IMPACT OF THE 2016 US PRESIDENTIAL ELECTION ON THE VOLATILITY OF THE US CAPITAL MARKETS

by

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Abstract

This paper examines the impact of the 2016 US Presidential Election on the volatility of the US capital markets. In addition to the election date, we analyze seven other events that are potentially influential to the direction of the election outcome, thus affecting the reaction of the US market. Our aim is to confirm past findings that suggest escalating volatility fluctuations surrounding an election period, and whether any related events would have any impacts on the stability of the capital markets.

Our result suggests that the 2016 US Presidential Election can be considered a unique case in that the reaction of the capital markets throughout the election period and any related news is relatively calm, and showing little signs of turbulence. We found that a 31-days event window surrounding an election date is the optimal window that portrays the reaction of the capital markets toward the election.

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Table of Contents

List of Figures

List of Tables

1: Introduction

1.1 Overview

The financial market has never been a stand-alone, self-sustained universe, unaffected by any external factors. On the contrary, it can be perceived as an interconnected web, where its efficiency depends on various determinants, one of them being politics. The vast influence of political decisions often creates uncertainties that end up shaking financial markets, and although there are various forms of political uncertainties, one prominent event is the presidential election, especially in the United States. The event reflects potential shifts in financial regulations and international relations that may shape the trajectory of the trade, business, and financial landscape. Considering the significance of the US as a market leader and a financial benchmark, the uncertainties that persist surrounding the event have historically caused fluctuations in the capital markets.

With the exception of the 2008 election where the escalating market fluctuations can be attributed to the financial crisis, periods surrounding the US Presidential Election have had relatively high volatilities of stocks in the US capital markets. One possible reason is that voters judge candidates mainly by their campaigns and usually not through proven results, thus there is a level of uncertainty within this period of change that causes the rising volatility. Having said that, measuring such uncertainty around varying election periods may result in different outcomes. In other words, the extent of uncertainty within the financial market during an election period is affected by other contributing factors, including the character of the candidates, the competitiveness of the election, as well as whether a certain candidate is running for his second period in the office; all of which makes the study of a certain election event unique from another.

Figures 1 & 2 illustrate the movement of the volatility index associated with the S&P 500 throughout a 91-days window of the 2012 and the 2004 US Presidential Elections respectively. The graphs show that the reactions are different in each of the election, with the 2012 election having a longer effect to the volatility of the S&P 500 Index compared to the 2004 election, in which the volatility subsided after the event. Although there could be various determinants to the different trends, which we will not be discussing in our study, this just shows that the US

Presidential Election does influence shocks that occur in the volatility of major indices like the S&P 500, and thus affecting the US financial market in general.

Figure 1.1   *VIX Index for 91-days window of the 2012 US Presidential Election Date. Source: Bloomberg L.P.*
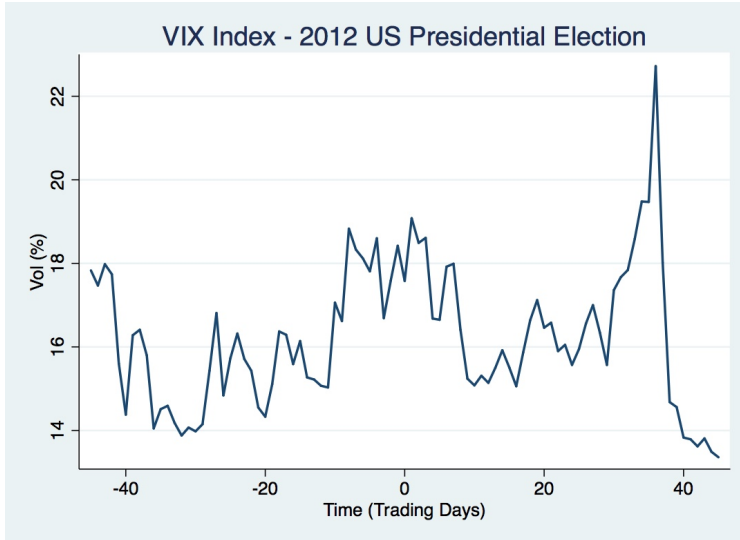
Figure 1.2   *VIX Index for 91-days window of the 2004 US Presidential Election Date. Source: Bloomberg L.P.*
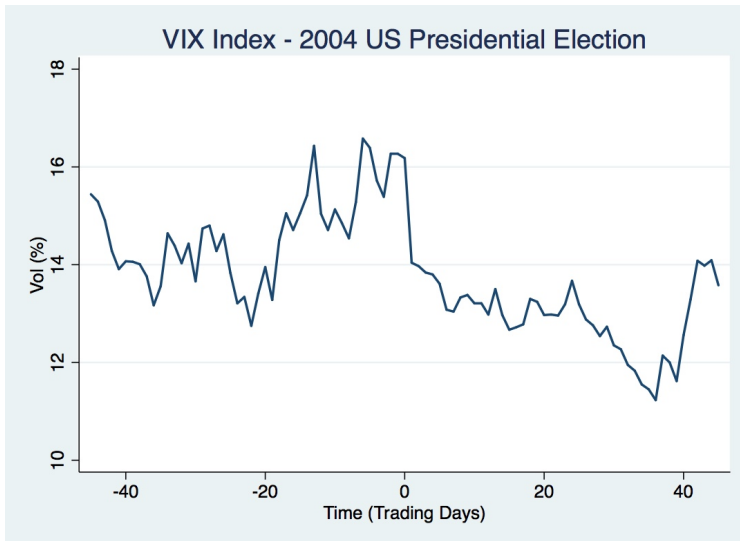
The importance of understanding the market fluctuations during an election period can be simplified into three instances. First, it is important to understand that the escalating fluctuations in the stock market during an election period can be attributed to the overreaction of the market to the election outcome and any related news. Therefore, they are generally not representative of the

trajectory of the market, as shown in both the 2008 & 2012 elections when Obama was elected, the S&P 500 suffered major losses in the few days following the outcome, and yet the index averaged an annual gain of 13.3% in Obama's administration (Renick, 2016). Second, having the right position during the election period may have great impacts on organizations. One example is Warren Buffett's Berkshire Hathaway that has gained an 8% increase in the NYSE ever since the outcome of the 2016 US Presidential Election due to president-elect Donald Trump's proposed policies that benefit the company (Basak, 2016). Finally, the rising VIX index prior to the election date shows that many investors do hedge their positions to mitigate the risks of a market slump following the election outcomes (Lahart, 2016).

With that in mind, studies related to the US Presidential Election would bring better clarity in terms of understanding the event window of an election event, the proper reaction towards an election outcome, trends following the election cycle, as well as measuring the normality of market reactions toward an election outcome compared to past elections. These will then serve as a solid foundation for investors to perform rational analyses of the market and mitigate the risks embedded in their portfolios throughout an election period.

Our study aims to examine the impact of the US Presidential Election on the volatility of the US capital markets. We use data from the 2016 Presidential Election, and we look to confirm the results of prior studies on previous elections and see whether the observed trends persist in 2016. This includes the proposed event-window in which the financial market starts to react to any election-related news and the volatility movement during the election date. Although our findings regarding the most appropriate event-window aligned with prior studies, we found that the 2016 Presidential Election is a unique case in terms of its reactions during and after the outcome were made public.

The remainder of this study is structured as follows: A literature review to shed light on the subject in general, and bring forth prior studies that have touched upon the impact of the US Presidential Elections on the financial market. Then it will be followed by a description of the contribution of our study, and then an elaboration on our methodologies and data collection process. A breakdown of our results will come follow, and then summed together with a section on implications and a conclusion.

