Is firm-level political risk priced in the equity option market?*

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ABSTRACT

We find a negative relation between firm-level political risk and future delta-hedged equity option returns. A quasi-natural experiment based on Brexit corroborates this finding since after the referendum there is a decrease in the option returns of the positive-Brexit exposure firms. The predictability is driven by the jump risk component of political uncertainty, is more pronounced in periods of high intermediary constraints and is stronger among high-demand pressure options but weaker among politically active firms. Finally, consistent with a risk-based explanation, investors of options on politically risky firms get compensated with high returns when major unexpected political shocks take place.

Keywords: political risk; option returns; Brexit; jump risk; intermediary constraints

JEL Classification: G13, G18

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Uncertainty associated with possible changes in government policies and their future impacts can significantly affect the risk perceptions of capital market participants. Pástor and Veronesi (2012, 2013) build a theoretical framework in which investors demand a risk premium as compensation for political uncertainty. Motivated by the fact that options constitute ideal securities for isolating and studying various risk premiums, Kelly et al. (2016) extend this framework and find that options whose lives span political events such as national elections and global summits tend to be more expensive as they provide protection against the risks associated with those events. However, their study relies on index options and variation in aggregate political risk. In this paper, we examine whether firm-level political risk exhibits predictive power for the cross-section of equity option returns. There are two main reasons for which it is important to investigate the existence of a such a pricing effect at the individual firm level.

First, the market-wide risks associated with major political events are typically easy to analyze. For example, it seems straightforward that investors were well-aware of the summits that took place in 2010 due to the Greek crisis and had adjusted their portfolios beforehand in order to hedge against potential adverse market reactions and increases in volatility. As Hassan et al. (2019) (HHLT henceforth) illustrate in their seminal paper, however, firm-level political risk is much more difficult to be quantified and is also more heterogeneous and volatile than previously thought. Instead of having an economy-wide effect, a certain policy may affect a particular sector, state, or demographic group. At the same time, firms with different business and operating characteristics tend to respond differently to a particular political decision. For example, the uncertainty surrounding the potential implementation of a new state regulation is expected to affect disproportionately firms with a higher percentage of their sales coming from the given state. Therefore, it is less clear whether investors conceive the complex relations surrounding firm-level political risk, and, if they do, how they trade in anticipation of this multifaceted type of uncertainty. Overall, by focusing on firm- rather than aggregate-level political risk we can get a much more granular picture of whether and how political risk is priced, especially given that firm-level effects can be concealed when aggregated at the overall market level.

Second, the fact that political risk is priced in the context of the index option market does not mean that this relation necessarily holds for the equity option market too. In fact, there is abundant evidence that the two markets are rather segmented and exhibit significant differences in terms of trading activity and investor composition. For example, the index option market has a higher percentage of firm proprietary investors than the equity option market, and its end-user demand refers more to put rather than call options as is the case for the equity option market (Bollen and Whaley, 2004; Pan and Poteshman, 2006; Lakonishok et al., 2007; Lemmon and Ni, 2014). Such differences in trading patterns are also accompanied by differences in the pricing effects prevalent in the two markets. Bakshi et al. (2003) show that equity options are associated with less negative risk-neutral skewness values than index options. Importantly, Bakshi and Kapadia (2003b) and Carr and Wu (2009) find that equity option returns are lower – in absolute terms – than index option returns, while Driessen et al. (2009) show that correlation risk is priced in index options but not in equity options. This means, for example, that if political risk is priced at the aggregate level mainly because it increases the correlation among stocks (Pástor and Veronesi, 2012), then it is likely that it is not priced at the individual firm level. Overall, given the important differences in the two markets, it remains an open empirical question whether political risk matters for individual stock options.

For our empirical exercises we use a comprehensively validated measure of firm-level political risk, $PRisk$, developed by HHLT. HHLT perform a textual analysis of each firm's quarterly earnings conference calls and quantify firm-level political risk based on the percentage of the conversation about politics surrounding a synonym of risk or uncertainty. Thus, this measure of political risk is completely determined by the exchange of information among financial market participants and is entirely independent from stock or option prices. Moreover, it is different from other aggregate political uncertainty measures such as Baker et al.'s (2016) measure of economy-wide policy uncertainty (EPU) or election-based uncertainty measures. In fact, HHLT show that around 90% of the total variation in their measure of political risk occurs at the firm level, while the variation in aggregate political risk over time accounts for only 1%. They further emphasize that the firm-level variation in political risk is not explained by differential exposure to aggregate political risk.

Our analysis relies on the returns of long option positions that are delta-hedged on a daily basis with the appropriate number of underlying shares. This procedure ensures that our findings on option returns are not driven by the options' directional exposure to the underlying stocks. Using a Fama and MacBeth (1973) cross-sectional regression analysis we find that firm-level political risk is significantly and negatively associated with future delta-hedged call and put option returns.[1] This implies that investors are willing to pay high prices for the options of politically risky firms, consistent with the notion that options – due to their embedded leverage, as well as vega and gamma exposure – increase in value in case of severe stock price movements caused by political incidents. The relation remains significant after controlling for a wide range of stock- and option-related characteristics. We confirm the main cross-sectional regression findings using a panel regression approach and alternative measures of option returns.

[1] Due to put-call parity, any predictability arising for call returns will most likely arise also for put returns and vice versa. However, this might not always be the case. For example, Byun and Kim (2016) show that investors bid up the prices of the call options on lottery-type stocks leading to put-call parity violations. Ramachandran and Tayal (2021) find that short-sale constraints exhibit strong predictive power for the returns of put options on overpriced stocks but not for the returns of the respective call options. In our analysis, we find that the political risk effect is equally present among both call and puts. Still, in Section 3.4, we show that the effect on put options is stronger in periods of tighter constraints for the financial intermediaries providing crash insurance. This is not the case for call options.

Overall, our results lend credence to the notion that political risk is to a large extent a firm-specific phenomenon which is priced even without having a homogeneous or systematic effect across stocks.[2]

A portfolio-sorting analysis corroborates a significant difference in average returns between the low- and the high-political risk quintile portfolio. This analysis further reveals that the political risk effect is more strongly driven by high-political risk firms, is robust throughout the sample period, and is even more pronounced after mid-2008 when the dispersion of political risk across firms was elevated. Finally, we show that an easy-to-implement trading strategy produces significant profits even after taking into consideration the typical transaction costs faced by sophisticated investors.

In a next step, we turn to Brexit as a setting in order to investigate a potentially causal interpretation of our results. Brexit offers a unique quasi-natural experiment for several reasons. First, the outcome of the June 2016 referendum was largely unexpected. Second, the uncertainty over the relation between the UK and the EU was not completely resolved around the referendum. Third, only a subset of US firms, i.e., those that had headquarters, subsidiaries, customers, suppliers, or competitors in the UK, were clearly exposed to Brexit risk (Campello et al., 2022; Hassan et al., 2023). We identify treated firms based on a Brexit risk measure that is constructed in a similar manner with our main political risk measure. Our hypothesis is that after the referendum investors pay a higher price for the options of those firms that are exposed to Brexit risk. Using a difference-in-difference approach, we find a significant negative relation between exposure to Brexit risk and delta-hedged option returns after the Brexit referendum, but not before. Therefore, our evidence lends credence to a causal relation between innovations in political risk and option prices and returns.

We attempt to dissect the political risk premium embedded in option prices by first investigating its sources. Our analysis shows that firms with higher political risk are indeed riskier. Their stocks are associated with volatility and jump risks, i.e., higher volatility, more negative skewness, higher kurtosis, and more pronounced extreme returns. Further, given that delta-hedged option returns are driven by both types of risks (Bakshi and Kapadia, 2003a), we examine which of the two risk premia contributes more to the negative effect of firm-level political risk on option returns. In line with Cremers et al. (2015), we construct option portfolios that are exposed only to jump risk (delta-vega-neutral) and option portfolios that are exposed only to volatility risk (delta-gamma-neutral). We find a significant relation between political risk and delta-vega-neutral portfolio returns, but an insignificant relation between

[2] Since the firm-level political risk is largely idiosyncratic, a question that arises is why it is priced and not diversified away. We posit that politics-related volatility and jump risks can be priced as long as they are correlated with the pricing kernel (alternatively, there are at least some investors in the market that are averse to those risks). For example, it might be the case that some investors are undiversified (Merton, 1987) or engage in narrow framing (Barberis and Huang, 2001) and hence are willing to pay a premium for hedging purposes (see, e.g., Kapadia and Zekhnini, 2019; Liu, 2022). Or it might be the case that politics-related risks are correlated with certain systematic risk factors such as labor income (see, e.g., Herskovic et al., 2016). While disentangling the two potential frameworks is beyond the scope of the paper, we believe that both have merits and can co-exist.

political risk and delta-gamma-neutral portfolio returns. These results indicate that investors pay a premium mainly to hedge against (or even speculate on) politics-related jump risks.

Bollen and Whaley (2004) and Gârleanu et al. (2009) suggest that, in the presence of market imperfections, markets makers face inventory risk and hence charge a higher premium when option demand grows large. If investors use indeed options to hedge against or speculate on potential stock price jumps stemming from political shocks, we expect high-political risk firms to be associated with a stronger demand pressure. Using signed option volume data from the International Securities Exchange to compute option net buying pressure, we find that this is the case for both call and put options. Furthermore, in line with demand-based option pricing arguments, we provide evidence that political risk is more strongly associated with future option returns when it is accompanied by elevated buying pressure.

Next, we investigate the role of intermediary constraints in explaining the politics-related option return predictability. In particular, Chen et al. (2019) show that elevated crash risk lowers the intermediaries' capacity to bear tail risk exposures making them more reluctant to provide crash insurance and increasing the respective crash risk premium. Since our option return predictability is also related to politics-induced jump risks, we expect to find a more pronounced effect – especially for the case of put options – in periods of tightened intermediary constraints. Indeed, using Chen et al.'s (2019) intermediary constraints measure, we find that, when financial intermediaries become constrained, the prices of high-political risk put (but not call) options tend to rise and the crash-related political risk premium becomes higher.

Finally, if the documented option return predictability reflects a valid political risk premium, this implies that investors accept *low returns on average* for the options of politically risky firms because such options serve as hedging instruments and hence earn *high option returns* in the months with *unexpected political shocks*. Using a set of important largely unexpected political events, we confirm that the options on high-political risk firms increase more in value and generate more positive option returns than the options on low-political risk firms in politically stressful periods. In other words, consistent with a risk-based explanation of our predictability results, investors appear to pay a premium on average because they are compensated with high returns in the periods when they need them the most (i.e., when the shocks actually materialize).

Two additional analyses shed more light on the nature of the political risk effect on option returns. First, we explore whether firms who actively engage in the political process by lobbying politicians or by donating to election campaigns can mitigate the price impact of political risk on options. Consistent with the notion that political activism can reduce uncertainty, lobbying and political donations are associated with a significantly less negative relation between political risk and expected delta-hedged option returns. Furthermore, we find that this mitigating role of political activism stems from non-partisan firms, i.e., those firms that hedge against political risk by donating simultaneously to both parties, rather than from partisan firms, i.e., those firms that greatly tilt their donations towards a single party. Second, in addition to the cross-sectional relation between political risk and option returns, we investigate the respective time-series relation by studying how option returns respond to unexpected increases or decreases in firm-level political risk after earnings conference calls. We find that, when there is a positive surprise in political risk, delta-hedged option returns decrease after the earnings call. The opposite effect is also present but statistically insignificant. This evidence is consistent with the idea that, as new information about a firm's political risk is revealed during an earnings call, investors adjust their expectations and accept lower option returns after an increase in the firm's political risk level.

Our paper makes several contributions to the existing literature. First, it is related to a series of studies that use the EPU index and election events or cycles to examine the association between aggregate political risk and the outcomes of various financial markets, such as the stock, credit, option, CDS, and commodity market (Pástor and Veronesi, 2013; Belo et al., 2013; Brogaard and Detzel, 2015; Baker et al., 2016; Kelly et al., 2016; Liu et al., 2017; Liu and Zhong, 2017; Wang et al., 2019; Kaviani et al., 2020; Hou et al., 2020). However, as previously mentioned, economy-wide political risk masks a large proportion of the variation in political risk across firms but also across time for each given firm. Accordingly, we contribute to the infant literature that examines the impact of firm-specific political risk on asset prices. Gad et al. (2023) investigate the effect of political risk on a broad set of credit market outcomes, Saffar et al. (2019) study its effect on bank loan contracting, while Gorbatikov et al. (2019) find that it is priced in the equity market. Different from these papers, we focus on the option market in order to understand investors' preferences towards politics-induced volatility and/or jump risk.

Second, our work extends prior studies that analyze the cross-section of individual stock option returns. Cao and Han (2013) and Hu and Jacobs (2020) study the impact of stock volatility on delta-hedged and raw option returns, respectively. Goyal and Saretto (2009) suggest that the difference between implied volatility and past stock return volatility exhibits cross-sectional predictive power because it reflects investors' misestimation of volatility dynamics. Vasquez (2017) and Cao et al. (2023) identify the volatility term structure and the volatility-of-volatility, respectively, as strong predictors of option returns, while Zhan et al. (2022) and Bali et al. (2023) show that a large number of stock characteristics serve as powerful predictors too. Another literature stream focuses on the skewness preference of investors and its effect on the returns of various option portfolios (Bali and Murray, 2013; Boyer and Vorkink, 2014; Byun and Kim, 2016).[3] Most of the earlier option return predictors are derived from option and stock price data that are observable in the market. In contrast, our suggested option return predictor,

[3] Other studies that investigate return predictability in the equity option market include An et al. (2014), Christoffersen et al. (2018), Gao et al. (2018), Ramachandran and Tayal (2021), Eisdorfer et al. (2022), Boulatov et al. (2022), Vasquez and Xiao (2023), Choy and Wei (2023), Andreou et al. (2023), Cao et al. (2023).

political risk, is an intangible concept that is reflected in the conversations among market participants during conference calls.

1 Data and variables

1.1 Data

Our data comes from several sources. Data for firm-level political risk is generously provided by HHLT. We obtain data for all U.S. individual stock options including daily closing bid and ask quotes, trading volume, open interest, implied volatilities and various Greeks for each option from the Ivy DB database provided by Optionmetrics. We include options for securities which are listed as common stocks (share codes 10 and 11) and are traded on NYSE, AMEX, or NASDAQ (exchange codes 1, 2, and 3). Underlying stock prices and returns are downloaded from CRSP. Relevant accounting information is collected from Compustat. Further, we obtain analyst coverage and forecast data from IBES. Due to the availability of the political risk measure, our sample covers the period from January 2003 to June 2019.

1.2 Variables

1.2.1 Delta-hedged option returns

Given that an option is a derivative on a stock, option returns are highly correlated with stock returns. To remove the mechanical effect of stock price movements on option returns, we follow Bakshi and Kapadia (2003a) and Cao and Han (2013) and calculate the gain of a delta-hedged option position as the change in the value of a self-financing portfolio containing a long call (put) option, hedged by a short (long) position in the underlying stock. Consider a call option that is hedged discretely *N* times over a period $[t, t+\tau]$, where the hedge is rebalanced at each of the dates t_n, with $n = 0, 1, \ldots, N-1$, $t_0 = t$ and $t_N = t + \tau$. The gain of a discretely delta-hedged call option in excess of the risk-free rate is given by:

$$\prod(t, t+\tau) = C_{t+\tau} - C_t - \sum_{n=0}^{N-1} \triangle_{C,t_n} \left[S(t_{n+1}) - S(t_n)\right] - \sum_{n=0}^{N-1} \frac{a_n r_{t_n}}{365} \left[C(t_n) - \triangle_{C,t_n} S(t_n)\right], \quad (1)$$

where C_t is the call option price on date t, $\triangle_{C,t_n}$, $S(t_n)$ and r_{t_n} are the delta of the call option, the underlying stock price, and the annualized risk-free rate on date t_n, respectively, and a_n is the number of calendar days between t_n and t_{n+1}. The delta-hedged put option gain is calculated by replacing the call price and call delta in Equation (1) with the put price and put delta.

At the end of each month and for each optionable stock, we select one call and one put option that are the closest to being at-the-money and have the shortest maturity among the options with more than one month to maturity. We hedge each option on a daily basis until the end of next month. To obtain delta-hedged option returns that are comparable across different stocks, we use the scaled delta-hedged call option gain, $\prod(t,t+\tau)\,/(\triangle_t\, S_t - C_t)$, and the scaled delta-hedged put option gain, $\prod(t,t+\tau)\,/(P_t - \triangle_t\, S_t)$. The scaling factors $(\triangle_t\, S_t - C_t)$ and $(P_t - \triangle_t\, S_t)$ represent the total value of the initial position in stocks and options.

We apply several filters to the extracted option data following Cao and Han (2013). First, to avoid illiquid options, we exclude options if the trading volume is zero, if the open interest is zero or missing, if the bid quote is zero, if the bid quote is larger than the ask quote, or if the average of the bid and ask price is lower than 1/8. Second, in an attempt to mitigate the impact of possible early exercise on our results, we discard options whose underlying stock pays a dividend during the remaining life of the option.[4] Third, we exclude all options that violate standard no-arbitrage conditions. Fourth, we only keep options with moneyness higher than 0.8 and lower than 1.2. Only options whose last trading dates match the record dates are retained. Finally, following Zhan et al. (2022), we only keep firms with both call and put options available after filtering.

1.2.2 Firm-level political risk

HHLT create a text-based measure of firm-level political risk by applying a computational linguistics algorithm to the public transcripts of the quarterly earnings conference calls of listed US firms. In these conference calls, senior management and market participants discuss about topics that affect the firm's financial performance. First, HHLT develop a training library of political texts, $\mathbb{P}$, using an undergraduate political science textbook, supplemented with texts from the political sections of newspapers, and a training library of non-political texts, $\mathbb{N}$, using financial accounting textbooks and texts from newspapers' financial sections. Then, a determination of words that signal political topics is achieved by comparing the adjacent two-word combination bigrams from these training libraries. Finally, the political risk measure is constructed by counting the number of exclusive political bigrams surrounding a synonym for risk or uncertainty and dividing it by the total number of bigrams in the transcript (to adjust for the transcript's length):

$$PRisk_{i,t} = \frac{\sum_{b}^{B_{i,t}} \left(1[b \in \mathbb{P}\backslash\mathbb{N}] \times 1[|b-r| < 10] \times \frac{f_{b,\mathbb{P}}}{B_{\mathbb{P}}} \right)}{B_{i,t}}\,, \qquad (2)$$

where $1[\dots]$ is the indicator function, $\mathbb{P}\backslash\mathbb{N}$ denotes the set of bigrams contained in $\mathbb{P}$ but not $\mathbb{N}$, r is the position of the nearest synonym of risk and uncertainty, $b = 1, \dots, B_{i,t}$ is the number of bigrams in the call transcript, $f_{b,\mathbb{P}}$ is the frequency of bigram b in the political training library, and $B_{\mathbb{P}}$ is the total number of bigrams in the political training library.

[4] In essence, the call options in our sample are very close to European. Of course, removing dividend-paying stocks does not address the problem of early exercise in the case of put options. While we acknowledge this limitation of the study, we note that studies such as Boyer and Vorkink (2014) find that early exercise has a limited impact on relative option returns.

