newer bonds, but the coupon rate is lower. The difference is made up by effectively selling the future pay-out of the bond's face value at a discount today. In other words, the market value of the old bonds must fall. Therefore, if global conflict harms the economy, leading to an increase in sovereign credit risk and thus treasury yields, the value and hence realized return of existing sovereign bonds falls. Noteworthy is that the change in treasury yield and the change in the value of the sovereign bond are dependent

upon other factors, such as for example the time to maturity. It is therefore not possible to say categorically that an X% increase in treasury yields leads to a Y% decrease in sovereign bond value.

The hypothesized effects of global conflict on returns of various classes of assets as described above are based on fundamental relationships. In the literature, there is a large number of papers that empirically find and theoretically explain deviant responses. For example, in studying financial market reactions to major breakpoints of World War II, Frey and Kucher (2000) find that the response is completely different for different events. Most notably, the markets were completely unaffected by the German capitulation in 1945. Brune et al (2015) find that increases in likelihood of conflict drive down stock prices, but the actual outbreak of war itself is often paired with a stock market upswing.

The arguments for deviant responses that have been developed in the literature, however, do not hold up when using a monthly aggregate measure for global conflict, as is employed in this paper's analysis. Some such arguments fail to hold up because they rely on day-to-day asset market responses, and do not apply when looking at monthly levels. For example, some papers find that asset markets might respond differently than expected in case the investors have anticipated a conflict event beforehand. If investors expect conflict to drive down (up) asset prices, then they will go short (long) in these assets to make a profit, until the current price is in accordance with their expectations. But it is unlikely that investors predict the aggregate level of global conflict weeks ahead of time with near-certainty. If they do not, then at least a part of the fundamental effects of global conflict on asset markets will be visible in the month of measurement. What is not discussed in the literature, but seems a likely explanation for stock market upswings the day after a conflict event, is the possibility of an overreaction to the imminence of the conflict in the days before. Howe (1986) finds that stock market correct overreactions slowly for good news and more rapidly for bad news. Arguably, the correction of the overreaction to the conflict event's imminence may already be in progress once the conflict actually occurs.

Another reason behind deviant asset market responses that plays no role within this paper's methodology, is that a conflict event conveys more information than simply an increase in the amount of conflict. Investors can interpret these events as the termination of a turbulent prologue (Schneider & Troeger, 2006), an expedition of the conflict's end (Schneider & Troeger, 2006), a contribution towards a positive outcome (Chappell and Eldridge, 2000), or sign of lower intensity of the conflict than initially anticipated (Brune et al, 2015). However, in contrast to an event, a monthly level of global conflict is one-dimensional and does not provide any additional information that would justify deviant asset market responses.

The last class of arguments of why certain asset markets may show deviant responses to conflict is centred around the notion of safe haven assets. For example, Le Bris (2012) explains a stock market boom in France during World War II as a sensible consequence of the high inflation of the Franc. The population massively fled the currency and bought real assets such as stocks instead. This argument might still play a role for internationally used 'safe' assets, such as US and German sovereign bonds

and US dollars; but in other cases, the aggregate level of conflict across the world should hardly force a flight from one asset class into the other, as variance in this factor is not expected to have an extreme effect.

The financial economics literature has proposed a multitude of explanations why asset market responses might deviate from what is to be expected based on the fundamental relationships, but none of them hold up in the context of this paper. That means the hypothesized effects of global conflict on currency values, stock indices, treasury yields, and commodities at the beginning of this section still stand.

The effect of global impact on volatility is more straightforward. Conflict leads to uncertainty, turbulence, and quickly shifting expectations, and should therefore increase volatility in any asset market. Schwert (1990) suggests that volatility is not just dependent upon singular events, but also on global political stability. Schneider and Troeger (2006) discuss the possibility that conflict might decrease volatility, if it terminates a period of uncertainty in anticipation of the conflict. However, a higher level of global conflict does not necessarily mean that there are fewer turbulent conflict prologues; rather, it signals that more of them have taken place during the month.

2.3 Global conflict as risk factor

In standard asset pricing theory, investors require compensation for risk in the form of a premium. Idiosyncratic asset risk can be diversified away and is hence not priced in the market. Systemic risk affects the market as a whole, which means exposure to this factor cannot be diversified. Hence the risk premium depends on an assets' covariance with the market portfolio. This basic notion results in the capital asset pricing model, which models asset returns as the sum of the risk-free rate and the product of the market risk premium and the asset's sensitivity to market risk. When modelling returns according to this formula, a number of anomalies persistently shows up in the data. To account for these anomalies, researchers have come up with additional risk factors, such as the three-factor model by Fama and French (1993).

Another example of a risk factor is the so-called 'rare disaster risk factor' as identified by Barro (2006). Berkman, Jacobsen, and Lee (2011) show that a derivative of this risk factor, the political crisis risk factor, is priced by the market. Is the level of global conflict expected be a priced risk factor? Conflict has a system-wide effect on assets, and therefore cannot be diversified away. Even though some assets are expected to respond positively and others negatively, the market could still pay a risk premium (discount). The reason is that an investor cannot immunise his portfolio against different sources of risk simultaneously, so building a portfolio without exposure to conflict risk has a real cost. If indeed the level of global conflict has a significant impact on the global landscape of

financial markets, then this risk factor should be priced by the market. Those assets with a positive response in return to global conflict should have a risk 'discount' in the next period.

Table 2.1 provides an overview of all the hypothesis which were derived in section 2.2 and 2.3.

Table 2.1: Overview of hypotheses
This table presents an overview of the hypotheses derived in the theoretical framework. Hypothesis H2a and H2b are opposites. I expect global conflict to affect all currencies, and since the exchange rate is a relative value denomination, the effect depends on which currency is more severely affected.

Hypotheses	
H1	*Global conflict has a negative contemporaneous effect on stock index returns*
H2a	*Global conflict has a positive contemporaneous effect on currency exchange rates versus the USD*
H2b	*Global conflict has a negative contemporaneous effect on currency exchange rates versus the USD*
H3	*Global conflict has a positive contemporaneous effect on commodities futures returns*
H4	*Global conflict has a positive contemporaneous effect on treasury yields (and a negative impact on sovereign bond returns)*
H5	*Global conflict has a positive contemporaneous effect on volatilities across all four asset classes*
H6	*Historic sensitivity of asset returns to global conflict has a positive effect on next-month asset returns*

3 The UNSC conflict indicator

3.1 The Security Council and its resolutions

The United Nations Security Council (UNSC) was founded as one of the Primary Organs of the United Nations briefly after World War II. The League of Nations, the predecessor of the United Nations, had failed to prevent war on a global scale, and the victors decided that a new organisation was required to advance peace. In 1945, delegates from 50 nations met in San Francisco to draft the United Nations Charter (the Charter), which was signed on June 26th.

Article 23 through 32 of the Charter lay out the foundations of the Security Council. They stipulate the organ's composition, basic rules of procedure, and most importantly, its mission and powers. Article 24.1 states that *"...Members confer on the Security Council primary responsibility for the maintenance of international peace and security, and agree that in carrying out its duties under this responsibility, the Security Council acts on their behalf.*" With this clause, UN member states recognise the Security Council as a legitimate defender of peace and security in the world. Article 34 confers the Security Council with a mandate to investigate any situation that could give rise to conflict. This mandate makes the Security Council the world's primary institution for identification and reconciliation of global conflict, making it the best-suited political organ to base the global conflict indicator on.

There Security Council is composed of fifteen member, five of which are permanent. These five permanent members (P5) have a so-called 'veto power' over votes pertaining to substantive matters, which means that any one of the P5 is able to block a resolution's adoption independent of its support from other members. This is a detriment to the UNSC as a conflict identifier, because certain controversial conflicts are unlikely to be meaningfully addressed within one of its resolutions. The ten non-permanent members are re-elected biannually over pre-determined regions. This ensures all geographical regions are equitably represented in debate and agenda-setting, and thus that the discussed topics are representative of all ongoing conflict across the world.

Meetings are set by the President of the Council, a roll rotated monthly across all members. The President will call for a meeting upon the request of a member of the Council, a non-member state (provided it accepts the condition of pacific settlement), the UN Secretary-General, or the UN General Assembly. Meetings may be planned in advance, or held at short notice in cases of emergency. The interval between meetings cannot exceed 14 days, meaning that in any given month at least two meetings are held.

The Security Council fulfils its key functions and powers through adopting resolutions. Each resolution consists of preambulatory clauses, which outline the underlying considerations and

arguments, and the operative clauses, which formulate the opinions, directives, and decisions of the Council. Each clause starts with an italicized verb, indicating the purpose and gravity of the clause.

3.2 Classification of UNSC terminology

The Security Council uses a specific terminology for the leading verbs of its resolutions. The choice for the leading verb depends on how much urgency and concern the UNSC wishes to convey in its statement. This concern can be conveyed directly in expressions of opinion, or indirectly by serving as motivation for decisions and calls to action. How much urgency and concern the UNSC wishes to express is assumed to be proportional to the severity, intensity, impact, and scope of the underlying conflict. When I discuss the 'gravity' and 'severity' of resolutions and clauses, I refer to the extent to which they imply intensity, severity, impact, and scope of the underlying conflicts.

An example of terminology which is indicative of a resolution's gravity is that the Security Council *requests*' some things, but '*demands*' others. Gruenberg's (2009) study of UNSC resolutions is of particular relevance to my operationalization of global conflict, because it is one of the only studies which interprets the employed terminology in terms of severity of underlying conflicts.

Gruenberg's research purpose was to compare the language of the Security Council in dealing with similar events across different countries. Specifically, he investigated whether the Council was biased against Israel. In his analysis, Gruenberg distinguished between three types of words: emotive words, instructive words, and modifiers. Whereas emotive words are used to express an opinion, instructive words are intended to prompt action, and modifiers increase the gravity of a statement.

Words that may seem synonymous elsewhere, can bear an incrementally different meaning within the semantic framework of the Security Council's resolutions. For example the dictionary definition of 'deplore' is 'to regret strongly' or 'deserving of deprecation (strong disapproval)'. Similarly, the word 'condemn' means 'to declare reprehensible, wrong, or evil…'[9]. It is not immediately obvious which emotive word carries more weight. The Security Council, however, tends to employ 'deplore' for situations where customary international law is breached, and to use 'condemn' in cases of human rights violation (Gruenberg, 2009). Therefore, usage of the word 'condemn' signifies a graver resolution than usage of the word 'deplore'.

Gruenberg analysed the contexts in which different words were used to rate their gravity. Table 3.1 shows which words Gruenberg included in his analyses. While emotive words and instructive words have a clear ranking in terms of gravity, this is not apparent for modifiers. Gruenberg implies that modifiers are used to increase the gravity of a statement without making the crude and blunt move to a graver base word. In this way, the terminology gives the Security Council a precise way of expressing

[9] According to Merriam-Webster

their perceptions of conflict and communicating their actions to the international community. Gruenberg provides no evidence, however, for this assumption; it is unclear whether for example *'urgently calls upon'* is indeed weaker than *'recommends'*.

Table 3.1: Gruenberg's (2009) classification of UNSC terminology
This table shows the classification of words used in UNSC resolutions to express grave statements as identified by Gruenberg (2009). In his paper, Gruenberg searches for bias from the UNSC against Israel. He identifies significant words in resolutions, rates their gravity by studying in which contexts they are generally used, and compares the choice of words for resolutions about Israel with other resolutions. The list below denotes the words he deems important for a resolution's gravity.

Emotive words (ascending in gravity)	**Instructive words** (ascending in gravity)	**Modifiers**
Concerned	Decide	Deeply
Grieved	Call upon	Gravely
Deplored	Recommend	Solemnly
Condemned	Request	Strongly
Alarmed	Urge	Urgently
Shocked	Warn	Vigorously
Indignant	Demand	
Censured		

Gruenberg's classification is useful for finding inconsistent applications of a particular subset of the Security Council's terminology. If, for example, the Council generally '*requests*' a certain action of countries, but '*urges*' Israel to do the same thing under the same circumstances, indeed an instance of bias is discovered. The purpose of Gruenberg is to find examples of bias, not ascertain the overall gravity of a resolution. The latter is what is required for this paper, as the overall gravity of the resolution is the best mirror of global conflict. There are several reasons why Gruenberg's framework is not sufficient in ascertaining the gravity of a resolution.

First of all, Gruenberg's list of words is incomplete. *'Notes with regret'*, *'appreciates'*, and *'encourages'* are examples of emotive or instructive expressions, but they are not considered by Gruenberg. There are many other examples.

Second, Gruenberg includes only explicit instructive words and does not account for implicit instructions. The Security Council very often expresses the opinion that something needs to be done by certain actors rather than directly asking them to do it. An example is the first operative clause of S/RES/1587 (2015), which '*Stresses* the obligation of all states to comply fully with the measures imposed by resolution 733 (1992)'. This is similar to calling upon states to comply with the measures. There might be a semantic difference between a pure instruction and the statement of an opinion or preference, but the Security Council often uses them interchangeably. Hence one cannot restrict the analysis to pure instructions (like Gruenberg's instructive words) when assessing a resolution's gravity.

Third, Gruenberg does not take into account terminology which expresses positive sentiments. The list of emotive words does not include positive emotive words, such as '*welcomes*', '*approves*', and '*commends*'. An abundance of positive words in a resolution suggests that a conflict is being resolved, and should decrease the gravity of a resolution.