1.2 Literature Review

Gemmill (1992) and Nippani & Medlin (2002) all agree that political uncertainties greatly affect both returns and risks of financial assets, and thus affecting the market as a whole. With regards to the shift in political power in the US, there has been a perceived trend regarding the influence a political party brings to the table. Both Sy & Zaman (2011) and Santa-Clara & Valkanov (2003) have noticed that the financial market usually reacted better under a democratic president; a theory that had come to be known as the Presidential Puzzle. Li & Born (2006) also acknowledged this very trend, but went on explaining the prominence of the election rather than looking at the period of the office. Aside from the nature of the president, an administration period may be affected by external situations as well, like natural disasters or war. In that sense, the US presidential election can be considered a more prominent factor with regards to fluctuations and uncertainties in the market. Li & Born (2006) added that with presidential elections, the uncertainties of the outcome are what causing all the commotion in the market. If there is a satisfying level of certainty regarding the outcome of the election, there are fewer effects in the market.

Kelly, Pástor, & Veronesi (2016) stated in their study that regardless the extent of the uncertainties, any protection regarding price, variance, and tail risks tend to become more expensive before political events like the election, signaling the importance of the event. Pantzalis, Stangeland, & Turtle (2000) have found significant abnormal returns two weeks prior to the election, while Białkowski, Gottschalk, Wisniewski (2008) highlighted volatility shocks across international markets within a 51-days event window. Goodell & Vähämaa (2013) noticed that the implied volatility of the S&P 500 index increased along with the increasing probability of winning for the eventual winner. In other words, as investors form expectations based on speculations regarding the potential president-elect, uncertainties grow stronger. There have even been studies regarding how to profit from these fluctuations in the market, like one proposed by Hobbs & Riley (1984).

Dobson & Dufrene (1993) found that the impacts of the US Presidential Election are global, where the international markets reflect the anxieties of investors awaiting the next future leader of an influential nation. They found that overseas market tend to become more correlated with the S&P 500 index in the month surrounding the event. This signals the need to diversify for many international portfolio managers, but also illustrate the level of importance of the event for other markets outside of the US.

1.3 Contribution

Our study will be based on the paper written by Białkowski et al. (2008), considering their use of stock market volatility to describe the effects of the US presidential election. Although we will not completely follow the methodologies described in their paper, the basic idea would remain the same, and that is to determine whether there is abnormal volatility during the period before and after the election.

The difference lies in the point of emphasis, where as they approach the subject to determine the period of significant volatility shocks during the election, we will be observing major news leading up to the election and see whether they pose any impacts to the capital markets in the US. Considering that the 2016 election is a unique case in the sense that there is a great degree of competitiveness, with candidates reported in constant scandals, our study aims to analyze the periods surrounding these scandals in addition to the election to bring more depth into the study of the event. As Li & Born (2006) mentioned, the volatility in the market is often due to the uncertainty regarding the outcome of the election, and thus with regards to the 2016 election, our study will add value in analyzing competitive elections with no front-runners.

2: Methodology & Data

2.1   Methodology

We will be analyzing the impact of the 2016 US Presidential Election and the most resonant news throughout the election period using a volatility event-study approach. Volatility was the chosen metric due to its sensitivity that portrays greater swing in value, thus depicting a clearer reaction or expectation towards an event. We begin our analysis with determining stationary properties for the returns of the studied indices and their natural logarithm. Non-stationary variables may perpetually carry the effect of a shock, which can mislead the robust results for the time series analysis. For consistent approach towards handling statistical stationarity of returns, we base our analysis on the log-returns of obtained indices. Returns are calculated using Equation 1.

$$R_{i,t} = E(S_{i,t}) = \ln \frac{S_{i,t}}{S_{i,t-1}} \qquad (1)$$

We then use the GARCH (1,1) framework with autoregressive terms to estimate conditional and realized variances of the underlying log-returns with respect to the corresponding partial autocorrelations of $R_{i,t}$ (Bollerslev, 1986; Bollerslev, Chou, & Kroner, 1992; Bollerslev, Engle, & Nelson, 1994).

$$R_{i,t} = \alpha + \sum_{j=1}^{p_i} \varphi_j R_{i,t-j} + \varepsilon_{i,t}, \varepsilon_{i,t} \sim N(0, V_{i,t}) \qquad (2)$$

$$V_{i,t} = \gamma_0 + \gamma_1 V_{i,t-1} + \gamma_2 \varepsilon_{i,t-1}^2 \qquad (3)$$

Where $R_{i,t}$ is the continuously compounded return on the US stock market index *i* on a day *t*, p_i is the lag of autoregressive process with respect to the significant partial autocorrelation of $R_{i,t}$, $\varepsilon_{i,t}$ denotes the realized standard deviations over a chosen time period, and $V_{i,t}$ stands for $R_{i,t}$'s predicted conditional variance.

We jointly estimate (2) and (3) using the Maximum Likelihood method over the estimation window immediately preceding the event window. Taking into consideration the clustering of news distribution over the chosen time period for the election campaign, as well as the work of Brown & Warner (1985), we have decided to choose a 91-trading day estimation window. The chosen estimation window will provide a relatively accurate GARCH process and the possibility to include all significant news in our sample.

One should keep in mind that we use a one-step-ahead forecast and this will limit the ability to generate an event-independent projection. To study the significance of cumulative abnormal volatility over the event window and eliminating the immediate effect of the news on forecasted volatility, we will be forecasting our conditional variance on the sth day of our event window based on the data set available on the last day of estimation window $t*$.

$$E(V_{i,t^*+s} | \Omega_{t^*}) = \gamma_0 \sum_{j=0}^{s-1} (\gamma_1 + \gamma_2)^j + (\gamma_1 + \gamma_2)^{s-1} \gamma_1 V_{i,t^*} + (\gamma_1 + \gamma_2)^{s-1} \gamma_2 \varepsilon_{i,t^*}^2 \qquad (4)$$

After obtaining the realized volatility of the indices over the event window from (2) and estimated volatility from (4), we calculated cumulative abnormal volatility over the chosen event window using Equation 5.

$$CAV_i(t^* + 1, t^{**}) = \sum_{j=t^*+1}^{t^{**}} |\varepsilon_{i,j}^2 - V_{i,j}^2| \qquad (5)$$

Where $t*+1$ is the start day of the event window, $t**$ is the last day of the event window, $\varepsilon_{i,j}^2$ is the squared residuals obtained from (2) and the representation of realized volatility over $(t*+1, t**)$ time period, and $V_{i,j}^2$ is the forecasted volatility over $(t*+1, t**)$ time period.

Testing the significance of the impact of the election and the relevant news on the volatility of the observable indices representing the main spheres of the US economy, we state that under the null-hypothesis, the outcome is as expected for the market and has been priced accordingly. In other words, the GARCH (1, 1) framework should forecast volatility close to realized parameters and cumulative abnormal volatility should not significantly fluctuate from zero.

$$H_0: CAV_i(t^* + 1, t^{**}) = \sum_{j=t^*+1}^{t^{**}} |\varepsilon_{i,j}^2 - V_{i,j}^2| = 0 \qquad (6)$$

The test statistic for the hypothesis stated in (6) is therefore,

$$\tau_i(t^* + 1, t^{**}) = \sqrt{\frac{\sum_{j=t^*+1}^{t^{**}} \frac{(\epsilon_{i,j}^2 - V_{i,j}^2)^2}{V_{i,j}^2}}{t^{**} - t^* - 1}} \sim \chi_{(t^{**} - t^* - 1)}^2 \qquad (7)$$

Where $(t**-t*-1)$ are the degrees of freedom for $\tau_{crit}^{0.05}$ obtained from χ^2 distribution table. To highlight the contrasts with previous research papers, we apply the same methodology described above with the substitution of $\varepsilon_{i,j}^2$ in (5), (6), (7) by CBOE implied volatility indices

corresponding to the studied indices. We performed the same test (6) and (7) to determine the significance of cumulative abnormal volatility between estimated and implied values. To reinforce our findings, these tests were completed over 5-, 11- and 21-days event windows. These different windows will give us the opportunity to compare results obtained from a longer event window during which volatility shocks may fade to a shorter event window over which shocks in realized volatility might still be obvious without opportunity to normalize over a long time period.

2.2   Data Collection

We collected two sets of data that are required to provide a clearer insight to our study. The time period of our data ranges from the beginning of 2015 when there are discussions about the potential candidacy of Donald Trump and Hillary Clinton, to approximately 10 trading days after the election. There are clear limitations to the data we collected, especially because Białkowski et al. (2008) showed that historically, the volatility fluctuations in the financial market lasted within a 51 days window. However, due to the time constraint of our study, we decided that a 21-days window would be sufficient to illustrate the reactions of the financial market to the presidential election.

