How Does Geopolitics Affect Financial Markets?

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- Geopolitical events matter for foreign exchange and equity markets, but their impact differs across countries. Where geopolitical risks are of an extreme and binary nature, markets tend to react less consistently

- Currency spot markets often react instantly to negative events, losing as much value in two days, on average, as they normally do over a month. However, they react more strongly to positive events over the medium term

- Equity markets react to positive and negative events in a more symmetrical fashion; after an event, rolling returns stay above or below the historical average for one to two months

- The study tentatively suggests a 'sweet spot' for USD-based equity investors at around one month after positive geopolitical events, due to the combined effects of currency and equity outperformance outweighing a modest increase in volatility

- Markets treat geopolitical events as beta drivers, though this is much more pronounced for negative events than positive ones

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Introduction

In Alexandre Dumas's 1844 novel *The Count of Monte Cristo,* news of an impending cross-border revolution in Spain leads to financial panic among French investors. Some investors end up selling Spanish bonds at a great loss, only to see the price bounce back after the news proves to be erroneous.

Geopolitics matters to markets in the real world too and has been a major theme in 2018, as the post-war global order is dismantled and protectionism takes hold. But, as in Dumas's tale, it can be hard for investors to know how to react to such uncertainty. In this paper, we examine attempts to assess the impact of geopolitics on markets and conduct our own analysis on how it plays out over different time periods. Our hope is that investors can use this analysis when considering how best to respond to future geopolitical events, in terms of both the risks and opportunities they may present.

Measuring Geopolitical Risk

Academics and industry analysts have built barometers of geopolitical risk to help investors measure and tackle the instability brought about by geopolitical events. For example, the Geopolitical Risk Index (GPR) by Caldara and Iacoviello[1] provides a benchmark indicator of news headlines related to geopolitical tensions, wars or terrorism. In their study, the authors identified correlations between higher measures of geopolitical risk and increases in capital flows from emerging economies to the developed world, considered 'safe havens' in times of stress by investors. They also conclude that higher risk leads to lower stock returns in tandem with increases in VIX[2] and higher corporate spreads.

Figure 1
Geopolitical Risk Index versus MSCI World 1985–2018

- Daily GPR Index
- 1-yr Moving Avg GPR
- MSCI World (RHS)
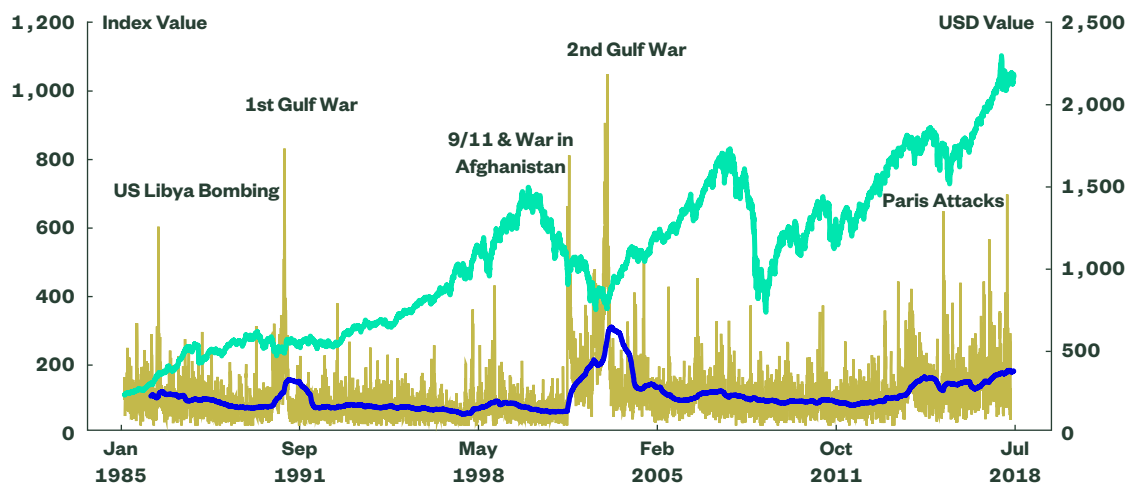
Source: State Street Global Advisors Research using GPR index data from https://2.bc.edu/matteo-iacoviello/gpr. htm#home and MSCI World data from Bloomberg.

However, as Figure 1 shows, the correlation between the GPR data (including a 1-year moving average of the GPR) and the performance of the MSCI World Index since 1980 does not seem very sound. In this context, just one geopolitical episode seems to respect a correlation pattern, namely the 9/11 attack to the Twin Towers in New York. Nevertheless, the episode and the political-military response occurred in the midst of a multi-year bear market trend linked to the dot-com crisis. Also, when the data covering the 18-month period from 9/11 onwards is excluded, the correlation with lower equity returns or higher volatility is no longer robust. Other comparable global indices share the same characteristics, with swings in geopolitical risk not systematically correlated to asset prices. However, an alternative approach is commonly based on 'event studies', where single geopolitical events are measured in terms of market impact. The most frequently used indices in this regard are the Dow Jones Industrial or the S&P 500 and Figure 2 represents an attempt to capture equity market reactions to geopolitical events.

Figure 2
**S&P 500 Reaction to
Geopolitical Events**

Event	Dates of Market Reaction	Cumulative Decline During Reaction (%)	Performance, 1 month After Reaction (%)	Performance, 1 year After Reaction (%)	Trading Days to Recoup
US operation in Cambodia	29 April — 14 May 1970	-7.8	-1.40	+35.5	75
October War & Oil Embargo	6–26 October 1973	-1.4	-13.3	-37.1	1,576
Iranian hostage crisis	2–7 November 1979	-2.6	+7.7	+29.3	3
US invasion of Panama	13–19 December 1989	-2.9	-1.0	-3.6	7
Iraq invades Kuwait	2–23 August 1990	-13.6	-0.8	+28.4	115
US embassy bombings in Africa	7–14 August 1998	-2.5	-3.1	+25.2	2
9/11 attacks	11–21 September 2001	-11.6	+12.8	-13.7	24
Arab Spring reaches Libya	20 February — 19 March 2011	-4.8	+2.0	+6.4	27
Annexation of Crimea by Russia	February — March 2014	Negligible Effect on Markets			

Source: State Street Global Advisors Research, Bloomberg.

