The Economic Effects of Violent Conflict: Evidence from Asset Market Reactions

Massimo Guidolin

Manchester Business School, MAFG, and Federal Reserve Bank of St. Louis

Eliana La Ferrara

Bocconi University, IGIER

This version: January 2010

This article studies the effects of conflict onset on asset markets applying the event study methodology. The authors consider a sample of 101 internal and inter-state conflicts during the period 1974-2004 and find that a sizeable fraction of them has had a significant impact on stock market indices, exchange rates, oil and commodity prices. This fraction is inconsistent with pure chance, i.e., with the selected probability of type-I errors in our tests of statistical significance. The results suggest that, on average, national stock markets are more likely to display positive than negative reactions to conflict onset . When the authors distinguish between internal and inter-state conflicts, they find that the fraction of significant results is higher for international conflicts. When the authors classify events according to the region where they occur, they find that Asia and the Middle East are the regions where conflicts tend to have the strongest effects. Finally, the article reports evidence that abnormal returns would have accrued to investors systematically exploiting conflict onset to implement conflict-driven strategies. Results are robust to selecting a subset of high-intensity conflicts and to expanding the time window over which conflict events are defined. The findings of the paper confirm the economic importance of the effects of conflicts on asset markets.

JEL codes: G14, P16.

Keywords: conflict, civil war, event study, asset markets, stock prices

Introduction

The relationship between civil war and economic performance has recently come to the forefront of the economic debate (for a survey, see Blattman & Miguel, 2009). The growing interest in the economic causes and consequences of civil wars has spurred a large number of studies both in political science and in economics. Some of these studies explore the factors that affect the likelihood of conflict onset and duration (e.g., Collier & Hoeffler, 1998, 2004; and Montalvo & Reynal-Querol, 2005); other studies find a negative relationship between political instability and investments (e.g., Alesina & Perotti, 1996; and Svensson, 1998). A common approach of these studies is to rely on cross country regressions in which dummy variables for the presence of conflict in a given country at a given time are correlated to investment rates, economic growth, natural resource endowments, and many other variables. One criticism often addressed to this approach is the difficulty in identifying a causal relationship between the occurrence of conflict and the variable(s) of interest.

The purpose of our article is to effectively narrow down the analysis of the economic consequences of wars to a context where the endogeneity problem is relatively easier to address, namely the relationship between the *onset* of violent conflict and investors' perceptions as measured by *asset market reactions*. In fact, it seems appropriate to think that civil wars and other conflict-related events are hardly caused by oscillations of asset prices in regulated markets. By asset markets we mean not only stock markets, but also the markets in which currencies, standardized commodities (e.g., oil and agricultural products), and futures contracts are traded. We do this by relying on a methodology that is widely applied in finance, but seldom employed in the conflict literature: the event study approach.

Our goal is twofold. First, we use the event study methodology to provide original empirical results on the effects that the onset of war has on stock market indices, exchange rates, oil, and commodity prices. Second, we investigate whether the effects of conflicts on key financial variables could have been used to produce abnormal investment profits from strategies that systematically buy or sell assets based on their average reactions to typical conflict events. We also document that results are robust to selecting a subset of high-intensity conflicts and to expanding the time window over which conflict events are defined to possibly capture early changes in expectations.

We find that event studies highlight some significant patterns. First of all, on average, national stock markets are more likely to display positive than negative reactions to conflict onset. The US stock market is the one that displays the strongest reactions, producing positive abnormal returns in correspondence to 12% of the conflict events investigated. Because in the article we use statistical tests of 5% size, only 5% of the significant coefficients may be imputed to chance. When we

distinguish between internal and international conflicts, we find that in general the fraction of significant results is higher for international than for internal conflicts, in both directions. When we classify events according to the region where they occur, we find that location in the Middle East is very important for commodity indices including oil prices: 73% of the conflict onsets occurring in this region have an impact on oil futures that is significantly different from zero (46% negative and 27% positive). Finally, we find remarkable evidence that abnormal returns would have accrued to investors systematically exploiting conflict onset by buying and selling assets.

This article is related to several recent contributions that have explored the economic effects of civil conflicts. Some studies apply the event study methodology to firm-level data and study how the stock prices of different firms respond to conflict in the regions where they operate (see e.g., Abadie & Gardeazabal, 2003 on conflict in the Basque region and Guidolin & La Ferrara, 2007 on conflict in Angola).

Another set of studies focuses on financial indicators as opposed to firm-level data, and explores either the effect of the risk of war *ex ante*, or the consequences of differing intensities in conflict *ex post*. Among the former, Rigobon & Sack (2005) study the reaction of US financial indicators to war risk between January 2003 and March 2003, when the second Iraqi war became imminent. They find that increases in the level of war risk are associated to lower Treasury yields, lower equity prices, higher oil futures prices, and a fall in the dollar. Leigh, Wolfers, & Zitzewitz (2003) and Wolfers & Zitzewitz (2009) investigate the reaction of oil and stock prices to war-related news using prediction markets; Amihud & Wohl (2004) distinguish between the effects of a probability increase before and after the outbreak of the Second Gulf war on 20 March 2003. Hall (2004) uses Swiss exchange rates during World War I to extract information on expectations about the resolution of the war. Chen & Siems (2004) apply the event study methodology to study the response of US and other global capital markets to 14 terrorist and military attacks in the 20th century. Schneider & Troeger (2006) study the reactions of three stock market indices (Dow Jones, FTSE and CAC) to the intensity of conflicts in Iraq, Israel and in the former Yugoslavia in the period 1990-2000. Finally, Willard, Guinnane & Rosen (1996) rely on financial market reactions to identify which events during the US Civil War were regarded as turning points.

One first dimension in which our article differs from the existing literature is the methodology: we rely on event studies rather than on GARCH model-based filtered measures of risk (volatility) because we are not dealing with high frequency data (we use weekly and not daily data), hence the problems of time dependence in the variance are less serious. Our work also differs from the studies mentioned above because it considers a much broader set of conflicts, namely, all the conflicts for which the initiation can be dated in a precise week in the period 1971-2004. For this purpose, we use data on conflicts from the PRIO-Uppsala Armed Conflict Dataset version 4-2008 that can be

assigned with high precision to a week within our sample period.

Moving away from case studies obviously has a cost, and that is the lack of precision on the daily evolution of the conflicts. Our indicator for the onset of conflict corresponds to the official starting date, and this is inevitably more or less accurate depending on the occurrence of previous events and on the degree to which a war was anticipated. However, it should be noted that these effects and measurement issues should bias our results towards finding *no effect* of a conflict on asset prices, in the sense that when the conflict was perceived to be initiated by other events, the official starting date should contain no new information for market participants. To the extent that we do find significant effects, this can be interpreted as a signal that markets learn something in the week in which a war officially starts: the new information may be simply that the probability of conflict occurrence has increased from a positive (possibly high) value to one, or it may relate to the aggressiveness of each party and how long the conflict is going to last. On the other hand, using a large sample has the advantage of allowing us to draw general conclusions. In this sense, we see our choice of conducting an event study analysis on the broadest possible set of conflicts for which political and financial data can be matched as the closest correspondent to the cross-country regressions on which much of the current debate has been based.

The remainder of the article is organized as follows. We first present a simple theoretical framework with predictions for asset market reactions to conflict news. Then we illustrate our empirical strategy and data sources. The next section contains our first body of empirical results. After that we perform a simulated investment experiment to test whether the reaction of asset prices to conflict news may have been exploitable. We conclude in the final section.

Theoretical framework

The goal of our empirical exercise is to measure the effects of official conflict onset by looking at *investors' reactions*. Such a task is of importance not only to financial economists, but also to political scientists who may be interested in assessing both the ability of asset markets to *predict* situations of political tension (see e.g., Chan & Bobrow, 1981) and the *effects* of conflicts on expectations and the process of capital accumulation. If security prices reflect the present discounted value of the long-run stream of cash flows generated by an asset, the measurement of the economic effects of conflict onset can be performed by looking at changes of asset prices that occur in connection with such events. As we shall conduct our analysis on several asset markets, in what follows we develop some predictions regarding the effects we expect to find and we address the question of why asset markets can react differently to the same news.

