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International Bachelor in Economics and Business Economics

Did NAFTA Get Trumped?
An analysis of Trump's election promise and his subsequent tweets about NAFTA on the stock market returns in Mexico

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Abstract:

In this thesis, I investigate Trump's election promise of repealing or renegotiating NAFTA if he was to become president. The goal of this thesis is to determine the impact of Trump's promise on the Mexican stock market and to see whether traditional factors like size, market-to-book ratio and the industry of the firm can explain the presence of abnormal returns. An event study analysis is done using 5 different event windows, including the 2016 US elections and Trump's subsequent tweets on NAFTA. Using multiple abnormal return models I find a cumulative average abnormal return of close to -1% over a 21 day event window. Furthermore, these abnormal returns tend to be significant over multiple parametric and nonparametric tests, with the strongest negative reaction observed just after the event takes place. From the effects analysed, only the presence of a size effect is found, with larger firms losing more value around the event.

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1. Introduction

Government policies are a central part in how the economy functions and works. The government possesses a lot of power in the ways it can stimulate and affect the economy. Some of the methods include the use of taxation, the currency regime, and the monetary and fiscal policies they adopt (Kundu, 2018). However, most countries participate in a democratic institution which may result in the changing of governments and perhaps a change in the viewpoints on certain economic decisions.

The various rules and regulations of the government and their impacts on the economy have been closely analysed by quite a few researchers. For example, Cebula (1997) looks at the impact of government taxation on the size of the underground economy. Using the United States as a case study, Cebula finds that from 1973 to 1994, a higher personal income tax rate led to a bigger underground economy. Ramey (2011) looks at the other spectrum of fiscal policy, mainly focusing on government spending and the impact of that on the economy. Once again, using data from the United States, Ramey finds that the "…US aggregate multiplier for a temporary, deficit-financed increase in government [spending] is between 0.8 and 1.5." This multiplier refers to the knock-down effect of government spending which leads to an increase in income and further boosts to the economy.

On the other hand, research on the effect of government policies and regulation on the capital markets is contrasting. Binder (1985) looks at measuring the effect of regulation on stock prices. He looks at twenty major changes in regulatory constraint since 1887 and after conducting tests on monthly and daily returns, finds that "…significant price changes [are found] about as often as is expected owing to chance." He goes on to state that this lack of significant result is due to the anticipation of the announcement, as formal regulatory announcements tend to receive a lot of coverage in the news. This tends to make event studies on regulatory events ineffective. Hence, Kundu (2018) looks at the US elections of 2016 as an exogenous shock to the system and shows how the election led to new beliefs on future government policies which were subsequently reflected in the stock price. Kundu focuses on the de-regulation promises made by Trump and finds that stocks in the most regulated industry earned 14% cumulative abnormal returns around the time of the election.

Similar to Kundu, this paper looks at Donald Trump and one of the promises he made during his campaign trail. More specifically, this paper looks at Trump's view on free trade agreements and stock price responses to that. The North American Free Trade Agreement (NAFTA) is a bilateral trade agreement between the US, Canada and Mexico which came into effect on the 1st of January, 1994. The purpose of NAFTA was to encourage economic activity between the three countries by gradually eliminating tariffs on products imported via these countries. These tariffs, particularly the ones related to agriculture, textiles and automobiles, were gradually eliminated between the inception of NAFTA and the 1st of January, 2008 (United States Trade Representative). One of Trump's promises during his campaign was to renegotiate or even withdraw from NAFTA, going as far as calling it "one of the worst deals our country has ever made, from an economic standpoint" (Jagannathan, 2017).

Another promise made by Trump during his campaign were to the states in the Rust Belt such as Michigan, Ohio and so on to bring back manufacturing jobs to the states and to revitalize blue-collar America. (S.A Miller, 2017). These two promises are closely related because America is one of the biggest steel importers and these jobs could be brought back through trade barriers on steel imports if NAFTA is revoked. The elimination of NAFTA would hugely affect Mexico as 10% of US steel imports are exported by Mexico (Reuters, 2018). Also Mexico is a huge exporter of manufacturing based products with America being a major trade partner, and so the removal of NAFTA to boost American jobs would significantly impact the country (Observatory of Economic Complexity). Furthermore, Mexico's agricultural sector might also be affected as the country is one of the top two exporters of agricultural produce to America (Cooke, 2017).

This paper aims to investigate the effect of Trump's promise of the renegotiation of NAFTA on the Mexican stock market. It aims to do this by investigating the stock prices of Mexican traded firms after the 2016 US elections as well as President Trump's subsequent tweets about the free trade agreement with Mexico after his win. The second part of the research will contain a regression analysis on the previously found abnormal returns, with explanatory variables such as the industry of the firm, the market value of equity and the market-to-book ratio.

My results show that over a 21 day period around the events, nearly every day exhibits an abnormal return that is significantly different from zero. Over the 21 day period, the Mexican firm cumulatively drops by an average of 1% over the 5 different events used and is consistent across different abnormal return models. Furthermore, the most pronounced negative reaction is seen after the actual day of the event, where the market drops by close to 1.4% over the first 3 days – [0,+2], with the market experiencing 0.5% of the drop on days 0 and 1. Furthermore, the evidence shows that the cumulative average abnormal returns found above are significant over a variety of parametric and non-parametric tests for all windows that incorporate days after the event – [0,+1], [0,+2] and [0,+5]. The event window [-10,+10] also exhibits significant negative returns.

In terms of explaining the abnormal returns, out of all the effects analysed, only the size effect was significant. The size effect states that larger firms have lower returns around stock market crashes with my evidence displaying a 0.5% lower abnormal return for larger firms over a 3 day window. A similar cumulative return was also seen over the window [0,+5], implying that larger firms do not tend to lose further value after the first 3 days.

Lastly, the paper checks whether the overall results of the paper are driven by the negative returns surrounding the 2016 elections. While, the 2016 election does exhibit larger negative returns which slightly skews the overall results, negative returns are still present for the other events looked at. The non-election events display on average a negative 0.5% cumulative average abnormal return over a 3 day window. This return is closer to -1% using the market-adjusted model. Furthermore, these returns are significant over all the significance tests applied.

This paper is related to various strands of research. While papers such as Leblang and Mukherjee (2004) and Herron (2000) look at stock market volatilities after elections in the US and UK respectively, this paper looks at explicit changes in security prices after political events. This is similar to Kundu's (2018) research on stock market reactions to Trump's election. However, while Kundu's paper looks at US stock market reaction, my paper expands the research to look at the impact of the American election and Trump on an international level. At present, there is very little literature on the impact of political policies on foreign stock markets. This paper tries to fill that gap in literature, by providing strong and robust evidence that Trump's policy decisions or the implication of his future policy decisions result in significant negative abnormal returns in the Mexican stock market. Studying the international implications of a decision is becoming of greater importance to society due to the increased globalisation present. The greater mutual interdependence of economies and the virtual vanishing of borders leads to the creation of new stakeholders and the possibility to impact a larger number of people, both domestic and foreign, with government policies .

The rest of the paper is organised as follows: the following section provides the literature review where previous literature on this topic will be examined. Section three explains how the data was obtained and transformed and also describes the methodology used in obtaining the abnormal returns. Section four presents the abnormal returns found. Section five provides conclusions and helps determining the potential impact of Trump and his future policy implications on the Mexican stock market.

2. Literature Review and Hypotheses

2.1 Event Studies Using Political Events

The majority of event studies conducted tend to focus on the inflow of financial news in the market and the impact of this on the stock prices. However, there are a few papers with a similar background to this paper, where the impact on stock prices is judged on the inflow of political news. As mentioned before, the closest paper to my subject is the one by Kundu (2018) who looks at the changes in stock prices in the most regulated industries after the 2016 US elections.

Thompson (1993) employs an event study analysis to investigate the expectation of investors about the consequences of the Canada – United States free trade agreement (FTA). She estimates the abnormal stock market returns to portfolios for Canadian manufacturing industries for six different FTA related events. Her conclusion is that the abnormal returns are only significant for one event – reaching the agreement in October 1987 – and the industry specific returns are consistent with her prior hypotheses. In these industries, Thompson finds that industries like lumber, wood and paper are at an advantage whereas industries like textiles and apparel are at a disadvantage.

Similarly, Jensen (2007) looks at stock price responses to the WTO ruling on the 2002 US steel tariffs. He evaluates the impact of both the tariff and the ruling by WTO on the expectations of market actors. Jensen concludes that although the dispute garnered a lot of attention and there was a lot of debate over the response of the administration, the market participants only reacted to one event. This event was the WTO ruling of the tariffs being a violation of laws, with the ruling "…eliciting a negative and significant stock price response." In fact, he finds that the market had already anticipated Bush repealing the tariffs, and acted accordingly.

Herron (2000) investigates the economic impact of the 1992 British elections. In particular, he explains "…how [the] prices of publicly traded securities can be used to estimate the expected economic consequences of national elections." Herron finds that had the Labour party won the 1992 British elections, there would have been a 1% increase in the UK short term interest rates. This would have led to a drop in the British stock market by approximately 5% along with a huge rise in volatility.

Leblang and Mukherjee (2004), similarly investigate the impact of presidential elections and the stock market. They contest the claim by Herron (2000) and other researchers that when investors expect left parties – Democrats (US) or Labour Party (UK) – to win the election, the market volatility increases. Using data from the 2000 US presidential elections, they find that when the market expects a Democratic win, the market volatility in fact decreases.