HHLT subject their political risk measure to a wide range of validity checks. Since our sample includes only optionable stocks and hence is necessarily different from theirs, we further conduct our own series of validation checks. Consistent with HHLT, Table IA 1 in the Internet Appendix shows that in our sample increases in $PRisk$ are associated with significant decreases in firms' capital investment rate, planned capital expenditures, and hiring. In addition, firms with higher $PRisk$ tend to subsequently donate more to political campaigns and invest in lobbying activities. Further validation analysis in Section 3.2 provides evidence that stocks with a higher $PRisk$ measure are riskier, i.e., they exhibit higher realized return volatility and kurtosis, more negative return skewness, and larger stock price jumps (mostly negative). Therefore, in our sample of optionable stocks $PRisk$ correlates with firm-level outcomes in a way that is indicative of reactions to political risk.

Figure IA 1A plots the mean $PRisk$ across firms in our optionable stock sample and the HHLT sample at each point in time and compares it with the newspaper-based measure of economic policy uncertainty (EPU). First, we observe that despite the different sample the two average $PRisk$ time-series move in lockstep. In fact, the correlation between the two is 0.97. Second, the average level of $PRisk$ varies intuitively over time and spikes near prominent political events such as presidential elections,[5] the failure of Lehman Brothers, the 2011 debt-ceiling dispute, and the Brexit referendum. In addition, average $PRisk$ has a correlation coefficient of 0.68 with EPU over our sample period. Figure IA 1B shows how the cross-sectional dispersion of $PRisk$ evolves over time. Consistent with HHLT, the dispersion in $PRisk$ across firms is particularly high when the average level of $PRisk$ is also high. Both the level and the dispersion of $PRisk$ increase after mid-2008.

Overall, the $PRisk$ measure captures the proportion of the conversation devoted to risks related to political (rather than non-political) topics. A higher proportion implies that the firm faces more severe political risk. The political risk level for each firm in each month is based on the $PRisk$ value extracted from the most recent conference call.

1.2.3 Control variables

To isolate the effect of political risk on delta-hedged option returns, we include in our main analysis a large set of alternative firm characteristics that reflect various aspects of a firm's performance or risk and have been used in prior studies on option return predictability (see, for example, Cao and Han 2013; Zhan et al., 2022).

[5] Figure IA 2 of the Internet Appendix presents the results of a regression of $PRisk$ on a dummy variable that takes the value of one in the quarters corresponding to the two close US presidential elections of our sample (2008 Q4 and 2016 Q4) as well as dummies that refer to the two quarters before and after the elections. As expected, these two presidential elections are associated with a substantial increase in average $PRisk$ which starts the quarter before, reaches a maximum in the election quarter, and slowly reverts thereafter.

We first consider a set of popular stock-related characteristics, namely size, idiosyncratic volatility, reversal, momentum, book-to-market ratio, stock illiquidity, gross profitability, leverage and institutional ownership. We further control for firm-level political sentiment to disentangle its effect from that of political risk. Political sentiment is the first moment of political exposure and is obtained from HHLT as well. The procedure for constructing $PSentiment$ closely follows that for measuring $PRisk$, i.e., it relies on counting the number of political bigrams conditioning on the proximity to words representing positive or negative sentiment based on the Loughran and McDonald (2011) sentiment dictionary, instead of words associated with risk or uncertainty. Controlling for political sentiment alleviates the concern that senior management might use politics as an excuse for negative news about economic performance. To address potential concerns that the effect of firm-level political risk on delta-hedged option returns might simply pick up heterogeneous exposure to aggregate political risk, we also include a firm-level EPU beta. We provide a detailed description of all the above variables in Appendix A.

1.3 Descriptive statistics

Table 1 presents descriptive statistics for delta-hedged option returns, firm-level political risk, and other control variables during our sample period from January 2003 to June 2019. Following Gorbatikov et al. (2019), $PRisk$ is winsorized each month at (0, 95) and is normalized by its standard deviation across the whole sample. All explanatory variables (except for the dummy variables) are winsorized period-by-period at (0.5, 99.5) to mitigate the potential effects of outliers in our regression analysis.

After merging the option return with the political risk data, our final sample consists of 113,288 option-month observations for both delta-hedged call and put option returns and covers 3,450 unique firms. The average number of stocks per month is 575. Table IA 2 in the Internet Appendix reports the sample coverage statistics of the underlying stocks. On average, our analysis includes about 22% (17%) of the stocks in the HHLT sample (CRSP universe), with those stocks, however, corresponding to 41% (38%) of the total market capitalization. Therefore, our sample is tilted towards relatively large stocks. The industry distribution of the underlying stocks is very similar to that in the HHLT sample and in the full CRSP universe. As a result, the $PRisk$ effect on option returns is unlikely to be driven by specific industries.

[Insert Table 1 here]

Table 1 shows that delta-hedged call and put option returns are negative on average (-1.19% and -0.77%, respectively), consistent with prior empirical studies (Bakshi and Kapadia, 2003b; Carr and Wu, 2009; Cao and Han, 2013).[6] The average moneyness of call and put options is very close to 1 with a

[6] The considerable difference in average returns between call and put options is likely driven by higher end-users' demand pressure for calls as compared to puts. This demand pressure might be related to investors' gambling preferences (Byun and Kim, 2016).

standard deviation of 0.05. The time to maturity ranges from 47 to 52 days, with an average of 50 days. Our variable of interest, $PRisk$, has an average value of 0.85 and a median value of 0.51 indicating a right-skewed distribution of political risk among firms in our sample.

2 Effect of firm-level political risk on delta-hedged option returns

2.1 Cross-sectional regression analysis

We use Fama and MacBeth (1973) cross-sectional regressions to study the relation between firm-level political risk and future delta-hedged option returns. In particular, each month we perform the following cross-sectional regression:

$$DepVar_{i,t+1} = \beta_0 + \beta_1 \times PRisk_{i,t} + \boldsymbol{\gamma}' \times \mathbf{Z}_{i,t} + \varepsilon_{i,t+1}\,, \tag{3}$$

where $DepVar_{i,t+1}$ is the call or put option return of firm i that is formed at the end of month t and is hedged on a daily basis until the end of month $t+1$, $PRisk_{i,t}$ is the level of political risk for firm i at the end of month t based on the most recent conference call, $\mathbf{Z}_{i,t}$ represents the vector of our control variables, and $\varepsilon_{i,t+1}$ captures the error term.

Table 2 reports the time-series averages of the slope coefficients, the corresponding Newey and West (1987) t-statistics, and the average adjusted R^2.

[Insert Table 2 here]

Specifications (1) and (3) present the results from a univariate analysis of call and put option returns, respectively. We observe that the coefficient on $PRisk$ is negative in both cases. A one standard deviation increase in political risk is associated with a decrease of 18 bps in one-month ahead delta-hedged call returns and a decrease of 15 bps in one-month ahead delta-hedged put returns. Moreover, these results are strongly significant at the 1% level (t-statistic = −7.12 for calls and t-statistic = −6.70 for puts). After adding the full set of control variables as in Specifications (2) and (4), the coefficient on $PRisk$ remains negative (–0.16 in both cases) with equally strong statistical significance.[7] Therefore, the impact of other control variables on the association between firm-level political risk and future option returns is negligible. These results support the notion that political risk is priced in the equity option market. In other words, it appears that investors tend to pay a premium for options on firms with higher level of political risk, thus lowering their expected subsequent returns.

We note that the results with respect to the alternative firm characteristics are generally strong and confirm the predictions and findings of previous studies. For example, options with high idiosyncratic

[7] The results are very similar if $PRisk$ is winsorized each month at (0, 99) rather than at (0, 95). See Table IA 3 in the Internet Appendix.

volatility and high stock illiquidity are associated with lower future returns, corroborating the idea that market makers charge a premium for options on stocks with high arbitrage costs (Cao and Han, 2013). Interestingly, political sentiment and EPU beta do not provide any significant predictive power. The former result is consistent with the idea that delta-hedged returns are immune to stock price movements and hence to the first moment of political shocks, while the latter result is in line with HHLT's observation that firm-level political risk is not adequately explained by a model that incorporates relatively stable firm-level exposures to aggregate political risk.

We verify our cross-sectional regression results by using a panel regression analysis. We add time (i.e., monthly) fixed effects in all panel regression specifications as we are particularly interested in the cross-sectional effect of firm-level political risk. The estimation results are reported in Table IA 4 of the Internet Appendix and are consistent with our main conclusion. For example, the coefficient on $PRisk$ is -0.17 (t-statistic = -7.45) for the multivariate regression with delta-hedged call option returns. Further adding industry fixed effects, defined by the two-digit SIC code, we observe that our coefficient of interest reduces to -0.13, but is still significant (t-statistic = -5.54). Therefore, only 4 bps out of the 17-bps effect are driven by industry-level variation in political risk. If we further control for permanent differences across firms by adding firm-fixed effects, the coefficient on $PRisk$ drops to an effect size of 7 bps per standard deviation change but remains significant (t-statistic = -2.87). This is consistent with the idea that within-firm variation in political risk is also priced in option markets. We obtain very similar statistical inference from the panel regressions with delta-hedged put option returns.

Collectively, the findings in this section suggest a strong negative association between firm-level political risk and future delta-hedged option returns. Equivalently, there is a premium for both call and put options on firms with high level of political risk. The relation remains robust after controlling for a large set of alternative firm characteristics.

2.2 Robustness tests

We investigate the robustness of the negative effect of firm-level political risk on future delta-hedged option returns to controlling for several popular option-related characteristics. In particular, we utilize as controls the volatility deviation (Goyal and Saretto, 2009), volatility term structure (VTS, Vasquez, 2017), volatility-of-volatility (VOV, Baltussen et al., 2018; Cao et al., 2023), volatility spread (Bali and Hovakimian, 2009; Yan, 2011), higher-order risk-neutral moments (RNS/RNK, Bakshi et al., 2003) and option illiquidity (Christoffersen et al., 2018). The exact definition of all these characteristics is provided in Appendix A.

The results presented in Table 3 show that all the option-related control variables exhibit strong predictive power consistent with prior studies. We further observe that the association between political risk and future call and put option returns remains particularly robust and always statistically significant at the 1% level. Overall, we conclude that the $PRisk$ effect on the cross-section of option returns cannot be subsumed by various option-related characteristics.

[Insert Table 3 here]

Next, we check the robustness of our findings to alternative definitions of option returns. Specifically, we consider the delta-hedged option gain until month end scaled by the initial stock price, the delta-hedged option gain until month end scaled by the initial option price, and the delta-hedged option gain until maturity scaled by the initial overall position. The results, reported in Table IA 5 of the Internet Appendix, show a consistently negative and strongly significant relation between these alternative option return measures and political risk. It follows that political risk affects future option returns irrespective of the exact way these returns are estimated.

2.3 Portfolio-sorting analysis

In this section, we study the relation between political risk and option returns using a portfolio sorting approach. On the last trading day of each month, we sort firms into quintiles based on their level of political risk.[8] The top quintile contains the firms with the highest level of $PRisk$ and the bottom quintile the firms with the lowest level of $PRisk$. We also construct a long-short portfolio that goes long options on high-$PRisk$ firms and short options on low-$PRisk$ firms. The portfolios are equal-weighted, option value-weighted, i.e., weighted by the market value of the option open interest, or stock capped value-weighted, i.e., weighted by the market value of the underlying stock winsorized at the NYSE 80th percentile (Jensen et al., 2023).[9] We rebalance the portfolios on a monthly basis and measure their subsequent returns.

[Insert Table 4 here]

Table 4 reports the times series average of the delta-hedged call and put option returns across the five quintile portfolios as well as the Q5−Q1 portfolio for both weighting schemes. We find that the average option returns decline (almost) monotonically as we move from Q1 to Q5. For example, in the case of equal-weighted call option portfolios, the low-$PRisk$ quintile has an average return of −0.97%, while the high-$PRisk$ quintile has an average return of −1.32%. Similarly, in the case of equal-weighted put option portfolios the low-$PRisk$ quintile has an average return of −0.56%, while the high-$PRisk$ quintile has an average return of −0.85%. Accordingly, the return spread is about 0.30% per month and is highly significant at the 1% level (t-statistic = −5.14 in the case of call options and t-statistic = −5.87 in the case of put options). In addition, the largest drop in option returns is observed when we move from Q4

[8] Table IA 6 in the Internet Appendix reports the results from a decile-sorting analysis. Our conclusions hardly change when we use ten instead of five portfolios.

[9] Standard (uncapped) stock value-weighted results are reported in Table IA 7 of the Internet Appendix. These results are qualitatively similar to the capped ones only for the case of call options.

to Q5 (from −1.16% to −1.32% in the case of call options and from −0.71% to −0.85% in the case of puts options) and corresponds to the largest increase in the average level of $PRisk$ (from 0.59 to 1.62). Therefore, while the effect of political risk on option returns is almost monotonic, it is driven to a large extent by firms with a high level of political risk. Finally, all the results are similar when we examine the respective option value- or stock value-weighted portfolios.

We further examine whether the option return difference between high- and low-$PRisk$ firms can be explained by some prominent asset pricing factors. To this end, for each call and put option portfolio we report the alpha with respect to two factor models. The first model includes the Fama and French (1993) three factors augmented with the Carhart (1997) momentum factor. The second model further adds two volatility factors: the zero-beta straddle return of the S&P 500 index (Coval and Shumway, 2001), and the change in VIX (Ang et al., 2006). Table 4 shows that controlling for the above risk factors has minimal impact on our results. In fact, the Q5−Q1 alphas are always similar in magnitude and in statistical significance to the respective raw returns. Overall, the relation between $PRisk$ and future delta-hedged option returns is unlikely to be driven by firms' exposure to standard stock market or volatility risk factors.

Figure 1 plots the monthly time-series of the Q5−Q1 equal-weighted portfolio returns across time. Strikingly, we observe that the returns are consistently negative across years for both call and put options. In fact, the effect becomes even stronger in the most recent period, i.e., after mid-2008. While this result is opposite from the one typically observed for stock market anomalies (McLean and Pontiff, 2016), it is in accordance with the evidence presented in Zhan et al. (2022) for option market anomalies. In our context, the increased predictive power of $PRisk$ in recent years can be explained by the fact that the average level of $PRisk$ and more importantly its dispersion across firms are higher in the post-2008 period (see Figure IA 1B in the Internet Appendix). As expected, the pricing effect of political risk is stronger when a large number of firms face elevated political uncertainty (thus driving the dispersion and mean of $PRisk$ up), rather than when the majority of firms have a political risk level close to zero.

3 Dissecting the political risk premium

3.1 An event study: The Brexit referendum

In this section, we attempt to provide a causal interpretation of our results by analyzing the impact of the political uncertainty associated with the Brexit process on the option returns of US listed firms. After more than 40 years of far-reaching legal and economic integration, the Brexit vote on June 23rd, 2016 led to a withdrawal mandate and triggered many challenges over the terms of UK's future relationship with the European union. Several studies have documented the impact of Brexit exposure on employment, investment, and productivity for both UK and non-UK firms (Bloom et al., 2019;

Campello et al., 2022; Hassan et al., 2023). We examine the relation between delta-hedged option returns and firm-level Brexit risk before and after the June 2016 referendum using a difference-in-difference methodology. We hypothesize that following the vote the option contracts of firms exposed to Brexit uncertainty would have higher premiums and lower returns than the option contracts of firms without such exposure.

Brexit offers a unique quasi-natural experiment to measure the effect of political risk on the option prices of US firms for several reasons. First, the referendum had a global significance, while its outcome was largely unanticipated. For example, in the morning of June 20th, 2016 the "Leave" odds offered by Ladbrokes, Betfair, and William Hill – three major betting companies in the UK – were 11/4, 11/4, and 13/5, respectively, all implying a higher than 70% probability of "Remain". Moreover, the Google search for "Brexit Leave" only rose significantly after the vote indicating a surprise for most people. Second, the prolonged political process following the referendum created a series of exit negotiations, yielding persistent uncertainty over the future relationship between the UK and EU for several years after the vote. Third, political risk from Brexit appeared to be transmitted across international borders. Many firms listed in the US had headquarters, subsidiaries, customers, suppliers, shareholders, or competitors in the UK and were affected by this foreign-born political uncertainty (Campello et al., 2022; Hassan et al., 2023). Exposure to the UK plausibly triggered an exogeneous shock to these firms, but not to others.

Hassan et al. (2023) adapt the HHLT's text-based method of measuring firm-level political risk to quantify firm-level exposure to Brexit risk for US listed firms based on their quarterly earnings call transcripts. In particular, Brexit risk is measured by counting how many times the call participants use synonyms of "risk" or "uncertainty" surrounding the term "Brexit" and adjusting it for the transcript's length:

$$BrexitRisk_{i,t} = \frac{\sum_{b}^{B_{i,t}}(1[b = Brexit] \times 1[|b - r| < 10])}{B_{i,t}}\ , \tag{4}$$

where $1[\dots]$ is the indicator function, $b = 1, \dots, B_{i,t}$ are words contained in the call of firm i in quarter t, and r is the position of the nearest synonym of risk or uncertainty. Hassan et al. (2023) subject their Brexit risk measure to a range of validation checks including: (1) a positive association between the estimated level of Brexit risk and the chance that a given firm has subsidiaries, headquarters, or sales revenues in the UK, and (2) economically meaningful responses of the equity prices as well as the investment, and employment growth decisions of different firms to the Brexit shock.

To further adapt Hassan et al.'s (2023) measure of firm-level Brexit risk in our difference-in-difference setting, we define treated firms as the ones having positive Brexit risk in any quarter from July 2016 to June 2017 and control firms as the ones having zero Brexit risk over this period:

$$Treat_i = 1\left[\sum_{July\ 2016}^{June\ 2017} BrexitRisk_{i,t} > 0\right]. \quad (5)$$

We start by plotting in Figure 2A the difference in average firm-level political risk between treated (positive exposure to Brexit risk) and control (no exposure to Brexit risk) firms from June 2015 to June 2017.[10] As expected, the figure reveals a sudden jump in the political risk difference after Brexit, suggesting that firms exposed to Brexit risk experienced an increase in $PRisk$. More importantly, we observe in Figure 2B that the average level of option implied volatility of treated firms increased following the Brexit referendum as compared to that of control firms. In Panels C and D, we plot the monthly delta-hedged call and put option returns for treated and control firms before and after the Brexit vote month. This preliminary evidence shows that the difference in average delta-hedged option returns between the two groups decreased following the referendum. In other words, firms with Brexit exposure were perceived to face a higher uncertainty and this was indeed reflected in the increased option implied volatilities and decreased option returns.

Next, we employ difference-in-difference regressions to compare differences in delta-hedged option returns between treated and control firms before and after the June 2016 Brexit vote. This is equivalent to estimating the following model:

$$DepVar_{i,t+1} = \beta_0 + \beta_1 Treat_i + \beta_2[Treat_i \times Post_t] + \beta_3 Post_t + \boldsymbol{\gamma}'\mathbf{Z}_{i,t} + \varepsilon_{i,t+1}\,, \quad (6)$$

where $DepVar_{i,t+1}$ is the call or put return of firm i that is formed at the end of month t and is hedged on a daily basis until the end of month $t+1$. $Treat_i$ is a dummy variable defined as in Equation (5). $Post_t$ equals one for months after June 2016. $\boldsymbol{Z_{i,t}}$ is a set of control variables for firm i in month t. In some of the models, we further include time and industry or firm fixed effects.[11] The t-statistics are computed using standard errors that are robust to heteroskedasticity and clustered at the firm level.