Let us start from the fact that all assets carry a positive value insofar as they will produce positive, possibly uncertain, future cash flows. Such cash flows take the form of an explicit monetary

payment in the case of financial assets: stocks pay uncertain dividend streams, bonds pay coupons, etc. For non-financial assets, cash flows take the form of future production or consumption uses: for instance, a futures contract on coffee beans delivers a predetermined quantity of the commodity at a later date which can be used in industrial production; the value of future availability of the commodity may be identified with the stream of net revenues in production. In all cases, future cash flows need to be discounted to the present in order to find the price of an asset. The discount rate is best seen as time-dependent and uncertain, to reflect the underlying riskiness of the cash flows discounted, i.e., it will generally incorporate a risk premium that reflects the risk aversion of market participants.

We can summarize these considerations in the following pricing formula for a generic asset characterized by future, uncertain cash flow stream $\{C_{t+j}\}_{j=1}^{H}$:

$$P_t = \sum_{j=1}^{H} \frac{E_t\left[C_{t+j}\right]}{\prod_{j=1}^{H}\left(1 + r^f + E_t\left[\pi_{t+j}\right]\right)}, \tag{1}$$

where $E_t[\cdot]$ denotes the expectation operator conditional on $\Im_t$, that is the information available at time t, r^f is the riskless interest rate, and $\pi_{t+j} \geq 0$ is the future, uncertain risk premium required on the asset. The investment horizon H can be arbitrarily large.

A piece of news like the onset of a conflict consists of a change in the information set $\Im_t$, i.e. an update from $\Im_{t-1}$ to $\Im_t$. The news will affect the price of the asset through two channels: the sequence of expected future cash flows $\{E_t[C_{t+j}]\}_{j=1}^{H}$ is updated; the sequence of future risk premia $\{E_t[\pi_{t+j}]\}_{j=1}^{H}$ also gets updated. This may imply a change in the price of the asset, $\Delta P_t \equiv P_t - P_{t-1}$.

Consider now two different assets A and B, for example two national stock market indices. Three implications can be drawn from the simple formula above regarding the effects of political news. First, ΔP_t^A and ΔP_t^B may differ when either $E_t[C_{t+j}]$ or $E_t[\pi_{t+j}]$ react differently to the news. Second, these differences need not regard cash flows to be *immediately* received, but can refer to any period between t and H. Third, changes in prices need not reflect *objective* changes in either fundamentals (cash flows) or riskiness of the two assets, but may reflect changes in the *expectations* of these quantities. A *perception* that the impact might be heterogeneous is more than sufficient to cause ΔP_t^A and ΔP_t^B to differ. It is therefore crucial to understand what factors affect investors' *expectations* on the effects that an event – e.g., the onset of a conflict – may have on future cash flows or risk premia. Any variable affecting the likelihood that a conflict is resolved quickly should play an important role, as well as variables that help predict the intensity of the conflict and the extent of disruption that it may bring to productive activities.

A few examples may be relevant to the analysis that follows. These also represent a set of

predictions on the likely effects from conflict onset on asset prices:

- In the measure in which international (inter-state) conflicts involve (almost by construction) the general macroeconomic conditions of multiple countries and therefore of many governments and firms, it is likely that the effects of a given conflict may be on average larger for international conflicts than for internal ones. This effect goes through both changes in future, expected risk premia ($\{\Delta E_t[\pi_{t+j}]\}_{j=1}^{H}$) and changes in future predicted cash flows ($\{\Delta E_t[C_{t+j}]\}_{j=1}^{H}$). Additionally, it is sensible to expect that major reactions will be observed in the asset prices expressed by the markets of the countries directly involved in any conflicts.[1]
- It is possible to observe small or no reaction of asset prices ($\Delta P_t \geq 0$) even though the onset of a conflict has powerful effects on both risk premia and cash flows. When the event causes changes of future expected risk premia and cash flows that move in the same direction, because (1) is a ratio, $\Delta P_t \cong 0$ may obtain. For instance, if a national stock market perceives a war outbreak as bad news for firm future cash flows (i.e., the war will cause lower profits) but also as a reason to induce a recession that lowers future risk premia (e.g., as an effect of de-leveraging which is typically of recessions), then it is possible for stock prices not to react to war news.
- If a basket of financial assets contains claims on the profits/revenues from economic activities that in any way (directly, like in the case of weapon sales, or indirectly) may benefit from the onset of conflict situations internationally or in specific regions of the world, then – because in this case the effects of $\Delta E_t[C_{t+j}] > 0$ is likely to out-weight any possible change of expected risk premia in the same direction – we are likely to observe the price of that basket to positively react to conflict news.
- In the case of assets traded in a country whose macroeconomic stability strongly depends on foreign supply of raw materials and commodities (such as oil and food), oil conflicts localized in countries/regions which are net exporters of such goods are likely to cause diminished forecast of future output in the importing countries ($\Delta E_t[C_{t+j}] < 0$) as well as increased of future risk premia ($\Delta E_t[\pi_{t+j}] > 0$), with the result that stock prices should decline.
- When the effects of a conflict that breaks out at time t are already anticipated in earlier time periods $\tau < t$ (i.e., the changes $\Delta E_\tau[C_{\tau+j}]$ and $\Delta E_\tau[\pi_{\tau+j}]$ occur in earlier periods and fail to exactly compensate each other), we could witness a gradual run-up or decline in prices between τ and t, with the result that even though ΔP_τ may display a trend for $\tau < t$, $\Delta P_t \cong 0$ may still

[1] However the presence of multinational firms with relevant operations in many countries may alter this basic prediction and cause large reactions in asset prices in countries and markets not directly affected by a conflict.

occur.

- When an asset is demanded and supplied as a function of material production needs and/or of actual extraction and farming, then its price behavior will be more predictable and less prone to volatility caused by simple revisions in expectations. For instance, the effect of conflict-related events should be stronger for future prices than for spot prices, because the latter are by construction more strongly determined by physical supply and demand. Additionally, when political events occur during periods in which there are strong changes in the demand and/or supply dynamics of commodities and goods, it is conceivable that while the price of financial assets may strongly react to news, the effect on commodity prices may be weaker and the two types of assets may also move in opposite directions.

We attempt to test these hypotheses/restrictions with reference to the conflict events described and classified in the following section.

Empirical strategy and data

Event study methodology

To investigate the above questions we rely on the event study methodology (see the survey in Campbell, Lo & MacKinlay, 1997) and Web Appendix A1 to this article for a detailed description of this methodology). In our case this involves estimating the following market model:

$$r_t = \alpha + \beta r_t^I + \varepsilon_t, \tag{2}$$

where r_t is the rate of return on an asset, r_t^I is a general market index, ε_t is a white noise error term and α, β are unknown parameters to be estimated. Denoting with t_0 the date of the event, (2) is estimated using a set of observations preceding the event, and the estimated residuals are calculated over an *event window* $[t_0 - k, \quad t_0 + k]$, i.e. for a number of days around the event date. Specifically, the residuals of interest – called *abnormal returns* – are calculated as:

$$e_t \equiv \hat{\varepsilon}_t = r_t - \hat{\alpha} - \hat{\beta} r_t^I \qquad t = t_0 - k, ..., t_0 + k \tag{3}$$

where $\hat{\alpha}, \hat{\beta}$ are the estimates obtained over an *estimation window* $[t_0 - k - T, \quad t_0 - k - 1]$ which precedes the event window and has a length of T periods.

Since the objective is to quantify the *overall* impact on asset prices, it is common practice to focus on the cumulant of the abnormal returns (3) over the event window, the cumulative abnormal return (CAR):

$$CAR \equiv \sum_{t=t_0-k}^{t_0+k} e_t. \tag{4}$$

$CAR > (<) 0$ is suggestive of a positive (negative) impact of the event at time t_0 on asset prices. To make sure that $CAR \neq 0$ is not due to pure chance, it is standard practice to formally test the null

hypothesis *CAR*=0 against a two-sided alternative.