Overall, similar to financial news, it can be seen that political news also tends to affect the stock market. While Kundu (2018), Herron (2000) and Leblang and Mukherjee (2004) investigate the impact of elections, Thompson (1993) and Jensen (2007) look at political decisions and their impact. The similarities between all the papers is that after the event in question, the financial market experiences a significant reaction. This reaction was portrayed in the capital market through a change in the volatility or through actual changes in security prices. In our scenario, if NAFTA were to be renegotiated or to be withdrawn I would expect the Mexican stock market and Mexican firms to be negatively impacted. A similar reaction would also be observed at the implication of the above. The reason for this is because Mexico exports over $300 million worth of goods to America and the United States accounts for 81% of Mexico's export (World Integrated Trade Solutions, 2018). This makes Mexican firms highly dependent on America. Hence, the first hypothesis of the paper is:

$$H_1 : CAAR < 0$$

$$A\ significant\ negative\ cumulative\ average\ abnormal\ return\ is\ to\ be\ expected$$
$$over\ the\ event\ windows\ in\ the\ Mexican\ stock\ market$$

2.2 Regression Analysis

The second half of this paper contains a regression analysis to try and explain the abnormal returns that might be found using the event study methodology. The expectation from the event study analysis is to find negative abnormal returns for the event windows due to the close trade ties between Mexico and the US.

Several studies have pointed to a size effect where larger firms tend to lose more value than smaller firms around stock market crashes. For example, Wang, Meric, Liu and Meric (2009) examine 8 different stock market crashes from 1962 to 2007 using a large sample of US firms. They find that among other factors stocks with larger capitalization tend to have significantly lower returns around a stock market crash. Fauzi and Wahyudi (2016) build on the research by Wang et al. and aim to determine the characteristics of stocks and firms that are deliberately affected by stock market crashes. Similar to Wang et al. (2009), they find that among other effects, larger stocks tend to lose out more heavily on the day of the crash. Miyajima and Yafeh (2007) research firm characteristics in the Japanese banking crisis and find contrasting evidence where smaller stocks have lower returns during the crisis. However, they find this effect to be limited, with the effect predominantly being driven by the lower returns for low credit rating firms with limited access to the financial market.

A counter-argument to the size effect might be that larger firms, in particular multinational corporations (MNCs), conduct business in many economies. Hence, they are exposed to the risks and uncertainties from other economies as well, which contribute to their lower returns. Michel and Shaked (1986) compare the financial performance of MNCs to domestic corporations (DMCs) and then "…present a comparison of selected financial characteristics of the firms in the two groups." They find that DMCs have significantly superior risk-adjusted returns to MNCs and that the larger size of MNCs does not explain the difference in performance between the groups. This leads to the formulation of the second hypothesis:

$$H_2: \beta_{MarketCap} < 0$$

$$Larger\ firms\ will\ have\ significantly\ lower\ cumulative\ abnormal\ returns\ than\ smaller\ firms\ over\ the\ event\ windows$$

As was shown previously, Mexico and America have extremely close trade ties where America accounts for 81% of Mexican exports (World Integrated Trade Solutions, 2018). Hence, a negative reaction in the Mexican stock market is to be expected at Trump's disapproval of NAFTA. However, similar to Thompson (1993), we would expect some industries, in particular the ones that export to America, to be hit more significantly with the constant uncertainty over NAFTA. This is based on the conclusion of Skinner (1994) who finds that "…bad news disclosures generate larger stock price reactions than good news disclosures." A significant promise made by Trump to his supporters during the campaign was to bring back manufacturing jobs through the use of steel tariffs. This promise affects Mexico in 2 ways. Firstly, as mentioned before, the United States is the biggest steel importer in the world and Mexico accounts for 10% of these imports (Reuters, 2018). Furthermore, the top exports of Mexico are manufacturing based such as vehicle parts and delivery trucks (Observatory of Economic Complexity). Therefore, if Trump plans to bring back manufacturing jobs through the renegotiation or repealing of NAFTA, I would expect Mexico's manufacturing sector to be severely hit, as both Mexican steel and manufactured products become more expensive to American consumers.

$$H_{3A}: \beta_{Manufacturing} < 0$$

$$\textit{Firms operating in the manufacturing sector will have significantly lower cumulative abnormal returns compared to other sectors}$$

Another sector that might be significantly hit over the NAFTA uncertainty is the agricultural sector. Over the period of 2013-2015, Canada and Mexico were the largest suppliers of agricultural products to America, with Mexico exporting $19.3 billion worth of goods. Furthermore, the United States is Mexico's largest agricultural trading partner, buying 79% of Mexican exports, these predominantly being beer, vegetables and fruit (Zahniser & Daugherty, 2018). Similar to the manufacturing sector, the agricultural sector should also be severely impacted in a negative manner throughout the study.

$$H_{4A}: \beta_{Agricultural} < 0$$

$$\textit{Firms operating in the agricultural sector will have significantly lower cumulative abnormal returns compared to other sectors}$$

However, the threats by President Trump over NAFTA will have an impact on the Mexican peso as well. The currency in fact weakened by more than 14% from the time Trump won the Republican nominee through his inauguration. The peso was also seen to plunge by more than 7% on the day Trump became president (He, 2017). These currency movements might actually make Mexican exports cheaper to American consumers in the short run (Askew, 2016). Hence, in the short run, exporting industries might actually experience positive returns due to the depreciating currency.

$$H_{3B+4B}: \beta_{Manufacturing}, \beta_{Agricultural} > 0$$

$$Firms\ operating\ in\ the\ agricultural\ and\ manufacturing\ sector\ will\ have\ significantly\ higher\ cumulative\ abnormal\ returns\ compared\ to\ other\ sectors$$

The last kind of effect that will be analysed is the performance of growth and value stock. La Porta, Lakonishok, Shleifer and Vishny (1997) find that value stocks tend to outperform growth stocks. They show that this outperformance is due to the difference in earnings announcement for the stocks. This difference accounts for 25-30% of the annual return difference over the first two to three years and is 15-20% for the next two years. Skinner and Sloan (2002) build on this conclusion and find that the outperformance of value stocks is due to the expectational errors of future earnings performance. They show that growth stocks are equally likely to announce positive earnings surprise as negative, but that growth stocks, in general, exhibit an asymmetrically large negative reaction to adverse announcements. Hence, based on the conclusions by Skinner and Sloan, growth stocks will have a tendency to react negatively to the uncertainty around NAFTA. Furthermore, this reaction should be most pronounced among the manufacturing and agricultural sector if H_{3A} and H_{4A} are true.

$$H_5: \beta_{MBRatio} < 0$$

$$Growth\ stocks\ will\ have\ significantly\ lower\ cumulative\ abnormal\ returns\ than\ value\ stocks\ over\ the\ event\ windows$$

$$H_6: \beta_{MBManufacturing}, \beta_{MBAgricultural} < 0$$

$$Manufacturing\ and\ agricultural\ growth\ stocks\ will\ have\ significantly\ lower\ cumulative\ abnormal\ returns\ in\ comparison\ to\ other\ sectors$$

3. Data And Methodology

The entire data that was required for the analysis of the research question was obtained from the Compustat Global database from Wharton Research Data Services (WRDS). The first thing that was obtained was the daily security prices for the period 1st of January, 2016 to the 18th of April, 2018 for all Mexican firms on the stock exchange. There were initially 138 firms on the Mexican stock exchange, but this was later cut down to 131 as some firms had stopped being listed on the stock exchange or there were firms that had been integrated on the exchange after the 2016 elections. Among other screening variables, the daily closing price of the firms were obtained. The price needed to be adjusted for stock splits and dividends and hence were adjusted using the methodology that WRDS uses to calculate its returns for its world indices. The formula for the adjusted price is:

$$Adjusted\ Price\ (Aj.P) = \left(\frac{PRCCD}{AJEXI}\right) * TRFD \tag{1}$$

The daily closing price (PRCCD) is divided by the daily adjustment factor (AJEXI) which accounts for stock splits and dividend payments. This fraction is then multiplied by the daily total return factor (TRFD) which accounts for reinvested dividends. Lastly, returns are calculated as:

$$R = {(Aj.P_1 - Aj.P_0)}\big/{Aj.P_0} \tag{2}$$

3.1 Event Study Methodology

Fama, Fisher, Jensen and Roll (1969) (FFJR, henceforth) first introduce the concept of the market model to estimate abnormal returns during an event window. Using data from 1926 to 1960, they use the following model to conduct an event study analysis:

$$R_{it} = \alpha_i + \beta_i R_{mt} + u_{it}$$

In their analysis, FFJR, use the residual (u_{it}) as an estimator for the abnormal return to measure the stock prices around stock splits. However, Binder (1998) criticizes the model as it includes the event period in the estimation period of the market model parameters causing the coefficients to be biased. Binder subsequently shows how studies by Scholes, uses data prior to the event to estimate these parameters in order to avoid the bias.

Similar to the market model, the Capital Asset Pricing Model (CAPM) can also be used to generate abnormal returns. However, MacKinlay (1997) finds that the "…validity of the restrictions imposed by the CAPM on the market model is questionable." This introduces the possibility that the results of the study are biased by the CAPM, and so MacKinlay concludes that the use of CAPM has ceased to exist as these biases can be avoided by using the market model.

Abnormal returns can also be calculated without using the market model or the CAPM. Brown and Warner (1980) focus on the mean-adjusted returns model and the market-adjusted model and compare the performance of those models to the market model. They conclude that the market model seems to perform well in many different conditions. They also find that in some cases, the simpler mean-adjusted and market-adjusted model perform no worse than the market model. Their later paper (1985) reinforces this conclusion using daily data instead of monthly data. Furthermore, the paper also sheds light on the fact that in contrast to popular opinion, the characteristics of daily data generally present few difficulties in event study analyses.

In summary, the market model is chosen over the CAPM because it seems to be the better performing model based on the conclusions of MacKinlay (1997). The mean-adjusted and market-adjusted models are also used to gain a deeper understanding and to also provide a comparison of the market reaction. Furthermore, as Ball and Warner (1980, 1985) show, the simpler event study methods perform no worse than the market model. In terms of the estimation window, unlike FFJR (1969), a window preceding the event window is chosen to avoid a bias in our model. To account for inefficiencies in the market, and to fully avoid bias in our returns an in between period of 50 days is kept between our estimation window and event window. In the end, an estimation window of 159 trading days is chosen from days [-220, -61] while the event window is kept at [-10, +10].

