What do financial markets think of the 2016 election? *

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Abstract

On September 26, 2016, Hillary Clinton was regarded by post-debate polls to have defeated Donald Trump in the first Presidential debate, and her odds of election in the Betfair prediction market increased from 63 to 69 percent. Given that most financial markets are typically quiet during that time, movements in asset prices likely reflect market participants' collective view of the impact of the 2016 election. During the debate event window, U.S., UK and Asian stock markets rose, crude oil rose, the currencies of trading partners such as Mexico, South Korea, and Canada rose against the dollar, and expected future U.S. stock market volatility dropped sharply. Given the magnitude of the price movements, we estimate that market participants believe that a Trump victory would reduce the value of the S&P 500, the UK, and Asian stock markets by 10-15%, would reduce the oil price by $4, would lead to a 25% decline in the Mexican Peso, and would significantly increase expected future stock market volatility.

Market movements over the October 7-9 weekend, during which a tape was released that prompted many Republicans to unendorse Trump, tell a largely consistent story. Clinton's probability of election rose, stocks rose, volatility fell, and the currencies of Mexico and Canada rose against the dollar.

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I. Introduction

What do financial markets think of the 2016 election? We conduct an event study analyzing the response of financial and prediction markets to the most consequential single event (so far!) during the 2016 general election campaign: the first Presidential debate, which occurred on September 26, 2016. Polls taken immediately after the debate found that voters thought Clinton had won the debate by a clear margin. The debate created an abrupt shift in the dynamics of the race, increasing the chances the chances of a Clinton presidency, and reducing the chance of a Trump presidency.

Figure 1 illustrates the changes in prediction market prices and stock market in the hours around this event. Both markets were relatively tranquil in the period before and after the debate. But during the debate itself, both moved quite sharply. A prediction market security traded on Betfair.com that is worth $1 if Clinton wins the Presidency rose from 63 to 69 cents between 9 and 11 PM Eastern Time (i.e., during the debate and first 20 minutes of post-debate analysis). While the main U.S. financial markets were closed, overnight trading in S&P 500 futures reveal that this event also led financial market traders to sharply revise their assessment of the value of stocks. The December 2016 S&P 500 future rose in lockstep with Ms. Clinton's election chances, suggesting that markets expect stocks to be more valuable under President Clinton than President Trump.

Figure 1
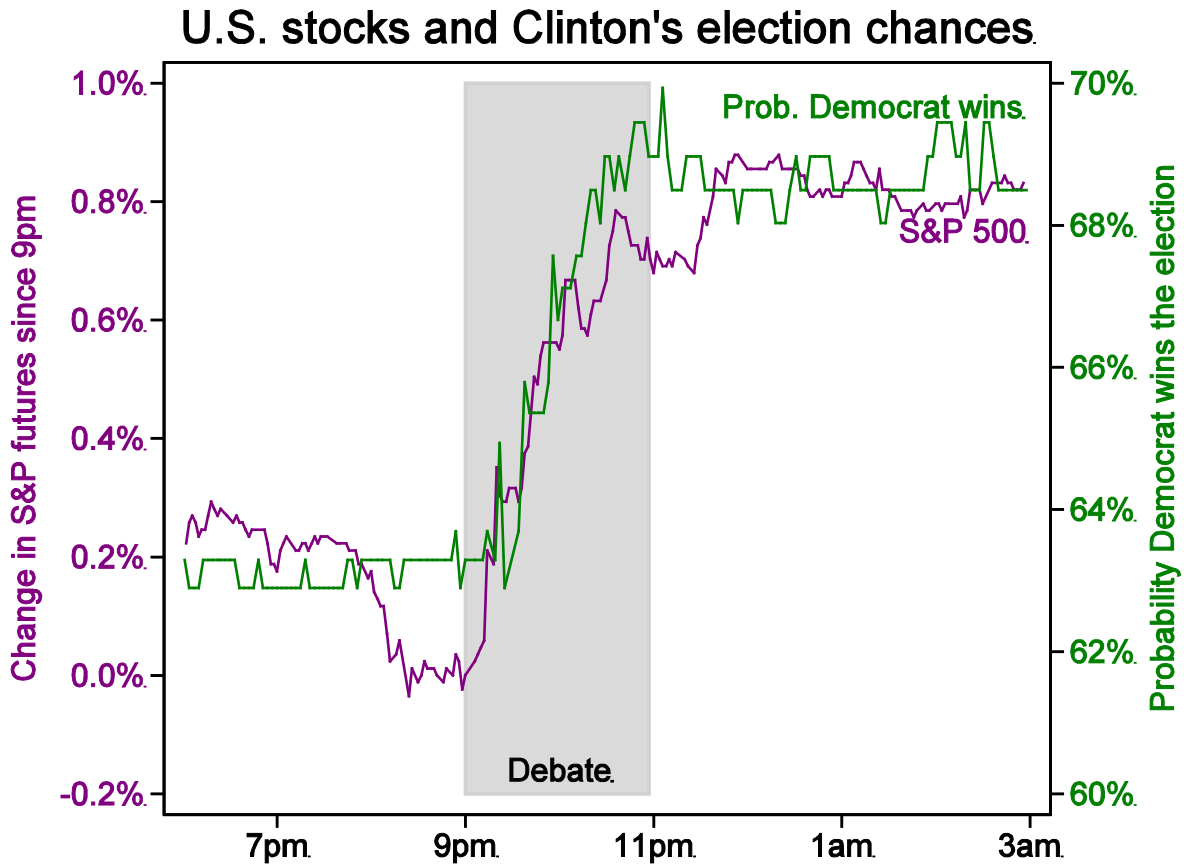
The magnitudes involved are large. The S&P 500 futures rose by 0.71 percent during the debate window in response to a 6 percent increase in Clinton's victory probability. This implies that market

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participants believe that the S&P 500 will be worth 12 percent more under a President Clinton. Movements in other U.S. stock indices tell a similar story. A 12 percent difference is large both in absolute terms, and relative to how previous political shocks have moved the market.

Conducting similar analyses of how other financial markets responded to the change in election odds paints a more complete picture. During the debate futures tracking expected future U.S. stock market volatility fell sharply, suggesting that markets are more uncertain about outcomes under a Trump presidency. Oil prices rose, gold prices fell, and Treasury prices declined slightly. Roughly speaking, these movements suggest that a Clinton presidency is expected to lead to stock market volatility that is 15-30 percent lower, Treasury yields that are 25 basis points higher, and oil that is $4 per barrel more expensive.

Movements in overseas markets suggest that the U.S. election is expected to have significant global implications. The debate led the British FTSE 100 to rise by as much as U.S. stocks did. The same is true of many Asian markets, too. South Korea's KOSPI increased by about twice as much as the U.S., UK, and other Asian markets in USD terms, implying very large economic effects for firms in this country.

Foreign exchange markets suggest that some of this is driven by trade. The currencies of Mexico and Canada — both of which are partners in NAFTA, which Trump has threatened to end or renegotiate — rose sharply, as did those of other nations with which the U.S. has free trade agreements, including South Korea, Australia, and New Zealand. The Japanese Yen was the only major currency to decline against the dollar during the debate.

All told, these movements suggest that financial markets expect a generally healthier domestic and international economy under a President Clinton than under a President Trump.

Our findings also represent a break from history. In past work (Snowberg, Wolfers, and Zitzewitz, 2007a), we have analyzed the response of the U.S. stock market in the days surrounding past Presidential elections. In almost every case back to 1880, equity markets have risen on the news that Republicans win elections and fallen when Democrats win. But our analysis of 2016 shows it to be a strong exception to this rule.

In what follows, we will outline our data and methods in greater detail and then present our results for a range of financial indicators. In Section II, we frame our analysis in the context of the literature on political event studies. Section III outlines our analytic framework and empirical methods. Section IV presents our results. Section V compares the market's response to the 2016 election with other political events. Section VIII concludes.

II. Political Event Studies

Event studies, in which an analyst gauges the likely impact of an event using asset price movements, are widely used by academics, financial professionals, and journalists. In this case, we focus on an event study because the event we analyze — a widely watched debate — yielded a sharp and clearly exogenous shock to the probability of a Clinton versus Trump presidency. By focusing on stock price movements during a short window in which stocks otherwise barely move, we can be confident that we are isolating the effects of the debate. Moreover, because we can isolate the precise political shock—developments on a debate stage—we can be more confident that this shock does not somehow reflect reverse- or third-factor causation, in which improving economic conditions cause the change in political odds, rather than the other way around.

Why take the trouble to identify an event window in which almost all news affecting asset prices is plausibly election-related? Why not simply regress changes in asset prices on changes in a prediction market price tracking election probabilities during the entire pre-election period? As we discuss in Snowberg, Wolfers and Zitzewitz (2013), election odds will be correlated with financial markets for a variety of reasons—electoral shocks affect the economy; the economy affects the election; and other factors affect both economic and electoral conditions. As such, the simple correlation between prediction market and asset prices confounds the effect of the election on the economy with the effect of the economy on the election and the effect of other factors on both. Moreover, through the 2016 election cycle there has not been much variation in election odds, and so a pure time series study would lack statistical power. Indeed, the reason that we focus on the first debate is that it is the largest identifiable political shock during this election cycle (so far).

A shortcoming of traditional event studies is that the extent to which an event is a surprise is difficult to determine. For example, financial markets did not much respond to the reelection of Presidents Ronald Reagan or Bill Clinton, but this is because their elections contained very little news, since both were heavy favorites by election night (83 and 93 percent, respectively). In contrast, President Harry Truman's reelection contained a lot of news, since his pre-election odds of winning were much lower (11 percent). As we discuss in Snowberg, Wolfers, and Zitzewitz (2007a, 2007b and 2013), a prediction market can calibrate the news content of an event. Indeed, we find that the first 2016 debate raised the chances of a Clinton presidency by roughly 6 percent. Thus even if the change in stock prices of 0.71 percent appears quite small in absolute terms, it is quite large relative to the magnitude of the political shock.

Another shortcoming of traditional event studies is that they are retrospective: we usually learn about the expected effects of an event afterwards, but not in time to affect any policy or political decision involved. For instance, UK stock markets dropped by 11.0 percent in Dollar terms when the UK voted for Brexit, suggesting that markets believed that Brexit would cause substantial economic losses. However, this information was not available prior to the vote, when proponents and opponents of Brexit made very different predictions about its economic impact. A credible measure of market participants' views of the impact of Brexit prior to the vote may have helped inform voters' decision making. By analyzing the market response to an intermediate event—in this case, a debate that moved election odds—our analysis can help inform decision-making in real time.

Interestingly, the first political event study to utilize a prediction market that we are aware of also analyzed a media-savvy outsider businessman running for President on an economic platform arguably outside the current mainstream. In 1996, Steve Forbes challenged Robert Dole for the Republican nomination, and the centerpiece of his platform was a flat tax that would have sharply reduced top marginal tax rates, reducing the value of municipal bonds, whose interest payments are generally not taxed. Slemrod and Greimel (1999) found that muni bond prices fell when Forbes' odds of winning the nomination increased, consistent with asset prices taking account of political probabilities.

While Slemrod and Greimel was written only after the 1996 primary contest ended, in Leigh, Wolfers, and Zitzewitz (2003), we used a similar methodology to estimate market participants' expectation of the effect of the 2003 Iraq War before it began. For such studies to be possible, one needs sharp movements in the probability of an event occurring and during a window in which potentially confounding non-event-related news is minimal.

III. Methods

To explain why, we turn to explaining our event study methodology.

Analytic framework

Consider a simple model of an election and an asset price. For simplicity we focus on the case in which either Clinton or Trump will win the 2016 election. Suppose also that in addition to the December 2016 S&P 500 future (which sells for a price we denote $S\&P$), two derivatives trade: a security that sells at price C and settles for the value of the S&P 500 in December if Clinton wins (but zero otherwise), and another derivative which sells at price T and settles for the value of the S&P 500 in December if Trump wins (but zero otherwise). Owning a regular S&P future is equivalent to owning a portfolio with one of each of these derivatives, and so arbitrage ensures that the regular S&P future sells for the same price a bundle comprising one of each of these derivatives:

$$S\&P = C + T$$

There is also a prediction market, where you can buy a security that pays $1 if Clinton wins at a price $P^{Clinton\ wins}$ and a similar security that pays $1 if Trump wins, at a price of $P^{Trump\ wins}$. Because one of them must win the election, a bundle containing one of each of these prediction market securities will definitely yield a $1 payoff, and so

$$P^{Clinton\ wins} + P^{Trump\ wins} = 1.$$

However, we are more interested in comparing the price of two conditional derivatives. In particular, we denote $S\&P^{Clinton}$ as the price of a derivative that settles for the value of the S&P 500 in December in the states of the world where Clinton wins (and if she doesn't win, then all trades are unwound). Likewise, $S\&P^{Trump}$ is the price of a derivative that settles for value of the S&P 500 in December in the states of the world in which Trump wins (and if he doesn't win, all trades are unwound). The difference between the price of these two conditional futures prices reflects differences in investors' expectations of the value of the S&P in the states of the world in which Clinton wins and Trump wins, and differences in their required equity premium in those states of the world. If $S\&P^{Clinton} > S\&P^{Trump}$, as we find, either investors expect the value of the S&P 500 to be higher if Clinton wins, or they require a higher risk premium if Trump wins, or both.

While these derivatives are not directly traded, their payoff structure can be replicated by a combination of buying the derivatives described above, and insuring against each candidate losing by buying stock in prediction markets. Thus, a no-arbitrage condition ensures that:

$$S\&P^{Clinton} = \frac{C}{P^{Clinton\ wins}}, \text{ and } S\&P^{Trump} = \frac{T}{P^{Trump\ wins}}.$$

Putting these together yields the following:

$$S\&P = P^{Clinton\ wins} \times S\&P^{Clinton} + P^{Trump\ wins} \times S\&P^{Trump}$$

In other words, the price of an S&P 500 future reflects a weighted average of its value under Clinton, and its value under Trump, with weights provided by prediction market prices linked to their respective elections. Because the sum of these weights must add to one, this in turn yields the following straightforward expression, which we can take to the data:

$$S\&P = S\&P^{Clinton} - \underbrace{\left(1 - P^{Clinton\ wins}\right) \times \left(S\&P^{Clinton} - S\&P^{Trump}\right)}_{\text{"Trump discount"}}$$

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This expression highlights precisely how an event which increases the Clinton prediction market price will yield a decline in the S&P 500, from which we can infer the "Trump discount" (or "Clinton premium"). Our measure of the "Trump discount" is the difference between the value of an S&P 500 future in the state of the world in which Clinton wins, and the value of the S&P 500 future in the state of the world in which Trump wins. In turn, this discount reflects some combination of higher expected stock prices under President Clinton and a higher risk premium under President Trump.

Empirical strategy

Our identifying assumption is that the debate led to a change in $P^{Clinton\ wins}$ but nothing that occurred during our event window changed the market's value of either $S\&P^{Trump}$, or $S\&P^{Clinton}$. (We will explore the validity of this shortly.) As such, the combination of the change in the S&P 500 and the change in prediction market prices is sufficient to identify the size of the "Trump discount":

$$\Delta S\&P = \Delta P^{Clinton\ wins} \times \left(S\&P^{Clinton} - S\&P^{Trump}\right), \text{ which implies that:}$$

$$\underbrace{\left(S\&P^{Clinton} - S\&P^{Trump}\right)}_{\text{"Trump discount"}} = {\Delta S\&P}\Big/{\Delta P^{Clinton\ wins}}$$

As this equation shows, the ratio of the change in the value of the S&P 500 (or indeed, any financial price) to the change in the value of the Trump prediction market security reveals the difference in the value of that financial price in the two alternative states of nature in which Clinton or Trump are elected.

In order to put our estimate of the Trump discount" in more intuitive terms—as a percentage change, rather than an arbitrary number of index points—we divide both sides of the above equation by a baseline level of the S&P 500 to get:

$$\underbrace{\frac{S\&P^{Clinton} - S\&P^{Trump}}{S\&P^{baseline}}}_{\text{"Trump discount" as a percentage}} \approx {\%\Delta S\&P}\Big/{\Delta P^{Clinton\ wins}}$$

In the introduction of this paper, we applied this logic, juxtaposing the 0.71 percent rise in the S&P 500 with the 6 percent rise in the price of Clinton in the prediction market to conclude that the Trump discount was roughly $\frac{0.71}{0.06} = 11.9\%$ of the pre-debate value of the S&P 500.[1]

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[1] This involves an approximation because we're normalizing both $S\&P^{Clinton} - S\&P^{Trump}$ as well $S\&P^{after\ debate} - S\&P^{before\ debate}$ by the same baseline level of the S&P 500. When we calculate the right-hand side as the percentage change in the S&P 500, we're effectively using $S\&P^{before\ debate}$ as our baseline, while a more natural baseline for the left-hand-side might be either $S\&P^{Trump}$, or $S\&P^{Clinton}$. For small changes, $\frac{S\&P^{Clinton}-S\&P^{Trump}}{S\&P^{Trump}} \approx \frac{S\&P^{Clinton}-S\&P^{Trump}}{S\&P^{Clinton}} \approx \frac{S\&P^{Clinton}-S\&P^{Trump}}{S\&P^{before\ debate}}$.

