Measuring Geopolitical Risk*

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PRELIMINARY AND INCOMPLETE

Abstract

We present a monthly index of geopolitical risk (GPR index) based on a tally of newspaper stories that contain terms related to geopolitical tensions, and examine its evolution and effects since 1985. The GPR index spikes around the Gulf War, after 9/11, during the 2003 Iraq invasion, during the 2014 Russia-Ukraine crisis, and after the Paris terrorist attacks. Overall, the GPR index offers a good proxy for movements in geopolitical risk over time. At the macro level, we find that higher geopolitical risk leads to a decline in real activity and is associated with increases in the VIX, lower oil prices, and higher corporate credit spreads. Across a sample of emerging economies, higher GPR predicts lower activity especially for economies with higher country risk.

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1 Introduction

Major geopolitical events are often regarded as setting the stage for radical changes in the business cycle and in financial markets, and geopolitical risks are often cited by central banks officials, the financial press, and business investors as key determinants of investment and spending decisions.[1] As a tell-tale sign of the importance of geopolitical risks, several companies profitably publish ratings, indices and intelligence reports containing detailed and colorful information on where it is safe, or dangerous, to do business. A google search of the term "geopolitical risk map" returned 161,000 hits as of May 2016,[2] with the first 20 results containing the names of at least ten different companies, insurance agencies and organizations that publish and sell indices measuring geopolitical risk across countries, regions and over time.[3]

Yet virtually all of these indices suffer from a variety of shortcomings that make them hardly usable for applied research. First, these indices are often qualitative measures of geopolitical risk and are constructed in a judgemental way, using a few colors (orange and red being the favorites), number scales from 1 to 5, or a letter grading scales that are meant to tell the risky places and times apart from the safe ones. Second, these indices vary little over time, or they are available for only a short period. A notable example, the Doomsday Clock,[4] measures the countdown to a possible global catastrophe, with fewer minutes to midnight measuring higher risk, but the value of this index has changed only six times in the last twenty years. Third, when these indices are quantitative, they are constructed as combinations of other variables which are meant to react to, rather than measure, geopolitical risks, such as gold, the VIX, the dollar index, and other financial market indicators.

In this paper we develop a monthly, quantitative index of global geopolitical risk –the GPR index– that goes back to 1985 and aims at providing a complement to many available, qualitative indices of geopolitical risk. Drawing on the methodology pioniereed by Baker et al. (2015), our index is constructed counting the occurrence of words related to geopolitical tensions in leading international newspapers. Our index is plotted in Figure 1. It spikes during the Gulf War and during the 2003 invasion of Iraq.[5] It peaks around 9/11. More recently, it spikes up both during the Ukraine/Russia crisis, and around

[1] See for instance Greenspan (2002) and www.bloomberg.com (2016).

[2] Search perfomed on May 2, 2016.

[3] For example, one can find, among the first 20 results of the search, the following companies providing businesses with the intelligence to make the right decisions in world of uncertainties: Control Risks Online, Aon plc, Marsh-McLennan, Verisk Maplecroft, CSO Online, Euler Hermes, Risk Advisory, Strategic Risk.

[4] The Bulletin of the Atomic Scientists webpage has more details about the Doomsday Clock.

[5] Throughout the paper, we refer to the particular events adopting the naming convention followed by the Wikipedia entry for that event.

the Paris terrorist attacks.

We then study the relationship between our index and business cycle and financial market movements. We find that a typical spike in the GPR —sized to match the jump after major episodes of higher geopolitical risk— depresses U.S. and advanced economies' industrial production by about 1 percent, and leads to a tightening in various measures of financial conditions. Most importantly, we find that what matters about geopolitical events is the uncertainty surrounding them: a version of our index that separates "geopolitical threats" from "geopolitical acts" shows that threats have much more powerful effects than acts.

An important upshot of our index is that it quantifies episodes of geopolitical tensions that could hardly be predicted ahead of time and that are, by and large, exogenous to world economic conditions. Our index is available at https://www2.bc.edu/matteo-iacoviello/gpr.htm.

2 Construction of the Geopolitical Risk Index

2.1 Basics

The goal of this paper is to understand the macroeconomic and financial consequences of major global political events and risks such as wars, terrorism and regional political tensions. In recent years, these types of events and risks have been described by the press as "geopolitical," which explains why we call our index the geopolitical risk (GPR) index.

The journalistic use of the term "geopolitical risk" does not meet any scholarly definition. In fact, a formal definition of geopolitical risk is not available, but rather seems to be an extension of "political risk" to major global events. Political risk is itself a fuzzy concept, and its definition has substantially evolved over history, with one definition referring to "political risk" as the risk an investment's returns could suffer as a result of political changes or instability in a country (Sottilotta (2013)). While such definition implies that the consequences of (geo)-political risk are economic, it does not specify what the determinants of (geo)-political risk are.

We define geopolitical risk as the risk associated with events such as wars, terrorist acts and political tensions that affect the normal and peaceful course of international relations. Both wars and terrorist events aim at achieving political or ideological goals through the use of violence, although they differ in scope, methods, and type of actors. Political tensions, even when initially confined inside one country, can also create geopolitical instability, to the extent that they increase the probability of future conflicts.

Our index aims at measuring, throughout history, these risks and associated instability. In practice, we construct the GPR index counting the occurrence of words related to geopolitical tensions in leading newspapers. In particular, the GPR index reflects automated text-search results of the electronical archives of 11 national and international newspapers: The Boston Globe, Chicago Tribune, The Daily Telegraph, Financial Times, The Globe and Mail, The Guardian, Los Angeles Times, The New York Times, The Times, The Wall Street Journal, and The Washington Post. We calculate the index by counting the number of articles related to geopolitical risk in each newspaper and for each month (as a share of the total number of articles). The index is then normalized to average a value of 100 in the 2000-2009 decade,[6] so that a reading of 200, for instance, indicates that newspaper mentions of geopolitical risk in that month are twice as large than during the 2000s.[7]

The search identifies articles containing references to any of the eight categories of words reported in Table 1. Broadly speaking, the first five categories of words are related to geopolitical threats and tensions, while the last three categories are related to geopolitical events and acts. Group 1 includes the key words geopolitical risk and tension. Groups 2 to 5 include words that identify newspaper articles that are also related to geopolitical risks and tensions, although they do not mention these words specifically. We constructed groups 2 to 5 by analyzing the content of the articles found by searching only words contained in group 1. The use of multiple terms is also made necessary by the evolution of journalistic language as the word geopolitical became of wide-spread use after 9/11.

Groups 6 to 8 aim at capturing press coverage of actual geopolitical events. We do this for two reasons. First, geopolitical events are often associated with increase in uncertainty and risk. Hence, searching directly for events rather than risk can help getting a more precise identification of the timing of some risk-inducing shocks (as press coverage might be initially related to the event itself and would cover their broader implications only with a lag). Second, in assessing the impact of geopolitical risk, we want to control for the direct impact that the event itself might have. For this reason, in Section 2.3 we create two sub-indexes that try to measure threats and acts separately.

Figure 1 presents the benchmark raw index. The index is characterized by ten major spikes corresponding to key geopolitical events. The first spike is recorded in April 1986 and it corresponds to the US bombing of Lybia. The second spike happens during the Kuwait invasion and the subsequent

[6] A monthly reading of 100 for the index corresponds to about 250 articles per month containing terms related to geopolitical risk.

[7] The companion dataset reports the total number of articles across newspapers in each month. The number of articles is trendless around 70,000 since the early 1990s. For one representative newspaper, this corresponds to about 200 articles per day, of which about one in 300 mentions, on average, terms related to geopolitical risk. As a comparison benchmark, one in 500 articles mentions the Beatles, and one in 300 articles mentions the Federal Reserve.

Table 1: Search Categories for the benchmark GPR index

Search Category	Words
1. Geopolitical Risks	(Geopolitical) AND (risk OR risks OR concern OR concerns OR tensions OR tension OR uncertainty)
2. Bilateral Regional Tensions	("United States") AND (tensions) AND (military OR war OR geopolitical OR coup OR guerrilla OR warfare) AND ("Latin America" OR "Central America" OR "South America" OR Europe OR (Africa NOT "South Africa") OR "Middle East" OR "Far East" OR Asia)
3. War or Military Risks	("war risk" OR "war risks" OR "risk of war" OR "fear of war" OR "war fears" OR "military threat" OR "military threats")
4. Nuclear Threats	("nuclear war" OR "nuclear catastrophe" OR "atomic war") AND (fear OR threat OR terror OR risk)
5. Terrorist Threats	("terrorist threat" OR "terrorist threats")
6. Beginning of Wars	("beginning of the war") OR ("outbreak of the war") OR ("onset of the war") OR ("escalation of the war") OR ("start of the war")
7. Life Cost of War	(war AND "heavy casualties") OR (battle AND "heavy casualties")
8. Terrorist Acts	("terrorist act" OR "terrorist acts")

Note:

Iraq invasion by the US. The index remains below 100 until 9/11, when it spikes to about 300. The index reaches its maximum during the 2003 invasion of Iraq. The following three spikes are related to terrorist acts: The March 2004 Madrid bombing, the July 2005 London bombing, and the August 2006 transatlantic aircraft plot, a terrorist plot to detonate liquid explosives on seven airliners travelling from the United Kingdom to the United States and Canada. The index stays at low levels during the global financial crisis and its aftermath. It surges again in July 2014, amidst rising geopolitical tensions in Ukraine and Iraq, as well as at the end of 2015, at the time of the Paris and San Bernardino attacks.

One feature of the GPR index is that it does not seem to capture the end of the Cold War and the dissolution of the Soviet Union, nor to spike during key events such as the fall of the Berlin Wall and 1991 Soviet coup d'état attempt. The are two main reasons. First, the dissolution of the Soviet Union has been a decade-long process characterized by many events that, taken in isolation, did not generate unusually large press coverage. Second, the fall of the Berlin wall, which is now viewed as one of the defining moments of the 20th century, was not covered at the moment as such. A similar consideration applies to the 1991 Soviet coup. The latter event is captured if we add to the bilateral tensions category, the word Soviet Union, but its inclusion only generate a modest spike in the index. The fall of the Berlin Wall is very hard to capture, unless we add Germany to the list of words.