Since the market model and the market adjusted model use a market return to calculate abnormal returns, the returns from the world index in WRDS is used as a proxy. The daily WRDS World Indices are indices that are market-capitalization weighted for 39 different countries. Using the returns without dividends, a daily average return over the 39 countries is calculated from the 1st of January, 2016 to the 18th of April, 2018, and is used in place of the market return.

The next step requires the event being defined and determining the exact date on which said event took place. As mentioned above, the paper not only looks at the 2016 US elections but also at President Trump's subsequent tweets about the agreement. The tweets were recovered from a website called the Trump Twitter Archive (accessed April 17th, 2018) and tweets that specifically mentioned NAFTA in a bad light were chosen. The 5 events chosen are described in more detail in Table 1.

Table 1: Description of the Political Events (source: trumptwitterarchive.com)

Event Date	***Description of Event/Tweet***
08/11/2016	Trump wins the 2016 US Elections
26/1/2017	The U.S. has a 60 billion dollar trade deficit with Mexico. It has been a one-sided deal from the beginning of NAFTA with massive numbers...
27/08/2017	We are in the NAFTA (worst trade deal ever made) renegotiation process with Mexico & Canada. Both being very difficult, may have to terminate?
18/01/2018	The Wall will be paid for, directly or indirectly, or through longer term reimbursement, by Mexico, which has a ridiculous $71 billion dollar trade surplus with the U.S. The $20 billion dollar Wall is "peanuts" compared to what Mexico makes from the U.S. NAFTA is a bad joke!
05/03/2018	We have large trade deficits with Mexico and Canada. NAFTA, which is under renegotiation right now, has been a bad deal for U.S.A. Massive relocation of companies & jobs. Tariffs on Steel and Aluminum will only come off if new & fair NAFTA agreement is signed. Also, Canada must..

For the elections, similar to Kundu (2018), November 9th, 2016 is used as the first day after the event when the market starts. It should also be noted that even though the 27th of August, 2018 is a Sunday, and therefore there was no trading on the day itself, the tweet took place early in the morning allowing enough time for market participants to process the information. Hence, the 28th of August is still considered as the first day after the event took place.

3.1.1 Mean-Adjusted Model

The mean adjusted model involves a very simple methodology to calculate the abnormal returns as it does not adjust the returns for risk. The model assumes that while returns can vary for different firms, the firm-specific returns are constant over a time period (Event Study Metrics). Hence, the returns for a firm will be the same over different time periods.

The first step in calculating the abnormal returns using this model is to find the average return for the firm over the estimation period chosen. The constant mean return model is:

$$R_{it} = u_i + \varepsilon_{i,t} \tag{3}$$

The parameter u is estimated by the arithmetic mean of the returns in the estimation window where $E\left[\varepsilon_{i,T}\right] = 0$:

$$\hat{u} = \frac{1}{M_i} \sum_{i=T_0+1}^{T_1} R_{i,T} \tag{4}$$

The above formula takes the average return over the estimation period where M_i is the number of non-missing returns over this period. Hence in this paper this amounts to:

$$\hat{u} = \frac{1}{159} \sum_{t=-220}^{-61} R_{i,T} \tag{5}$$

Lastly, abnormal returns is given as:

$$AR_{i,T} = R_{i,T} - \hat{u} \tag{6}$$

3.1.2 Market Model

The market model is the second model considered in this paper. The model adjusts for risk and assumes that individual firm returns are in a a linear and constant relation with the returns of a market index (Event Study Metrics). This is shown as:

$$E\left[R_{i,t}\right] = \alpha_i + \beta_i R_{M,T} + \varepsilon_{i,T} \tag{7}$$

In this model, α_i and β_i are OLS estimates that are obtained over the estimation window of [-220, -61], while $E\left[\varepsilon_{i,T}\right] = 0$. The returns that are obtained are the returns that were expected while abnormal returns are given as:

$$AR_{i,T} = R_{i,T} - E\left[R_{i,t}\right] = R_{i,T} - \alpha_i - \beta_i R_{M,T} \tag{8}$$

As mentioned above the average WRDS world indices are used as a proxy for the market return in this model.

3.1.3 Market-Adjusted Model

The market-adjusted model is the simplest method that can be used to calculate abnormal returns. The abnormal returns are found by subtracting actual return from its corresponding market index return.

$$AR_{i,T} = R_{i,T} - R_{M,T} \tag{9}$$

$R_{M,T}$ is the return of a market index, which in our case is the average return of the WRDS world indices. As MacKinlay (1997) shows, this model can be seen as a restricted market model where $\alpha_i = 0$ and $\beta_i = 1$ for each stock. Therefore, an estimation window is not necessary as the parameters are already known. Hence the paper just subtracts the market return from the firm return over the event window to obtain abnormal returns.

3.2 Significance Testing

Once the abnormal returns have been obtained, the next step is to test whether the returns are significant. Ball and Warner (1980) also compare the performance of parametric and non-parametric tests. They find the Patell test and the cross-sectional test to be reasonably well specified and that the t-tests reject the true null hypothesis at approximately the significance level of the test. They find that, non-parametric tests on the other hand tend to not be correctly specified.

Similar to Brown and Warner, Armitage (1995) tests different event study methodologies and significance tests. Armitage finds that the choice of the significance test depends on the characteristics of the data but the evidence indicates that standardizing the abnormal returns as shown by the Patell test is the best method.

Boehmer, Musumeci and Poulsen (1991) study different significance tests under conditions of event-induced variance. They find that when an "…event causes even a minor increase in variance, the most-commonly used methods reject the null-hypothesis of zero average abnormal return too frequently when it is true." Hence, they propose an alternative based on Patell's test. They suggest to standardize abnormal returns and then to apply a cross-sectional t-test as this avoids the frequent rejections of true null hypothesis without significantly reducing the power of the test.

In terms of non-parametric significance test, Campbell and Walsey (1993) evaluate the performance of different test statistics using daily returns from NASDAQ. They find that the daily returns from NASDAQ possess a large degree of non-normality and this leads to the rejection of the null hypothesis in the absence of abnormal returns. They find that the rank test introduced by Corrado performs well in a number of different conditions. Their later paper (1996) reinforces this conclusion with the use of NYSE securities.

However, Cowan (1992) disagrees with some of the conclusions that Campbell and Walsey make. Cowan concludes that a rank test is only more powerful under ideal conditions and finds that in many cases the generalised sign test performs better. He concludes that a rank test is more powerful in detecting abnormal returns for one or two day event windows but that the sign test becomes more powerful as the event window increases. Cowan also finds that the rank test is misspecified for NASDAQ stocks which are more prone to thin-trading as compared to the sign test. Lastly, he concludes that the generalised sign test provides more power than a parametric test when the variance of the stock return increases during the event window. In comparison, the rank test rejects the true null hypothesis too often in case of increased variance.

In terms of choosing between parametric tests, there doesn't seem to be a consensus as to which tests performs better and hence both the cross-sectional test and the Patell test will be performed. In addition, to account for event-induced variance the test by Boehmer, Musumeci and Poulsen will also be run. As far as non-parametric tests, a decision to run the generalised sign test by Cowan was made. This is because the test performs better under longer event windows and for thin-traded stocks. These parameters apply to our data, especially the stocks being thin-traded, as daily stock price returns are used.

3.2.1 Cross-Sectional T-Test

The cross-sectional t-test is defined as:

$$T_{cross} = {CAAR_{(T1,T2)}} \big/ {\hat{\sigma} CAAR_{(T1,T2)}} \tag{10}$$

The test checks whether the cumulative average abnormal return (CAAR) is equal to zero or not - $H_0 = 0$ and $H_a \neq 0$. The variance of this test is based on the cross-section of abnormal returns:

$$\widehat{\sigma^2} CAAR_{(T1,T2)} = \frac{1}{N-1} \sum_{i=1}^{N} (CAR_i - CAAR)^2 \tag{11}$$

In our sample of data, N refers to the 131 Mexican firms.

3.2.2 Patell/Standardized Residual Test

The standardized residual test developed by Patell (1976) tests the null hypothesis that the cumulative average abnormal return is equal to zero - $H_0 = 0$ and $H_a \neq 0$. The test standardizes each abnormal return because it assumes that the returns are uncorrelated and that the variance is constant over time. It further operates under the assumption that returns are independent across security events (Event Study Metrics). The standardization of each abnormal return is done as follows:

$$SAR_{i,T} = {AR_{i,T}} \big/ {\sigma S(AR_i)} \tag{12}$$

The standard deviation of the abnormal return is estimated from the abnormal returns of the estimation window:

$$\hat{\sigma}S(AR_i) = \hat{\sigma}AR_i \sqrt{\left[1 + \frac{1}{M_i} + \frac{\left(R_{m,t} - \overline{R_m}\right)^2}{\sum_{t=T_0}^{T_1}\left(R_{m,t} - \overline{R_m}\right)^2}\right]} \tag{13}$$

$\overline{R_m}$ is the mean of the market index over the estimation period which in my sample is calculated as:

$$\overline{R_m} = \frac{1}{159}\sum_{t=-220}^{-61} R_{m,T} \tag{14}$$

M_i refers to the number of returns present over the estimation window, which would be equal to 159 in my sample if there were no missing returns. Lastly, $\hat{\sigma}AR_i$ is the standard deviation of the returns over the estimation period, which in this case is:

$$\hat{\sigma}AR_i = \sqrt{\frac{1}{159}\sum_{t=-220}^{-61}\left(R_{i,T} - \bar{R}_\iota\right)^2} \tag{15}$$

$$\bar{R}_\iota = \frac{1}{159}\sum_{t=-220}^{-61} AR_i \tag{16}$$

Hence, for a multiple day event window, testing whether $H_0: CAAR = 0$ is given by the formula:

$$Z_{Patell} = \frac{1}{\sqrt{N}}\sum_{i=1}^{N}\frac{CSAR_i}{\sigma CSAR_i} \tag{17}$$

$CSAR_i$ is the cumulative standardized abnormal return while $\sigma CSAR_i$ is the standard deviation over the event window:

$$CSAR_i = \sum_{t=T_1+1}^{T_2} SAR_{i,T} \tag{18}$$

$$\sigma CSAR_i = \sqrt{L_2\frac{M_i - 2}{M_i - 4}} \tag{19}$$

3.2.3 Standardized Cross-Sectional/BMP Test

Boehmer, Musumeci and Poulsen (1991) have developed a new parametric test which is robust to event-induced variance increases of stock returns. They achieve this by using the standardized residual test together with a variance estimate based on the cross-section of event-window abnormal returns (Event Study Metrics).