An exact calculation yields results that are similar to those reported in the text: A 6 percentage point rise in Clinton's chances led the S&P 500 to rise from 2135 to 2150.25, an increase of 15.25 points, suggesting that (in index points) the "Trump discount" $S\&P^{Clinton} - S\&P^{Trump} = \frac{15.25}{.06} = 254.2$ index points. In turn, this implies that $S\&P^{Clinton} = 2229$ and $S\&P^{Trump} = 1975$. To convert the "Trump discount" to a percentage, we need to choose a baseline level. The most natural baselines are $S\&P^{Clinton}$, $S\&P^{Trump}$, or the midpoint of $S\&P^{Trump}$ and $S\&P^{Clinton}$. Against these alternative baselines, the "Trump discount" is 12.9%, 11.4% or 12.1%, respectively. Our approximation measures it as 11.9%, relative to the baseline of $S\&P^{before}$.

Statistical inference

In order to assess whether the 0.71 percent rise in the stock market during the debate is statistically significant, we need to compare it to the distribution of changes in the S&P 500 under the null hypothesis that the Trump effect is zero. We apply two approaches to constructing this counterfactual distribution—one is a standard parametric t-test, and the other is a non-parametric randomization test.
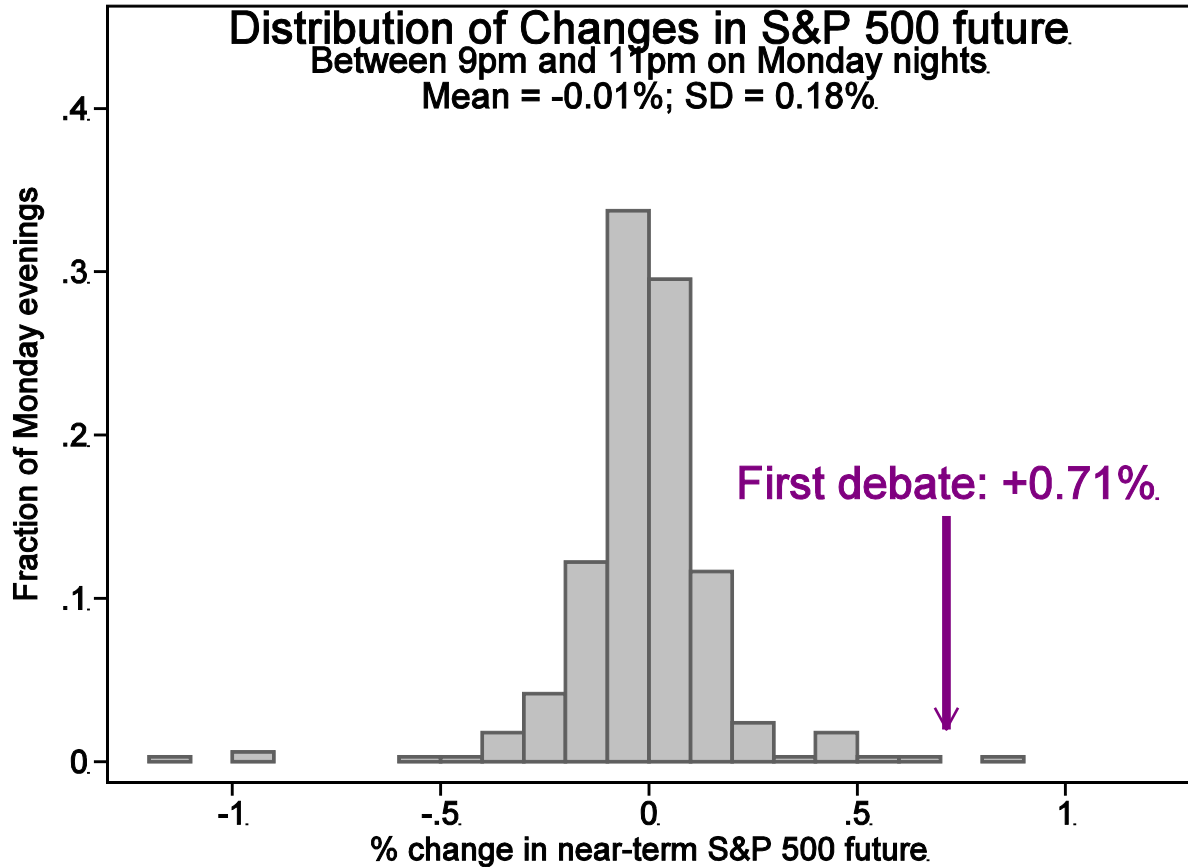
Parametric statistical tests

We collected data on movements in the S&P 500 between 9pm and 11pm Eastern time for every Monday between January 1, 2010 and September 25, 2016. The mean of these movements is -0.01 percent, and the standard deviation is 0.18 percent, which is small relative to the 0.71 percent movement on the debate night. This standard deviation is a parametric measure of the standard error of our estimate of the market movement. (To see this, note that if we regressed 9 to 11 PM changes in the S&P 500 on an event window dummy for a sample that included our event Monday and the N prior Mondays, the standard error on the dummy variable would be the $\frac{\sqrt{N+1}}{N}$ times the standard deviation of returns for the non-event days.)

This standard error can be used to determine the statistical significance of our estimate in the usual fashion, by constructing a t-statistic and then conducting a t-test. For the change in the S&P 500, the t-statistic is 0.71/0.18 = 4.1, which is statistically significant at conventional levels.

A non-parametric statistical test

The problem with the parametric approach is that it assumes that asset price changes are identically and normally distributed. As an alternative, we follow the logic of a randomization or permutation test, and compare the change in the market on debate night with the full distribution of past changes in the S&P future during the Monday 9pm-11pm window. Figure 2 illustrates.

Figure 2

Distribution of Changes in S&P 500 future.
Between 9pm and 11pm on Monday nights.
Mean = -0.01%; SD = 0.18%.

First debate: +0.71%.

(y-axis) Fraction of Monday evenings

(x-axis) % change in near-term S&P 500 future.

We calculate non-parametric p-values for our estimates as the share of past market movements that are larger in absolute value. For instance, 1.2 percent of the Mondays in the period between January 1, 2010 and September 25, 2016 had market movements larger than the 0.71 percent that occurred during the debate, so we calculate our non-parametric p-value as 0.012. The key assumption that this approach makes is that market movements on Monday evenings are drawn from a common distribution. If anything, this is a conservative estimate, since market volatility has declined since 2010-11, making large stock movements less common.[2]

Adjustments for our Wald Estimator

So far, we've described the standard errors for our event study estimates of how much financial prices changed in response to the first debate. Our estimate of the "Trump discount" is somewhat more complicated: It is the ratio of the change in financial prices to the change in prediction market prices, and so is effectively a Wald Estimator. Standard errors for this ratio need to account for imprecision in the denominator (i.e., the prediction market movement) as well as the numerator (the financial market movement). Fortunately, prediction markets are typically even quieter in the 9 PM to 11 PM window. Using Betfair.com prices collected approximately every four hours by Predictwise.com, we find that

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[2] When we experimented with parametric methods that allowed for changes in volatility (e.g., GARCH), we generally obtained lower standard errors than with OLS.

the standard deviation of a two-hour change in $P^{Clinton}$ is about 0.37 percent at that time of night.[3] The standard correction implies that standard errors for our Wald Estimators will be about 3 percent larger than a scaled-up standard error for the market movement.

Threats to identification

There are a variety of threats to our identifying assumption, which we explore now.

Was the market responding to election-related news?

Our identification rests on the assumption that financial markets were responding to election-related news. A variety of pieces of evidence are consistent with this.

First, Figure 1 illustrates that throughout the debate, the value of the S&P 500 moved in virtual lockstep with the prices in political prediction markets, which should only respond to election-related news.

Second, anecdotal reports gathered by the financial media suggest that traders were consciously assigning higher asset values due to a strong debate performance by Clinton.[4]

Third, as Figure 3 illustrates, the Mexican Peso rose sharply during our event window, and indeed, it rose more dramatically than any other currency. In light of Mr. Trump's threats to restrict both trade and immigration from (and thus, indirectly, remittances to) Mexico, this also suggests that the markets were responding to election-related news.

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[3] In the 290 days of history of the Betfair "Democratic candidate to win the Presidency" contract available on Predictwise, the standard deviation of the price change in the four-hour window that contains 10 PM ET from is about 0.53 percent. Correcting this to a two-hour standard deviation by dividing by the square root of 2 yield 0.37 percent.

[4] See, e.g. the participants quoted in "Factbox: Market Participants React to U.S. Presidential Debate," *Reuters*, 9/27/2016 or Forsyth, Robert, "Global Markets Cast Ballots for Clinton after Debate" *Barron's*, 9/27/2016 (http://www.barrons.com/articles/global-markets-cast-ballots-for-clinton-after-debate-1474949630).

Figure 3

Mexican Peso
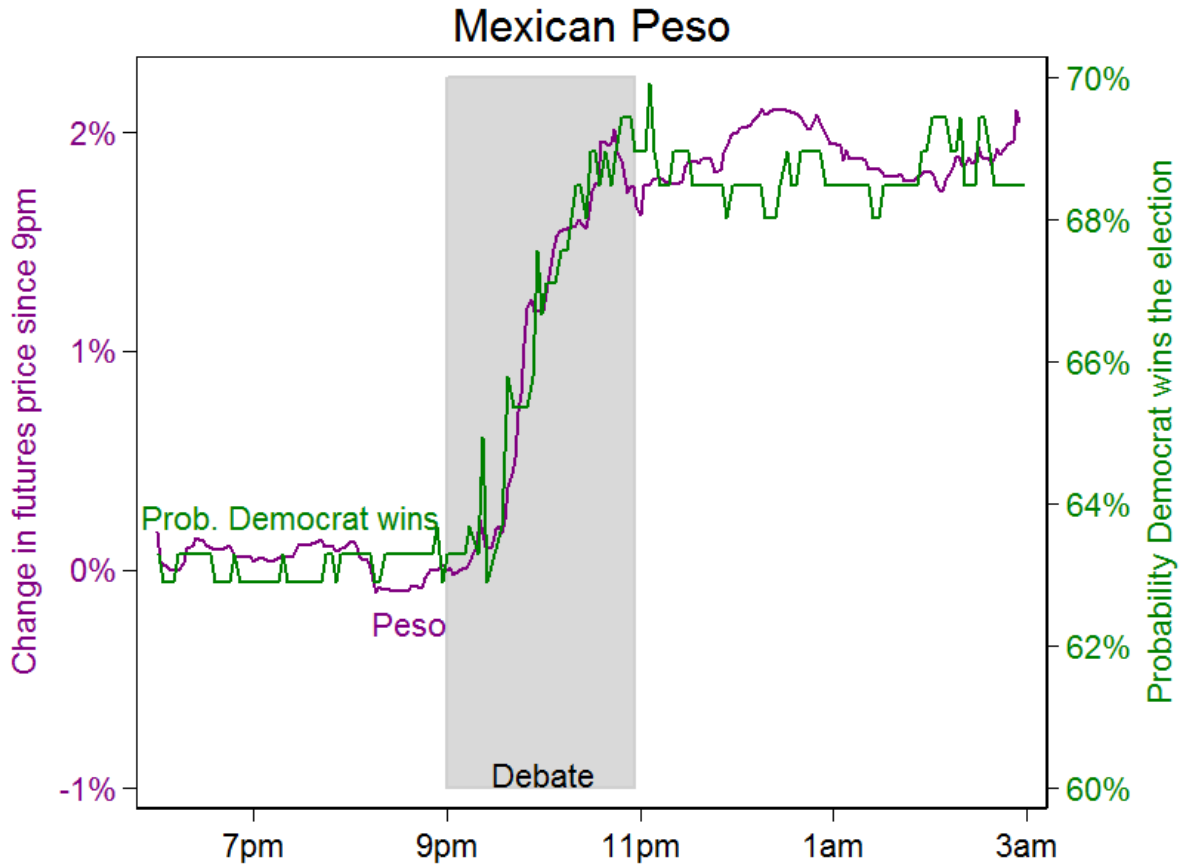
Were their confounding events during the debate?

Our inference that the debate led stocks to rise could be confounded if the stock market was responding to other forms of news. We checked the flow of financial news through the evening of the debate, and could find no evidence that there was any meaningful economic or financial news released during the event window.

In some sense, this is not surprising. The debate was held between 9pm and 11pm (Eastern time) on a Monday evening, which is traditionally a tranquil period for financial markets. Figure 4 shows the evolution of the near-term S&P 500 future during 9-11pm on each of the previous 200 Monday evenings. As can be seen, it is very rare for the market to move as much as it did during the debate. Indeed, the only times that the market has moved this sharply has been in response to quite distinct news events.

Figure 4

Change in S&P 500 future
in the 9pm-11pm Monday night window
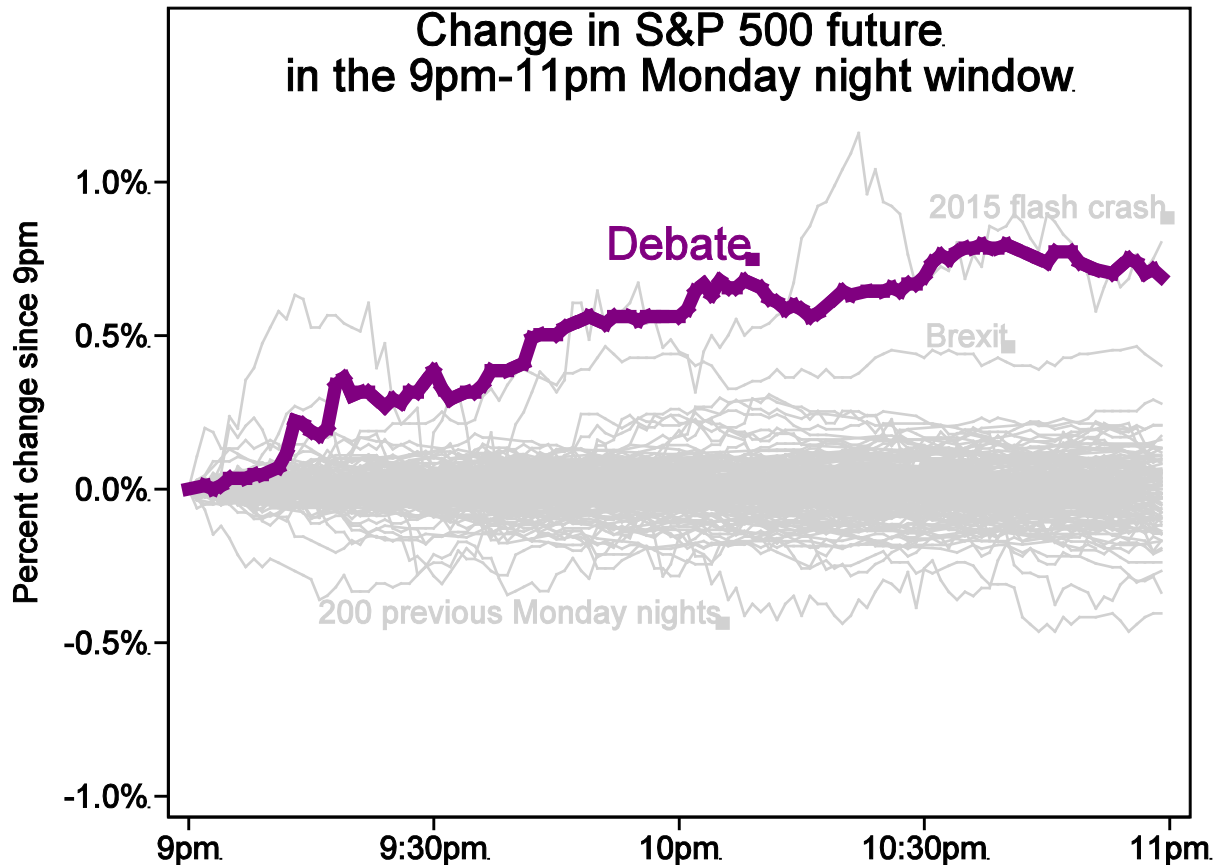
Were markets re-evaluating the fitness of the candidates?