An alternative approach – which we refer to as 'dummy regression approach' – consists of estimating a set of regressions in which the event dates are represented by dummy variables and the full sample is used. Denote with τ the full length of the sample and consider the following market model:

$$r_t = \alpha + \beta r_t^I + \gamma I_t + \varepsilon_t \qquad t = 1,...,\tau \tag{5}$$

where ε_t is white noise and I_t is an indicator variable that takes value 1 over the event period and zero otherwise. In the above formula, γ measures the impact of the event on asset returns. A test for whether the event had a significant effect on asset returns simply amounts to a *t*-test of whether the estimated parameter γ is zero or is significantly different from zero.

Data sources

In our empirical analysis we use weekly data from February 1971 to December 2004. We combine data on political events with data on stock and commodity prices. In what follows we briefly describe our variables and the criteria for coding political events.

Financial data

Our financial indicators include, first of all, MSCI (Morgan Stanley Capital International) stock indices for the World, the US, UK, France and Japan. We also use the trade-weighted exchange value of the US dollar versus major currencies; and the prices of oil, gold, and the Goldman Sachs general commodities and agricultural commodities indices. In particular, the Goldman Sachs agricultural commodities spot index refers to cocoa, coffee, corn, cotton, soybeans, sugar, and wheat. The general index includes weekly prices for energy (natural gas and petroleum), agricultural goods, precious metals, and industrial metals commodities.

Performing tests on *futures* prices is particularly important in the case of oil and gold, since most of the speculative trades – more susceptible to be driven by revisions of beliefs triggered by political events – take place in the futures segments and not in the spot markets where demand mostly satisfy production/consumption needs. Oil prices are taken from the Wall Street Journal and correspond to the closing settlement price on one-month future contracts written on West Texas Intermediate Oil reserves. The gold price is the closing price of six-month futures contracts and is also compiled from the Wall Street Journal.

Conflict data

For information on political events, we rely on the PRIO-Uppsala Armed Conflict Dataset 4-2008 (ACD) and retain conflict episodes for which onset can be attributed to a precise week.[2] No other

[2] In particular, we retain conflicts for which the start date is known with precision equal to 1 or 2 in the ACD. For six conflicts that were not dated to a precise week in ACD, we were able to find the start date through other sources. These are detailed in section A2 of our Web Appendix. Our results are robust to the omission of these six conflicts.

selection criteria were applied, i.e., all ACD conflicts in the period 1971-2004 were retained. In our empirical analysis we also consider the subset of conflicts with 'intensity' equal to 2 in ACD, which basically involves conflicts for which the estimated number of casualties exceeds 1,000. Our full sample consists of 101 episodes. Of these, 72 can be classified as internal, that is, they involve a government and some internal opposition without external interventions. The remaining 29 episodes pertain to what we loosely define as international conflicts, and they include what the ACD classifies as extra-systemic, interstate and internationalized conflicts. A full list of the conflicts in our sample and of their main characteristics is provided in a Web Appendix (A2, Table A1), together with summary statistics on the type and location of the conflicts (A2, Table A2).

The average conflict lasts slightly less than 6 years, with 41% of the conflicts lasting less than 1 year. International conflicts – defined as the ones that involve two or more countries – tend to be resolved faster (their average duration is 3.6 years and 55% of them are resolved in less than a year) than internal conflicts, which have average duration of 6.9 years and for which only 35% of the conflicts is resolved in less than a year. More than one third (39%) of the conflicts involve African countries, followed by Asia (including the Middle East, 31% ?), and Europe (because of the fall-outs from the fragmentation of the former Soviet Union, 19%).

Importantly, a large portion of the conflicts do not have a major economic or financial motivation, and involve countries whose international weight, economic and political, is not very high. This rules out the possibility that conflicts may be triggered by the very dynamics of asset prices, which restricts the link we investigate to be a causal one. Also, for the same reason, ex ante one would not expect a large number of significant impacts on asset returns, at least in the aggregate.

Results

In this section we present our results in three steps. We start with an illustration of the event study methodology taking as a case study the second war against Iraq. This echoes the recent interest in part of the literature, see e.g., Leigh, Wolfers & Zitzewitz (2003) and Amihud & Wohl (2004). Moreover this allows us to present a graphical analysis as well as formal testing and to convey the flavor of the approach that we have applied to all 101 conflict episodes in our sample. We next present the results of this more comprehensive analysis, aggregating different episodes depending on the categories defined above. Finally, we report a series of estimated dummy regressions to see what results emerge when we use the full sample.

A case study of the Iraqi War

It is useful to start by illustrating the event study methodology through an example: the invasion of Iraq on 20 March 2003 by the United States and a US-led coalition. For this purpose, we select the week ending on 21 March 2003 as our event window and use an estimation window of 100 weeks

before the onset of the conflict. We then test whether the cumulative abnormal returns (CAR) recorded on a number of asset markets during the week of the event were significantly different from zero, and we report graphs with the evolution of the CAR in the five weeks before and after the event. The vertical lines in the figures correspond to the week in which the event (conflict onset) took place. Zero abnormal return lines are provided for readability.

INSERT FIGURE 1 ABOUT HERE

Starting with the performance of the stock market indices, the evolution of the CAR for the MSCI World index in Figure 1 shows a striking effect: the cumulative abnormal increase during the week ending 21 March calculated over the five preceding weeks is 10 percentage points, which is a huge overall return in financial terms. This is significant at the 1 percent level. Clearly, global investors perceived the official initiation of this conflict as good news despite the fact that it was not totally unanticipated (see e.g., Amihud & Wohl, 2004). An overall positive effect also emerges for individual stock markets although this impact is not always statistically significant (see Figure 2).

Figure 3 shows the impact of the event on other assets. Panel A reports the results for commodity markets: the cumulative effect is negative for both for the overall and for the agricultural commodity indices, reaching a decline of 16 percentage points for the Goldman Sachs commodity index, compared to the five preceding weeks. The most sensible interpretation of this negative effect is that the arm wrestling between Saddam Hussein's regime and the international community might have caused an excess demand motivated by the desire to build up commodity stocks and escape pessimistic but extreme scenarios (e.g. non-conventional war tactics on either sides): when such fears dissipate and the war is actually initiated, the excess demand disappears and commodity prices fall.[3]

INSERT FIGURE 2 ABOUT HERE

INSERT FIGURE 3 ABOUT HERE

The most severe drop is experienced by oil futures. In Panel B the CAR on oil future contracts was negative and about 34 percentage points in magnitude during the week of the conflict, when calculated with reference to the two preceding weeks; this effect is significant at the 1 percent level and qualitatively consistent with the results in Amihud & Wohl (2004). Clearly, investors interpreted

[3] However, it is remarkable that on the day of initiation of the conflict, a number of commodity price indices actually increased. These effects are measured and discussed in the section for dummy regression approach.

the initiation of a conventional, limited Iraqi War as an indication that the world's oil production would be affected on a limited scale only, thus curbing both speculative pressures and the tendency to hoard (i.e. to anticipate the timing of future, expected purchases). However, on the day the conflict was initiated, the oil futures shoots up to then resume its downtrending course in the following days.

Finally, Panel C of Figure 3 shows the evolution of the Gold futures index and of the trade-weighted dollar exchange rate. While there does not seem to be any statistically significant impact on futures gold prices (which decline very sluggishly), the effect is markedly positive and significant for the dollar, as also reported by Amihud & Wohl (2004). Again, this suggests that markets viewed the initiation of the conflict as positive for the US economy, possibly suggesting a war rally effect.

Overall, our results from this event study differ from those of Rigobon & Sack (2005) and Wolfers & Zitzewitz (2009), who find positive effects on oil prices and negative effects on the dollar. However, their analysis is *ex ante* and regards the perceived risk of war, while ours is *ex post* and reflects market reactions to how the *actual* initiation of the war (and possibly the evolution over the first few days of the conflict) would affect financial variables, as in Amihud & Wohl (2004).