[Insert Table 5 here]

Table 5 reports results from regressions using a sample of ± 1 year around the referendum. Note that we exclude the referendum month, June 2016, because we want to understand how investors' expectations about political uncertainty are priced before and after a shock without having our results confounded by the unexpected shock itself. As shown in Specifications (1) and (5), the coefficient on $Treat$

[10] Our definition of treated firms relies on Brexit risk exposure being measured ex-post according to Equation (5). Due to the lack of anticipation of the Brexit outcome, firm-level Brexit uncertainty based on textual analysis of call transcripts only arose sharply after the referendum. Intuitively, our empirical setting assumes time-invariance of firms' exposure to Brexit risk. This assumption is reasonable given that Brexit risk is mostly associated with time-invariant firm characteristics that measure a firm's exposure to the UK economy. The results are very similar if treated firms are defined based on Brexit risk being zero or positive in the whole two-year period surrounding the referendum.

[11] When we include time and firm fixed effects, the dummy variables $Post_t$ and $Treat_i$ are dropped from the regression model.

is not significantly different from zero. This implies that before the Brexit vote there is no significant relation between delta-hedged call or put option returns and Brexit risk exposure, consistent with the idea that investors regarded Brexit as a very unlikely scenario. The $Treat \times Post$ interaction coefficient is negative (-0.29 for calls and -0.24 for puts) and statistically significant (t-statistic = -2.17 for calls and t-statistic = -2.00 for puts), indicating a negative association between option returns and firms' exposure to Brexit risk after the referendum. In other words, in response to the Brexit vote the option contracts of US firms with exposure to Brexit risk become more expensive and earn more negative subsequent returns. The findings are robust to including time fixed effects as shown in Specifications (2) and (6). Further adding industry (classified by two-digit SIC code) fixed effects in Specifications (3) and (7) does not change our inference. The interaction term is still negative (-0.30 and -0.23 for call and put options, respectively) and significant at the 5% level (t-statistic = -2.36 and t-statistic = -2.02 for call and put options, respectively). Finally, when we include firm rather than industry fixed effects as in Specifications (4) and (8), we obtain very similar and significant results for the $Treat \times Post$ interaction term. Overall, we find that after the referendum the average delta-hedged option returns of firms exposed to Brexit risk are around 20 to 30 basis point lower than the returns of firms without any exposure to Brexit risk.

As a robustness check, we first examine the dynamic effect of Brexit by tracking the changes in delta-hedged option returns in months before and after the Brexit referendum. Using a range of interactions with time dummies surrounding June 2016, we estimate dynamic regressions and report the interaction coefficient estimates in Figure IA 3 of the Internet Appendix. The results suggest that there is no evidence of diverging pre-trends in option returns between treated and control firms prior to the referendum and the decrease in delta-hedged option returns of the treated firms, relative to the control firms, becomes evident just after the referendum month. Second, we expand our analysis to a longer period of ± 3 years around the Brexit vote. Results are reported in Table IA 8 of the Internet Appendix. We find that the interaction coefficients are negative (with a less pronounced effect compared to the shorter sample period in Table 5) and statistically significant for all regressions with delta-hedged call and put options returns. This is line with the idea that the prolonged political uncertainty following the referendum had a persistent impact on the option prices of the firms that were exposed to Brexit risk. Finally, in Table IA 9 of the Internet Appendix, using a sample window of ± 1 year around the vote month, we perform a series of placebo analyses with the same month as the Brexit vote, but with different years. We do not observe any negative and statistically significant pseudo difference-in-difference estimators, suggesting that our findings are not spurious results.

Overall, using the Brexit referendum as a quasi-natural experiment and a difference-in-difference approach, we provide causal evidence that political risk affects option prices and returns. In particular, the negative relation between delta-hedged option returns and firms' exposure to Brexit risk after the referendum indicates that option returns become lower in response to an increase in political risk.

3.2 Sources of the risk premium

Having established that investors accept low returns for the options of politically risky firms, we now turn our attention to understanding the sources of this political risk premium. From a theoretical point of view, low delta-hedged option returns can be associated with the presence of negative volatility and jump risk premiums (e.g., Bakshi and Kapadia, 2003a). Importantly, political risk can lead to financial shocks that cause price jumps and changes in volatility (Pástor and Veronesi, 2012; 2013). Therefore, in this subsection, we investigate whether volatility and/or jump risk premiums can explain the option return predictability associated with political risk.

[Insert Table 6 here]

We start the analysis by exploring whether stocks with higher $PRisk$ are indeed riskier. In particular, we perform a series of Fama and MacBeth (1973) cross-sectional regressions that are identical to that in Section 2.1 but use various risk measures estimated at the end of month t as dependent variables. Panel A1 of Table 6 reports the results for realized volatility, skewness and kurtosis, as well as maximum and minimum return within the month. It can be seen that higher $PRisk$ is significantly related to higher realized volatility, more negative realized skewness, and higher realized kurtosis of stock returns. It is also significantly related to higher maximum daily return and lower minimum daily return, with the effect being stronger for the case of minimum return. In essence, political risk manifests itself via elevated volatility and increased level of mostly negative but also positive jumps.[12] Panel A2 of Table 6 presents the results for risk-neutral volatility, skewness and kurtosis. Consistent with the evidence based on the realized moments, $PRisk$ appears to be also associated with higher risk-neutral volatility and kurtosis and lower risk-neutral skewness. Therefore, our results suggest that firm-level political uncertainty is related to both volatility and jump risks and hence investors might use options to hedge either of them or even both.

To shed further light on the nature of the politics-related risks priced in the individual equity option market, we examine the predictive power of $PRisk$ for the returns of delta-vega-neutral portfolios, i.e., portfolios exposed to jump risk but immune to volatility risk, and delta-gamma-neutral portfolios, i.e., portfolios exposed to volatility risk but unaffected by jump risk (see Cremers et al., 2015). In particular, at the end of each month t and for each firm we keep the most at-the-money (call or put) option from

[12] The fact that political uncertainty can be associated with both negative and positive jumps is in line with Pástor and Veronesi (2012). In their model, the direction and size of the jump depend on the extent to which a policy change is expected by the market as well as on the actual decision of the government to implement the change or not.

those options that satisfy our filtering criteria and expire on the third Friday of month $t+2$. Next, we further keep the option that has the same strike price with the first one but expires in month $t+3$. In the case of call options, we create a delta-vega-neutral (delta-gamma-neutral) portfolio by going short the short-maturity (long-maturity) call, long an appropriate amount of long-maturity (short-maturity) calls so as to render the position vega-neutral (gamma-neutral) and long an appropriate amount of shares so as to make the overall position delta-neutral too. In the case of put options, the position is similar but goes long the short-maturity (long-maturity) put, short an appropriate amount of long-maturity (short-maturity) puts and long an appropriate amount of shares. Following Zhan et al. (2022), we keep the positions open for one month without rebalancing. Note that the call option positions entail negative gamma/vega exposures, while the put option positions entail positive gamma/vega exposures. Therefore, we expect political risk to be positively related to the delta-vega-neutral and delta-gamma-neutral call option portfolio returns, and negatively related to the delta-vega-neutral and delta-gamma-neutral put option portfolio returns.

The results, presented in Panel B of Table 6, show that $PRisk$ is a strong predictor of call and put option delta-vega-hedged returns, with the regression coefficients having the expected sign on each occasion. In contrast, it does not exhibit any significant predictive power for the call or put delta-gamma-hedged returns. Overall, our evidence suggests that, while firm-level political risk is associated with both increased volatility and more severe (mainly negative) jumps, investors seem to price mostly the jump risk component.

3.3 The role of option demand pressure

It is well-established that, given an imperfect option market environment, higher option demand leads to higher option prices because market makers are left with unhedged positions and hence charge higher premiums in order to compensate for the inventory risk that they face (Bollen and Whaley, 2004; Gârleanu et al., 2009; Muravyev, 2016). Therefore, if the high option prices – and consequently low future option returns – of politically risky firms are indeed driven by investors' desire to hedge against negative or speculate on positive stock price jumps, we expect such firms to be associated with a more pronounced demand pressure.

To test for this, we use signed option volume data from the International Securities Exchange (ISE) Trading Profile.[13] This dataset disaggregates all end-users' trades into buy or sell orders and also classifies the trade initiator as a public customer or a firm. Following Chen et al. (2019), we proceed by examining the relation between $PRisk$ and public customers' net buying pressure, calculated as the

[13] While the ISE options volume data represent about 30% of the total equity options trading volume across all exchanges, Ge et al. (2016) show that the data are representative of the total options volume provided by Optionmetrics.

difference between total monthly open buy positions and total monthly open sell positions scaled by stock trading volume.[14]

[Insert Table 7 here]

Panel A of Table 7 reports the results from Fama and MacBeth (1973) regressions of net buying pressure for calls, puts, as well as combined calls and puts, on contemporaneous $PRisk$ controlling for the stock-characteristics used in Section 2.1. It can be seen that firm-level political risk is strongly positively associated with option demand pressure in all three cases. For example, when we combine call and put options, the regression coefficient is 0.29 with a t-statistic of 4.19. The regression coefficient shows that a one-standard deviation increase in political risk is associated with an increase of 0.29 in scaled net buying pressure, i.e., associated with 29,000 more open buy versus open sell option positions per 100,000 of traded shares. Given that the average scaled net buying pressure in our sample is 0.75, the relation is economically significant.[15]

We further scrutinize the interrelation among firm-level political risk, option buying pressure, and future delta-hedged returns, by examining whether the predictive power of political risk for option returns is more pronounced among firms with high demand pressure. Specifically, we run the main Fama and MacBeth (1973) regressions from Section 2.1 separately for firms with demand pressure below or above the cross-sectional median value of each month. Panel B of Table 7 presents the results. When we consider call option returns, the coefficient of $PRisk$ is -0.14 for the subsample of low-demand pressure firms, but -0.26 for the subsample of high-demand pressure firms. Similarly, when we consider put option returns, the coefficient on $PRisk$ is -0.12 for the subsample of low-demand pressure firms, but -0.23 for the subsample of high-demand pressure firms. Importantly, these differences are statistically significant at the 5% level (t-statistic = -2.42 and t-statistic = -2.20 for call and put options, respectively). Therefore, our empirical results show that the relation between political risk and option returns is about two times stronger when we consider high-demand pressure options compared to low-demand pressure options.

Collectively, we provide evidence that, in line with demand-based option pricing arguments, political risk is accompanied by elevated option demand on the part of public customers, and accordingly, its predictive power for future option returns is more pronounced for high-demand pressure options.

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[14] Our net buying pressure analysis covers the period from January 2006 to April 2016. We exclude from it options with more than 180 days to maturity.

[15] Our evidence of a positive average difference between open buy and open sell customers' positions is in line with Pan and Poteshman (2006), Lakonishok et al. (2007) and Lemmon and Ni (2014). Gârleanu et al. (2009) find that end-users are net sellers in the equity option market, but this is because they use open interest rather than trading volume in their analysis. As Lakonishok et al. (2007) show, public customers hold their purchased option positions for a much shorter period than their written option positions.

3.4 The role of intermediary constraints

In a recent paper, Chen et al. (2019) utilize market makers' crash insurance-related option selling activities to identify periods of tightened intermediary constraints. They further show both empirically and theoretically that time-varying intermediary constraints constitute a main driver of risk premia in financial markets. Specifically, elevated crash risk lowers the intermediaries' capacity to bear tail risk exposures making them more reluctant to provide crash insurance and increasing the respective crash risk premium. In our context, this implies that we expect to find a more pronounced political risk premium in the equity option market in periods of tightened intermediary constraints. In addition, since the theory is related to crash risk, we expect the conditioning effect of intermediary constraints to be stronger for put option return predictability.

To test the role of intermediary constraints on the $PRisk$ effect, we employ Chen et al.'s (2019) $PNBON$ measure, which represents the (normalized) public net open-buying volume (equivalently financial intermediaries' net selling volume) of deep-out-of-the-money (DOTM) S&P500 index put option. When $PNBON$ is relatively low and accompanied by a negative price-quantity relation, it is indicative of supply shocks. Following Chen et al. (2019), we proceed by examining whether the three-month return spread between high- and low- $PRisk$ firms is higher in periods of relatively low $PNBON$. In particular, we perform the following regression:

$$r_{Q5-Q1,t+1\to t+3} = \alpha + b \times PNBON_t + \gamma_j \times X_{j,t+1\to t+3} + \varepsilon_{t+1\to t+3} \tag{7}$$

where $r_{Q5-Q1,t+1\to t+3}$ is the difference in delta-hedged call or put option returns between high- and low-$PRisk$ firms from $t+1$ to $t+3$, $PNBON_t$ is the normalized $PNBO$ at time t, and $X_{j,t+1\to t+3}$ is a vector of risk factors, including market, size, value, momentum, and the two volatility factors. We present results for months with negative price-quantity relation since these are the months that are more clearly related to supply shocks.[16]

[Insert Table 8 here]

The regression results are reported in Table 8. Interestingly, we do not find any significance for $PNBON$ when we consider the call option return spread. In contrast, we observe that in the case of put option returns the coefficient on $PNBON$ is positive and statistically significant at the 5% level. Specifically, the put option return spread increases (in absolute terms) by 16 basis points, when there is a one-standard deviation decrease in $PNBON$. In other words, when financial intermediaries become constrained,

[16] The results are very similar in the case of the full sample period. This is expected because the sample period for this analysis is from January 2003 to December 2012 and Chen et al. (2019) show that this period is dominated by a negative price-quantity relation.

the prices of high-$PRisk$ put options tend to rise and the crash-related political risk premium becomes higher.

It is important to note that the supply shock effect discussed in this section and the demand pressure effect discussed in the previous section are not inconsistent with each other. In particular, market makers might lower their supply and increase the option prices when they become more constrained and crash averse, whilst they might continue supplying options at higher option prices when there is elevated demand pressure and hence increased inventory risk. Both effects help us understand better the way political risk is priced in the equity option market. Chen et al. (2019) (see their Section 3.5) also point out that demand and supply effects coexist in the option markets.

3.5 Major political shocks

Our evidence so far is consistent with an environment where option prices incorporate a premium that reflects investors' expectations about political risk. In other words, investors accept *low returns on average* for the options of high $PRisk$ firms, because options serve as hedging instruments against the volatility and (mainly) jump risks associated with political events. In this section, we push our analysis one step further in order to validate the risk-based explanation of our predictability results. In particular, if the $PRisk$ effect represents indeed a valid risk premium, we expect to find that high $PRisk$ firms earn *high option returns* in cases of *unexpected political shocks*. Specifically, an important unforeseen political event is likely to have a more pronounced effect on the volatility and jumps of high $PRisk$ firms and hence the value of the respective options will increase leading to high option returns, exactly as investors hope for when purchasing these options driven by hedging motives.

To test for this conjecture, we perform the following regression:

$$r_{Q5-Q1,t} = \alpha + \beta \times Shock\_dummy_t + \gamma \times X_t + \varepsilon_t, \qquad (8)$$

where $r_{Q5-Q1,t}$ is the difference in delta-hedged call or put option returns between high and low $PRisk$ firms, $Shock\_dummy_t$ is a dummy variable that takes the value of one in months with extreme political events and zero otherwise, and X_t is a vector of the same risk factors that are used in Section 2.3.

We use the following important and largely unexpected events as our political shocks: the Lehman Brothers bankruptcy (September 2008), the debt-ceiling dispute (July 2011), China's currency devaluation (August 2015), the Brexit vote (June 2016), Trump's election (November 2016), and the Trump-triggered trade war (March 2018). Note that, unlike Section 3.1 which explores the difference in the way political uncertainty expectations are priced before and after a shock, in the analysis of this section we investigate the reaction of option prices on the shock itself.

[Insert Table 9 here]

In Table 9, we find that the estimate for the constant term α is negative and statistically significant at the 1% level for both call and put options, confirming again a strong negative relation between $PRisk$ and future delta-hedged option returns during normal periods. Importantly, the estimate for β is positive and also significant, with a larger magnitude compared to α (at 1.22 with t-statistic = 2.69 in Specification (2) and at 0.93 with t-statistic = 3.12 in Specification (4)). Thus, consistent with a risk-based explanation, the options on high-$PRisk$ firms outperform those on low-$PRisk$ firms in politically stressful times, while they underperform in normal periods. In other words, investors accept low option returns for politically risky firms on average, because they are compensated with high returns in the periods when they need them the most.[17]

In Table IA 10 in the Internet Appendix, we re-estimate Equation (8) after replacing the variable $Shock\_dummy$ with the variable $Shock\_dummy + 1\ month$, which moves the event window a month after the actual political shocks. In this placebo analysis, we find that the β coefficient is consistently insignificant.

Collectively, our results show that, while the options of politically risky firms are associated with low returns on average, they compensate investors with particularly high option returns in periods of major political shocks. Therefore, this evidence provides further credence to a risk-based explanation for the documented option return predictability. In addition, it helps us reject a potential "peso problem" explanation, which would imply that the option returns of politically risky firms are downward biased simply because major political events have not materialized during our sample period.

4 Additional analyses on the $PRisk$ effect

4.1 Economic significance

Section 2.3 investigates the relation between $PRisk$ and subsequent option returns at the portfolio level but, similar to the regression analysis, it utilizes scaled delta-hedged option gains. While theoretically sound, these option gains stem from self-financed positions and hence are not convenient for assessing portfolio profitability. Even though the primary aim of the paper is to understand the pricing of political risk in the option market rather than to identify a novel trading strategy, in this section we attempt to shed more light on the economic magnitude associated with the $PRisk$-induced option return predictability by focusing our attention on more traditional option returns. In line with Goyal and Saretto (2009)

[17] The above result is also evident in Figure IA 4 which plots the average delta-hedged option returns for the high- and low-$PRisk$ quintile portfolios during political shock months versus normal periods. We observe that during normal periods, both high- and low-$PRisk$ firms have negative delta-hedged option returns, but option returns of high-$PRisk$ firms are more negative on average. In contrast, delta-hedged option returns for both high- and low-$PRisk$ firms turn positive when market-wide political shocks materialize and the options of high-$PRisk$ firms increase more in value, generating more positive option returns and thus, providing a hedge against political shocks.

and Zhan et al. (2022), we create delta-hedged call and put option positions that remain open for one month without rebalancing the delta hedges. In particular, we construct a long-short trading strategy that goes short delta-hedged calls or puts on firms that belong to the top $PRisk$ quintile portfolio and long delta-hedged calls or puts on firms that belong to the bottom $PRisk$ quintile portfolio. In addition, we investigate the impact of transaction costs on the profitability of the $PRisk$-based long-short trading strategies. Specifically, we consider different ratios of effective to quoted bid-ask spread ranging from 0% to 50%.

[Insert Table 10 here]

Table 10 presents the average return of the long-short option value-weighted portfolio for calls and puts and for each effective to quoted spread ratio scenario. When the ratio is 0%, i.e., when trading takes place at the midpoint price, we observe a sizeable average long-short portfolio return that takes the value of 0.94% per month in the case of calls and 0.78% per month in the case of puts. Both return spreads are highly significant with t-statistics of about 6. By construction, the return spread decreases monotonically as we move towards higher transaction cost levels. When we consider a 25% effective to quoted spread ratio, the trading strategy remains profitable earning on average 0.32% per month in the case of call options and 0.26% per month in the case of put options (t-statistic of 2.10 and 2.45 for calls and puts, respectively). In line with Heston et al. (2022), these returns can be further improved if we avoid those options that are costlier to trade, i.e., if we exclude from the analysis options with quoted bid-ask spreads higher than 10%. By optimizing the trading strategy this way, the average call option long-short portfolio return becomes 0.45% per month, while the average put option long-short portfolio return becomes 0.41% per month (t-statistic of 2.12 and 3.13 for calls and puts, respectively). Finally, when we consider a 50% effective to quoted spread ratio, we find that the profitability of the $PRisk$-based trading strategy dissipates.[18]

Muravyev and Pearson (2020) emphasize that some sophisticated investors can predict option prices at high frequency and rely on this predictability to time their trades and minimize their transaction costs. In particular, they find that the effective to quoted spread ratio for investors who use execution algorithms for timing purposes lies between 20%-30%. This means that, while the profitability of the trading strategy associated with firm-level political risk falls within the bounds of transaction costs when we consider retail investors, it does exceed the transaction costs faced by sophisticated investors hence offering them exploitable trading opportunities.