An alternative explanation for the rise in equity prices during the debate, aside from the shift in electoral probabilities, would be financial market participants becoming more optimistic about the prospects for the economy under either or both candidates. We think this is unlikely during Presidential debates in general and during the September 26 debate in particular. Candidates rarely announce new policies during debates, and neither candidate did so on September 26. If anything, Mr. Trump's weak performance might have weakened the market's faith in his leadership abilities, which would have tempered the rise due to the shift in political probabilities, leading our method to underestimate. While Ms. Clinton performed strongly, her many decades in public life make it unlikely that this would have much changed the perceptions of informed analysts about her abilities.

Prediction market accuracy

Political prediction markets tend to be quite illiquid and reflect only limited volumes, relative to traditional financial markets. As such, it is worth assessing whether the movements in the prediction market price were warranted, as our analysis relies on them. Here, our supporting evidence is necessarily somewhat limited.

Our main analysis uses data from the British betting exchange BetFair. We also have data from another prediction market — a smaller market called PredictIt, which unlike BetFair, takes bets from

Americans (in order to pass muster with U.S. regulators, PredictIt caps the size of trading positions). That market also shows Clinton's odds of winning the election rose by 6 percent during the debate.[5]

Beyond that, we have worked to reconstruct the narrative of political news through the evening. During the debate, pollster Frank Luntz live-tweeted dial responses from a focus group of 27 undecided Pennsylvania voters. He reported that Mr. Trump may have won the first passage of the debate,[6] but the rest of the debate clearly went to Ms. Clinton. As the debate finished, Mr. Luntz wrote that when asked who won the debate, "6 people said Trump and 16 said Clinton."[7] Chris Kofinis of Park Strategies also live-tweeted responses from his focus group of 29 undecided voters in Ohio, and they reported a similar narrative. At the conclusion, they reported that 11 respondents said Clinton won, zero said Trump won, and 17 said "neither."[8] In the minutes following the debate CNN reported on their own focus group in which 18 of 20 undecided voters in Florida said that Clinton won.[9] All of this supports that the narrative shown by prediction markets — that it became increasingly clear through the debate that Clinton was emerging as the likely winner, perhaps by a large margin.

Before 1am, CNN reported results from poll of 521 registered voters which showed that 62% thought Clinton "did the best job in the debate", versus 27% for Trump.[10] That CNN poll appeared to oversample self-identified Democrats, and so it is not surprising that subsequent polls were less lop-sided. Those polls included: PPP (51% scored Clinton the winner, compared with 40% for Trump), YouGov (57% Clinton; 30% Trump); Morning Consult (49% to 26%); Echelon Insights (48% to 22%); and Gallup (61% to 27%).[11] We list all of these nationally representative surveys, because they yield a very different story than the various online reader surveys which are unrepresentative and are easily gamed by computer-savvy pranksters. Many of these "surveys" suggested that Mr. Trump won the debate.

The magnitude of the prediction market response to Ms. Clinton's win also looks to be in line with historical norms. Her margin of victory on the Gallup poll was historically large, yet still somewhat smaller than Mitt Romney's 72% to 20% win over Barack Obama in the first debate of the 2012 election cycle.[12] That somewhat larger win yielded a somewhat larger shift in prediction markets, which moved 7 percentage points in Mr. Romney's favor. As we'll see in Section VI, financial markets responded very differently to this change in electoral fortunes.

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[5] Lower frequency data from the Iowa Electronic Market, a University-run prediction market that also accepts U.S. investors and limits stakes, show movements of a similar magnitude.

[6] At 9:35pm "Trump is really winning tonight" (https://twitter.com/FrankLuntz/status/780581541432872961), by 10:07pm "So far, 17 people in my group say Hillary is winning; 3 say Trump" (https://twitter.com/FrankLuntz/status/780589729544667136)

[7] https://twitter.com/FrankLuntz/status/780598663978418176

[8] https://twitter.com/ChrisKofinis/status/780622960554024960

[9] CNN focus group: http://mediamatters.org/video/2016/09/27/cnn-focus-group-declares-hillary-clinton-winner-first-debate/213347

[10] http://www.cnn.com/2016/09/27/politics/hillary-clinton-donald-trump-debate-poll/index.html?sr=twCNN092716hillary-clinton-donald-trump-debate-poll0535AMVODtopPhoto&linkId=29235135

[11] PPP: http://www.publicpolicypolling.com/main/2016/09/voters-nationally-say-clinton-won-debate-5140.html; YouGov: https://today.yougov.com/news/2016/09/27/57-viewers-say-clinton-won-first-debate/; Morning Consult: https://morningconsult.com/2016/09/28/clinton-bests-trump-debate-half-likely-voters-say/; Echelon Insights: https://twitter.com/EchelonInsights/status/781185336760266752; Gallup: http://www.gallup.com/poll/195923/clinton-debate-victory-larger-side-modern-debates.aspx.

[12] http://www.gallup.com/poll/157907/romney-narrows-vote-gap-historic-debate-win.aspx

We now turn to outlining our full set of results, assessing how a variety of financial prices responded to this sharp shift in election probabilities.

IV. Results

Table 1 reports changes in financial asset prices during the debate event window on September 26, 2016. Only asset markets that were open during that time period and that had at least one trade in the 20 minute periods of 8:40-9:00 PM and 10:40-11:00 PM are included.

Table 2 reports standard deviations of market movements during the 9 PM to 11 PM window in the pre-debate (January 1, 2010 to September 23, 2016) period, along with the share of days that had a larger absolute market movement during this window than was observed during the debate. As discussed above, the former can be interpreted as a standard error and the latter as a model-free p-value. These data are reported using either just Monday evenings or all evenings (Sunday-Thursday in the U.S.) for which markets are open as the sampling distribution, but results are very similar. Statistical significance in Table 1 is reported using the Monday-only model-free p-values from Table 2.

U.S. Equity Markets

We begin by analyzing U.S. equity markets. Figure 5 shows the evolution of the near-term futures on each of the major U.S. stock indices during overnight trading. All four of these indices rose in parallel during the debate.
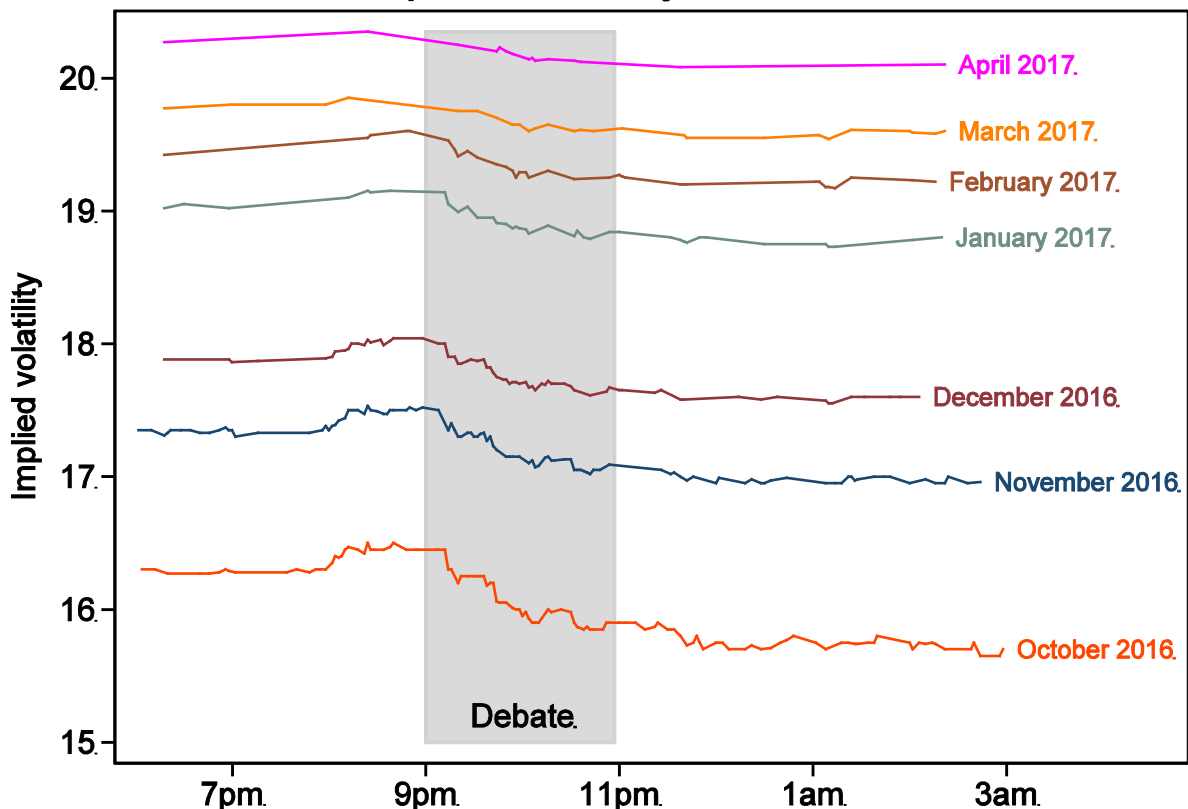
Figure 5

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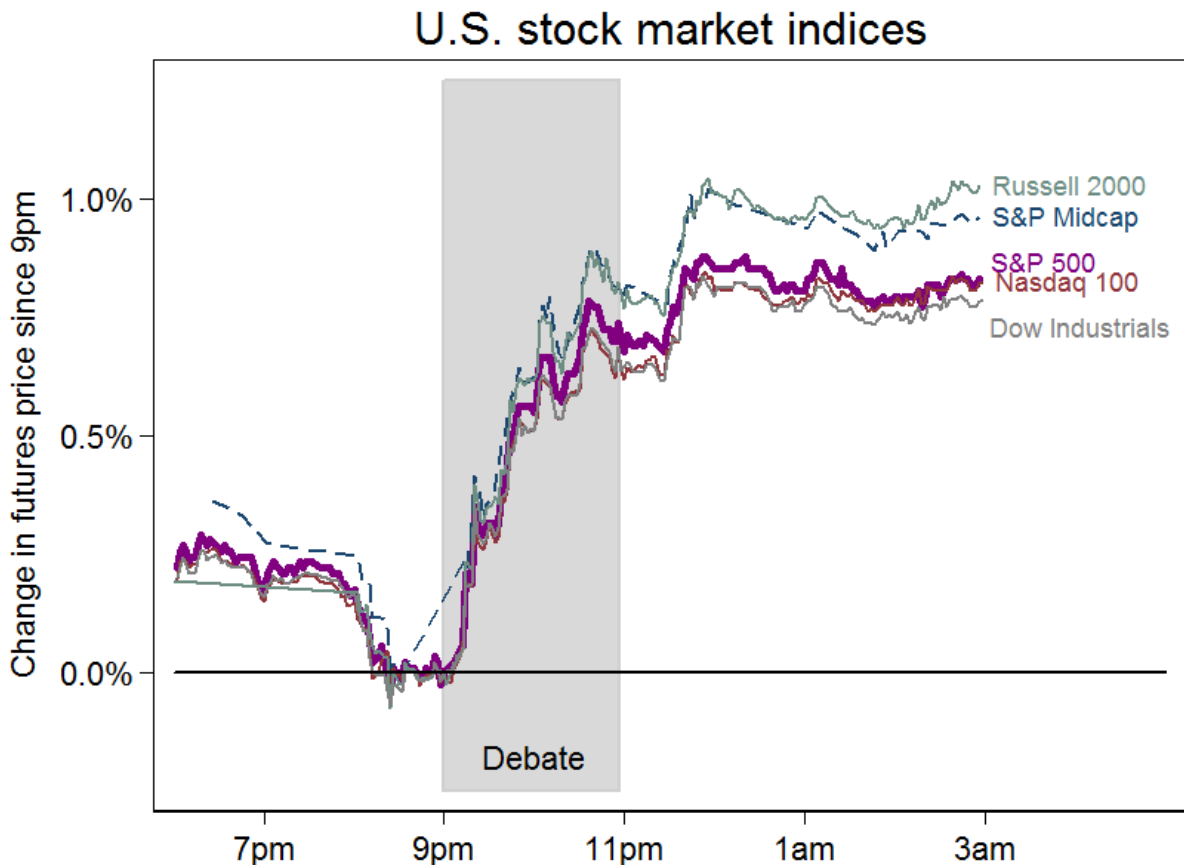
During the debate event window, the S&P 500 future rose by 0.71 percent, implying that the value of the S&P 500 is about 12% higher under a President Clinton than under a President Trump. Evidence from other indices suggests that this was a broad-based gain. The tech-heavy Nasdaq-100 index, which also excludes financial firms, rose by a similar amount, as did the Dow Jones Industrial average, which focuses on large companies. The Russell 2000, which focuses on small-cap stocks rose slightly more during the debate than the other indices, as did the S&P Midcap index, although this latter index was rarely traded in this window (and indeed, in Figure 5 we compare its price to the last pre-debate trade, which occurred at 8:32pm.)

Uncertainty and VIX Futures

Part of the "Trump discount" may reflect greater uncertainty, and so next we turn to studying movements in VIX futures, which track market expectations of future volatility. These futures imply that markets expect much lower volatility under Clinton than under Trump. For the October and November futures, this is partly mechanical, since the increase in Clinton's victory probability from 63 to 69 percent reduces the uncertainty about who will win the election. But the decline in the VIX futures for December and subsequent months is consistent with there being significantly less uncertainty under a President Clinton.

Figure 6

Interest rates

We have also examined overnight trading in the December 2016 treasury futures, and Figure 7 shows that bond prices at all maturities fell during the debate. These declining prices—which

correspond with higher interest rates—are most clearly evident for the 2-year, 5-year and 10-year treasury notes, where the declines are statistically significant, and they follow a reasonably plausible pattern. The prices of longer-term bonds also fell, but these futures have more volatile prices, and the changes were not statistically significant. Trading in these longer-duration bonds was very thin, which may also explain why they were particularly noisy during our event window. Federal Funds futures were flat and thinly traded during the debate, so we omit them from the tables and figures.

Figure 7

Treasury Notes and Bonds.
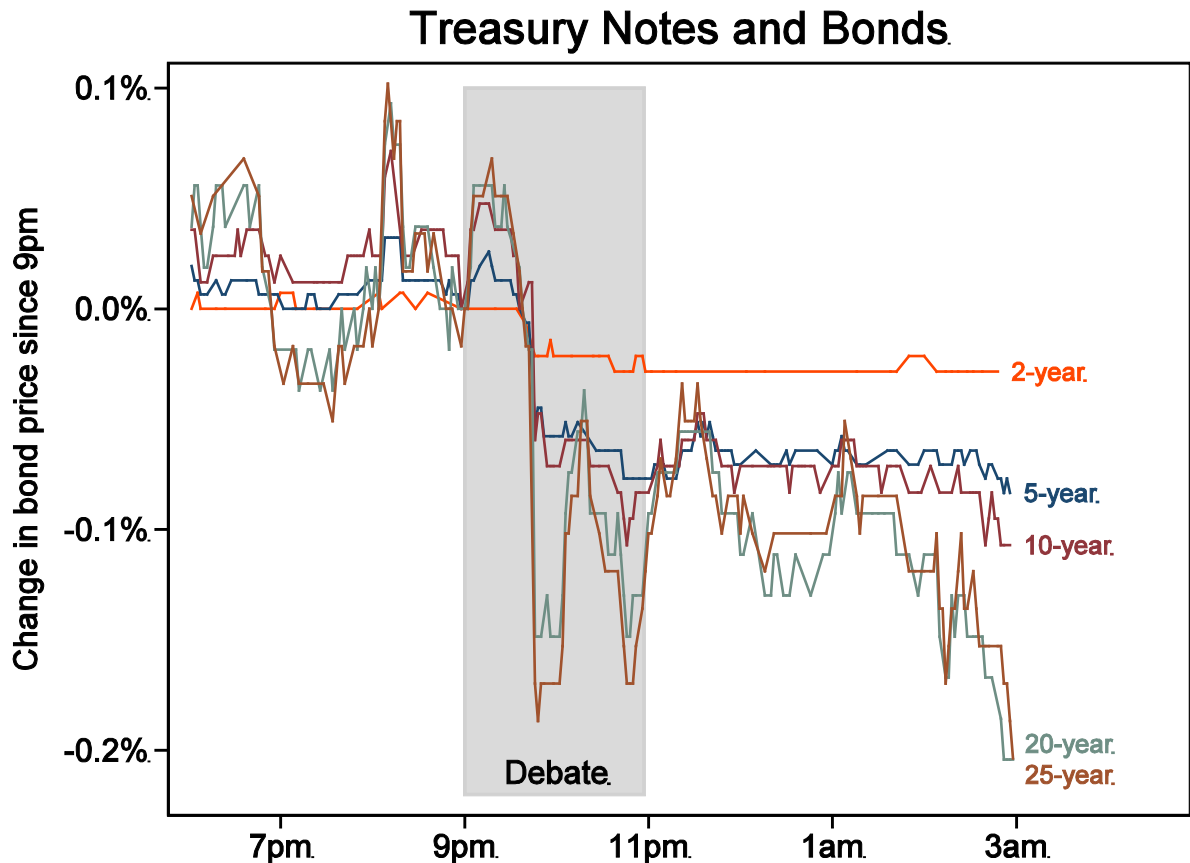
In terms of economic significance, the 0.48% lower price for the 2-year future under a President Clinton corresponds to a yield that is about 0.15 percentage points higher. The 1.6% lower price for the 10-year future implies a yield that is about 0.24 percentage points higher.