Figure 2 elaborates further on the construction of our index. Our choice of words is motivated by the need to include phrases that minimize two types of error. The first error is that of not capturing articles that do mention heightened geopolitical tensions. For this reason, our index has to be broad enough to include many of the words that can be believed to be associated with higher risk, such as risks, threats and tensions, together with military, war, and geopolitical. Our choice of nine keywords strikes a compromise that we regard as reasonable. As shown in the figure, no phrase dominates the index, and each contributes differently at different points in time. As Figure 2 shows, 9/11 provide an important watershed not just in the level of the index, but also in its composition. Prior to 9/11, "*military threat(s)*" account for the majority of words. After 9/11, "*terrorist threat(s)*" come to dominate.

The second error in constructing the index would be that of counting newspaper articles that feature words that might have to do with geopolitical tensions, but effectively end up capturing also things other than heightened geopolitical tensions. Three examples that we exclude from our benchmark index are "*terrorist attack(s)*", "*WMD*" (weapons of mass distruction), and "*arms control*". The phrase "t*errorist attacks*" has become, both in the press and in the popular culture, a byword for 9/11. As such, it is often used to mark an historical era, rather than actual fluctuations in geopolitical risk. For instance, ever since 9/11, the index including terrorist attacks spikes every year in September, as newspapers devote coverage to the anniversary of the 9/11 attacks. As a consequence, including "*terrorist attacks*" in the index dwarfs fluctuations in the index prior to 9/11 in a way that we do not think accurately reflects the importance of geopolitical tensions in the 1980s and the 1990s. The word "*WMD*" registers a peak during 2003, around the time of Iraq invasion, but, ever since, has been associated more with the political choices of former president G.W. Bush than with actual geopolitical risks.[8] The word "*arms control*" is relatively more popular in the Cold War era, and tilts the index in a way to give higher weight to pre–9/11 risks. It is also the word that captures the highest fraction of "false risks" among the words we searched, accounting for 15 percent of false positives throughout the sample in question.[9] Additionally, "*arms control*" may, more than other phrases, capture positive developments

[8] For instance, "WMD" became word of the year 2002, peaking in newspapers in January 2003, at the time of the announcement of the American Dialect Society, hardly reflecting a rise in geopolitical risks in that month. See http://www.americandialect.org/.

[9] Since the 1990s, the phrase "Arms Control" often appears in obituaries remembering the efforts of diplomats, negotiatiors, scientists and officials who, in various eras, worked in the field of arms control proposals, negotiations and agreements.

on the geopolitical front, as controlling arms could highlight progress in reducing future geopolitical risks.

2.2 What Are We Measuring?

A crucial aspect that concerns the measurement of geopolitical risk is that exposure to such risk varies both geographically and by sector of the economy. Our index captures geopolitical events and risks as perceived by the public and as reflected in the press in Anglo-Saxon countries, and in particular in the United States: to construct the index we use eight American, two British and one Canadian newspaper. Moreover, one of our search categories measures bilateral regional tensions between the United States and other regions of the world.

At the same time, geopolitical events that involve the United States and their interest abroad are events with global implications. Furthermore, the newspapers we search have wide geographical coverage, but in terms of content and in terms of sales. Hence, our index should be also a good proxy for global geopolitical risk.

Moreover, the use of press coverage has the potential to induce fluctuations in (or exceedingly high levels of) the GPR index even if the underlying geopolitical risk factors remain constant due to changes in geopolitical-related risk aversion of the public and state-dependent bias in news coverage. For example, the high levels in the years following 9/11 (constructed from this U.S. centric selection of newspapers) may potentially reflect more public fear (towards geopolitical tensions) than actual risk during that period. This is however exactly what we want to capture.

2.3 Geopolitical Threats vs. Geopolitical Acts

Figure 3 decomposes our index in two subindices, the GPT (GPR Threats), and the GPA (GPR Acts).

Our GPR index captures a convolution of shocks to first and higher order moments of the distribution of geopolitical events. Spikes in risk often coincide with realization of big events. We attempt to disentangle the direct effect of geopolitical events from the effect of pure geopolitical risks by constructing two indexes: Geopolitical threats (GPT): Search categories 1 to 5; Geopolitical acts (GPA): Search categories 6 to 8.

2.4 Long-span Historical GPR Index

Using a similar methodology as for the benchmark index, we construct a long-span monthly GPR index dating back to 1900. We restrict the newspapers' coverage to three journals only for which we can retrieve data all the way back to the beginning of the 20th century, namely the New York Times, Wall Street Journal, and the Washington Post. Aside from a smaller set of newspapers, and from a larger set of synonims mostly added to capture shifts in the usage of particular words,[10] the index closely mimics the benchmark index for the period in which the coverage overlaps.

Figure 4 displays the monthly historical index. Even here, every major spike in the index can be associated with episodes of rising geopolitical tensions. The index stays elevated during the two world wars, and peaks at the onset of both of them.

Figure 5 further illustrates how the components in our measure of historical geopolitical risk have evolved over the last 115 years. Early in the sample, the index rises and stays high during World War I and World War II, and phrases directly related to the conflict itself come to dominate the index. The index stays at high levels between the 1950s and the 1980s, at a time when the threat of a nuclear war and rising geopolitical tensions between countries become more prevalent than wars themselves. Since the 2000s, terrorism events have come to dominate the index, alongside rising bilateral tensions among countries.

2.5 Human Audit

A human audit of a sample of the articles suggests that the news-based approach used to construct the index can produce a reasonable, replicable indicator of geopolitical risk. We found a very high correlation between the computer-generated indices presented here and human-generated indices, with the discrepancy mostly capturing noise, and uncorrelated to major macroeconomic variables.

Newspapers typically cite geopolitical risks in one of the following cases:

- Newspapers feature articles mentioning geopolitical risks presumably when such risks warrant writing such articles (e.g. "US steps up pressure on Russia amid growing risk of war over Ukraine.")
- Newspapers quote companies, industry experts, economists, political leaders or policy-makers who refer to such uncertainties in speeches, interviews, testimonies (e.g. "[The company] said there

[10] In particular, we do two changes: (1) We include "war peril", "war danger", "war menace" (as well as "peril of war", "danger of war" and "menace of war") in search category #3, mostly to capture shifts in the use of vocabolary over time. (2) We include in search category #6 any article containing all the words (war AND military AND attack AND troops AND army AND navy). These additional keywords account for less than 15 percent of all successful searches.

are a range of macroeconomic and geopolitical uncertainties that could slow growth of global gross domestic product and affect sales of its products.")

- Newspapers comment on economic and financial events attributing some outcomes to rising or falling geopolitical risks (e.g. "U.S. stocks closed higher as [...] strong retail sales gave investors reasons to buy equities despite a resurgence of geopolitical uncertainties.")

In some cases, our human audits revealed cases of articles which the computer–generated approach classified as capturing geopolitical risk even though the human reading was / could have been less adamant about the inclusion.

- In 1985, several abortion clinics in the United States received "terrorist threats" which could, or could not, capture higher geopolitical risk in a broad sense.
- Here and there, books reviews, obituaries, anniversary articles and movie reviews mention these words.[11]

All told, after reading a sample of 1,600 articles that were included in the index (50 per each year), our preliminary analysis indicates that our computer–generated index is not picking up junk, and that any discrepancy is essentially uncorrelated with economic conditions. Additionally, our human reading found very little evidence of talk about falling risks, except perhaps in 1990, after the fall of the Berlin Wall.

Figure 6 examines further the robustness of our index to the inclusion and exclusion of additional phrases. The top panel illustrates how a broader index that includes more keywords is essentially a scaled-up version of our benchmark index. A version of the index that broadens the set of words identifying bilateral tensions also neatly identifies the onset of the Kosovo War as an additional episode of rising geopolitical risk. The bottom panel illustrates a narrow version of the index which excludes articles containing particular words which, in our human audits, were often correlated with false positives. Words in this category include "obituary", "stalker", and "movie", among others. By subtracting these words from our search, we exclude from counting "terrorist threats" to the likes of singer and actress Madonna, actress Meg Ryan and former NBA player Dennis Rodman as episodes of rising geopolitical tensions.

[11] Here are two examples of articles mentioning the phrases above for reasons not related to geopolitical risks: (1) "The arrest of the Mafia boss leads to a higher risk of war for succession", or (2) "100 years ago today, The Globe reported that the Japanese bombardment of Port Arthur continued and three Russian cruisers were sunk. Insurance rates against the risk of war between France and Britain rose from 20 to 30 per cent".

3 Relation to Popular Measures of Economic Uncertainty

3.1 Relation to Other Measures of Geopolitical Risk

Several papers have used various proxies in order to construct quantitative measures of political or geopolitical risk. A widely used database is the ICB annual database, which provides detailed information on 447 major international political crises that occurred over the period 1918–2006. This database has been widely used in the political science literature, as well as in studies on war and economics. One example is the work by Berkman et al. (2011), who extract crisis events from the a database of 447 international political crises during the period 1918–2006, to create a crisis index that shows substantial variation over time by adding up, for each year, the total number of crises. Not surprisingly, such index is a crude measure of geopolitical risk, and is only available annually.

Another database is the Militarized Interstate Disputes Dataset, which records all instances of when one state threatened, displayed, or used force against another. This dataset is only available with several years delay and is only available annually.[12]

Another database is the Uppsale Conflict Data Program, which records ongoing violent conflicts since the 1970s, again annually, and using only limited measures – such as number of armed conflicts in each year.[13]

Other papers have performed news–searches looking for early warning signals for wars [see e.g. Chadefaux (2014)]

3.2 Relation to Other Measures of Economic Uncertainty

Figure 7 compares our benchmark index with other measures of uncertainty: VIX, gold, the EPU index of Baker et al. (2015).

4 Macroeconomic Effects of Geopolitical Risk

4.1 Overview

In this section, we investigate the macroeconomic and financial effects of geopolitical risk.

[12] See http://cow.dss.ucdavis.edu/data-sets/MIDs .

[13] See http://ucdp.uu.se/.