A cursory reading suggests that an instant negative impact derived from a specific geopolitical event occurs but it typically recovers over time. Nonetheless, the empirical evidence is again very modest and one of the main challenges is to isolate geopolitics as a return driver, since the S&P 500 index captures an enormous amount of information, i.e. market knowledge. In fact, geopolitics is only one information attribute and hence will likely be diluted by other information, particularly as time passes.

Furthermore, geopolitical risk typically affects commodity prices as an economic input in developed markets. Yet the role of oil in the modern economy has been significantly declining in recent decades, which has weakened the link between geopolitical headlines and developed markets. With the exclusion of commodity markets, geopolitics is therefore a form of tail risk, which is rarely captured in headline prices. In addition, neither dedicated indices nor event studies focused on broad developed markets adequately reflect the idiosyncratic and qualitative nature of geopolitical risks. In fact, geopolitical indices like the GPR do not distinguish the nature of wars, and consequently the market implication of a specific war. As a matter of fact, a civil war in sub-Saharan Africa differs from a multi-party war in the Middle East, and the market relevance is not adequately captured by the index. Finally, as Figure 2 shows, it is hard to identify many events with significant geopolitical relevance making a systematic analysis difficult.

Our Approach To Geopolitical Risk

In light of the challenges in consistently capturing the links between geopolitical events and market reactions, this paper introduces an enhanced event study approach by compiling a large sample of events across different markets, subject to specific criteria. In plain English, we have tried to find real world laboratory conditions. Therefore, we have selected markets with sufficient liquidity, well-functioning financial systems and an exchange rate regime that is not pegged and responds to market forces. Also, in our selection we have excluded commodity producers as the intention is to gauge a 'pure' form of geopolitical risk that doesn't transmit via commodity export prices. Finally, we have selected markets that are geopolitically exposed in order to gather sufficient evidence for the study. In this regard, only four EM markets met all the above criteria: India, Israel, South Korea and Turkey.

For this group, we compiled a subjective list of 71 distinct geopolitical events, stretching back to the late 1980s and categorised them as either 'positive' or 'negative' (see event list in Figure 12 in the appendix). We then proceeded to measure market reactions to the abovementioned list of events along different time intervals (instant [two days]/one week/one month/one quarter/ one year). Since political risk is endemic in the markets under analysis during the studied time period, we have adopted a definition of geopolitical risk as a transnational risk to economic activity or cross-border trade and capital flows emanating from political actors. This includes all forms of violence (e.g. low-intensity conflicts, assassinations, terrorism and wars) as well non-violent diplomatic measures (e.g. transit or border closures, boycotts and sanctions). In the selection of positive events, we identified milestones in conflict resolution, geopolitical integration or alliance building. [For detailed review of our methodology, please see appendix 2].

With regards to the transmission mechanism of our list of events on local currencies we have considered the implicit impact on underlying structural demand and supply factors. These include interest rates, balance of payments dynamics and the long-term inflation trends affecting exchange rate formation. More specifically, we have considered the transmission mechanism through the following channels:

- **Trade Channel** geopolitical events can hit the volume of regional or global trade or make the trade more costly and lessen demand for the national currency of exporters;

- **Capital Flows Channel** geopolitical events can affect capital inflows from non-residents, or trigger a capital in-/outflow from residents, as they re-evaluate their risk-return considerations;[3]

- **Macroeconomic Channel** geopolitics can affect the outlook on the government's fiscal position as well as inflation dynamics;

- **Confidence/Sentiment Channel** most importantly, none of the channels above need to actually materialise; exchange rates react instantly to the change in expectations of market participants.

As for equities, the value of publicly traded shares represents the discounted future profits of a group of companies operating in the national economy accessible to investors.

- One transmission mechanism of geopolitical risk into the stock market is **economic**, as the expectations of the economic impact of geopolitical events can affect investors' view of earnings.

- The **confidence and sentiment** channel is also powerful and works through changing valuations, as investors may demand a higher risk premium for uncertainty. A country's stock market, therefore, is a proxy of investors' views of the country's economic prospects and its international links.

The currency and equity markets are also interlinked through capital flows. The markets we considered trade in local currencies. When domestic investors engage in a stock market sell-off, they may re-allocate into safer assets in the same currency (and may keep at least some currency for domestic consumption). International investors, however, would frequently exit the economy altogether and convert into other currencies; in more extreme scenarios, domestic investors may also follow suit unless their ability to do so is restricted by capital controls.

Currency Markets

In light of the above mentioned parameters, we have selected the spot rate and the 1-month option-implied volatility rate as metrics to gauge the effects of geopolitical events on the local currency markets. The spot rate indicator represents large, liquid markets with significant volumes (spot rates in fact attracts the broadest range of participants in a specific market) and the 1-month option-implied volatility rate, a forward-looking indicator which reflects how derivatives markets reprice risk.

In detail, we have analysed spot rates since 1986, and option implied volatility series from the earliest available dates[4] observing the performance of local currency in the markets under analysis on an 'instant' (2-day),[5] weekly, monthly, quarterly and annual basis.

The analysis is based around long-term averages since 1986, as at least three of the four economies under analysis have experienced periods of comparatively high inflation and endured structural depreciation over 30 years. This approach helps not only to assess the magnitude of returns but also the deviation from long-term averages for negative or positive events, which is relevant for our analysis.

Figure 3
Spot Currency Performance

|	**2-Day**	**Week**	**Month**	**Quarter**	**Year**
Spot Return, %					
Historical average	-0.06	**-0.16**	**-0.66**	-1.90	-6.82
After positive events	0.05	**0.01**	**0.73**	0.47	-4.69
After negative events	**-0.64**	**-0.67**	**-0.99**	-2.91	-6.71
1-Month Option Implied Volatility, %					
Change after a positive event	—	—	**-7.25**	—	—
Change after a negative event	—	—	**1.83**	—	—

Note: Averages across all positive and negative events where data is available, weighted equally across 4 markets; results not annualised; Source: Bloomberg, State Street Global Advisors Research.

As Figure 3 shows, across the four countries in our sample, negative geopolitical events generate an instant reaction with the average[6] currency depreciating by 0.64% within 2 trading days, while positive events barely register. This scenario is in line with the conventional wisdom that the spot market is the place where markets 'vent' their initial reaction before undertaking a more comprehensive assessment of each asset class. To add context to the -0.64% number, we note that it is 10 times worse than the average 2-day performance over the past 32 years; in addition, the long-term average monthly performance of the four currencies is -0.66%; meaning that after a negative event currencies undergo their expected monthly fall in only two days.