Next, we turn to analyzing international markets so as to assess the global consequences of the U.S. election. We start with the FTSE 100, which tracks the fortunes of 100 of the largest companies traded on the London Stock exchange, although this means that it includes many international companies, rather than purely British concerns. The reason to focus on this index is that its futures are traded overnight on the Chicago Mercantile Exchange, whereas other European indices are not.

Figure 8

London and New York
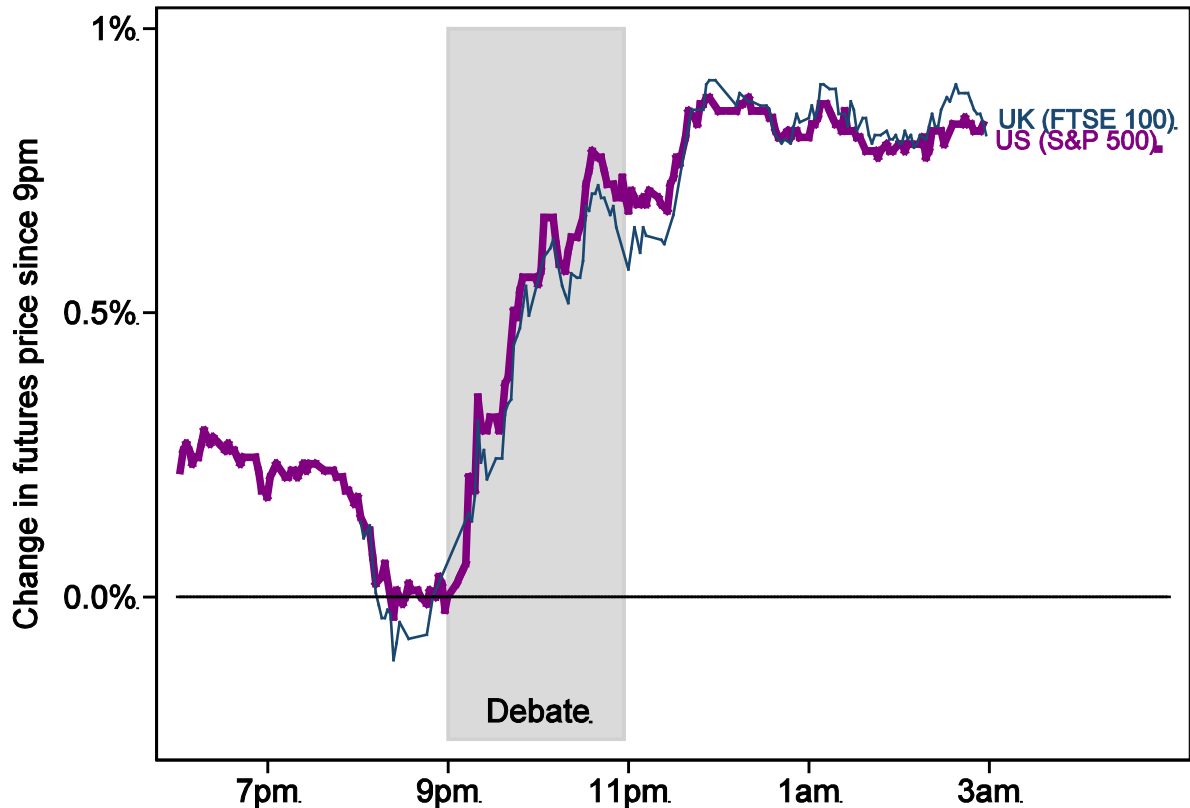
Next, we turn to analyzing international markets, so as to assess the global consequences of the U.S. election. We start with the FTSE 100, which tracks the fortunes of 100 of the largest companies traded on the London Stock exchange (which includes many international companies, rather than purely British concerns). The reason to focus on this index is that its futures are traded overnight on the Chicago Mercantile Exchange, whereas other European indices are not.

Figure 8 illustrates that the FTSE virtually paralleled the S&P 500 during the debate. Of course, this is not unusual — the two indices tend to closely commove, and this is also true during overnight trading. But it does suggest that traders believed that whatever news was driving the S&P 500 was also perceived to be relevant to the value of the FTSE-100. In this case, it means that the U.S. presidency is consequential for the world economy — enough that the FTSE is expected to be 10 percent lower under President Trump than President Clinton, and that this gap is closer to 14 percent in U.S. dollar terms.

While other European markets were closed during the debate, the Monday night debate occurred during Tuesday morning trading hours in a number of Asian markets, and Hong Kong opened 15 minutes after the debate started. In each of these markets, stock prices rose sharply during the debate. The largest movements were in Japan, Korea and Hong Kong, where the stocks rose *more* sharply than

they did in the United States. The effect in Singapore was similar to that in the United States. [13] The rally was weakest in Australia.

Figure 9

International Stock Indices

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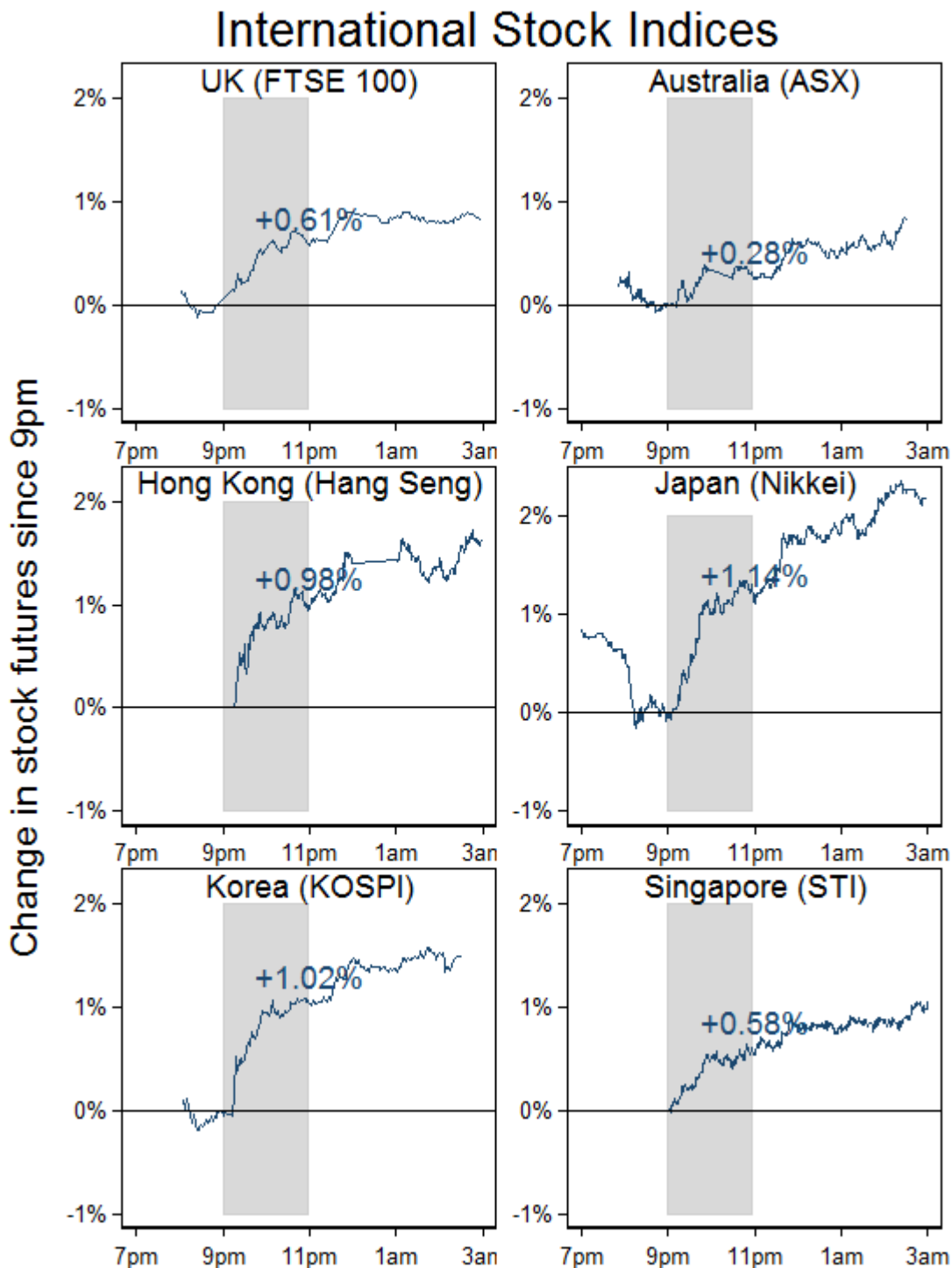
[13] While we lack the intraday data to construct standard errors for the Asian stock indices, given how large the movements are in the Nikkei 225 and KOSPI indices relative to their daily standard deviations (1.4 and 1.0 percent in local currency, respectively), it likely these changes are statistically significant.

All told, this evidence—while necessarily piecemeal—suggests that news about the U.S. election has led traders around the world to substantially revise the prices at which they're willing to buy stocks. A Trump presidency is not seen as uniquely harmful to the United States, but rather is a broad global threat that impacts each of the equity markets we have studied.

Foreign exchange rates

The international implications of the election can also be seen in the value of exchange rates. Most foreign currencies strengthened against the US Dollar and Euro during the debate, with the main exception being the Japanese Yen, which weakened.

As Figure 10 shows, the debate led to particularly sharp appreciations of the Mexican Peso and the Canadian dollar —the United States' nearest neighbors and partners in NAFTA. Extrapolating, this suggests that the Peso would be worth nearly 30 percent more under a Clinton presidency, and the Canadian dollar would be worth 10 percent more. The currencies of other free-trade partners, including Korea and Australia, also rose strongly. While the U.S. is the largest export market for South Africa, we were somewhat surprised to see the Rand rise as strongly as it did. Each of these changes was statistically significant, as were the rises in the British Pound and the Russian Ruble. While the Indonesian Rupiah rose between the start and the end of the debate, the timing of the move looks like it may have been in response to other factors, and the change was not statistically significant.

Figure 10

Exchange Rates (to the U.S. Dollar)
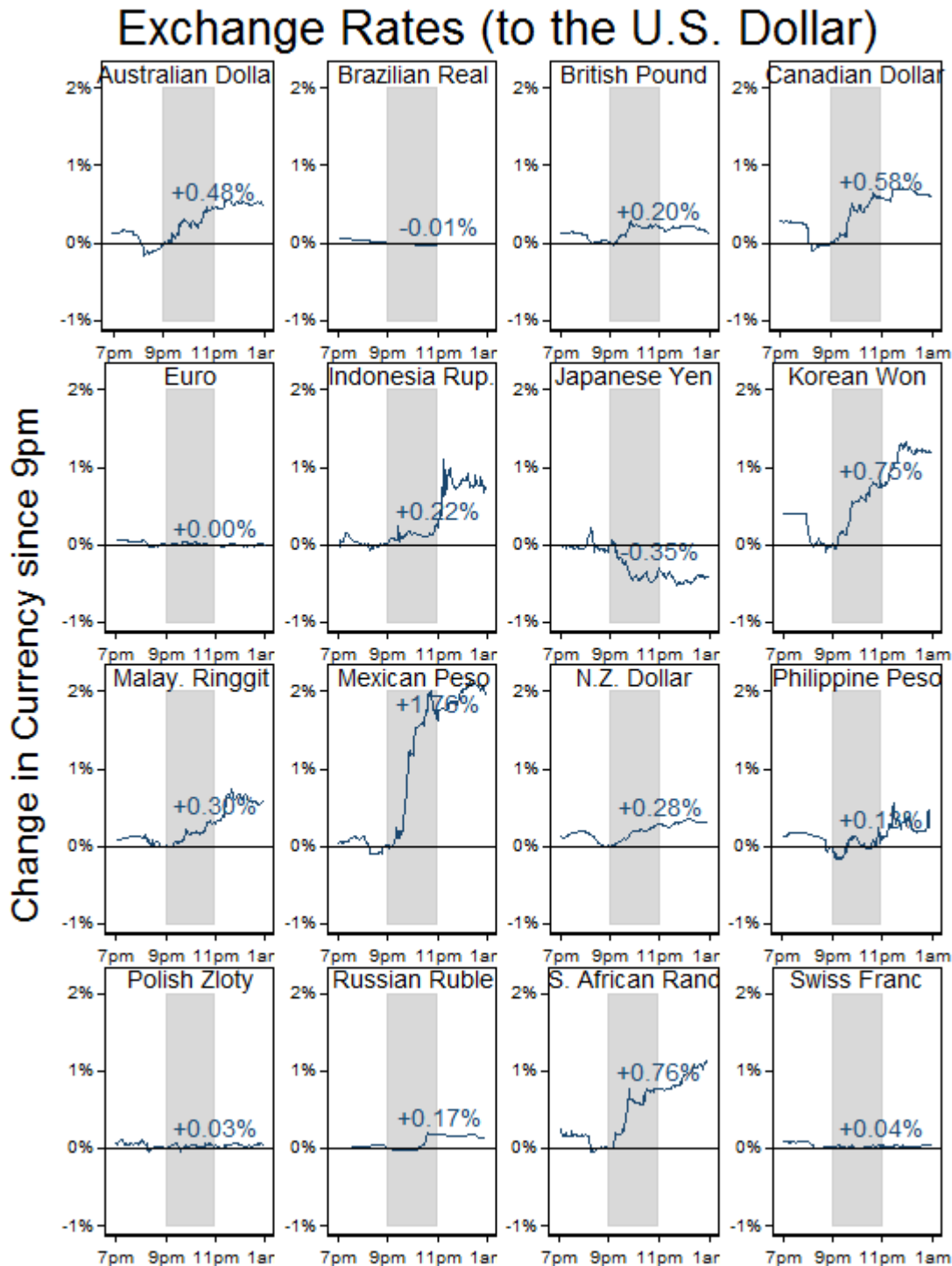
Interestingly, the US dollar-Euro exchange rate remained remarkably stable throughout the debate. The Japanese Yen is the only major currency to have depreciated during the debate, and the decline was statistically significant.

Energy and precious metal prices

Finally, we can analyze the response of energy and precious metal prices, each of which are also traded on global markets. In each case, we focus on the futures contract that is most heavily traded.