Initially, as shown in section 3.2.2, the abnormal returns are standardized, after which the cross-sectional average of $CSAR_i$ is calculated. The standardized cross sectional tests whether the cumulative average abnormal returns is equal to zero - $H_0: CAAR = 0$ and $H_a: CAAR \neq 0$:

$$Z_{BMP,t} = \sqrt{N}\frac{\overline{CSAR_i}}{\sigma CSAR_i} \tag{20}$$

$\overline{CSAR_i}$ is the average standardized cumulated abnormal returns over N firms, with standard deviation:

$$\sigma CSAR_i = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(CSAR_i - \overline{CSAR_i})^2} \tag{21}$$

$$\overline{CSAR_i} = \frac{1}{N}\sum_{i=1}^{N} CSAR_i \tag{22}$$

3.2.4 Cowan Generalized Sign Test

The generalized sign test proposed by Cowan (1992) doesn't take into account the distribution of the returns. The test checks for abnormal returns by looking at whether the proportion of negative abnormal returns are different over the estimation period and the event window. The null hypothesis of the test is that the fraction of negative abnormal returns is the same over both windows (Başdaş, 2013). The formula for estimating this fraction of negative abnormal returns over the estimation window is:

$$\hat{p} = \frac{1}{N}\sum_{i=1}^{N}\frac{1}{M_i}\sum_{t=-220}^{-61}\varphi_{i,t} \tag{23}$$

where

$$\varphi_{i,t} = \begin{cases} 1 \; if \; AR_{i,T} < 0 \\ 0 \; otherwise \end{cases} \tag{24}$$

Thus, the generalized sign statistic becomes:

$$Z_g = \frac{w - N\hat{p}}{\sqrt{N\hat{p}(1-\hat{p})}} \tag{25}$$

where w refers to the number of stocks that have a negative cumulative abnormal return over the event window.

3.3 Regression Methodology

The data required to test for the size effect, the industry effect and the growth versus value effect, is also obtained from the WRDS database along with the security prices for the firms.

3.3.1 Size Effect

Similar to the papers discussed in section 2, I test for the size effect by using the market value of equity of the individual firm. In their studies, Banz (1981) and Wong (1989) calculate market value of equity using the price and shares outstanding. Hence, from Compustat, the daily closing price and the number of shares outstanding are obtained which when multiplied together give the market value of equity. The market value from the day prior to the start of the event window is chosen. Lastly, it should be noted that since the distribution of the market values were highly skewed, the logarithm of the values were taken as to better fit the regression model.

3.3.2 Industry Effect

The industry effect is tested by grouping firms together in the industry they work in. This is done by using the global industry classification (GIC) codes which can be found when downloading the security prices from the Compustat Daily Securities database. The GIC industry group codes are used to make sure the filtered data would not be too narrow and the codes 1510 and 3020 are used to proxy for the manufacturing sector and the agricultural sector respectively (S&P, 2006). Hence, two dummy variables are created where the variables take the value of 1 if the firm is part of industry group 1510 or 3020 respectively.

3.3.3 Growth Versus Value Effect

In terms of testing for this effect, the data is once again obtained from Compustat, where in addition to the previously calculated market value of equity, the book value of equity is used. To calculate the book value of equity, the widely used formula total assets minus total liabilities is used. Next, the market-to-book (MB) ratio is found by dividing the previously calculated market value by the book value. Hence, similar to Capaul, Rowley and Sharpe (1993), growth stocks are defined as stocks with high MB ratios while stocks with low MB ratios are value stocks. It should be noted, that the distribution of the ratios were highly skewed and so the variable is transformed into a logarithmic one.

As for the regression model, the MB ratio is used as an explanatory variable on its own but a new variable testing for the interaction between the MB ratio and the industry effect is also created. This new variable tests explicitly for H_6 to check whether the growth effect is most pronounced in exporting industries. The variable is simply calculated by multiplying the MB ratio with the dummy variables for the manufacturing and agricultural sector respectively.

3.3.4 Regression Model

The final regression model contains 6 explanatory variables and can be defined as such:

$$CAR_{i,T} = \alpha_i + \beta_i(logMarketValue) + \beta_i(Manufacturing) + \beta_i(Agricultural) + \beta_i(logMBRatio) + \beta_i(logMB * Manufacturing) + \beta_i(logMB * Agricultural) + \varepsilon_i$$

4. Empirical Results

For our sample period of 1/1/2016 to 18/4/2018, a total number of 78,600 returns from 131 securities are obtained from Compustat. For these 131 securities, a total of 13,755 abnormal returns are calculated over the 5 event windows assuming a maximum event window of 10 days prior and after the event day. These abnormal returns will be closely analysed in the next few sections.

4.1 Abnormal Returns by Model

The first set of results that are analysed is the average abnormal returns (AAR) that are obtained over the 131 securities and over the 5 different event windows. Hence, these results give a brief overview of how the Mexican financial markets react to the uncertainty surrounding NAFTA, as shown by the 2016 US elections and subsequent tweets said by Trump. Table 2 provides a day wise breakdown of the average abnormal returns that are seen over a 21 day event window over the 5 event windows chosen.

Table 2: Daily Average Abnormal Return (AAR) over 131 Mexican securities and over the 5 event windows. The returns are separated by the returns model used and give a brief overview of the Mexican stock market reaction to the uncertainty surrounding NAFTA.

	Mean-Adjusted	***Market Model***	***Market-Adjusted***
-10	0.092%	0.119%	0.122%
-9	0.065%	0.106%	0.279%
-8	-0.011%	-0.022%	0.184%
-7	-0.202%	-0.215%	0.247%
-6	-0.132%	-0.149%	-0.112%
-5	-0.303%	-0.273%	-0.303%
-4	0.108%	0.149%	0.736%
-3	0.024%	0.044%	-0.220%
-2	0.280%	0.301%	0.769%
-1	0.595%	0.604%	0.765%
0	-0.277%	-0.283%	-0.378%
1	-0.308%	-0.308%	-0.494%
2	-0.736%	-0.727%	-0.983%
3	-0.018%	-0.006%	-0.129%
4	0.276%	0.238%	-0.111%
5	0.145%	0.148%	0.027%
6	-0.206%	-0.208%	-0.264%
7	-0.136%	-0.156%	-0.204%
8	-0.408%	-0.406%	-0.417%
9	-0.165%	-0.158%	-0.351%
10	0.061%	0.057%	-0.001%
Sum	**-1.256%**	**-1.145%**	**-0.836%**

As can be seen from table 2, the abnormal returns provided by each model are quite similar, with the mean-adjusted model showing the highest abnormal return over the entire window (-1.256%), whereas the market-adjusted model shows the least return of -0.836%. There are quite a few similarities within the models with all the models showing that cumulatively the market drops by nearly 1% on average after Trump was elected president and when he tweets something negative about the NAFTA. Another similarity between the model is that they seem to follow the same pattern, where prior to the event window, the market seems to react positively while it seems to react much more negatively on the day of the event and the subsequent days after it. Figure 1 below provides a visual representation of table 2 and gives a more clear comparison between the models.

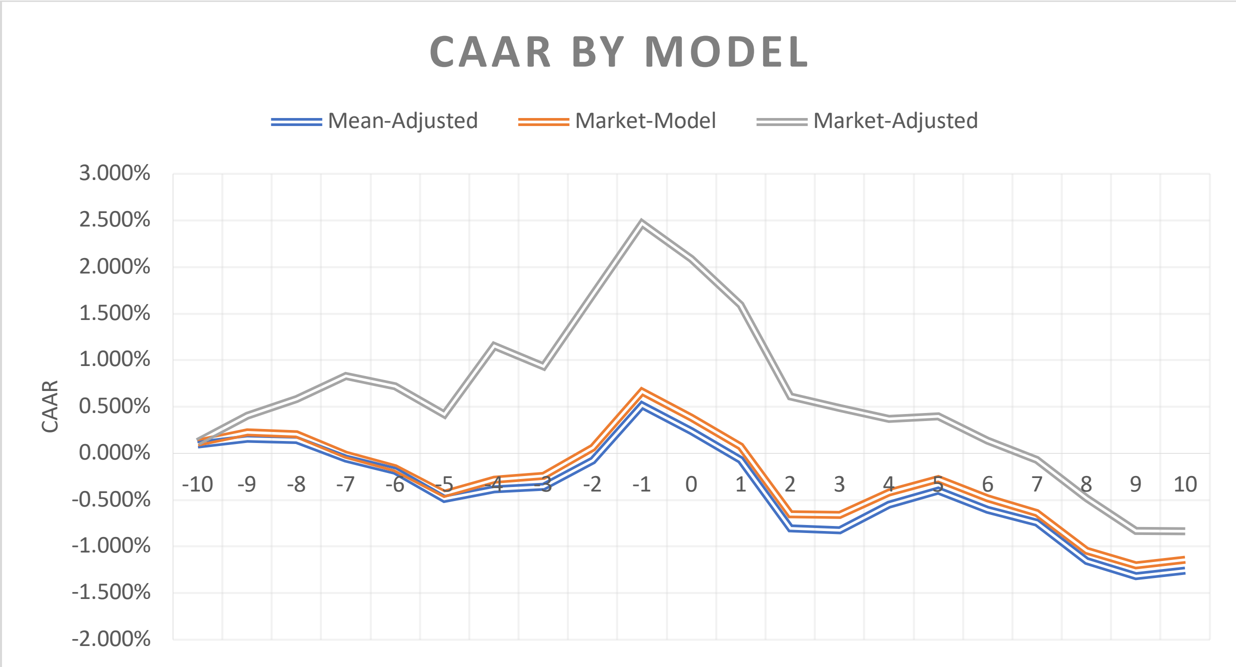

Figure 1: The Cumulative Average Abnormal Return (CAAR) earned over the 21 day event window for all 5 event windows.