The **weekly** performance results move in the same direction as instant reactions but with a few differentiations. In this regard, after a week or a month after an event, overshooting is likely to have cleared, relevant central bank interventions are likely to have been carried out, and the broader consequences of the event in question are likely to have become clearer. Also, markets have had more time to process positive news, if any. As Figure 4 illustrates, the changes to currencies performance due to a geopolitical events occurs during the first few days. There is also very little discernible reaction to positive events on a weekly horizon, while the reaction to negative events is dominated by the substantial initial impulse.

Figure 4
Daily Spot Currency Returns, Before and After an Event
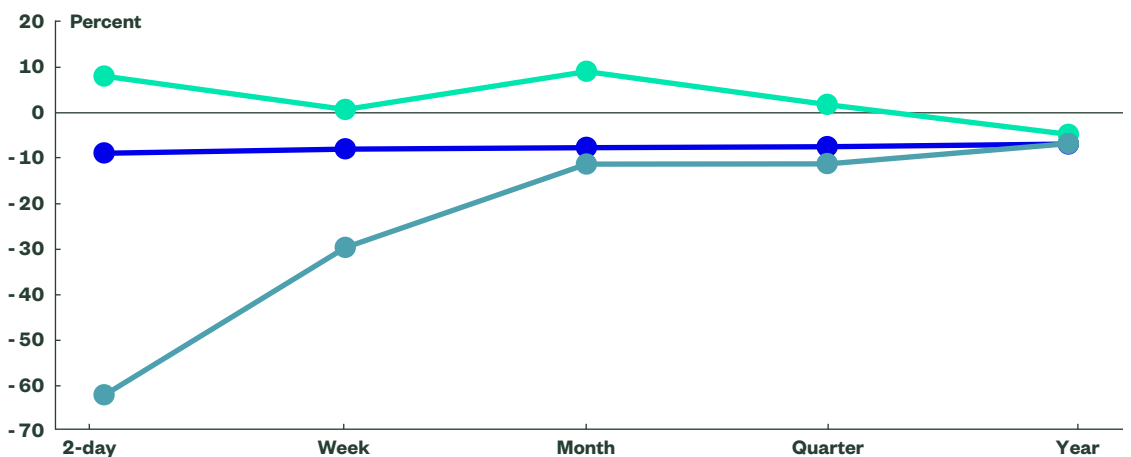
■ Positive Events
■ Negative Events
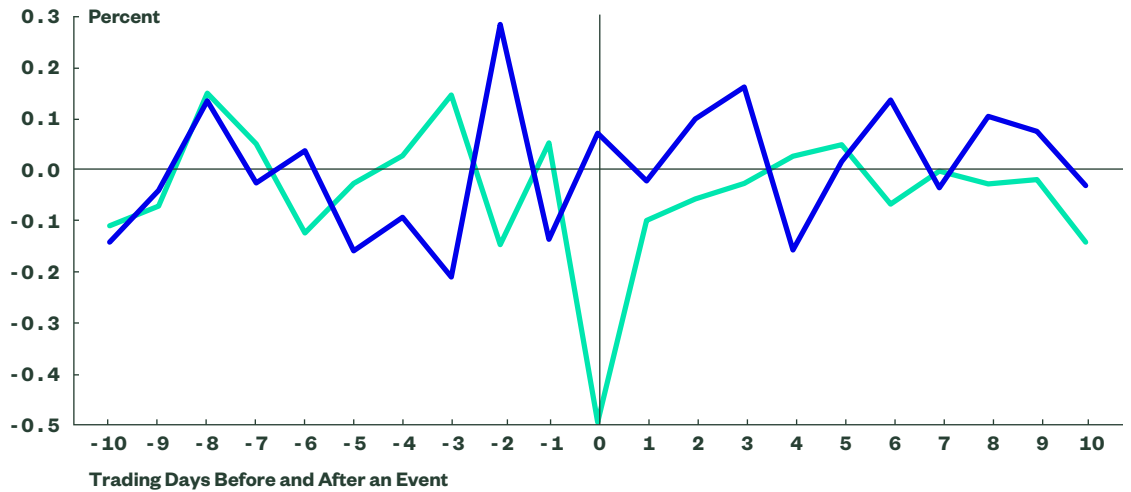
Note: Averages across all positive and negative events where data is available, weighted equally across 4 markets; Source: Bloomberg, State Street Global Advisors Research.

On a **monthly** basis, currencies still underperform after negative events, but this gradually mixes with structural depreciation trend, indicating a degree of mean-reversion. The assessment of mean-reversion can be aided by using annualised results, which are presented in Figure 5: the numbers do not reflect actual gains and losses, but the approach is useful for analytical comparison of different time horizons, and of deviations from the average. The chart clearly indicates that while effects of negative events indeed begin to wane, currencies experience pronounced over-performance one month after positive events. In absolute, non-annualised terms, currencies gain 47 basis points of value — despite typically losing around 2%. Contrary to the 'venting' of markets after negative events, positive events are absorbed cautiously and gradually, but on a greater scale.

Figure 5
Annualised Currency Performance

■ Historical Average
■ After Positive Events
■ After Negative Events

Note: Averages across all positive and negative events where data is available, weighted equally across 4 markets; results annualised; Source: Bloomberg, State Street Global Advisors Research.

Quarterly results still point to a visible difference between positive and negative events, but some of the markets begin to converge to historical averages (India and Israel — for positive events, Turkey for negative events). The gap between annualised performance after positive and negative events almost halves between 1-month and 3-month mark. Other factors, such as inflationary dynamics in Turkey or external assets and liabilities in Korea, begin to dominate. On an **annual** horizon, all geopolitical events appear largely absorbed.[7]

The results for option-implied volatility are marginal and somewhat inconsistent across the four markets with regards to negative events, while a marked fall in volatility takes place in the aftermath of positive events. An explanation may lie in the more sophisticated nature of options markets, which could be less prone to overreact to geopolitical events compared to the spot market. Also, our event sample is small as many of the most relevant ones took place in 1980s and early 1990s for which data is not readily available.