A large sample event study: summary of results

In this section we summarize the results of the complete set of event studies that we conducted, reporting the percentage of cases in which the null of no effect of the conflict was rejected against the alternative of negative or positive effects. We discuss here the tests significant at the 5 percent level, using a one-week event window and an estimation window of 100 weeks before the onset of the conflict. The next section performs robustness checks concerning these choices and deals with potential issues with the fact that a portion of our conflicts may have been anticipated.

Table I reports our results on MSCI stock market indices (Panel A) and on commodities (Panel B). The numbers in the table represent the percentage of cases in which the null of no effect is rejected against the alternative of negative (columns '<0') or positive (columns '>0') effect. Since we are using tests of 5% size, only 5% of the significant coefficients may be imputed to chance.[4] For readability, we have therefore bold-faced all instances in which our estimated percentages exceed 5%. Also, to visually detect the sign of the most common pattern of reactions, we have shaded the cells corresponding to categories of events for which the incidence of positive reactions was strictly greater than that of negative reactions.

[4] Notice that in a classical statistical framework, conclusions ought to be drawn by comparing the fraction of significant cases reported in the text with the size of the tests implemented (i.e., the probability of a type-I error of incorrectly rejecting the null hypothesis of no impact, while true). By construction, such comparison is not amenable to any straightforward computation of standard errors or further significance levels. We attempt in the robustness check section to establish the economic significance of the portfolio implications of conflict events.

INSERT TABLE I ABOUT HERE

Starting from the full set of conflicts (first line in Panel A), we see that the incidence of positive reactions always exceeds 5%, and that in all cases but for the Japanese stock index the share of positive reactions is strictly greater than that of negative ones. This is what one would expect if conflict episodes led to higher expected future profits and/or lower uncertainty (implying less penalizing discount factors). In fact, what depresses equity valuations is often the uncertainty that precedes a conflict, not the onset of the conflict itself. The case study in the previous section provides specific evidence on one such episode.

A second result that emerges from Panel A of Table I is that the US market seems to be the one that reacts the most, with 7.8% of the cases being negative and 11.8% being positive. This can be rationalized in several ways. First, the US – in their quality of leaders in the consumption and transformation of both energy and raw materials – are a country whose macroeconomic stability strongly depends on foreign supplies, so that any disruption to the international system of trading patterns may easily cause major reactions. Second, a large proportion of multinational corporations are traditionally listed on the US market, which makes the US stock market particularly reactive to international conflicts. Third, over time the bulk of the speculative activity has moved towards the most efficient financial centers (the NYSE and the NASDAQ), while scores of companies not located in the United States have elected to be listed either in the US, or to issue synthetic securities (ADRs) that represent stock certificates issued outside the US. Finally, especially since the mid-1980s, the US has been involved in a non-negligible number of international conflicts, often with the objective to police complex disputes. This creates a direct link between conflicts and the perspectives (e.g. budget deficits) of the US economy. While some of these motivations may also apply to other stock markets, the concomitance of all these factors is quite unique of the US and helps explain the greater reactivity of its stock market index.

When we distinguish between internal and international conflicts (second and third line in Panel A), we find that in general the fraction of significant results is higher for international conflicts. This finding can be rationalized observing that international conflicts involve the general macroeconomic conditions of multiple countries, governments and firms. As in the full sample, the US index is the one that yields on average the highest proportion of significant results, reacting to both internal and international conflicts.

Next, we distinguish conflicts based on the region where they occur, namely, Africa, Asia, America, Europe, and the Middle East. The US stock index is most reactive to conflict episodes in Latin America, which is not surprising given the high degree of involvement of US corporations in this region (see, e.g., Dube & Kaplan, 2009). Interestingly, the UK, France and Japan markets tend to

display systematically positive reactions to conflict onsets in Africa. This may reflect the fact that some of these stocks represent claims on the profits/revenues from economic activities that may benefit from the onset of conflicts, similarly to the African case study on Angolan diamonds in Guidolin & La Ferrara (2007).

In panel B of Table I we report analogous results for several commodities, oil, gold and the dollar exchange rate. Our goal is to understand whether these prices respond to perceived shortages that may follow a conflict or, in the case of gold and the dollar, whether they act as safe-havens. For the overall commodity index we still find that in the aggregate the incidence of positive reactions exceeds that of negative ones. It is also the case that international conflicts tend to generate more reactions, especially in the dollar exchange rate.

In terms of location, conflicts occurring in the Middle East are the ones with the greatest impact on commodity prices, especially on oil futures. Strikingly, over 45% of conflict onsets in this region have a negative and significant impact on oil futures. In this literature, 45% is certainly a large, impressive fraction. This effect is consistent with the one we found in our case study (as in the previous section), and confirms a generalized tendency of market participants to hoard in the face of uncertainty regarding future oil supplies. When conflicts in the Middle East are actually initiated, the excess demand motivated by speculative pressures disappears and oil future prices fall.

We also notice that international conflicts tends to cause massive, positive reactions from the weighted (vs. a basket of other currencies) dollar exchange rate index. This is consistent with the typical view of the US dollar as a 'safe haven' asset, in the sense that during periods of higher uncertainty on the state of the international relationships that normally *precede* the onset of international conflicts, investors from all over the world would hoard substantial amounts of short-term US dollar deposits (if not even cash per se), which cause the dollar to appreciate, on average. Once the conflict erupts, most of the uncertainty finds resolution and the dollar exchange rate tends to drop, on average.

We also analyzed our results in relation to conflict intensity, where the latter is proxied by conflict duration and the estimated number of casualties. In general, we find that the longer is the duration of a conflict, the higher is its probability of causing a statistically significant impact on asset returns. No systematic pattern emerges with respect to number of casualties. However, we find these findings difficult to interpret as both the duration and the number of casualties come to be realized ex post, and may have been difficult to predict at the moment of conflict onset (which is when we measure asset market reactions).

Finally, in the Web Appendix to this article (A3, Table A3) we report the results of a conflict-by-conflict analysis where, for each conflict onset, we computed how many times the event study gave evidence of a statistically significant CAR. To limit the amount of information contained in the table, in this case we focus on high-intensity conflicts. We found that, conditional on a significant

effect being produced, each event affects on average more than 3 markets/asset types.[5]

Dummy regression approach

We supplement the evidence reported above by performing a few full-sample, regression-based analysis using the dummy approach described in our methodology section. Table II reports results of regressions where our dependent variable is the weekly stock index abnormal return predicted from a market model in which the national stock index is regressed on the MSCI World index. Results for commodities are qualitatively similar and therefore omitted, but they are available upon request.

Table II exploits the structure offered by a multivariate regression to use a few variables as control variables. In particular, besides regressing abnormal financial returns on a set of conflict dummies, we also use colonial dummies and distances as additional explanatory variables. Colonial dummies are set to one when a conflict involves one or more countries that have had historical colonial ties with the country (practically, UK or France) in which a financial market is located. No cases of colonial ties to Japan or the US could be identified. Distance is computed as the geodesic distance provided by CEPII (in thousands of kilometers) between the location of a given financial market and the capital of the countries involved in the conflict; averages are used with reference to conflicts in which more than one country/location are involved.

INSERT TABLE II ABOUT HERE

The most notable result in Table II is that US abnormal stock returns positively and significantly react on average to conflict news. This holds both when we group all conflicts (column 1) and when we distinguish internal and international conflicts (column 2), and is consistent with the results of the event study analysis in table II. In the aggregate, the magnitude of the increase is 1.4 percentage points on a weekly basis, which is non-negligible given that we are looking at abnormal returns in excess of what is explained by their average co-variation with a market index. Interestingly, the effect gets smaller as the distance of a conflict to the heart of the US financial system increases (columns 1 and 2), consistent with the fact that conflict episodes in the Americas and in Europe have the strongest positive impact (column 3).