Fourth, Gruenberg makes the seemingly unjustified choice to take '*decides*' as the weakest form of instruction. With an incidence of 4528, the word accounts for 33% of the incidence of Gruenberg's instructive words in UNSC resolutions since 1994. Gruenberg states that '*decides*' is different from other instructive words, because it is the only one that does not use a direct object. In my opinion, that means it's not an instructive word at all, but rather its own category. '*Decides*' is also a unique word, because of the variety of its applications. It can be used, for example, to employ a peacekeeping operation, but also to move the location of a meeting. '*Decides*' can be used to implement strict measures in serious crises, but it is also commonly used in procedural resolutions, or to extend long-term mandates. The incidence of '*decides*' is therefore not indicative of the gravity of the resolution, and should not be mixed in with other instructive words.

It is also noteworthy that the words '*indignant*', *'censured'*, *'solemnly'*, and *'vigorously'* have not been used once since 1994, and *'shocked'* has been used only twice. The scarcity of these words justifies their exclusion from the current analysis.

Based on the considerations above, I propose a different classification of the Security Council's terminology. I use five different categories: verbs of expression, emotive objects of expression, verbs of instruction, verbs of action, and modifiers. The verbs of expression can be either neutral, neutral with gravity, positive, or negative. I have analysed ~100 resolutions, distributed evenly across time, to fill out the categories, and verified my choices with native speakers that are intimately familiar with Security Council terminology. The purpose of this classification is to assess the gravity of the situation to which the resolution is a response. The classification is outlined in table 3.2.

This methodology does not only capture positive and negative verbs, but also positive and negative statements made by combining a neutral expressive verb with a positive or negative object. An example is '*expresses its appreciation*'. It ignores objects of expression which themselves are neutral, such as 'intention', 'commitment', or 'determination'.

Various conjugations of the modifiers are aggregated under one counter. For example, '*strongly*' is counted towards the incidence of '*strong*'. For the verbs of expression and verbs of instruction, the conjugations for simple present ('*approves*') and present continuous ('*approving*') are counted separately. This way, it is possible to infer whether the verb precedes a preambulatory or operative clause. An operative clause carries more weight in a resolution, and is considered a graver mode of expression. Therefore, if the resolution has a relatively high amount of leading verbs in the simple present, the resolution could be considered as graver. For verbs of action, only the simple present form is considered, as no actions should be decided on in the preambulatory section of the resolution. Indeed, the conjugation '*deciding*' occurs only 9 times in the 1501 resolutions.

Table 3.2: This paper's classification of UNSC terminology.
This table shows an overview of words which are indicative of the gravity of a resolution. The classification builds upon Gruenberg (2009), but is far more complete, such that I can use it to judge the gravity of a resolution in its entirety. I have analyzed a subsample of ~100 resolutions to fill the categories. The categories and words used in the table below form the basis of the various proxies for global conflict.

Verbs of expression	**Emotive objects of expression**	**Verbs of instruction**	**Verbs of action**	**Modifiers**
Neutral Acknowledges Affirms Continues Echoes Expresses Notes Reaffirms Recalls Recognizes Reiterates	*Positive* Appreciation Gratitude Support *Negative* Alarmed Concern Regret Sympathy	Authorizes Calls upon Demands Directs Encourages Endorses Insists Invites Recommends Reminds Requests Requires Urges Warns	Decides	Deep Full Grave Great Serious Strong Urgent
Neutral with gravity Emphasizes Stresses Underlines Underscores				
Positive Appreciates Approves Commends Looks forward Pays tribute Supports Welcomes				
Negative Condemns Deplores Regrets				

Furthermore, the classification does not include leading verbs which only occur in preambulatory clauses. Examples include '*highlighting*', '*convinced of*', and '*distressed by*'. There is a large variety of such words, which makes them difficult to include. More importantly, leading verbs for preambulatory clauses cannot contribute significantly to the gravity of a resolution. If the expression of a sentiment is important to the Security Council, they will convey this message in the resolution's core.

My system has no ranking in terms of severity within each class. To propose such a ranking, one needs expert knowledge of the Security Council's underlying politics, and of the conflicts which their resolutions address. Luckily, no such ranking is required for the purposes of this research. The system allows numerous ways to infer the gravity of a resolution. One example would be the ratio of positive words (both verbs of expression and objects of expression) over negative words. Another example would be the ratio of neutral words with gravity over regular neutral words.

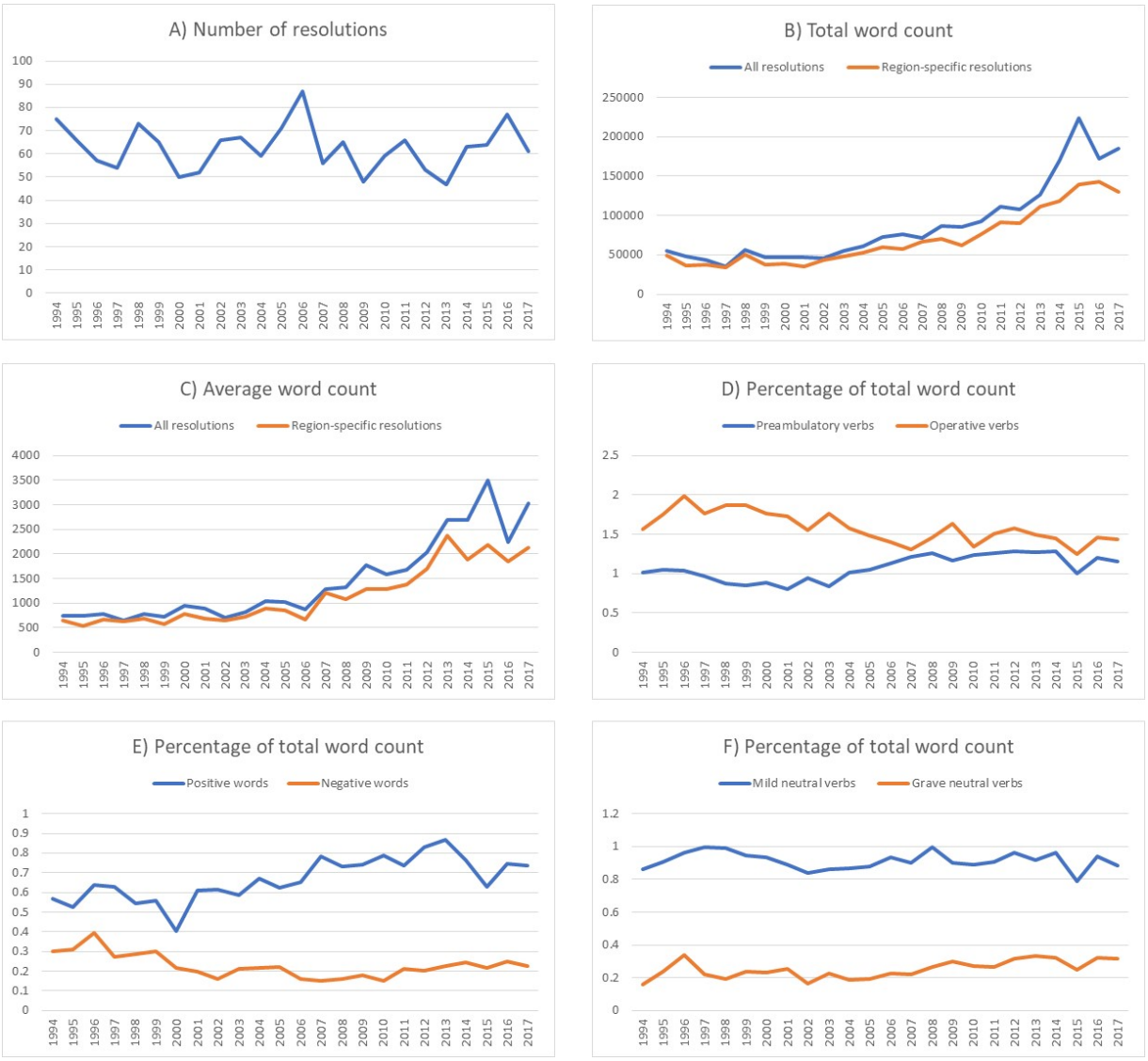
3.3 Database construction and description

The proxies of global conflict are based on the resolutions of the Security Council. In order to derive the proxies, I built a database with relevant information on all of the Council's resolutions from January 1994 through December 2017. The information is obtained by performing text analysis of the resolutions with the open-source software Python. The time span of 24 years is sufficient to cover the origination and resolution of a large number of crises in various regions of the world. Resolutions before 1994 are unfit to be included for three technical reasons. First of all, the standards on resolution-writing have continuously adjusted over time. Older resolutions often have accompanying statements, several resolutions in one document, and deviations in terminology. This adds noise to the times series. Second, older PDFs do not contain actual text but rather images of text. There are some Python libraries that can deal with this, but none to a satisfying extent, meaning that again noise is introduced in the data. Thirdly, the quality of documentation of UNSC resolutions weakens significantly for older resolutions. Press statements and verbatim meeting records are regularly recorded within the same file as the resolution. As the documentation is not neatly organized, I could not include these without manually preparing each individual resolution. Furthermore, UNSC resolutions yield little insight in global conflict during the Cold War era, since the Council was practically deadlocked at the time; only after 1991 did the Council open up to address conflict in the world (Malone, 2004).

From 1994 onwards, only a handful of resolutions was poorly recorded and therefore unsuitable. The total number of resolutions included in the study is 1501. From each resolution I obtain the date, word count, topic, geography, region, an oil dummy and international trade dummy for the involved countries, and incidences of specific types of words, as explained in the previous section. I provide an extensive description of the text analysis of the resolutions and the construction of the database in Appendix A. This appendix discusses some of the challenges and the methods I used to overcome them. Noteworthy here is that I counted two versions of the modifier count: a simple modifier count, which uses the total incidence of the modifiers, and an advanced modifier count, which only includes those instances of modifiers that precede or follow trigger words of other categories. The argument is that modifiers only increase the severity of resolutions insofar as they amplify the meaning of other significant words. It is also worth mentioning that 18.5% of the resolutions does not address a specific geography, but a general topic that is resurfacing throughout various conflicts (e.g. child soldiers or the protection of women).

Before deriving various proxies for global conflict, this section explores the potential and the pitfalls of the database. Graph 3.1 depicts the development of several variables, aggregated on a yearly level, over time. Graph 3.1.a shows the annual amount of resolutions. The variable has a healthy variation, which means the amount of resolutions may be sensitive to the situation in the

Graph 3.1: Descriptive graphs of the UNSC resolutions database
Graph 3.1.a/f depict various graphs that give an overview of the UNSC database. All of them depict annual levels between 1994-2017 and are based on the 1501 resolutions included in this study. Graph d/f show the incidence of specific word types as percentage of overall word count.



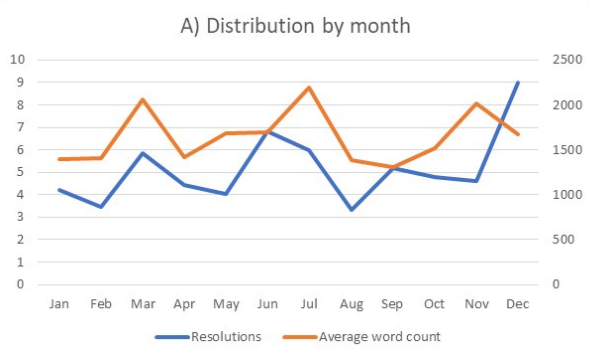
world. The highest number of resolutions is 87 in 2006, and the lowest number is 47 in 2013. Graph 3.1.b shows the total amount of words used in UNSC resolutions per year. A clear upward trend is visible, starting in 2002 and reaching its steep peak in 2015. The average of the latest five years is 3.7 times the average of the earliest five years. Since the number of resolutions in 3.1.a shows no trend, the increase in the amount of words is due to the increased average amounts of words per resolution, as depicted in 3.1.c.

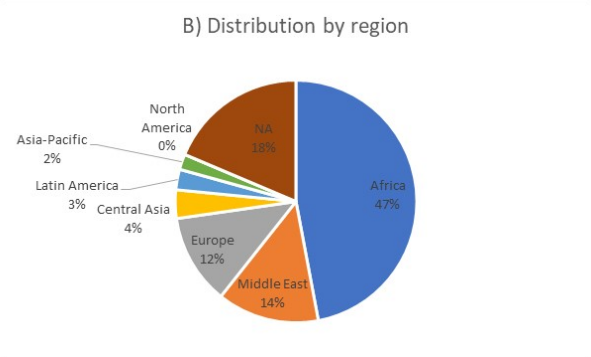
One possible explanation for this development is that at the end of 2001, the Security Council entered its so-called legislative phase (Szasz, 2002; Talmon, 2005). On the 28th of September in 2001, the Council published a groundbreaking resolution in response to the rising threat of terrorism. Acting under Chapter VII of the UN charter, the Council ordered all states, instead of one particular country involved in a crisis, to undertake a list of actions. By issuing an order to all states, the UNSC utilized the full extent of its mandate for the first time. Arguably, resolutions with such orders require more detailed and elaborate clauses.

Graph 3.1.d shows the percentage of preambulatory and operative verbs of the total amount of words in a resolution. The gap between the two types has decreased over time. Since operative clauses are of more importance, this indicates a relative decrease in gravity of resolutions over time. Graph 3.1.e shows the percentage of words in a resolution that exhibit a clearly positive or negative sentiment. The gap has widened over time, suggesting that the Council's language has become more optimistic. Graph 3.1.f shows the percentage of neutral words of expression, separated for mild and grave ones. There is moderate variation and no significant time trend. Furthermore, it is striking that graphs 3.1.d/f all show a dip in 2015; apparently the sharp peak in total words was not accompanied by a proportional increase in words of any significance.