The first set of information we collected was the relevant news concerning both presidential candidates Donald Trump and Hillary Clinton during their campaigns through media outlets like Bloomberg, CNN, The New York Times and Washington Post. From these, we narrowed down eight news that can be considered quite influential toward the election outcome and thus prompting the reaction of the US capital markets. They were the three presidential debates, two email scandals against Hillary Clinton, as well as Donald Trump's tax and tape scandals. Presidential debates were chosen due to their influence on the US electorate. Although the debates do not dictate the election outcome, they provide a representative insight on the direction of the election.

The email scandals against Hillary Clinton serve as important news due to the repercussions that could include the prohibition of her candidacy in the 2016 election. If her candidacy was still allowed, her reputation as a potential leader would be jeopardized, and this would effect the direction of the election, and thus the reaction of the market. Another factor to consider is that the second investigation for this scandal happened less than two weeks before the election date.

Donald Trump's scandals were different compared to Hillary Clinton's in that his scandals were moral issues by nature, whereas Hillary Clinton's involved legal repercussions. The release of a tape with Donald Trump's lewd comments in it, as well as the report on his tax avoidance were chosen due to widespread reaction by news media and the significant impact on the perceived public opinion, especially among some social groups. As these events gained nation-wide attention, we expect them to have effects on the financial market.

To point the event and estimation windows corresponding to each of the news, we constructed a set of explanatory variables that clearly determines durations of each window with respect to the date of the news appearing in the public. The variables are as follow:

Time indicates the number of observation and begins in January 2nd, 2015.

Days_before_event is defined as the difference between the value of the Time variable at the current day and the Time variable at the event day.

Event_window (dummy variable) indicates the interval of dates with chosen length within which event occured.

Count_event_observations indicates duration of the *Event_window*

Estimation_window (dummy variable) indicates the interval of dates which are used to apply the GARCH(1,1) framework to forecast volatility.

The last set of data we collected was the daily returns and volatilities of the major US equity indices that track the US financial markets and could be significantly affected by the election. We obtained these numbers using the Bloomberg terminal. The goal with this data set is to have a variety of data that are representative of the US market. We collected data with the previously mentioned time frame for the following indices:

Table 2.1   US Stock Indices with corresponding Volatility Indices

US Stock Index	Ticker on Bloomberg Terminal System	Corresponding Implied Volatility Index	Ticker on Bloomberg Terminal System
Standard & Poor's 500 Composite Index	SPX INDEX	CBOE Volatility Index	VIX INDEX
Standard & Poor's 100 Composite Index	OEX INDEX	CBOE S&P 100 Volatility Index	VXO INDEX
NASDAQ – 100 Index	NDX INDEX	CBOE NASDAQ Volatility Index	VXN INDEX
Dow Jones Industrial Average	INDU INDEX	CBOE DJIA Volatility Index	VXD INDEX
Russell 2000 Index	RTY INDEX	CBOE Russell 2000 Volatility Index	RVX INDEX

3: Results

3.1   General Insights

With regards to the events leading up to the election, there seemed to be minimal impact to the market, and that any increase in volatility cannot be directly linked to the election-related news of either candidate. In other words, the market seemed unfazed by any news that would affect the direction of the potential president-elect, considering that results of the news being linked to the financial market are insignificant for all the event windows we tested.

Our results show that the GARCH model that was used to forecast volatility trends within the event window seemed to align with the realized volatility. While this may be expected for the prior events, the election itself should be accompanied with abnormal volatilities, as previously highlighted by Białkowski et al. (2008). What was much more apparent in this case was the difference in the volatility indices compared to the GARCH model and the realized volatility. The movements in implied volatility depict the nature of human behavior that tends to overreact to certain news with great deal of uncertainties embedded in them.

One trend that we expected as we observed the fluctuations in the market was the greater significance in abnormal volatility closer to the election date (Pantzalis et al., 2000). This, however, was not the case in the 2016 election, signaling that there is a degree of uniqueness in this election compared to the past. We found that the results were consistent throughout the five indices we had as part of the study. In the following elaborations, we will be using the S&P 500 index and its corresponding volatility index to illustrate our results, considering its widespread use as an indicator of the market, and that it accurately represents the other indices in our results as well (See Appendix).

3.2   Events

3.2.1   First Presidential Debate – September 27th, 2016

Figure 3.1   *Portrays the movements of implied, realized, and estimated volatilities within a 21-days window of the First 2016 US Presidential Debate. Source: StataCorp, 2015.*
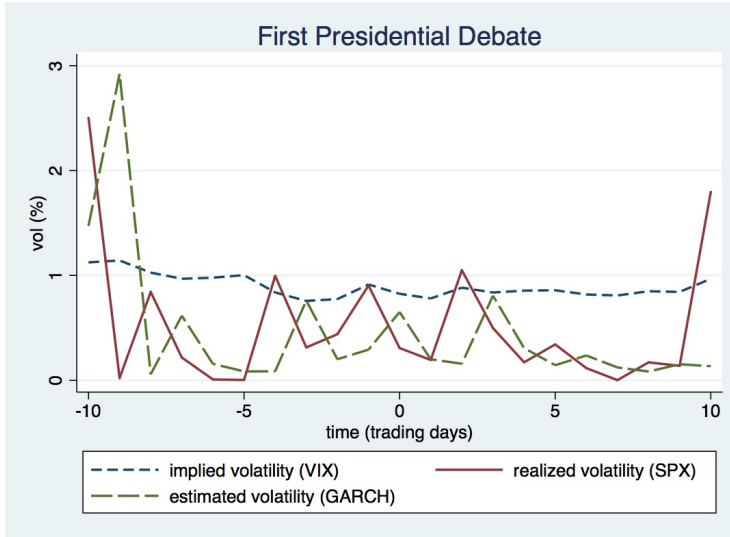
As the first major event where both presidential-candidates met, the first presidential debate depicted a starting point of a reaction in the market, should there be one. Our results, however, indicated that the abnormal volatility within this period does not really reflect the occurrence of the event. With online polls suggesting a favorable position for presidential-candidate Hillary Clinton during the event, the market reacted with a 0.71% increase in the S&P 500 futures (Wolfers & Zitzewitz, 2016). This reaction, however, was not portrayed in the volatility movements, suggesting that the result of the debate was not out of the expectations of the market, and thus volatility remaining stable.

Table 3.1   *Presents test statistics and p-value of the difference between the S&P 500 volatility movements as well as the VIX index compared to the GARCH forecast for 5-days, 11-days, and 21-days event windows for the First Presidential Debate.*

First Presidential Debate				
Event Window	**Index**	**Test Statistics**	**P-Value**	**Decision (α=0.05)**
5	spxindex	0.6819	0.9535	do not reject null
	vixindex	0.7744	0.9418	do not reject null
11	spxindex	1.1654	0.9997	do not reject null
	vixindex	1.4379	0.9991	do not reject null
21	spxindex	1.1482	1.0000	do not reject null
	vixindex	1.4394	1.0000	do not reject null

The results in the table above indicates that we cannot reject the null hypothesis in that there is no abnormal volatility recorded with the S&P 500 index. The VIX Index also portrayed the same outcome, with insignificant p-values. This demonstrates that although the expectations toward the event were much greater than reality, there seems to be minimal indications regarding the existence of abnormal volatilities.

What can be drawn out of this result is that the event does not pose much threat to the stability of the capital markets, and even though the outcome of the debate had an arguably strong influence in the direction of the eventual election, there is too little information at this point to determine the future of the market. As mentioned earlier, this result was not out of the ordinary, as it remained consistent with previous studies that indicate there is a certain window when market starts reacting more to any election-related news.

