

The Ephemeral Brent Geopolitical Risk Premium

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Motivations underlying the research

In our previous research, we have highlighted a self-perpetuating tri-variate cycle in oil prices, financial market conditions, and geopolitical risk, which dates back at least to the early 1970s and has continued to this day. Low oil prices lead to heightened geopolitical risk in the Middle East and more broadly, and the latter eventually leads to higher oil prices, which leads to increased global financial liquidity due in part to recycling of petrodollars. Petrodollar recycling, in turn, plays a critical role in raising the prices of various financial assets, including commodity and oil prices, and also contributes to arms deals that can fuel later geopolitical strife. Upswings of the secular business cycle are thus amplified through oil and financial markets, until asset overvaluation and high energy prices precipitate a downturn in the business cycle, which is likewise amplified by withdrawal of petrodollars from the global financial system. Although we do not know of other authors who have connected all three components of this global self-perpetuating cycle, our analysis for each of the three pairwise combinations of variables agree with other research in the literature.

In recent years, we have noticed that correlation structures between oil prices, geopolitical risk, and global financial liquidity have exhibited changes in magnitude and structure, and we wanted to investigate those changes in some detail. In this paper, we have focused on one particular pair of variables: oil prices and geopolitical risk. We study the changing correlation structure at different times and time horizons between Brent prices and a geopolitical risk index, conditioning on variables that measure the level of aggregate economic activity and oil inventories, as proxies for physical oil market supply-and-demand conditions.

Research performed

We conducted three sets of statistical analyses to investigate the changing correlation structure between Brent prices and the geopolitical risk index compiled by Caldara and Iacoviello, based on major newspaper reports. All three sets of analysis were conducted conditional on Kilian's index of global economic activity, constructed from shipping data, and global oil inventory data from Energy Intelligence Group, publisher of Petroleum Intelligence Weekly. The first analysis, which spans partial correlation structures for various time horizons from two months to several years, used Continuous Wavelet Transform (CWT) analysis. This analysis showed somewhat stable trends over the past decade at the medium term of one to three years, and to a lesser extent at the shorter term of six to twelve months. The primary result from this analysis was to show that oil prices followed geopolitical events during the Arab spring period in 2011–12 but have led those changes by about two months since the end of the Arab Spring in 2013.

Unfortunately, CWT results showed too much variation at the shorter time horizon of two to three months. Therefore, we used a second methodology, Vector Autoregression (VAR), at the monthly frequency, allowing for two different regimes in the periods 1993–2004 and 2005–2018. The results of this analysis reconfirmed our earlier results using CWT—that after the end of the Arab Spring in 2013, oil prices have moved ahead and in the same direction of geopolitical events by approximately two months. Finally, we conducted GARCH-MIDAS analysis of oil price volatility for the shortest possible time

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horizon allowed in our data, which is daily, and found that dynamic oil price volatility structures at this time horizon suggest that speculative traders with this time horizon were reacting to geopolitical events.

Main conclusions

Our main result from the two sets of analyses using CWT and VAR methodologies—that oil price movements have led same-direction geopolitical risk movements by approximately two months since the end of the Arab Spring in 2013—is consistent with the hypothesis that some financial market speculators, such as macro hedge funds and algorithmic traders, may amass long positions in Brent in anticipation of geopolitical threats that might potentially lead to oil disruptions. Under the hypothesis, such traders would build long positions based on initial news reports regarding a possible geopolitical event, thus contributing to the advance rise in oil futures prices, and would take profits once the events materialize. While we do not have direct evidence on this trading strategy presented in this paper, anecdotal examination of the periods preceding several geopolitical events lend further credibility to this interpretation.

Price movements at the daily frequency are driven by different types of financial traders, and we find in our third analysis that geopolitical risk has had a positive effect on oil price volatility in later days during the second half of the sample from 2005 to 2018. We conclude that while purely financial speculative traders may base their trading reactions on geopolitical events, more sophisticated investors with longer time horizons anticipate geopolitical events successfully, and trade two months in advance of those events—resulting in higher prices two months prior to heightened geopolitical risk, and vice versa.