Graph 3.2 shows a division of the 1501 resolutions by month of publication and by the addressed region. 3.2.a shows a peak in the amount of resolutions during June and most notably during December. The reason for this is that the Council follows a large number of long-term conflicts, and generally gives updates on their status halfway and/or at the end of a year. This limits the validity of the monthly number of resolutions as a proxy for global conflict, since the seasonal variation is predominantly driven by procedural matters and not variation in underlying conflict. A solution is to deseasonalise the time series. This is not necessary for proxies leaning on trigger words, since their incidence is extremely low in procedural resolutions.

Graph 3.2: Distribution by month and by geographic region
Graph 3.2.a shows the number of resolutions and the word count for each month averaged over the 24-year sample period. Especially the number of resolutions clearly spikes in June and December, which hints towards the presence of strong seasonality. Graph 3.2.b shows the distribution of the 1501 resolutions over the various regions they address.



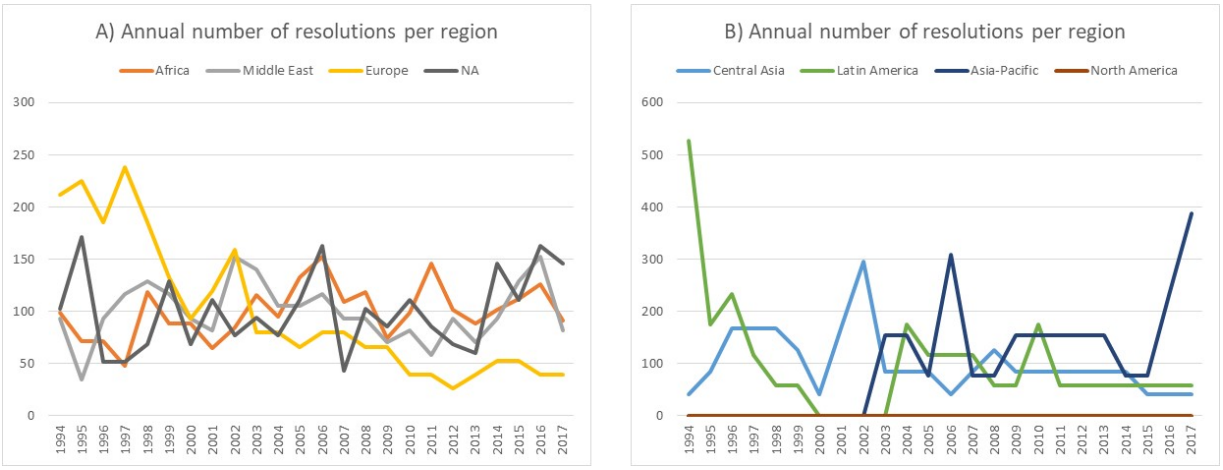


Graph 3.2.b shows the distribution of the resolutions across regions. The Security Council has not dealt with a crisis in North America since 1994. Africa is the main purveyor of agenda items, accounting for 58% of the region-specific resolutions. The Middle East and Europe follow at a distance, and Central Asia, Latin America, and the Asia-Pacific require attention only irregularly.

Graph 3.3 shows the amount of resolutions over time per region, indexed at the region's average. The trends in the graphs can be linked to important historical developments. Europe received most attention in the late '90s. Around that time, the fall of the USSR had reignited ethnic conflicts in Georgia, unrest in the Yugoslavian area repeatedly led to war, most notably in Bosnia and Kosovo,

and border disputes between Cyprus and Turkey reached their zenith in the 1997-1998 missile crisis. Although many of these tensions persisted throughout the next decade, few new conflicts emerged, and the Council's attention for Europe dwindled. A new upswing in 2013-2014 coincides with the civil unrest in Ukraine and the Russian annexation of Crimea.

Graph 3.3: The annual numbers of resolutions per region.
Graph 3.3.a and 3.3.b depict the indexed annual number of resolutions per region. The variance in the series can be related to historic accounts of conflict in the included countries. Each series is indexed against its own 24-year average.



The picture for the Middle East is also reasonable. The first visible peak is 1998, when the United States and the United Kingdom bombed Iraq in operation "Desert Fox". This marked a high-point in the Iraq disarmament crisis. The motivation for attacking Iraq was their non-compliance with conditions previously set in UNSC resolutions. After a period of cool-down, the Council refocused its attention on the country in 2002-2003, at the onset of the Iraq war. On the 12th of September, 2002, President Bush argued for an invasion of the country in front of the Council, which sparked debate in the international community and led to a series of UNSC resolutions. From 2014 onwards, another peak starts building up, as the Syrian conflict grew more violent and ISIL started gaining momentum in Iraq and the Levant. Note also that the Arab spring of 2011 initially affected countries such as Tunisia, Libya, and Egypt, which in this study are part of the African region, and not of the Middle East. Indeed, Africa shows a peak of UNSC interest in this year.

Lastly, I will consider some of the outliers in graph 3.3.b. Latin America's peak in 1994 was fuelled by unrest in Haiti and El Salvador. Central Asia peaks first in 1996, when the Taliban conquered Kabul and founded the Islamic Emirate of Afghanistan. A second peak is in 2002, when the United States and the United Kingdom engaged the Taliban in Afghanistan as part of the War on Terror. The Asia-Pacific spikes first in 2006, due to a conflict in Timor-Leste and the first-ever nuclear test conducted by North Korea. The second jump starts in 2016, when North Korea performed tests with a hydrogen bomb and nuclear war heads. These events showed North Korea's destructive potential to the world, and gave rise to serious concern amongst the international community.

3.4 The conflict proxies and their performance

The previous section provides anecdotal evidence that the amount of attention spent by the Security Council on certain regions over time roughly mirrors the historical conflict narrative of these regions. To what extent UNSC behaviour reflects the global conflict narrative, can be measured in multiple ways. This section proposes and evaluates nine concrete proxies derived from the database. These nine proxies are in various ways measures of how emotive and how active the Security Council has chosen to be over time, in response to the amount and severity of conflict in the world. First, I discuss each proxy in turn. Afterwards, I discuss the appropriate measurement interval for the proxies. Third, I consider the correlations between the varying proxies. Lastly, I compare the proxies with three widely used measures for international conflict, based on the Uppsala Conflict Data Program, the Correlates of War project, and the International Crisis Behaviour Project.

The first proxy is the number of resolutions in a specified period. The intuition behind this proxy is straightforward: if there is more conflict in the world, the Council needs more resolutions to address it. Unfortunately, the amount of conflict is not the sole driver of the resolution count. The amount of resolutions on procedural matters or updates on long-term files also varies over time. Seasonality drives a large share of the variation in the number of 'insignificant' resolutions, as discussed in the previous section. For that reason, an alternative for this proxy is a deseasonalized version, which is constructed by subtracting the time-of-year's 24-year average from each monthly observation.

The second proxy is the summed word count over all resolutions in a specific period. There are two sources of word count variation: the number of resolutions, which indicates conflict following the logic explained above; and the words per resolution. The central assumption of this proxy is that more severe conflicts require a more direct and involved approach from the Council, which they stipulate in more detailed and wordy resolutions. This is not necessarily true. One of the most acute conflict events during the sample period is the 9/11 terrorist attack on the World Trade Centre. The next day, the UNSC published a resolution to condemn the acts in the strongest terms, and to express their complete commitment to the fight against terrorism. The resolution counted a mere 276 words. Within a month, two more resolutions were released to address the topic, yielding a total of 2194 words. In contrast, the same month the Council released a bureaucratic resolution with a list of goods countries were prohibited to sell to Iraq. The resolution did not mark any change in the conflict, but nonetheless counted 3940 words.

The third proxy is the summed modifier count over all resolutions in a specific period. If there is more severe conflict, the Council requires more modifiers to amplify their expressions of concern. The modifier count has the advantage over the word count that it filters out bureaucratic texts. Indeed, the resolution on prohibited export items to Iraq has a modifier count of only three according to the simple

method, and zero according to the advanced method. This proxy is tested both in its simple and advanced form.

The fourth proxy is the summed count of instructive verbs over all resolutions in a specified period. If there is more conflict, the UNSC gives instructions to more different parties; if there is more severe conflict, resolving the situation is more urgent, and the UNSC gives more instructions to the involved parties. Indeed, the three resolutions on terrorism shortly after 9/11 employ fifteen instructive verbs, whereas the bureaucratic resolution on export to Iraq uses only one.

The fifth proxy is the summed count of grave neutral verbs of expression over all resolutions in a specified period. The underlying logic is that the UNSC uses the graver part of their vocabulary only in dire situations. The more conflict events occur in a time period, the more often the Council uses these words. It is true that verbs such as '*emphasizes*' and '*stresses*' convey more urgency than mild verbs of expression such as *'notes'* and '*reaffirms*', and are therefore more common in resolutions aimed at severe conflict events. However, these words can also be used as passive instructions. For example, '*Emphasizes* the importance of cooperation on…' is a milder formulation than '*Calls upon* X and Y to cooperate on…'. A graver resolution could have fewer grave verbs of expression, in case a part of them has been replaced by verbs of direct instruction.

The sixth proxy is the summed count of the word '*condemns*' over all resolutions in a specified period. This specific verb has a special place within the UNSC terminology, because it is the default response to conflict events. On September 12th, 2001, the first operative clause condemns the events of the previous day. Subsequent clauses describe a more detailed response, but the first and foremost reaction of the UNSC is condemnation. Since this is a recurring pattern, a higher '*condemns*' count implies a higher level of conflict.

The seventh proxy is the ratio of operative verbs over preambulatory verbs for all resolutions in a specified period. As explained in section 3.2, the UNSC has the choice to convey a statement as an active expression, or background consideration. Formulating an opinion as an operative clause carries more weight. Therefore, a relatively high amount of operative clauses signifies a graver situation. This hypothesized relationship is not obvious. The amount of preambulatory clauses could be driven by other factors as well. An example is that a controversial resolution might require plenty of explanation for relatively few actions. Another possible explanation is that preambulatory clauses are relatively harmless giveaways during negotiations, which might increase their number significantly in certain cases.

The eighth proxy is the ratio of negative words over positive words summed over all resolutions in a specified time period. The idea is relatively straightforward: when a resolution contains a large share of words which express negative sentiments, it indicates an escalation of conflict; if a resolution contains a large share of words which express positive sentiments, it indicates progress towards the conflict's resolution. The main pitfall for this proxy is the large variety of ways in which the Council can express positive and negative sentiments. The database includes only those words which can

uniformly be associated with positivity or negativity, regardless of the context. Many expressions of positive or negative sentiments rely on the context for interpretation.

The ninth and final proxy is the ratio of grave neutral verbs of expression over mild neutral verbs of expression summed over all resolutions in a specified time period. Resolutions which respond to severe conflict situations are assumed to use a grave vocabulary. This ratio should therefore indicate the severity of conflict in the world.

The nine proxies discussed above are all calculated over a certain measurement period. Using a longer measurement period means that more variation within a period cancels each other out, which decreases the variance of proxies. Furthermore, it reduces the number of observations, which is undesirable for statistical purposes. However, in choosing the measurement period, I am constrained by the response time of the UNSC. Taking a weekly interval, for example, makes little sense, as the Council rarely responds to a conflict event within a week (the resolution on the 12th of September 2001 being an exception to this rule).

The response time of the Security Council differs significantly for various conflicts. As a rough rule of thumb, conflict events are addressed by resolutions from approximately two weeks after the event onwards, and it takes several months before the Council's attention on the issue begins to fade (though resolutions on the topic might continue for years). The monthly measurement interval is appropriate, because it strikes a balance between the response time of the UNSC and the statistical considerations. In section 4.4 I rerun the analysis when leading the UNSC proxies by one month, which 'corrects' for the response time of the UNSC.

I considered three aspects in choosing which global conflict proxies to proceed with: correlations amongst each other, correlations with established measures of conflict, and theoretical judgement.
The correlations between the conflict proxies are displayed in table 3.3. If two proxies are both good indicators of global conflict, one might expect them to correlate with each other. However, a low correlation isn't necessarily a sign that one of them has poor performance, since the proxies might capture a different portion of conflict variation. Four things are striking about the correlation table. First, the resolution count proxy has low correlations across the board, both as the standard and deseasonalized measure. This is not surprising. The resolution count purely proxies the number of conflicts which the Council addresses, whereas the other proxies also depend on the severity of these conflicts. Second, word count has high correlations across the board. If the UNSC uses more words, chances are they also use more modifiers, instructive verbs, etc. The higher the correlation, the stronger the suggestion that variance in a specific-word counter is merely a reflection of a proportional increase in total word count. For that reason, it is desirable that the advanced modifier count and the '*condemns*' count show less correlation with total word count than other proxies; this means that they have a stronger own will, meaning their count co-moves with total word count only under certain circumstances. Perhaps, only in the cases where total word count variation is driven by swings in underlying conflict. Third, the advanced modifier count and '*condemns*' count show remarkably high

correlation with each other. Conceivably, this means they are both strongly indicative of conflict. Fourth, out of the three ratio proxies, only the grave-over-mild ratio behaves reasonably.

Table 3.3: Correlations between global conflict proxies
This table reports the correlations amongst the global conflict proxies measured on a monthly basis. The correlations give some insight into what drives variation in a number of proxies. For example, lower variation between the modifier count and word count means the former is not just proportionally increasing with the latter, but depends on other factors as well.