An overall positive and significant effect is also found for UK abnormal stock returns, but not for France and Japan. When the estimation results are disaggregated on the basis of the location of the conflict, the coefficients tend lose statistical significance. Two notable results are the positive

[5] An interesting point made by one referee was that asset markets may react not to the news of conflict onset per se but to expected policy reactions (e.g., the imposition of arms embargoes). To address this point, we collected the dates of imposition of all UN arms embargoes, as well as all US unilateral embargoes. The mean delay between the onset of conflict and the embargo imposition is 7.2 years, the median delay is 4 years. Given these findings and given our choice of (very short) event windows, while we cannot in principle exclude that asset price reactions reflect policy changes, we think that this is unlikely to be driving our results.

reaction of the US stock index (negative for the other indices) to conflicts in Latin America, and the positive reaction of the Japanese index to conflicts in Asia.

Further Analysis and Robustness Checks

Event selection

For the main results we chose to rely on the largest possible set of conflicts whose initiation could be dated to a precise week in the PRIO-Uppsala Armed Conflict Dataset. This has the advantage of yielding a large sample that can be disaggregated into subsets (e.g. type of conflict or location), and also avoids possible arbitrariness in selection criteria. But it also has a disadvantage, namely that of grouping conflicts of worldwide resonance with some of relatively minor importance. To address the last point, we repeated our analysis on a subset of conflicts that are classified as high-intensity ('intensity' score equal to 2) in the ACD. This typically amounts to considering conflicts that resulted in more than 1,000 battle deaths.

The results if this analysis are reported in the Web Appendix to this article (tables A4 and A5) and are broadly consistent with those obtained in the full sample. If anything, our main results are quantitatively stronger. For example, the average increase in US abnormal returns due to conflict is 2.3 percentage points instead of the 1.4 obtained in table II, as one would expect given that high intensity conflicts should be on average more salient and more visible to investors.

Fluctuating Probability of War and Event Windows

For a number of our conflict events, the estimation windows used so far include protracted periods of fluctuating probability of conflict (see Figure 1 in Leigh, Wolfers & Zitzewitz, 2003 with reference to the second Gulf War). When this occurs, our choice of limiting the event window to the week of the conflict onset may become problematic. As a result, we have also experimented with longer event windows, such as [-4,+4], [-1,+1], and [0,+2], where in $[-k\ ,+n\ ]$ $-k$ indicates the number of weeks to be included in the analysis that precede the ACD dating of the event, and $+n$ the number of weeks that follow ACD dating.

Table A6 in the Web Appendix to this article reports results for the [-1,+1] event window, i.e., when the week of a conflict event and the two surrounding weeks are included.[6] The overall picture was qualitatively unchanged compared to our baseline in Table I.

Wealth Effects of Investing in Conflicts

[6] Results for the [-4,+4] and [0,+2] are qualitatively similar and available upon request from the authors.

As a final empirical contribution, we examine the wealth implications of conflicts for hypothetical investors. The goal of this analysis is to understand whether it would be possible to systematically exploit stock market reactions to accumulate wealth in response to conflict. In a sense, one could view this as a test of whether the effects we find are quantitatively and economically relevant or not.

We perform the following simulation exercise. We start by computing the average abnormal returns underlying Table I, and assume that investors buy an asset when its average abnormal returns are positive, and sell when they are negative. We then endow a hypothetical investor with 1 dollar on 1 February 1971.[7] In correspondence to each week with a conflict event, we allow the investor to purchase (sell) an asset at the beginning of the week of the event when on average the asset price increases (decreases) – on the basis of the results obtained in Table I – as a result of this type of event. In correspondence to the weeks in which no conflict event takes place, the investor takes no action and keeps the money idle.

In Table III for each asset and type of event we report the difference between the final wealth as of 31 December 2004 obtained with the strategy described above, compared to a strategy in which the investor purchases (sells) the world market portfolio instead of the specific asset under consideration. In this sense, Table III displays a notion of abnormal cumulative wealth that could have been accumulated by an investor betting on conflict events. Consider for instance, the estimate 0.041 for the US stock market in correspondence to the aggregate of the conflicts (first line). Take an investor that starts with 1 dollar on 1 January 1971 and buys (sells) US stocks in correspondence to all conflict events in the week in which the event occurs, when the type of event has been found to positively (negatively) affect US stocks; the US stocks are then held over the following week. Our estimate means that this investor would obtain by 31 December 2004 an additional final wealth 4% higher than under a naive strategy that buys the world market portfolio in the same event-weeks.

Panel A of Table III concerns stock prices. The overall results are quantitatively modest, especially considering we have implemented the simulated portfolio method over a 24-year long period. Looking at the aggregate of the conflicts, the largest results would have obtained by buying UK stocks, with a significant abnormal wealth outcome of 27%. However, in qualitative terms a few patterns emerge that are interesting. First, international conflicts seem to produce the largest results: for half of the indices, the abnormal wealth cumulants exceed 19% which starts being remarkable even over a 24-year long period. Second, in terms of location, it is clear that the (Southern and Central) American conflicts are the ones causing the largest wealth effects, followed by African conflicts.

INSERT TABLE III ABOUT HERE

[7] All returns are calculated in US dollars. The choice of a unit initial numeraire allows us to interpret all results that follow as percentage results

Panel B of Table III concerns the abnormal wealth gains from adopting an investment strategy that tries to systematically exploit the effects of conflicts on commodity prices. Results are consistent with those recorded for stock markets. In quantitative terms, conflict-based strategies produce rather modest abnormal wealth cumulants over time, of 21% over a period of 24 years. The result from oil futures stands out from the rest of the findings, with a significant abnormal wealth gain of 80%. However, also for the commodity markets it remains true that international conflicts produce the largest (most exploitable) wealth effects, with a (significant) average of 21% and 3 markets significant out of a total of 5, and peaks of 17% (gold) and 74% (oil futures). In geographical terms, and in the perspective of a commodity trader, the most sensitive areas are America, Africa, and the Middle East.

Concluding remarks

Asset markets constitute an interesting environment to study the economic effects of violent conflict, because analysts and investors trading on such markets are generally sensitive to news regarding the future prospects of the economies that are of some importance for the assets they trade. In this article we have applied the event study methodology – a methodology that is widely used in finance but seldom in political science – to study markets' reactions to the initiation of violent conflict. In order to conduct a large sample study, we consider as events all conflict onsets that can be dated in a precise week between 1971 and 2004. Surprisingly (given the degree of heterogeneity among conflicts and the fact that a number of them may have been anticipated), we do find significant effects on asset prices in a non-negligible fraction of the cases, which in general cannot be simply justified by mere chance.

Several generalized patterns emerge from our analysis. First, while the reactions of other national indices are typically mixed, the US market tends to systematically react *positively* to the onset of conflicts rather than negatively. Other authors (e.g., Leigh, Wolfers & Zitzewiz, 2003, and Rigobon & Sack, 2005) have highlighted that US stock markets would be prone to declines as a result of uncertainty caused by the impending risk of conflicts. Combined with our results, this suggests that the US market may be frequently characterized by war rallies, periods in which the uncertainty on impending conflicts gets resolved by the onset of the conflict itself, with the result that stock prices surge after the actual initiation of conflict.

Second, international conflicts tend to have a stronger impact on stock market indices than internal ones. This may be due to the fact that inter-state conflicts involve the macroeconomic conditions of multiple countries, as well as to the lower degree of uncertainty regarding the resolution of the conflict that is typically associated with inter-state (as opposed to intra-state) conflicts.

Third, commodity prices are quite reactive to events in the Middle East. In particular, oil futures

systematically exhibit a downturn in response to conflict onset in this region. One possible interpretation is that in the weeks (or months) preceding the outbreak of the conflict, hoarding and speculative pressures drive up the price of oil futures and, once the hostilities actually begin, this tendency is reversed.