Figure 11
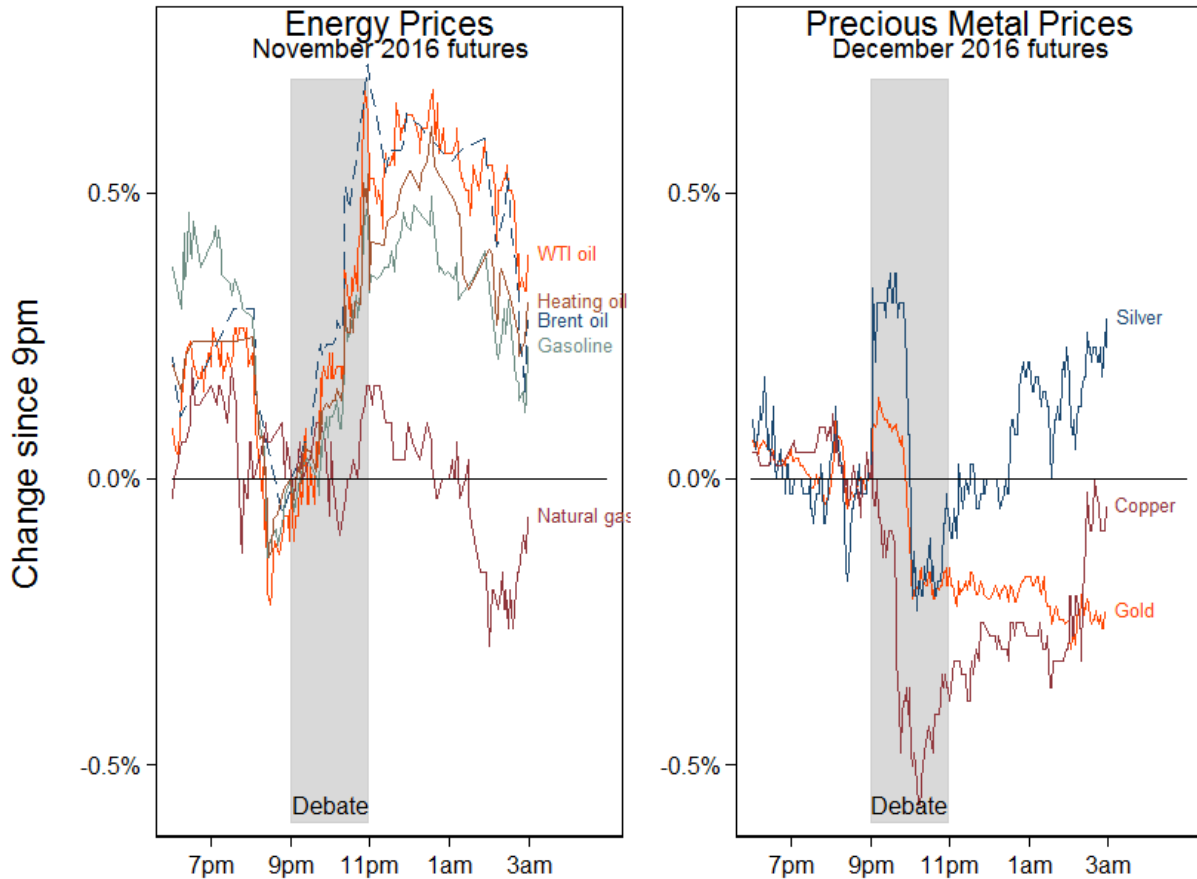
As Figure 11 illustrates, energy prices rose during the debate, but the increases were only statistically significant for West Texas Intermediate (WTI) crude oil and unleaded gasoline. The price movements for both Brent and WTI crude oil imply an oil price that would $4 per barrel higher under a President Clinton.

The prices of both Gold and Silver fell slightly during the debate, but they were also extremely volatile, initially rising then falling. Given that neither of these changes were statistically significant, and that this time series pattern did not match what was happening to the election odds, we don't think this is a finding worth emphasizing. Other precious metals (Palladium and Platinum) did not change during the debate, and agricultural commodities were also generally flat.

V. A Second Event: The Trump Tape

Eleven days after the first debate, a news story broke which led to a second sharp revision in Mr. Trump's odds of winning the election. At 4:02pm EST on Friday October 7, the Washington Post released a video of an outtake from "Access Hollywood" in which Mr. Trump boasted of having sexually assaulted women.[14] The full political impact that this tape would have was not immediately obvious, but it set off a cascade of political reactions that extended through the weekend (and beyond): Dozens

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[14] https://www.washingtonpost.com/politics/trump-recorded-having-extremely-lewd-conversation-about-women-in-2005/2016/10/07/3b9ce776-8cb4-11e6-bf8a-3d26847eeed4_story.html

of leading Republicans announced that they were withdrawing their endorsements or other support for Mr. Trump, other leading Republicans called for him to step aside, and rumors started to swirl that Mr. Trump might be replaced on the Republican ticket by Mike Pence.

An imperfect natural experiment

At first blush, this appears to present an ideal opportunity for a subsequent event study. However, it is confounded in several important respects. The import of the tape was not immediately obvious to market participants, and as Figure 12 shows, it took quite some time for the prediction market to adjust. In part, this reflects the difficulty of interpreting the magnitude of political news — this was not the first scandal to hit the Trump campaign, and many others were forgotten within a news cycle or two.

Figure 12
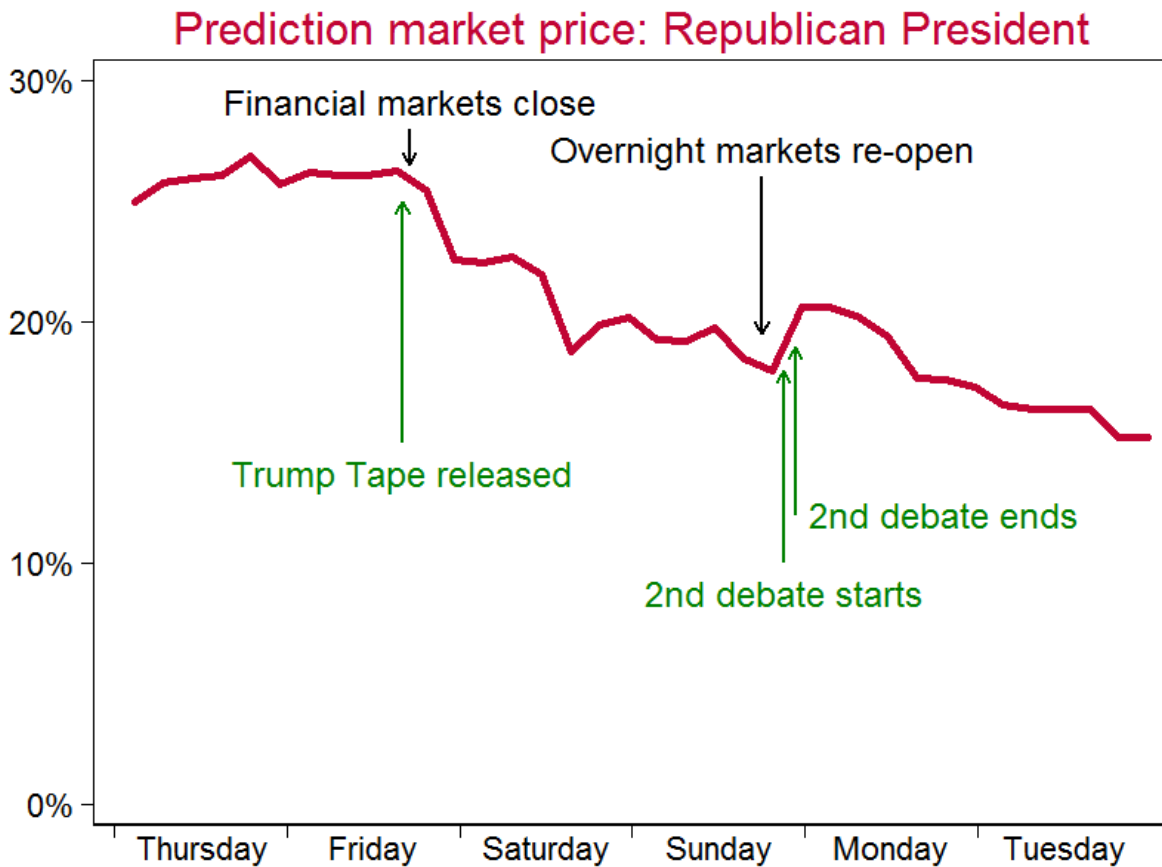
Moreover, the tape was not the only source of news over the weekend. Rather, it was the catalyst for political tumult, including a large number of individually smaller "events" as many leading Republicans unendorsed Mr. Trump, or suggested that he step aside. Unfortunately almost all of this played out over the weekend, when markets—including overnight futures markets—were closed. To explain: Overnight futures trading runs almost continuously from Sunday evening through to Friday afternoon, which is why we had high frequency data during the first debate. But these markets are closed from Friday afternoon through to Sunday evening, which is when the saga surrounding the Trump tape played out. Thus, we can't examine how financial markets responded within a narrow window; the best we can do is compare prices on Friday afternoon at 4pm—minutes before the story broke—with opening prices when overnight futures opened more than two days later, at 6pm on

Sunday. This longer window makes it more likely that there were other confounding influences shaping financial markets, and it sharply reduces our statistical power.

In addition, markets were responding to more than one political development. Partly, they responded to the decreased likelihood of a Trump win; partly they responded to the increased likelihood that a more conventional Republican — Mike Pence — would take over as the Republican nominee; and partly they responded to the emerging possibility that this scandal would also give Democrats control of the House, as well as the Senate. A further confounding factor is that if Democrats also won the House, this would likely mean the end of divided government, and the start of a period of unified government.

The potential increase in disunity in the Republican Party also raises further complications. Our identifying assumption that the event window only contain news that would shift the odds of each candidate winning, and not about their likely performance in office, nor about the state of political competition after the 2016 election. This is arguably less plausible for the Trump Tape window. Disunity in the Republican Party could affect the policies implemented under a Clinton Presidency – or under a still possible Trump Presidency, and emerging fissures among Republican lawmakers also raised concerns about the longer-term viability of the Republican Party.[15]

Despite these difficulties, this event window is the only other sharp shift in electoral probabilities during the general election campaign, and so we will still attempt to learn what we can about market expectations from them. To preview our conclusions: The inferences we draw from this second event are sufficiently noisy that they cannot falsify either the null hypothesis that the market did not react to this change in election odds, nor can they falsify the competing null hypothesis that the market response was consistent with the large "Trump discount" we documented above.

Market movements after the tape's release

First, we start by assessing the change in electoral probabilities. On Friday afternoon, traders at Betfair rated the chances of a Republican presidency at 26.3 percent, and markets were confident that Mr. Trump would be the Republican nominee. By 6pm on Sunday evening, the chances of a Republican presidency had fallen to a 18.0 percent, a decline of 8.3 percentage points.[16] Other prediction markets registered a somewhat smaller change: At PredictIt, the decline was 5 percentage points; the Iowa Electronic Markets (which is linked to the winner of the popular vote) registered a decline of 6.5%, and internet bookmakers adjusted the odds of a Trump win by 6.4%. Another way to scale the size of the political shock is to look at the reaction of the Peso, which had become the preferred financial instrument for placing large bets on the election outcome. The Peso rose by 1.76% during the first debate, but only 1.62% over this later event window.

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[15] See, e.g., Frum, David, "How to Rebuild the Republican Party," The Atlantic, 10/7/2016 (http://www.theatlantic.com/politics/archive/2016/10/how-to-rebuild-the-republican-party/503282/); Spiliankos, Peter, "Reconciliation Starts with Honesty and Humility," National Review, 10/10/2016 (http://www.nationalreview.com/article/440897/republican-reconciliation-noah-rothman-never-trump-peace-terms); Crouere, Andy, "Turn Out the Lights, the Republican Party is Over," Townhall.com, 10/15/2016 (http://townhall.com/columnists/jeffcrouere/2016/10/15/turn-out-the-lights-the-republican-party-is-over-n2232692).

[16] In contrast, prediction markets barely moved during the second debate. This is the norm for most Presidential and Vice-Presidential debates – the first debate in 2016 and, as we discuss below, 2012 are the useful exceptions to this rule.

All told, the change in electoral probabilities that took place over the weekend following the release of the Trump tape looks to be roughly similar to the change during the first debate, although one could make the case that it was either moderately larger, or alternatively, slightly smaller. To be clear, this is a statement about the impact of the Trump tape that had become evident within the first two days; the *total* effect of the Trump tape—much of which played out over the following week—may have been larger still. But in order to preserve statistical power, we are forced to analyze the effects that became evident over the weekend. (Widening our event window into the follow week would yield much less statistical power, because financial markets are much more volatile during on weekdays, particularly during regular trading hours.)

Figure 13 juxtaposes this change in electoral odds with movements in the near-term S&P 500 future, which traded at 2146.75 at 4:00 pm ET, just before the Washington Post story was released. The futures market remained open for another 15 minutes, but didn't really move. Equally, neither did prediction markets, suggesting that the political import of the news was not yet clear. The S&P 500 futures market then re-opened at 6pm on Sunday October at 2152.25, up 0.26% from 4 pm Friday.

<p align="center">**Figure 13**</p>
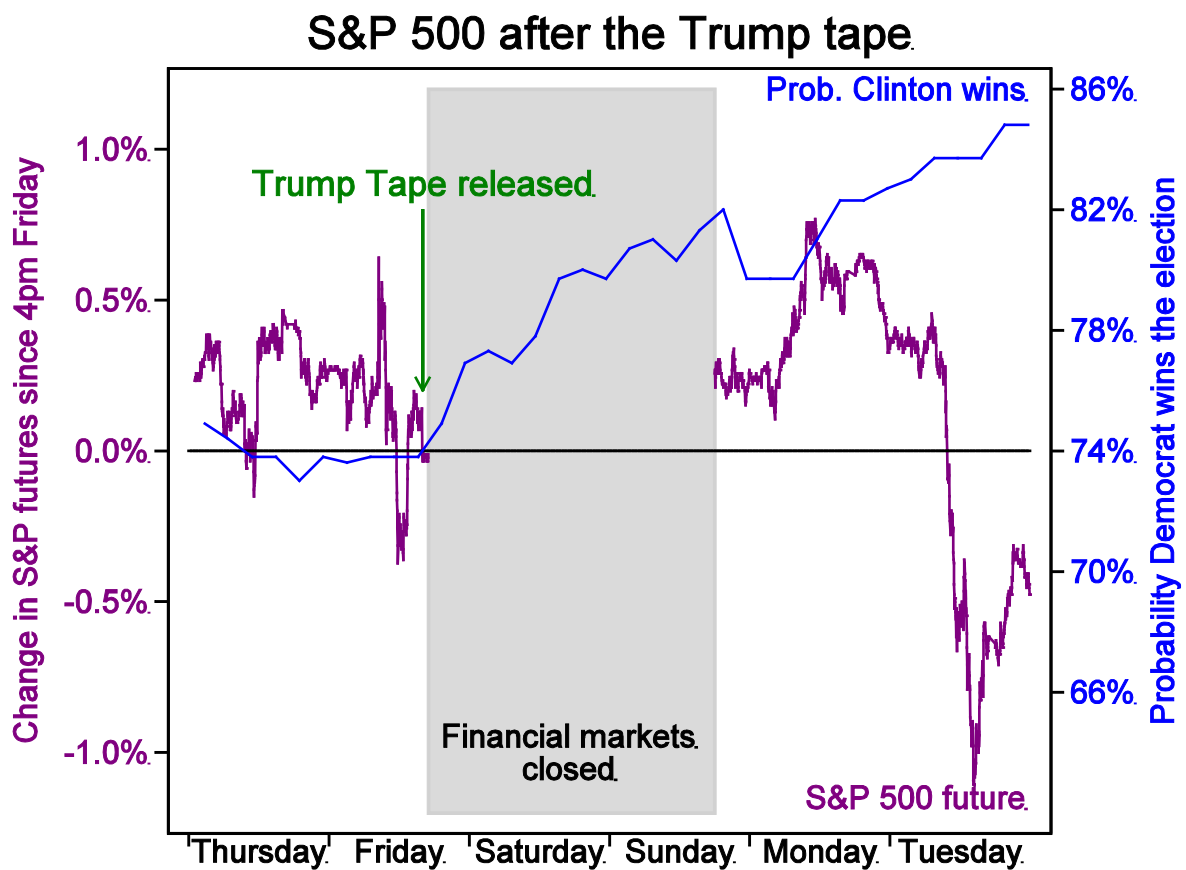
In order to construct a second estimate of the "Trump discount" from these market movements, we need to take a position on precisely how much Mr. Trump's election prospects fell. If the election odds moved by 8.3% — the largest shift across the different prediction markets — then the "Trump discount" was $\frac{0.26\%}{8.3\%} = 3.1$ percent. Substituting smaller estimates of the change in electoral odds yields larger estimates of the "Trump discount". For instance, if the change in electoral odds was the same as

that in the first debate (6 percent), then this event window suggests that the "Trump discount" is $\frac{0.26\%}{6\%} = 4.3$ percent. Either way, these estimates appear a bit smaller than suggested in the previous section. However, they are also less precise.

Figure 14 plots the distribution of changes in the S&P 500 over the equivalent time period for weekends (4pm Friday through to the open on 6pm Sunday) since 2010, and it reveals that a 0.26% rally is relatively unremarkable. Indeed, the standard deviation of over-the-weekend changes in the S&P 500 future is 0.40 percent, so we cannot reject the null hypothesis that the tape caused no statistically significant move in market prices.