Equity Markets

Equity indices can be analysed by looking at a variety of stock indices available in each market. Although, the nature of the specific geopolitical events could affect the performance of certain companies more than others, we have found the differences between large cap and broad-based indices to be irrelevant.[8] Neither did we have sufficient standardised data to analyse each market on an industry-by-industry basis. Therefore, we have opted for MSCI indices to analyse the impact of geopolitical events on local equity markets, as they are constructed on a consistent basis across countries and provide the longest data series.

Figure 6
Performance of MSCI Local Indices, %

	2-Day	Week	Month	Quarter	Year
Return					
Historical average	0.14	**0.33**	**1.45**	4.57	23.34
After positive events	0.65	**1.32**	**5.70**	7.36	39.26
After negative events	-0.73	**-2.41**	**-2.02**	0.09	12.93
Volatility					
Historical average	—	**3.22**	**7.21**	12.89	26.65
After positive events	—	**4.10**	**7.66**	13.48	29.41
After negative events	—	**4.68**	**8.38**	13.50	25.71
Volatility (Annualised)					
Historical average	—	**22.87**	**24.99**	25.78	26.65
After positive events	—	**29.10**	**26.53**	26.96	29.41
After negative events	—	**33.25**	**29.02**	27.00	25.71
Risk-adjusted Return					
Historical average	—	**0.09**	**0.18**	0.31	0.75
After positive events	—	**0.25**	**0.61**	0.40	1.06
After negative events	—	**-0.48**	**-0.26**	0.04	0.59
Average Pairwise Correlation of 20d Returns					
Change after a positive event	—	—	**-8.35**	—	—
Change after a negative event	—	—	**17.36**	—	—

Note: Averages across all positive and negative events where data is available, weighted equally across 4 markets; results not annualised; Source: Bloomberg, State Street Global Advisors Research.

Returns

As in the case of currency markets, our analysis observed instant reactions, weekly, monthly, quarterly and annual returns as well as their volatility for the same time horizons and at pairwise correlation, in order to gauge whether stock performance within the index tends to converge or diverge after a geopolitical event.

As Figure 6 shows, on average, instant reactions reflect the positive or negative nature of any event, but the underlying data shows a lack of consistency across the four markets under analysis, which indicates that equity investors may take a longer time horizon to react to geopolitical changes. Also, according to our analysis, these types of reactions are far more symmetrical than those in currency markets. As Figure 7 illustrates, higher-frequency data suggests that equity markets display a somewhat higher degree of anticipation for those events compared to currency markets.

Figure 7

MSCI Local Currency Monthly Rolling Returns, bps Above/Below Historical Average

■ Positive Events
■ Negative Events
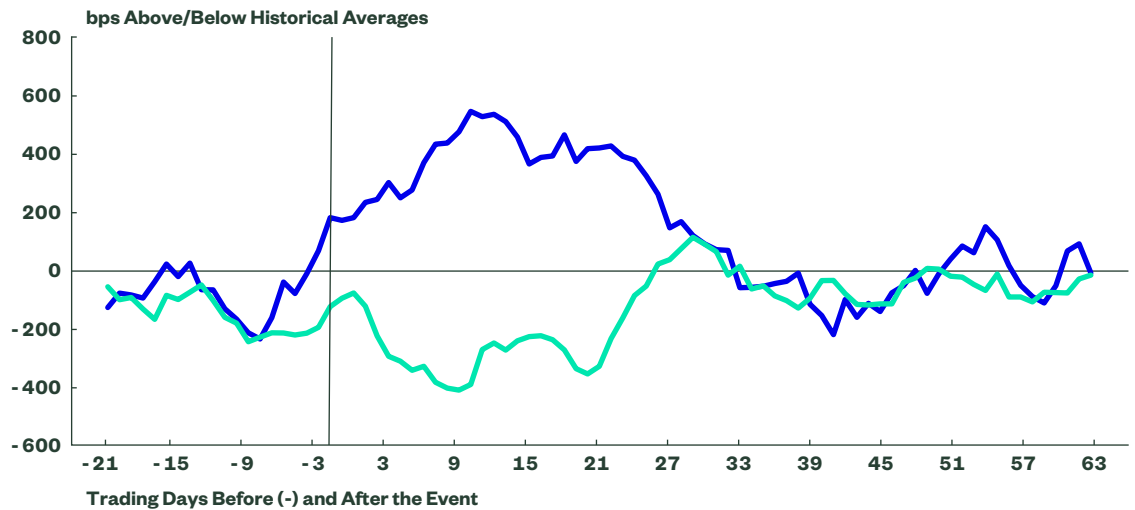
Note: Averages across all positive and negative events where data is available, weighted equally across 4 markets; results not annualised; Source: Bloomberg, State Street Global Advisors Research.

Weekly and **monthly** results are pronounced both in absolute terms and in relation to historical returns. For instance, a month after a negative event, equity indices tend to be, on average, 2.02% below their pre-event level. Also, the deviations from historical averages linked to negative events are more pronounced and persistent than in currency markets, as per Figure 8, displaying annualised results. Three of the four markets in our sample show pronounced over-performance in the aftermath of positive geopolitical events, which, in annualised terms, almost fully persists between one-week and one-month marks.

Figure 8
**Performance
of MSCI Local
Indices, Annualised**

■ Historical Average
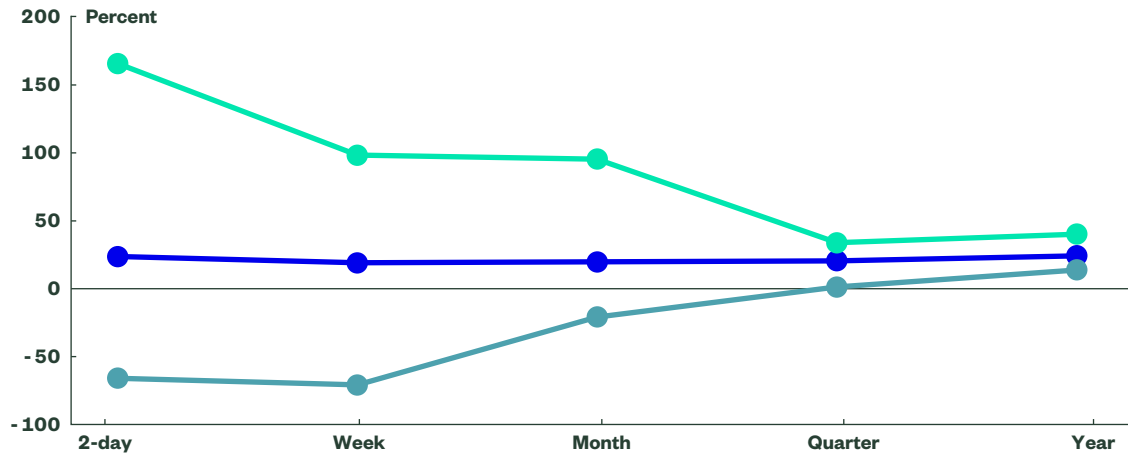■ After Positive Events
■ After Negative Events

Note: Averages across all positive and negative events where data is available, weighted equally across 4 markets; results annualised; Source: Bloomberg, State Street Global Advisors Research.