4.2 Global Effects

We first provide an encompassing overview about the global macroeconomic effects of geopolitical risk by estimating a monthly VAR from 1985M1 through 2015M12 which includes a broad set of real and financial variables. The model consists of eight variables: (1) the GPR index; (2) the option-implied volatility on the S&P 100 stock futures index constructed by the Chicago Board of Option Exchange (VIX); (3) log US industrial production; (4) the log of advanced economies industrial production; (5) the log of emerging economies industrial production; and (6) the log of the Brent price of oil expressed in real terms dividing by the U.S. CPI index. (7) Moody's Seasoned Baa Corporate Bond Yield Relative to Yield on 10-Year Treasury Constant Maturity; (8) the Standard and Poors 500 index, [expressed in real terms];[14] The IP indexes and the real price of oil are linearly detrended prior to estimation. All VAR models presented in the paper are estimated using Bayesian techniques. We impose a Minnesota prior on the reduced-form VAR parameters by using dummy observations as in Del Negro and Schorfheide (2011). The resulting specification, which includes a constant, is estimated using six lags of the endogenous variables.[15]

We identify the structural shocks by using a Cholesky decomposition of the covariance matrix of the VAR reduced-form residuals, ordering the GPR index first. Our ordering implies that the GPR index reacts contemporaneously only to its own shock. Hence, any contemporaneous correlation between the macro variables and the GPR index reflects the effect of the GPR on the macro variables. While the characteristics of the GPR index discussed in Section 2 lend support to this assumption, later we explore robustness to alternative Cholesky orderings.

The solid lines in Figure 8 show the median impulse responses to an exogenous increase in the GPR index of 120 points, while the shaded areas represent the corresponding 68-percent pointwise credible bands. The shock equals the average change in the index following the nine episodes of largest increases in geopolitical risk.[16] The rise in the GPR index induces a small and short-lived increase in overall global risk, as proxied by the VIX. On the real side, IP in various geographical regions responds quickly to the increase in geopolitical risk. The decline in the U.S. bottoms out at 0.8 percent after 6 months, and converges slowly back to trend. The dynamic response of IP in advanced economies is broadly

[14] Caldara et al. (2016) provides details on the construction of the IP indexes for advanced and emerging economies.

[15] The vector of hyperparameters of the Minnesota prior is $\lambda = [1, 3, 1, 1, 1]$. We use the first year of the sample as a training sample for the Minnesota prior. All the results reported in the paper are based on 10,000 draws from the posterior distribution of the structural parameters, where the first 2,000 draws were used as a burn-in period.

[16] These episodes are U.S. bombing of Lybia in 1986, the Kuwait Invasion, the Gulf War, 9/11, the Iraq invasion, the 2005 London bombings, the Transatlantic aircraft plot, the Russian annexation of Crimea, and the 2015 Paris terrorist attacks.

similar. IP in emerging economies contracts too, bottoming out at 0.8 percent below trend 6 months after the shock, somewhat faster than in the U.S. and in the Advanced Economies.

The increase in the GPR leads to a decrease in oil prices, which bottom out at 8 percent below trend after a few months. This results stands in contrast with much of the conventionally held view that higher geopolitical risk drives oil prices persistently higher, a view that might reflect a selective memory that confounds all geopolitical tensions with "oil supply shocks driven by geopolitical tensions in the Middle East". The evidence from our VAR reflects the result that higher geopolitical risk creates recessionary effects, thus impacting negatively on oil demand and prices. In the appendix, Figure A.1 offers a perspective on this finding plotting oil prices and the change in the GPR around the periods of largest increases in the index. As the figure shows, the relationship between changes in GPR and changes in oil prices is, at best, tenuous, a finding that is corroborated by our VAR.

All told, the VAR evidence presented above is suggestive of sizeable recessionary effects of an increase in GPR.

4.3 Threats vs Acts

Next, we evaluate the difference between innovations in the two broad components of our GPR index, GPT – Threats Index – vs GPA – Acts Index. We do so by estimating the same VAR of before, replacing the GPR index with these two components. We are interested in the effects of shocks to these two subcomponents. A natural identification scheme is one where we assume that GPT innovations do not affect GPA contemporaneously, whereas GPA innovations affect GPT contemporaneously.

The impulse responses to these GPT and GPA shocks are shown in Figure 9. The upshot of these impulse responses is that they lend support to the old idea, attributed to London financier Nathan Rothschild, that one should buy on cannons, sell on trumpets. An innovation to GPT (the pure risk component of our index) leads to a small but short–lived rise in GPA, and produces large and protracted recessionary effects, as well as to a decline in stock prices. By contrast, a positive shock to the GPA leads to a small but short–lived decline in economic activity, whereas the stock market rises sharply one month after the shock.

4.4 Robustness

As can be clearly seen in Figure 1, the 9/11 terrorist attacks are the episode that induced the largest increase in the index (the index rose to a its highest level with the Iraq war two years later, but from already elevated levels). Moreover, 9/11 is potentially associated with a structural break in the index, which remained persistently elevated after the terrorist attacks converging towards a higher level compared to the first part of the sample. But the 9/11 terrorist attacks were not a typical geopolitical event, as they targeted the world financial center and provoked direct financial effects by forcing the closure of the U.S. stock market and other major financial institutions. Moreover, the 9/11 attacks had also a great impact on news coverage of terrorism and more broadly of geopolitical events outside the U.S., which might account for the level change of our index.

Figure 10 reports the impulse responses to a GPR shock of a VAR model that includes two separate dummies for September and October 2001,[17] and another VAR model uses a censored version of the GPR index. The censored GPR index (shown in Figure A.2) is constructed by setting to zero all observations on the GPR where the index (1) increases by less than 1 standard deviation relative to the previous year average, and (2) is lower than its highest value in the previous six months. The resulting index captures relatively large and unprecedented increases in geopolitical risk, and hence is less affected by a a potential long-term shift in vocabulary usage.

The impulse responses to a GPR shock in the model with the 9/11 dummies are very similar to the baseline model.

The impulse responses to a shock of the censored GPR index are also broadly unchanged. By censoring the GPR index, a GPR shock induces a very temporary increase in geopolitical risk, which is zero 3 months after the shock. The lack of persistance translates into a more muted response of IP in the U.S. advanced economies. Interestingly, the decline in oil prices becomes larger, reaching 10 percent 3 months after the shock. The responses are in general less persistent.

FInally, in Figure 11 we explore the robustness to an alternative Cholesky ordering where we order the GPR index after the VIX and oil prices, that is, last in the block of fast-moving variables. By construction, the impact response of the VIX is zero. This exclusion restriction lowers the entire dynamic path of the VIX, which declines marginally after the shock. However, despite the decline in the VIX, a shock to GPR has the same effects recessionary effects as in the benchmark model. Hence, this result highlights that while geopolitical risk might transmit through higher global volatility, it has a significant independent effect.

In Figure A.3 in the Appendix, we show that our results are robust to including Bloom's measure of risk in the index.

[17]We included a dummy for both September and October because news coverage of the 9/11 terrorist attacks and especially their geopolitical implications was higher in October than in September.

5 Conclusions

TBA

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A Construction of the Index

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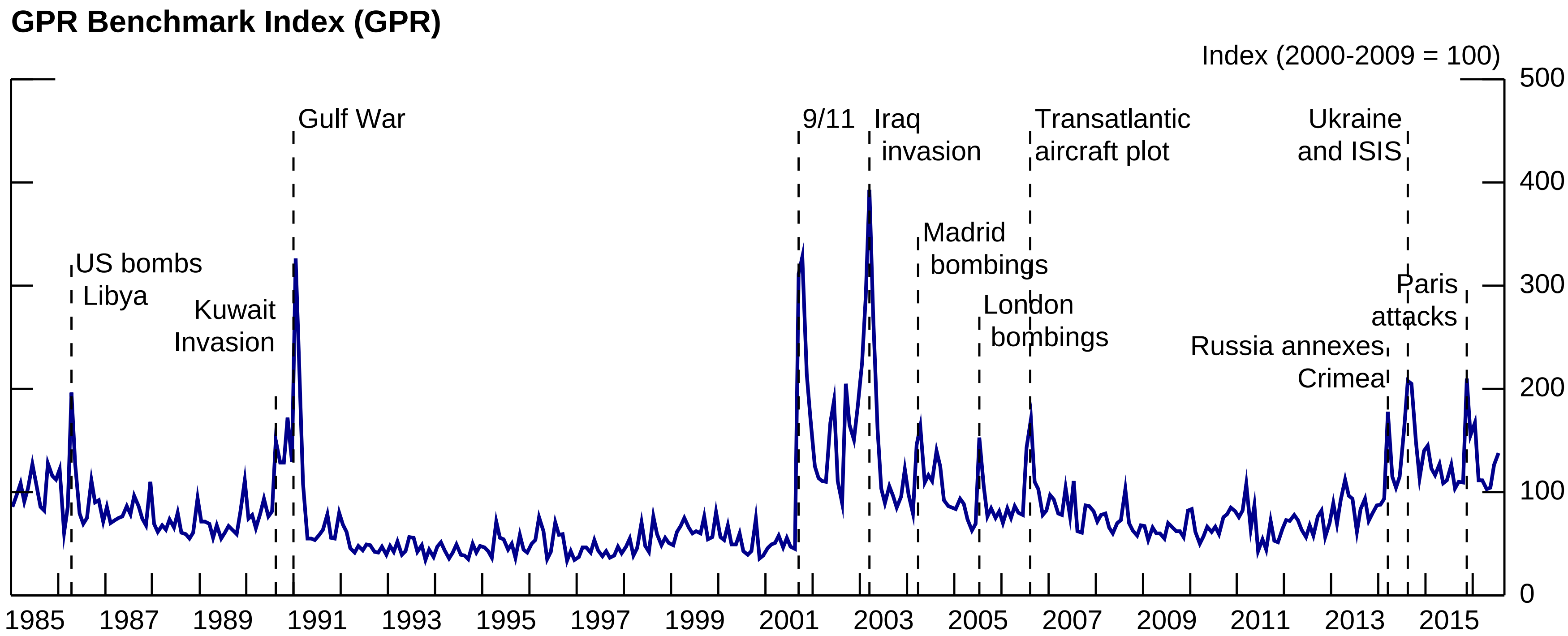
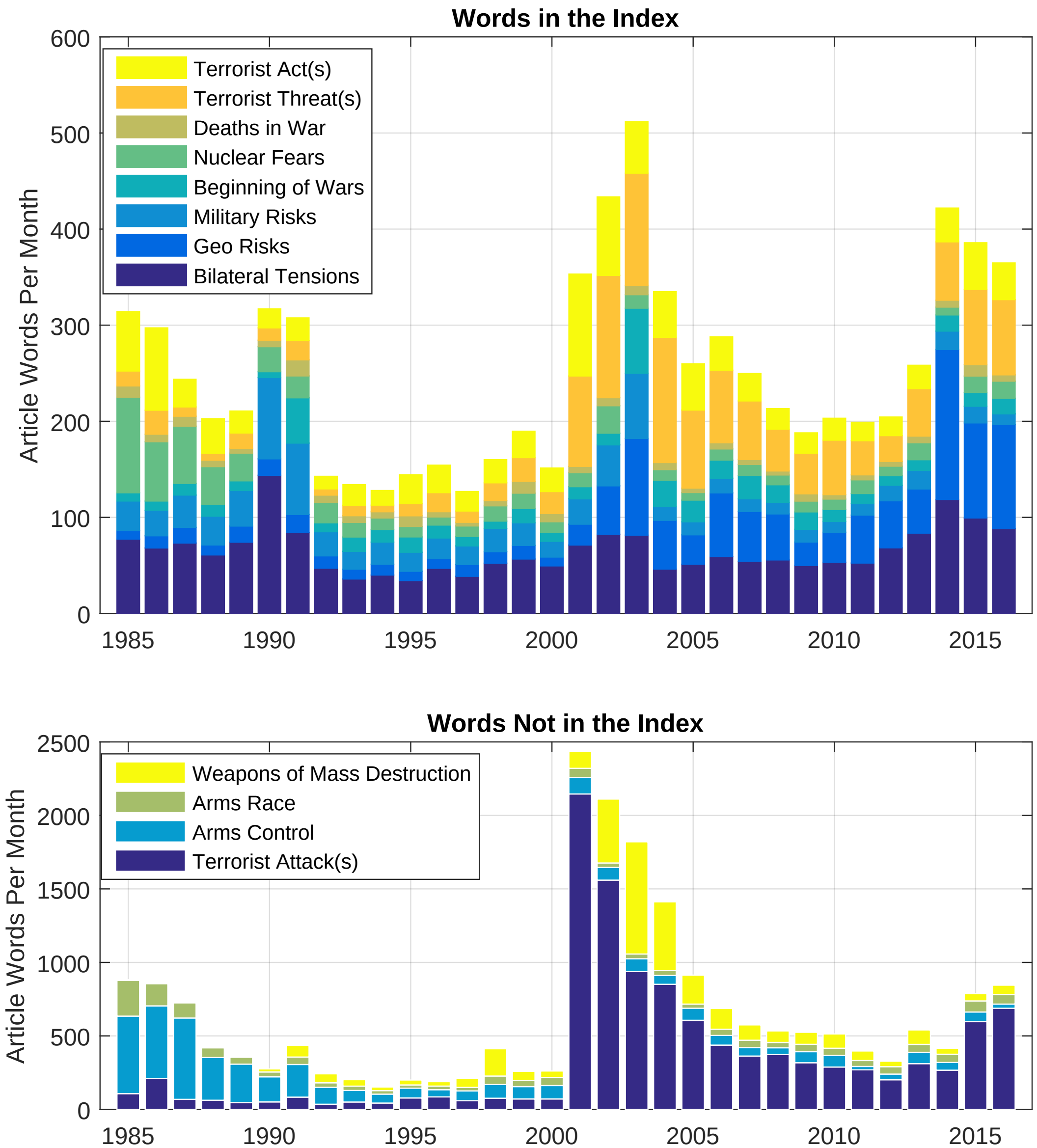
Figure 1: The Geopolitical Risk Index, January 1985–July 2015



