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Title:

*“Geopolitical Summits and Market
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Author(s):

Nicholas Fulton
2019-2020 Undergraduate Research
Fellow

Geopolitical Summits and Market Volatility*

James W. Boudreau[†]

Nicholas Fulton[‡]

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Abstract

We provide evidence of a negative relationship between short-term market volatility and geopolitical summit meetings. More specifically, our results show a significant decrease in the VIX volatility index for days surrounding geopolitical events such as G7 or G20 meetings. Though the decrease in volatility is short-lived, this finding may be surprising given the nature of these events as well-known, publicized meetings that are primarily focused on long-term goals.

JEL Classification Codes: E44, F42, F53, G14.

Keywords: Geopolitics, G7, G20, NATO, volatility.

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[†]Kennesaw State University, E-mail: jboudre5@kennesaw.edu.

[‡]Kennesaw State University, Email: nicholasfulton14@gmail.com

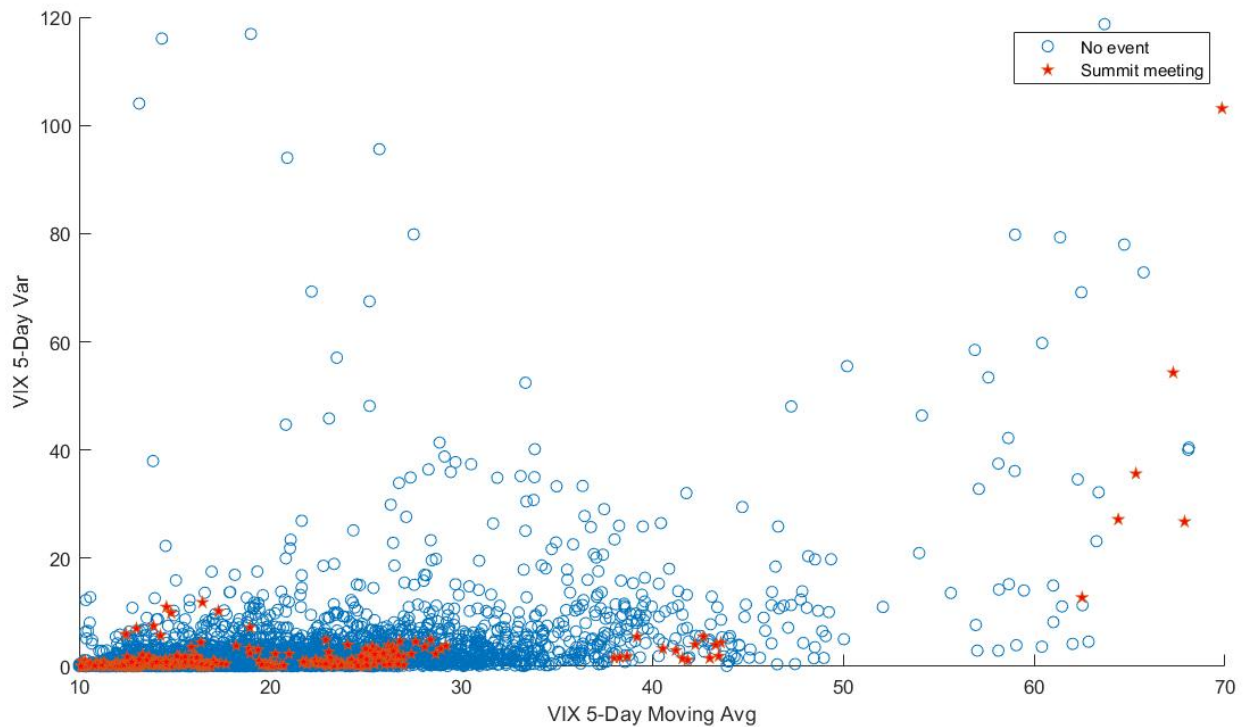
1 Introduction

We provide evidence of a negative short-run relationship between geopolitical summit events and market volatility. In particular we focus on meetings of the G7, G20, NATO, and OPEC. While these groups are quite different in terms of purpose, they often conclude their meetings with few if any binding agreements. Though the G20's official aims are directly related to economic stability, for example, Lo Duca and Stracca (2014) find no impact after its summit meetings on asset prices, and only some short-lived effects on volatility. Our results further support theirs, but extend to include a larger variety of events, yielding more consistent evidence of a drop in short-term volatility.