[18] In Table IA 11 of the Internet Appendix, we present the same results for the two most prominent option-related predictors (Volatility Deviation and VTS), and for all our stock-related predictors included in Table 2 as controls. While some of the trading strategies, such as those based on IdioVol, Size, and Illiquidity remain particularly profitable even at 50% effective to quoted spread ratio levels, most of the strategies, similar to our strategy, lose their profitability at this level of transaction costs.

4.2 The impact of lobbying and political donations

Several prior studies have shown that some firms attempt to alleviate their exposure to political shocks by establishing political connections or by engaging in political activism in the form of political donations and lobbying (Faccio, 2006; Cooper et al., 2010; Tahoun, 2014; Correia, 2014; Chen et al, 2015). Motivated by this strand of the literature, we hypothesize that option investors will accept less negative returns for the option contracts of politically active firms – or equivalently they will be willing to pay less for hedging or speculating through those contracts – because they will anticipate that the financial performance and the stock returns of such firms will be less sensitive to political risk.

We examine firms' management of political exposure, either through lobbying politicians or by donating money to political campaigns using their Political Action Committees (PACs). Our source of data for lobby expenses and campaign contributions are from the Center for Responsive Politics (CRP).[19] We manually match company names in the CRP data with those in CRSP as they have no common identifier. Out of 3,450 unique firms in our sample, there are 1,395 lobbying firms and 764 firms that donate money to candidates during federal election campaigns. We define $lnLobby$ as the natural logarithm of one plus a firm's lobbying expenses over the past four quarters and $lnDonate$ as the natural logarithm of one plus a firm's campaign donation amount over the past four quarters. We then interact both of these measures with firm-level political risk and include them in our baseline regression specification. The interaction term addresses the question of whether the effect of political risk on option returns is reduced in magnitude for firms that actively engage in the political process.

[Insert Table 11 here]

The regression results are presented in Table 11. In Specifications (1) and (4), we show that lobbying is associated with a less negative relation between political risk and future delta-hedged call and put option returns. The estimated coefficient on the interaction term is 0.57 (t-statistic = 1.84) and 0.68 (t-statistic = 2.85) for the regression with call and put option returns, respectively. We obtain a similar result by using campaign donations as a proxy for political activism in Specifications (2) and (5). The positive and significant interaction terms (1.14 with t-statistic = 3.28 for calls and 1.16 with t-statistic = 3.72 for puts) indicate a less prominent effect of political risk on option returns for donating firms. Overall, our evidence supports the idea that investors expect that politically active firms will be less affected by political shocks and hence accept a less negative return for a given level of $PRisk$.

We push our analysis one step further and investigate whether the mitigating role of political activism in the context of the political risk-option returns relation is affected by the firm's partisan or non-partisan donation strategy. For example, in 2020 the coal company Alliance Resource Partners collected around $1.3 million via PACs, but more than 99% of this amount was donated to candidates of the

[19] The data is available at http://www.opensecrets.org.

Republican party. This is consistent with the company having a history of opposing environmental regulations, such as the Clean Power Plan. Therefore, while Alliance Resource Partners is clearly a politically active firm, its partisan profile and its strong ties with the Republican party are likely to be regarded by investors as risk-enhancing rather than risk-mitigating elements. Overall, we expect that the dampening role of political activism that we document above is mainly driven by non-partisan firms, because such firms have access to the political decision-making process irrespective of which party is in power and in this manner are more able to protect themselves against adverse political shocks.

We identify firms that tilt their campaign donations towards only one particular party by defining $Partisan$, a dummy variable that is equal to one (zero) if the absolute difference between donations to Democratic and Republican political campaigns scaled by the total donation is above (below) the median value of all donating firms in a given month. In Specifications (3) and (6) of Table 11 we augment Specifications (2) and (5) by including the three-way interaction term $PRisk \times lnDonate \times Partisan$ and the associated lower-order terms into our baseline regression. The $PRisk \times lnDonate$ terms are positive in both specifications (1.82 with t-statistic = 3.30 for calls and 1.42 with t-statistic = 3.59 for puts) suggesting that political donations significantly reduce the extent to which political risk affects the option returns of non-partisan firms. This is in line with the idea that a more moderate donating approach serves indeed as a risk mitigation strategy. In addition, we find that in both specifications, the $PRisk \times lnDonate \times Partisan$ terms are negative and significant at the 10% level (-7.79 with t-statistic = -1.74 for calls and -5.95 with t-statistic = -1.70 for puts). Hence, for partisan firms the combined effect of political donations and political risk on option returns is even stronger. Overall, the results of this exercise lend support to the hypothesis that political contributions are perceived by option investors as a successful risk management strategy as long as they are not targeted to only one party.

4.3 Response to earning calls

The main analysis of the paper primarily focused on the cross-sectional relation between firm-level political risk and future option returns. To further strengthen our empirical evidence, we now turn to the investigation of the respective time-series relation by exploring how option returns behave before and after the release of new information about political risk during earnings conference calls.

Earnings calls constitute one of the main information sources that are utilized by investors in order to update their expectations about a firm's future prospects and risk exposures. However, it is natural to assume that the level of political risk that is revealed during such calls is to some extent predictable and hence already incorporated into option prices. Therefore, we focus our attention to unexpected increases or decreases in political risk. Following Gorbatikov et al. (2019), we capture the surprise component of firm-level political risk using an AR1 regression augmented with the contemporaneous aggregate economy-wide political uncertainty (EPU) of Baker et al. (2016). In particular, we estimate the following regression separately for each firm using the full history of observations:

$$PRisk_t = \alpha + \beta \times PRisk_{t-1} + \gamma \times EPU_t + \varepsilon_t\ , \tag{9}$$

and define ε_t as the surprise component of firm-level political news during month t's earning call.[20]

[Insert Table 12 here]

Table 12 presents the average delta-hedged call and put option returns around unexpected increases or decreases in political risk. We define cases of an unexpected increase (decrease) in firm-level political risk as the earnings calls that correspond to the top (bottom) tercile of ε across the whole sample. To measure the impact of unexpected news about political risk on option returns, we compute the average option return in the two months before the earnings call month and compare it with the average option return in the two months after the earnings call month. Similar to Section 3.1, the earnings call month is excluded from the analysis. If political risk is indeed priced by option investors, we expect to observe a significant time-series effect as well, i.e., we expect to find statistically different average option returns before and after the surprise event.

We find that option returns decrease significantly after an unexpected increase in firm-level political risk. For example, the average delta-hedged put option return decreases from −0.66% to −0.78% after such an increase. Importantly, the spread between post-event and pre-event put option returns is negative (difference = −0.12%) and statistically significant (t-statistic = −2.21). We find a similar decreasing pattern for delta-hedged call option returns too. The difference between post-event and pre-event call option returns is −0.11% (t-statistic = −1.78). An opposite increasing pattern for option returns is observed after an unexpected decrease in political risk. However, this effect is not statistically significant. The difference in return spread between political risk increases and decreases is −0.17% (t-statistic = −2.13) for put option returns and –0.19% (t-statistic = −2.07) for call option returns, respectively.

Overall, our time-series empirical evidence lends further support to the idea that firm-level political risk is priced in the option market. Moreover, consistent with the cross-sectional analysis which showed that the $PRisk$ effect is largely driven by high-political risk firms, the above analysis demonstrates that in a time-series context the $PRisk$ effect is mainly driven by increases in political risk.

4.4 Other analyses

Most cross-sectional pricing patterns, both in the context of the stock market and in the context of the equity option market, are known to be more pronounced among stocks that are subject to high limits-to-arbitrage, face high informational frictions, and/or are financially distressed (Zhang, 2006; Avramov et al., 2013; McLean and Pontiff, 2016; Zhan et al., 2022; Vasquez and Xiao, 2023). Accordingly, we

[20] In Table IA 12 of the Internet Appendix, we re-estimate Equation (9) controlling for stock return in month $t-1$ and firm profitability in month t. The results using this alternative estimation method for the unexpected change in political risk are quantitatively very similar.

explore whether this conditioning effect also holds for the case of the option return predictability associated with firm-level political risk. Motivated by prior studies, we utilize five conditioning variables, namely firm size, analyst coverage, dispersion in analyst earnings forecasts, idiosyncratic volatility, and default risk. The detailed description of these variables is provided in Appendix A. The results, reported in Table IA 13, confirm that the predictive power of $PRisk$ for option returns is clearly stronger among firms that are relatively small, volatile, financially distressed, are followed by fewer analysts, and are associated with higher dispersion in beliefs.

In this last set of tests, we examine whether the political risk-option return relation is driven by specific political topics, and whether different topics affect option returns in different ways. HHLT apply the same textual analysis approach used for the construction of the overall political risk measure, but condition on words specific to a topic and hence decompose $PRisk$ into eight separate aspects, namely economic policy and budget, environment, trade, institutions and political process, healthcare, security and defense, tax policy, and technology and infrastructure. The results, presented in Table IA 14, show that all topic-specific political risk measures exhibit strong negative predictive power for future option returns. In addition, there is a large variation in the regression coefficients, with economic policy-related $PRisk$ having the least economically significant impact and healthcare-related $PRisk$ having the most economically significant impact.

5 Conclusion

This paper investigates whether political risk is priced in the equity option market. Using a comprehensive text-based measure of firm-level political risk, we find a negative and highly significant cross-sectional relation between political risk and future delta-hedged call and put option returns. This relation remains particularly robust across time and across different specifications. Interestingly, the predictability can give rise to a simple trading strategy that produces significant profits after taking into consideration the typical transaction costs faced by sophisticated investors. Finally, we provide causal evidence on the relation between political risk and future option returns using Brexit as a quasi-natural experiment. Firms exposed to Brexit uncertainty had a much stronger reduction in average option returns after the referendum compared to other firms.

We delve into the economic nature of the political risk effect by showing that firms with higher political-risk are associated with increased volatility and jumps, but that only politics-related jump risks are priced in the equity option market. As further evidence consistent with a risk-based explanation, we show that despite the fact that investors pay a premium for the options on high-political risk firms and earn low returns on average, they are compensated with high returns in months that experience major unexpected political shocks. In line with the notion that intermediary constraints might become more severe in cases of elevated political-driven crash risk, we further find that the political risk premium increases in periods when financial intermediaries become constrained. In addition, the results suggest that high firm-level political risk is associated with increased option net buying pressure and the effect of political risk on future option returns is more pronounced when it is accompanied by elevated option demand.

Finally, another set of analyses provide additional interesting insights with respect to the documented pricing phenomenon. For example, option returns are less sensitive to political risk when the company actively engages into the political process, but more sensitive when the underlying stock is exposed to limits-to-arbitrage and distress risk. Moreover, political risk affects option returns also in a time-series context, in the sense that an unexpected increase in political risk after an earnings call leads to a significant decrease in the following months' option returns. Overall, our paper completes the picture with respect to the way investors perceive and price the risks stemming from uncertain political decisions.

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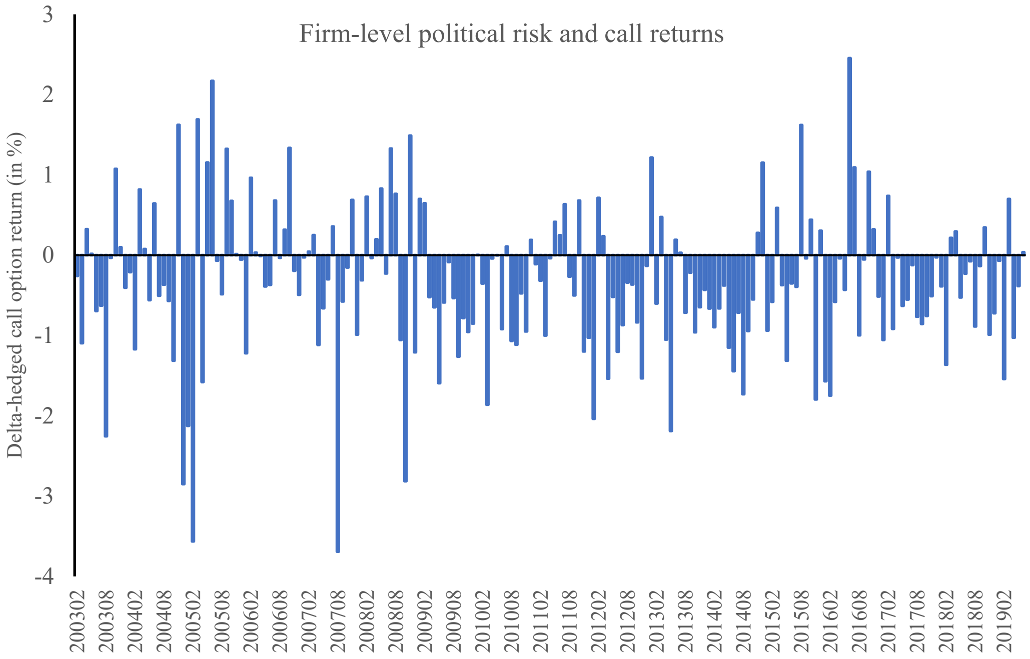
Figure 1: Returns of long-short option portfolios across time

This figure plots the monthly time-series delta-hedged option returns of the Q5-Q1 equal-weighted portfolio (in percentage terms). Firms are sorted to portfolios on a monthly basis based on their level of political risk. The top panel presents the results for call options, while the bottom panel presents the results for put options. Our sample spans the period from January 2003 to June 2019.



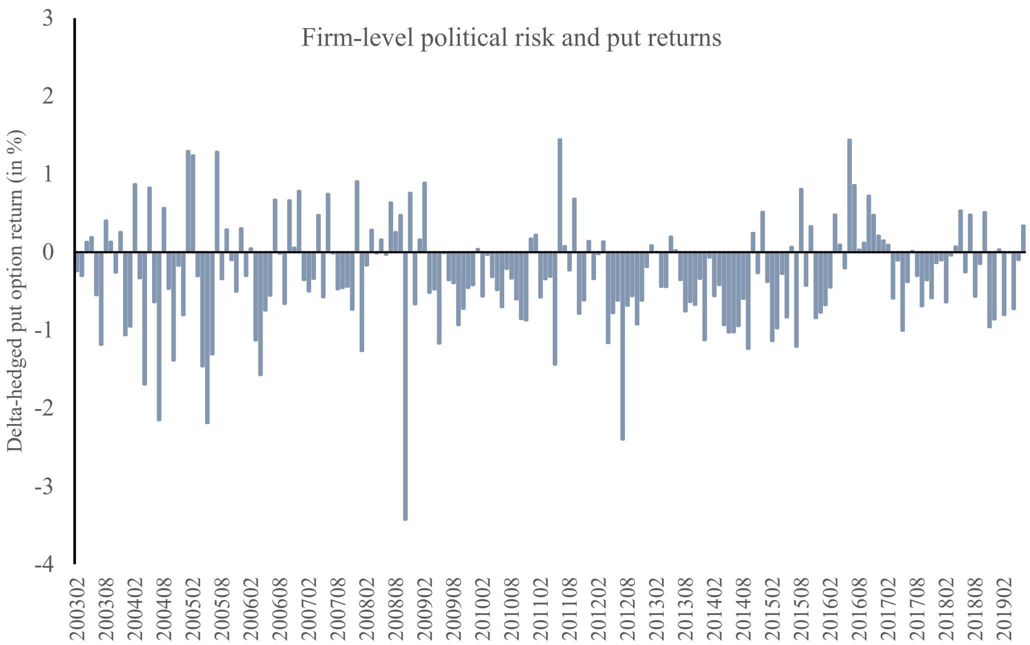
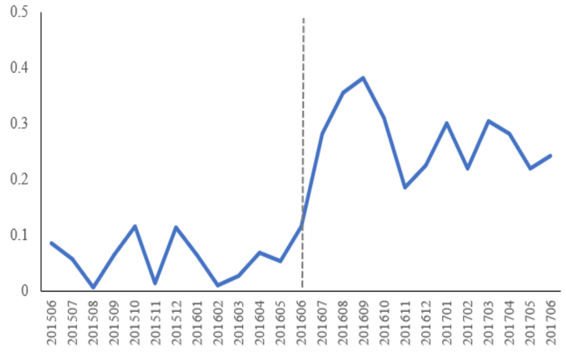


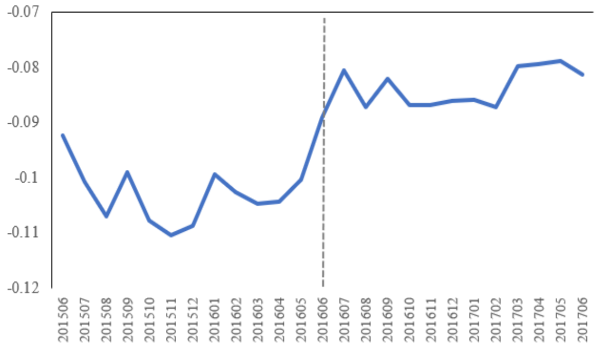
Figure 2: $PRisk$, implied volatility, and delta-hedged option returns around Brexit

Panel A plots the monthly difference in average $PRisk$ between treated (positive exposure to Brexit) and control (no exposure to Brexit) firms over June 2015 to June 2017. Panel B plots the monthly difference in average option implied volatility between treated (positive exposure to Brexit) and control (no exposure to Brexit) firms. Panel C (Panel D) plots the average delta-hedged call (put) option returns for treated (blue line) and control firms (grey line), respectively, before and after the Brexit referendum. The blurred blue and grey lines show the option returns for treated and control firms, respectively, for individual months relative to the Brexit referendum.