	Resolution count	Deseasonalized resolution count	Word count	Simple modifier count	Advanced modifier count	Instructive verb count	Grave neutral verbs of expression count	*Condemn* count	Ratio of operative over preambulatory	Ratio of positive over negative	Ratio of grave over mild
Resolution count	1.00										
Deseasonalized resolution count	0.84	1.00									
Word count	0.51	0.36	1.00								
Simple modifier count	0.49	0.38	0.90	1.00							
Advanced modifier count	0.40	0.31	0.82	0.93	1.00						
Instructive verb count	0.51	0.36	0.92	0.89	0.86	1.00					
Grave neutral verbs of expression count	0.38	0.28	0.87	0.91	0.89	0.86	1.00				
Condemn count	0.36	0.29	0.76	0.86	0.90	0.80	0.83	1.00			
Ratio of operative over preambulatory	0.01	-0.05	-0.13	-0.14	-0.14	-0.09	-0.17	-0.12	1.00		
Ratio of positive over negative	0.01	0.02	-0.15	-0.08	-0.01	-0.14	-0.17	0.01	0.14	1.00	
Ratio of grave over mild	-0.05	-0.04	0.22	0.26	0.25	0.23	0.45	0.25	0.11	-0.10	1.00

Another consideration in evaluating the efficacy of the proxies is their correlation with measurements of conflict from established sources. I studied three datasets in detail: the International Crisis Behaviour Project (ICB), which is at the foundation of the paper by Berkman, Jacobsen, and Lee (2011); the Correlates of War (CoW) dataset, which has been the predominant conflict dataset during the 20th century; and the Uppsala Conflict Data Program (UCDP), which became the main challenger to CoW (Eck, 2005). UCDP's most important innovation is a drastically lower threshold for conflict. The ICB recognizes an event as a crisis if the state's highest-level decision-maker sees it as a threat to basic values and as contributor to an increasing likelihood of military hostilities. The CoW dataset contains all conflicts which have an annual death count higher than 1000. The UCDP includes all conflicts where the number of annual casualties exceeds 25, and distinguishes between one-sided violence, state-based violence, and no-state violence.

The UNSC conflict proxies are best evaluated using the UCDP data for two reasons. First, the methodology of conflict identification is more in line with the behaviour of the UNSC. The ICB identifies an average of less than four ongoing crises each year, whereas the UNSC in most years discusses over 20 different region-specific topics. The high kill count threshold of CoW practically means it focuses on full-blown wars only, leaving out conflict events such as 9/11 and the North-Korean nuclear threat. The second reason is a statistical argument: the low conflict count for CoW and ICB leads to crude and extreme variation, which might dishevel the correlations. Furthermore, neither of the datasets covers the full time span of the UNSC proxies.

I extracted two variables from the UCDP dataset to correlate with the UNSC-based proxies: the annual number of ongoing conflicts, and the annual number of conflict-related casualties. Graph 3.4 shows the indexed values over time. For the conflict-related casualties count, I left 1994 out of scope. The death toll of the Rwandan genocide is more than 500% of the aggregate death toll of all conflicts in any other year within the sample period, which downplayed the correlations of all proxies with that variable.

Graph 3.4: Annual conflict series from the UCDP.
This graph depicts the annual number of conflicts and the annual number of conflict-related casualties taken from the Uppsala Conflict Data Program. The series are indexed against their own average.

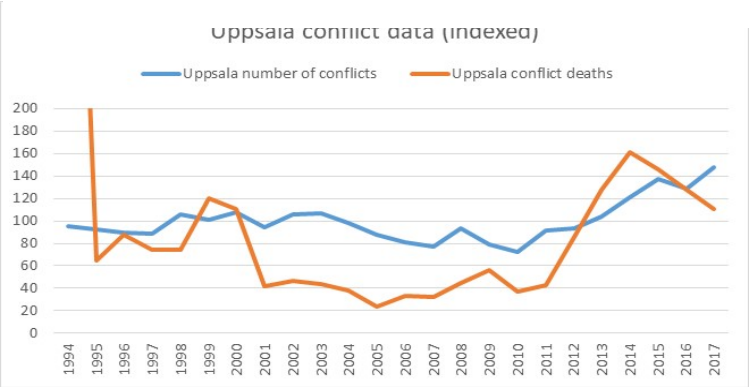


Table 3.4 shows the correlation of the proxies with the UCDP variables. Resolution count is not deseasonalized, as the measurement period for the correlations is annual. The main takeaways of the correlations in table 3.4 are that the advanced modifier count and the '*condemns*' count outperform the other word count proxies, and that the grave over mild neutral verbs of expression ratio is the only ratio with desirable results. These insights align with those from table 3.3. For this reason, I will use these three as conflict proxies for the next chapters, along with the baseline proxy of the resolution count.

Table 3.4: The average values, standard deviations, and correlations with UCDP series per conflict proxy.
This table reports the average value and standard deviation for each global conflict proxy, as well as their correlation with the chosen benchmark series in the UCDP conflict count and UCDP casualty count. Since the UCDP series are measured at an annual level, the conflict proxies are aggregated at an annual level as well. Positive correlations with the UCDP series serve as evidence that the proxies reflect real variation in conflict.

Conflict proxies	Average value	Standard deviation	Corr. with UCDP conflict count	Corr. with UCDP casualty count
Resolution count	5.21	2.57	0.12	-0.14
Word count	7374.34	6716.95	0.69	0.61
Simple modifier count	32.34	27.67	0.71	0.66
Advanced modifier count	10.94	11.55	0.77	0.71
Instructive verb count	62.92	57.79	0.67	0.63
Grave neutral verbs of expression count	19.78	19.73	0.67	0.67
Condemn count	3.45	4.39	0.76	0.73
Ratio of operative over preambulatory	1.57	0.82	-0.02	-0.05
Ratio of positive over negative	0.40	0.32	0.11	-0.28
Ratio of grave over mild	0.27	0.14	0.33	0.55

4 Contemporaneous impact

4.1 Financial data

Chapter 3 explains the underlying data for the conflict proxies. This section discusses the financial data series that were used in the analysis. Since the research interest is testing the effect of global conflict on global asset markets, the financial data needs to represent the global financial landscape within the four asset classes. Therefore, it is important to use a diversified sample including assets from various regions of the world. Including financial data from a large number of countries poses two important challenges. First of all, data quality is not always up to par, especially for developing countries and during the earlier years of the sample period. One symptom is a large amount of missing observations. Another recurring issue with data for equity is strong time-variance in the constituent count for country-specific stock indices, which heavily distorts index returns. A second challenge is consistency in measurement across countries. For example, treasury yields for different countries are often based on sovereign bonds with different characteristics, complicating the cross-country comparisons.

To resolve these issues, I opt for a single, reliable data source per asset class. For commodities, I use the S&P GSCI total return indices. These production-weighted indices are designed to reflect global price movements in commodities, which make them appropriate for this paper's research interest. The core dataset includes twenty-two individual commodity indices, such as the indices for gold, cotton, coffee, and hogs; several categorical commodity indices, such as energy, agriculture, and precious metals, are used for additional analyses. The data for currencies is based on the WMR benchmark rates against the US dollar. These daily closing spot rate benchmarks serve as standard forex rates to allow for easy cross-country comparisons. The sample includes forty-two currencies of significant economies across the world. The equity market series are taken from the MSCI market indices. The core sample includes forty-four stock indices for individual countries. Six regional indices and eleven sectoral indices are used for additional analyses. The treasury yield data is based on the Thomson Reuters 10-year government bid-rate benchmark series. 10-year bonds are chosen over 3-month bonds, because the short-term rates are only affected by conflict if it threatens the government's immediate solvability. Unfortunately, it is impossible to use time series for the underlying sovereign bond value, since the value depends on characteristics such as date of issue and time to maturity, which vary heavily across countries and over time. Forty-three countries are included in the sample.

All data has been collected using Thomson Reuters Datastream. All time series are available at a daily interval, which allows for the calculation of volatility for each month. In total, 289 months are used in the analysis.

4.2 Main regressions

To assess the contemporaneous impact of global conflict on asset markets across the world, I look at the effect of the conflict proxies on each individual asset within our dataset, and gauge the patterns. First, I test this effect by running OLS time series regressions using monthly returns and monthly volatility as dependent variables. Volatility is measured as the standard deviation of daily returns within a month. The returns and volatility time series per asset are winsorized, by equating the lowest 5% and highest 5% of the observations to the 5^{th} and 95^{th} percentile, respectively. The reason for this is to limit the role of extreme values in the analysis. Extreme values in the tails of the return and volatility series are expected to be caused by factors with low incidence and high impact. Global conflict is not expected to be such a factor, as it is averaged out across the world, meaning it is always present with only moderate variation, and a watered-down impact. The variables are tested for stationarity using the augmented Dickey-Fuller test. No unit roots are found in the four conflict proxies, as their t-values are all below -12. For the returns and volatilities series of the 150 assets, the presence of a unit root cannot be rejected at the 1% significance level in only three instances.

The regressions are run in their simplest form, with only the conflict proxy as explanatory variable. The time dependence in the volatility is not modelled by choosing for example a GARCH-type specification, because the data is measured at a monthly interval, meaning that time dependence plays a less significant role (Guidolin & La Ferrara, 2010).

Table 4.1 summarizes the results of the regressions. For each asset class, the individual asset returns and volatilities are regressed on the conflict proxies, and the main reported results are based on the number of significant outcomes.

A critique which might be levelled against the analysis is that the results are mostly due to chance. If you perform a large number of regressions, some of them will yield 'significant' results, even in the absence of an effect. To corroborate that the findings represent a real effect and are not based on coincidence, two additional analyses are performed. First, I run a one-sided binomial test. A one-sided binomial test evaluates the likelihood that I get X or more than X 'hits' in N attempts when my probability of a hit is P. By accepting a result as significant at the 10% margin, I allow for a 10% chance that the effect of a meaningless variable is interpreted as a meaningful effect (type-I error). That means that if you run 1200 regressions on randomly generated data samples without any causal relationships, ~10% of them will yield a 'significant' result. To test if the count of significant

outcomes of my regressions can be explained by coincidence alone, I calculated the chance that this number of significant outcomes would be achieved in the absence of any effect at all. The binomial test models the analysis as twelve-hundred throws with a ten-sided dice of which one

Table 4.1: Outcome of the main contemporaneous regressions.
This table reports the results of the 1200 main regressions. The numbers under 'full sample analysis' represent the amount of significant regressions using straightforward OLS models: $r_t = \alpha + \beta Conflict_t + \varepsilon_t$. The binomial test column is calculated as 1- p | Binomial test (N=no. of regressions, X=no. of significant regressions, P = 0.10). The average significant resolution counts over the hundred redrawn samples and their standard deviations are presented in the last four columns. Cells of particular interest are shaded.

Dependent variable		**Conflict proxy**	**Full sample analysis** *Significant regression count*			**Binomial test** *Likelihood of real result*	**Resampling outcome** *Positive*		*Negative*	
			Positive	Negative	Total		Mean	St. dev.	Mean	St. dev.
Currencies	Return	Resolution count	2	5	7	88%	4.1	(2.8)	5.4	(3.2)
Total: 42		Modifier count	2	5	7	88%	2.7	(2.1)	7.7	(3.4)
		Condemn count	4	5	9	98%	4.2	(3.1)	6.0	(3.1)
		Ratio grave over mild	1	9	10	100%	1.2	(1.3)	10.2	(5.2)
	Volatility	Resolution count	3	1	4	38%	4.9	(3.2)	2.9	(2.3)
		Modifier count	14	7	21	100%	11.9	(3.8)	6.7	(2.3)
		Condemn count	13	6	19	100%	11.5	(4.2)	5.7	(2.2)
		Ratio grave over mild	14	5	19	100%	13.5	(4.9)	4.3	(1.7)
Commodities	Return	Resolution count	1	0	1	11%	2.9	(2.5)	1.8	(2.4)
Total: 21		Modifier count	1	0	1	11%	1.3	(0.9)	5.3	(2.6)
		Condemn count	0	0	0	0%	1.5	(1.0)	5.1	(2.8)
		Ratio grave over mild	0	0	0	0%	3.0	(3.4)	2.8	(2.0)
	Volatility	Resolution count	2	0	2	36%	2.9	(2.5)	1.8	(2.4)
		Modifier count	1	5	6	99%	1.3	(0.9)	5.3	(2.6)
		Condemn count	1	5	6	99%	1.5	(1.0)	5.1	(2.8)
		Ratio grave over mild	2	2	4	85%	3.0	(3.4)	2.8	(2.0)
Stock indices	Return	Resolution count	0	1	1	1%	2.0	(2.8)	4.5	(5.2)
Total: 44		Modifier count	0	0	0	0%	2.0	(3.1)	2.0	(2.8)
		Condemn count	0	0	0	0%	3.9	(4.7)	0.8	(1.4)
		Ratio grave over mild	0	8	8	93%	1.2	(1.7)	10.2	(7.0)
	Volatility	Resolution count	0	1	1	1%	1.7	(3.2)	7.2	(7.2)
		Modifier count	3	26	29	100%	2.3	(1.8)	25.9	(5.8)
		Condemn count	3	29	32	100%	2.1	(1.8)	27.1	(6.1)
		Ratio grave over mild	4	15	19	100%	3.8	(4.4)	15.1	(6.7)
Treasury yields	Return	Resolution count	0	2	2	6%	4.5	(3.7)	4.5	(3.0)
Total: 43		Modifier count	0	7	7	87%	3.0	(3.3)	8.5	(5.5)
		Condemn count	0	5	5	57%	3.0	(2.9)	8.6	(5.4)
		Ratio grave over mild	1	1	2	6%	3.1	(2.8)	4.0	(3.9)
	Volatility	Resolution count	2	1	3	18%	5.0	(5.3)	3.4	(2.5)
		Modifier count	29	5	34	100%	28.3	(1.7)	4.0	(1.4)
		Condemn count	29	4	33	100%	28.1	(1.7)	3.6	(1.2)
		Ratio grave over mild	26	4	30	100%	23.8	(3.5)	3.7	(1.9)

side bears the label 'significant'. Three things are worth pointing out. First, if there is a 0% chance all significant outcomes are based on coincidence, it is still possible that some are based on coincidence. Second, the binomial test does not yield reliable estimates under the given circumstances, because the trials are not truly independent. Returns on different assets are known to be intercorrelated, which means that the significance of one regression increases the likelihood that the next regression is significant as well. This means that the chance of 'extreme' outcomes (in this case that a much larger share than 10% of the regressions is significant) is underestimated by the binomial test. Hence, the test results cannot be used to prove that the significant regression outcomes are not based on coincidence; still, they give some indication as to which clusters of regressions have a surprisingly high number of significant outcomes. Third, the used P-values of 0.10 in the binomial tests are too conservative. The p-values of the regression are not equal to 0.10, after all, but lower.