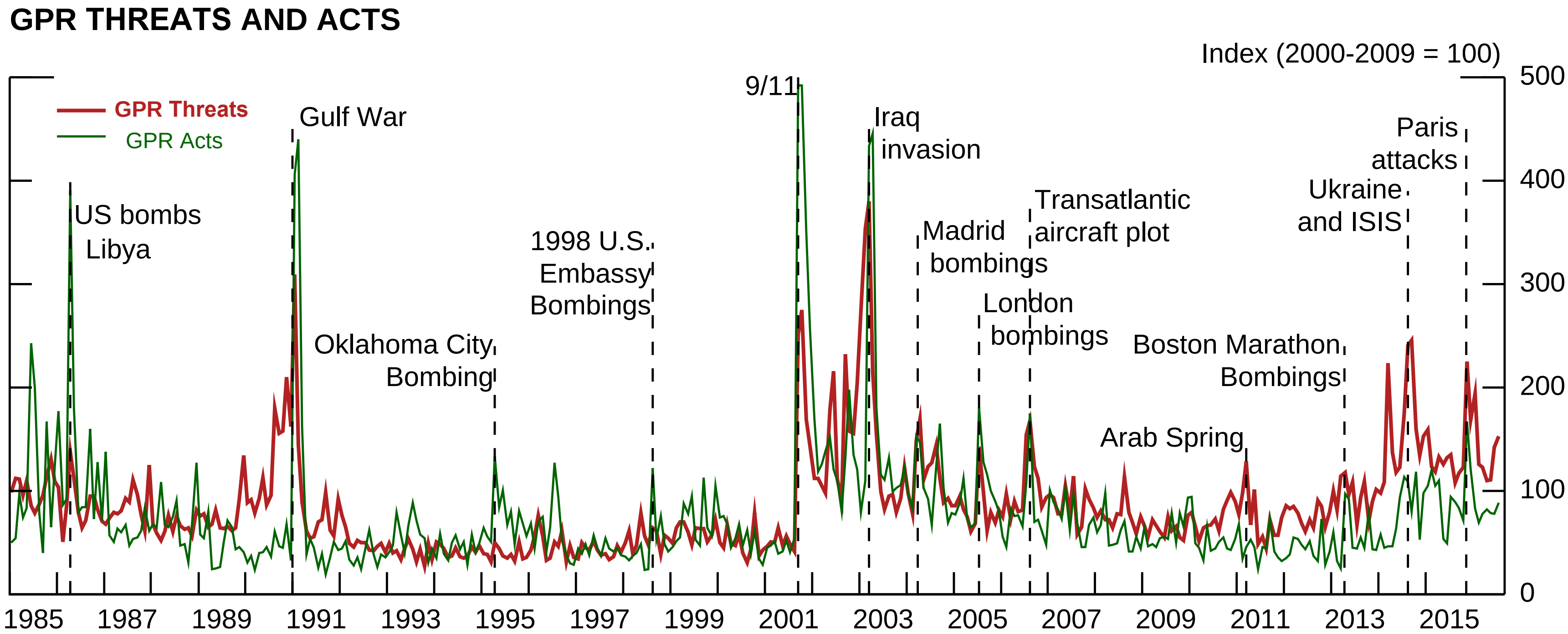
Note: The line plots our benchmark GPR index.

Figure 2: The Geopolitical Risk Index: Contribution of Various Words



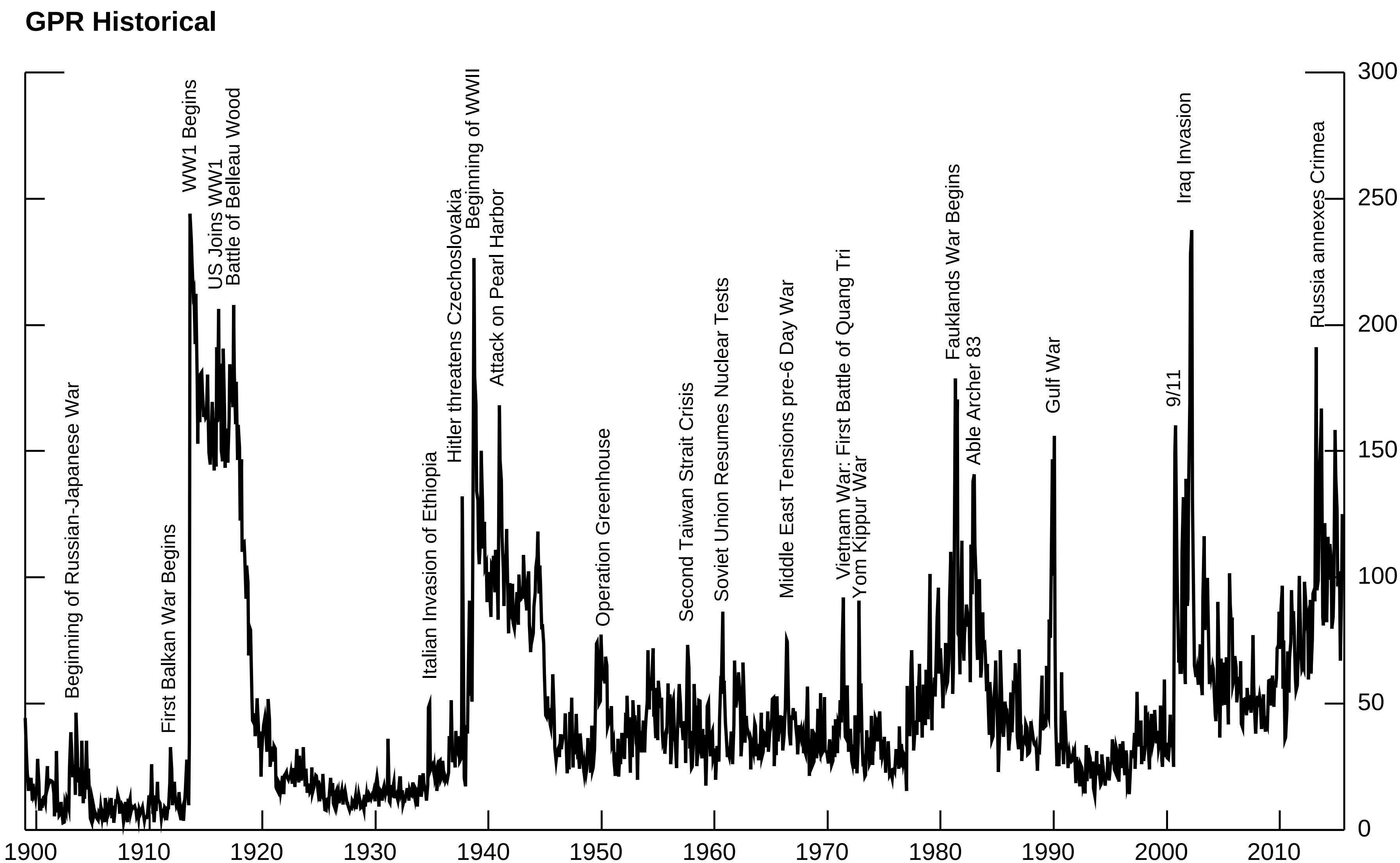
Note: The chart plots the cumulative contribution of the various phrases that enter the GPR index (top panel), and of some other phrases that do not enter the index (bottom panel). Higher geopolitical risk since the 2000s reflects increased mentions of both terrorist acts and terrorist threats, as well as an increased use of terms directly mentioning geopolitical uncertainties.