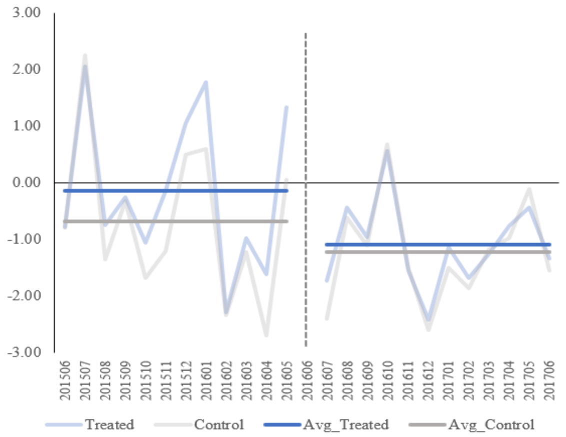
Panel A: Difference in PRisk between treated and control firms



Panel B: Difference in IV between treated and control firms



Panel C: Delta-hedged call returns of treated and control firms



Panel D: Delta-hedged put returns of treated and control firms

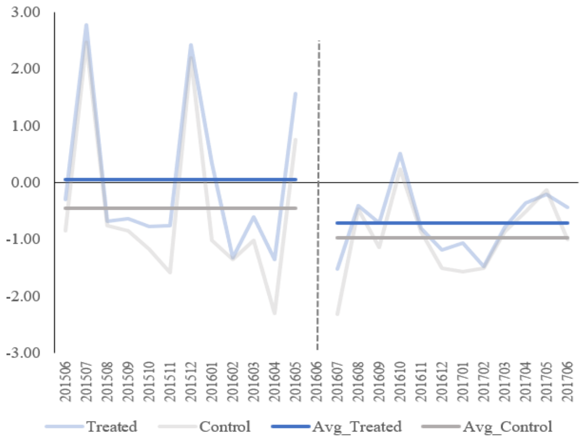


Table 1: Descriptive statistics

This table presents summary statistics for delta-hedged option returns, firm-level political risk, and control variables. All values are calculated as the time series average of the monthly cross-sectional means, distribution statistics, and percentiles. Panel A reports descriptive statistics for delta-hedged call (put) option returns, which are calculated as the scaled delta-hedged call (put) option gains. The delta-hedged call (put) option gain is the change over one month in the value of a portfolio that goes long one call (put) contract and is re-hedged daily with a certain number of underlying shares so that the portfolio is not sensitive to the underlying price movement. The scale factor for the delta-hedged call and put option gain is (△*S − C) and (P − △*S), respectively, where △ is the Black-Scholes option delta. Moneyness is the ratio of the underlying stock price to the option strike price. Panel B reports the text-based measure of firm-level political risk and the stock-related characteristics used in the paper. $PRisk$ and $PSentiment$ are standardized to have unit standard deviation. $PRisk$ is winsorized each month at (0, 95). All other variables are winsorized at (0.5, 99.5). Our sample spans the period from January 2003 to June 2019.

Panel A: Delta-hedged option returns

	Observations	Mean	STD	10th	25th	50th	75th	90th
Delta-hedged call gains till month-end / (Δ*S − C) (%)	113,288	−1.19	4.76	−4.73	−2.70	−1.23	0.12	1.88
Call moneyness	113,288	1.00	0.05	0.94	0.98	1.00	1.03	1.06
Delta-hedged put gains till month-end / (P − Δ*S) (%)	113,288	−0.77	3.85	−3.73	−1.94	−0.59	0.63	2.12
Put moneyness	113,288	1.00	0.05	0.94	0.98	1.00	1.03	1.07
Days to expiration	113,288	50	2	47	49	50	51	52

Panel B: Independent variables

	Observations	Mean	STD	10th	25th	50th	75th	90th
$PRisk$	113,288	0.85	0.94	0.04	0.18	0.51	1.14	2.23
$PSentiment$	113,288	1.01	0.91	0.03	0.49	0.96	1.50	2.07
EPU beta	102,726	−0.06	0.57	−0.70	−0.37	−0.07	0.24	0.58
Size	113,288	14.91	1.47	13.12	13.85	14.77	15.87	16.93
BM	109,342	0.47	0.39	0.12	0.21	0.36	0.61	0.92
IdioVol	113,283	0.28	0.15	0.13	0.17	0.24	0.34	0.47
Reversal	113,283	0.01	0.08	−0.09	−0.04	0.01	0.06	0.11
Momentum	110,583	0.22	0.51	−0.27	−0.08	0.13	0.39	0.77
Illiquidity	113,283	0.20	0.66	0.01	0.02	0.05	0.16	0.44
Inst Own	112,434	0.78	0.23	0.44	0.68	0.83	0.93	1.01
Leverage	112,702	0.53	0.26	0.20	0.34	0.52	0.70	0.87
Profitability	112,827	0.33	0.29	0.05	0.16	0.30	0.47	0.70

Table 2: The effect of firm-level political risk on future delta-hedged option returns: Fama-MacBeth regressions

This table reports the average coefficients and average adjusted R^2 values from Fama and MacBeth (1973) cross-sectional regressions of delta-hedged option returns in month $t + 1$ (in percentage terms) on firm-level political risk ($PRisk$) and control variables measured at the end of month t. The main independent variable is the standardized $PRisk$ at the end of month t based on the most recent conference call. Control variables include political sentiment, EPU beta, log of market cap, book-to-market ratio, idiosyncratic volatility, return reversal, momentum, stock illiquidity, institutional ownership, leverage, and gross profitability. Our sample spans the period from January 2003 to June 2019. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	Delta-hedged call option returns		Delta-hedged put option returns	
	(1)	(2)	(3)	(4)
$PRisk$	−0.18***	−0.16***	−0.15***	−0.16***
	(−7.12)	(−6.58)	(−6.70)	(−7.73)
$PSentiment$		−0.02		−0.02
		(−1.20)		(−1.26)
EPU beta		0.03		0.02
		(0.81)		(0.48)
Size		0.20***		0.18***
		(9.92)		(13.17)
BM		0.31***		0.32***
		(4.56)		(6.28)
IdioVol		−2.02***		−1.73***
		(−14.35)		(−18.53)
Reversal		0.96***		−0.07
		(3.69)		(−0.31)
Momentum		0.18**		0.11**
		(2.08)		(2.20)
Illiquidity		−0.27***		−0.29***
		(−4.71)		(−7.28)
Inst		0.48***		0.45***
		(5.26)		(5.11)
Leverage		0.10		0.14**
		(1.22)		(2.27)
Profitability		0.54***		0.37***
		(6.36)		(4.57)
Intercept	−1.16***	−4.32***	−0.60***	−3.41***
	(−11.05)	(−11.62)	(−4.71)	(−12.82)
Adjusted R^2	0.001	0.086	0.001	0.092

Table 3: Controlling for option-related characteristics

This table reports the Fama and MacBeth (1973) cross-sectional regression results for the effect of firm-level political risk on delta-hedged option returns controlling for several option-related characteristics. The dependent variable is the delta-hedged call or put option return in month $t+1$ (in percentage terms). The main independent variable is the standardized firm-level political risk ($PRisk$) at the end of month t based on the most recent conference call. Volatility deviation is the log difference between the past twelve month realized volatility and the current Black-Scholes implied volatility extracted from ATM options. Volatility term structure (VTS) is the difference between long-term and short-term implied volatility. Risk-neutral skewness (RNS) and kurtosis (RNK) of stock returns are inferred from a portfolio of options across different strike prices following Bakshi et al. (2003). Volatility spread is the difference in the implied volatilities between ATM call and ATM put options at the month end. Volatility-of-volatility (VOV) is the standard deviation of the daily percentage change in ATM implied volatility within the month. Option illiquidity is the option bid-ask spread divided by its midpoint price. Our sample spans the period from January 2003 to June 2019. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	Delta-hedged call option returns			Delta-hedged put option returns		
	(1)	(2)	(3)	(4)	(5)	(6)
$PRisk$	–0.17***	–0.18***	–0.17***	–0.15***	–0.15***	–0.14***
	(–6.90)	(–6.70)	(–6.88)	(–6.50)	(–6.76)	(–6.39)
Volatility Deviation	1.87***	1.77***	1.70***	1.64***	1.49***	1.40***
	(12.64)	(12.00)	(11.39)	(13.94)	(14.18)	(13.91)
VTS	2.48***	1.87***	1.73***	3.23***	2.97***	2.75***
	(4.48)	(3.47)	(3.29)	(5.67)	(5.72)	(5.58)
RNS		–0.61***	–0.52***		–0.25***	–0.14***
		(–11.99)	(–9.64)		(–4.74)	(–3.66)
RNK		0.18***	0.22***		0.18***	0.25***
		(7.16)	(7.96)		(7.59)	(10.08)
Volatility Spread		–4.18***	–4.57***		11.40***	11.19***
		(–6.87)	(–7.49)		(18.29)	(18.73)
VOV		–6.49***	–5.34***		–5.46***	–3.83***
		(–9.40)	(–7.07)		(–8.93)	(–6.16)
Option Illiquidity			–1.52***			–2.23***
			(–7.55)			(–11.26)
Intercept	–1.18***	–1.85***	–1.84***	–0.62***	–1.10***	–1.11***
	(–8.64)	(–9.46)	(–9.18)	(–3.92)	(–6.36)	(–6.20)
Adjusted R^2	0.03	0.06	0.08	0.03	0.09	0.11

Table 4: Portfolio-sorting analysis

This table reports the average returns (in percentage terms) of option portfolios sorted by the underlying asset's $PRisk$. $PRisk$ is the standardized firm-level political risk at the end of month t based on the most recent conference call. At the end of each month from January 2003 to May 2019, we sort stocks into quintiles according to their political risk level. We report the average next month's delta-hedged call and put option return for each quintile portfolio and the average return differential between the top and the bottom quintile. The portfolios are equal-weighted, option value-weighted, i.e., weighted by the market value of the option open interest, or stock value-weighted, i.e., weighted by the market value of the underlying stock winsorized at the NYSE 80th percentile each month. We also report the alphas with respect to two factor models. The first model includes the Fama and French (1993) three factors and the Carhart (1997) momentum factor, while the second model further adds the zero-beta straddle return of the S&P 500 index from Coval and Shumway (2001) and the change in VIX. Our sample spans the period from January 2003 to June 2019. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

			Delta-hedged call option returns (%)			Delta-hedged put option returns (%)		
	No. firms	Average $PRisk$	Equal-weighted	OV-weighted	SV-weighted	Equal-weighted	OV-weighted	SV-weighted
Q1	115	0.07	–0.97	–0.76	–0.87	–0.56	–0.54	–0.47
			(–8.48)	(–5.48)	(–7.48)	(–5.47)	(–3.97)	(–3.71)
Q2	115	0.18	–1.02	–1.00	–0.88	–0.66	–0.65	–0.56
			(–10.20)	(–9.10)	(–8.59)	(–6.11)	(–4.61)	(–4.18)
Q3	115	0.33	–1.07	–1.08	–0.90	–0.72	–0.78	–0.60
			(–9.89)	(–8.30)	(–8.15)	(–6.84)	(–6.10)	(–4.62)
Q4	115	0.59	–1.16	–1.06	–0.97	–0.71	–0.64	–0.56
			(–11.21)	(–7.43)	(–9.06)	(–6.77)	(–4.99)	(–4.36)
Q5	115	1.62	–1.32	–1.26	–1.07	–0.85	–0.91	–0.67
			(–11.79)	(–8.67)	(–9.55)	(–7.70)	(–7.26)	(–5.14)
Q5–Q1		1.55	–0.34***	–0.50***	–0.20***	–0.29***	–0.38***	–0.20***
			(–5.14)	(–3.30)	(–3.31)	(–5.87)	(–4.22)	(–4.40)
4-factor alpha			–0.34***	–0.57***	–0.20***	–0.30***	–0.42***	–0.21***
			(–5.02)	(–3.61)	(–3.20)	(–5.53)	(–3.92)	(–3.95)
6-factor alpha			–0.31***	–0.59***	–0.17***	–0.28***	–0.45***	–0.18***
			(–4.71)	(–3.07)	(–2.82)	(–5.26)	(–3.61)	(–3.35)

Table 5: The effect of Brexit risk on delta-hedged option returns

This table reports the difference-in-difference estimates for delta-hedged option returns before and after the Brexit vote. The Brexit referendum took place in June 2016. $Treat$ is a dummy variable that takes the value of one if firms have positive Brexit risk in any quarter from July 2016 to June 2017 and zero otherwise. $Post$ equals one for the months after June 2016. We present the regression results for both call and put option returns using a sample of ± 1 year around the referendum month. Control variables include Brexit sentiment, size, book-to-market ratio, idiosyncratic volatility, return reversal, momentum, stock illiquidity, institutional ownership, leverage, and gross profitability. We report only the coefficients on $Treat$, $Post$, and their interaction; the coefficients on the remaining variables are suppressed for the sake of brevity. Robust t-statistics, clustered at the firm level, are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	Delta-hedged call option returns				Delta-hedged put option returns			
Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Treat$	0.01	0.01	0.01		0.07	0.08	0.05	
	(0.11)	(0.06)	(0.12)		(0.82)	(0.91)	(0.62)	
$Treat \times Post$	–0.29**	–0.29**	–0.30**	–0.25**	–0.24**	–0.23**	–0.23**	–0.22**
	(–2.17)	(–2.32)	(–2.36)	(–2.05)	(–2.00)	(–2.05)	(–2.02)	(–1.98)
$Post$	–0.56***				–0.49***			
	(–8.87)				(–9.13)			
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Industry FE	No	No	Yes	No	No	No	Yes	No
Firm FE	No	No	No	Yes	No	No	No	Yes
Observations	11,311	11,311	11,311	11,311	11,311	11,311	11,311	11,311
Number of treated	1,102	1,102	1,102	1,102	1,102	1,102	1,102	1,102
Adjusted R^2	0.06	0.15	0.16	0.20	0.07	0.20	0.21	0.24

Table 6: Sources of the risk premium

Panel A reports the results from the Fama and MacBeth (1973) cross-sectional regressions of various risk measures estimated in month t on $PRisk$, controlling for firm characteristics. Panel A1 uses realized volatility (STD), skewness (SKEW) and kurtosis (KUR), as well as maximum (MAX) and minimum return (MIN) within the month as dependent variables. Panel A2 uses risk-neutral volatility (RNV), skewness (RNS) and kurtosis (RNK) as dependent variables. Panel B reports the results from the Fama and MacBeth (1973) cross-sectional regressions of delta-vega-neutral call (put) option portfolio returns (jump risk sensitive) and delta-gamma-neutral call (put) option portfolio returns (volatility risk sensitive) respectively in month $t+1$ on $PRisk$, controlling for firm characteristics. The control variables included are the same with Specification (2) of Table 2. We report the coefficients on $PRisk$; the coefficients on the remaining variables are suppressed for the sake of brevity. Our sample spans the period from January 2003 to June 2019. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

Panel A: $PRisk$ and various risk measures

A1: $PRisk$ and Realized moments

	STD	SKEW	KUR	MIN	MAX
$PRisk$	0.01***	−0.01*	0.04**	−0.10***	0.03**
	(3.78)	(−1.80)	(2.45)	(−4.36)	(2.43)
Controls*	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.31	0.22	0.03	0.31	0.46

(*) Exclude IdioVol

A2: $PRisk$ and Risk-neutral moments

	RNV	RNS	RNK
$PRisk$	0.01***	−0.01***	0.02*
	(8.88)	(−3.19)	(1.68)
Controls	Yes	Yes	Yes
Adjusted R^2	0.62	0.15	0.11

Panel B: Volatility risk and jump risk premium

	Call options		Put options	
	(1) Delta-neutral, vega-neutral	(2) Delta-neutral, gamma-neutral	(3) Delta-neutral, vega-neutral	(4) Delta-neutral, gamma-neutral
$PRisk$	0.66***	0.18	−0.43***	0.09
	(4.33)	(0.28)	(−2.59)	(0.10)
Controls	Yes	Yes	Yes	Yes
Adjusted R^2	0.12	0.11	0.13	0.06

Table 7: Firm-level political risk and option demand pressure

Panel A reports the results from the Fama and MacBeth (1973) cross-sectional regressions of option net buying pressure on $PRisk$, controlling for firm characteristics. Net buying pressure is the difference between the total monthly open buy positions and open sell positions from public customers scaled by stock trading volume in that month. Panel B presents the Fama and MacBeth (1973) cross-sectional regression results with respect to the effect of option demand pressure on the relation between firm-level political risk and delta-hedged option returns. We sort firms into two equal groups based on their option net buying demands each month and then perform the regressions of delta-hedged option returns in month $t + 1$ (in percentage terms) on $PRisk$, controlling for firm characteristics, within each subsample. The control variables included are the same with Specification (2) of Table 2. We report the coefficients on $PRisk$ in each subsample and their difference; the coefficients on the remaining variables are suppressed for the sake of brevity. The data are from the International Securities Exchange and cover the period from January 2006 to April 2016. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

Panel A: $PRisk$ and option demand pressure

	Call options	Put options	Total
$PRisk$	0.19***	0.11**	0.29***
	(3.30)	(2.39)	(4.19)
Controls	Yes	Yes	Yes
Adjusted R^2	0.03	0.03	0.03

Panel B: Conditioning effect of option demand pressure

	Delta-hedged call option returns		Delta-hedged put option returns	
	Low Demand	High Demand	Low Demand	High Demand
$PRisk$	−0.14***	−0.26***	−0.12***	−0.23***
	(−4.33)	(−6.22)	(−4.75)	(−5.22)
Controls	Yes	Yes	Yes	Yes
Adjusted R^2	0.10	0.10	0.10	0.10
Difference	−0.12**		−0.11**	
(t-stat)	(−2.42)		(−2.20)	

Table 8: The role of intermediary constraints

This table reports the results from the regressions of the average 3-month-ahead delta-hedged option return spreads between high- and low-$PRisk$ (equal-weighted) quintiles on $PNBON$, controlling for other risk factors. We present the results for months with negative price-quantity relation ($b_{VP} < 0$). $PNBON$ is the (normalized) public net open-buying volume (equivalently financial intermediaries' net selling volume) of deep-out-of-the-money (DOTM) S&P500 index put option (Chen et al., 2019). The risk factors include the Fama and French (1993) three factors (MKT, SMB, HML), the Carhart (1997) momentum factor (UMD), the zero-beta straddle return of the S&P 500 index (STRADDLE) from Coval and Shumway (2001) and the change in VIX (DVIX). Our sample spans the period from January 2003 to December 2012. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	Q5-Q1 call returns (%) [t+1: t+3]	Q5-Q1 put returns (%) [t+1: t+3]
	$b_{VP} < 0$	$b_{VP} < 0$
Alpha	−0.54***	−0.40***
	(−3.50)	(−3.89)
$PNBON$	−0.03	0.16**
	(−0.40)	(2.07)
MKT	−0.01	0.03
	(−0.19)	(0.83)
SMB	0.05	0.01
	(0.70)	(0.22)
HML	−0.05	−0.03
	(−0.98)	(−0.58)
UMD	−0.01	0.00
	(−0.67)	(−0.07)
STRADDLE	−0.01*	0.00
	(−1.83)	(−0.22)
DVIX	0.00	0.00
	(1.04)	(0.24)
Adjusted R^2	0.09	0.10

Table 9: Political shocks

This table reports the results from the regressions of the delta-hedged option return spreads between high- and low-$PRisk$ (equal-weighted) quintiles on $Shock\_dummy$, controlling for other risk factors. $Shock\_dummy$ is a dummy variable that takes value of one in months with unexpected political events and zero otherwise. The extreme unexpected political events in our sample period include the Lehman Brother bankruptcy (September 2008), the debt-ceiling dispute (July 2011), China's currency devaluation (August 2015), the Brexit vote (June 2016), Trump's election (November 2016), and the Trump-triggered trade war (March 2018). The risk factors include the Fama and French (1993) three factors (MKT, SMB, HML), the Carhart (1997) momentum factor (UMD), the zero-beta straddle return of the S&P 500 index (STRADDLE) from Coval and Shumway (2001) and the change in VIX (DVIX). Our sample spans the period from January 2003 to June 2019. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	Q5−Q1 call returns (%)		Q5−Q1 put returns (%)	
	(1)	(2)	(3)	(4)
Alpha	−0.38***	−0.35***	−0.32***	−0.31***
	(−5.83)	(−5.50)	(−6.76)	(−5.78)
$Shock\_dummy$	1.07**	1.22***	0.86***	0.93***
	(2.34)	(2.69)	(4.22)	(3.12)
MKT		−0.03		−0.01
		(−1.52)		(−0.36)
SMB		0.01		0.01
		(0.40)		(0.70)
HML		0.01		0.02
		(0.27)		(0.64)
UMD		0.00		0.01
		(0.27)		(0.54)
STRADDLE		0.00		0.00
		(0.35)		(0.55)
DVIX		0.04*		0.02
		(−1.82)		(−1.14)
Adjusted R^2	0.04	0.06	0.05	0.06