Figure 1 graphs the sum of the AAR's that were shown in table 2. The set of conclusions derived from table 2 seem to be enforced by figure 1. All the different models seem to follow a similar pattern of increasing returns prior to the event day and decreasing returns after it. Hence, a primary conclusion of the stock market reacting negatively after the events can be arrived upon. This is similar to the expectations of this paper, as the two countries are very close trade partners and the removing of the free trade agreement would negatively impact Mexico and its huge export sector. Further conclusions that can be made from figure 1 is that the market-adjusted model is much more pronounced than the other models, as it exhibits the largest positive returns and the largest negative returns over the window. Moreover, the mean-adjusted model and market model seem to be symmetric and provide the same set of abnormal returns.

As mentioned before, when looking at symmetrical event windows – for example [-10,+10] – the returns seem to be fairly symmetrical as well but do show a cumulatively negative return as a whole over the window. Since, this paper aims to explain the negative returns, the positive returns aren't taken into consideration. The graph further shows that the biggest negative reactions in the market tend to be in the first few days of the event window, with the negative returns lasting till about 4 days after the event.

Appendix A checks whether the overall returns found here are primarily driven by the election. It does this by analysing the returns from the elections separately from the other events and finds that there are negative abnormal returns for Trump's tweets as well. The negative returns from the tweets are not as large as the elections and only seem to last a few days. However, this is to be expected as the election is a bigger shock to the market than his speculative tweets about NAFTA. Furthermore, while the election returns do skew the data slightly, a cumulative average drop of 0.5% is still witnessed after the other events suggesting a significant impact on the market.

The next step is to find the return windows that exhibit the most significant negative abnormal returns. This is done by performing a simple cross-sectional t-test on all 21 days to find which days exhibit significant returns. Using this test in conjunction with figure 1 allows us to determine which days provide the most significant negative returns.

Table 3: A simple cross-sectional t-test is run on all the days individually as shown by formula's 10 and 11, where AAR is substituted instead of CAAR. The reported t-values are shown below.

	Mean-Adjusted	***Market Model***	***Market-Adjusted***
-10	1.926*	2.430**	2.590***
-9	1.257	2.074**	5.562***
-8	-0.190	-0.378	3.329***
-7	-3.336***	-3.426***	4.061***
-6	-2.711***	-3.034***	-2.312**
-5	-4.919***	-4.449***	-4.858***
-4	1.923*	2.461**	13.387***
-3	0.433	0.769	-3.945***
-2	3.935***	4.309***	10.801***
-1	7.785***	7.816***	10.016***
0	-5.378***	-5.443***	-7.344***
1	-2.462**	-2.494**	-3.922***
2	-9.434***	-9.232***	-12.373***
3	-0.243	-0.082	-1.769*
4	4.310***	3.751***	-1.721*
5	2.530**	2.610***	0.479
6	-3.890***	-3.925***	-4.812***
7	-2.529**	-2.931***	-3.844***
8	-7.121***	-6.999***	-7.119***
9	-3.881***	-3.703***	-8.430***
10	1.026	0.948	-0.016

*** 1%, ** 5%, *10%

A glance at table 3 shows that of the 21 days analysed around the window, all the days exhibit significant abnormal returns apart from 1 or 2 days. Moreover, this significance is seen predominantly at the 1% level. Hence, the decision to examine 6 different windows was taken.

This included an even split between symmetrical windows and also windows that just looked at returns after the day of the event. The symmetrical windows included [-10,+10], [-5,+5] and [-2,+2] to check whether the negative returns after the event day were asymmetrically larger than the positive returns prior to the event day. Furthermore, as shown before the strongest negative abnormal returns are seen just after the day of the event and so windows [0,+1], [0,+2] and [0,+5] were also analysed to check for the strength of the negative reaction.

While the days [-7,-5] and [+6,+9] possessed significant negative abnormal returns, they were not taken into consideration as the former is ex ante which doesn't explain much about the returns. Even though the latter is ex post, it is not analysed as the market could be reacting to a different event and hence the results could be biased.

4.2 Significance Testing on Cumulative Average Abnormal Returns

Table 4 provides the cumulative average abnormal returns (CAARs) for the different event windows that were chosen above. In terms of the windows, all the windows provide a negative CAAR reinforcing our previous conclusion of the negative impact on the Mexican stock market due to the NAFTA uncertainty. In terms of the symmetric windows, the largest negative abnormal return is shown by the 21 day window [-10,+10] while the smallest is shown by the 11 day window [-5,+5]. Furthermore, the largest CAAR is exhibited through the first 3 days of the event window where the market drops by nearly 1.4%. Of this drop, close to 0.5% is actually seen on the event day and the first day combined. Hence, this could potentially provide investors with a viable opportunity to sell their Mexican stocks.

Table 4: Cumulative Average Abnormal Returns (CAAR) for the different windows

	Mean-Adjusted	***Market Model***	***Market-Adjusted***
CAAR [-10,+10]	-1.256%	-1.145%	-0.836%
CAAR [-5,+5]	-0.215%	-0.113%	-0.320%
CAAR [-2,+2]	-0.447%	-0.413%	-0.322%
CAAR [0,+1]	-0.585%	-0.591%	-0.872%
CAAR [0,+2]	-1.322%	-1.318%	-1.855%
CAAR [0,+5]	-0.919%	-0.937%	-2.068%

Figure 2, provides a visual comparison of the CAARs found by the different models. Over the symmetric windows, the market-adjusted model provides the least negative abnormal return cumulatively. As shown before, this is due to the large positive returns it finds prior to the day of the event. However, the market-adjust model reacts more violently after the event day as well, as the market seems to be in a downfall even after 5 days. In comparison, the market model and mean-adjusted model find the strongest reaction in the first couple of days after which the market doesn't exhibit further negative returns. The returns shown by the market model and the mean-adjusted model seem to be identical over all the windows analysed.

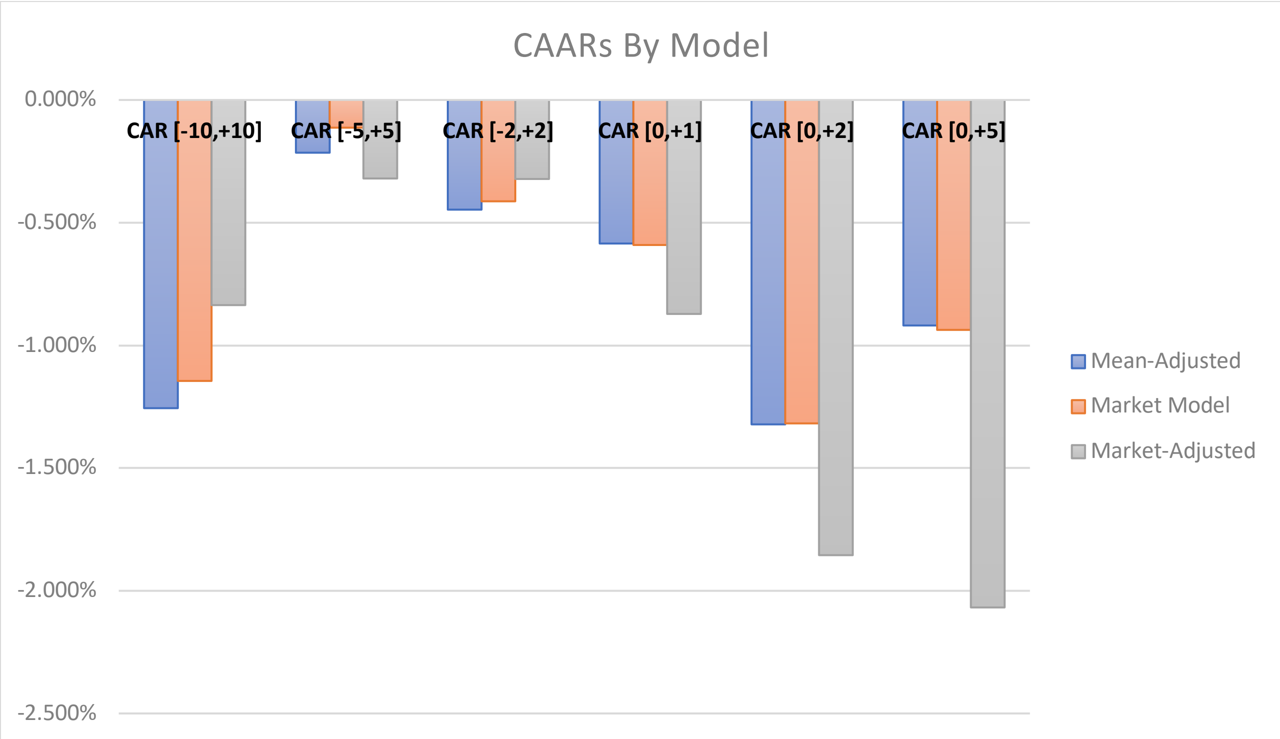

Figure 2: A graph of the CARs shown in table 4 to provide a comparison of the returns found by the different models.

Table 5 below tests for the significance of the returns and provides evidence whether the abnormal returns found in the previous section are by chance or not. This helps proving whether Trump and his expected policies have a significant international impact. If they do, investors could potentially use these political events as a strategy to sell Mexican stocks or to maybe even short them.

Table 5: The reported t-values and z-values for the parametric and non-parametric tests are given below for each of the windows chosen above. The tests are run similar to the formulas provided in the methodology.