The **3-month** results are critical to understand the length of the event impact. On average, indices recover in nominal terms to pre-event levels, the gap between the performance after negative and positive event collapses, and performance begins to mean-revert for positive as well as negative events. Therefore, the effects of geopolitical events seem to last somewhere between one and three months.

This scenario is also confirmed by at the analysis of the rolling monthly returns before and after events. As Figure 7 shows, outperformance of post-positive event returns over post-negative lasts for 29 trading days (roughly 1½ months), while the subsequent gap in performance is mainly driven by the accumulated outperformance. Interestingly, the initial deviation from long-term trends is stronger for positive events, but the mean-reversion after one month occurs more quickly for positive events, in contrast with the performance in spot markets.

Taking Figure 6 at face value, it seems that the events matter even at a **one-year horizon**, given the notable difference in returns. However, this result is not consistent across the markets under study and is heavily driven by a few outliers. Higher-frequency data still indicates that the main effects of geopolitical events occur in a time period of just over a month.

South Korea is the only market where returns do not react as expected (please see Figure 11 in the appendix for more information). Virtually all geopolitical events relevant for South Korea relate to North Korea's nuclear programs. In this context, the nature of risks is binary, as their economic impact can only materialise if a full-scale military conflict breaks out. It is pure tail risk. And unless such risk becomes imminent and material, there is relatively little economic sense for equity investors to significantly reduce their exposure to this market. This is in contrast with the performance of the Korean Won in the spot market, which actually has a propensity to overreact.

Volatility

With regards to volatility (Figure 6, the two middle sections), the evidence we have found is relatively weak. We would generally expect it to increase after negative events, but it can also increase after positive events. On a weekly horizon, the observed increase is almost tautological, as it reflects the instant deviation of returns from long-term trends. On a monthly basis, volatility is more elevated after negative events according to our observations, but this difference disappears entirely over a three-month horizon. In addition, when calculating risk-adjusted returns, on each of the time horizon studied, the rank ordering of averages (positive — historical — negative) is consistent and does not contradict other findings. In this regard, annual results continue to deviate positively or negatively from the historical average even after taking higher resulting annual volatility into account.

Sweet Spot for Investors

To add more robustness to our analysis, we have reviewed the results on a currency-adjusted basis, as highlighted in Figures 9 and 10. This exercise is needed to create a globally comparable base for international investors. Moreover, equity returns are nominal and inflation is an important determinant of exchange rates. Although the lack of daily inflation statistics to construct a full inflation-adjusted series makes this exercise difficult, FX-adjusted results can provide an imperfect proxy for short-term returns in real terms. The most difference occurs at the one month horizon: when we incorporate the strong currency performance at this horizon, the returns in equity markets actually improve compared to one-week mark. As confirmed by risk-adjusted returns in Figure 9, the one-month mark after a positive geopolitical event suggests a "sweet spot" for an international equity investor. Furthermore, after negative events, indices take a far longer time to recover in foreign-currency terms. The differences in volatility persist longer. Finally, despite our caution in interpreting one-year results, this indicator suggests that on a risk-adjusted basis, markets do nearly 'shrug off' negative events within a year, while positive events still reverberate even at that time horizon.

Figure 9
Performance of MSCI Local Indices, Converted to USD, %

	2-Day	Week	Month	Quarter	Year
Return					
Historical average	0.08	**0.20**	**0.90**	2.90	14.07
After positive events	0.71	**1.24**	**6.47**	8.52	29.46
After negative events	-1.39	**-3.01**	**-2.93**	-2.11	7.11
Volatility					
Historical average	—	**3.70**	**8.32**	14.88	30.86
After positive events	—	**4.55**	**8.64**	14.73	33.03
After negative events	—	**5.35**	**9.71**	15.65	29.74
Volatility (Annualised)					
Historical average	—	**26.29**	**28.82**	29.77	30.86
After positive events	—	**32.32**	**29.92**	29.47	33.03
After negative events	—	**37.99**	**33.64**	31.30	29.74
Risk-adjusted Return					
Historical average	—	**0.05**	**0.11**	0.19	0.43
After positive events	—	**0.25**	**0.65**	0.48	0.80
After negative events	—	**-0.68**	**-0.35**	-0.11	0.38

Note: Averages across all positive and negative events where data is available, weighted equally across 4 markets; results not annualised unless otherwise stated; Source: Bloomberg, State Street Global Advisors Research.

■ Historical Average
■ After Positive Events
■ After Negative Events
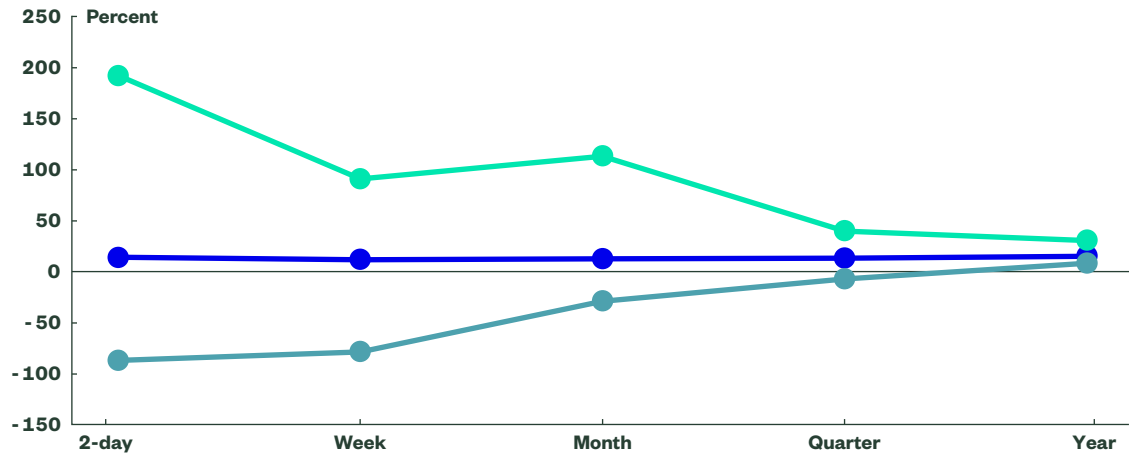
Note: Averages across all positive and negative events where data is available, weighted equally across 4 markets; results annualised; Source: Bloomberg, State Street Global Advisors Research.