The aim of the second additional analysis is to evaluate the robustness of the counts. I use bootstrapping to resample the data. From my 289 observations, I draw random samples of 200 observations with replacement, meaning that any given observation could be drawn into the new sample multiple times. Using this technique, I create hundred new data samples, and run the 1200 regressions on them. The table reports the average count of significant outcomes across all samples, as well as the standard deviation. A high standard deviation relative to the mean implies that the number of significant regressions is highly dependent upon the specific observations you use, which means that the result is fragile. If, on the contrary, the standard deviation is low, it lends some credibility to the belief that the result is robust.

Before discussing the results, two things are worth mentioning. First, the resolution count proxy performs poorly. The binomial test predicts a 97% chance of finding the realized or higher number of significant outcomes for the 300 regressions with this proxy in case no effect exists at all. Even when reducing excess conservatism by using the weighted average significance threshold at which the regressions are significant, the binomial test gives a 34% chance the outcomes are pure coincidence. Chapter 3 provides more arguments in favour of the performance of the other three conflict proxies. For these two reasons, the resolution count proxy should receive less attention when interpreting the table. Second, the modifier count and *condemn* count follow each other. Given their comparable nature, this is an expected pattern.

With respect to currencies, I find that the effects on asset returns are mixed, especially when using the modifier count and *condemn* count proxy. This is in line with the hypothesis of chapter 2. The slight domination of the negative effect is in line with the suggestion from the literature that the US dollar, relative to other currencies, tends to benefit from conflict, as it is used as international 'safe-haven' asset (Guidolin & La Ferrara, 2010). Furthermore, it is striking that for about $1/3^{rd}$ of the currencies, conflict has a significant positive effect on volatility. This is in line with expectations. Surprisingly, for $1/6^{th}$ of the currencies, conflict has a significant negative effect on volatility. Further investigation into which currencies respond to conflict yields two insights. First, the currencies whose

returns are negatively impacted, show a positive impact on volatility. This tells the coherent story that these particular economies are more sensitive to global conflict. Second, eyeball analysis yields no striking patterns on which type of country responds in what way, when considering factors such as proximity to heavy-conflict areas, state of development, openness of the economy, net position in oil trade, proneness to conflict, and ties with the US. Therefore I cannot corroborate the findings of Leigh, Wolfers, and Zitzewitz (2003) that especially the openness of the economy and net oil imports are crucial determinants for which economies are affected by global conflict.

The return on commodities seems completely unaffected by global conflict. The positive relationship I hypothesized can thus not be confirmed. Guidolin and La Ferrara (2010) find that 6.9% of conflict events lead to an abnormally high return on commodities. Their effect is in line with expectations, but not overwhelmingly large, hence it is no great surprise that I cannot corroborate their findings here. There is some indication in my results that for a number of commodities, the volatility decreases in response to a rising level of global conflict. There is no obvious pattern here, as the commodities for which the volatility responds negatively include industrial metals, agricultural products, and energy. When looking at different total commodity market indices, such as the Bloomberg commodity index or the Rogers international commodity index, I still do not find a positive effect of conflict on returns.

The hypothesis that the return on stock indices is negatively affected by global conflict, does not seem to be supported. Only the ratio of grave over mild words causes a drop in a number of stock index returns, but across the hundred redrawn samples, the standard deviation for this count is extremely high. The outstanding result for this asset class is that the volatility of a large number of stock indices is negatively affected by the modifier count, *condemn* count, and ratio grave over mild words. The negative impact is robust to resampling. This anomalous result is not in line with the hypothesis, nor with recurring findings in the literature (see for example, Guidolin & La Ferrara, 2010; Rigobon & Sack, 2005). One possible explanation, as discussed in chapter 2, is that conflict serves as relief of turbulent and uncertain prologues. Political tensions lead to wide speculation by the market, and the eruption of conflict, especially when it's significant enough to draw the attention of the UNSC, could give the market its answer and thereby stabilise index values. Schneider and Troeger (2006) discuss this possibility with respect to specific case studies of conflict; with respect to global levels of conflict, however, it seems far-fetched to say that conflict indeed substitutes uncertain pre-conflict scenario's. To the best of my knowledge, no other papers find a similar result, or provide an alternative explanation. Another reason for the unexpected result could be omitted variable bias. When I add a one-month lag of volatility, twelve-month lag of volatility, or the month ID number to the equation, the number of significant negative outcome falls somewhat, but remains quite high. I fail to recognize another variable beside time which could explain a spurious relationship. An interesting pattern is that for a number of European countries, including Portugal, Italy, and Austria, the expected

positive effect on volatility holds true. MSCI Europe is also the only regional index of which the volatility is not significantly decreased by conflict.

For treasury yields, I find some evidence that returns respond negatively to global conflict. This is against expectations, but when taking a closer look, the result makes sense. The countries for which the treasury yield falls in response to global conflict includes low-risk countries such as Germany, France, the Netherlands, Belgium, Ireland, and Switzerland. Amongst countries with low-risk sovereign bonds, these countries are typically less involved in conflict than some others, such as the United States and United Kingdom. Hence the significant negative effects could be interpreted as support for the safe haven argument. In accordance with expectations, the volatility of treasury yields shows an overwhelmingly positive response to increases in global conflict levels. Note also the extremely low standard deviations when retesting this result amongst hundred randomly drawn samples.

Overall, the strongest effects are the positive effect on volatility for currencies and treasury yields, and the negative effect on volatility for stock indices. The effects on returns are thin and fragile. Indeed, when performing the binomial test on the 600 returns regressions, I find a likelihood of 51% that it is based on coincidence (although this likelihood drops to 0% when taking as binomial P-value the average significance threshold that the p-values of the regressions lie below). Still, the level of global conflict can stir up the global asset markets, and it is therefore worth researching its behaviour as a risk factor.

Table 4.2 reports the average effect of an increase of one standard deviation in the conflict proxies on the return and volatility of the assets. The average impact of one standard deviation change in conflict proxies on asset returns and volatilities per asset class is consistent with the results from table 4.1.

Table 4.2: Effect of conflict on asset returns and volatilities
This table shows the average effect of one standard deviation change in the conflict proxies on asset returns and volatilities. This is calculated as the standard deviation in the proxy multiplied by the average beta. The non-weighted average gives a 25% weight to each asset class. The weighted average is based on the number of assets within each class.

Series type	Asset class	Resolution count	Modifier count	*Condemn* count	Ratio grave over mild
Return	Currency	-0.053	-0.082	-0.022	-0.103
	Commodity	0.051	-0.246	-0.140	-0.145
	Stock index	-0.088	-0.056	0.090	-0.371
	Treasury yield	0.033	-0.237	-0.205	-0.033
	Non-weighted average	-0.014	-0.155	-0.069	-0.163
	Weighted average	-0.024	-0.142	-0.058	-0.167
Volatility	Currency	0.008	0.011	0.011	0.005
	Commodity	0.002	-0.030	-0.026	0.003
	Stock index	-0.020	-0.091	-0.089	-0.028
	Treasury yield	0.045	0.408	0.388	0.143
	Non-weighted average	0.009	0.075	0.071	0.031
	Weighted average	0.010	0.089	0.084	0.035

4.3 Excess return and abnormal return

In the previous section, I have explored the effect of global conflict on asset returns and volatilities. Arguably, however, it is more appropriate to use excess returns, as the risk-free rate should hardly be affected by the level of global conflict. For that reason, excess returns are a 'cleaner' measurement of what ought to be affected, and should present a stronger variance in the dependent variable. Berkman, Jacobsen, and Lee (2011) run their analysis on total returns as well as excess returns. I subtracted the monthly global risk-free rate, as provided by Kenneth French in his online data-library[10], from the asset returns to obtain the excess returns.

A third possible measurement for returns is provided by abnormal returns. Guidolin and La Ferrara (2010) use abnormal returns in their paper. I estimate the following equation for each asset:

(4.1) $$r_t = \alpha + \beta r_t^{MSCI\ World} + \varepsilon_t$$

The regression use observations from t-1 until t-60 with a rolling window. Using the alpha, beta, and return on the market index (MSCI World index), I calculate the predicted value. The difference between the predicted and realized value is taken as abnormal return. The idea is that the deviations in return from their long-term pattern are driven by a number of risk factors, and global conflict could be one of them. Noteworthy is that global conflict can also affect the MSCI World index, which would not be captured with this approach.

The excess and abnormal returns are winsorized in a similar fashion as the total return and volatility series. The results of the regression analysis are reported in table 4.3. In general, the results for abnormal and excess returns mirror the results for total returns as described in the previous section. Two mutations stand out. First, abnormal and especially excess returns show more positive effects for treasury yields, and fewer negative effects. This is consistent with the interpretation of the total return results in the previous section. Conflict has a negative effect on treasury yields when it increases demand for the sovereign bonds by causing a flight to safe haven assets. However, the consequential decrease in treasury yield should be ascribed to a fall of the risk-free rate, and hence falls away when looking at excess returns. Indeed, when regressing the risk-free rate on our conflict proxies, I find a negative effect that is significant at the 1%-level.

The other striking mutation is that conflict has a positive effect on the excess return for currencies, whereas the total and abnormal returns are more often negatively affected. That means that appreciations of the dollar caused by conflict, relative to other currencies, often coincide with increases of the risk-free rate, whereas appreciations of other currencies do not. This speaks to the global use of dollar-denominated assets as safe haven assets. Guidolin and La Ferrara (2010) also state that the dollar is often hoarded by investors in countries which are threatened by conflict.

[10] Available here: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

Table 4.3: The outcome of the contemporaneous regressions using abnormal returns and excess returns
This table reports the results of the contemporaneous regressions where abnormal returns and excess returns are taken as dependent variables. Abnormal returns are calculated as the error term from a market-model of asset returns, using 5-year rolling window regressions (see equation 4.1.). I calculate excess returns by subtracting the global risk-free rate from asset returns. The global risk-free rate is taken from Kenneth French' data library. Cells of particular interest are shaded.

Dependent variable	**Conflict proxy**	**Positive**			**Negative**		
		Return	Abn. return	Exc. return	Return	Abn. return	Exc. return
Currencies	Resolution count	2	1	1	5	6	6
Total: 42	Modifier count	2	1	9	5	6	1
	Condemn count	4	1	11	5	5	1
	Ratio grave over mild	1	0	5	9	13	3
Commodities	Resolution count	1	1	0	0	0	1
Total: 21	Modifier count	1	0	0	0	0	0
	Condemn count	0	1	0	0	0	0
	Ratio grave over mild	0	0	0	0	0	0
Stock indices	Resolution count	0	4	0	1	1	1
Total: 44	Modifier count	0	0	0	0	0	0
	Condemn count	0	1	0	0	0	0
	Ratio grave over mild	0	4	0	8	3	7
Treasury yields	Resolution count	0	3	0	2	3	3
Total: 43	Modifier count	0	1	3	7	3	1
	Condemn count	0	2	2	5	1	0
	Ratio grave over mild	1	0	2	1	1	1

4.4 Alternative specifications for conflict proxies

The conflict proxies used in the analyses of the previous sections are based on all 1501 UNSC resolutions between 1994 and 2017, but the database allows for a great number of different specifications based on different subsamples. In this section, I explore the effects of the four conflict proxies when calculated using a number of different subsamples of resolutions. The first subsample includes all resolutions which concern countries with high oil exports or high exports. The cut-off for being a trade-intensive country is an average annual export value of over 100B dollars; the cut-off for being an important oil exporter is 300k barrels per day. These cut-off values are reverse-engineered, as they lead to appropriate lists of oil- and trade-intensive countries. In total, 46 countries are included, which amounts to 167 resolutions. The second subsample includes all resolutions concerning the Middle East. The Middle East is a heavy-conflict area (205 resolutions) with a large impact on the world economy through its oil production. The third subsample consists of all resolutions that address a specific geographic area, rather than general issues. Resolutions that deal with general issues arguably cannot be directly with the level of conflict at any specific moment. The fourth recalculation

of the conflict proxies uses all 1501 resolutions, but leads them by one month. The reasoning is that the UNSC often responds to conflict with a significant delay, and that the proxies might be more suited to measure conflict in the previous month. Table 4.4 presents the result.

Table 4.4: The outcome of the contemporaneous regressions with different conflict proxy specifications
This table reports the regression results using different specifications for the conflict proxies. The proxies for global conflict can be recalculated using different subsamples of the resolutions. The trade & oil proxies are calculated using only the resolutions which address conflict in countries with high (oil) exports. The Middle East proxies are based on all resolutions which directly concern conflict in the Middle East. The geography-specific resolutions include those who refer to a specific conflict episode instead of a more general topic in conflict. The one-month led proxies are the main proxies led by one month, to correct for the delayed response time of the UNSC. The numbers in the cells denote the number of resolutions that are significant and show a positive or negative coefficient for the conflict proxy, respectively.

