





ARTICLE



<https://doi.org/10.1057/s41599-024-02824-w>

OPEN

Firm-level political uncertainty, corporate lobbying and risk-taking

Lukas Timbate¹ , Dongil Kim² , Dereje Asrat³ & Hwang Sungjun²

Prior research shows that political uncertainty affects general economic and firm-related outcomes. However, little is known about how firm-specific political uncertainty is related to corporate risk-taking. Taking advantage of a recent construct and using a large sample of non-financial U.S. firms covering the period between 2002 and 2021, we find compelling evidence that firm-specific political uncertainty is positively related to corporate risk-taking, especially for larger firms. On average, a one standard deviation rise in the level of political risk at the firm-level results in a 2.53% increase in risk-taking. Further analysis shows that the impact of firm-level political uncertainty on corporate risk-taking is more pronounced for firms that spend more on corporate lobbying. Our results are significant and robust to alternative risk-taking measures and endogeneity tests.

¹ Kyungsoo University, Busan, South Korea. ² Pusan National University, Busan, South Korea. ³ Bahirdar University, Bahir Dar, Ethiopia.
email: kdi50@pusan.ac.kr

Introduction

Recent political tension between Russia and Ukraine, China, and the U.S. has renewed interest in the effect of political situations on investment, corporate finance, employment, and other firm characteristics (Li et al. 2022; Gaur et al. 2023). Politics and related policy changes are typically fraught with uncertainty for business and society (Li et al. 2022). Political parties conduct extensive negotiation and discussion when forming and implementing policies, which takes a considerable amount of time but can still yield unpredictable outcomes. Recent studies have found that political uncertainty has adverse economic effects such as increased default risk (e.g., Pástor and Veronesi, 2013; Saffar et al. 2019; Gad et al. 2022) and reduced employment and production output (e.g., Baker et al. 2016). It also reduces corporate investment and innovation (e.g., Hassan et al. 2019; Choi et al. 2021). The finance literature also provides evidence supporting the claim that political uncertainty is an essential factor determining firm risk-taking and financial performance (e.g., Jones and Banning, 2009; Goodell and Bodey, 2012; King et al. 2021). Despite the effects of political uncertainty receiving increased attention from academia recently, the relationship between political uncertainty and corporate risk-taking is still unclear.

Goodell and Vähämaa (2013) investigate the effects of US presidential elections on the stock market and discover a link between election uncertainty and stock market volatility. Furthermore, Pantzalis et al. (2000) examine the impact of election cycles across a large number of countries. Like Pantzalis, Tran (2019) demonstrate that policy uncertainty is negatively associated with companies' risk-taking behavior using international data from 18 countries from 2005 to 2016. These findings imply that when political uncertainty increases, corporate managers reduce corporate risk-taking. In general, political uncertainty may increase firm cash flow volatility and exacerbate information asymmetry between firms and creditors (Brogaard and Detzel, 2015). Firm managers are less likely to take risks as the cost of external financing rises (Boubakri et al. 2013). According to Qi et al. (2010), firms face a higher cost of debt financing in countries with comparatively low political rights, leading firms to borrow less and engage in less risky activities. Studies also show that when political uncertainty increases, managers become more conservative (Bernanke, 1983; Bloom, 2009; Panousi and Papanikolaou, 2012). As a result, such corporate executives are more likely to avoid risky activities.

On the other hand, firms subject to higher firm-level political uncertainty are likely to engage in lobbying to gain access to policymakers. During periods of high political uncertainty, such firms will have political access, and as a result, they can get private information. In other words, high levels of firm-level political uncertainty increase lobbying incentives. Hassan et al. (2019) supports this argument and argues that during periods of high political uncertainty, firms tend to donate more to political campaigns, create links with politicians, and invest in lobbying activities. According to Akey and Lewellen (2017), in comparison to policy-neutral enterprises, policy-sensitive firms boost their political contributions by roughly eight to thirteen percent more. Some studies (including Akey and Lewellen, 2017) also suggest that the scope of political interference naturally creates the possibility that some firms and economic agents get connected to politicians to have an informational advantage regarding future political events and how they might affect the company. This suggests that the future is less uncertain for those firm managers, and, as a result, they may take more risks (Asrat, 2020). In summary, there is no clear evidence of the influence of political uncertainty at the firm-level on risk-taking, and examining how firm-level political uncertainty affects corporate risk-taking activities is an empirical research question.