In one sense, the given geopolitical events should not have an effect on market volatility due to the fact that the events occur within the same time frame each year and the events are publicly known, as are the surrounding economic conditions. The events could be classified as a constant in market volatility due to their publicity, known dates of occurrence, and the fact that these geopolitical summits rarely (if ever) release any new information to the market. However, a parabolic pattern in VIX(CBOE Volatility Index) can be observed in days immediately following these events. Running a treatment effects estimation with k-nearest neighbor matching with summit days as dummy variables we find a coefficient of -1.61, which represents a drop in volatility for days immediately following the event. The coefficient is statistically significant with a z-score of -11.61, and the model accounts for economic conditions using differenced DOW Jones values, time fixed effects and lagged VIX. The results from the treatment effects estimation represent 29 years of VIX data, and lead one to wonder: are geopolitical summits a long-term solution to macroeconomic stability?

2 Data and Overview

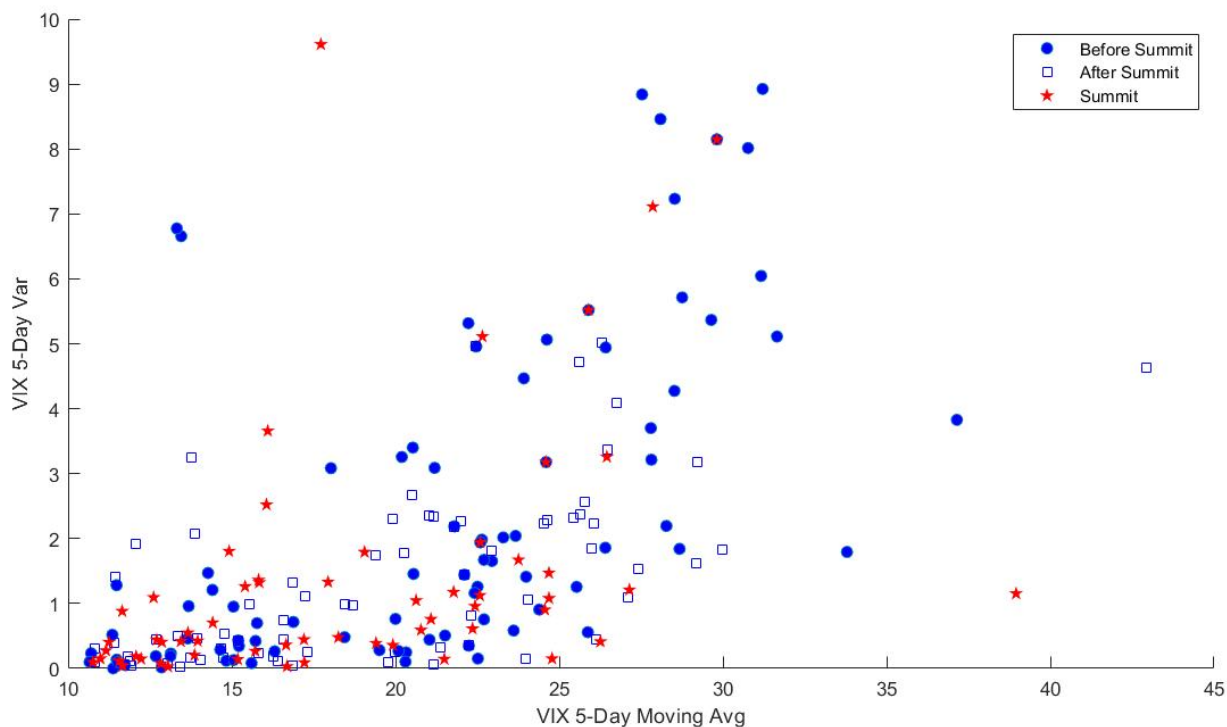
Our primary data source is the VIX, along with the DOW Jones Industrial average as a control for surrounding economic conditions. Our treatment variable is the occurrence of a global summit, and in that category we include G7, G20, NATO, and OPEC. The inclusion of NATO and OPEC may seem incongruent, but we omit any NATO meeting that directly involve a declaration of war or major military action,



such as the meeting in 1993 in which NATO intervened in the Bosnian conflict. We also similarly omit OPEC meetings with major declarations of changes in oil supply.