In regard to the **average pairwise correlation** (the average correlation between 20-day returns of every possible pair of stocks within the index — see figure 6), equity markets deem adverse events as beta events, with correlations shooting up and markets negatively performing on a broad basis. This is consistent with our finding that the results for the equity markets are not materially different depending on the index used. However, for positive events, there is a mild fall in correlations. One of the reasons is while there are few winners (probably the defence industry) from negative events, the gains of positive events may be distributed less evenly (for example, a regional trade agreement can make protected industries lose out). However, the single-country results (please see appendix for more information) suggest that South Korea is the only market where pairwise correlations grow significantly after positive events, as the nature of its geopolitical risk is severe and binary.

Conclusion

The exercise we undertook was empirical rather than theoretical and only concerned three metrics in financial markets: the spot market, currency options, and equities.

Despite the idiosyncrasies of any such study, there are a number of useful results. First, while the currency market reaction is in line with conventional wisdom, the study illustrates just how quickly such reaction occurs. The outperformance of currency after positive events is a non-trivial result which warrants further research.

Second, our findings provide some idea of the magnitude of equity market impact and, more importantly, the time window of any reaction. Third, and most importantly, the large impact of events, especially positive ones, and the gradual way in which markets seem to be absorbing them suggests that at least in some instances, geopolitical factors can be fundamental to market performance, rather than merely providing the news cycle in the background. Our study thus makes a substantive contribution to the construction of a road map for investors to assess the effects of geopolitics on markets.

One channel not examined is the bond market for which we were unable to gather a satisfactory sample, as generic government bond yield series are too short in most cases, non-generic historical bond yield series are often unavailable at the frequencies we required, and credit markets are often illiquid and very idiosyncratic.

The government bond markets represent a particularly interesting area for future research, not least because unlike currency and equity markets, there is no 'common sense' reaction which we would expect from them — domestic investors may view them as safe assets for so long as they stay within the domestic currency, while foreign investors may treat those as a proxy for country risk. Post-2008, such markets may react very differently depending on the degree to which each of them built up debt; in addition, the short end of the yield curve represents opportunities for carry trades, which could put our findings on currency into a better context.

Another area for further research would be to differentiate events in terms of expected outcomes. Some major events have clear build-up periods (e.g. the 1991 or 2003 Iraq Wars), whereas others are genuine news surprises. Our sample does not capture any such differences.

With those gaps in mind, our study nevertheless suggests that geopolitics is a discernible factor in financial markets. All four markets we considered are emerging markets, though comparatively advanced ones. Deeper and more liquid developed markets could experience those events with different magnitudes but we would expect the same general direction.

Acknowledgements

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Methodology

This study examines the reaction of financial markets to geopolitical factors by selecting markets that are heavily exposed to geopolitical risk and meet certain levels of liquidity and efficiency. Only four met the criteria: India, Israel, South Korea and Turkey. For these markets, we studied the impact of 71 geopolitical events between 1986 and 2018, calculating the effects on the returns and volatility of currency and equity markets. For more on our methodology, please see Appendix.

Endnotes

1 Caldara, Dario and Iacoviello, Matteo. "Measuring Geopolitical Risk", Working Paper, Board of Governors of the Federal Reserve Board, January 2018.

2 CBOE Volatility Index.

3 This channel can be disrupted by capital controls, which, for example, currently operate in India.

4 Please refer to the appendix for more information on the sample.

5 See appendix for the explanation of why 2-day horizon is appropriate for the assessment of instant reaction.

6 Hereafter, unless otherwise specified, 'average' refers to equally-weighted average across 4 economies.

7 In our sample, positive events still generated excess returns, but the latter result is driven solely by Turkey where the magnitude of nominal returns is high due to historical periods of high inflation.

8 Stand-alone small-cap indices were insufficiently available for the time period under study.

Country-specific Results

Figure 11
Results for Individual Markets

	INDIA					ISRAEL				
Currency Performance	**2-Day**	**Week**	**Month**	**Quarter**	**Year**	**2-Day**	**Week**	**Month**	**Quarter**	**Year**
Spot Return (%)										
Historical average	-0.04	-0.10	-0.40	-1.18	-4.54	-0.02	-0.05	-0.19	-0.57	-2.27
After positive events	-0.05	-0.21	-0.12	-0.82	-3.23	0.11	-0.12	1.06	-0.39	-2.73
After negative events	-0.40	-0.58	-0.96	-4.22	-4.05	-0.68	-0.34	-0.41	-1.50	-6.13
1-month Option Implied Volatility (%)										
Change after a positive event	—	—	—	—	—	—	—	—	—	—
Change after a negative event	—	—	1.01	—	—	—	—	—	—	—

	KOREA					TURKEY				
Currency Performance	**2-Day**	**Week**	**Month**	**Quarter**	**Year**	**2-Day**	**Week**	**Month**	**Quarter**	**Year**
Spot Return (%)										
Historical average	0.00	0.00	0.01	0.05	0.09	-0.19	-0.49	-2.03	-5.91	-20.54
After positive events	0.24	0.04	0.66	1.65	-2.08	-0.09	0.35	1.33	1.42	-10.73
After negative events	-0.23	-0.30	-0.23	-0.44	1.34	-1.23	-1.46	-2.35	-5.49	-18.02
1-month Option Implied Volatility (%)										
Change after a positive event	—	—	-3.13	—	—	—	—	-15.19	—	—
Change after a negative event	—	—	5.53	—	—	—	—	-3.81	—	—