Dependent variable		**Confict proxy**	**Trade & oil**		**Middle East**		**Geography-specific**		**One-month lead**	
			Positive	*Negative*	*Positive*	*Negative*	*Positive*	*Negative*	*Positive*	*Negative*
Currencies	Return	Resolution count	2	3	0	2	0	6	8	1
Total: 42		Modifier count	0	2	1	4	2	6	1	1
		Condemn count	1	4	1	5	5	5	2	2
		Ratio grave over mild	0	7	1	2	1	14	1	1
	Volatility	Resolution count	8	4	3	2	3	1	3	0
		Modifier count	6	2	7	2	15	7	10	7
		Condemn count	10	1	11	2	16	5	11	7
		Ratio grave over mild	2	0	4	2	19	6	17	5
Commodities	Return	Resolution count	0	0	0	0	0	2	0	0
Total: 21		Modifier count	0	5	0	0	0	1	0	1
		Condemn count	1	4	0	0	0	0	1	5
		Ratio grave over mild	0	7	0	1	0	5	0	3
	Volatility	Resolution count	1	9	4	0	3	0	1	0
		Modifier count	1	4	1	2	1	4	1	3
		Condemn count	1	2	1	2	1	4	1	5
		Ratio grave over mild	5	0	0	0	7	2	7	1
Stock indices	Return	Resolution count	16	1	4	0	0	0	0	3
Total: 44		Modifier count	0	1	0	0	0	0	0	0
		Condemn count	1	1	0	1	0	0	0	1
		Ratio grave over mild	0	0	0	0	0	9	1	0
	Volatility	Resolution count	5	1	0	0	1	0	5	0
		Modifier count	0	15	1	17	3	26	3	25
		Condemn count	0	4	2	9	3	27	3	26
		Ratio grave over mild	2	0	1	15	5	20	2	12
Treasury yields	Return	Resolution count	0	7	3	1	0	2	4	2
Total: 43		Modifier count	0	9	2	4	0	9	0	8
		Condemn count	0	3	2	1	0	5	1	6
		Ratio grave over mild	0	7	0	1	1	0	0	0
	Volatility	Resolution count	15	2	5	0	3	0	4	4
		Modifier count	25	3	27	1	29	4	29	6
		Condemn count	29	0	28	0	29	3	29	6
		Ratio grave over mild	6	1	25	1	26	3	28	3

The overall patterns strongly reflect the earlier findings in section 4.2, which attests to the robustness of the result. The exception is the resolution count proxy, which shows a number of extremely deviant responses, for example when taking the one-month lead on currency returns, or when taking the trade & oil specification on stock index returns.

Arguably, global conflict changes slowly over time, and market expectations with respect to this variable do not shift because of minor monthly variations. Perhaps, then, it is better to focus on the months with large jumps in conflict, which should yield a more significant response from investors. I construct three dummy variables which indicate whether a month has known extreme conflict or not. The first dummy includes each month that contains one of the 167 resolutions which concern countries with high (oil) exports. This classification is based on the idea that conflicts in these geographies are especially impactful for the world economy. The second dummy takes all months which contain a resolution that falls within the top 10% of resolutions with respect to a certain conflict proxy. This classification relies more on the severity of conflict, rather than its potential to affect the world economy. The first dummy yields 121 high-conflict months; for the second dummy this number is 73 (when using the modifier count proxy). The third dummy variable only includes the overlapping months in the other two dummy variables. Table 4.5 reports the results of the regressions.

Table 4.5: Outcome of regressions using dummies for high-conflict months
This table reports the results of the regressions using dummies for months with high conflict. The trade & oil dummy includes those months with a resolution that addresses conflict in a country with large (oil) exports (121 months). The 10% modifier count dummy includes those months in which the UNSC issued a resolution that contains more modifiers than at least 90% of the resolutions (73 months). The numbers in the cells denote the number of resolutions that are significant and show a positive or negative coefficient for the conflict proxy, respectively Cells of particular interest are shaded.

Dependent variables		**Trade & oil dummy**		**10% Modifier count dummy**		**Combined dummy**	
		Positive	*Negative*	*Positive*	*Negative*	*Positive*	*Negative*
Currencies	Return	0	2	2	7	1	2
	Volatility	3	4	11	8	8	7
Commodities	Return	0	2	0	1	0	1
	Volatility	3	6	1	6	1	2
Stock indices	Return	10	1	0	0	0	0
	Volatility	3	1	2	34	1	22
Treasury yields	Return	0	3	0	10	1	9
	Volatility	5	2	28	5	27	3

Two observations stand out. First, the number of stock indices, currencies, and treasury yields of which the volatility is affected by conflict shrinks aggressively when using trade & oil dummies as conflict variable. Second, ten stock indices find a positive effect on returns from the trade & oil dummies. This indicates, contrary to the hypothesis from chapter 2, that conflict in important countries for the world economy has positive effects on certain national stock indices.

5 Conflict risk premium

The previous chapter finds support that global conflict affects asset returns and especially volatilities. This chapter aims to uncover to what extent this risk is priced by the market using the Fama-Macbeth (1973) two-step procedure. My approach is based on the study of Berkman, Jacobsen, and Lee (2011). The central logic of the approach is to cross-sectionally test in each period what the effect is of historic sensitivity to unexpected conflict on next-month returns, and consequently average these coefficients across time. The reason to perform a cross-sectional analysis first and then average it across time, instead of running a panel-type regression, is because you cannot pool investor decisions at different points in time.

In this chapter, the resolution count proxy is excluded from analysis. The reason is twofold. First, the results of the previous chapter do not warrant further investigation, as the proxy performed poorly in the contemporaneous impact analyses. Second, the proxy is not autoregressive, meaning there is no adequate method to model unexpected changes in the proxy, which is necessary for this approach.

A variable is only a risk factor insofar as its negative impact on returns is unknown ahead of time. For this reason, I test unexpected conflict as risk factor. A simple autoregressive model is used to elicit unexpected conflict:

(5.1) $$Conflict_t = \alpha + \beta Conflict_{t-1} + \varepsilon_t$$

Unexpected conflict is defined as the series of error terms from equation 5.1. I calculate each asset's historical sensitivity to unexpected conflict at each point in time by running a rolling window regression of 60-month windows using a specified model for asset returns. The model I use here is a Fama-French three-factor model (1993) extended by the risk factor for unexpected conflict. The Fama-French three-factor model has originally been developed in the context of individual stocks, but can be applied to other asset classes as well, even though for example a commodity does not have a book-to-market ratio. The reason is that the company size and book-to-market ratio are not actually included in the model. The size and value factor represent the differences in return between large and small companies, or high book-to-market and low book-to-market companies, respectively. These can be interpreted as risk premiums on underlying risk factors, and when other asset classes strongly co-vary with them, then they are also exposed to this risk. Asness, Liew, and Stevens (1997) find for example that national equity indices strongly respond to the value and momentum factor; Asness, Moskowitz, and Pedersen (2013) find that value and momentum premiums correlate strongly across asset classes. The data used for the MKTRF, HML, and SMB factors in the Fama-French 3-factor model are the global data series from Kenneth French' data library[11]. The global factor loadings can be applied to all assets, even though it has been shown empirically that local risk factors generally outperform global

[11] Available here: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

risk factors in modelling returns (Fama & French, 2013). The formula for the rolling window regressions is displayed below:

$$r_{i,t} = \alpha_i + \beta_i^{MKTRF} MKTRF_t + \beta_i^{SMB} SMB_t + \beta_i^{HML} HML_t + \beta_i^{Conflict} Conflict_t + \eta_{i,t} \quad (5.2)$$

This regression is re-estimated each period using the previous 60 observations as data. The rolling window regressions produce a panel of betas for each conflict factor.

For each month, I run a cross-sectional test of the effect of the conflict betas for month *t* have a on the returns in month *t + 1*. In other words, I test if investors require a premium for sensitivity to conflict risk. Before doing so, I transform the conflict sensitivities to decile ranks each month, to minimise the effect of measurement errors (Nagel, 2005). The following cross-sectional formula is used to test the effect of conflict sensitivity on one-month ahead returns:

$$r_{i,t+1} = \gamma_t + \gamma_{MKTRF,t+1}\beta_{i,t}^{MKTRF} + \gamma_{SMB,t+1}\beta_{i,t}^{SMB} + \gamma_{HML,t+1}\beta_{i,t}^{HML} + \gamma_{Conf,t+1}\beta_{i,t}^{Conf} \quad (5.3)$$

The p-values of the Fama-Macbeth analysis are based on Newey-West standard errors (Petersen, 2009). The lag length is set at 4, which is appropriate for the number of observations. The results are reported in table 5.1. If I use quintile instead of decile ranks, the results are very similar.

Table 5.1: Outcome of the Fama-Macbeth regressions
This table reports the outcome of the Fama-Macbeth regressions. The numbers denote the coefficients (gammas). The gammas were calculated by averaging the coefficients of the monthly cross-sections over time. The stars indicate at which significance level the explanatory variables are significant: * = .10, ** = .05, *** = .01.

Assets	Conflict proxies	MKTRF	SMB	HML	Conflict
All	Modifier count	0.628**	0.375**	0.096	0.004
	Condemn count	0.624**	0.360*	0.097	0.006
	Ratio grave over mild	0.642**	0.373*	0.093	0.008
Currencies	Modifier count	0.162	0.165	0.155	0.011
	Condemn count	0.074	0.224	0.066	-0.001
	Ratio grave over mild	0.086	0.207	0.111	0.0
Commodities	Modifier count	1.103**	0.378	-0.323	-0.030
	Condemn count	1.149**	0.442	-0.223	-0.045
	Ratio grave over mild	1.368***	0.262	-0.333	-0.028
Stock indices	Modifier count	0.381	0.552***	0.050	0.001
	Condemn count	0.302	0.524***	0.038	0.015
	Ratio grave over mild	0.318	0.535***	0.041	-.030
Treasury yields	Modifier count	-0.238	-0.054	0.114	-0.008
	Condemn count	-0.311	0.150	-0.070	-0.048
	Ratio grave over mild	-0.133	0.384	-0.040	0.007

I find no evidence that investors require a risk premium for global conflict risk in any asset class. First, none of the conflict betas have a significant effect on one-month ahead returns, and second, the gammas are all very close to zero.

The MKTRF factor shows a significant positive gamma. This is in line with the theoretical predictions of the CAPM model, but goes against established empirical results. Fama and French (1992), for example, find a negative gamma for the market beta in a two-factor Fama-Macbeth regression on US stock returns. Many papers have attempted to explain this disparity between theory and empirical findings. Frazzini and Pedersen (2014), for example, argue that investors are constrained in taking leverage, and therefore cannot achieve high levels of riskiness in their investments without purchasing high beta assets. High beta assets are therefore overrated versus low beta assets, leading to a higher risk-adjusted return for low beta assets than high beta assets. Given the robustness of the result that MKTRF yields a negative gamma, the finding here is striking. When looking within each asset class, I find a significant gamma for MKTRF only in case of commodities. There is no consensus on the extent to which commodity futures markets are integrated with other asset markets and hence exposed to the same systemic risk factors[12].

I also find a significant non-zero risk premium for the size factor, but not for the value factor. One possible explanation is the use of global data in computing the risk factors. Fama and French (2002) find that the HML yields significant premiums in twelve out of thirteen major financial markets, but Griffin (2002) points out that world factors perform significantly worse than local factors when explaining asset returns.

The fact that historic sensitivity to conflict in asset returns does not lead to a premium is not surprising. In the contemporaneous analyses of chapter 4 I find some indication of significant effects, but can't convincingly conclude that global conflict indeed affects asset returns. The effects are far more pronounced for asset volatilities. Investors do not just like returns, but they also dislike volatility. This idea is central to classical asset pricing theory, as for example described by Markowitz (1952), and still widely accepted. Perhaps then, investors require a risk premium on conflict because it drives up the volatility of assets, even if there is no premium related to covariance with asset returns?

Some papers have shown that market volatility is a risk factor, since market volatility is time-variant and asset return sensitivity to the factor is priced in a cross-section (Adrian & Rosenberg, 2008).The average volatility in assets is not equal to the market volatility, but also consists of the averaged idiosyncratic volatilities. Goyal and Santa-Clara (2003) find that market-wide idiosyncratic asset volatility matters in predicting market return. Malkiel and Xu (2002) explain that idiosyncratic risk cannot be fully ignored as it cannot be diversified away in reality. Constrained investors do not hold the market portfolio, due to transaction costs, incomplete information, and institutional restrictions – and because of the constrained investors, other investors cannot hold the market portfolio

[12] For a more in-depth discussion, see for example Rouwenhorst and Tang (2012) and Daskalaski, Kostakis, and Skiadopoulos (2014).

either. This forces them to care about total volatility instead of just co-variance with market volatility. Malkiel and Xu (2002) find that idiosyncratic risk is significantly priced in the cross-section of stocks.

If market-wide idiosyncratic volatility is time-variant, then just like returns, it might co-vary with the conflict risk factor. There is a premium on sensitivity in asset returns to market volatility and market-wide idiosyncratic volatility, and if total volatility is sensitive to conflict, then indirectly, risk premiums could co-vary with the conflict risk factor. Hence the global conflict factor might be priced in the market not for its effect on asset returns, but for its effect on total asset volatilities.

I can test this indirectly by running a Fama-Macbeth analysis using volatility-based conflict betas (denoted as omega). The omegas are estimated by conducting a rolling window regression at each point *t* for each asset using the past 60 monthly observations:

$$v_{i,t} = \alpha_i + \omega_i^{Conf} Conflict_t + \eta_{i,t} \quad (5.4)$$

Equation 5.4 calculates how sensitive total asset volatility is to global conflict. Assuming that the total asset volatility is priced, I can assess whether sensitivity of total asset volatility to conflict is also priced, by using the omegas as explanatory variables in a cross-section of next-month asset returns.

To do so, I replace the conflict betas in formula 5.3 with the conflict omegas of 5.4. Next-month returns are still driven by the same Fama & French factors using the betas of equation 5.2, but the additional factor is not sensitivity to conflict in asset returns but in asset volatilities. The gammas and their significance are reported in table 5.2.