Figure 3: The Geopolitical Risk Index: The Two Sub-Indices



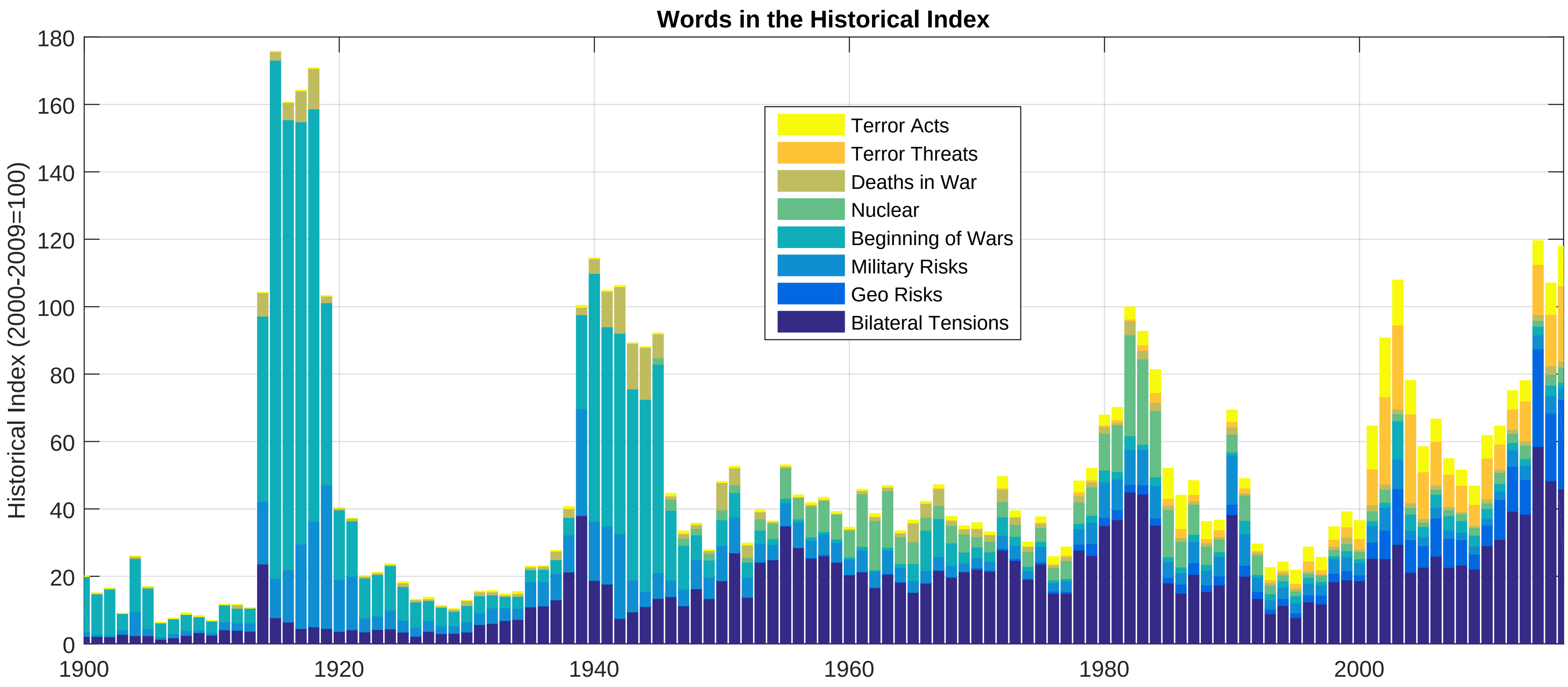
Note: This figure decomposes our benchmark index into two subcomponents. The GPR RISKS component measures only the risk aspect of geopolitical tensions, as measured by search terms 1, 2, 3, 4 and 5 in Table 1. The GPR ACTS component measures the actual occurrence of events, as measured by search terms 6, 7 and 8 in Table 1.

Figure 4: The Historical Geopolitical Risk Index



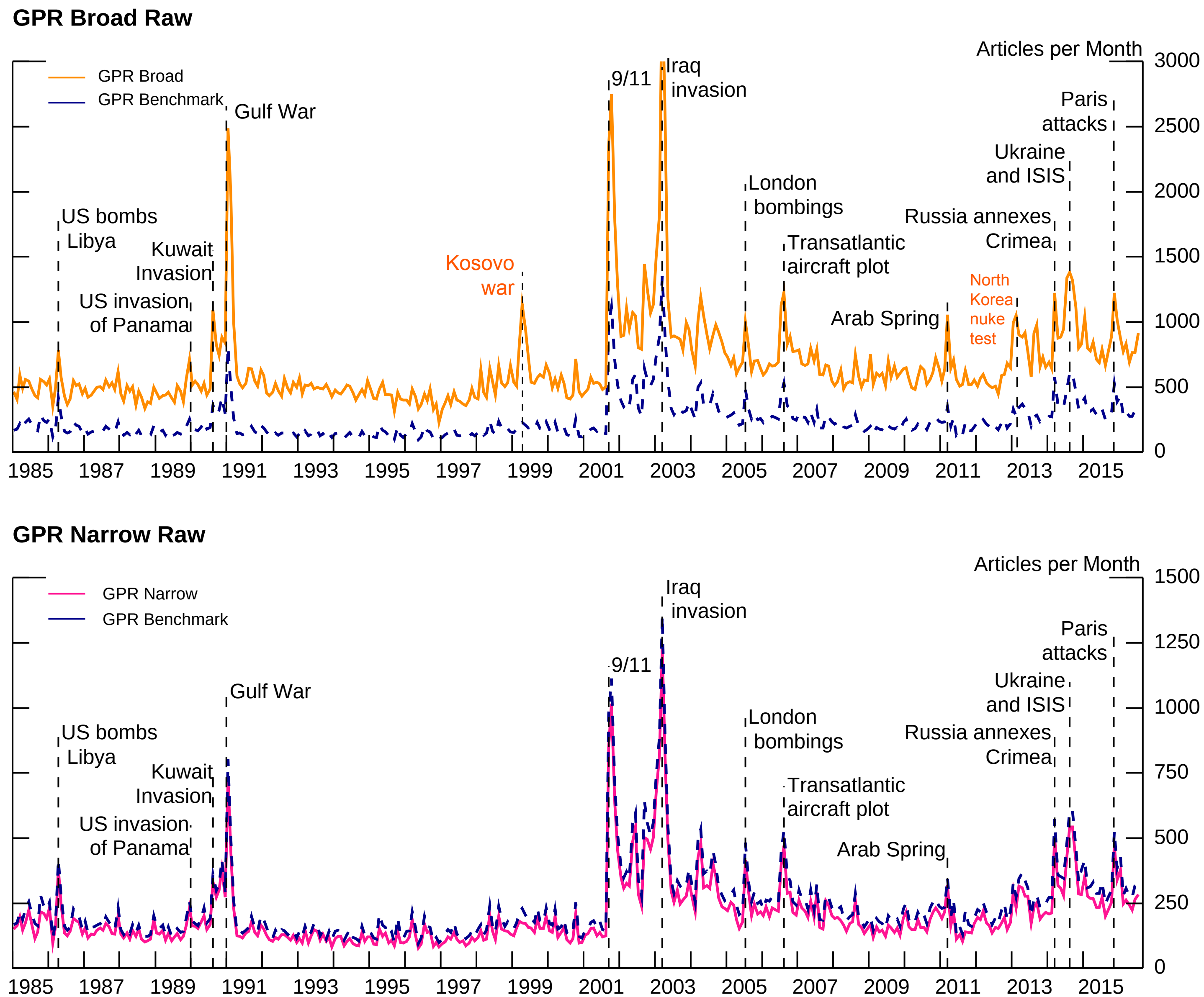
Note: The line plots the monthly GPR index since 1900.

Figure 5: The Historical Geopolitical Risk Index: Contribution of Various Words to the Index



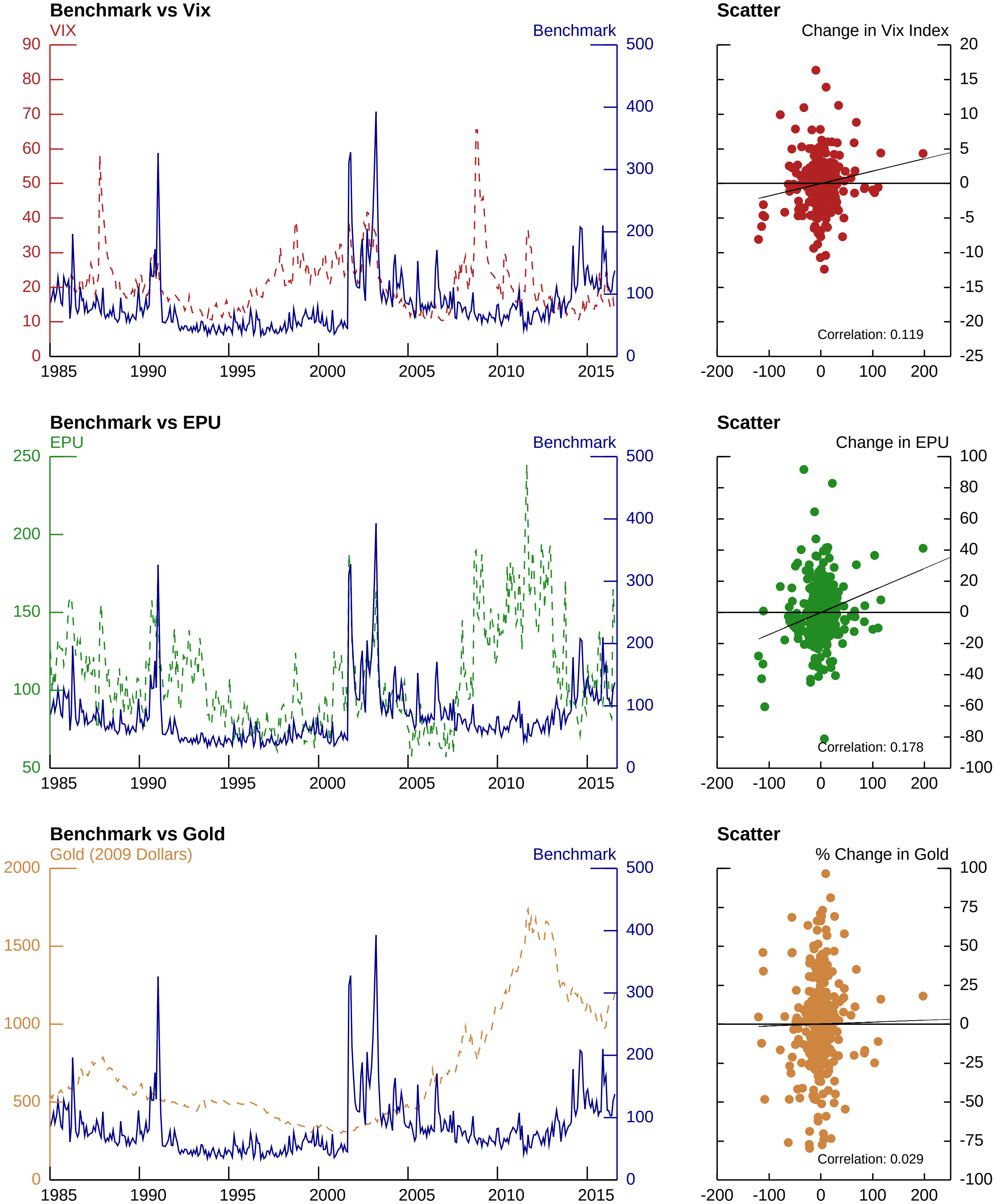
Note: The line plots the annualized (average of monthly values) GPR index since 1900, broken down by its keywords.