Table 10: Economic significance of political exposure trading strategy

This table presents the impact of bid-ask spreads on the profitability of the high-low delta-hedged call and put option returns sorted by firm-level political risk. We examine the results using the full option sample as well as the sample of options with percentage bid-ask spreads below 10%. At the end of each month from January 2003 to May 2019, we sort options into quintiles according to their firm-level political risk and hold the option portfolios for one month without rebalancing the delta hedges. The portfolios are option value-weighted. We report the Q5–Q1 delta-hedged call (put) option returns for different ratios of the effective bid-ask spread to the quoted bid-ask spread: 0% (No cost), 10%, 25%, and 50%. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

Effective to Quoted Spread	Long-short delta-hedged call returns (%)		Long-short delta-hedged put returns (%)	
	Full sample	Relative spread < 0.1	Full sample	Relative spread < 0.1
0% (No cost)	0.94***	0.82***	0.78***	0.76***
	(5.81)	(3.74)	(6.04)	(5.66)
10%	0.69***	0.68***	0.57***	0.62***
	(4.43)	(3.10)	(5.26)	(4.67)
25%	0.32**	0.45**	0.26**	0.41***
	(2.10)	(2.12)	(2.45)	(3.13)
50%	−0.31**	0.09	−0.25**	0.07
	(−2.16)	(0.43)	(−2.31)	(0.58)

Table 11: Firm-level political risk and political risk management

This table presents the Fama and MacBeth (1973) cross-sectional regression results with respect to the effect of political activism on the relation between firm-level political risk and delta-hedged option returns. $lnLobby$ is the natural logarithm of one plus a firm's lobbying expense over the past four quarters. $lnDonate$ is the natural logarithm of one plus a firm's campaign donation over the past four quarters. $Partisan$ is a dummy variable that takes the value of one if the absolute difference between donations to Democratic and Republican political campaigns scaled by the total donation is above the median across firms in that month. The control variables included are the same with Specification (2) of Table 2. We report only the coefficients on $PRisk$, $lnLobby$, $lnDonate$, $Partisan$, and their associated interactions; the coefficients on the remaining variables are suppressed for the sake of brevity. The coefficients on $lnLobby$ and $lnDonate$, as well as the associated interaction terms, have been multiplied by 100. Our sample spans the period from January 2003 to June 2019. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	Delta-hedged call returns			Delta-hedged put returns		
	(1)	(2)	(3)	(4)	(5)	(6)
$PRisk$	−0.20***	−0.20***	−0.20***	−0.20***	−0.19***	−0.19***
	(−5.65)	(−6.86)	(−6.98)	(−6.76)	(−7.25)	(−7.33)
$PRisk \times lnLobby$	0.57*			0.68***		
	(1.84)			(2.85)		
$lnLobby$	−0.80***			−0.84***		
	(−3.54)			(−5.58)		
$PRisk \times lnDonate$		1.14***	1.82***		1.16***	1.42***
		(3.28)	(3.30)		(3.72)	(3.59)
$lnDonate$		−1.04***	−1.83***		−0.84***	−1.31***
		(−3.33)	(−5.08)		(−4.68)	(−4.53)
$Partisan$			−0.09			0.17
			(−0.37)			(0.58)
$PRisk \times Partisan$			0.67			0.58
			(1.39)			(1.64)
$lnDonate \times Partisan$			2.43			−0.89
			(1.07)			(−0.34)
$PRisk \times lnDonate \times Partisan$			−7.79*			−5.95*
			(−1.74)			(−1.70)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.09	0.09	0.08	0.09	0.09	0.09

Table 12: Response to earnings calls

This table reports the average monthly delta-hedged call and put option returns (in percentage terms) around unexpected increases and decreases in firm-level political risk. The surprise component for each firm's political risk is captured using an AR1 regression augmented with the contemporaneous EPU value. We define unexpected increases (decreases) in firm-level political risk as the earnings calls that correspond to the top (bottom) tercile of this surprise component across the whole sample. We report the average delta-hedged option returns in the two months before and the two months after the earnings call month. Our sample spans the period from January 2003 to June 2019. t-statistics are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	Delta-hedged call option returns (%)			Delta-hedged put option returns (%)		
Political risk surprise	Increase	Decrease	Difference	Increase	Decrease	Difference
Pre-event return	−0.94	−0.97	0.03	−0.66	−0.75	0.08
Post-event return	−1.05	−0.89	−0.16	−0.78	−0.70	−0.08
Difference	−0.11*	0.08	−0.19**	−0.12**	0.05	−0.17**
	(−1.78)	(1.23)	(−2.07)	(−2.21)	(0.80)	(−2.13)

Appendix A: Variable definitions

A.1 Firm- and stock-related characteristics

- ***PRisk*** (firm-level political risk): is measured as the proportion of the conversation in quarterly conference calls devoted to risks related to political topics. For details, see HHLT. $PRisk$ for each firm in each month is based on the available political risk of the firm extracted from the most recent conference call. $PRisk$ is winsorized each month at (0, 95) and is normalized to have unit standard deviation.
- ***PSentiment*** (firm-level political sentiment): is measured by counting political bigrams conditioning on the proximity to words representing positive or negative sentiment based on the Loughran and McDonald (2011) sentiment dictionary. For details, see HHLT. $PSentiment$ for each firm in each month is based on the available political sentiment of the firm extracted from the most recent conference call. $PSentiment$ is winsorized each month at (0.5, 99.5) and is normalized to have unit standard deviation.
- **EPU beta**: is estimated from a regression of monthly stock excess returns on the innovations of the economic policy uncertainty index controlling for the market excess returns over the past 60 months with a requirement of at least 36 months of non-missing stock returns.
- **Size:** is the natural logarithm of the market capitalization, which is the product of stock price and number of shares outstanding at the end of the month.
- **BM** (Book-to-market ratio)**:** is the ratio of a firm's book value of equity to its market value of equity where the market value of equity is the market capitalization at the end of the fiscal year. The book value of equity is total stockholders' equity (Compustat item "seq"), plus deferred taxes (Compustat item "txditc" or the sum of items "txdb" and "itcb" if "txditc" is missing), minus preferred stock (Compustat item "pstkrv", or "pstkl", or "pstk" in that order of availability).
- **IdioVol** (Idiosyncratic volatility)**:** is the standard deviation of the residuals, $\varepsilon_{i,\tau}$, from the regression of daily excess stock returns on daily Fama and French (1993) three factors: $r_{i,\tau} - r_{f,\tau} = \alpha_{i,t} + \beta_{i,t}^{M} \times (r_{M.\tau} - r_{f,\tau}) + \beta_{i,t}^{S} \times SMB_{\tau} + \beta_{i,t}^{H} \times HML_{\tau} + \varepsilon_{i,\tau}$, over the past one month with a requirement of at least 15 non-missing daily stock returns.
- **Reversal:** is the cumulative stock return over the past one month.
- **Momentum:** is the cumulative stock return over the period from month $t - 12$ to month $t - 1$.
- **Illiquidity** (Amihud's (2002) stock illiquidity)**:** is computed as the average of the daily ratio of absolute return to dollar volume within the past one month (multiplied by 10^8). We require at least 15 daily observations.
- **Inst** (Institutional ownership): is the percentage of shares owned by institutional investors divided by the number of shares outstanding. Data are from Thomson Reuters Institutional (13f) Holdings.
- **Leverage:** is the ratio of total liabilities (Compustat item "lt") to total assets (Compustat item "at").
- **Profitability**: is the ratio of revenues (Compustat item "revt") minus costs of goods sold (Compustat item "cogs") to total assts (Compustat item "at")**.**
- **STD, SKEW,** and **KUR**: are the standard deviation, skewness, and kurtosis of daily stock returns over the month with a requirement of at least 15 non-missing daily stock returns.

- **MIN** and **MAX**: are, respectively, the minimum and maximum daily stock return within the month with a requirement of at least 15 non-missing daily stock returns.

A.2 Option-related characteristics

- **Volatility Deviation**: is the log difference between the realized volatility, calculated as the annualized standard deviation of daily stock returns over the past 12 months, and the at-the-money implied volatility. At-the-money implied volatility is defined as the average implied volatility of a call and a put option with absolute value of delta equal to 0.50 and 30 days to maturity. Data are from the Volatility Surface file.
- **VTS** (Volatility Term Structure): is the difference between the at-the-money implied volatility for options expiring in 91 days and that for options expiring in 30 days. At-the-money implied volatility for each horizon is defined as the average implied volatility of a call and a put option with absolute value of delta equal to 0.50. Data are from the Volatility Surface file.
- **RNV, RNS,** and **RNK** (Risk-neutral volatility, skewness, and kurtosis): are the higher-order risk-neutral moments estimated as in Bakshi, Kapadia and Madan (2003) using options with 30 days to maturity and absolute delta lower or equal to 0.50. We interpolate the implied volatility smile using a cubic smoothing spline for the moneyness levels that range within the available data and extrapolate using the respective boundary values for moneyness levels outside the available data. The integrals of the formulas are estimated using the trapezoidal approximation. Data are from the Volatility Surface file.
- **VOV** (Volatility-of-Volatility): is the standard deviation of the percentage changes in at-the-money implied volatility within the month. At-the-money implied volatility is defined as the average implied volatility of a call and a put option with absolute value of delta equal to 0.50 and 30 days to maturity. We require at least 15 daily observations. Data are from the Volatility Surface file.
- **Volatility Spread**: is the difference between the implied volatility of a call option with delta equal to 0.50 and 30 days to maturity and that of a put option with delta equal to −0.50 and 30 days to maturity. Data are from the Volatility Surface file.
- **Option illiquidity**: is the ratio of the difference between the option ask and bid quotes to the midpoint of option bid and ask quotes.

A.3 Other conditioning variables

- **Default probability:** We employ Bharath and Shumway's (2008) version of the Merton distance to default model to get estimates of default probability. Each month, a firm's default probability, $DP_{i,t}$, is calculated as follows:

$$DP_{i,t} = N\left(-\frac{\ln\left(\frac{V}{D}\right) + (r_{t-1} - 0.5\sigma_V^2)T}{\sigma_V\sqrt{T}}\right)$$

where $N(.)$ is the cumulative normal distribution, V is the total value of the firm's assets, which equals the firm's market value of equity (ME) plus the face value of debt (D) in month t, T is the firm's debt maturity assumed equal to one year, r_{t-1} represents the expected return on the firm's total assets and is estimated as the annualized stock return from the past 12 months, and σ_V is the volatility of the firm's total assets. Specifically, σ_V is computed as the weighted average of the volatilities of the firm's equity and debt:

$$\sigma_V = \left(\frac{ME}{ME + D}\right)\sigma_E + \left(\frac{D}{ME + D}\right)\sigma_D$$

where σ_E is the volatility of the firm's equity estimated using monthly equity returns over the past 36 months, and σ_D is the volatility of the firm's debt estimated as: $\sigma_D = 0.05 + 0.25\sigma_E$. The face value of debt (D) equals current liabilities (Compustat item "dlcq") plus half the long-term debt (Compustat item "dlttq").

- **Analyst Coverage**: is the number of analysts following the firm. If the value is missing, it is set equal to zero. Data are obtained from IBES.
- **Analyst DISP**: is the dispersion in analysts' forecasts, computed as the standard deviation of analysts' earnings forecasts for the next fiscal year, scaled by the absolute value of the average earnings forecast. Data are obtained from IBES.
- **Option net-buying pressure**: is the difference between total monthly open buy positions and total monthly open sell positions of public customers scaled by stock trading volume over the month.
- $\boldsymbol{lnLobby}$: is the natural logarithm of one plus a firm's lobbying expenses over the past four quarters.
- $\boldsymbol{lnDonate}$: is the natural logarithm of one plus a firm's campaign donations over the past four quarters.
- $\boldsymbol{Partisan}$: is a dummy variable that takes the value of one if the absolute difference between donations to Democratic and Republican political campaigns scaled by the total donation is above the median across firms in the month.

Internet Appendix

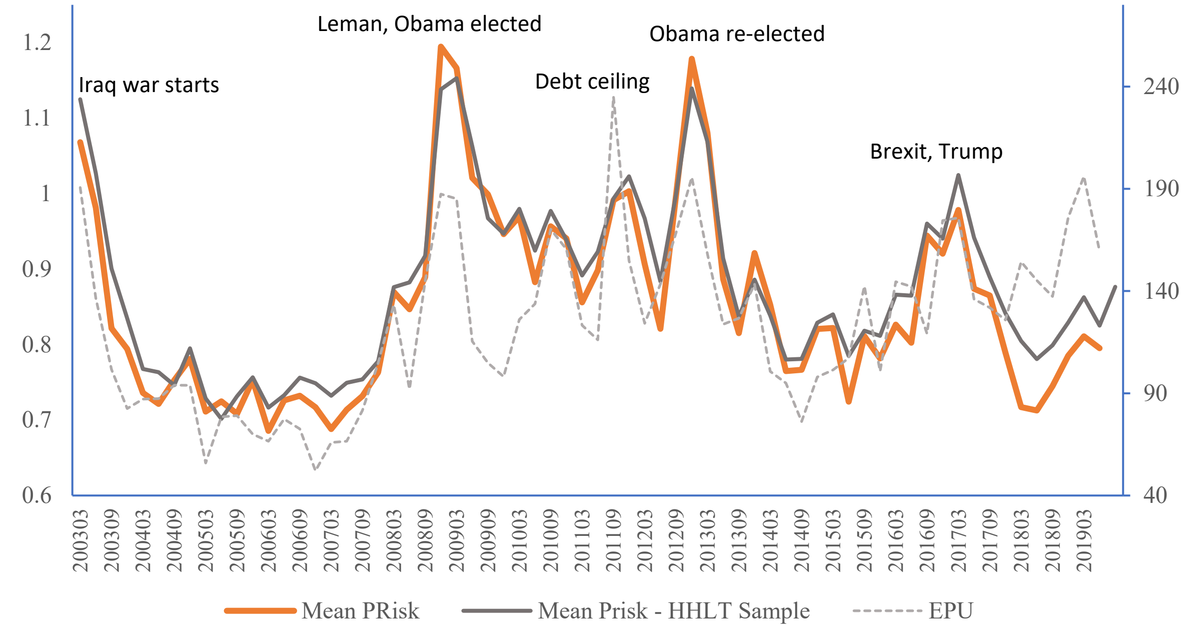
for

Is firm-level political risk priced in the equity option market?

Figure IA 1: Cross-sectional mean and standard deviation of $PRisk$ over time

Panel A plots the time-averages of $PRisk$ across firms in our optionable stock sample and in HHLT's stock sample in each quarter together with the news-based Economic Policy Uncertainty (EPU) Index developed by Baker et al. (2016). Panel B plots the time-series of the cross-sectional standard deviation of $PRisk$ and the mean of $PRisk$ using our optionable stocks. Our sample spans the period from Q1 2003 to Q2 2019.

Panel A: Mean of PRisk (Our sample & HHLT sample) and EPU over time



Panel B: Standard deviation of $PRisk$ over time

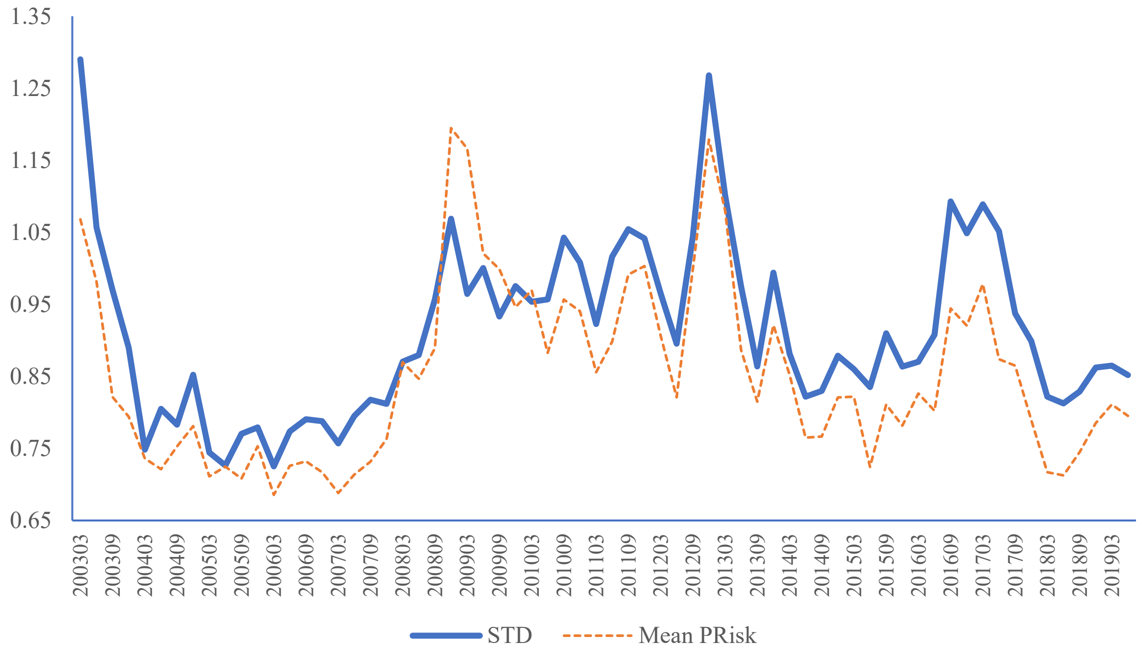


Figure IA 2: Variation of $PRisk$ around close presidential elections

This figure plots, based on our optionable stock sample, the coefficients and 95% confidence intervals from a regression of quarterly firm-level political risk (standardized) on dummy variables indicating quarters with close presidential elections (2008 Q4 and 2016 Q4), as well as two leads and lags. The specification also controls for firm fixed effects and the log of firm assets. Standard errors are clustered at the firm level.