	INDIA					ISRAEL				
MSCI Local Indices	**2-Day**	**Week**	**Month**	**Quarter**	**Year**	**2-Day**	**Week**	**Month**	**Quarter**	**Year**
Return										
Historical average	0.10	0.25	1.11	3.42	14.66	0.04	0.10	0.41	1.26	5.35
After positive events	0.23	1.08	6.01	11.44	41.77	0.55	2.89	7.45	8.68	1.59
After negative events	0.92	-0.57	-0.90	0.41	28.66	-2.96	-3.94	-6.32	-3.41	-9.63
Volatility										
Historical average	—	2.64	5.99	10.77	22.40	—	2.60	5.76	10.25	21.05
After positive events	—	3.14	7.34	13.57	28.28	—	3.76	6.80	11.44	27.04
After negative events	—	3.48	7.30	13.08	25.02	—	4.27	7.99	12.70	23.43
Risk-adjusted Return										
Historical average	—	0.10	0.19	0.32	0.65	—	0.04	0.07	0.12	0.25
After positive events	—	0.22	0.88	0.82	1.41	—	0.55	0.93	0.64	0.32
After negative events	—	-0.47	-0.28	0.15	1.09	—	-0.75	-0.65	-0.16	-0.10
Average Pairwise Correlation of 20d Returns										
Change after a positive event	—	—	-7.08	—	—	—	—	-20.09	—	—
Change after a negative event	—	—	0.52	—	—	—	—	56.46	—	—

Past performance is not a guarantee of future results; results not annualised. Index returns reflect capital gains and losses but do not include income and the reinvestment of dividends.

Figure 11

Results for
Individual Markets (cont'd)

MSCI local indices	KOREA					TURKEY				
	2-Day	Week	Month	Quarter	Year	2-Day	Week	Month	Quarter	Year
Return										
Historical average	0.09	0.19	0.82	2.51	10.79	0.31	0.78	3.45	11.09	62.54
After positive events	-0.26	-2.18	-0.95	-14.59	-9.97	2.07	3.48	10.29	23.91	123.66
After negative events	0.16	-0.12	-0.66	1.28	18.57	-1.04	-5.00	-0.20	2.07	14.14
Volatility										
Historical average	—	3.14	6.96	12.35	25.41	—	4.51	10.14	18.19	37.73
After positive events	—	2.83	5.73	12.19	25.47	—	6.67	10.77	16.73	36.86
After negative events	—	2.87	6.00	10.40	19.55	—	8.11	12.23	17.83	34.85
Risk-adjusted Return										
Historical average	—	0.06	0.12	0.20	0.42	—	0.17	0.34	0.61	1.66
After positive events	—	-0.23	-0.19	-1.03	-0.26	—	0.45	0.81	1.17	2.79
After negative events	—	-0.08	0.07	0.25	0.98	—	-0.63	-0.17	-0.08	0.38
Average Pairwise Correlation of 20d Returns										
Change after a positive event	—	—	-9.55	—	—	—	—	3.33	—	—
Change after a negative event	—	—	1.77	—	—	—	—	10.71	—	—

MSCI Local Indices, Converted to USD	INDIA					ISRAEL				
	2-Day	Week	Month	Quarter	Year	2-Day	Week	Month	Quarter	Year
Return										
Historical average	0.08	0.20	0.91	2.92	12.89	0.04	0.10	0.40	1.28	5.33
After positive events	0.17	0.52	5.88	10.55	37.73	0.73	2.73	8.50	9.91	1.15
After negative events	0.60	-1.00	-1.45	-0.66	30.20	-3.92	-4.41	-7.55	-4.84	-13.57
Volatility										
Historical average	—	2.89	6.62	11.94	24.90	—	3.00	6.62	11.76	24.05
After positive events	—	3.30	7.77	14.44	30.13	—	3.93	7.52	12.87	29.68
After negative events	—	3.63	7.77	14.05	26.52	—	5.08	8.91	14.09	26.54
Risk-adjusted Return										
Historical average	—	0.07	0.14	0.24	0.52	—	0.03	0.06	0.11	0.22
After positive events	—	-0.06	0.80	0.73	1.24	—	0.47	0.96	0.64	0.19
After negative events	—	-0.51	-0.35	0.10	1.11	—	-0.71	-0.78	-0.37	-0.32

Past performance is not a guarantee of future results; results not annualised. Index returns reflect capital gains and losses but do not include income and the reinvestment of dividends.

Figure 11
Results for
Individual Markets (cont'd)

MSCI Local Indices, Converted to USD	KOREA					TURKEY				
	2-Day	Week	Month	Quarter	Year	2-Day	Week	Month	Quarter	Year
Return										
Historical average	0.10	0.21	0.88	2.70	12.38	0.11	0.30	1.43	4.71	25.69
After positive events	-0.02	-2.13	-0.31	-12.99	-10.91	1.96	3.84	11.80	26.60	89.87
After negative events	-0.02	-0.47	-0.67	0.91	20.63	-2.22	-6.17	-2.04	-3.85	-8.81
Volatility										
Historical average	—	3.61	8.06	14.34	29.78	—	5.31	11.97	21.50	44.71
After positive events	—	3.01	6.45	12.79	28.33	—	7.96	12.80	18.84	44.00
After negative events	—	3.46	7.15	12.62	23.54	—	9.23	15.01	21.85	42.35
Risk-adjusted Return										
Historical average	—	0.06	0.11	0.19	0.42	—	0.06	0.12	0.22	0.57
After positive events	—	0.00	-0.04	-0.79	-0.19	—	0.57	0.87	1.36	1.94
After negative events	—	-0.24	0.01	0.15	0.88	—	-1.24	-0.26	-0.33	-0.17

Past performance is not a guarantee of future results; results not annualised. Index returns reflect capital gains and losses but do not include income and the reinvestment of dividends.

APPENDIX 2:
Methodological Notes

The event list was created in the following way:

- We identified four emerging market economies which are highly exposed geopolitically and have relatively liquid and deep financial markets.

- For all four, we compiled a subjective list of geopolitical events based on historical chronologies;

- These events were split into 'negative' and 'positive' and used for performing the calculations in the tables.

- The underlying data on the relevant financial indicators was downloaded from Bloomberg. Calculations were made in the following way:

- MSCI returns: percentage change in the level of MSCI index compared to its level 2 days/1 calendar week/month /year ago. For historical averages, full series starting from late 1980s used. For the assessment of instant reactions, we chose a 2-day horizon over a 1-day one, as the intra-day timing of the events differs considerably.

- MSCI FX adjusted returns: series of MSCI index levels divided by the spot FX series. Returns calculated on the newly obtained series in the same way as for local-currency MSCI returns.