3.2.2 Donald Trump Tax Scandal – October 4th, 2016 | Donald Trump Tape Scandal – October 7th, 2016

Figure 3.2   *Portrays the movements of implied, realized, and estimated volatilities within a 21-days window of Donald Trump's Tax Scandal. Source: StataCorp, 2015.*
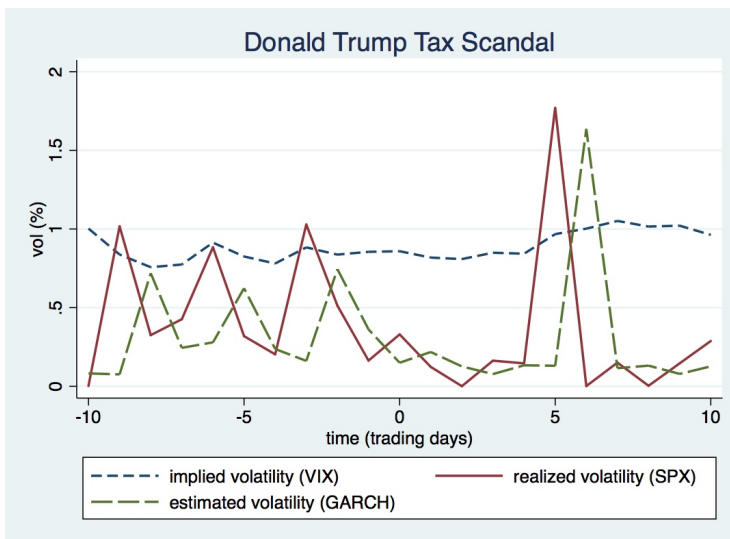
Figure 3.3   *Portrays the movements of implied, realized, and estimated volatilities within a 21-days window of Donald Trump's Tape Scandal. Source: StataCorp, 2015.*
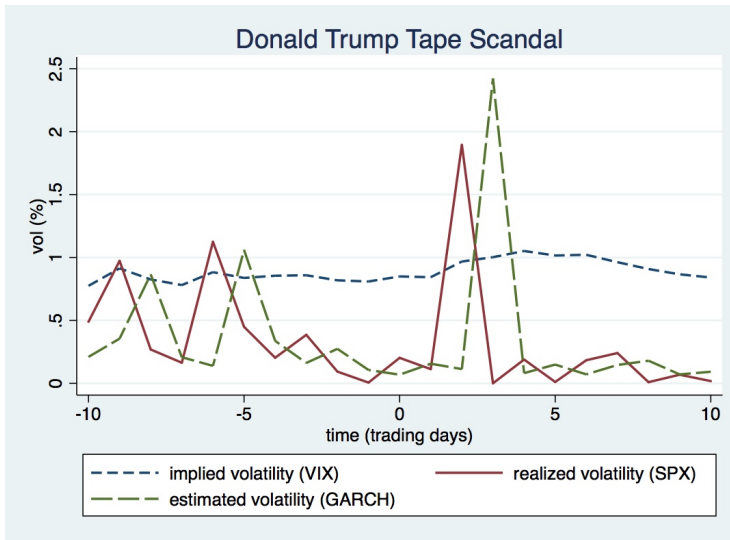
These events represent a few of the bigger scandals experienced by either candidate, and were the beginning of a series of leaked reputational hazards for Donald Trump. Trump was a unique candidate in that his blunt way of speech has earned him a reputation of honesty by some parties, but also viewed inappropriate by others. His various claims and promises during his campaign, including the ban of all Muslims in the United States (Diamond, 2015) have prompted both positive and negative responses, and this indicated a greater perceived uncertainty should he become president. These uncertainties, however, were not captured by our result, as shown in the graph above, where the realized volatilities seemed to align almost perfectly with the estimated volatilities.

Table 3.2   *Presents test statistics and p-value of the difference between the S&P 500 volatility movements as well as the VIX index compared to the GARCH forecast for 5-days, 11-days, and 21-days event windows for Donald Trump's Tax Scandal.*

Donald Trump Tax Scandal				
Event Window	Index	Test Statistics	P-Value	Decision (α=0.05)
5	spxindex	0.3700	0.9849	do not reject null
	vixindex	0.9623	0.9155	do not reject null
11	spxindex	0.8762	0.9999	do not reject null
	vixindex	0.9625	0.9999	do not reject null
21	spxindex	0.9654	1.0000	do not reject null
	vixindex	1.2081	1.0000	do not reject null

Table 3.3   *Presents test statistics and p-value of the difference between the S&P 500 volatility movements as well as the VIX*
index compared to the GARCH forecast for 5-days, 11-days, and 21-days event windows For Donald Trump's
Tape Scandal.

Donald Trump Tape Scandal				
Event Window	Index	Test Statistics	P-Value	Decision (α=0.05)
5	spxindex	0.2510	0.9928	do not reject null
	vixindex	1.8528	0.7628	do not reject null
11	spxindex	0.3006	1.0000	do not reject null
	vixindex	1.2930	0.9994	do not reject null
21	spxindex	0.7095	1.0000	do not reject null
	vixindex	1.1511	1.0000	do not reject null

Although this was a major event that could impact Donald Trump's electability, the market seemed to react rather optimistically to the news. There seemed to be consistent movements between the realized and the estimated volatility, indicating that there was no abnormality recorded in terms of the stability of the market. One interesting trend that could be observed out of the Trump scandals is that there seemed to be more reactions in the market compared to the Clinton scandals (See Section 3.2.4). Due to presidential-candidate Trump's media presence, the market seemed to react more towards his scandals that could have influential impacts toward the election outcome. While there was no abnormal volatility recorded during these periods, the difference in reactions between the two candidates does illustrate how the capital markets judge the level of uncertainties involved in the electability of one candidate compared to another.

3.2.3   Second Presidential Debate – October 10th, 2016

Figure 3.4   *Portrays the movements of implied, realized, and estimated volatilities within a 21-days window of the Second Presidential Debate. Source: StataCorp, 2015.*
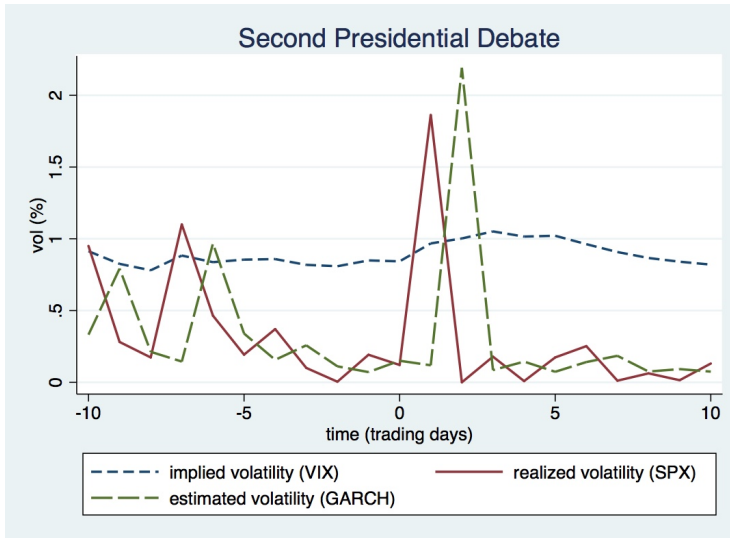

The trend of a calm market still remained until the second presidential debate, which shed light on the former-presidential-candidate Donald Trump's controversies regarding taxes and the recorded tape. At this point, the market seemed to have sets of expectations that mitigate uncertainties, as illustrated with the constant trend. The graph above portrays a slight shock in volatility after the debate, but this cannot be considered abnormal since the estimated volatility also forecasted similar trends. What can be observed, however, is the same shock lasted longer for the implied volatility, signaling a pattern where human behavior has influenced the stability of the market. The graph portrays that the shock in realized and estimated volatilities were only present for 1 trading day, while the rise in implied volatility lasted for about 5 trading days. This means that the market expected a longer impact than what occurred in reality. Some reasons of this trend could include the widespread access to the market that allows individuals who does not behave rationally to influence the trajectory of the market. We will not be elaborating these reasons further due to the scope of our study, but this trend is definitely a matter that can be explored in more depth.