Figure 6: The GPR Index and a Broader and Narrower GPR Measure



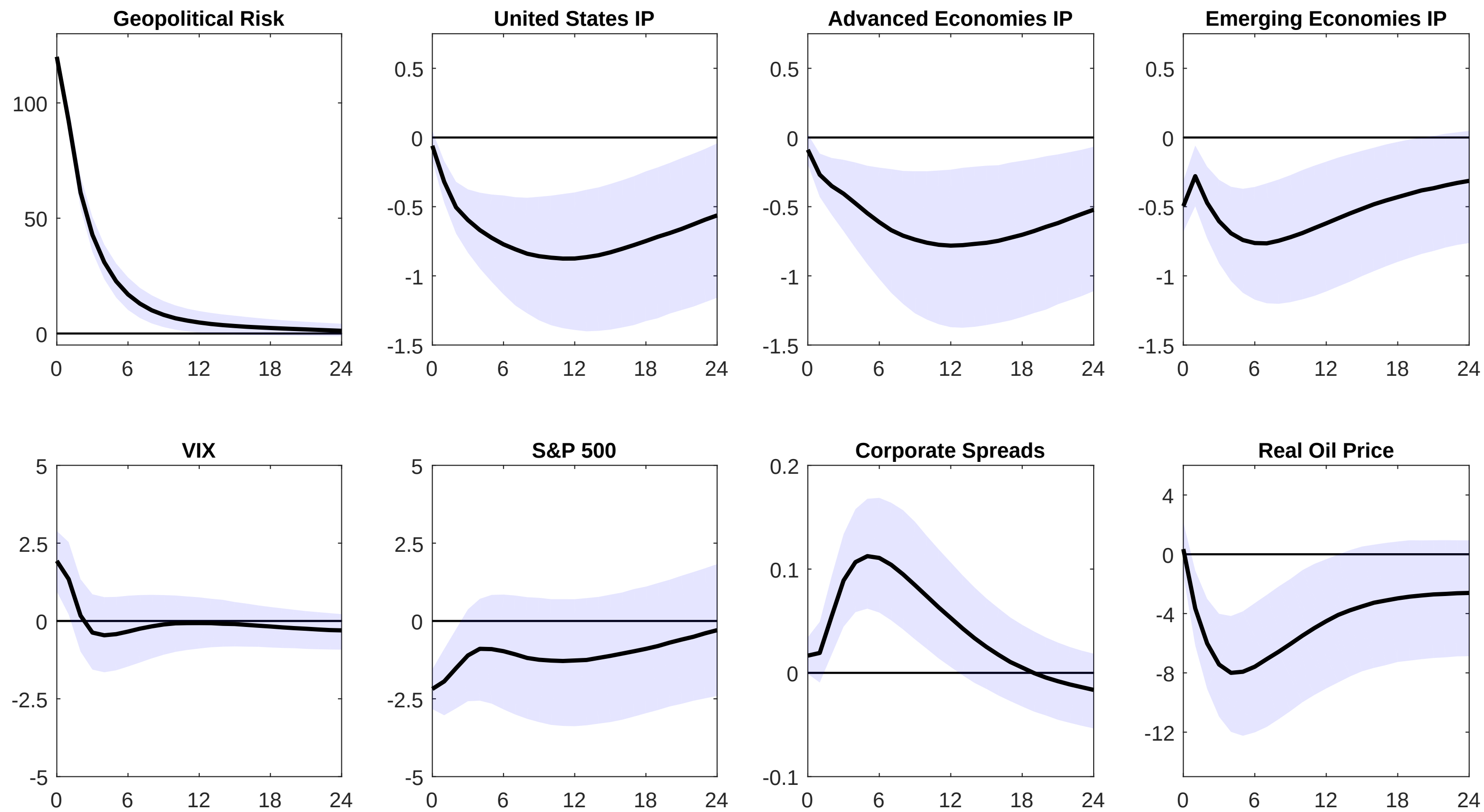
Note: This figure compares the benchmark index with one broader (GPR BROAD, top panel) and one narrower (GPR NARROW, bottom panel) measure of geopolitical risk. GPRBROAD replaces "tensions" in search category no.3 with "tensions OR risk(s) OR instability OR fear OR chaos"; it also enlarges replaces search category no.8 with "terrorist act(s)" OR "terror attack" OR "terror act". GPRNARROW drops from the benchmark search all the articles that mention (First World War OR Second World War OR Anniversary OR WWII OR WWI OR obituary OR stalker(s) OR film(s) OR movies(s)).)

Figure 7: The Geopolitical Risk Index and other Measures of Risk



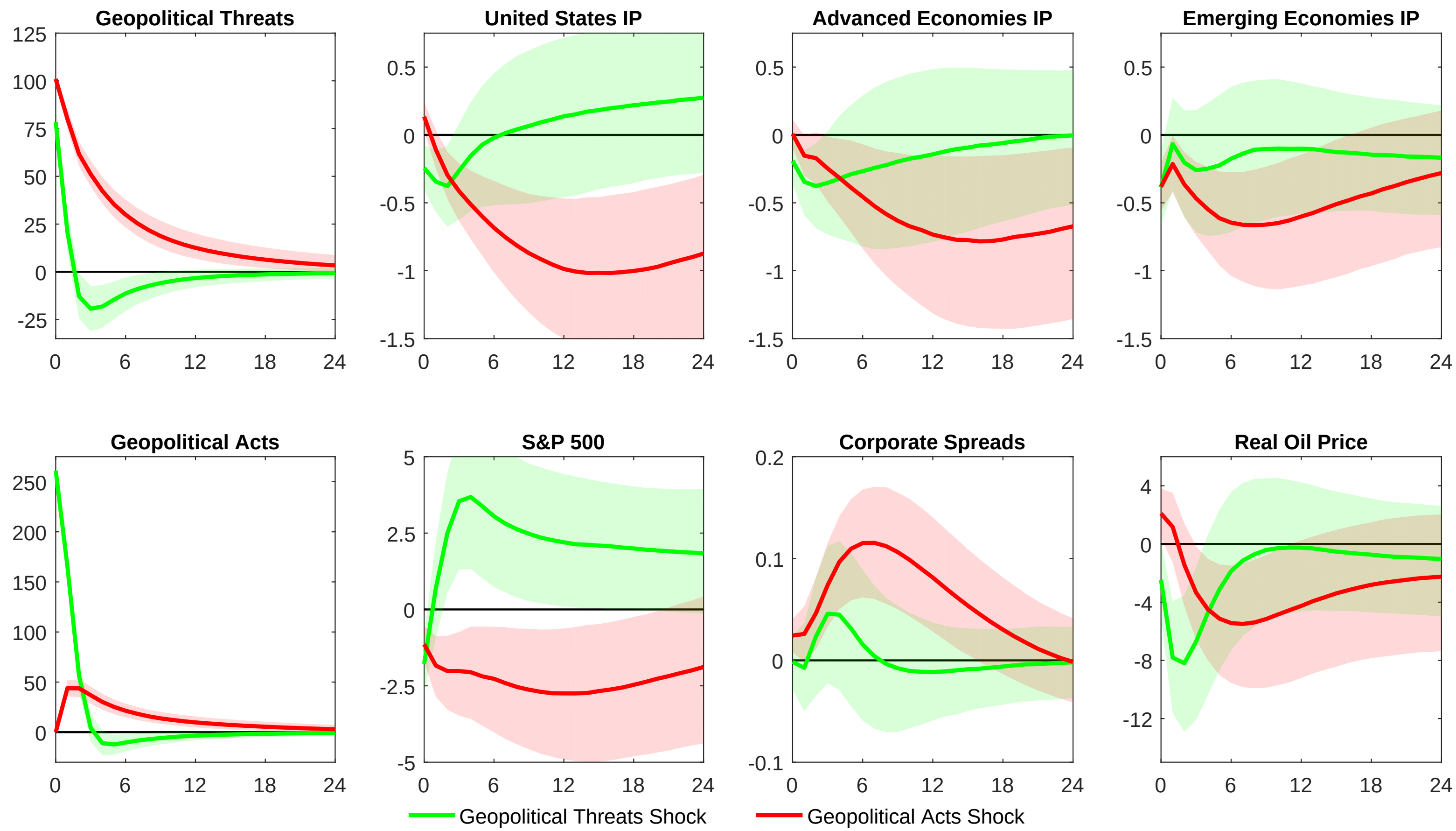
Note: This figure compare the GPR index with VIX, the EPU Index, and with the price of Gold.