		CAAR [-10,+10]	*CAAR [-5,+5]*	*CAAR [-2,+2]*	*CAAR [0,+1]*	*CAAR [0,+2]*	*CAAR [0,+5]*
Mean-Adjusted	Cross-Sectional (T-Test)	-4.322***	-1.012	-2.646***	-4.613***	-8.364***	-5.582***
	Patell (Z-Test)	-2.417**	-0.801	-1.187	-2.939***	-5.924***	-3.507***
	BMP (Z-Test)	-3.764***	-0.994	-1.900*	-4.199***	-8.063***	-4.577***
	Cowan (Z-Test)	3.277***	0.413	2.919***	6.677***	6.856***	4.530***
Market Model	Cross-Sectional (T-Test)	-3.891***	-0.525	-2.431**	-4.686***	-8.327***	-5.702***
	Patell (Z-Test)	-2.228**	-0.565	-1.070	-2.938***	-5.932***	-3.570***
	BMP (Z-Test)	-3.452***	-0.703	-1.693*	-4.187***	-8.102***	-4.641***
	Cowan (Z-Test)	3.029***	0.357	3.207***	6.770***	6.414***	4.810***
Market-Adjusted	Cross-Sectional (T-Test)	-2.710***	-1.456	-1.840*	-6.789***	-11.455***	-12.102***
	Patell (Z-Test)	-0.582	0.145	-0.604	-3.593***	-7.799***	-6.255***
	BMP (Z-Test)	-1.198	0.295	-1.048	-5.476***	-12.077***	-12.674***
	Cowan (Z-Test)	1.185	0.828	1.719*	8.492***	8.492***	9.027***

*** 1%, ** 5%, *10%

In terms of the first window analysed [-10,+10], both the parametric tests and non-parametric tests find significant negative abnormal returns for the market and mean-adjusted model at the 1% level. In terms of the market-adjusted model, apart from the cross-sectional test, none of the other tests reject the null hypothesis. As mentioned before these results might be due to the greater sensitivity of the market-adjusted model which on average might not be exhibiting significant negative abnormal return. However, for the sake of this paper, since 2 out of 3 models reject the null hypothesis for this window, this paper concludes that the market dropped on average by over 1% during this window throughout the events analysed.

As for the other symmetric windows – [-2,+2] and [-5,+5] – none of the tests find returns that are significantly different from zero for the latter. For the former, the results seem mixed. While the cross-sectional test and the Cowan test seem to find significant negative abnormal returns – at the 1% level for the market and mean-adjusted model – the other tests do not necessarily reject the null hypothesis. The BMP test does find significantly negative returns for 2 out of 3 models but this is at the weaker 10% significance level. Hence, it seems difficult to conclude whether the 5 day event window does in fact exhibit negative cumulative returns.

When looking at the windows after the event day, the conclusions are much more clear and robust. The evidence points that for all 3 event windows analysed, all the tests show that there seems to be significant negative abnormal return and this is valid at the 1% significance level. Furthermore, for all the different return models, the window [0,+2] seems to be the most significant event window analysed. These 3 event windows seem to prove hypothesis 1 of the paper which suggests that Trump's disapproval on NAFTA would cause a significantly negative impact on the Mexican stock market. Hence, to conclude, the evidence shows that returns are significantly different from zero for the 3 event windows that look at returns after the day of the event and the longer 21 day window analysed.

4.3 Explaining the Abnormal Returns

This section aims to explain the previously found significantly negative abnormal return with the explanatory variables which were briefly introduced in the theoretical framework. Before, the results of the regression analysis are shown certain descriptive statistics regarding the explanatory variables are discussed. Table 6 provides a brief overview of the distribution of the market capitalization of Mexican firms and also of their MB ratio's to give an idea of the valuation of Mexican firms.

Table 6: Descriptive statistics regarding the market capitalization and the MB ratio of Mexican firms on the stock market

Variable	***Mean***	***Median***	***Std. Dev***	***25th Percentile***	***75th Percentile***	***Min***	***Max***
Market Cap ($ million)	55504.48	18000	110724.9	5416.56	53975	36.11	838671.20
MB Ratio	2.677	1.333	4.756	.906	2.342	.167	39.646

From table 6 it can be seen that the size of Mexican firms range from $36 million to close to $840 billion. With a median of $18 billion, the majority of Mexican firms can be considered as large cap stocks. However, with a mean of just about $55 billion, it should be taken into consideration that the majority of the firms lie below the mean. This provides evidence of the skewness in the data, and hence the logarithm of the variable should be taken. For the MB ratio, a mean of 2.677 and a median of 1.333 represents the skewness in the data, which should be corrected by using the logarithm. However, using 3 as a threshold, it can be seen that the majority of Mexican stocks are in fact value stocks.

Furthermore, the distribution of the industry codes should also be analysed. Table 7 does exactly that. The table shows that the majority of firms in fact tend to be in the manufacturing (1510) and agricultural sector (3020). With the two sectors accounting for 11.8 and 12.6 percent respectively, industry distribution is highly concentrated in Mexico's top export sectors.

Table 7:Descriptive statistics regarding distribution of firms according to their GIC codes. (source: S&P, 2006)

Industry	***Frequency***	***Percentage (%)***
1010 = Energy	2	1.57
1510 = Materials	15	11.81
2010 = Capital Goods	12	9.45
2020 = Commercial & Professional Services	2	1.57
2030 = Transportation	7	5.51
2510 = Automobiles & Components	3	2.36
2520 = Consumer Durables & Apparel	9	7.09
2530 = Consumer Services	4	3.15
2540 = Media	4	3.15
2550 = Retailing	4	3.15
3010 = Food & Staples Retailing	8	6.30
3020 = Food, Beverage & Tobacco	16	12.60
3030 = Household & Personal Products	2	1.57
3520 = Pharmaceuticals, Biotechnology & Life Sciences	3	2.36
4010 = Banks	11	8.66
4020 = Diversified Financials	9	7.09
4030 = Insurance	2	1.57
5010 = Telecommunication Services	6	4.72
5510 = Utilities	1	0.79
6010 = Real Estate	11	8.66

Table 8 provides the results of the regression analysis that was conducted on the abnormal return windows. As a whole, many of the variables looked at were unsuccessful in explaining the presence of the abnormal return. A closer look is taken below.

Table 8: Regression analysis of the 3 event windows providing significant negative returns and the explanatory variables

	Mean-Adjusted			Market Model			Market-Adj.		
	CAR [0,+1]	CAR [0,+2]	CAR [0,+5]	CAR [0,+1]	CAR [0,+2]	CAR [0,+5]	CAR [0,+1]	CAR [0,+2]	CAR [0,+5]
LogMarketCap	-.0012	-.0032***	-.0030**	-.0012	-.0032***	-.0029**	-.0011	-.0030***	-.0026**
Agriculture	.0150	.0167	.0117	.0147	.0163	.0104	.0155	.0174	.0133
Manufacturing	-.0005	-.0003	.0025	-.0005	-.0004	.0025	-.0002	.0001	.0033
LogMBRatio	.0007	.0025	.0029	.0006	.0023	.0025	.0011	.0031	.0041
LogMBAgric	-.0045	-.0047	-.0013	-.0043	-.0044	-.0005	-.0050	-.0053	-.0027
LogMBManuf	-.0031	-.0069	-.0102	-.0028	-.0065	-.0094	-.0034	-.0073	-.0111
Constant	.0040	.0156	.0173	.0041	.0157	.0169	-.0003	.0082	.0015

*** 1%, ** 5%, *10%

The first variable to be analysed was the market value of the firm. The variable is significant across all the different models at the 1% level for the 3 day window and at the 5% level for the 6 day window. Using the market model as an example, I find that larger firms earn cumulatively 0.5% lower returns than smaller ones. This number is found by multiplying the coefficient (-.0032) into the standard deviation of the market cap variable (1.696). This is similar for the event window [0,+5], implying that the majority of the negative return for larger firms is seen just after the event. This return is also consistent across all the different models as well. While the drop in returns found in this paper do not correspond to a stock market crash, I find that similar to Wang et al. (2009), larger firms earn lower returns around adverse events.

Secondly, the returns of the agricultural industry were looked at through a dummy variable. The most surprising thing about the results is that the returns are in fact positive. This should be interpreted with caution as the results just show that in comparison to other industries, the agricultural sector earns a positive return. However, this still contradicts our initial explanation, where we assumed that the agricultural sector would be one of the worst hit sectors. The results seem to agree with the alternative hypothesis $[H_{4B}]$ of the export industry doing well in the short run due to the depreciating currency. Nevertheless, these coefficients are insignificant which means that the agricultural sector does not in fact earn returns that are significantly different from any other industry.

In terms of the manufacturing sector, I find the magnitude of the coefficients are close to zero as well as them being insignificant. This implies that this sector does not in fact explain the negative abnormal returns observed, and similar to the agricultural sector, the manufacturing sector does not earn returns that are different from any other industry. While, I initially believed that exporting firms would suffer more severely with Trump's disapproval of NAFTA, my results display that the Mexican stock market as a whole was negatively impacted irrespective of the industry.

Another surprising result in our analysis is the presence of positive coefficients for the MB ratio. Looking at the mean-adjusted results, a positive return of 0.2% $[.0025 * .9238]$ is seen for growth stocks during the first 3 days - [0,+2]. This return is slightly higher for the market model. Nonetheless, these coefficients are insignificant implying that growth stocks do not exhibit returns different from value stocks. This contradicts previous analysis that find proof of value stocks outperforming growth stocks. The only logical explanation for the results is that the outperformance of value stocks found by Skinner and Sloan (2002) and La Porta, Lakonishok, Shleifer and Vishny (1997) are found over multiple years, implying that value stocks might still in fact outperform growth stocks in this sample.

The last two variables analysed are the interaction effect of growth and value stocks with industries. This is done to check whether growth stocks exhibit asymmetrically large negative reactions to adverse announcements. For the manufacturing sector, I find the coefficients to be negative irrespective of the event window. For example, the market model exhibits a return of -0.1% $[(-.0065 + .0023) * .3077]$ and -0.2% $[(-.0094 + .0025) * .3077]$ for growth stocks in the manufacturing industry over the window [0,+2] and [0,+5] respectively. As for the agricultural sector, the negative coefficients are only seen for the 2 and 3 day windows after which the returns become positive. However, both sets of coefficients are insignificant, implying that growth stocks in all sectors seem to have the same returns.