Second Presidential Debate				
Event Window	**Index**	**Test Statistics**	**P-Value**	**Decision (α=0.05)**
5	spxindex	0.2310	0.9938	do not reject null
	vixindex	1.9777	0.7399	do not reject null
11	spxindex	0.2717	1.0000	do not reject null
	vixindex	1.4690	0.9990	do not reject null
21	spxindex	0.6646	1.0000	do not reject null
	vixindex	1.1739	1.0000	do not reject null

The observation is reinforced with the results in the table, which shows consistent trends in that there are no significant results for the abnormal volatilities. It can be observed that implied volatility, in its essence will be much greater than the estimated volatility, while the realized will be somewhere in the middle. So the trend we are looking for is not that implied volatility is greater than the estimated volatility, rather that the movement of implied volatility remained relatively constant, with no significant jumps within periods surrounding the events. This result illustrates that even one month prior to the election date can still be considered too early to see the effects of the election on the capital markets.

3.2.4   Hillary Clinton Email Scandal – October 17th, 2016 | Hillary Clinton Email Scandal Two – October 28th, 2016

Figure 3.5   Portrays the movements of implied, realized, and estimated volatilities within a 21-days window of Hillary Clinton's First Email Scandal. Source: StataCorp, 2015.
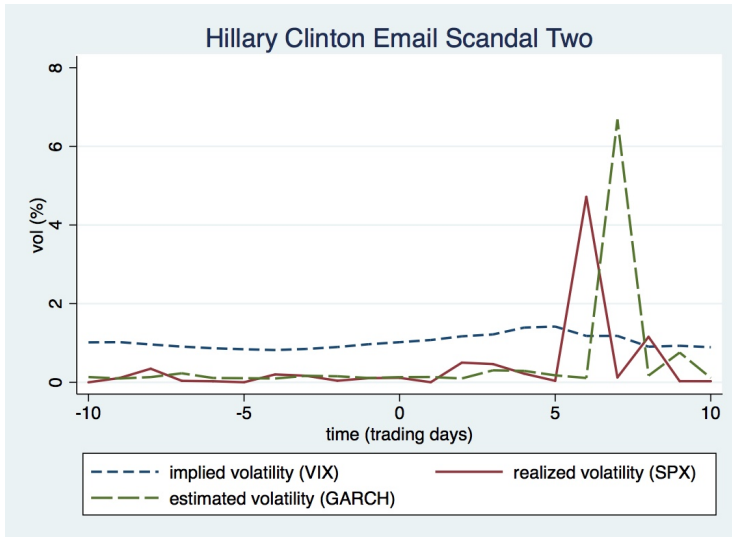
The timeline of the scandals for both of the candidates were unique in the sense that they cluster in a certain period of time. In this case, Donald Trump's scandals occurred before the second presidential debate, while Hillary Clinton's occurred after. Looking at the graphs above, there were no immediate impacts of the Clinton scandals to the capital markets, despite being closer to the election date. The fluctuations in volatilities seemed to be perfectly captured by the estimated volatilities, showing no abnormalities.

As mentioned earlier, the difference in reactions between the Trump scandals and the Clinton scandals seemed to be obvious, with Figure 3.5 and Figure 3.6 showing steady-state movements during the periods of the two events. The shocks that can be seen in both graphs can be attributed to the second presidential debate and the election date respectively, considering the proximity of these scandals to other events that we chose to analyze.

Table 3.5   *Presents test statistics and p-value of the difference between the S&P 500 volatility movements as well as the VIX index compared to the GARCH forecast for 5-days, 11-days, and 21-days event windows for Hillary Clinton's First Email Scandal.*

Hillary Clinton Email Scandal				
Event Window	**Index**	**Test Statistics**	**P-Value**	**Decision (α=0.05)**
5	spxindex	0.1856	0.9960	do not reject null
	vixindex	2.3724	0.6676	do not reject null
11	spxindex	1.4463	0.9991	do not reject null
	vixindex	1.9118	0.9970	do not reject null
21	spxindex	1.1711	1.0000	do not reject null
	vixindex	1.6944	1.0000	do not reject null

Table 3.6   *Presents test statistics and p-value of the difference between the S&P 500 volatility movements as well as the VIX index compared to the GARCH forecast for 5-days, 11-days, and 21-days event windows for Hillary Clinton's Second Email Scandal.*

Hillary Clinton Email Scandal Two				
Event Window	**Index**	**Test Statistics**	**P-Value**	**Decision (α=0.05)**
5	spxindex	0.1339	0.9979	do not reject null
	vixindex	2.0942	0.7184	do not reject null
11	spxindex	0.1687	1.0000	do not reject null
	vixindex	1.8301	0.9975	do not reject null
21	spxindex	0.2240	1.0000	do not reject null
	vixindex	1.6856	1.0000	do not reject null

The tables above reinforce the results, with similar trends as previous events. Looking at the p-values of the realized volatilities, we cannot reject the null hypothesis that there was no abnormal volatility throughout the period surrounding the events. By the looks of the graph, however, the implied volatility seemed to show slightly more movements, depicting the anxiousness of the market, as the election date gets closer.

3.2.5 Third Presidential Debate – October 20th, 2016

Figure 3.7   *Portrays the movements of implied, realized, and estimated volatilities within a 21-days window of the Third Presidential Debate. Source: StataCorp, 2015.*
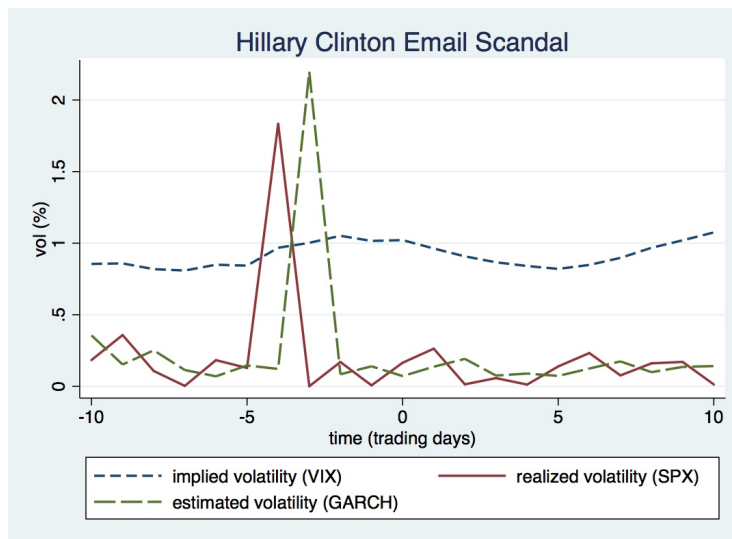

Table 3.7   *Presents test statistics and p-value of the difference between the S&P 500 volatility movements as well as the VIX index compared to the GARCH forecast for 5-days, 11-days, and 21-days event windows for the Third Presidential Debate.*

Third Presidential Debate				
Event Window	Index	Test Statistics	P-Value	Decision (α=0.05)
5	spxindex	0.4048	0.9821	do not reject null
	vixindex	1.7694	0.7781	do not reject null
11	spxindex	0.2588	1.0000	do not reject null
	vixindex	1.8752	0.9972	do not reject null
21	spxindex	1.0671	1.0000	do not reject null
	vixindex	1.7974	1.0000	do not reject null

The third and final presidential debate marked the last time both candidates face each other to present their cases. Although implied volatility seemed to be reacting throughout this period, which can be considered normal as per prior studies regarding the presidential election, there was minimal movements in the realized volatility, and the GARCH model, which forecasted the volatility using data from previous periods, captured this. The table above also offers the same explanation, showing that the null hypothesis of no abnormal volatility cannot be rejected for the realized volatility.

The shock in the VIX Index suggests that the reaction towards the presidential election becomes more apparent, with people hedging their positions and managing their risks by

purchasing derivatives. The upward trend of the implied volatility persisted until the election date, showing that there was much anticipation of the outcome of the election, regardless of who the eventual winner will be.