Figure 1 displays a very broad overview of the VIX data in terms of its 5-day moving average and variance. We plot the mean-variance for each day for 1990-2019, with non-event days in blue and the days of summits in red. Though this is an admittedly simple view, the distinction does begin to emerge. The days of events seem to display a lower mean and variance than non-event days. For a slightly clearer view, Figure 2 focuses on just those days 5 days before a summit, two days after a summit occurred, and a week after a summit occurred.¹ Though the contrast is not as stark, the pattern is still consistent. Days just following the summit display lower volatility than non-event days surrounding the same time period. In the next section we explore the relationship further.

¹We experimented with the number of days before and after the event, and the image was consistent. The graphs axis are different scales.



3 Estimation and Results

We use a treatment effects estimation with k-nearest neighbor matching to compare the event days to the non-event days. The treatment effects estimation is a type of difference-in-difference approach that tests whether the VIX (as well as its moving average and variance) on average is different based on whether an event has occurred or not. We use the event days as the treatment variable, lagged VIX ($t - 1, \dots, t - 4$), time fixed effects, differenced DOW Jones values and volumes as control variables, and VIX as the dependent variable which returned a coefficient value of -1.61 and a z-score of -11.61 (table 1 row 1). The treatment effects estimation using VIX variance as the dependent variable returned a coefficient value of -.976 with a z-score of -9.96 (table 1 row 2), and using VIX average as the dependent variable returned a coefficient value of -1.61 with a z-score of -12.82 (table 1 row 3). Not included are our estimates with alternative lag specifications and additional controls, but this brief synopsis does show a consistent relationship: market volatility is muted immediately following and preceding the global summits we study in spite of their fairly limited actions.

Table 1: Treatment-effects Estimates with K-Nearest Neighbors Matching(Lag)

	<i>coef</i>	<i>std.err.</i>	<i>Z</i>
<i>VIX</i>	-1.61	.138	-11.61
<i>VIXavg</i>	-1.61	.125	-12.82
<i>VIXvar</i>	-.976	.098	-9.96

Table 2: Treatment-effects Estimates with K-Nearest Neighbors Matching(Lead)

	<i>coef</i>	<i>std.err.</i>	<i>Z</i>
<i>VIX</i>	-1.63	.133	-12.20
<i>VIXavg</i>	-1.58	.136	-11.61
<i>VIXvar</i>	-1.01	.085	-11.86

We have also experimented with leading days of VIX as suggested by Imai, Kim, and Wang (2020), and found results similar in size and significance to those using leads. This indicates that there are significant differences in the market in the days both preceding and after the the events we study. Since we are using a treatment effects approach we do not include both at the same time, since some days leading the first days preceding an event lag those during, etc. But in the future we plan to explore these patterns more in-depth.

4 Discussion

Our findings show a distinct negative correlation between short-term market volatility and geopolitical events. The treatment-effect estimation shows a statistically significant coefficient in VIX, VIX variance, and VIX average values, which represents a minor decrease in market volatility after events occur. The treatment-effect estimation also shows the same behavior before events occur. The short-term muted volatility for both before and after the events leads one to believe that geopolitical events are market stabilizers. Though we have not displayed any evidence ruling out a long-term effect in this short paper: our research thus far has lead us to believe that geopolitical events are better suited for short-term market stability.

Our research on the relationship of geopolitical events and market volatility is still ongoing, and we are in the process of establishing a similar relationship between these events and asset prices, and refining these relationships with more detailed macroeconomic explanatory variables. Previous work such as Savor

and Wilson (2013) and Lucca and Moench (2015) has found that economic announcements on inflation data or news from the FOMC (respectively) impact the market, but as far as we know, other than Lo Duca and Stracca (2014), who restrict attention to the G20, we are the only ones to investigate the market impact of these major summits.

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