Fourth, conflict onset is generally associated with a depreciation of the US dollar vis-à-vis other currencies. This is related to the safe-haven role of short-term assets denominated in the greenback currency, the demand of which tends to surge in periods of high uncertainty that typically precedes the dates of formal conflict onset, to subsequently disappear when tension evolves in open hostile operations.

Finally, we have shown that it would have been possible to systematically exploit market reactions to conflict to invest and accumulate wealth, with average excessive (i.e., in excess of simple strategies that fail to exploit the specific asset market reactions to conflicts) gains in the order of 14 to 20 percent over a period of 24 years. This suggests that there may be significant incentives for investors to exploit conflict-related information.

References

Abadie, Alberto & Javier Gardeazabal (2003) The economic costs of conflict: A case-control study for the basque country. *American Economic Review* 93(1): 113-133.

Alesina, Alberto & Roberto Perotti (1996) Income distribution, political instability and investment. *European Economic Review* 40(6): 1203-28.

Amihud, Yakov & Avi Wohl (2004) Political news and stock prices: The case of Saddam Hussein contracts. *Journal of Banking and Finance* 28(5): 1185-1200.

Blattman, Christopher & Edward Miguel (2009) Civil war. *Journal of Economic Literature*, forthcoming.

Campbell, John; Andrew Lo & Craig MacKinlay (1997) *The econometrics of financial markets*. New Jersey: Princeton University Press.

Chan, Steve & Davis Bobrow (1981) Horse races, security markets, and foreign relations: Some implications and evidence for crisis prediction. *Journal of Conflict Resolution* 25(2): 187-236.

Chen, Andrew & Thomas Siems (2004) The effects of terrorism on global capital markets. *European Journal of Political Economy* 20(2): 349-366.

Collier, Paul & Anke Hoeffler (1998) On the economic causes of civil war. *Oxford Economic Papers* 50(4): 563-573.

Collier, Paul & Anke Hoeffler (2004) Greed and grievance in civil war. *Oxford Economic Papers* 56(4): 563-595.

Dube, Arindrajit & Ethan Kaplan (2009) Coups, corporations and classified Information. *mimeo*, UC Berkeley.

Guidolin, Massimo & Eliana La Ferrara (2007) Diamonds are forever, wars are not. Is conflict bad for private firms? *American Economic Review* 97(5): 1978-93.

Hall, George (2004) Exchange rates and casualties during the First World War. *Journal of Monetary Economics* 51(8): 1711-42.

Leigh, Andrew; Justin Wolfers & Eric Zitzewitz (2003) What do financial markets think of war with Iraq? NBER working paper No. 9587.

Montalvo, Jose & Marta Reynal-Querol (2005) Ethnic polarization, potential conflict and civil war. *American Economic Review* 95(3): 796-816.

Rigobon, Rigobon & Brian Sack (2005) The effects of war risk on U.S. financial markets. *Journal of Banking and Finance* 29(7): 1769-89.

Schneider, Gerald & Vera Troeger (2006) War and the world economy: Stock market reactions to international conflicts. *Journal of Conflict Resolution* 50(5): 623-645.

Svensson, Jakob (1998) Investment, property rights and political instability: Theory and evidence. *European Economic Review* 42(7): 1317-41.

Willard, Kristen; Timothy Guinnane & Harvey Rosen (1996) Turning points in the civil war: Views from the Greenback market. *American Economic Review* 96(86) 1001-1018.

Wolfers, Justin & Eric Zitzewitz (2009) Using markets to inform policy: The case of the Iraq war. *Economica* 76(302): 225-250.

We thank two anonymous referees, Han Dorussen, Gerald Schneider and participants at the PAC Meeting in Konstanz for helpful comments. Erika Deserranno, Elizabeth La Jeunesse, Silvia Redaelli, Deborah Roisman, and Yu Man Tam provided excellent research assistance. La Ferrara acknowledges financial support from the Polarization and Conflict Project CIT-2-CT-2004-506084 and from the European Research Council grant ERC-2007-StG-208661. The usual disclaimer applies. Correspondence: Massimo.Guidolin@mbs.ac.uk, eliana.laferrara@unibocconi.it. The data and self-contained STATA-codes to perform the analyses of this article, as well as the appendices, are available at www.igier.unibocconi.it/laferrara.

MASSIMO GUIDOLIN, b. 1968, PhD in Economics (University of California, San Diego, 2000); Assistant Professor, Dept. of Economics, University of Virginia (2000-2004); Senior Economist and then Assistant Vice-President, Financial Markets, Research Division, Federal Reserve Bank of St. Louis (2005 -); Professor of Finance, Chair and Co-Director of the Center for the Analysis of Investment Risk, Manchester Business School, University of Manchester, United Kingdom (2006-). His fields of interest are the econometrics of asset pricing models, applied forecasting in finance and macroeconomics, and the interaction between financial markets and conflict events. His publication outlets include the American Economic Review, the Economic Journal, Journal of Econometrics, and Journal of Financial Economics.

ELIANA LA FERRARA, b. 1968, PhD in Economics (Harvard University). Professor of Economics, Bocconi University, Milan. Research Fellow of the Centre for Economic Policy Research (CEPR) and the Innocenzo Gasparini Institute for Economic Research (IGIER); Member of the European Development Research Network (EUDN); Affiliate of the Bureau for Research in Economic Analysis of Development (BREAD). Member of the Council of the European Economic Association. Her fields of interests are development economics, public economics and political economics. She has published original research on the following topics: conflict and financial markets, ethnic diversity, political participation and trust, informal institutions in developing countries, political competition in weak states. Her publication outlets include the American Economic Review, The Quarterly Journal of Economics, Journal of Public Economics, Journal of Development Economics, Economics and Politics.