Figure 14
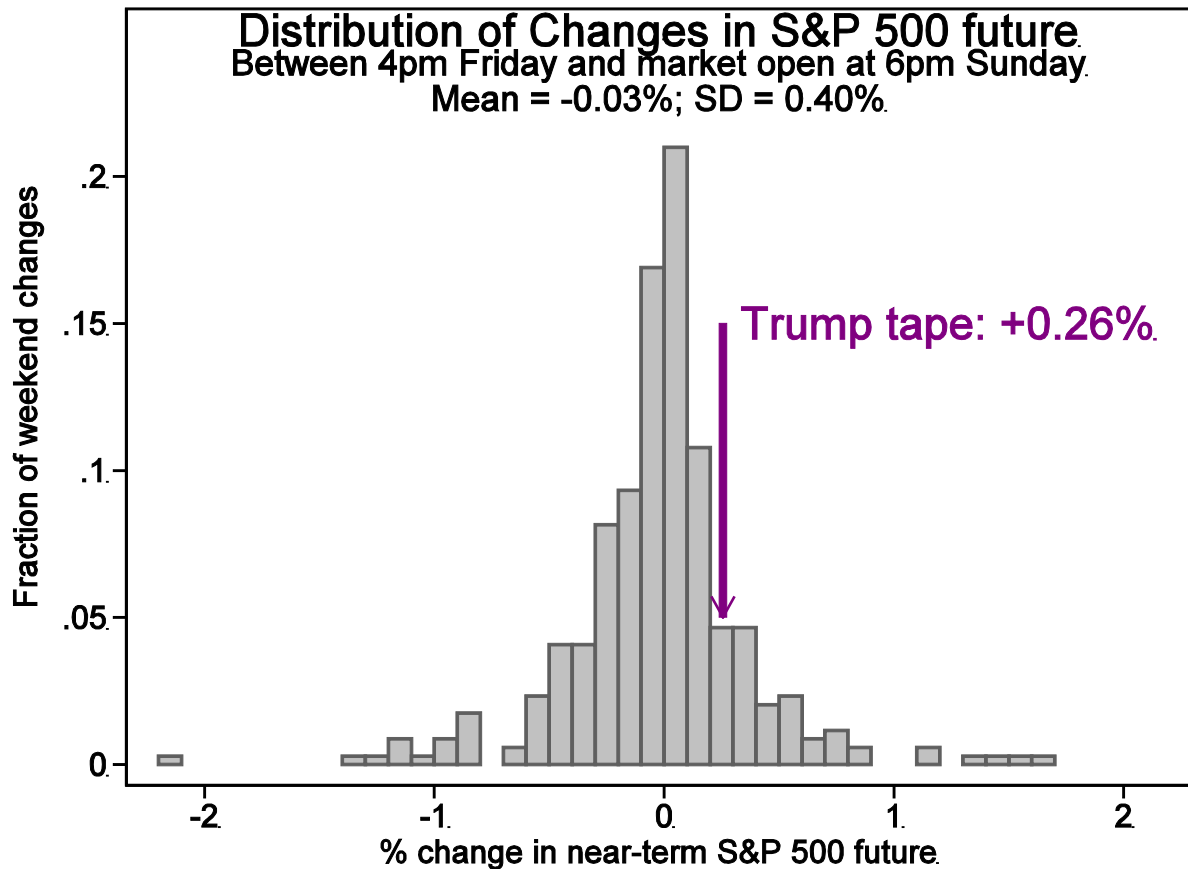
Equally, Figure 14 highlights a central problem of learning much from this episode: Over a typical weekend, enough other factors change that the market often records relatively large movements, even on weekends not marred by political scandal. These other factors would make it much tougher to detect the effect of the "Trump tapes" even if the "Trump discount" were as large as our earlier estimates suggest.

Comparing results from the Trump tape and the first debate

To assess whether this second event study is consistent with our earlier findings, we turn to analyzing a different null hypothesis — that the "Trump discount" is the same in the two episodes. If the shock to election probabilities is similar, then they should have yielded a similar response in financial markets. Thus, we now analyze the null hypothesis that the financial market movements

during each event window was the same. This is equivalent to asking whether the difference in the financial market response to each episode was statistically significantly different from zero.

Table 3 repeats our earlier estimates and standard errors for market movements during the Debate window, and adds estimates and standard errors for market movements during the Trump Tape window. Generally speaking, those financial prices that moved sharply in the first event also moved sharply during the second event. (The British Pound is a notable exception, perhaps due to ongoing Brexit-related news during the second of our event windows.)

The final two columns Table 3 then report estimates and standard errors of the difference in the market movements during each event window. Standard errors are constructed assuming that the non-electoral market movements in the two windows are independent.[17] These latter estimates can be interpreted as tests of whether our estimates of the "Trump discount" in each window are the same. Apart from the British Pound, all of these estimates are statistically insignificant, suggesting that we cannot reject the null that the market responded similarly in both episodes. In turn, this reflects the relative imprecision of our estimates of the effects of the Trump tape, which is due to the length and thus noisiness of the second event window.

Figure 15 provides another window into why the differences in the point estimates across these two episodes may well reflect random noise. Our test statistic is the difference between the change in the S&P 500 from 9pm to 11pm on a Monday and the change over a window that began 11 days later and ran from 4pm Friday to 6pm Sunday. Thus, we construct the equivalent difference using data back to 2010, and show this distribution in Figure 15. As this figure shows, it is not unusual for other factors to create relatively large differences in S&P returns across these two windows.

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[17] Specifically, we calculate the standard error as the square root of the sum of the squared standard errors in each window.

Figure 15

Distribution of differences in S&P 500 changes
between two event windows
Difference: 0.46%

Difference in the %change in near-term S&P 500 future between two windows
Window 1: Change from 9pm to 11pm on Monday evening less
Window 2: Change from 4pm Friday to 6pm Sunday, 11 days later
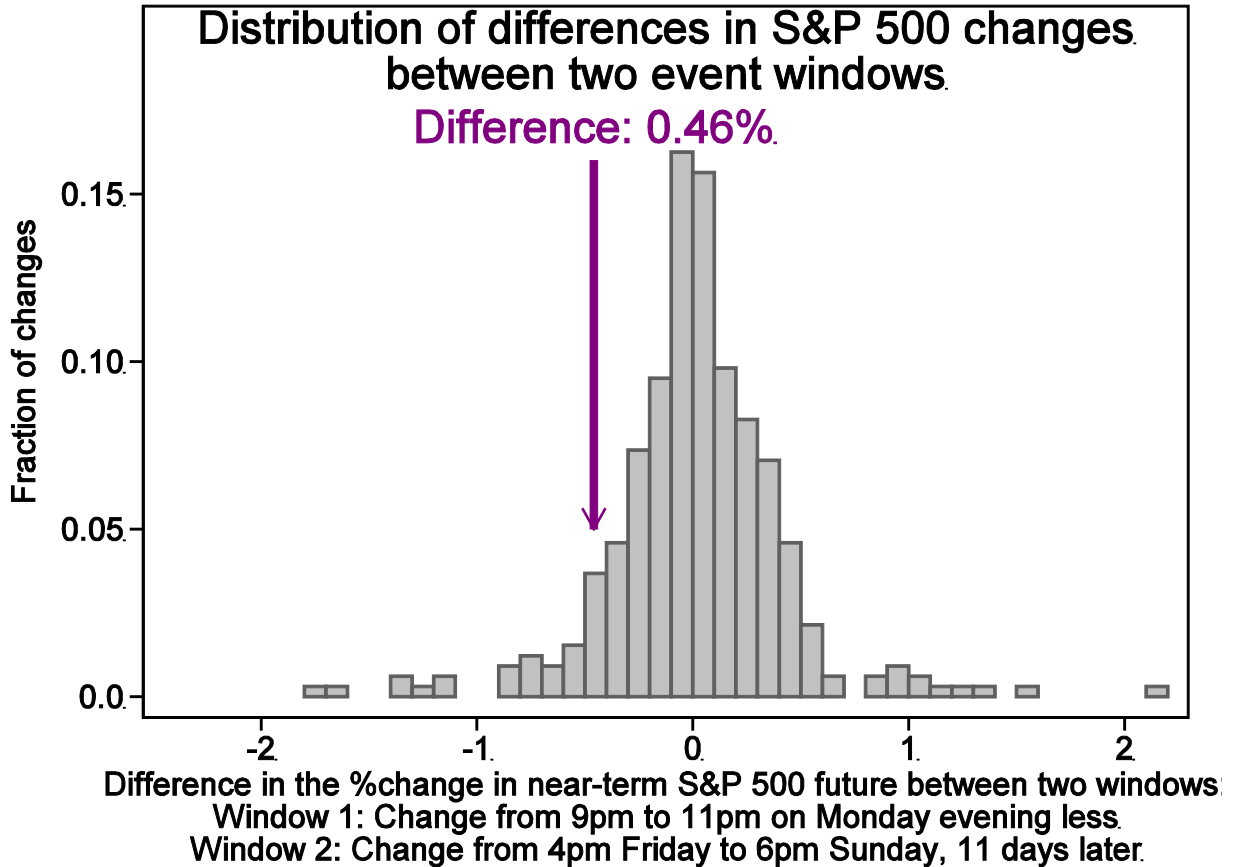
Beyond statistical noise, another reason that our point estimates from these two event studies may differ is that the Trump tape arguably includes more than one event—it combines a reduced chance of a Trump presidency, an increased chance of a Pence presidency, an increased chance of unified Democratic control of the White House and both houses of Congress, and the possible future repercussions of division among Republicans. By contrast, the first debate did not lead to speculation about Trump dropping out, nor did it much change the odds of Democrats taking the House or Senate. While it would be interesting to try to say something about how markets view these other events, Figure 15 illustrates that we lack the statistical power to do so.

Combining the results from the two event studies

An alternative use of the results from the Trump Tapes window is to ignore the potential confounding political news and treat this second event as a second opportunity to learn about the size of the "Trump discount." That is, we can combine information from both event studies to come up with a more precise estimate of the "Trump discount."

Our estimates from the debate window were significantly more informative than those from the Trump tape, which typically had standard errors that were about twice as large of those from the debate window (this is roughly true for equities, Treasuries, energy, and metals, but the ratio varies considerably for volatility and exchange rates). Thus we calculate a precision-weighted average in which we weight each estimate by the inverse of its variance, which is the square of the standard error.

This means that our estimates typically put about 80 percent weight on results from the debate event study and 20 percent weight on those from the Trump tape event study.

Table 4 presents the results of that exercise, as well as the weights we use in each case. Typically these estimates of the "Trump discount" are somewhat smaller than those shown in Table 1, but given the greater precision that comes from using more information, so are the standard errors. As a result, our findings about statistical significance remain similar.

If there were other events that sharply shifted the odds of a Trump v. Clinton presidency, we would want to analyze them, too. However, while there were many notable news cycles through the campaign, few moved the election odds by much. While the first debate yielded a sharp shift in election odds, neither the second, the third, nor the Vice Presidential debate moved them meaningfully. And while the election odds did move through the course of the campaign, they did so gradually, and over a period of weeks, rather than hours. These movements in election odds have less clearly-identifiable causes, and so the correlation between prediction markets and financial markets may reflect the influence of omitted variables such as shifts in populist sentiment, the state of the economy, or other factors. Moreover over these longer horizons, so many other factors are moving financial markets that we lack the statistical power to identify political effects, even if they are large.

VI. The "Trump Discount" in Historical Context

We now turn to the putting our results in a broader historical context, comparing our estimate of the "Trump discount" with the market's assessment of candidates in past elections. We begin by comparing the 2016 race with the 2012 election, and then turn to comparisons stretching back throughout (and beyond!) the last century.

The 2012 Election

The first debate in 2012

For a debate to yield insight into how markets assess the consequences of different candidates winning, it needs to shifts the candidates' odds of winning sharply.[18] That is, the debate needs to yield a surprising outcome and the markets need to digest its import quickly. However such surprises are rare. Indeed, in the era in which modern political prediction markets have been active, there has only been one other debate that moved political probabilities by more than 5 percent: the first debate in 2012, when Mitt Romney thumped a lackluster President Obama.[19] As such, it provides a natural comparison point to our analysis of the first Clinton-Trump debate.

During this debate, the prediction market security at Intrade tied to a Romney victory rose from 25 to 32 percent (using a 9 PM to 11 PM window as we do for 2016). As the left panel of Figure 16

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[18] To see this, note that if the standard deviation of normal market movements during a 2-hour debate window is 0.2 percent, then a debate that changes election probabilities by 5 percent will yield an electoral effect estimate with a standard error of just over 4 percent (since when we divide by the electoral probability we scale up the error in the estimate by a factor of 20; we then need to adjust for any imprecision in our measurement of the prediction market change). This means the estimate would have a confidence interval of roughly +/- 8 percent.
[19] We base this statement on an analysis of changes in electoral probabilities from the Iowa Electronic Markets from midnight Central Time on the day before the debate to midnight on the evening of the debate. The next two most consequential debates were the second and third Presidential debates in 2000, won by Bush and Gore, respectively. Each was accompanied by a probability shift of approximately 4 percent.

shows, this led the S&P 500 to rise by 0.33 percent. (We've kept the axes consistent with Figure 1, so as to allow a direct comparison.)
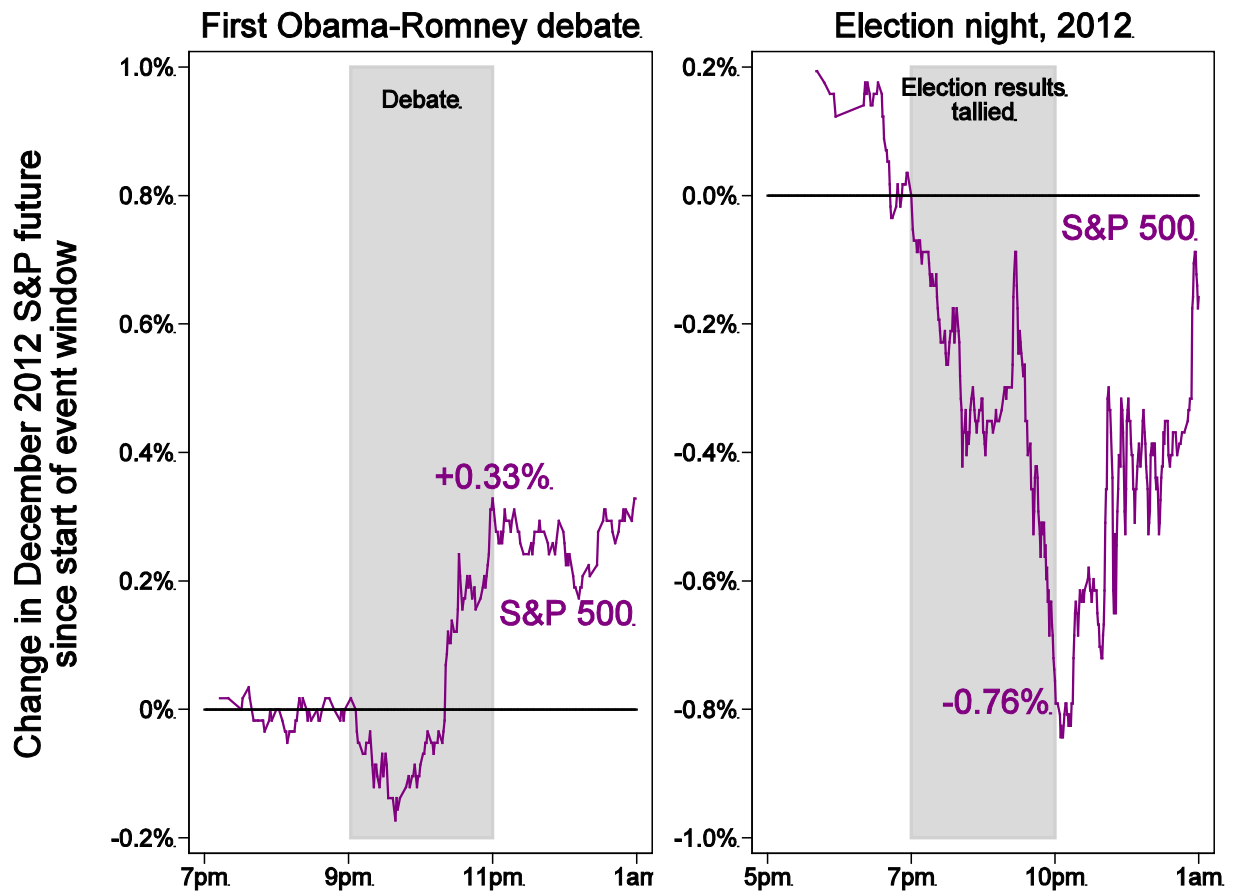
This yields two immediate observations. First, in 2012, the market rose in response to an increased chance of a Republican president, which stands in stark contrast to 2016, when it rose in response to an increased chance of a Democrat. And second, the effect in 2012 is much smaller. Comparing the shift in prediction markets with that in the stockmarket suggests that markets priced in a "Romney premium" of $\frac{0.33\%}{32\%-25\%} = 4.7$ percent. The standard error of this estimate is roughly 3 percent. As such, while the confidence interval around this estimate is fairly wide, it still allows us to reject the hypothesis that the market assessed the consequences of a Romney Presidency similarly to that of a Trump presidency.