Table 5.2: Outcome of the Fama-Macbeth regressions using volatility omegas
This table reports the results of the Fama-Macbeth regressions using volatility omegas (historic sensitivity of volatility to conflict) as input for the conflict risk factor. The numbers denote the coefficients (gammas). The gammas were calculated by averaging the coefficients of the monthly cross-sections over time. The stars indicate at which significance level the explanatory variables are significant: * = .10, ** = .05, *** = .01. Cells of particular interest are shaded.

Assets	Conflict proxies	MKTRF	SMB	HML	Conflict
All	Modifier count	0.625**	0.391**	0.039	0.008
	Condemn count	0.657**	0.399**	0.071	-0.020
	Ratio grave over mild	0.684**	0.388**	0.096	-0.022
Currencies	Modifier count	0.127	0.168	0.204	-0.008
	Condemn count	0.051	0.117	0.152	-0.007
	Ratio grave over mild	0.194	0.317	0.142	0.029**
Commodities	Modifier count	0.964*	0.225	-0.291	0.041
	Condemn count	1.083**	0.516*	-0.326	-0.032
	Ratio grave over mild	1.259**	0.444	-0.389	-0.380
Stock indices	Modifier count	0.396	0.607***	-0.022	0.019
	Condemn count	0.383	0.533***	-0.067	0.011
	Ratio grave over mild	0.387	0.571***	-0.042	-0.040
Treasury yields	Modifier count	-0.325	0.0246	-0.005	-0.012
	Condemn count	-0.267	0.304	-0.026	-0.027
	Ratio grave over mild	-0.281	0.278	0.021	-0.040

The results for the Fama & French factors are very similar. The results for the conflict omegas suggest that investors require a conflict risk premium on currencies, because the total volatility of currencies is sensitive to global conflict, and investors dislike increases in total volatility. With p-values of 0.106 and 0.115, the conflict factor is almost significant in the Fama-Macbeth regressions for treasury yields and stock indices, respectively.

The interpretation of the coefficients requires caution. I provide no mathematical derivation of the Fama-Macbeth approach using volatility-based omegas, which means the exact economic meaning is unclear. The gammas at the very least include both the sensitivity of total volatility to conflict, and the sensitivity of returns to total volatility, which means I cannot interpret them in any straightforward manner. One possible interpretation is that global conflict is a risk factor of the second order, as it is a significant driver of other risk factors, namely market volatility and market-wide idiosyncratic volatility.

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6 Conclusion

Political and financial economists have used asset market reactions to research the effect of conflict on the economy. Their research produces varying results, depending on for example the type of conflict and the a priori market expectations. This paper's research agenda moves away from day-to-day market responses to specific conflict episodes, and instead aims to uncover the fundamental relationships between global conflict levels and asset markets, by researching the effects of the level of global conflict on the monthly returns and volatilities for a broad sample of assets across four asset classes. The second aim is to evaluate the efficacy of a novel measure of global conflict based on United Nations Security Council resolutions. Third, the paper connects conflict research to the literature on risk factors in asset pricing by testing whether investors require a premium for historic sensitivity to global conflict.

I find some indication that global conflict measured by the selected proxies affects the returns on some assets. However, sensitivity to global conflict is not priced by investors. Based on the results of this paper, it seems too ambitious to conclude that the level of global conflict affects asset returns. Data mining is a more likely explanation for a large share of the results. One likely reason for the lack of significant results is that time-variation in global levels of conflict has a dissipated effect on any specific economy. Where some conflicts escalate, others subside, and the vast majority of the world economy at any point in time is not directly involved with conflict. That is to say, although conflict across the world may ripple throughout the world economy, perhaps these ripples are not large enough to make any measurable impact.

The effect on volatility is more pronounced. I find a robust result that volatility of currencies and treasury yields increases in response to conflict, and the volatility of stock indices decreases. Whereas the former relationship aligns with expectations, the latter is at odds with expectations. Based on the current literature, the explanation of this result is unclear. When I calculate sensitivities of asset volatilities to global conflict risk, and use these to predict one-month ahead returns, I find a significant effect for currencies. This could be an indication that global conflict is a second order risk factor, because it drives up other established risk factors, such as market volatility and idiosyncratic volatility.

The analyses have also led to a number of other relevant contributions to the contemporary literature. First, the safe haven theory seems consistent with the empirical results. Treasury yields of the safest sovereign bonds decrease in response to conflict, but this pattern largely disappears in the case of excess returns. Furthermore, the US dollar seems to benefit from global conflict, because conflicted parties hoard the currency. An interesting observation is that global conflict has a significantly negative effect on the global risk-free rate. Second, I find no obvious pattern in which countries' asset markets are affected by conflict. Factors such as net oil imports and openness of the

economy, as proposed by Leigh, Wolfers, and Zitzewitz (2003), do not seem to play a large role in determining which assets are sensitive to conflict. Third, when defining conflict through a dummy variable which distinguishes between conflict in economically significant and insignificant countries, I find a change in results. The effects on asset volatility largely dissipate, and a significant positive effect on stock indices arises. Although any robust explanation of this phenomenon is forthcoming, one reason could be that the downfall of a major power allows its competitors to grow their exports. Fourth, I find a significantly positive risk premium for the market risk factor and the size factor from Fama & French three-factor model. This is theoretically tenable, but the positive gamma for the market risk factor is an unusual result within empirical studies.

In terms of the performance of the proxies for global conflict, I am reasonably confident that the proxies chosen for this study drew effectively on the information provided by a semantic analysis of UNSC resolutions. Especially the advanced modifier count, *condemn* count, and ratio of grave over mild neutral verbs of expression look promising. They filter away the bulk of bureaucratic, repetitive, and otherwise non-essential text from the resolutions, and seem to be driven by real conflict.

That being said, there are some fundamental issues with the UNSC resolutions as a data source that could be refined in order to improve the robustness of my analysis. First, the UNSC responds to conflict with a significant delay and over a long period of time. Cursory analysis leads to a tentative observation that the UNSC first responds to major conflict events with a two-week delay, and produces follow-up resolutions within the subsequent three months. It is therefore difficult to pinpoint the timing of the underlying conflict developments which have led to a surge or decline in the proxies. There is sufficient evidence that upswings in proxies coincide with increases in conflict, but a number of extraneous variables adds noise in this equation. Financial markets absorb information very quickly. This mismatch between rapid adjustment in dependent variables and an imprecise measurement of timing by the proxies may qualify the research findings. Furthermore, the monthly measurement period rendered the application of certain econometric techniques unfeasible, such as the event study used by Guidolin and La Ferrara (2010). It makes little sense to perform an event study when the measurement interval exceeds the desired estimation window for abnormal asset returns.

Another issue is the presence of so-called 'empty' resolutions which do not signify new conflict developments. Procedural resolutions are filtered out quite effectively by the proxies, but it is more difficult to eliminate the resolutions with updates on long-term files. These types of resolution contain modifiers and condemn past actions, but not necessarily because of recent developments, and therefore detract from the accuracy of the proxies. The number of such resolutions spike in June, and especially in December. One way to deal with this issue is by registering the novelty of the conflict each resolution addresses. I have attempted this by comparing the topic of each resolution with the topics in earlier resolutions, but found that the error margin was too large, due to inconsistent classification of topics on the publicly accessible UNSC resources. For example, "Syria" shows up in a topic description for the first time on March 6th 2016, but only because previous resolutions had been

referring to ‘the situation in the Middle East’. However, it does seem possible to exclude this type of resolution, as information on which conflicts the UNSC is seized of, and when update meetings are scheduled is publicly available.

A third noteworthy point is that the average word count of resolutions has multiplied over the last 25 years. Even though the proxies are found to be stationary, I expect this development over time must have led to some noise.

Another expected caveat of the approach, which has been elucidated above, is that UNSC resolutions are less likely to cover controversial conflicts and military interventions involving P5 countries. In retrospect, this has not proven to be much of an issue. Practically all major conflicts have shown up in the database, including controversial ones such as for example the Syrian Civil War, the annexation of Crimea, and the US invasion of Iraq, even if they were at times more severely delayed.

Lastly, I would like to emphasise that resolutions are not the only publicly available information source from the UNSC. Their website also includes verbatim records of nearly all meetings, voting outcomes, and press statements. Future research should consider ways to incorporate multiple sources into their conflict proxies, especially since these other sources outpace resolutions in responding to conflict events.

This study has also known limitations outside of the conflict proxies, three of which I consider of major importance. The first is the data for sovereign bonds. I only found standardized, widely available data for treasury yields, which are related to sovereign bond values but co-vary with them in an indirect and non-linear way. This prevents me from calculating actual sovereign bond returns series, which in turn complicates the cross-sections analysed in chapter 5.

The second limitation is the methodology of counting significant regression outcomes to gauge patterns in the effect of global conflict on assets. This approach heavily depends on the significance levels of regressions by essentially making each single regression into an ‘all or nothing’ result. In reality, the outcomes aren’t that black-and-white. Furthermore, when running a large number of regressions, you will always find a number of significant results, due to type-I errors. Evidence from binomial tests and resampling suggest that my most robust results cannot be explained by coincidence alone. However, it is statistically difficult to generalise these findings to the whole asset class, as I cannot estimate the margin of error in the count of significant regression outcomes.

The third limitation of this study is that I am unable to explain, based on the literature, why I find certain anomalous results. The negative effect of global conflict on the volatility of stock indices, and the negative gammas for the conflict omegas for treasury yields and stock indices are particularly unexpected. The theoretical literature which might explain the deviant results is extremely thin, and I have not found another empirical paper with the same outcome. Unfortunately, this study does not show which mechanics drive such unexpected asset market responses.

There are three important directions for future research leading from the paper’s research findings. First, it would be useful to verify the anomalous results with respect to stock index volatilities, and

explain where they come from. It is likely that the result is due to idiosyncrasies of this particular study, but if not, then the result could lead to very impactful insights. It might have significant bearing on the debate amongst political economists on the gains and costs of war, and therefore global integration. Second, the literature should explore more systematically the fundamental relationships between global conflict and asset markets. The vast majority of financial economics papers referred to in this article have been concerned with market dynamics and investor expectations, and to a much lesser extent, with the underlying effect of global conflict on asset classes. The relationship could be much better understood on both sides of the equation: which factors determine whether a conflict is or isn't impactful for the world economy, and which factors determine whether assets are vulnerable to global conflict. An interesting research agenda for the future would be investigating multinationals and how they deal with conflict affecting their international production or sales activities. Finally, the potential of the United Nations in general, and the Security Council in particular, as source for future proxies of (global) conflict, should not be underestimated. There are a number of complications, but several methods to resolve them still remain unexplored. Furthermore, the theoretical motivation in favour of UNSC-based proxies is still valid, and research based on these proxies would be a useful complement to the existing literature.

Appendix A – Database construction

To derive the global conflict proxies, I have a database with information on all United Nations Security Council resolutions from 1994 to 2017. I collected the date, word count, topic, geography, region, an oil dummy and international trade dummy for the involved countries, and incidences for a variety of words and word types. In this appendix I describe this process in some detail.

The first step in the process was downloading all the resolutions from the official UN website. Afterwards I converted them into standard .txt files. Using the imported glob library for Python, I created a list with the directories for all these text files. I then created a loop that goes through the aforementioned list and analyses each resolution in turn.

The first section of this loop cleans the text. The entire document is de-capitalized and all types of interpunction are removed. The text is then split up into a list of words, and all white space is eliminated. After this operation, I was able to extract the word count and the date. The word count is simply the number of items in the words list. Due to the standardized resolution format, the date is always depicted by the 9^{th}, 10^{th}, and 11^{th} word for resolutions after February 28^{th} of 2000, and the 10^{th}, 11^{th}, and 12^{th} word for older resolutions.

The next step was determining the incidence of several categories of words. In order to do so, I looped through each word in the resolution, and compared them to varying conjugations of the words in table 3.2. The incidence of leading verbs in the present continuous and simple present are kept separate, such that I can distinguish between operative and preambulatory clauses. I have counted modifiers in two different ways. First I used a simple method, where I simply took the overall incidence of the words. In a more advanced method, I only included those modifiers which precede or follow a trigger word of the other categories. The reason is that some of the words can also be used in other contexts. For example, S/RES/2206 (2016) reaffirms 'the need for a full and timely implementation of…'. In this context 'full' is not a modifier. Furthermore, according to Gruenberg (2006), modifiers affect a resolution's gravity only in their capacity to adjust the meaning of emotive or instructive words. The incidence of modifiers according to the simple method is 9315; the incidence of modifiers according to the advanced method is 3150. A similar type of ambiguity can occur with '*concern*'. Apart from its definition as 'a feeling of unease or distress', it can also be used as 'to relate to'. I rely on the assumption that the incidence of '*concern*' in its alternative definition is roughly proportional to the word count across resolutions.

At this point, the Python code is able to create an Excel file with all resolutions and their date, word count, and incidences of trigger word categories. By comparing the amount of resolutions in the Excel file to the amount of resolutions on the UN website, I can verify that no manual mistakes were made while downloading the PDF files and converting them to plain text. The next step is to add the topic, geography, region, and oil and trade dummy variables.

UNSC resolutions have no topic in the document itself, but a very brief description is given next to the PDF-link on the UN website. I used these as entries for the topic variable. I could do so by manually copying this description column into my Excel file. The only problem was that some of the dates in the resolutions were different from the publishing date on the website. This misaligned the order of the resolutions, which disallowed me from copy-pasting the column. The reason for the difference in date is that the resolution itself contains its original issue date, while the issuing date on the website (which also determines the order of the resolutions and topics on the website) changes in case of a reissue. Reissues occur irregularly due to technical errors within a resolution. After manually reordering the observations such that the dates were matching, I inserted the topics.