Figure 8: The Impact of Increased Geopolitical Risk



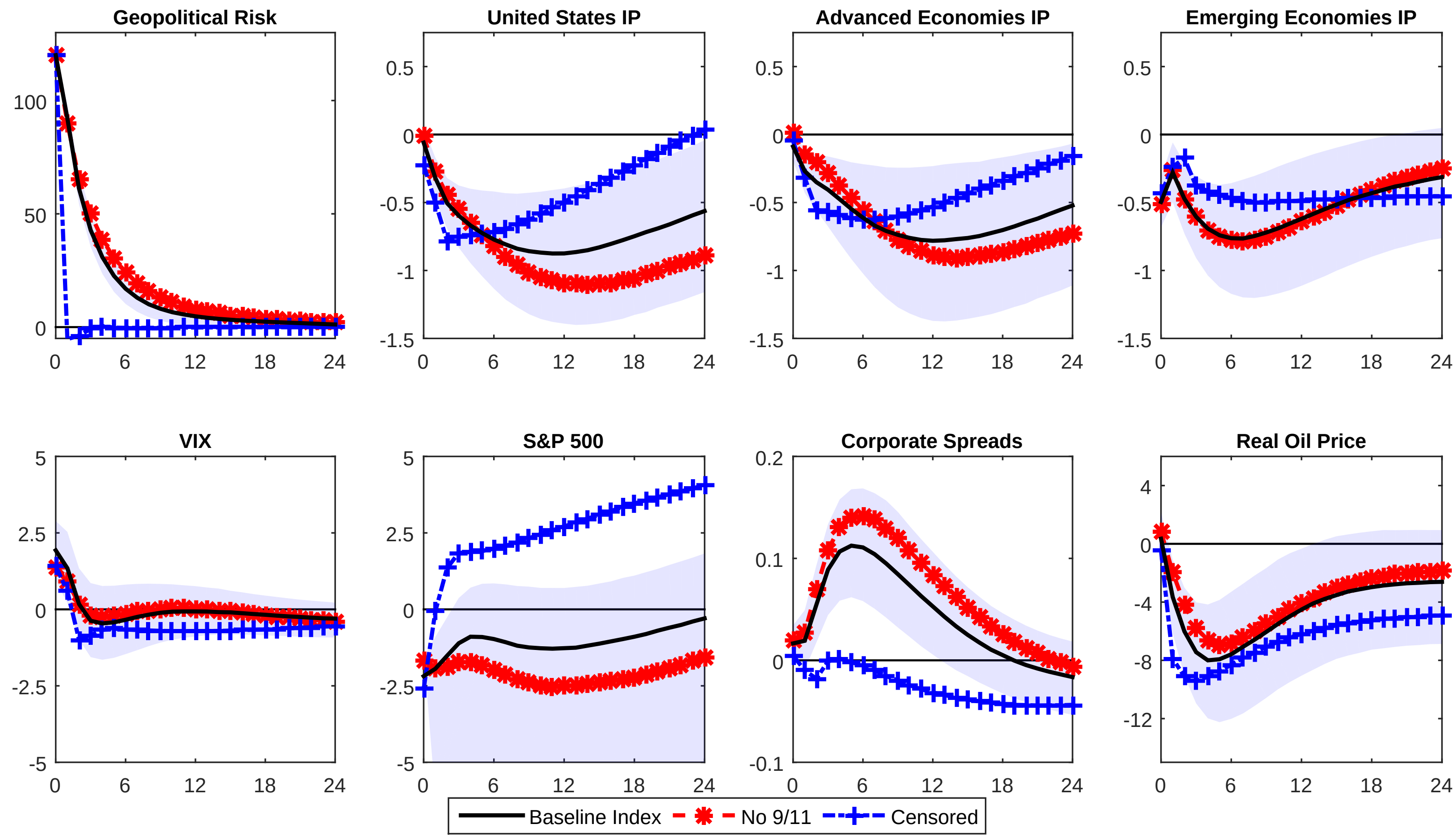
Note: The black solid line in each panel depicts the median impulse response of the specified variable to a rise of 120 points in the GPR index, while the shaded bands represent the 68 percent pointwise credible set. GPR index and the VIX are in levels, the corporate spread in basis points. All responses are measured in percent. The horizontal axis measures months since the shock.

Figure 9: The Impact of Increased Geopolitical Risk: Acts vs Threats



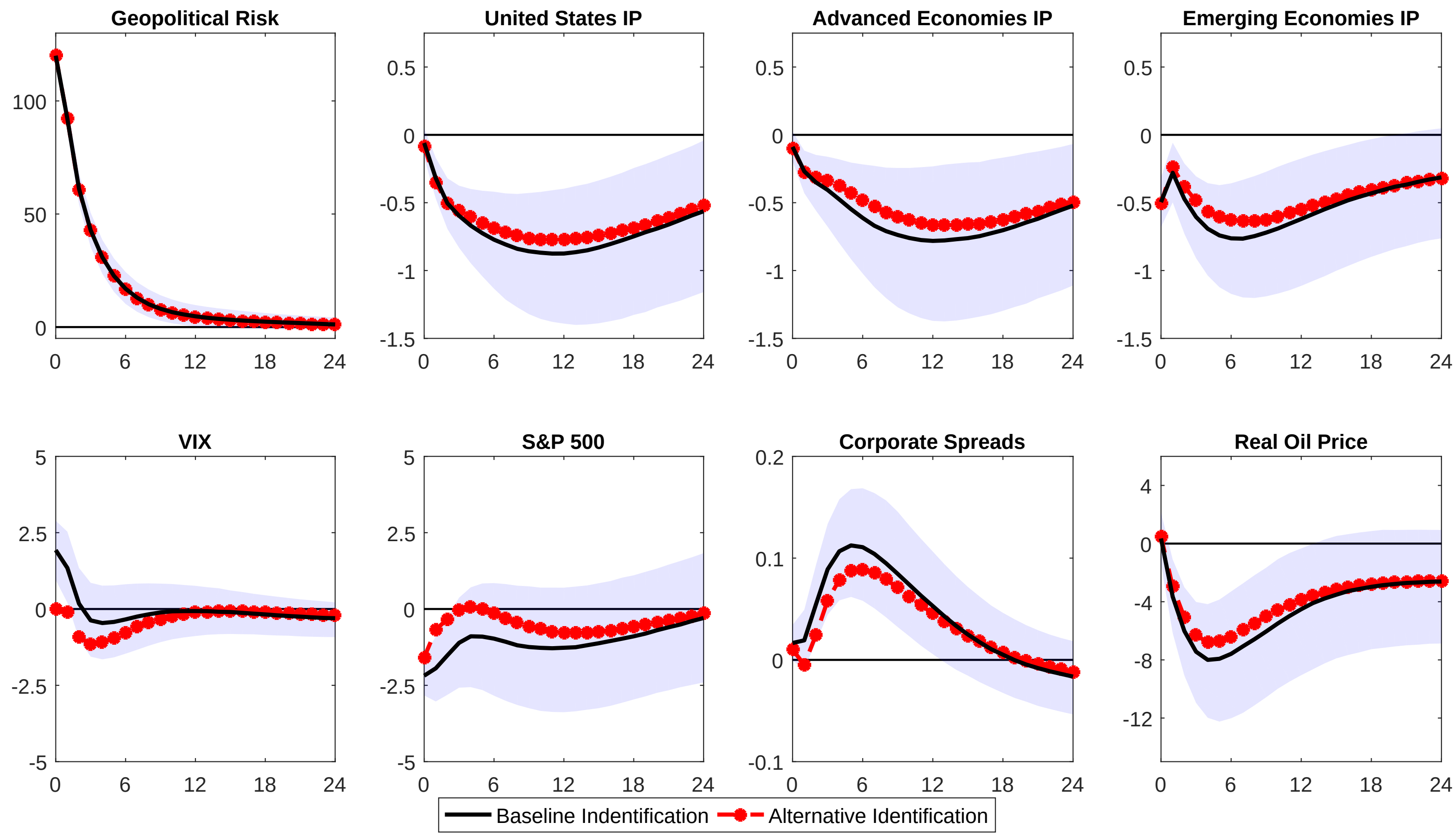
Note: VIX included in the VAR but not shown. GPR indices in levels, corporate spread in basis points. All responses are measured in percent. The horizontal axis measures months since the shock.

Figure 10: The Impact of Increased Geopolitical Risk: 9/11 and a Censored Version



Note: The black solid line in each panel depicts the median impulse response of the specified variable to a rise of 120 points in the GPR index, while the shaded bands represent the 68 percent pointwise credible set. The horizontal axis measures months since the shock.