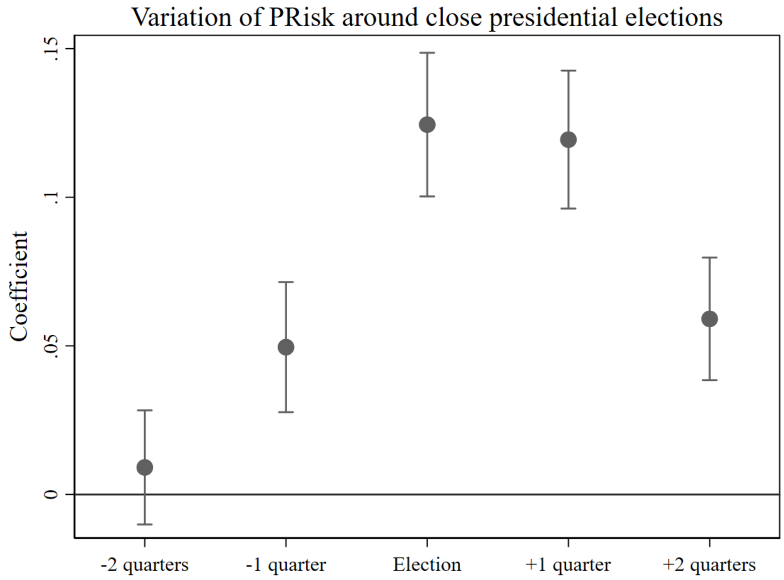
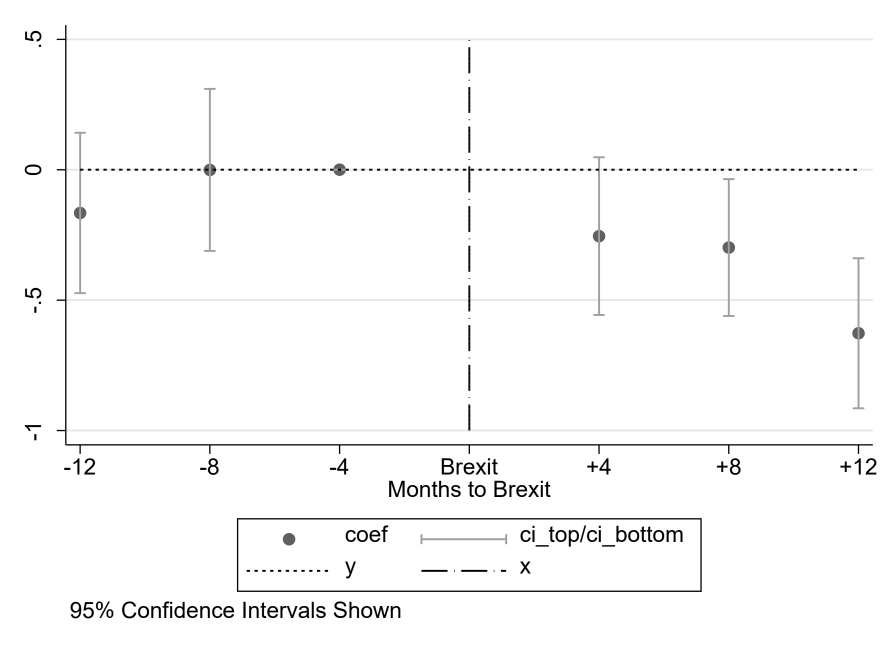


Figure IA 3: Dynamic effects of Brexit

This figure plots the dynamic effects of Brexit on delta-hedged option returns using a window of ± 1 year around the referendum month. The plotted coefficient estimates $Treat_i \times Post(\tau)_t$ come from modified difference-in-differences regressions in which we replace the $Post$ dummy with a series of dummy variables $Post(\tau)$, where $Post(1)$, $Post(2)$, $Post(3)$, $Post(4)$, $Post(5)$, and $Post(6)$ represent observations in [–12 months, –9 months], [–8 months, –5 months], [–4 months, –1 month], [1 month, 4 months], [5 months, 8 months], and [9 months, 12 months] relative to the Brexit referendum month, respectively. The omitted time window [–4 months, −1 month] serves as the baseline. The error bars represent 95% confidence intervals. Our regressions include firm characteristics and control for both time and industry fixed effects. Standard errors are clustered at the firm level. Panel A (Panel B) plots for delta-hedged call (put) option returns.

Panel A: Dynamic effects of Brexit on delta-hedged call returns



Panel B: Dynamic effects of Brexit on delta-hedged put returns

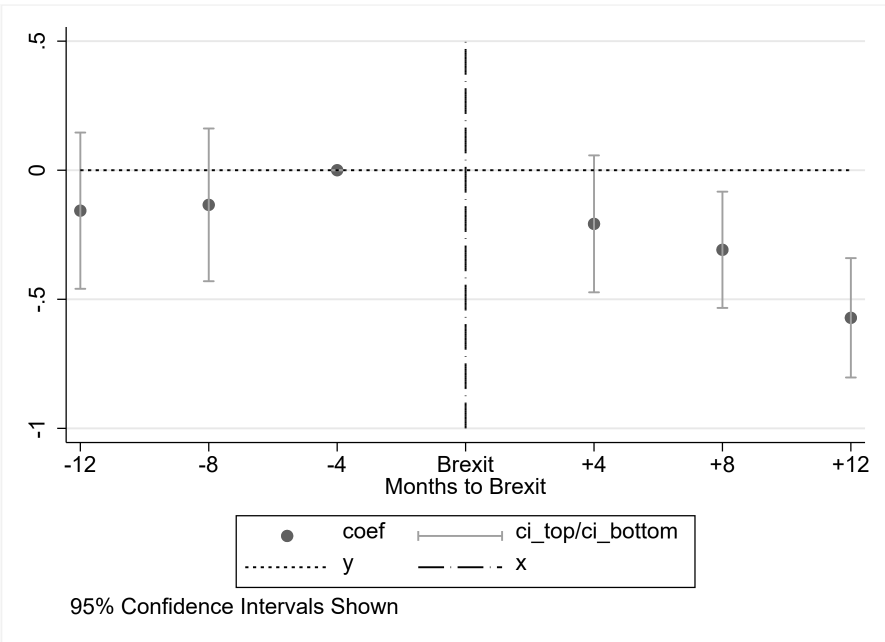
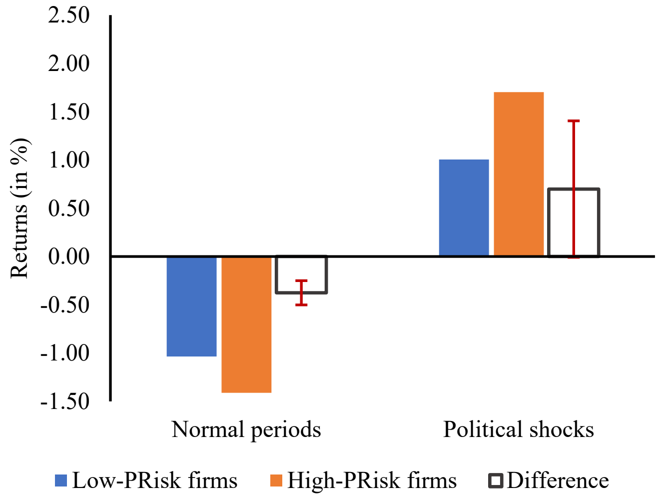


Figure IA 4: Normal periods versus unexpected political shock periods

Panel A (Panel B) plots the average delta-hedged call (put) option returns for high- and low-*PRisk* firms as well as their return differences together with 95% confidence intervals during normal periods versus during unexpected political shocks. These political shocks include the Lehman Brother bankruptcy (September 2008), the debt-ceiling dispute (July 2011), China's currency devaluation (August 2015), the Brexit vote (June 2016), Trump's election (November 2016), and the Trump-triggered trade war (March 2018). Our sample spans the period from January 2003 to June 2019.

Panel A: Delta-hedged call returns



Panel B: Delta-hedged put returns

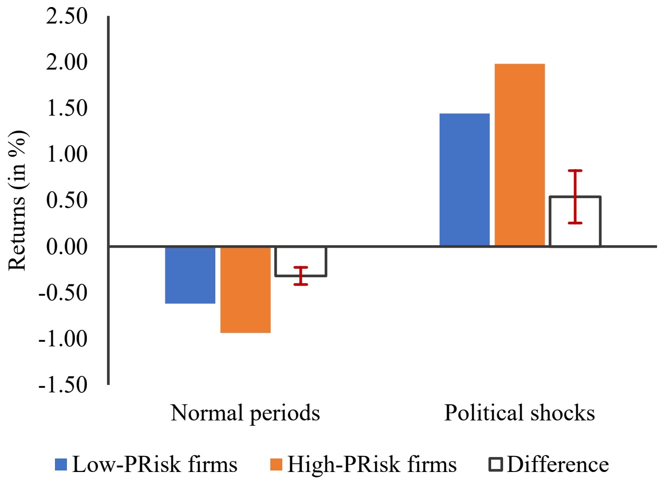


Table IA 1: Validation of $PRisk$ in optionable stock sample

This table reports the results from the panel regressions of capital investment (Specification (1)), capital expenditure (Specification (2)), net hiring (Specification (3)), lobbying (Specification (4)), and donation (Specification (5)) on firm-level political risk using quarterly data. I/K, the capital investment rate, is calculated recursively using a perpetual-inventory method. ΔCAPEX is quarter-to-quarter percentage change in the firm's total capital expenditure. ΔEmployees, net hiring, is the change in year-to-year employment over the last year's value. $lnLobby$ is the log of 1 plus total lobby expense. $lnDonate$ is the log of 1 plus the sum of contributions paid to federal candidates. All specifications control for the log of firm assets. Robust t-statistics, clustered at the firm level, are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	(1)	(2)	(3)	(4)	(5)
	I/K	ΔCAPEX	ΔEmployees	$lnLobby$ [t + 1]	$lnDonate$ [t + 1]
$PRisk$	−0.12***	−0.21**	−0.89***	0.34***	0.15***
	(−3.45)	(−2.56)	(−3.19)	(7.13)	(5.39)
Adjusted R^2	0.04	0.06	0.08	0.41	0.35
Obs.	60,384	60,384	20,859	60,384	60,384
Time FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes

Table IA 2: Sample coverage

This table provides the details about our sample of optionable stocks. Panel A reports the time-series summary statistics. Percent coverage of HHLT's stock sample (EW) is the number of stocks in our sample, divided by the total number of stocks with available firm-level political risk as in HHLT. Percent coverage of HHLT's stock sample (VW) is the total market capitalization of our sample stocks divided by the total market value of stocks in HHLT. Percent coverage of stock universe (EW) is the number of our sample stocks divided by the total number of CRSP stocks. Percent coverage of stock universe (VW) is the total market capitalization of our sample stocks divided by the total market value of all CRSP stocks. Panel B reports the time-series average of industry distribution for the stocks in our samples. The classification is based on two-digit SIC codes. Our sample spans the period from January 2003 to June 2019.

Panel A: Time-series distribution

	Mean	STD	10th	25th	50th	75th	90th
Stock % coverage of HHLT's stock sample (EW)	21.80	4.02	16.79	18.92	21.67	24.95	26.84
Stock % coverage of HHLT's stock sample (VW)	40.52	6.85	31.22	35.66	41.92	45.65	48.44
Stock % coverage of stock universe (EW)	17.22	4.58	10.89	14.09	17.65	20.59	22.46
Stock % coverage of stock universe (VW)	38.13	7.38	28.56	32.99	38.45	43.53	47.82

Panel B: Time-series average of industry distribution

Industry	Our sample	HHLT's sample	CRSP sample
Agriculture, Forestry, Fishing	0.08%	0.09%	0.12%
Mining	5.75%	5.32%	5.69%
Construction	1.58%	1.18%	1.08%
Manufacturing	40.67%	35.82%	35.20%
Transportation and Public Utilities	7.37%	9.93%	9.87%
Wholesale Trade	2.82%	3.05%	3.03%
Retail Trade	9.06%	5.83%	5.29%
Finance, Insurance, Real Estate	11.85%	16.11%	16.73%
Services	16.19%	17.81%	17.25%
Public Administration	4.60%	4.81%	5.67%
Others	0.03%	0.05%	0.07%

Table IA 3: Firm-level political risk and future option returns with $PRisk$ winsorized at (0, 99)

This table reports the average coefficients and average adjusted R^2 values from Fama and MacBeth (1973) cross-sectional regressions of delta-hedged option returns in month $t+1$ (in percentage terms) on firm-level political risk ($PRisk$) and control variables measured at the end of month t. $PRisk$ is winsorized each month at (0, 99) and is normalized by its standard deviation across the whole sample. Our sample spans the period from January 2003 to June 2019. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	Delta–hedged call option returns	Delta–hedged put option returns
	(1)	(2)
$PRisk$	−0.14***	−0.14***
	(−6.09)	(−6.93)
$PSentiment$	−0.02	−0.01
	(−1.16)	(−1.19)
EPU beta	0.03	0.01
	(0.76)	(0.43)
Size	0.20***	0.18***
	(9.83)	(13.08)
BM	0.31***	0.32***
	(4.47)	(6.26)
IdioVol	−2.02***	−1.73***
	(−14.05)	(−18.62)
Reversal	0.97***	−0.07
	(3.58)	(−0.29)
Momentum	0.18**	0.11**
	(1.97)	(2.20)
Illiquidity	−0.27***	−0.29***
	(−4.70)	(−7.31)
Inst	0.48***	0.45***
	(5.14)	(5.07)
Leverage	0.09	0.14**
	(1.15)	(2.19)
Profitability	0.54***	0.37***
	(6.29)	(4.67)
Intercept	−4.31***	−3.41***
	(−11.72)	(−12.75)
Adjusted R^2	0.086	0.092

Table IA 4: Panel regressions

This table presents the panel regression results for the effect of firm-level political risk on delta-hedged option returns. The dependent variable is the delta-hedged call or put option return in month $t+1$ (in percentage terms). The main independent variable is the standardized firm-level political risk ($PRisk$) at the end of month t based on the most recent conference call. Control variables include political sentiment, EPU beta, log of market cap, book-to-market ratio, idiosyncratic volatility, reversal, momentum, stock illiquidity, institutional ownership, leverage, and gross profitability. The industry fixed effects are defined by 2-digit SIC codes. Our sample spans the period from January 2003 to June 2019. Robust t-statistics, clustered at the firm level, are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	Delta-hedged call option returns				Delta-hedged put option returns			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$PRisk$	−0.17***	−0.17***	−0.13***	−0.07***	−0.13***	−0.15***	−0.11***	−0.06***
	(−5.88)	(−7.45)	(−5.54)	(−2.87)	(−5.74)	(−7.47)	(−5.27)	(−3.01)
$PSentiment$		−0.04**	−0.01	−0.01		−0.03**	0.00	0.00
		(−2.27)	(−0.52)	(−0.34)		(−2.14)	(−0.39)	(−0.02)
EPU beta		−0.03	−0.01	−0.04		−0.06***	−0.03*	−0.05**
		(−1.37)	(−0.56)	(−1.32)		(−2.99)	(−1.91)	(−2.29)
Size		0.22***	0.22***	0.22***		0.21***	0.21***	0.24***
		(18.84)	(18.69)	(6.40)		(20.07)	(20.63)	(8.65)
BM		0.23***	0.06	−0.17***		0.20***	0.09***	−0.12***
		(4.51)	(1.19)	(−2.90)		(5.72)	(2.74)	(−3.00)
IdioVol		−1.88***	−1.79***	−1.41***		−1.58***	−1.53***	−1.16***
		(−19.73)	(−18.87)	(−14.38)		(−22.42)	(−22.13)	(−15.89)
Reversal		0.98***	1.03***	1.10***		0.12	0.15	0.15
		(7.74)	(8.18)	(8.64)		(1.20)	(1.52)	(1.47)
Momentum		0.12***	0.11***	0.16***		0.15***	0.14***	0.15***
		(4.63)	(4.34)	(5.61)		(7.12)	(6.91)	(7.00)
Illiquidity		−0.06*	−0.04	0.01		−0.03	−0.02	0.04*
		(−1.84)	(−1.59)	(0.28)		(−0.69)	(−0.41)	(1.85)
Inst		0.51***	0.54***	0.38***		0.50***	0.53***	0.15**
		(6.66)	(7.39)	(4.24)		(7.70)	(8.56)	(2.04)
Leverage		0.16**	0.01	−0.25**		0.14**	0.10*	−0.16
		(2.32)	(0.19)	(−2.00)		(2.54)	(1.83)	(−1.58)
Profitability		0.53***	0.66***	0.31**		0.36***	0.49***	0.29***
		(7.31)	(8.72)	(2.26)		(6.22)	(7.87)	(2.84)
Intercept	−3.86***	−7.15***	−6.94***	−6.85***	−3.05***	−6.27***	−7.51***	−6.27***
	(−15.85)	(−22.31)	(−23.44)	(−11.85)	(−16.26)	(−23.25)	(−29.86)	(−13.87)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	Yes	No	No	No	Yes	No
Firm FE	No	No	No	Yes	No	No	No	Yes
Cluster by firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	113,288	98,230	98,230	98,230	113,288	98,230	98,230	98,230
R^2	0.15	0.18	0.19	0.18	0.21	0.25	0.26	0.24

Table IA 5: Alternative dependent variables

This table presents the Fama and MacBeth (1973) cross-sectional regression results for the effect of firm-level political risk on different measures of delta-hedged option returns: (1) and (4) delta-hedged gain until month end / stock price, (2) and (5) delta-hedged gain until month end / option price, and (3) and (6) delta-hedged gain until maturity / initial overall position. The main independent variable is the standardized firm-level political risk ($PRisk$) at the end of month t based on the most recent conference call. Control variables include political sentiment, EPU beta, log of market cap, book-to-market ratio, idiosyncratic volatility, return reversal, momentum, stock illiquidity, institutional ownership, leverage, and gross profitability. Our sample spans the period from January 2003 to June 2019. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	Delta-hedged call option returns			Delta-hedged put option returns		
	(1) Gain till month end/ Stock Price	(2) Gain till month end/ Option Price	(3) Gain till maturity/ (Δ*S − C)	(4) Gain till month end/ Stock Price	(5) Gain till month end/ Option Price	(6) Gain till maturity/ (P−Δ*S)
$PRisk$	−0.04***	−0.54***	−0.13***	−0.07***	−1.07***	−0.16***
	(−5.44)	(−3.24)	(−6.63)	(−7.22)	(−4.55)	(−8.55)
$PSentiment$	−0.01	−0.07	−0.03**	−0.01**	−0.14	−0.04***
	(−1.25)	(−0.48)	(−1.99)	(−2.33)	(−1.25)	(−2.81)
EPU beta	0.02	0.18	0.05	0.02	0.02	0.01
	(1.38)	(0.78)	(1.38)	(1.15)	(0.10)	(0.37)
Size	0.06***	0.31*	0.18***	0.08***	1.17***	0.19***
	(8.07)	(1.95)	(8.92)	(10.99)	(7.48)	(12.79)
BM	0.12***	0.94**	0.31***	0.15***	2.14***	0.30***
	(5.12)	(2.36)	(5.41)	(6.04)	(5.12)	(6.30)
IdioVol	−0.89***	−5.59***	−2.05***	−1.06***	−8.16***	−1.74***
	(−16.00)	(−5.83)	(−15.06)	(−21.85)	(−7.78)	(−18.72)
Reversal	0.40***	7.89***	1.08***	0.09	−1.75	−0.06
	(4.04)	(4.62)	(4.22)	(0.82)	(−0.95)	(−0.27)
Momentum	0.06*	1.25**	0.15	0.06**	0.67	0.13**
	(1.72)	(2.00)	(1.60)	(2.21)	(1.57)	(2.28)
Illiquidity	−0.04***	−0.36**	−0.12***	−0.10***	−0.68***	−0.19***
	(−3.65)	(−2.02)	(−3.69)	(−6.15)	(−2.97)	(−5.03)
Inst	0.18***	1.63***	0.52***	0.30***	0.90	0.46***
	(5.43)	(2.78)	(5.84)	(7.00)	(1.29)	(5.02)
Leverage	0.04	−0.79	0.04	0.04	1.17*	0.11*
	(1.08)	(−1.08)	(0.52)	(1.28)	(1.84)	(1.73)
Profitability	0.21***	1.88***	0.54***	0.24***	0.90	0.36***
	(6.67)	(4.01)	(7.44)	(6.48)	(1.46)	(3.98)
Intercept	−1.42***	−14.15***	−3.79***	−1.61***	−21.14***	−3.74***
	(−10.45)	(−5.48)	(−10.00)	(−11.06)	(−9.46)	(−12.17)
Adjusted R^2	0.07	0.03	0.07	0.10	0.04	0.09