Election Night 2012

There's a second clear event that sharply shifted the odds in 2012: Election night. The Betfair prediction market gave President Obama a roughly 80 percent probability of reelection for most of Election Day. Between 7pm and 10pm Eastern Time, exit polls were released and the early count from states in the east and midwest was strong enough for Mr. Obama that he could be reasonably assured

of reelection, and his Betfair price rose to 97.5 percent.[20] The right panel of Figure 15 shows that over this period, the S&P 500 futures fell by 0.76 percent. Taken together, these movements imply that the market price of the S&P 500 would have been $\frac{0.76\%}{97.5\%-80\%} = 4.5$ percent higher under a Romney Presidency. The standard error for this estimate is about 1.6 percent.[21]

Thus our two estimates of the "Romney premium" are remarkably consistent: The first debate suggests that it is 4.7 percent (with a standard error of 3.0%), and election-day suggests that it is 4.5 percent (with a standard error of 1.6%). The latter is more precise because the shift in electoral probabilities was larger. Both are smaller than the "Trump discount," and both suggest that unlike 2016, in 2012 traders were willing to pay more for stocks under a Republican president.

This analysis of the election night experiment suggests that we might be able to produce similar estimates of the "Republican premium" for a range of past elections. These past elections might provide further context for interpreting the size (and sign) of the "Trump discount." That's our next task.

The long history of U.S. elections

The best opportunities to learn about electoral effects on asset prices come from upset victories (e.g., Truman defeating Dewey in 1948) or the resolution of very close elections (e.g., Bush defeating Kerry in 2004). Unfortunately, when heavy favorites win, there is little news on Election Day, and thus little opportunity to learn.

Our data on changing electoral odds comes from an under-used source: Rhode and Strumpf (2004) document a long history of political prediction markets in the United States, with traders betting on the curb outside the New York Stock exchange. We supplement their historical data with odds from bookmakers in the UK, and, since 1988, from modern political prediction markets. In Snowberg, Wolfers, and Zitzewitz (2007a), we used this history to estimate the average expected electoral effect for Presidential elections from 1880 to 2004. Here, we estimate the "Republican premium" for each specific election — at least for the subset of these elections where election day yielded large enough shifts in expectations about the identity of the next president.

Table 5 reports both the election-day stock return for each of these events, and our estimate of the extent of the electoral surprise (for Republicans who win, this is 100% minus their election-eve probability, and for Republicans who lose, this is 0% minus their election-eve probability). We omit the three-way race in 1912, the unresolved race in 2000, and elections for which a 90-percent-or-higher favorite won, and thus there was limited news on election day (1920, 1924, 1964, 1972, 1992, 1996, and 2008).

Standard errors are estimated as the ratio of the standard deviation of daily returns during the period since the prior election and the election-day surprise. As expected, we obtain much more precise estimates for 50-50 races and for elections with an upset winner (like 1948) than for elections

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[20] We focus on Betfair in this analysis due to concerns that the Intrade market was affected on Election Night by a single large trader (Rothschild and Sethi, 2015). Using the Obama reelection probability from Intrade, which increased from 70 to 92 percent between 7 and 10 PM, would reduce both our estimated effect and standard error by about 20 percent.

[21] We calculate the standard error using the standard deviation of S&P 500 changes between 7 and 10 PM Eastern time from 1/1/2010 to 11/5/2012 (0.28 percent), dividing this by the prediction market movement of 17.5 percent, and then adjusting for the imprecision in a 3-hour prediction market change.

in which a heavy favorite wins. Estimates are also more precise for periods when markets were calm than for volatile periods, such as the Great Depression.[22]

While estimates for some elections are imprecise, some general patterns emerge from Table 5. Of the 24 elections we analyze, 18 yield estimates of a positive "Republican premium," and in nine of these cases, the premium is statistically significant at the ten percent level. None of the instances of a "Republican discount" are statistically significant, suggesting that the "Trump discount" is an historic anomaly. A broad political trend also appears: Generally the estimated effects are quite large prior the end of World War Two, but since then, estimated effects have been much smaller. This is consistent with a moderation of left-right differences on economic policy during the Cold War. Again, the emergence of a large "Trump discount" stands at odds with this historical trend.

VII.   A final puzzle: Nervousness about Trump, but calm overall

Taken together, the financial price movements suggest market participants expect a stronger economy under a President Clinton and higher risk under a President Trump. The increases in equity prices, energy prices, and Treasury yields during the debate are all consistent with a stronger economy under a President Clinton. Likewise the decline in the VIX futures, and in funding currencies like the Yen, Dollar, and Euro are all consistent with lower expectations of risk. The movement in the December VIX futures imply a VIX of 15.6 under President Clinton and 22.1 under President Trump. The differences for April 2017 are smaller (22.8 under Trump and 18.9 under Clinton). This is consistent with the market expecting significant additional policy uncertainty under a President Trump, especially in the transition period. The movements in foreign equity markets suggest that the implications of the U.S. election extend far beyond her borders.

A few results do not fit with this general pattern or are otherwise puzzling. The fact that the dollar weakened against most currencies as Trump was losing the debate is inconsistent with his advocacy of devaluation during the debate. The Russian Ruble appreciated during the debate despite Trump's apparent foreign policy tilt towards Russia.

There's one more finding that strikes us as puzzling. In the days following the first debate, Mr. Trump still had a 30 percent chance of winning the election. If the S&P 500 is worth 11 percent less under President Trump, then this introduces a significant source of uncertainty that the market should expect to be resolved over the subsequent six weeks. Either Trump losses, boosting the market by about 3.3 percent, or he wins, depressing it by about 7.7 percent.

Put all this together, and the election is expected to raise the standard deviation of stock returns by $\sqrt{70\% \times 3.3\%^2 + 30\% \times -7.7\%^2}$ = 5%. Yet the total volatility implied in S&P 500 options prices for that time period was roughly 14-16 percent annualized, which translates to an expected 6-week standard deviation of about 5 percent![23] Taken literally, this suggests that the resolution of the 2016 Presidential election accounts for all market uncertainty over this period, which strikes us as implausible.

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[22] For 2004, we conduct an analysis of higher frequency market movements on Election Night in Snowberg, Wolfers, and Zitzewitz (2007a) similar to the above analysis for 2012. This yields a more precise estimate than we can obtain using daily data; we find that the S&P 500 was expected to be about 2 percent higher under President George W. Bush (with a standard error of about 1 percent).

[23] The implied volatility of at-the-money S&P 500 index options was approximately 14 percent after the debate, while the VIX indices and VIX futures were approximately 16 percent.

Stated more simply, given how relieved markets seem to be at Clinton's debate victory having reduced Trump's victory probability from 37 to 31 percent, the pricing of VIX futures suggests that they remained excessively calm about his remaining chance of winning.

There are four possible resolutions of this puzzle. First, perhaps at this point, option markets were underestimating future volatility. Second, our estimate of the "Trump discount" could be too high. Third, prediction markets may have overstated the post-debate probability of Trump winning, thereby overstating Trump-related risk. Fourth, markets could be expecting non-electoral news to be minimal between now and the election.

The first explanation, while possible, would be at odds with the past literature, which has generally found that option implied volatility overpredicts future volatility (see., e.g., Poon and Granger, 2003). The second explanation is clearly plausible though. Even though our estimate of the "Trump discount" is statistically significant it is not particularly precise, and a 95 percent confidence interval stretches from 6 percent to 18 percent. If the true discount were actually only 9 percent, this would contribute to significantly the explaining the puzzle.

The third explanation that prediction markets is also a possibility. Past work (Snowberg, Wolfers, and Zitzewitz, 2005 and 2013; Page and Clemen, 2013) has found that political prediction markets tend to overprice longshot candidates, although given that the uncertainty introduced by a binary event is proportional to $\sqrt{p(1-p)}$ — where p is the probability — mispricings of the typically estimated magnitude would have limited effect on our calculations.

The final explanation may also explain part of the puzzle. For instance, both before and after the debate, the October and November 2016 Federal Funds futures prices implied a very low probability that the Fed would change interest rates before the election. If firms also chose to deliberately delay decisions and news announcements until after the election, it would help explain the otherwise surprisingly low level of volatility.

In summary, the low post-debate level of the VIX may argue for shading our expectations of a "Trump discount" down a bit from our point estimates. Nevertheless, were the true Trump Discount 9 percent rather than 12 percent, it is still quite large both in absolute terms and relative to historical norms.

VIII. Conclusion

When UK voters voted for Brexit, some expressed regret after seeing financial markets response.[24] This suggests potential benefits to estimating these responses in advance. Market participants quoted in the financial press suggest an apparent consensus that a Trump victory would lower equity prices, weaken the economy, and increase risk. Our calibration of these movements using prediction market movements during the debate suggest that the magnitudes of these effects would be much larger than in past Presidential elections. The estimated magnitudes of the "Trump discount" are more comparable to those that accompanied the Brexit vote or 2003 Iraq War.

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[24] See, e.g., Dearden,Lizzie, "Brexit Research Suggests 1.2 million Leave Voters Regret their Choice in Reversal that Could Change Result," The Independent, 7/1/2016 (http://www.independent.co.uk/news/uk/politics/brexit-news-second-eu-referendum-leave-voters-regret-bregret-choice-in-millions-a7113336.html)

Our results are potentially of interest to political scientists. Many commentators have discussed the possibility of a partisan realignment occurring in the Clinton vs. Trump contest.[25] While the permanence of this realignment is uncertain, our results speak to the extent to which the interests of the owners of large publicly-listed firms are — at least in 2016 —better represented by the Democratic party. Our past work examining market responses to Presidential elections found that, at least as far back as 1880, the Republican party was consistently regarded by market participants as better representing these interests. This is particularly striking given the extent to which the parties have exchanged places on other issues.

Academics and commentators have also discussed an increasing political polarization (e.g., McCarty, Poole, and Rosenthal, 2016). As recently as the 1996 or even 2000 election, U.S. Presidential politics appeared well described by median voter theory, which predicts that two political parties would compete by positioning themselves close to the political center. We interpreted our findings of relatively small stock market reactions to Presidential elections between 1880-2004 as consistent with this theory. Our results for 2016 are then likewise consistent with the general sense that the forces at work in median voter theory are no longer as dominant in U.S. politics.

We conclude by cautioning that none of our asset prices are proxies for social welfare. Our historical finding of a "Republican premium" in equity markets could be explained in part or full by differences in policies toward the taxation of capital. But this does not explain our 2016 results, since markets expect equities to be worth more under a President Clinton despite the fact that she has proposed capital tax increases and Trump has proposed cuts. Another source of difference between stockholder and social welfare would be the welfare of workers. While other economic research may lead one to be skeptical that the benefits for blue-collar workers of a President Trump's trade and immigration policies will be large, our results do not speak directly to these or other components of social welfare.

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[25] See, e.g., Brooks, David, "The Coming Political Reallignment," New York Times, 7/1/2016; Lind, Michael, "This is What the Future of American Politics Looks Like," Politico Magazine, 5/22/2016; Judis, John, "After 2016, Will Political Parties Ever Look the Same?" Washington Post, 3/11/2016.

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Table 1: Asset Prices Before and After First Presidential Debate

	Asset price level			Implied effect of a Clinton win	
	9pm	**11pm**	**%change**	**Local currency**	**USD**
U.S./UK Equity Index futures (all Dec 2016)					
S&P 500	2135	2150	0.71%**	11.9%	
S&P Midcap	1536	1549	0.82%***	13.7%	
Nasdaq 100	4805	4836	0.65%**	10.8%	
Russell 2000	1234	1244	0.81%**	13.5%	
Dow 30	17980	18098	0.66%**	10.9%	
FTSE 100 (local currency)	6770	6812	0.61%**	10.2%	13.5%
Asia-Pacific indices (spot indices for Korea and Singapore, futures for others; all local currency)					
Japan (Nikkei 225)	16175	16355	1.11%?	18.5%	12.7%
South Korea (KOSPI)	255.8	258.4	1.04%?	17.3%	29.9%
Hong Kong (Hang Seng)	23255	23485	0.99%?	16.5%	16.6%
Singapore (Straits Times)	2835	2851	0.58%?	9.7%	11.6%
Australia (ASX 200)	5360	5374	0.26%?	4.4%	12.3%
S&P 500 Volatility futures					
S&P 500 VIX October 2016	16.45	15.9	-3.34%***	NA	
S&P 500 VIX November 2016	17.52	17.05	-2.68%***	NA	
S&P 500 VIX December 2016	18.04	17.65	-2.16%***	-36.0%	
S&P 500 VIX January 2017	19.15	18.8	-1.83%***	-30.5%	
S&P 500 VIX February 2017	19.6	19.26	-1.73%***	-28.9%	
S&P 500 VIX March 2017	19.85	19.62	-1.16%**	-19.3%	
S&P 500 VIX April 2017	20.35	20.08	-1.33%***	-22.1%	
Treasury futures (all December 2016)					
2-Year T-Note	109.266	109.234	-0.03%**	-0.5%	
5-Year T-Note	121.633	121.539	-0.08%**	-1.3%	
10-Year T-Note	131.328	131.203	-0.10%*	-1.6%	
T-Bond	168.313	168.156	-0.09%	-1.5%	
Ultra T-Bond	184.031	183.844	-0.10%	-1.7%	
Foreign exchange (currency units per USD, spot rates)					
Mexican Peso (x 100)	5.0261	5.1143	1.76%***	29.3%	
South African Rand	0.0729	0.0734	0.76%***	12.6%	
Korean Won (x 1,000)	0.8994	0.9062	0.75%***	12.6%	
Canadian Dollar	0.7541	0.7585	0.58%***	9.7%	
Australian Dollar	0.7626	0.7662	0.48%*	7.9%	
Malaysian Ringgit	0.2416	0.2424	0.30%	5.0%	
New Zealand Dollar	0.7266	0.7287	0.28%	4.7%	
Indonesian Rupiah (x 10,000)	0.7672	0.7689	0.22%	3.7%	
British Pound	1.2955	1.2981	0.20%**	3.3%	
Russian Ruble	0.0157	0.0157	0.17%*	2.8%	
Philippine Peso (x 100)	2.0712	2.0739	0.13%	2.2%	
Singapore Dollar	0.7346	0.7354	0.11%	1.8%	
Swiss Franc	1.0311	1.0314	0.04%	0.6%	
Polish Zloty	0.2618	0.2619	0.03%	0.6%	
Hong Kong Dollar	0.1289	0.1290	0.01%	0.2%	
Euro FX	1.1246	1.1247	0.00%	0.0%	

Saudi Riyal	0.2669	0.2669	-0.01%	-0.2%
Brazilian Real	0.3085	0.3085	-0.01%	-0.2%
Chinese Yuan	0.1500	0.1499	-0.02%	-0.3%
Japanese Yen (x 100)	0.9968	0.9933	-0.35%**	-5.9%
Energy futures				
Crude Oil Brent	46.93	47.18	0.53%	8.9%
Crude Oil WTI	45.6	45.84	0.53%*	8.8%
Natural Gas	3.07	3.074	0.13%	2.2%
Gasoline RBOB	1.3759	1.3808	0.36%	5.9%
ULSD NY Harbor	1.4461	1.4521	0.41%*	6.9%
Metals futures (all December 2016)				
Gold	1341.4	1339.3	-0.16%	-2.6%
Silver	19.505	19.49	-0.08%	-1.3%
High Grade Copper	2.191	2.1825	-0.39%	-6.5%

Statistical significance at the 10, 5, and 1 percent level is indicated by 1, 2, and 3 asterisks, respectively. Statistical significance is determined using the model-free p-values for Mondays only given in Table 2. Statistical significance cannot be determined for Asian equity indices due to limitations in historical data availability (this is indicated with a question mark). For VIX futures beyond the first two near months, statistically significance is estimated using the standard error for the near month plus one due to the limit trading history of longer maturity contracts.

Note: For the Nikkei 225, the event window ends at 11:30 PM Eastern Time rather than 11 PM due to the market's lunch break.