5. Conclusion

In conclusions our results can be divided into 3 sections. The first is that irrespective of the type of abnormal return model used, a negative cumulative average abnormal return of close to 1% is found over a 10 day event window before and after the event day. Moreover, these returns are pretty much significant for each of the 21 days analysed, with the strongest negative reaction occurring just after the release of a tweet or after Trump won the election.

After conducting parametric and non-parametric tests, the return of close to -1% was found to be significant at the 1% level over the window [-10,+10]. Furthermore, the windows looking at abnormal returns after the day of the event – [0,+1], [0,+2] and [0,+5] – were all found to exhibit significant negative abnormal returns. From these, the largest negative return was found in the 3 day window where an abnormal return ranging from -1.3 to -1.8 percent was found depending on the model.

Lastly, certain explanatory variables have been analysed to try and explain the negative abnormal returns found above. From these I only find the presence of a size effect where larger firms earn on average lower returns around the event. In terms of the hypotheses stated at the start of the paper, only $H_1: CAAR < 0$ and $H_2: \beta_{MarketCap} < 0$ have been proven. For all the other hypotheses, the null hypothesis cannot be rejected, suggesting that returns are not significantly different from zero. This implies that the Mexican stock market as a whole seems to experience a significant negative reaction after every event irrespective of firm characteristics.

The aim of this paper was to investigate the effect of Trump's election win and his subsequent tweets on the Mexican stock exchange. These events were analysed due to his disapproval of NAFTA, and his promise to renegotiate or even withdraw from the agreement. The evidence obtained in the paper points to a significant negative reaction in the stock market after every event analysed. As Appendix A shows, these returns are present even when disregarding the returns around the 2016 elections. Hence, an investor could potentially sell or even short Mexican stocks close to the release of a tweet or future political events involving Trump and NAFTA. Since shorting brings extra transaction costs, a short term play selling the stocks would help avoid negative returns. These results can be of great use for day traders who can avoid incurring a loss by selling these Mexican stocks. When selling, larger stocks tend to earn worse returns and hence a strategy surrounding the selling of these stocks is recommended. As for the returns around tweets, the returns seem once again quite small to short, but a drop of close to 0.5% is still seen and so selling the stocks might once again be a better option. (Appendix A).

The practical findings of this paper relates to the international impact of certain political decisions. With greater globalisation there seems to be mutual interdependence in between markets and a decision made in one could easily impact another. My results go one step further by showing that the potential implication of a decision could also severely impact the market. The evidence shows that with Mexico and America being very close trade partners, a potential decision by Trump to leave NAFTA has severely impacted the Mexican market in a negative manner.

Further research surrounding this area of specialisation might be to analyse the same events shown in this paper on the Canadian stock market. Canada is also a trade partner in NAFTA and might have experienced the same reactions that Mexico did. This would cement the conclusions found in this paper. Other political events should also be analysed to check whether the evidence obtained in this paper seems to correspond to the other events also. An interesting area of research might be to analyse the impact of Brexit on both European markets and also British markets as the premise behind Brexit and this paper is quite similar.

References:

- Armitage, S. (1995). Event Study Methods and Evidence on their Performance. *Journal of Economic Surveys, 9(1),* 25-52. doi: 10.1111/j.1467-6419.1995.tb00109.x
- Askew, K. (2016). *How will Trump's presidency affect the global food industry*. Just-Food. Retrieved on May 29th, 2018 from: https://www.just-food.com/analysis/how-will-trumps-presidency-affect-the-global-food-industry_id134914.aspx
- Başdaş, Ü. (2013). Event Study Methodology for the Borsa Istanbul. *Graduate School of Social Sciences of Middle East Technical University*. Retrieved on May 17th, 2018 from: http://etd.lib.metu.edu.tr/upload/12616046/index.pdf
- Banz, R.W. (1981). The Relationship Between Return and Market Value of Common Stocks. *Journal of Financial Economics, 9(1),* 3-18. doi: 10.1016/0304-405X(81)90018-0
- Binder, J.J. (1985). Measuring the Effects of Regulation with Stock Price Data. *The RAND Journal of Economics, 16(2),* 167-183. doi: 10.2307/2555408
- Binder, J.J. (1998). The Event Study Methodology Since 1969. *Review of Quantitative Finance and Accounting, 11(2),* 111-137. doi: 10.1023/A:1008295500105
- Boehmer, E., Musumeci, J., & Poulsen A.B. (1991). Event study methodology under conditions of event-induced variance. *Journal of Financial Economics, 30(2),* 253-272. doi: 10.1016/0304-405X(91)90032-F
- Brown, B. The trump twitter archive. http://www.trumptwitterarchive.com/, 2018 (accessed April 17th, 2018).
- Brown, S.J., & Warner, J.B. (1980). Measuring Security Price Performance. *Journal of Financial Economics, 8(3),* 205-258. doi: 10.1016/0304-405X(80)90002-1
- Brown, S.J., & Warner, J.B. (1985). Using Daily Stock Returns. *Journal of Financial Economics, 14(1),* 3-31. doi: 10.1016/0304-405X(85)90042-X
- Campbell, C.J., & Wasley, C.E. (1993). Measuring security price performance using daily NASDAQ returns. *Journal of Financial Economics, 33(1),* 73-92. doi: 10.1016/0304-405X(93)90025-7
- Campbell, C.J., & Wasley, C.E. (1996). Measuring Abnormal Daily Trading Volume for Samples of NYSE/ASE and NASDAQ Securities Using Parametric and Nonparametric Test Statistics. *Review of Quantitative Finance and Accounting, 6(3),* 309-326. doi: 10.1007/BF00245187

- Capual, C., Rowley, I., & Sharpe, W.F. (1993). International Value and Growth Stock Returns. *Financial Analysts Journal, 49(1),* 27-36. doi: 10.2469/faj.v49.n1.27
- Cebula, R.J. (1997). An Empirical Analysis of the Impact of Government Tax and Auditing Policies on the Size of the Underground Economy: The Case of the United States 1973-94. *American Journal of Economics and Sociology, 56(2),* 173-185. doi: 10.1111/j.1536-7150.1997.tb03459.x
- Cooke, B. (2017). *Agricultural Trade*. Retrieved on June 5th, 2018 from: https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/agricultural-trade/
- Cowan, A.R., & Sergeant A.M.A. (1996). Trading frequency and event study test specification. *Journal of Banking & Finance, 20(10),* 1731-1757. doi: 10.1016/S0378-4266(96)00021-0
- Event Study Metrics. *Event Study Methodology*. Retrieved on April 4th, 2018 from: https://eventstudymetrics.com/index.php/event-study-methodology/
- Fama, E.F., Fisher, L., Jensen, M.C., & Roll, R. (1969). The Adjustment of Stock Prices to New Information. *International Economic Review, 10(1),* 1-21. doi: 10.2307/2525569
- Fauzi, R., & Wahyudi, I. (2016). The effect of firm and stock characteristics on stock returns: Stock market crash analysis. *The Journal of Finance and Data Science, 2(2),* 112-124. doi: 10.1016/j.jfds.2016.07.001
- He, L. (2017). *Trump Could Really Mess Up Mexico's Economy*. FiveThirtyEight. Retrieved on May 29th, 2018 from: https://fivethirtyeight.com/features/trump-could-really-mess-up-mexicos-economy/
- Herron, M. C. (2000). Estimating the Economic Impact of Political Party Competition in the 1992 British Election. *American Journal of Political Science, 44(2),* 326-337. doi: 10.2307/2669314
- Jagannathan, M. (2017). *Here are all the terrible things President Trump has said about NAFTA – before deciding to stick with it*. New York Daily News. Retrieved on April 8th, 2018 from: http://www.nydailynews.com/news/politics/terrible-president-trump-nafta-article-1.3107104
- Jensen, N. M. (2007). International institutions and market expectations: Stock price responses to the WTO ruling on the 2002 US steel tariffs. *The Review of International Organizations, 2(3)*, 261-280. doi: 10.1007/s11558-007-9013-2

- Kundu, S. (2018). Trump, Regulation and Stock Returns. *Center for Doctoral Studies in Business, University of Mannheim*. Retrieved from SSRN: https://ssrn.com/abstract=3143454
- La Porta, R., Lakonishok, J., Shleifer, A., & Vishny, R. (1997). Good News for Value Stocks: Further Evidence on Market Efficiency. *The Journal of Finance, 52(2),* 859-874. doi: 10.1111/j.1540-6261.1997.tb04825.x
- Leblang, D., & Mukherjee, B. (2004). Presidential Elections and the Stock Market: Comparing Markov-Switching and Fractionally Integrated GARCH Models of Volatility. *Political Analysis, 12(3)*, 296-322. doi: 10.1093/pan/mph020
- MacKinlay, A.C. (1997). Event Studies in Economics and Finance. *Journal of Economic Literature, 35(1),* 13-39. Retrieved on May 29th, 2018 from: https://www.jstor.org/stable/2729691
- Michel, A., & Shaked, I. (1986). Multinational corporations vs domestic corporations: Financial performance and characteristics. *Journal of international business studies, 17(3),* 89-100. doi: 10.1057/palgrave.jibs.8490435
- Miller, S. A. (2017). *Factory wages too low to generate Rust Belt renaissance promised by Trump, study finds*. Washington Times. Retrieved on April 8th, 2018 from: https://www.washingtontimes.com/news/2017/may/15/donald-trumps-manufacturing-jobs-promise-hard-to-k/
- Miyajima, H., & Yafeh, Y. (2007). Japan's banking crisis: An event study perspective. *Journal of Banking & Finance, 31(9),* 2866-2885. doi: 10.1016/j.jbankfin.2007.03.006
- Office of the United States Trade Representatives. *North American Free Trade Agreement (NAFTA).* Retrieved on April 7, 2018 from: https://ustr.gov/trade-agreements/free-trade-agreements/north-american-free-trade-agreement-nafta
- Patell, J.M. (1976). Corporate Forecasts of Earnings Per Share and Stock Price Behaviour: Empirical Test. *Journal of Accounting Research, 14(2),* 246-276. doi: 10.2307/2490543
- Ramey, V.A. (2011). Can Government Purchases Stimulate the Economy?. *Journal of Economic Literature, 49(3),* 673-685. doi: 10.1257/jel.49.3.673
- Reuters. (2018). *Top steel exporters to the United States*. Retrieved on April 7, 2018 from:https://www.reuters.com/article/us-usa-trade-factbox/factbox-top-steel-exporters-to-the-united-states-idUSKCN1GL1G0