Table IA 6: Portfolio-sorting analysis using deciles

This table reports the average returns (in percentage terms) of option portfolios sorted by the underlying asset's $PRisk$. $PRisk$ is the standardized firm-level political risk at the end of month t based on the most recent conference call. At the end of each month from January 2003 to May 2019, we first sort all firms with $PRisk$ of zero (before winsorization) into Portfolio 0 and then sort all other firms into decile portfolios based on their $PRisk$ in increasing order. We report the average next month's delta-hedged call and put option portfolio return for each decile and the average return differential between the top and the bottom portfolio (P10 − P0). The portfolios are equal-weighted, option value-weighted, i.e., weighted by the market value of the option open interest, or stock value-weighted, i.e., weighted by the market value of the underlying stock winsorized at the NYSE 80th percentile each month. We also report the alphas with respect to two factor models. The first model includes the Fama and French (1993) three factors and the Carhart (1997) momentum factor, while the second model further adds the zero-beta straddle return of the S&P 500 index from Coval and Shumway (2001) and the change in VIX. Our sample spans the period from January 2003 to June 2019. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	Delta-hedged call option returns (%)			Delta-hedged put option returns (%)		
	Equal-weighted	OV-weighted	SV-weighted	Equal-weighted	OV-weighted	SV-weighted
P0	−0.99	−0.87	−0.87	−0.57	−0.50	−0.51
	(−10.77)	(−8.94)	(−9.42)	(−5.04)	(−4.16)	(−4.80)
P1	−0.96	−1.04	−0.84	−0.57	−0.57	−0.49
	(−9.16)	(−9.24)	(−8.23)	(−5.41)	(−4.82)	(−4.60)
P2	−0.97	−0.93	−0.84	−0.67	−0.70	−0.58
	(−8.68)	(−6.80)	(−7.91)	(−6.03)	(−4.73)	(−5.18)
P3	−1.02	−1.04	−0.89	−0.65	−0.66	−0.56
	(−9.51)	(−8.19)	(−8.55)	(−5.87)	(−5.32)	(−5.13)
P4	−1.06	−1.11	−0.91	−0.68	−0.79	−0.57
	(−9.42)	(−9.09)	(−8.37)	(−6.36)	(−5.57)	(−5.35)
P5	−1.11	−1.02	−0.92	−0.75	−0.84	−0.62
	(−10.43)	(−7.68)	(−8.74)	(−6.91)	(−6.68)	(−5.59)
P6	−1.18	−1.19	−0.98	−0.70	−0.78	−0.56
	(−10.30)	(−8.23)	(−8.73)	(−6.44)	(−6.37)	(−5.31)
P7	−1.08	−1.05	−0.92	−0.71	−0.68	−0.57
	(−9.94)	(−8.37)	(−8.52)	(−6.85)	(−7.07)	(−5.47)
P8	−1.19	−1.14	−0.98	−0.75	−0.62	−0.60
	(−10.55)	(−9.31)	(−8.99)	(−6.61)	(−5.33)	(−5.31)
P9	−1.32	−1.45	−1.11	−0.78	−0.80	−0.60
	(−10.47)	(−10.55)	(−9.50)	(−7.29)	(−8.03)	(−5.40)
P10	−1.34	−1.39	−1.06	−0.89	−0.99	−0.69
	(−11.32)	(−10.77)	(−9.34)	(−7.40)	(−7.50)	(−6.18)
P10–P0	−0.34***	−0.52***	−0.19***	−0.32***	−0.49***	−0.18***
	(−5.35)	(−5.70)	(−3.60)	(−4.93)	(−4.81)	(−4.34)
4-factor alpha	−0.35***	−0.52***	−0.20***	−0.32***	−0.52***	−0.18***
	(−5.46)	(−5.83)	(−3.58)	(−4.99)	(−4.88)	(−4.23)
6-factor alpha	−0.35***	−0.53***	−0.21***	−0.31***	−0.50***	−0.17***
	(−5.26)	(−5.78)	(−3.98)	(−4.85)	(−4.28)	(−3.75)

Table IA 7: Portfolio-sorting analysis: Stock value-weighted portfolios

This table reports the average returns (in percentage terms) of option portfolios sorted by the underlying asset's $PRisk$. $PRisk$ is the standardized firm-level political risk at the end of month t based on the most recent conference call. At the end of each month from January 2003 to May 2019, we sort stocks into quintiles according to their political risk level. We report the average next month's delta-hedged call and put option return for each quintile portfolio and the average return differential between the top and the bottom quintile. The portfolios are stock value-weighted. We also report the alphas with respect to two factor models. The first model includes the Fama and French (1993) three factors and the Carhart (1997) momentum factor, while the second model further adds the zero-beta straddle return of the S&P 500 index from Coval and Shumway (2001) and the change in VIX. Our sample spans the period from January 2003 to June 2019. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	Delta-hedged call option returns (%)	Delta-hedged put option returns (%)
	SV-weighted	SV-weighted
Q1	−0.49	−0.36
	(−3.46)	(−2.57)
Q2	−0.59	−0.41
	(−5.35)	(−2.84)
Q3	−0.52	−0.42
	(−4.52)	(−2.89)
Q4	−0.57	−0.31
	(−4.61)	(−2.19)
Q5	−0.69	−0.38
	(−6.41)	(−3.00)
Q5−Q1	−0.20**	−0.02
	(−1.97)	(−0.26)
4-factor alpha	−0.22**	−0.03
	(−2.07)	(−0.30)
6-factor alpha	−0.16*	−0.05
	(−1.79)	(−0.53)

Table IA 8: The effect of Brexit risk on delta-hedged option returns: $\pm$ 3 years around the Brexit event

This table reports the difference-in-difference estimates for delta-hedged option returns before and after the Brexit vote. The Brexit referendum took place in June 2016. $Treat$ is a dummy variable that takes the value of one if firms have positive Brexit risk in any quarter from July 2016 to June 2019 and zero otherwise. $Post$ equals one for the months after June 2016. We present the regression results for both call and put option returns using a sample of $\pm$3 years around the referendum month. Control variables include Brexit sentiment, size, book-to-market ratio, idiosyncratic volatility, return reversal, momentum, stock illiquidity, institutional ownership, leverage, and gross profitability. We report only the coefficients on $Treat$, $Post$, and their interaction; the coefficients on the remaining variables are suppressed for the sake of brevity. Robust t-statistics, clustered at the firm level, are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	Delta-hedged call option returns		Delta-hedged put option returns	
Specification	(1)	(2)	(3)	(4)
$Treat$	0.03		0.03	
	(0.44)		(0.64)	
$Treat \times Post$	–0.14*	–0.19**	–0.11*	–0.11*
	(–1.87)	(–2.43)	(–1.67)	(–1.72)
Controls	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Industry FE	Yes	No	Yes	No
Firm FE	No	Yes	No	Yes
Observations	35,982	35,982	35,982	35,982
Number of treated	3,466	3,466	3,466	3,466
Adjusted R^2	0.15	0.19	0.20	0.22

Table IA 9: The effect of Brexit risk on delta-hedged option returns: Placebo tests

This table reports the difference-in-difference estimates for delta-hedged option returns before and after a series of placebo dates with the same day and month as the Brexit vote date but in different years. $Treat$ is a dummy variable that takes the value of one if firms have positive Brexit risk in any quarter from July 2016 to June 2019 and zero otherwise. $Post$ equals one for the months after the placebo month. We present the regression results for both call and put option returns using a sample of ± 1 year around the placebo vote months. Control variables include Brexit sentiment, size, book-to-market, idiosyncratic volatility, reversal, momentum, stock illiquidity, institutional ownership, leverage, and gross profitability. We report only the coefficients on $Treat$ and its interaction with $Post$; the coefficients on the remaining variables are suppressed for the sake of brevity. Robust t-statistics, clustered at the firm level, are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	± 1 year around Brexit date if Brexit date were in June 2015				± 1 year around Brexit date if Brexit date were in June 2017			
	Call returns		Put returns		Call returns		Put returns	
Specifications	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Treat$	–0.06		–0.06		–0.17*		–0.10	
	(–0.76)		(–0.82)		(–1.88)		(–1.38)	
$Treat \times Post$	0.03	0.05	0.01	0.08	0.11	0.07	0.04	0.04
	(0.23)	(0.34)	(0.08)	(0.81)	(1.07)	(0.67)	(0.42)	(0.42)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	No	Yes	No	Yes	No	Yes	No
Firm FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	10,576	10,576	10,576	10,576	12,526	12,526	12,526	12,526
Number of treated	1,055	1,055	1,055	1,055	1,182	1,182	1,182	1,182
Adjusted R^2	0.19	0.23	0.23	0.25	0.11	0.16	0.14	0.18

Table IA 10: Political shocks: Placebo test (1 month after the extreme political events)

This table reports the results from the regressions of the delta-hedged option return spreads between high- and low-$PRisk$ (equal-weighted) quintiles on $Placebo\ Shock\_dummy$, controlling for other risk factors. $Placebo\ Shock\_dummy$ is a dummy variable that takes the value of one in months a month after the actual extreme political events defined in Table 10, and zero otherwise. The risk factors include the Fama and French (1993) three factors (MKT, SMB, HML), the Carhart (1997) momentum factor (UMD), the zero-beta straddle return of the S&P 500 index (STRADDLE) from Coval and Shumway (2001) and the change in VIX (DVIX). Our sample spans the period from January 2003 to June 2019. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	Q5–Q1 call returns (%)		Q5–Q1 put returns (%)	
	(1)	(2)	(3)	(4)
Alpha	−0.34***	−0.30***	−0.29***	−0.27***
	(−5.04)	(−4.63)	(−5.74)	(−5.12)
$Placebo\ Shock\_dummy\ (+1\ month)$	−0.03	−0.08	−0.21	−0.20
	(−0.07)	(−0.17)	(−0.36)	(−0.38)
Control	No	Yes	No	Yes
Adjusted R^2	0.00	0.01	0.00	0.02

Table IA 11: Transaction cost analysis for the long-short returns based on other option return predictors

This table examines the impact of bid-ask spreads on the profitability of the long-short delta-neutral call and put writing option returns (in %) sorted by several option return predictors: Idiosyncratic volatility, Volatility Deviation, Volatility Term Structure (VTS), Size, B/M ratio, Gross Profit, Leverage, Illiquidity, Momentum, Reversal, and Institutional Holding. We examine the results using the full option sample. At the end of each month from January 2003 to May 2019, we sort options into quintiles based on the respective characteristics and hold the option portfolios for one month without rebalancing the delta hedges. The portfolios are option value-weighted. We report the long-short delta-hedged call (put) option returns for different ratios of the effective bid-ask spread to the quoted bid-ask spread: 0% (No cost), 10%, 25%, and 50%. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

Effective to Quoted Spread	Long-short delta-hedged call returns (%)				Long-short delta-hedged put returns (%)			
	0%	10%	25%	50%	0%	10%	25%	50%
IdioVol	2.76***	2.56***	2.07***	1.39***	2.62***	2.38***	2.02***	1.41***
	(10.60)	(8.81)	(8.25)	(5.88)	(14.34)	(13.28)	(11.52)	(8.20)
Vol Deviation	1.87***	1.54***	1.08***	0.25	1.67***	1.39***	0.98***	0.30**
	(7.51)	(6.40)	(5.07)	(1.16)	(10.53)	(9.03)	(6.55)	(2.04)
VTS	1.85***	1.54***	1.08***	0.31*	1.43***	1.18***	0.80***	0.17
	(9.46)	(8.18)	(5.62)	(1.81)	(10.61)	(9.16)	(6.64)	(1.51)
Gross Profit	1.87***	1.57***	1.11***	0.39*	1.11***	0.87***	0.50***	−0.11
	(8.32)	(7.08)	(5.12)	(1.81)	(8.24)	(6.49)	(3.75)	(−0.82)
Leverage	0.51***	0.23	−0.20	−0.86***	0.13	−0.11	−0.45***	−1.02***
	(2.72)	(1.25)	(−1.09)	(−4.77)	(1.04)	(−0.87)	(−3.64)	(−7.94)
Size	4.44***	3.96***	3.26***	2.11***	3.47***	3.11***	2.50***	1.63***
	(18.11)	(16.93)	(14.77)	(10.14)	(20.61)	(19.27)	(13.39)	(11.39)
BM	1.31***	1.05***	0.53**	0.00	0.61***	0.39***	0.06	−0.49***
	(6.11)	(5.00)	(2.58)	(0.00)	(5.02)	(3.31)	(0.54)	(−4.48)
Illiquidity	4.63***	4.11***	3.34***	2.08***	3.24***	2.85***	2.25***	1.23***
	(20.36)	(18.70)	(15.75)	(9.95)	(18.97)	(17.39)	(14.54)	(8.45)
Momentum	1.41***	1.10***	0.61**	−0.15	0.45***	0.19	−0.19	−0.82***
	(5.14)	(4.04)	(2.28)	(−0.54)	(2.59)	(1.08)	(−1.00)	(−3.98)
Reversal	0.82***	0.50***	0.01	−0.76***	0.10	−0.16	−0.54***	−1.18***
	(4.27)	(2.66)	(0.05)	(−4.26)	(0.77)	(−1.27)	(−4.38)	(−9.20)
Inst	0.65***	0.35**	−0.12	−0.85***	0.44***	0.18*	−0.20**	−0.83***
	(3.74)	(1.99)	(−0.67)	(−4.57)	(4.70)	(1.85)	(−2.00)	(−7.34)

Table IA 12: Response to earnings calls controlling for firm profitability and past stock return

This table reports the average monthly delta-hedged call and put option returns (in percentage terms) around unexpected increases and decreases in firm-level political risk. The surprise component for each firm's political risk is captured using an AR1 regression augmented with the contemporaneous EPU value, the lagged monthly stock return, and the concurrent value of firm's gross profitability We define unexpected increases (decreases) in firm-level political risk as the earnings calls that correspond to the top (bottom) tercile of this surprise component across the whole sample. We report the average delta-hedged option returns in the two months before and the two months after the earnings call month. Our sample spans the period from January 2003 to June 2019. t-statistics are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

	Delta-hedged call option returns			Delta-hedged put option returns		
Political risk surprise	Increase	Decrease	Difference	Increase	Decrease	Difference
Pre-event return	−0.93	−0.98	0.05	−0.64	−0.75	0.11
Post-event return	−1.05	−0.94	−0.11	−0.81	−0.69	−0.12
Difference	−0.12*	0.04	−0.16*	−0.17***	0.06	−0.23***
	(−1.71)	(0.65)	(−1.67)	(−2.91)	(0.95)	(−2.71)

Table IA 13: Cross-sectional variation

This table presents the Fama and MacBeth (1973) cross-sectional regression results with respect to the effect of limits-to-arbitrage and distress risk on the relation between firm-level political risk and delta-hedged option returns. Each month, we sort firms into two groups based on different conditioning variables: (1) firm size, (2) analyst coverage, (3) dispersion in analyst earnings forecast, (4) idiosyncratic volatility, and (5) default probability. We then perform the regressions of delta-hedged option returns in month $t+1$ (in percentage terms) on $PRisk$, controlling for firm characteristics, within each subsample. The control variables included are the same with Specification (2) of Table 2. We report the coefficients on $PRisk$ in each subsample and their differences; the coefficients on the remaining variables are suppressed for the sake of brevity. Our sample spans the period from January 2003 to June 2019. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

Panel A: Sorted by Size

	Delta-hedged call option returns		Delta-hedged put option returns	
	Small	Big	Small	Big
$PRisk$	−0.27***	−0.05*	−0.24***	−0.07***
	(−6.63)	(−1.80)	(−6.89)	(−3.09)
Controls	Yes	Yes	Yes	Yes
Adjusted R^2	0.08	0.06	0.09	0.06
Difference	0.22***		0.17***	
(t-stat)	(4.64)		(4.10)	

Panel B: Sorted by Analyst Coverage

	Delta-hedged call option returns		Delta-hedged put option returns	
	Low	High	Low	High
$PRisk$	−0.23***	−0.08***	−0.21***	−0.09***
	(−6.03)	(−2.74)	(−6.70)	(−3.73)
Controls	Yes	Yes	Yes	Yes
Adjusted R^2	0.09	0.08	0.10	0.08
Difference	0.15***		0.12***	
(t-stat)	(3.09)		(3.47)	

Panel C: Sorted by Analyst Forecast Dispersion

	Delta-hedged call option returns		Delta-hedged put option returns	
	Low	High	Low	High
$PRisk$	−0.09***	−0.23***	−0.12***	−0.19***
	(−2.75)	(−6.41)	(−4.61)	(−6.24)
Controls	Yes	Yes	Yes	Yes
Adjusted R^2	0.09	0.09	0.10	0.09
Difference	−0.13***		−0.07*	
(t-stat)	(−2.94)		(−1.68)	

Panel D: Sorted by Idiosyncratic Volatility

	Delta-hedged call option returns		Delta-hedged put option returns	
	Low	High	Low	High
$PRisk$	−0.05*	−0.27***	−0.10***	−0.22***
	(−1.66)	(−7.81)	(−3.98)	(−6.37)
Controls	Yes	Yes	Yes	Yes

Adjusted R^2	0.06	0.09	0.06	0.10
Difference	−0.22***		−0.12***	
(t-stat)	(−4.80)		(−2.75)	

Panel E: Sorted by Default Probability

	Delta-hedged call option returns		Delta-hedged put option returns	
	Low	High	Low	High
$PRisk$	−0.10**	−0.22***	−0.10***	−0.21***
	(−2.57)	(−7.11)	(−3.10)	(−8.46)
Controls	Yes	Yes	Yes	Yes
Adjusted R^2	0.08	0.10	0.08	0.11
Difference	−0.13**		−0.11**	
(t-stat)	(−2.51)		(−2.37)	

Table IA 14: Topic-specific measures of political risk and delta-hedged option returns

This table reports the Fama and MacBeth (1973) cross-sectional regression results for the effect of different topic-specific political risks on delta-hedged option returns. The dependent variable is the delta-hedged call (Panel A) or put (Panel B) option return in month $t + 1$ (in percentage terms). The overall measure of political risk is decomposed into eight separate topics, including economic policy and budget, environment, trade, institutions and political process, healthcare, security and defence, tax policy, technology and infrastructure. All topic-based measures are winsorized each month at (0, 95) and are standardized to have unit standard deviation. The control variables included are the same with Specification (2) of Table 2. We report only the coefficients on the topic-based political risk measures; the coefficients on the remaining variables are suppressed for the sake of brevity. Our sample spans the period from January 2003 to June 2019. Newey and West (1987) t-statistics with a lag length equal to four are reported in parentheses. *, **, and *** represent significance levels at 10%, 5%, and 1%.

Panel A: Delta-hedged call option returns

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$PRisk^{Econ}$	−0.10***							
	(−3.76)							
$PRisk^{Envi}$		−0.14***						
		(−3.62)						
$PRisk^{Trade}$			−0.11**					
			(−2.42)					
$PRisk^{Inst}$				−0.19***				
				(−5.48)				
$PRisk^{Health}$					−0.36***			
					(−5.94)			
$PRisk^{Security}$						−0.16***		
						(−5.15)		
$PRisk^{Tax}$							−0.12***	
							(−3.07)	
$PRisk^{Tech}$								−0.13***
								(−3.42)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09

Panel B: Delta-hedged put option returns

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$PRisk^{Econ}$	−0.13***							
	(−5.01)							
$PRisk^{Envi}$		−0.16***						
		(−4.41)						
$PRisk^{Trade}$			−0.16***					
			(−3.78)					
$PRisk^{Inst}$				−0.23***				
				(−6.91)				
$PRisk^{Health}$					−0.40***			
					(−7.83)			
$PRisk^{Security}$						−0.19***		
						(−6.33)		
$PRisk^{Tax}$							−0.14***	

							(−3.98)	
$PRisk^{Tech}$								−0.16***
								(−5.51)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09