3.2.6   2016 US Presidential Election – November 9th, 2016

Figure 3.8   *Portrays the movements of implied, realized, and estimated volatilities within a 21-days window of the 2016 US Presidential Election. Source: StataCorp, 2015.*
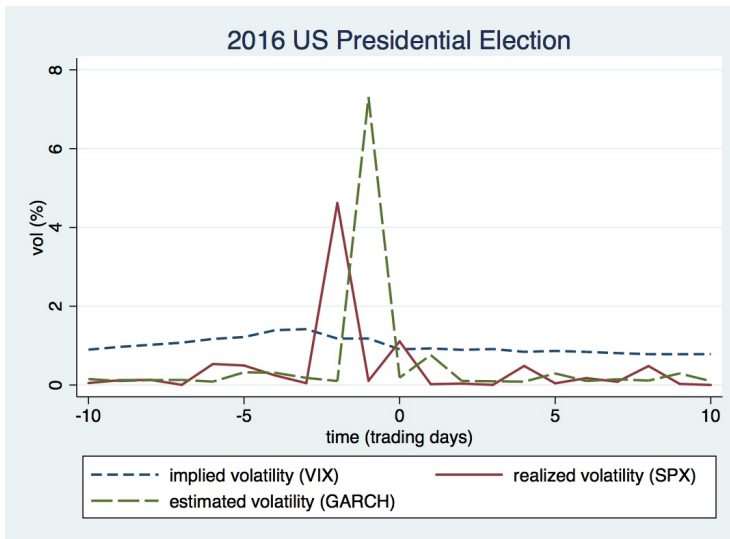
The reaction of the 2016 US Presidential Election was far from normal, to say the least. Looking at the graph above, there seemed to be quite a shock in volatility within a 5-days event window. This shock, however, subsided straight after the result of the election was announced, and the volatility ended up becoming lower and more stable for the next 10 days. This is an interesting result, considering that the market reaction of the election usually lasts longer than just overnight, and thus signaling that there are other determinants of the US election that had not been observed by previous studies.
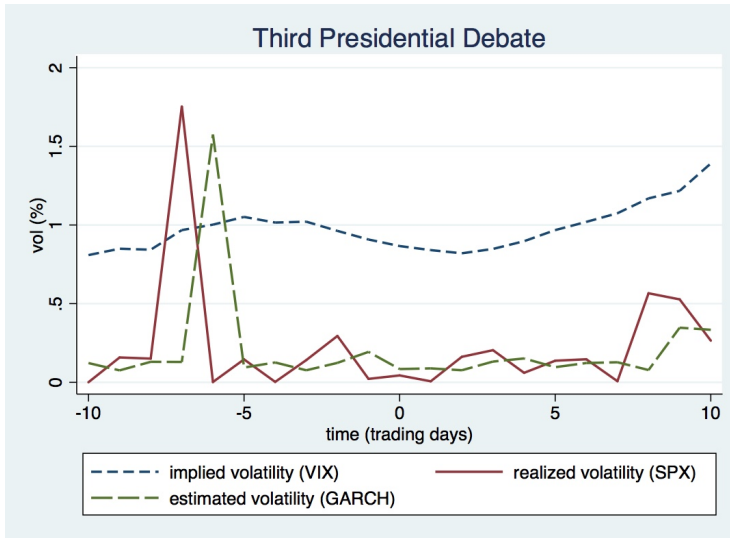
Table 3.8 Presents test statistics and p-value of the difference between the S&P 500 volatility movements as well as the VIX
index compared to the GARCH forecast for 5-days, 11-days, and 21-days event windows for the 2016 US
Presidential Election.

2016 US Presidential Election				
Event Window	**Index**	**Test Statistics**	**P-Value**	**Decision (α=0.05)**
5	spxindex	8.1805	0.0852	do not reject null
	vixindex	2.0077	0.7343	do not reject null
11	spxindex	5.4548	0.8588	do not reject null
	vixindex	2.5651	0.9899	do not reject null
21	spxindex	3.2898	1.0000	do not reject null
	vixindex	1.9019	1.0000	do not reject null

Looking at the above table, the p-value for the 5-days event window seemed close to
becoming significant, thus consistent with the graph where it shows a shock in volatility within
the same window. Our results show that the US capital markets did react and will always react to
the uncertainties posed by the presidential election. However, just like the 2016 election, where
the competitiveness seemed to be at a higher level, and that the candidates were not some of the
most predictable leaders, there could be different reactions in the market.

Figure 3.9   Portrays the normalized difference between implied, realized, and estimated volatility within a 21-days window
of the 2016 US Presidential Election. Source: StataCorp, 2015.
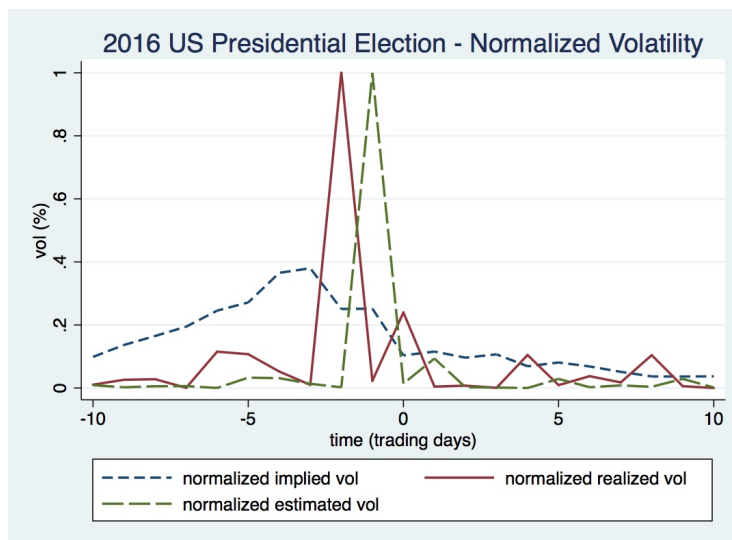
Another way to observe the reaction of the US capital markets on the election is the
normalized volatility within the period of the event. The purpose of this graph is to amplify the
movements of the volatilities to better capture the differences in trends. It can be seen in Figure
3.9 that the estimated volatility followed the realized volatility closely with a 1-day lag. With the

implied volatility, the upward movement prior to the election can be caused by derivatives purchases to hedge against the election outcome.

What is interesting was the reaction after the event, which was contradictory to the noise in the media prior to the election. With many articles and analyses from the New York Times (Sorkin, 2016), CNBC (Domm, 2016), and Bloomberg (Wong & Debnath, 2016), to name a few, there were widespread perceptions that the election of Donald Trump would drive the capital markets down, and weaken the US economy. With that in mind, the expected reaction after the election outcome was announced was that volatility would be chaotic, and the market would be in an uproar. In fact, that did happen as portrayed by the sudden shock in the realized volatility, but it quickly subsided just after 1 day of the election, where the volatility plateaued and gradually reached an all period low.

The outcome of the 2016 US Presidential Election was one of two great turnarounds that occurred in 2016. The 'Brexit' event that occurred earlier in the year also displayed the same result, in that the volatility shock only lasted for a very short period of time. Whether there are changes in the way the market view political uncertainties, or that these two events were simply 'black swans' to what was once a common trend when uncertainty was right around the corner, there are still implications that could be derived for individuals and firms to assess their positions and manage their risks.

3.3 Implications & Limitations

Our results indicate that the US market reacted unpredictably optimistic against what some thought was a low-probability event (Meckler, 2016). This calm demeanor of the capital markets also contradicts previous studies on the US presidential election, signaling the need to revisit the subject with more in-depth observations and analyses. We also determined that there were little impacts of news to the market with more than 1-month before the election date, considering the insignificant reactions even to major events surrounding the presidential election. With more influential news come greater reactions, but the shocks to the market were clearly apparent only closer to the election date, with event windows varying from time to time. Having said this, summing together our results with the results from Białkowski et al. (2008), the appropriate event window where market seemed to be reacting the most would be a 31-days event window.

To determine why these results were obtained would be the next step towards solving this unusual market reaction. Throughout the span of the past few elections, there have been major

changes that could play a role as to why the market did not react as expected. These changes include negative interest rates, which are becoming more widespread, increasing speed of information distribution worldwide, access to the financial market, as well as social issues within the US and overseas. To take account into each of these events would help single out determinants that play a big role in influencing the reaction of the market toward the election outcome.