- Volatility: volatility of daily returns at relevant horizons, normalised to match the return horizon; annualised where stated.

- MSCI pairwise correlation — average pairwise correlation of 20-day returns on individual stocks, provided by equity team.

- Option implied volatility — 21d option implied volatility downloaded from Bloomberg.

- Changes in the value of currency: data for historical averages from 1983 onwards. Because spot rates quoted in Bloomberg are inverse (units of local currency per US dollar), to calculate the change in value S between time point 0 and 1, we use the formula $(1/S(1))/(1/S(0))-1$.

- For sample size, see Figure 13.

Figure 12
12 List of Events Used

Date	Event	Country	Type
14-Apr-87	Turkey applies for EU membership (application)	Turkey	POS
8-Dec-87	First Intifada (beginning)	Israel	NEG
2-Aug-90	Iraqi invasion of Kuwait	Turkey	NEG
2-Aug-90	Iraqi invasion of Kuwait	Israel	NEG
1-Dec-90	New plant to process uranium	Korea	NEG
16-Jan-91	US coalition launches Gulf War	Turkey	NEG
16-Jan-91	US coalition launches Gulf War	Israel	POS
18-Jan-91	Iraqi Scud missiles hit Israel	Israel	NEG
21-May-91	Assassination of PM Rajiv Gandhi	India	NEG
1-Jun-91	Punjab Killings	India	NEG
30-Oct-91	First Intifada (end)	Israel	POS
1-Mar-93	Withdrawal from the NPT (Non Proliferation Treaty)	Korea	NEG
12-Mar-93	Bombay bombings	India	NEG
9-Sep-93	Oslo Accords announcement	Israel	POS
21-Oct-94	Agreed Framework	Korea	POS
4-Nov-95	PM Rabin assassination	Israel	NEG
28-Feb-97	Post-Modern Coup	Turkey	NEG
14-Feb-98	Coimbatore bombings	India	NEG
11-May-98	India Nuclear Test	India	NEG
28-May-98	Pakistan 1st Nuclear Test	India	NEG
15-Feb-99	Capture of Ocalan	Turkey	POS
21-Feb-99	Lahore Declaration	India	POS
8-May-99	Kargil War (beginning)	India	NEG
14-Jul-99	Kargil War (end)	India	POS
24-May-00	Lebanon withdrawal	Israel	POS
13-Jun-00	Pyongyan Summit	Korea	POS
29-Sep-00	Second Intifada (beginning)	Israel	NEG
16-Jul-01	Agra Summit (collapse of talks)	India	NEG
11-Sep-01	WTC Terror Attacks	Israel	NEG
11-Sep-01	WTC Terror Attacks	Turkey	NEG
29-Mar-02	Operation Defensive Shield (beginning)	Israel	NEG
3-May-02	Operation Defensive Shield (end)	Israel	POS
10-Sep-02	Rafiganj Train Wreck	India	NEG
12-Dec-02	Reactivation of Yongbyon	Korea	NEG
10-Jan-03	North Korea Withdrawal from NPT	Korea	NEG
24-Feb-03	Land-to-ship missile launch	Korea	NEG
20-Mar-03	US invasion of Iraq	Turkey	POS
27-Aug-03	Beginning of Six Party Talks	Korea	NEG
15-Dec-04	EU announces accession talks to start in 2005	Turkey	POS
8-Feb-05	Second Intifada (ends)	Israel	POS
10-Feb-05	North Korea announcements: suspension of Six Party Talks and creation of Nukes	Korea	NEG

Figure 12
12 List of Events Used
(cont'd)

Date	Event	Country	Type
3-Oct-05	Turkey begins EU accession process	Turkey	POS
2-Mar-06	US India nuclear agreement	India	POS
11-Jul-06	Mumbai train bombings	India	NEG
12-Jul-06	Lebanon War	Israel	NEG
9-Oct-06	North Korea's 1st Nuclear Test	Korea	NEG
11-Dec-06	EU halts accession process	Turkey	NEG
14-Jul-07	North Korea shut down of Yongbyo	Korea	NEG
28-Nov-08	2008 Mumbai Attacks	India	NEG
5-Apr-09	Unha-2 rocket Launch	Korea	NEG
24-May-09	North Korea's 2nd Nuclear Test	Korea	NEG
10-Feb-11	Restoration of India Pakistan ties	India	POS
7-Oct-12	US-South Korea Balistic Missile Deal	Korea	POS
12-Dec-12	Unha-3 rocket Launch	Korea	NEG
12-Feb-13	North Korea 3rd Nuclear Test	Korea	NEG
8-Mar-13	Shutting of Shared Border Point	Korea	NEG
8-Jul-14	Gaza War	Israel	NEG
7-Jun-15	Parliament elections with Kurdish party	Turkey	NEG
10-Oct-15	Ankara bombings	Turkey	NEG
24-Nov-15	Turkey shoots down Russian jet (beginning)	Turkey	NEG
1-Dec-15	Announcement of creation of hydrogen bomb by North Korea	Korea	NEG
2-Jan-16	Indian air force base attack	India	NEG
6-Jan-16	North Korea's test of 1st hydrogen bomb	Korea	NEG
16-Feb-16	Kwangmyŏngsŏng (Unha-3) Lauch	Korea	NEG
1-Jun-16	Turkey shoots down Russian jet (end)	Turkey	POS
15-Jul-16	Failed Coup	Turkey	NEG
9-Sep-16	North Korea 5th Nuclear Test	Korea	NEG
18-Sep-16	Terrorist attacks to Indian Base in Kashmir	India	NEG
3-Sep-17	North Korea 6th Nuclear Test	Korea	NEG
8-Mar-18	Meeting in Singapore Announced	Korea	POS
27-Apr-18	Inter-Korea Summit	Korea	POS

Figure 13
Sample Sizes

	POS	NEG	TOTAL
MSCI data			
India	4	11	15
Israel	4	6	10
Korea	5	19	24
Turkey	5	9	14
TOTAL	**18**	**45**	**63**
FX data			
India	4	13	17
Israel	6	9	15
Korea	5	19	24
Turkey	6	9	15
TOTAL	**21**	**50**	**71**
OIV Data			
India	0	4	4
Israel	0	0	0
Korea	4	17	21
Turkey	3	5	8
TOTAL	**7**	**26**	**33**

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