The topic of a resolution always includes the geography that is addressed. I exploited this to generate the entries for the geography variable. I loaded all the topics from the Excel file into Python, and, much similar as I did earlier with the resolutions, looped through them, cleaned the text, and converted each topic into a list of words. The UNSC always formulates the geography as noun rather than adjective, which simplifies textual analysis (e.g. 'crisis in Syria' rather than 'Syrian crisis').

Next up, I created a list with 204 unique countries in our world, and added other geographies which the UNSC often refers to (e.g. Sahara, Great Lakes region, Middle East, or Palestine). Colonies such as the Cayman Islands are treated as separate geographies. After 'cleaning' the geographies from capitals, white space, and interpunction, I split the geography names into single words as well. This was necessary in order to compare them with the words in the topic descriptions, as no single word in the topic description can ever be equal to a geography name with multiple words, such as 'United States of America'. But slicing geography names into single words posed problems as well, as the presence of a part of a geography's name is no guarantee that the resolution is about one specific geography. For example, if a resolution was about the United States of America, it now also seemed to be about the United Arab Emirates, due to the commonality of 'united'. To resolve this issue, I had to eliminate all words that appeared in two or more geography names. This list of 'unwanted' trigger words includes examples such as 'republic', 'north', 'east', 'of', 'the', 'america', 'great', 'democratic', and 'islands'. The downside of this exercise is that some geography names consisted only of 'unwanted' trigger words, and eliminating all of these would eliminate this geography in its entirety. An example is South Korea (linked with South Africa and North Korea). Hence I allowed the least damaging unwanted words into the list such that each geography has at least one trigger word. The result of this concession is that Korea, Congo, and Sudan are each counted as one geography instead of being split in two. I consider this a sufferable error in the database, as a crisis in South Sudan is probably also related to North Sudan.

Of course, not all resolutions of the UNSC are aimed at one specific geography. Some of them address multiple geographies, such as S/RES/2202 (2015) on the dispute between Ukraine and the Russian Federation. In this case, the entry for geography is simply 'ukrainerussian'. Alternatively, there are resolutions which do not address any geography at all. This is the case in 18.5% percent of

the resolutions. Recurring topics of this sort include terrorism, child soldiers, rights of women, and procedural matters. In such cases, the geography is set as 'NA'.

The next variables I constructed were the oil and trade dummies. The idea behind this variable is that conflict in countries with high oil exports or international trade are likely to have a stronger effect on global asset markets. The cut-off for being a trade-intensive country is an average annual value of over 100B dollars; the cut-off for being an important oil exporter is 300k barrels per day. These cut-off values are reverse-engineered, as they lead to appropriate lists of oil- and trade-intensive countries. The oil exports and international trade of a country are not constant over time; for the purpose of this study it was sufficient to base the classification on the average values over the sample period. 31 countries are marked as trade-intensive, and 25 as important oil exporters, but there is some overlap.

The last variable in the database is the region which the geography is part of. The regions used in this study are North America, Latin America, Europe, Africa, Middle East, Central Asia, and Asia-Pacific. The region of a resolution automatically follows from its geography.

Appendix B – Overview of financial assets

Table B.1: Overview of primary asset dataset
This table presents an overview of the primary financial asset dataset. The currencies are based on the WMR closing spot rate benchmarks. The commodity data used in the study are the S&P GSCI total return indices. The stock index returns are based on the MSCI national market indices. The treasury yields are represented by the Thomson Reuters 10-year government bid-rate benchmarks.

Currencies	Commodities	Stock indices	Treasury yields
Algeria	Cocoa	Argentina	Australia
Angola	Coffee	Australia	Belgium
Australia	Copper	Austria	Brazil
Brazil	Corn	Belgium	Canada
Canada	Cotton	Brazil	China
China	Crude oil	Canada	Colombia
Colombia	Gold	Chile	Czech Republic
Czech Republic	Heating oil	China	Eurozone
Ecuador	Lean hogs	Colombia	France
Eurozone	Light energy	Czech Republic	Germany
Hong Kong	Live cattle	Denmark	Greece
Hungary	Natural gas	Egypt	Hong Kong
India	Nickel	Finland	Hungary
Indonesia	Petroleum	France	India
Israel	Platinum	Germany	Indonesia
Japan	Silver	Hong Kong	Ireland
Kazakhstan	Soybeans	Hungary	Israel
Kuwait	Sugar	India	Italy
Malaysia	Ultra-light energy	Indonesia	Japan
Mexico	Wheat	Ireland	Malaysia
Nigeria	Zinc	Israel	Mexico
Norway		Italy	Netherlands
Oman		Japan	Nigeria
Pakistan		Malaysia	Norway
Philippines		Mexico	Pakistan
Poland		Netherlands	Philippines
Qatar		New Zealand	Poland
Russia		Norway	Portugal
Saudi Arabia		Pakistan	Russia
Singapore		Philippines	Singapore
South Africa		Poland	Slovakia
South Korea		Portugal	South Africa
Sweden		Russia	South Korea
Switzerland		Singapore	Spain
Taiwan		South Africa	Sweden
Thailand		South Korea	Switzerland
Turkey		Spain	Taiwan
United Arab Emirates		Sweden	Thailand
United Kingdom		Switzerland	Turkey
Ukraine		Taiwan	United Kingdom
Venezuela		Thailand	United States
Vietnam		Turkey	Venezuela
		United Kingdom	Vietnam
		United States	

Table B.2: Overview of secondary asset dataset
This table presents an overview of the secondary financial asset dataset, which was used for additional analyses. The commodities include a number of categorical S&P GSCI indices, as well as a number of alternative total commodity market indices. The stock indices are the regional MSCI market indices, and the MSCI industry indices.

Commodities	**Stock indices**
Energy	MSCI EM
Precious metals	MSCI World
Agriculture	MSCI AC World
Livestock	MSCI Europe
S&P GSCI TR	MSCI EAFE
MLCX TR	MSCI Pacific
Bloomberg commodity TR	MSCI IT
TR/CC CRB	MSCI Energy
Rogers international commodity TR	MSCI Financials
	MSCI Health care
	MSCI Real estate
	MSCI Industrials
	MSCI Utilities
	MSCI Materials
	MSCI Consumer discretionary
	MSCI Consumer staples
	MSCI Telecommunication services

Appendix C – Main regression outcomes

Table C.1: Overview of assets with significant outcomes in the main regressions
This table provides an overview of the asset series which are found to be significantly affected by contemporaneous global conflict in section 4.2. A positive coefficient for global conflict in a regression is denoted by (+), and a negative coefficient is denoted by (-).

Resolution count				**Modifier count**				**Condemn count**				**Ratio grave over mild**			
Return		*Volatility*		*Return*		*Volatility*		*Return*		*Volatility*		*Return*		*Volatility*	
Currencies															
Indonesia	(+)	China	(+)	Turkey	(+)	Brazil	(+)	Turkey	(+)	Brazil	(+)	Ecuador	(+)	China	(+)
Malaysia	(+)	Venezuela	(+)	Ecuador	(+)	China	(+)	Mexico	(+)	China	(+)	Brazil	(-)	India	(+)
Hungary	(-)	Kazakhstan	(+)	Norway	(-)	S. Africa	(+)	Pakistan	(+)	S. Africa	(+)	Japan	(-)	Russia	(+)
Poland	(-)	India	(-)	S. Arabia	(-)	India	(+)	Ecuador	(+)	India	(+)	India	(-)	Canada	(+)
UK	(-)			Venezuela	(-)	Russia	(+)	S. Arabia	(-)	Russia	(+)	Canada	(-)	Malaysia	(+)
Venezuela	(-)			Kazakhstan	(-)	Canada	(+)	Ukraine	(-)	Canada	(+)	S. Korea	(-)	Colombia	(+)
Kuwait	(-)			Kuwait	(-)	Malaysia	(+)	Venezuela	(-)	Malaysia	(+)	Australia	(-)	Sweden	(+)
						Colombia	(+)	Kazakhstan	(-)	Colombia	(+)	Taiwan	(-)	Hungary	(+)
						Singapore	(+)	Kuwait	(-)	Singapore	(+)	Sweden	(-)	Poland	(+)
						UK	(+)			Norway	(+)	Qatar	(-)	UK	(+)
						Norway	(+)			Ukraine	(+)			Norway	(+)
						Ukraine	(+)			Kazakhstan	(+)			Vietnam	(+)
						Kazakhstan	(+)			Oman	(+)			Kuwait	(+)
						Oman	(+)			Indonesia	(-)			Oman	(+)
						Ecuador	(-)			Philippines	(-)			Indonesia	(-)
						Japan	(-)			Switzerland	(-)			Thailand	(-)
						Indonesia	(-)			UAE	(-)			Venezuela	(-)
						Philippines	(-)			Algeria	(-)			Algeria	(-)
						Switzerland	(-)			Ecuador	(-)			Ecuador	(-)
						UAE	(-)								
						Algeria	(-)								
Commodities															
Heating oil	(-)	Live cattle	(+)	Nickel	(-)	Live cattle	(+)			Live cattle	(+)			Corn	(+)
		Sugar	(+)			Copper	(-)			Nickel	(-)			Wheat	(+)
						Cocoa	(-)			Cocoa	(-)			Cocao	(-)
						Cotton	(-)			Cotton	(-)			Heating oil	(-)
						Heating oil	(-)			Heating oil	(-)				
						Natural gas	(-)			Natural gas	(-)				
Stock indices															
Pakistan	(-)	India	(-)			Italy	(+)			Italy	(+)	USA	(-)	Italy	(+)
						Austria	(+)			Austria	(+)	Brasil	(-)	Spain	(+)
						Portugal	(+)			Portugal	(+)	Turkey	(-)	Austria	(+)
						USA	(-)			USA	(-)	Korea	(-)	Ireland	(+)
						China	(-)			China	(-)	Chile	(-)	Brasil	(-)
												Czech Rep	(-)	Turkey	(-)
						Brazil	(-)			Brasil	(-)				
						India	(-)			India	(-)	Finland	(-)	Korea	(-)
						Turkey	(-)			UK	(-)	Pakistan	(-)	Mexico	(-)
						Indonesia	(-)			Turkey	(-)			Taiwan	(-)
						Korea	(-)			Indonesia	(-)			Malaysia	(-)
						Mexico	(-)			Korea	(-)			Philippines	(-)
						Taiwan	(-)			Mexico	(-)			Russia	(-)
						Canada	(-)			Switzerland	(-)			Singapore	(-)
						Malaysia	(-)			Taiwan	(-)			Thailand	(-)
						Philippines	(-)			Canada	(-)			Colombia	(-)

			Russia (-)		Malaysia (-)		Czech Rep (-)
			Singapore (-)		Philippines (-)		Hong Kong (-)
			Thailand (-)		Russia (-)		Pakistan (-)
			Chile (-)		Singapore (-)		Poland (-)
			Colombia (-)		Thailand (-)		
			Sweden (-)		Chile (-)		
			Czech Rep (-)		Colombia (-)		
			Finland (-)		Sweden (-)		
			Hong Kong (-)		Czech Rep (-)		
			Hungary (-)		Netherlands (-)		
			Pakistan (-)		Hong Kong (-)		
			Poland (-)		Finland (-)		
			Israel (-)		Hungary (-)		
			New Zealand (-)		Pakistan (-)		
					Poland (-)		
					Israel (-)		
					New Zealand (-)		
Treasury yields							
Brasil (-)	Ireland (+)	Belgium (-)	Australia (+)	Eurozone (-)	Australia (+)	Taiwan (+)	Australia (+)
Philippines (-)	Venezuela (+)	Eurozone (-)	Belgium (+)	France (-)	Belgium (+)	Pakistan (-)	Belgium (+)
	Vietnam (-)	France (-)	Canada (+)	Germany (-)	Canada (+)		Canada (+)
		Germany (-)	Czech Rep (+)	Italy (-)	Czech Rep (+)		Czech Rep (+)
		Ireland (-)	Eurozonze (+)	Netherlands (-)	Eurozonze (+)		Eurozonze (+)
		Netherlands (-)	France (+)		France (+)		France (+)
		Switzerland (-)	Germany (+)		Germany (+)		Germany (+)
			Greece (+)		Greece (+)		Greece (+)
			Hungary (+)		Hungary (+)		Hungary (+)
			Hong Kong (+)		Hong Kong (+)		Indonesia (+)
			Ireland (+)		Ireland (+)		Ireland (+)
			Italy (+)		Italy (+)		Italy (+)
			Japan (+)		Japan (+)		Japan (+)
			Korea (+)		Korea (+)		Korea (+)
			Netherlands (+)		Netherlands (+)		Netherlands (+)
			Norway (+)		Norway (+)		Norway (+)
			Paksitan (+)		Paksitan (+)		Philippines (+)
			Philippines (+)		Philippines (+)		Portugal (+)
			Poland (+)		Poland (+)		Singapore (+)
			Portugal (+)		Portugal (+)		Slovakia (+)
			Singapore (+)		Singapore (+)		Spain (+)
			Slovakia (+)		Slovakia (+)		Sweden (+)
			S. Africa (+)		S. Africa (+)		Switzerland (+)
			Spain (+)		Spain (+)		UK (+)
			Sweden (+)		Sweden (+)		US (+)
			Switzerland (+)		Switzerland (+)		China (-)
			Thailand (+)		Thailand (+)		Israel (-)
			UK (+)		UK (+)		Nigeria (-)
			US (+)		US (+)		Vietnam (-)
			China (-)		China (-)		
			Malaysia (-)		Malaysia (-)		
			Nigeria (-)		Nigeria (-)		
			Venezuela (-)		Venezuela (-)		
			Vietnam (-)				

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