These factors become clear limitations to our results, in addition to the event window limitations we had due to time constraints. We have also yet to explore the impact of the election on international markets, where specific to this year's election, the current president-elect Donald Trump's campaign on slowing down cross-border activities will affect not only the domestic but also the international markets.

4: Conclusion

The financial market does not run independently, rather it is greatly affected by factors that, at first glance, does not seem to possess much influence on the market. One of these factors is political uncertainty that greatly affects the trajectory of the financial market. The US Presidential Election has been studied as an influential event that has impacts not only in the local market, but also overseas. With that said, there is a degree of curiosity that continues to drive incoming studies regarding the subject, so as to refine and confirm the proposed trends surrounding the event.

Our empirical study has shown that the 2016 US Presidential Election has a considerably different reaction from the expected trends from previous elections. There is a degree of calmness perceived in the market throughout the span of the election, with influential events prior to the election date not disrupting the stability of the US capital markets. While the expected reaction is shown in the implied volatility, the realized volatility seemed to draw a different picture, and this leads to the question of what may cause these differences in the reactions of the market.

Even with the uniqueness of the most recent US election, the implications for individuals or firms who would like to manage their positions during these volatile periods are still apparent. A window of 31 days surrounding the event seemed to show the most fluctuations and shocks in volatility, indicating that there is a degree of anxiousness in the general election itself, but these trends will be strengthened or weakened by unique factors that will vary for different elections. With that said, there is a need for market participants to start analyzing the trajectory of a certain election, beginning at the proposed event window, in order to be manage their risks and be at a stable position during these periods of uncertainties.

5: Appendix

Result for all obtained indices and event windows.

Event Window = 5 Days

US Presidential Election — 11/9/16

	cav	test	
SPX	6.46	8.18	not
NDX	12.43	6.65	not
OEX	6.95	8.84	not
INDU	7.46	9.41	not
RTY	18.92	5.63	not
VIX	3.68	2.01	not
VXN	5.38	2.77	not
VXO	3.63	2.20	not
VXD	3.39	2.52	not
RVX	2.74	0.58	not

First Presidential Debate — 9/27/16

	cav	test	
SPX	2.52	0.68	not
NDX	2.57	0.36	not
OEX	2.78	0.97	not
INDU	2.60	0.86	not
RTY	5.17	0.73	not
VIX	2.48	0.77	not
VXN	2.14	0.46	not
VXO	2.69	0.98	not
VXD	2.67	0.98	not
RVX	2.03	0.31	not

Trump Taxes — 10/4/16

	cav	test	
SPX	1.09	0.37	not
NDX	1.06	0.35	not
OEX	0.69	0.29	not
INDU	1.11	0.37	not
RTY	3.43	0.60	not
VIX	2.53	0.96	not
VXN	3.23	1.13	not
VXO	2.79	1.22	not
VXD	2.73	1.15	not
RVX	2.31	0.36	not

Event Window = 11 Days

US Presidential Election — 11/9/16

	cav	test	
SPX	8.18	5.45	not
NDX	71.77	3.91	not
OEX	8.63	5.90	not
INDU	8.40	6.19	not
RTY	31.13	3.20	not
VIX	9.05	2.57	not
VXN	62.67	2.13	not
VXO	9.41	3.05	not
VXD	8.48	3.25	not
RVX	17.34	0.65	not

First Presidential Debate — 9/27/16

	cav	test	
SPX	4.02	1.17	not
NDX	4.87	0.68	not
OEX	3.40	0.99	not
INDU	3.51	0.93	not
RTY	9.15	0.63	not
VIX	5.65	1.44	not
VXN	5.07	0.88	not
VXO	6.24	1.55	not
VXD	6.09	1.48	not
RVX	4.55	0.37	not

Trump Taxes — 10/4/16

	cav	test	
SPX	4.71	0.88	not
NDX	5.40	0.80	not
OEX	3.68	1.02	not
INDU	3.81	0.91	not
RTY	10.69	0.91	not
VIX	6.30	0.96	not
VXN	6.95	1.15	not
VXO	6.61	1.19	not
VXD	6.73	1.03	not
RVX	4.95	0.36	not

Event Window = 21 days

US Presidential Election — 11/9/16

	cav	test	
SPX	16.13	3.29	not
NDX	46.84	2.78	not
OEX	16.44	3.30	not
INDU	15.10	3.28	not
RTY	45.87	2.21	not
VIX	22.03	1.90	not
VXN	41.76	1.73	not
VXO	22.60	2.23	not
VXD	22.94	2.54	not
RVX	32.30	0.61	not

First Presidential Debate — 9/27/16

	cav	test	
SPX	11.44	1.15	not
NDX	16.45	1.35	not
OEX	8.37	0.98	not
INDU	9.33	0.85	not
RTY	20.23	0.72	not
VIX	13.47	1.44	not
VXN	15.84	1.35	not
VXO	13.50	1.40	not
VXD	13.25	1.23	not
RVX	13.64	0.55	not

Trump Taxes — 10/4/16

	cav	test	
SPX	8.00	0.97	not
NDX	13.72	0.73	not
OEX	5.82	0.91	not
INDU	6.17	0.85	not
RTY	18.87	0.70	not
VIX	13.48	1.21	not
VXN	17.18	1.02	not
VXO	13.92	1.34	not
VXD	13.58	1.23	not
RVX	10.52	0.34	not

10/7/16	Trump Tape Scandal				10/7/16	Trump Tape Scandal				10/7/16	Trump Tape Scandal		
	cav	test				cav	test				cav	test	
SPX	1.94	0.25	not		SPX	5.21	0.30	not		SPX	8.85	0.71	not
NDX	2.52	0.16	not		NDX	8.61	0.26	not		NDX	13.06	0.58	not
OEX	1.30	0.16	not		OEX	3.09	0.21	not		OEX	6.56	0.85	not
INDU	1.67	0.28	not		INDU	3.63	0.28	not		INDU	6.59	0.78	not
RTY	4.24	0.44	not		RTY	11.40	0.48	not		RTY	19.79	0.71	not
VIX	3.62	1.85	not		VIX	7.72	1.29	not		VIX	14.79	1.15	not
VXN	4.28	2.18	not		VXN	11.12	1.32	not		VXN	17.89	1.17	not
VXO	3.89	2.34	not		VXO	7.04	1.61	not		VXO	14.14	1.42	not
VXD	3.85	2.02	not		VXD	7.05	1.40	not		VXD	14.09	1.22	not
RVX	2.44	0.72	not		RVX	6.11	0.45	not		RVX	11.72	0.39	not

10/10/16	Second Presidential Debate				10/10/16	Second Presidential Debate				10/10/16	Second Presidential Debate		
	cav	test				cav	test				cav	test	
SPX	3.42	0.23	not		SPX	4.99	0.27	not		SPX	8.10	0.66	not
NDX	6.91	0.23	not		NDX	8.88	0.21	not		NDX	13.60	0.56	not
OEX	2.06	0.19	not		OEX	2.98	0.20	not		OEX	6.13	0.81	not
INDU	2.55	0.29	not		INDU	3.65	0.30	not		INDU	5.74	0.68	not
RTY	7.49	0.43	not		RTY	11.43	0.42	not		RTY	18.40	0.67	not
VIX	3.58	1.98	not		VIX	8.78	1.47	not		VIX	14.65	1.17	not
VXN	6.78	2.14	not		VXN	13.07	1.66	not		VXN	18.06	1.22	not
VXO	3.34	2.47	not		VXO	8.01	1.87	not		VXO	14.16	1.48	not
VXD	3.20	2.31	not		VXD	8.09	1.74	not		VXD	14.05	1.31	not
RVX	4.15	0.66	not		RVX	6.63	0.46	not		RVX	11.43	0.38	not