Annex - Figures

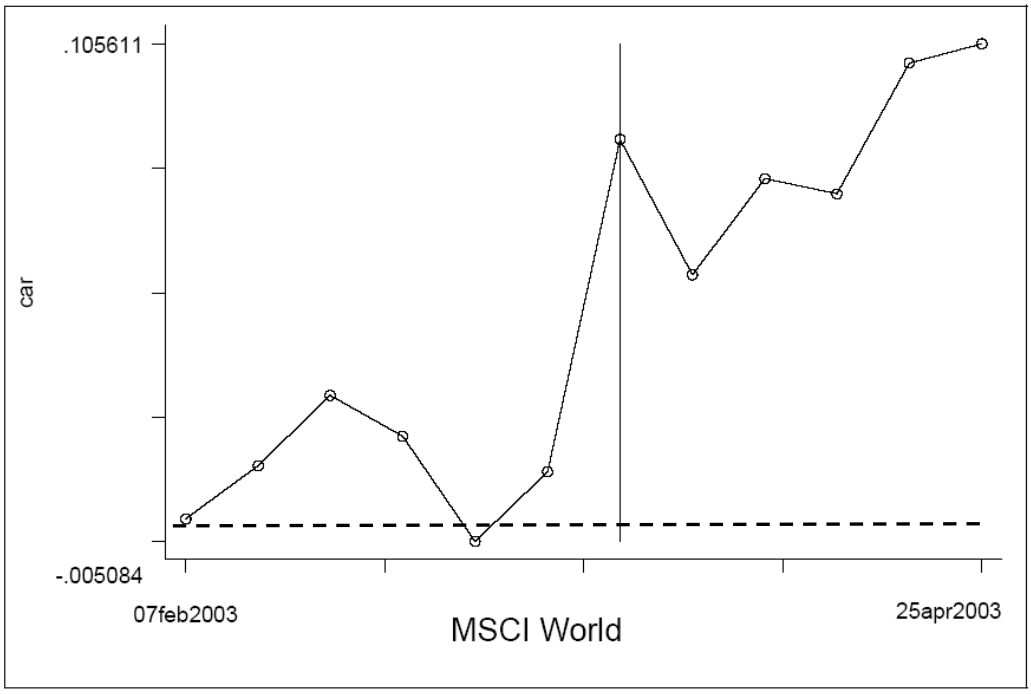


Figure 1. The world stock market

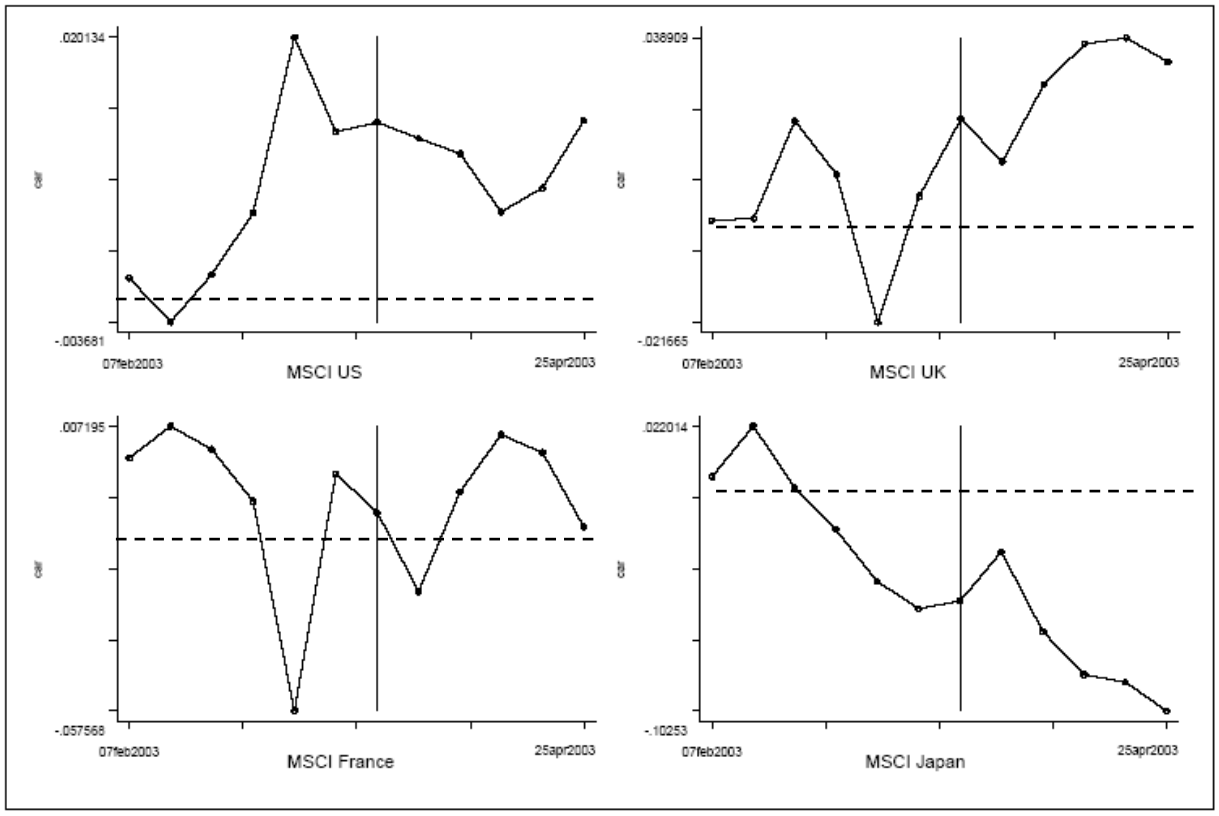
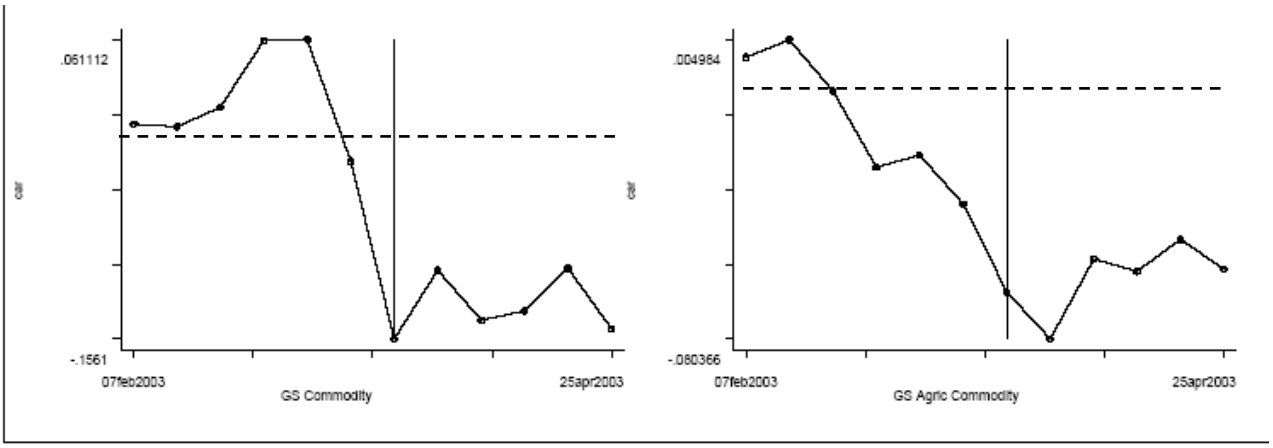
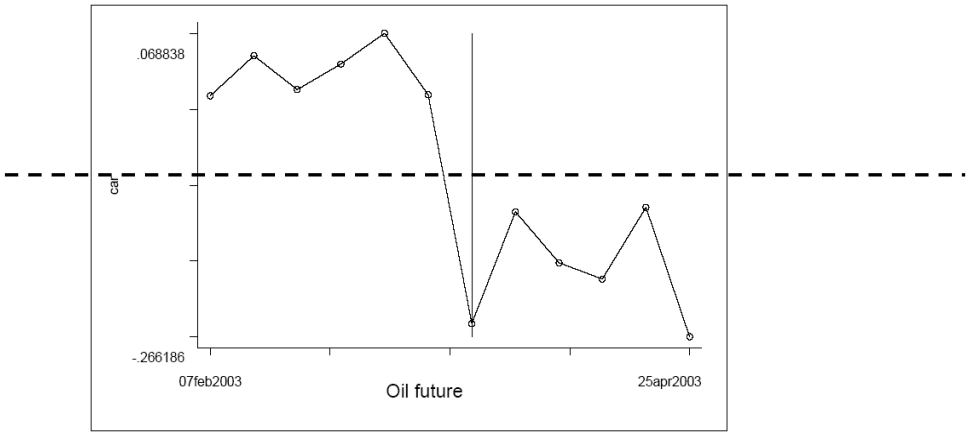


Figure 2. Reactions across stock markets

(A) Commodities



(B) Oil futures



(C) Safe-havens

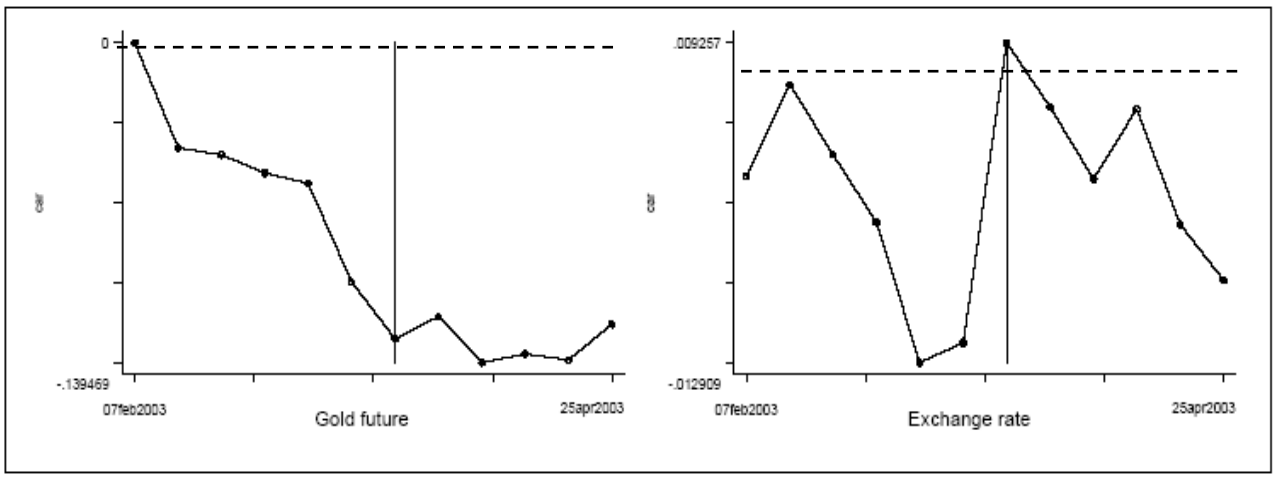


Figure 3. Other assets

Annex - Tables

Table I, Event Study Results (5% significance level; event window -0; +0)