- Skinner, D.J. (1994). Why Firms Voluntarily Disclose Bad News. *Journal of Accounting Research, 32(1),* 38-60. doi:10.2307/2491386
- Skinner, D.J., & Sloan, R.G. (2002). Earnings Surprises, Growth Expectations and Stock Returns or Don't Let an Earnings Torpedo Sink Your Portfolio. *Review of Accounting Studies, 7(2-3),* 289-312. doi: 10.1023/A:1020294523516
- Standard & Poor's. (2006). *Global Industry Classification Standards (GICS)*. Retrieved on May 27th, 2018 from: http://www.unm.edu/~maj/Security%20Analysis/GICS.pdf
- The Observatory of Economic Complexity. *OEC – Mexico Exports*. Retrieved on June 6th, 2018 from: https://atlas.media.mit.edu/en/profile/country/mex/
- Thompson, A. J. (1993). The Anticipated Sectoral Adjustment to the Canada-United States Free Trade Agreement: An Event Study Analysis. *The Canadian Journal of Economics, 26(2)*, 253-271
- Wang, J., Meric, G., Liu, Z., & Meric, I. (2009). Stock market crashes, firm characteristics, and stock returns. *Journal of Banking & Finance, 33(9),* 1563-1574. doi: 10.1016/j.jbankfin.2009.03.002
- Wong, K.A. (1989). The Firm Size Effect on Stock Returns in a Developing Stock Market. *Economics Letters, 30(1),* 61-65. doi: 10.1016/0165-1765(89)90157-2
- World Integrated Trade Solutions. (2018). *Mexico Trade at a Glance: Most Recent Values*. Retrieved on June 5th, 2018 from: https://wits.worldbank.org/CountrySnapshot/en/MEX
- Zahniser, S., & Daugherty, K. (2018). *Mexico Trade & FDI*. Retrieved on June 5th, 2018 from: https://www.ers.usda.gov/topics/international-markets-us-trade/countries-regions/nafta-canada-mexico/mexico-trade-fdi/

Appendices

A. Election vs Non-Election Results

This section aims to check whether the results that are obtained in the paper are primarily driven by the returns around the 2016 US elections. Checking for this helps reinforce our conclusions of the negative impact on the Mexican stock market. However, testing for this also helps in proving whether the negative returns are a recurring theme that is seen every time President Trump seems to imply his desire to remove or renegotiate NAFTA.

The first set of results that I will look at are the CAARs over the entire 21 day period. Figure 3 provides a comparison of the CAARs that are seen during the elections and on average across all the other events.

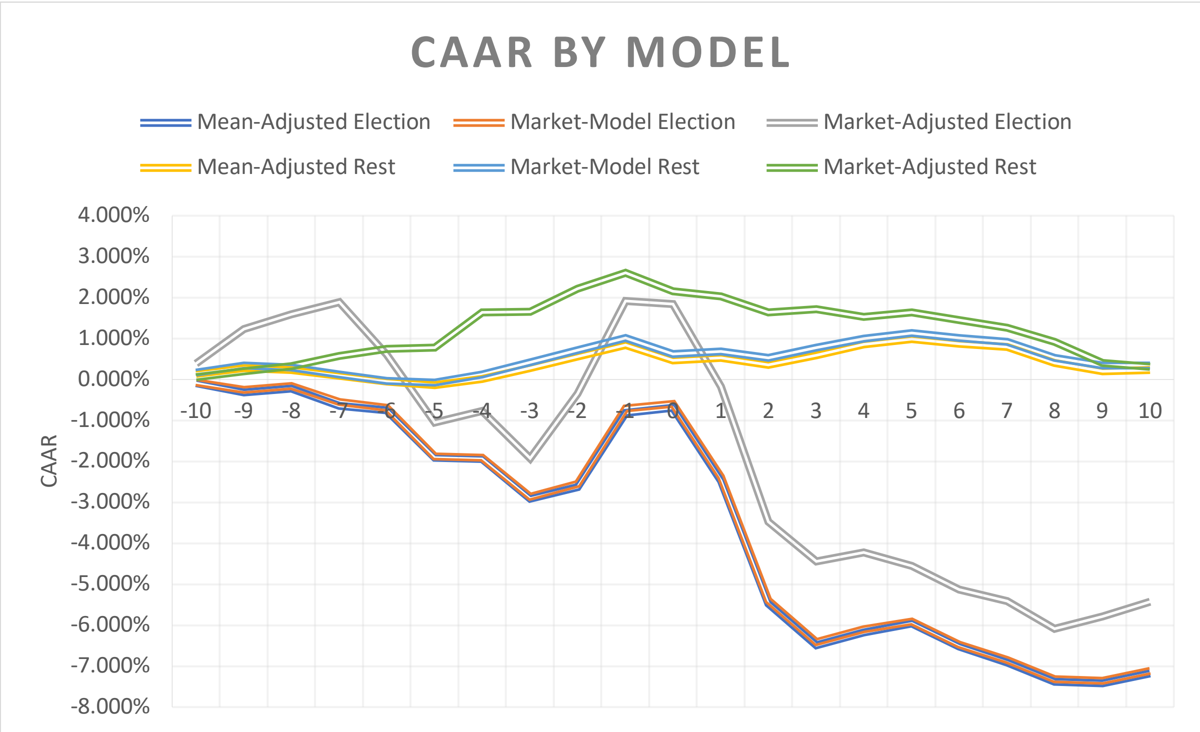

Figure 3: The graph provides a comparison of the CAARs seen during the 2016 elections and on average across the rest of the events across all the different models.

In terms of the model comparison, the results seem to be similar to the previous results where the mean-adjusted model and the market model are quite similar with the market-adjusted model being slightly more volatile. Figure 3 provides a clear distinction between the results that are seen during the elections and across the rest of the events. During the elections, the market was seen to be in a clear downfall with models showing cumulative drops of just over 7%. This drop is quite steep and can nearly be constituted as a stock market crash. In contrast, the returns around Trump's tweet seem to be quite stagnant. However, taking a closer look shows that the market seems to cumulatively drop by about 0.5% just after the release of a tweet. This is similar to the election returns where the steepest drops is seen just after Trump was announced as the next president.

The next step is to look at the CAARs over multiple event windows and compare them over the 2016 election and Trump's subsequent tweets about NAFTA.

Table 9:A comparison of the CAARs across the 2016 elections and Trump's subsequent negative tweets about NAFTA

	Mean-Adjusted		***Market Model***		***Market-Adjusted***	
	Election	Rest	Election	Rest	Election	Rest
CAAR [-10,+10]	-7.181%	0.225%	-7.115%	0.348%	-5.433%	0.313%
CAAR [-5,+5]	-5.214%	1.035%	-5.212%	1.162%	-5.164%	0.890%
CAAR [-2,+2]	-2.567%	0.084%	-2.529%	0.116%	-1.547%	-0.015%
CAAR [0,+1]	-1.660%	-0.317%	-1.675%	-0.320%	-2.087%	-0.569%
CAAR [0,+2]	-4.662%	-0.487%	-4.689%	-0.475%	-5.393%	-0.971%
CAAR [0,+5]	-5.151%	0.139%	-5.199%	0.128%	-6.474%	-0.966%

Table 9 shows that the election was an event that significantly shook the Mexican stock market with the market losing up to 7%, of which nearly 5% was lost just 3 days into Trump being elected president. The tweets that Trump puts out do not garner as much attention as shown by the indifferent returns seen throughout the event windows. However, windows [0,+1] and [0,+2] display a drop of 0.3% and 0.5% respectively. These drops are significantly steeper using the market-adjusted model. Since, the aim of this section is to show whether negative abnormal returns are present over the other events (tweets), table 10 only presents the significance results for the 2 and 3 day windows. For the election returns, although not reported, all windows were found to be significant at the 1% level.

Table 10: The reported t-values and z-values for the parametric and non-parametric tests are given below for each of the windows chosen above for all events except the 2016 elections. The tests are run similar to the formulas provided in the methodology.

		CAAR [0,+1]	*CAAR [0,+2]*
Mean-Adjusted	Cross-Sectional (T-Test)	-2.155**	-3.233***
	Patell (Z-Test)	-3.585***	-2.077**
	BMP (Z-Test)	-4.093***	-3.219***
	Cowan (Z-Test)	5.332***	4.794***
Market Model	Cross-Sectional (T-Test)	-2.188**	-3.149***
	Patell (Z-Test)	-3.578***	-2.045**
	BMP (Z-Test)	-4.078***	-3.179***
	Cowan (Z-Test)	6.124***	4.878***
Market-Adjusted	Cross-Sectional (T-Test)	-3.846***	-6.356***
	Patell (Z-Test)	-4.251***	-4.345***
	BMP (Z-Test)	-5.292***	-6.970***
	Cowan (Z-Test)	8.620***	8.976***

*** 1%, ** 5%, *10%

Table 10 provides the significance test results for the combined events excluding the 2016 elections. As can be seen from the table, both windows chosen exhibit significant negative returns predominantly at the 1% level. For the election returns, although not reported, all windows analysed in the event study were found to be significant at the 1% level. While the negative returns are substantially steeper for the elections and do tend to skew the overall results slightly, a cumulative drop of 0.5% after 3 days suggests that Trump's negative tweets on NAFTA does have a significant impact on the Mexican stock market. Hence, the overall results in this paper seem to be a recurring theme every time Trump mentions his displeasure with NAFTA.