10/17/16	Clinton FBI Email				10/17/16	Clinton FBI Email				10/17/16	Clinton FBI Email		
	cav	test				cav	test				cav	test	
SPX	0.55	0.19	not		SPX	3.91	1.45	not		SPX	5.88	1.17	not
NDX	1.59	0.45	not		NDX	9.38	1.55	not		NDX	13.80	1.16	not
OEX	0.45	0.19	not		OEX	2.69	1.19	not		OEX	3.92	0.92	not
INDU	0.22	0.12	not		INDU	2.85	1.21	not		INDU	4.10	0.89	not
RTY	2.35	0.59	not		RTY	9.66	1.08	not		RTY	16.87	0.86	not
VIX	4.26	2.37	not		VIX	8.64	1.91	not		VIX	16.74	1.69	not
VXN	4.18	3.50	not		VXN	11.84	2.49	not		VXN	20.25	2.29	not
VXO	4.45	2.77	not		VXO	8.64	2.24	not		VXO	16.59	1.98	not
VXD	4.34	2.72	not		VXD	8.55	2.24	not		VXD	16.62	1.89	not
RVX	2.61	0.48	not		RVX	7.40	0.51	not		RVX	11.94	0.49	not

10/20/16	**Third Presidential Debate**			10/20/16	**Third Presidential Debate**			10/20/16	**Third Presidential Debate**		
SPX	0.73	0.40	not	SPX	0.95	0.26	not	SPX	5.30	1.07	not
NDX	2.44	0.80	not	NDX	4.67	0.56	not	NDX	13.13	1.18	not
OEX	0.62	0.33	not	OEX	0.94	0.22	not	OEX	4.04	0.86	not
INDU	0.32	0.15	not	INDU	0.50	0.11	not	INDU	3.60	0.83	not
RTY	1.67	0.46	not	RTY	4.28	0.48	not	RTY	17.55	0.84	not
VIX	3.73	1.77	not	VIX	8.77	1.88	not	VIX	17.40	1.80	not
VXN	3.72	1.82	not	VXN	8.79	2.51	not	VXN	19.70	2.10	not
VXO	4.01	2.34	not	VXO	9.33	2.30	not	VXO	18.13	2.15	not
VXD	3.99	2.24	not	VXD	9.17	2.23	not	VXD	17.63	2.04	not
RVX	3.19	0.75	not	RVX	5.50	0.55	not	RVX	12.49	0.60	not

10/28/16	**Clinton FBI Email Two**			10/28/16	**Clinton FBI Email Two**			10/28/16	**Clinton FBI Email Two**		
SPX	0.70	0.13	not	SPX	1.28	0.17	not	SPX	14.85	0.22	not
NDX	1.86	0.47	not	NDX	5.97	1.01	not	NDX	41.11	0.77	not
OEX	0.75	0.45	not	OEX	1.54	0.37	not	OEX	15.38	0.29	not
INDU	0.53	0.18	not	INDU	0.80	0.17	not	INDU	14.14	0.15	not
RTY	3.79	0.68	not	RTY	7.23	0.49	not	RTY	38.93	0.48	not
VIX	4.54	2.09	not	VIX	9.96	1.83	not	VIX	22.23	1.69	not
VXN	4.09	1.27	not	VXN	7.78	1.39	not	VXN	38.54	1.50	not
VXO	4.95	3.04	not	VXO	10.83	2.45	not	VXO	23.08	2.18	not
VXD	4.81	2.90	not	VXD	10.53	2.36	not	VXD	22.33	2.09	not
RVX	2.49	0.28	not	RVX	5.78	0.55	not	RVX	25.98	0.49	not

Reference List

Basak, S. (2016). Berkshire Boost From Trump Tax Plan Seen as High as $29 Billion. Bloomberg L.P. Retrieved from https://www.bloomberg.com/news/articles/2016-12-05/berkshire-boost-from-trump-tax-plan-seen-as-high-as-29-billion

Białkowski, J., Gottschalk, K., & Wisniewski, T. (2008). Stock market volatility around national elections. Journal of Banking and Finance 32, 1941 – 1953.

Bloomberg L.P. (2012). VIX Index Line Chart 08/30/2012 to 01/11/2013. Retrieved from Bloomberg Database.

Bloomberg L.P. (2004). VIX Index Line Chart 08/30/2004 to 01/06/2005. Retrieved from Bloomberg Database.

Bollerslev, T. (1986). Generalized autoregressive conditional heteroskedasticity. Journal of Econometrics 31, 301-327.

Bollerslev, T., Chou, R. Y., & Kroner, K. F. (1992). ARCH modeling in finance. Journal of Econometrics 52, 5–59.

Bollerslev, T., Engle, R. F., & Nelson, D. B. (1994). ARCH models. Handbook of Econometrics 4, 2961 – 2984.

Brown, S. J. & Warner, J. B. (1985). Using daily stock returns: the case of event studies. Journal of Financial Economics 14, 3-31.

Diamond, J. (2015). Donald Trump: Ban all Muslim travel to U.S. CNN Politics. Retrieved from http://www.cnn.com/2015/12/07/politics/donald-trump-muslim-ban-immigration/

Dobson, J. & Dufrene, U. B. (1993). The impacts of U.S. presidential elections on international security-markets. Global Finance Journal 4, 39 – 47.

Domm, P. (2016). This is what could happen to the stock market if Donald Trump wins. CNBC LLC. Retrieved from http://www.cnbc.com/2016/11/02/this-is-what-could-happen-to-the-stock-market-if-donald-trump-wins.html

Gemmill, G. (1992). Political risk and market efficiency: Tests based in British stock and options markets in the 1987 election. Journal of Banking & Finance 16, 211-231.

Goodell, J. W. & Vähämaa, S. (2013). US presidential elections and implied volatility: The role of political uncertainty. Journal of Banking & Finance 37, 1108-1117.

Hobbs, G. R. & Riley, W. B (1984). Profiting from a Presidential Election. Financial Analysts Journal 40, 46 – 52.

Kelly, B., Pástor, Ľ., & Veronesi, P. (2016). The Price of Political Uncertainty: Theory and Evidence from the Option Market. The Journal of Finance 71, 2417 – 2480.

Lahart, J. (2016). Investors Get Election Jitters. The Wall Street Journal. Retrieved from http://www.wsj.com/articles/investors-get-election-jitters-1478276358

Li, J. & Born, J. A. (2006). Presidential Election Uncertainty and Common Stock Returns in the United States. The Journal of Financial Research 29, 609-622.

Meckler, L. (2016). Donald Trump Faces Narrow Path to White House Victory. The Wall Street Journal. Retrieved from http://www.wsj.com/articles/donald-trump-faces-narrow-path-to-white-house-victory-1471998055

Nippani, S. & Medlin, W. B. (2002). The 2000 Presidential Election and the Stock Market. Journal of Economics and Finance 26, 162-169

Pantzalis, C., Stangeland, D. A., & Turtle, H. J. (2000). Political elections and the resolution of uncertainty: The international evidence. Journal of Banking & Finance 24, 1575 – 1604.

Renick, O. (2016). Don't Worry When the Stock Market Goes Crazy After Election. Bloomberg
    L.P. Retrieved from https://www.bloomberg.com/news/articles/2016-11-07/don-t-worry-
    when-the-stock-market-goes-crazy-after-the-election

Santa-Clara, P. & Valkanov, R. (2003). The Presidential Puzzle: Political Cycles and the Stock
    Market. The Journal of Finance 58, 1841-1872.

Sorkin, A. R. (2016). What Happens to the Markets if Donald Trump Wins? The New York
    Times Company. Retrieved from http://www.nytimes.com/2016/11/01/business/
    dealbook/what-happens-to-the-markets-if-donald-trump-wins.html

StataCorp. 2015. Stata Statistical Software: Release 14. College Station, TX: StataCorp LP.

Sy, O. & Zaman, A. A. (2011). Resolving the Presidential Puzzle. Financial Management 40,
    331-355.

Wong, A. & Debnath, A. (2016). A Trump Win Could Sink the Dollar. Bloomberg L.P. Retrieved
    from https://www.bloomberg.com/news/articles/2016-11-06/world-s-best-currency-
    forecasters-see-dollar-rout-on-trump-win