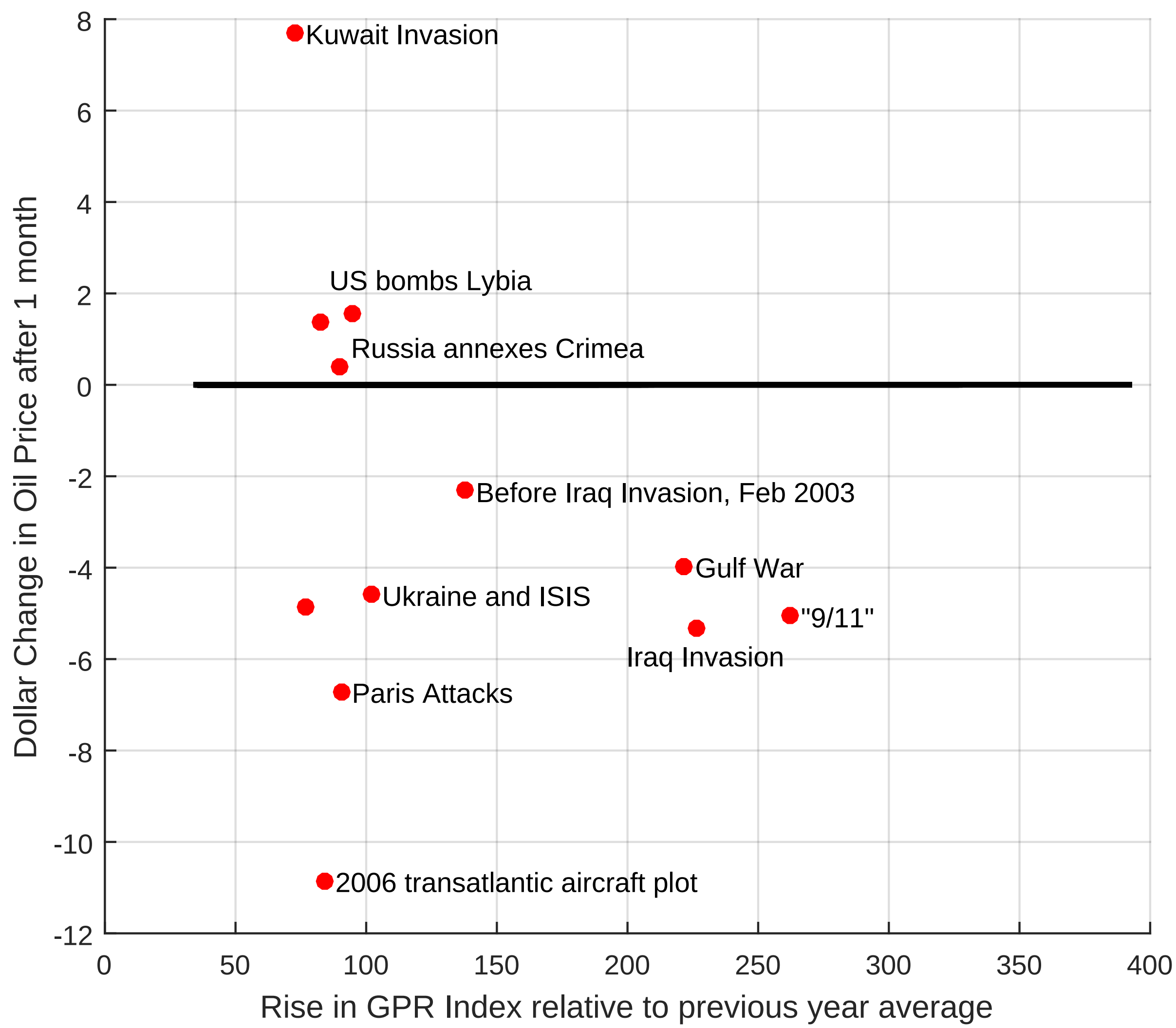
Figure 11: The Impact of Increased Geopolitical Risk: Alternative Ordering



Note: The black solid line in each panel depicts the median impulse response of the specified variable to a rise of 120 points in the GPR index, while the shaded bands represent the 68 percent pointwise credible set. The horizontal axis measures months since the shock.

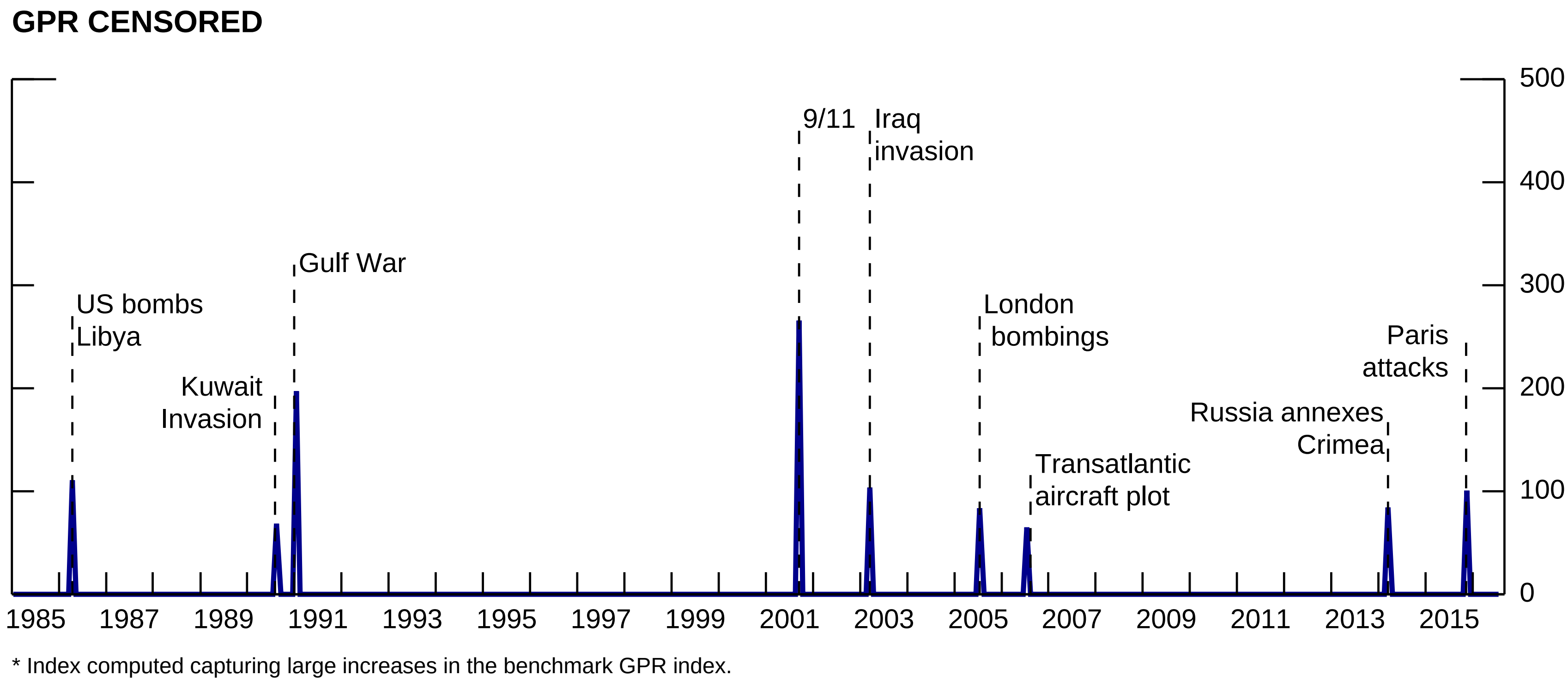
A Additional Figures

Figure A.1: GPR Spikes and Oil Prices



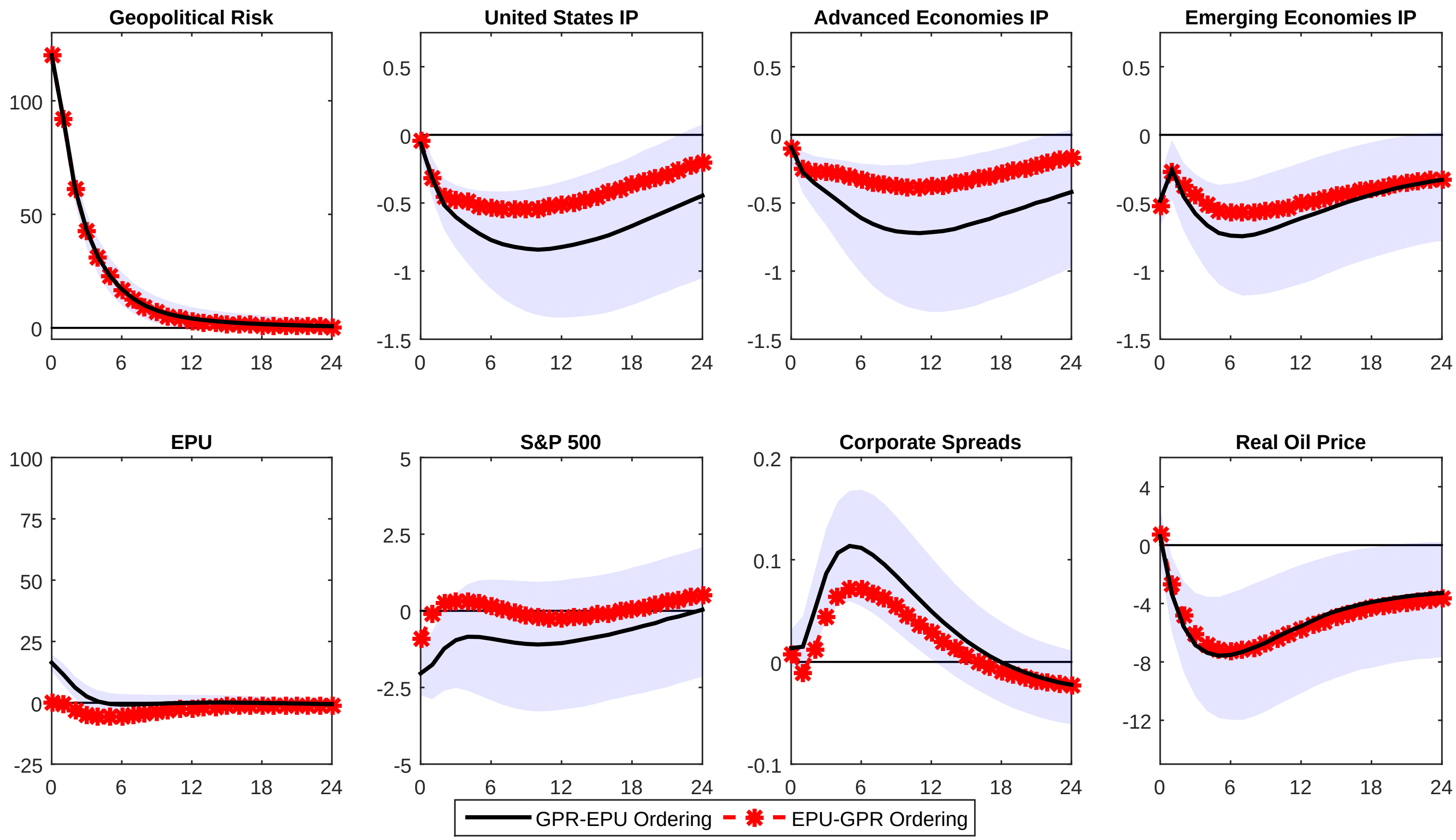
Note: GPR Spikes are identified by calculating all episodes where (1) GPR rises by at least 80 points relative to its previous year average, and (2) GPR is greater than its 6-month moving average.

Figure A.2: Censored GPR



Note: GPR Spikes are identified by calculating all episodes where (1) GPR rises by at least 80 points relative to its previous year average, and (2) GPR is greater than its 6-month moving average.

Figure A.3: The Impact of Increased Geopolitical Risk: Adding EPU to the Baseline VAR



Note: The black solid line in each panel depicts the median impulse response of the specified variable to a rise of 150 points in the GPR index, while the shaded bands represent the 68 percent pointwise credible set. The horizontal axis measures months since the shock.