Panel A: MSCI Stock Indices

	US		**UK**		**France**		**Japan**		**Defense**	
	<0	**>0**	**<0**	**>0**	**<0**	**>0**	**<0**	**>0**	**<0**	**>0**
All conflicts	**7.8**	**11.8**	4.9	**6.9**	3.9	**6.9**	**8.8**	**5.9**	**6.9**	**8.8**
Scope										
Internal	**8.2**	**11.0**	2.7	4.1	1.4	4.1	**9.6**	**5.5**	**9.6**	**6.8**
International	**6.9**	**13.8**	**10.3**	**13.8**	**13.8**	**13.8**	**6.9**	**6.9**	0.0	**13.8**
Location										
Africa	**15.0**	5.0	5.0	**10.0**	2.5	**7.5**	2.5	**10.0**	0.0	**15.0**
Asia	0.0	**16.7**	0.0	0.0	0.0	**8.3**	**8.3**	**8.3**	**16.7**	0.0
Americas	0.0	**35.0**	**10.0**	0.0	**15.0**	5.0	**30.0**	0.0	**10.0**	5.0
Europe	0.0	**21.1**	**5.3**	**5.3**	**5.3**	**5.3**	**10.5**	0.0	0.0	**5.3**
Middle East	**9.1**	0.0	0.0	**18.2**	**18.2**	**9.1**	0.0	**9.1**	**36.4**	**18.2**

Panel B: Commodities

	Over all commodities		**Agricultural commodities**		**Oil futures**		**Gold**		**US Dollar exchange rate**	
	<0	**>0**	**<0**	**>0**	**<0**	**>0**	**<0**	**>0**	**<0**	**>0**
All conflicts	4.9	**6.9**	**5.9**	**5.9**	**8.8**	**8.8**	4.9	4.9	3.9	**5.9**
Scope										
Internal	4.1	**5.5**	**5.5**	**6.8**	**9.6**	**9.6**	**6.8**	**5.5**	2.7	2.7
International	3.4	**10.3**	**10.3**	3.4	**10.3**	**6.9**	3.4	3.4	**6.9**	**13.8**
Location										
Africa	0.0	2.5	2.5	5.0	5.0	5.0	**7.5**	2.5	**7.5**	**7.5**
Asia	**8.3**	0.0	**8.3**	**8.3**	0.0	**8.3**	**8.3**	**8.3**	0.0	**8.3**
Americas	0.0	**10.0**	5.0	0.0	5.0	5.0	0.0	0.0	0.0	0.0
Europe	**5.3**	**15.8**	**5.3**	**10.5**	**10.5**	**10.5**	**5.3**	**5.3**	0.0	0.0
Middle East	**27.3**	**9.1**	**27.3**	**9.1**	**45.5**	**27.3**	0.0	**9.1**	**9.1**	**18.2**

Notes: Table reports the percentage of cases in which the null of no effect is rejected against the alternative of negative (columns <0) or positive (columns >0) effect. Significance level is 5%. Numbers exceeding 5% are bold-faced. Shaded cells indicate all cases in which the incidence of positive reactions is strictly greater than that of negative reactions.

Table II, Dummy Regression Approach

	MSCI USA			MSCI UK			MSCI France			MSCI Japan		
All conflicts	0.014***			0.020***			-0.003			0.009		
	(0.003)			(0.006)			(0.006)			(0.009)		
Internal		0.010***			0.012**			0.001			0.007	
		(0.003)			(0.006)			(0.006)			(0.007)	
International		0.011***			-0.001			-0.008			0.007	
		(0.003)			(0.007)			(0.007)			(0.008)	
Africa			-0.003**			0.004			0.002			0.006
			(0.002)			(0.004)			(0.005)			(0.004)
America			0.011***			-0.014*			-0.023**			-0.018**
			(0.003)			(0.008)			(0.011)			(0.007)
Asia			-0.003			0.006			0.003			0.010*
			(0.002)			(0.006)			(0.006)			(0.005)
Europe			0.012**			-0.004			0.002			-0.007
			(0.005)			(0.006)			(0.006)			(0.005)
Middle East			0			0.015*			0.001			0.003
			(0.004)			(0.009)			(0.009)			(0.008)
Conlony UK				-0.010	-0.010	-0.014*						
				(0.007)	(0.007)	(0.008)						
Conlony France							0.002	0.002	0.014*			
							(0.008)	(0.008)	(0.008)			
Distance to USA	-0.002***	-0.001***										
	(0.000)	(0.000)										
Distance to UK				0.001	0.000							
				(0.001)	(0.001)							
Distance to France							0.001	0.000				
							(0.001)	(0.001)				
Distance to Japan										-0.001	-0.001	
										(0.001)	(0.001)	
Observations	1547	1547	1547	1547	1547	1547	1547	1547	1547	1547	1547	1547

Notes: Table reports OLS coefficients of regressions in which dependent variable is the abnormal return of the stock market index listed by column. Standard errors in parenthesis. * denotes significance at 10%, ** at 5%, *** at 1% level.

Table III, Cumulative Abnormal Returns from an Initial Investment of One Dollar (event window -1; +1)

Panel A: MSCI Stock Indices

	US	UK	France	Japan	Average
All	**0.042**	**0.272**	**0.064**	**0.193**	**0.143**
Scope					
Internal	**0.015**	0.129	**0.131**	0.059	0.084
International	**0.062**	0.427	**0.210**	0.190	0.222
Location					
Africa	0.089	0.337	0.116	**0.039**	**0.145**
Asia	**0.045**	0.213	**0.079**	0.113	0.113
Americas	**0.155**	0.162	0.137	0.214	**0.167**
Europe	0.043	0.002	0.040	0.055	0.035
Middle East	0.067	**0.288**	0.043	**0.086**	**0.121**
Resources					
Oil	0.059	**0.006**	**0.038**	0.153	0.064

Panel B: Commodities

	Overall	Agricultural	Oil Futures	Gold	US dollar	Average
All	**0.172**	0.032	**0.800**	0.020	0.010	**0.207**
Scope						
Internal	0.086	**0.053**	**0.396**	0.189	0.032	0.151
International	0.027	0.090	**0.741**	**0.174**	**0.023**	**0.211**
Location						
Africa	**0.044**	0.143	0.485	0.260	0.015	**0.189**
Asia	**0.172**	0.171	**0.004**	**0.180**	0.002	0.106
Americas	0.161	**0.125**	**0.305**	0.019	0.021	**0.126**
Europe	0.185	0.122	0.117	0.009	0.009	0.088
Middle East	0.134	0.009	0.303	0.195	0.020	0.132
Resources						
Oil	0.185	**0.063**	0.247	**0.019**	**0.010**	0.105

Note: The table reports the cumulative net returns from a simulation exercise in which an investor is endowed with 1 dollar on 1 February 1971 and she subsequently purchases (sells) an asset at the beginning of the week of the event when (on average) the asset price increases (decreases) – on the basis of the results in Tables 1 and 2 – as a result of this 'type' of event. The returns are computed in excess of a strategy in which the investor purchases (sells) the world market portfolio instead of the specific asset under consideration. All returns are calculated in US dollars.