Table 2: Standard errors for market movements in the 9pm-11pm window

	Estimate	Standard error		Model-free p-value	
	Change during debate	Mondays only	All days	Mondays only	All days
U.S./UK Equity Index futures (all Dec 2016)					
S&P 500	0.71%	0.18%	0.19%	0.009	0.012
S&P Midcap	0.79%	0.19%	0.21%	0.005	0.007
Nasdaq 100	0.62%	0.17%	0.19%	0.013	0.015
Russell 2000	0.77%	0.19%	0.22%	0.008	0.012
Dow 30	0.63%	0.16%	0.17%	0.009	0.012
FTSE 100 (local currency)	0.58%	0.20%	0.23%	0.012	0.013
S&P 500 Volatility futures					
S&P 500 VIX near month	-3.34%	0.71%	1.36%	0.017	0.000
S&P 500 VIX near month + 1	-2.68%	0.42%	0.66%	0.011	0.000
Treasury futures (all December 2016)					
2-Year T-Note	-0.03%	0.01%	0.01%	0.019	0.019
5-Year T-Note	-0.08%	0.04%	0.04%	0.035	0.029
10-Year T-Note	-0.10%	0.07%	0.06%	0.134	0.097
T-Bond	-0.09%	0.11%	0.11%	0.259	0.229
Ultra T-Bond	-0.10%	0.14%	0.15%	0.325	0.297
Foreign exchange (currency units per USD, spot rates)					
Mexican Peso (x 100)	1.76%	0.12%	0.14%	0.000	0.001
South African Rand	0.76%	0.19%	0.22%	0.006	0.003
Korean Won (x 1,000)	0.75%	0.17%	0.19%	0.003	0.007
Canadian Dollar	0.58%	0.11%	0.11%	0.003	0.001
Australian Dollar	0.48%	0.28%	0.25%	0.074	0.058
Malaysian Ringgit	0.30%	0.22%	0.26%	0.118	0.107
New Zealand Dollar	0.28%	0.23%	0.21%	0.163	0.140
Indonesian Rupiah (x 10,000)	0.22%	0.58%	0.56%	0.386	0.380
British Pound	0.20%	0.10%	0.15%	0.040	0.031
Russian Ruble	0.17%	0.09%	0.09%	0.075	0.057
Philippine Peso (x 100)	0.13%	0.17%	0.17%	0.343	0.365
Singapore Dollar	0.11%	0.13%	0.12%	0.249	0.247
Swiss Franc	0.04%	0.11%	0.12%	0.686	0.651
Polish Zloty	0.03%	0.14%	0.17%	0.704	0.681
Hong Kong Dollar	0.01%	0.01%	0.01%	0.214	0.220
Euro FX	0.00%	0.12%	0.12%	0.980	0.980
Saudi Riyal	-0.01%	0.02%	0.02%	0.111	0.097
Brazilian Real	-0.01%	0.03%	0.04%	0.365	0.382
Chinese Yuan	-0.02%	0.13%	0.12%	0.671	0.701
Japanese Yen (x 100)	-0.35%	0.16%	0.22%	0.040	0.048
Energy futures					
Crude Oil Brent	0.53%	0.42%	0.40%	0.131	0.124
Crude Oil WTI	0.53%	0.31%	0.32%	0.077	0.080
Natural Gas	0.13%	0.25%	0.24%	0.515	0.481

Gasoline RBOB	0.36%	0.24%	0.25%	0.119	0.118
ULSD NY Harbor	0.41%	0.24%	0.24%	0.075	0.064
Metals futures (all December 2016)					
Gold	-0.16%	0.24%	0.26%	0.280	0.241
Silver	-0.08%	0.44%	0.49%	0.697	0.677
High Grade Copper	-0.39%	0.46%	0.46%	0.320	0.320

Standard errors are calculated as the standard deviation of market movements between 9 PM and 11 PM Eastern Time between 1/1/2010 and 9/25/2016, on days with at least one trade in the 30 minutes prior to each time. Model free p-value is the share of these days with an absolute market movements greater than the movement on 9/26/2016.

Table 3: Electoral impact estimates from "Trump tape" event study

	Debate #1		Trump tape		Trump tape - Debate	
	Change	**SE**	**Change**	**SE**	**Change**	**SE**
U.S./UK Equity Index futures (all Dec 2016)						
S&P 500	0.71%***	0.18%	0.26%	0.40%	-0.46%	0.43%
S&P Midcap	0.79%***	0.19%	0.23%	0.41%	-0.57%	0.46%
Nasdaq 100	0.62%***	0.17%	0.27%	0.39%	-0.35%	0.42%
Russell 2000	0.77%***	0.19%	0.22%	0.45%	-0.55%	0.49%
Dow 30	0.63%***	0.16%	0.28%	0.36%	-0.35%	0.40%
FTSE 100 (local currency)	0.58%***	0.20%	0.06%	0.58%	-0.52%	0.61%
S&P 500 Volatility futures						
S&P 500 VIX near month	-3.34%	0.71%	-1.00%	7.08%	2.35%	7.11%
S&P 500 VIX near month + 1	-2.68%	0.42%	-0.60%	2.13%	2.08%	2.17%
Treasury futures (all December 2016)						
2-Year T-Note	-0.03%**	0.01%	0.01%	0.03%	0.04%	0.03%
5-Year T-Note	-0.08%*	0.04%	-0.01%	0.09%	0.07%	0.10%
10-Year T-Note	-0.10%	0.067%	-0.02%	0.14%	0.07%	0.16%
T-Bond	-0.09%	0.11%	-0.08%	0.24%	0.02%	0.27%
Ultra T-Bond	-0.10%	0.14%	-0.10%	0.35%	0.00%	0.38%
Foreign exchange (currency units per USD, spot rates)						
Mexican Peso (x 100)	1.76%***	0.12%	1.62%***	0.15%	-0.13%	0.19%
South African Rand	0.76%***	0.19%	0.26%	0.39%	-0.50%	0.43%
Korean Won (x 1,000)	0.75%***	0.17%	-0.17%	0.94%	-0.93%	0.95%
Canadian Dollar	0.58%***	0.11%	0.42%***	0.12%	-0.17%	0.16%
Australian Dollar	0.48%*	0.28%	0.14%	0.23%	-0.34%	0.37%
Malaysian Ringgit	0.30%	0.22%	0.01%	0.86%	-0.29%	0.89%
New Zealand Dollar	0.28%	0.23%	0.33%	0.22%	0.05%	0.32%
Indonesian Rupiah (x 10,000)	0.22%	0.58%	1.37%**	0.69%	1.14%	0.90%
British Pound	0.20%**	0.10%	-0.24%	0.16%	-0.44%**	0.19%
Russian Ruble	0.17%*	0.09%	-0.01%	0.66%	-0.18%	0.66%
Philippine Peso (x 100)	0.13%	0.17%	0.07%	0.35%	-0.06%	0.39%
Singapore Dollar	0.11%	0.13%	0.04%	0.11%	-0.07%	0.17%
Swiss Franc	0.04%	0.11%	0.06%	0.46%	0.02%	0.48%
Polish Zloty	0.03%	0.14%	-0.04%	0.23%	-0.07%	0.27%
Hong Kong Dollar	0.01%	0.01%	0.00%	0.01%	-0.01%	0.02%
Euro FX	0.00%	0.12%	-0.13%	0.18%	-0.14%	0.21%
Saudi Riyal	-0.01%	0.02%	0.00%	0.20%	0.01%	0.20%
Brazilian Real	-0.01%	0.03%	-0.18%	0.64%	-0.16%	0.64%
Chinese Yuan	-0.02%	0.13%	0.03%	0.23%	0.04%	0.27%
Japanese Yen (x 100)	-0.35%**	0.16%	-0.15%	0.21%	0.21%	0.26%
Energy futures						
Crude Oil Brent	0.53%	0.42%	-0.10%	0.86%	-0.63%	0.95%
Crude Oil WTI	0.53%	0.31%	0.08%	0.68%	-0.45%	0.75%
Natural Gas	0.13%	0.25%	-0.47%	1.43%	-0.60%	1.45%
Gasoline RBOB	0.36%	0.24%	0.02%	0.51%	-0.34%	0.57%
ULSD NY Harbor	0.41%	0.24%	-0.05%	0.47%	-0.47%	0.53%

Metals futures (all December 2016)						
Gold	-0.16%	0.24%	0.17%	0.44%	0.32%	0.50%
Silver	-0.08%	0.44%	0.40%	1.17%	0.48%	1.25%
High Grade Copper	-0.39%	0.46%	-0.02%	0.83%	0.36%	0.95%

Notes: Market movements and standard errors for the Debate #1 event window are from Table 2; the standard errors are the standard deviation of log price changes on Monday nights between 9 PM and 11 PM Eastern between 1/1/2010 and 9/23/2016. Market movements for the "Trump Tape" window are changes from the last trade price before 4 PM Easter Time on Friday, October 7 to the closing price of the first two-minute period with a trade on Sunday, October 9. The first Sunday price is from approximately 4 PM for most Forex markets, 6 PM for most futures, and prior to 8 PM in all cases. Standard errors for the Trump Tape window are the standard deviation of log price changes between the last trade on Friday and the first time period with a trade the following Sunday between 1/1/2010 and 10/6/2016 (only 2-day weekends are included). The "Tape - Debate" estimate is the Trump estimate minus the Debate #1 estimate; the standard error assumes errors in the two windows are independent.

Table 4: Precision-weighted average estimates from combining both event studies

	Estimates of "Trump discount"		Precision-weights	Precision-weighted average	
	Debate #1	Trump tape	Debate weight	Estimate	Standard error
U.S./UK Equity Index futures (all Dec 2016)					
S&P 500	11.9%	4.3%	0.85	10.7%***	2.6%
S&P Midcap	13.2%	2.7%	0.83	11.5%***	2.8%
Nasdaq 100	10.3%	3.2%	0.85	9.3%***	2.5%
Russell 2000	12.8%	2.6%	0.85	11.3%***	2.8%
Dow 30	10.5%	3.3%	0.84	9.4%***	2.4%
FTSE 100 (local currency)	9.6%	0.7%	0.90	8.7%***	3.0%
Treasury futures (all December 2016)					
2-Year T-Note	-0.5%	0.1%	0.85	-0.39%**	0.17%
5-Year T-Note	-1.3%	-0.1%	0.83	-1.17%*	0.62%
10-Year T-Note	-1.6%	-0.3%	0.82	-0.29%	0.95%
T-Bond	-1.5%	-0.9%	0.85	-1.45%	1.56%
Ultra T-Bond	-1.7%	-1.2%	0.87	-1.62%	2.11%
Foreign exchange (currency units per USD, spot rates)					
Mexican Peso (x 100)	29.3%	19.3%	0.65	27.8%***	1.3%
South African Rand	12.6%	3.1%	0.81	11.4%***	2.7%
Korean Won (x 1,000)	12.6%	-2.1%	0.97	12.1%***	2.8%
Canadian Dollar	9.7%	5.0%	0.56	7.7%***	1.1%
Australian Dollar	7.9%	1.6%	0.43	4.3%**	2.1%
Malaysian Ringgit	5.0%	0.1%	0.94	4.7%	3.5%
New Zealand Dollar	4.7%	3.9%	0.50	4.3%**	2.0%
Indonesian Rupiah (x 10,000)	3.7%	16.3%	0.60	8.7%	6.0%
British Pound	3.3%	-2.8%	0.75	1.8%	1.3%
Russian Ruble	2.8%	-0.2%	0.98	2.7%*	1.5%
Philippine Peso (x 100)	2.2%	0.8%	0.81	1.9%	2.4%
Singapore Dollar	1.8%	0.4%	0.42	1.0%	1.0%
Swiss Franc	0.6%	0.7%	0.95	0.6%	1.8%
Polish Zloty	0.6%	-0.5%	0.74	0.3%	1.8%
Hong Kong Dollar	0.2%	0.0%	0.57	0.1%	0.1%
Euro FX	0.0%	-1.6%	0.71	-0.4%	1.4%
Saudi Riyal	-0.2%	0.0%	0.99	-0.2%	0.3%
Brazilian Real	-0.2%	-2.1%	1.00	-0.2%	0.5%
Chinese Yuan	-0.3%	0.3%	0.77	-0.2%	1.8%
Japanese Yen (x 100)	-5.9%	-1.7%	0.67	-4.5%**	1.8%
Energy futures					
Crude Oil Brent	8.9%	-1.1%	0.82	7.0%	5.9%
Crude Oil WTI	8.8%	1.0%	0.83	7.5%*	4.5%
Natural Gas	2.2%	-5.6%	0.97	2.0%	4.1%
Gasoline RBOB	5.9%	0.2%	0.83	5.0%	3.4%
ULSD NY Harbor	6.9%	-0.6%	0.81	5.5%*	3.3%
Metals futures (all December 2016)					

Gold	-2.6%	2.0%	0.79	-1.6%	3.2%
Silver	-1.3%	4.8%	0.88	-0.6%	6.7%
High Grade Copper	-6.5%	-0.3%	0.78	-5.1%	6.1%

Notes: The electoral impact estimates for the Debate #1 and Trump Tape windows are the coefficients from Table 3 divided by the decrease in the "Trump to Win" prediction market price during the window. The precision-weighted average weights the estimates for each window by their precision (their standard errors divided by the prediction market movements and then raised to the -2 power). The standard errors are from Table 3, and are adjusted for imprecision in the prediction market movements (see footnote in the text for a discussion of this issue).

Table 5: The "Republican Premium" in previous competitive elections

	Candidates		Prediction market	Winner		Electoral surprise	Election day stock return		"Republican premium"	
	Democrat	Republican	Prob(Repub)			I(Rep) – Prob(Rep)			Coefficient	SE
1880	Hancock	Garfield	75.2%	Garfield		24.8%	-0.59%		-2.4%	(3.2%)
1884	Cleveland	Blaine	52.8%	Cleveland		-52.8%	-1.25%		2.4%**	(1.2%)
1888	Cleveland	Harrison	50.0%	Harrison		50.0%	0.40%		0.8%	(1.6%)
1892	Cleveland	Harrison	50.8%	Cleveland		-50.8%	0.20%		-0.4%	(1.4%)
1896	Bryan	McKinley	79.9%	McKinley		20.1%	3.33%		16.6%***	(5.3%)
1900	Bryan	McKinley	82.4%	McKinley		17.6%	2.48%		14.1%***	(5.3%)
1904	Parker	T. Roosevelt	83.3%	T. Roosevelt		16.7%	0.98%		5.9%	(5.1%)
1908	Bryan	Taft	85.7%	Taft		14.3%	2.01%		14.1%**	(6.4%)
1916	Wilson	Hughes	51.8%	Hughes		-51.8%	-0.44%		0.8%	(1.4%)
1928	Smith	Hoover	83.3%	Hoover		16.7%	1.19%		7.1%*	(4.3%)
1932	F. Roosevelt	Hoover	17.4%	F. Roosevelt		-17.4%	-4.40%		25.3%*	(13.2%)
1936	F. Roosevelt	Landon	28.1%	F. Roosevelt		-28.1%	1.55%		-5.5%	(6.2%)
1940	F. Roosevelt	Wilkie	33.3%	F. Roosevelt		-33.3%	-3.27%		9.8%**	(4.9%)
1944	F. Roosevelt	Dewey	20.8%	F. Roosevelt		-20.8%	-0.11%		0.5%	(3.6%)
1948	Truman	Dewey	88.9%	Truman		-88.9%	-4.56%		5.1%***	(1.0%)
1952	Stevenson	Eisenhower	54.6%	Eisenhower		45.4%	0.34%		0.7%	(1.5%)
1956	Stevenson	Eisenhower	80.0%	Eisenhower		20.0%	-0.99%		-5.0%	(3.5%)
1960	Kennedy	Nixon	38.5%	Kennedy		-38.5%	0.47%		-1.2%	(1.7%)
1968	Humphrey	Nixon	54.5%	Nixon		45.5%	0.18%		0.4%	(1.3%)
1976	Carter	Ford	53.2%	Carter		-53.2%	-1.14%		2.1%	(2.0%)
1980	Carter	Reagan	76.8%	Reagan		23.2%	1.73%		7.5%**	(3.3%)
1984	Mondale	Reagan	83.2%	Reagan		16.8%	0.31%		1.8%	(5.6%)
1988	Dukakis	G.H.W. Bush	81.1%	G.H.W. Bush		18.9%	-0.16%		-0.8%	(6.8%)
2004	Kerry	G.W. Bush	50.0%	G.W. Bush		50.0%	1.15%		2.3%	(2.5%)

Sources: Snowberg, Wolfers, and Zitzewitz (2007a). Elections where the winner had a 90 percent of greater probability of winning (1920, 1924, 1964, 1972, 1992, 1996) are not reported due to the imprecision of the associated electoral impact estimate. 1912 (a three-way race) and 2000 (whose outcome was unclear on election night) are omitted, but see the 2007 paper for an analysis of market movements on Election Night 2000. The implied effect of each election is calculated as the ratio of the election window stock return and the change in the probability of a Republican President. Ratios are not reported when the denominator (i.e., the surprise in the election result) is less than 10 percent.