Thus, motivated by the growing number of studies on the environmental determinants of firm risk-taking and the role of political uncertainty on firm-specific decisions, we investigate whether firm-level political uncertainty affects managerial risk choices across U.S. listed companies. Using a sample of 32,695 U.S. firm-year observations from 2002 through 2021, we find robust evidence that firm-level political uncertainty is positively associated with firm risk-taking. Greater firm-level political uncertainty is related to more risk-taking behavior, especially for larger firms. We also find that the firm-level political uncertainty effect is more amplified for firms with higher lobbying spending. The relationship between firms' exposure to political uncertainty and corporate risk-taking was only slightly stronger for the period following the 2008 financial crisis. The results are also robust to the use of both aggregate and specific political uncertainty metrics. Firms' risk-taking is especially positively related to political uncertainties in economic policy and budget, institutions and political process, health care, security and defense, tax policy, and technology and infrastructure.

To alleviate the potential endogeneity issue, we apply the propensity score matching method. We regress the indicator of the highest firm-level political uncertainty index scores on the firm-level control variables, and we use the estimated coefficients from this first-stage regression to compute the propensity score for each observation. Then we match the firms with the highest and lowest political uncertainty scores based on their propensity scores. Finally, we repeat the baseline analysis using the PSM sample and find a significantly positive relationship between firm-level political uncertainty and risk-taking.

This study contributes to the existing related literature in three ways. The first contribution is related to the strand of literature directly investigating the relationship between political risk and corporate risk-taking (Pantzalis et al. 2000; Jones and Banning, 2009; Goodell and Vähämaa, 2013; Akey and Lewellen, 2017; Tran, 2019; Gorbatiokov et al. 2019; Wen et al. 2020). While the relationship is considered negative in prior studies measuring political risk at the collective (economic) level, it is claimed that the use of an economy-wide collective measure of political risk is inappropriate as it captures a firm's heterogeneous exposure to aggregate political risk (Gad et al. 2022). The existing literature focuses primarily on collective political uncertainty in order to identify its firm-level effects. We adopt a new measure of political risk developed by Hassan et al. (2019) using computational linguistics. This measure, which is the share of quarterly earnings conference calls devoted to discussing political risk, is a robust proxy for firm-level political risk (Choi et al. 2021; Chatjuthamard et al. 2021; Gad et al. 2022). Our findings revealed a positive relationship between firm-level political risk and corporate risk-taking.

This study also contributes to the strand of research exploring the relationship between political uncertainty and corporate investment and capital structure decisions. Prior research shows that higher political uncertainty is related to increased costs of external financing (Khwaja and Mian, 2005; Qi et al. 2010; Francis et al. 2014; Brogaard and Detzel, 2015; Waisman et al. 2015; Zhang et al. 2015; Bradley et al. 2016; Gao et al. 2019; Saffar et al. 2019; Gad et al. 2022) and reduced corporate investment (Brandon and Yook, 2012; Choi et al. 2021; King et al. 2021). Recent empirical research, however, suggests that the link may depend on how the political risk indicator is measured. For example, while Luo et al. (2016) document a sharp decrease in stock price for politically connected firms following a political scandal in China, while Gorbatiokov et al. (2019) provide evidence showing a rise in annual stock returns with an increase in firm-specific political risk. The current study provides direct evidence, supporting the latter finding and showing that politically sensitive firms are more likely to take a risk. While vast research documents the impact of political risk on businesses at a macro level,

we show that the relationships should be re-examined at a micro level.

We also shed light on the strand of research focusing on the role of political connections (Faccio et al. 2006; Yu and Yu, 2011; Boubakri et al. 2013; Luo et al. 2016; Wellman, 2017; Pham, 2019). Previous studies have generally found that political connections play a moderating role in alleviating the negative effects of political uncertainty on a company. However, our findings suggest that political connection could be a consequence of firm-level political risk. There is a possibility that a higher level of political uncertainty will result in a greater desire to become involved in the political issue, particularly for larger companies that are equipped to do so, and, in the process, to become informed about it. The more informed the managers are, the less uncertainty they will be, and the more they will be willing to take a risk. Additionally, our study contributes to the popular research approach widely used in accounting and finance: event study. While it is very common to study how macro-economic factors such as a political scandal, a financial crisis, or a natural disaster might have affected corporate performance and decision-making, our results in this study indicated the need to consider such factors in terms of the level of their impact at firm-level rather than collectively.

The paper is organized as follows: The second section presents a review of related literature and hypothesis development. The third part describes the data and descriptive results. The fourth section presents the main empirical results. The fifth section reports the additional tests and robustness checks, and the final section discusses and concludes the paper.

Literature review and development of hypotheses

Substantial research illustrates the significance of political instability in the financial sector. Pástor and Veronesi (2013), for instance, construct an asset-pricing model that forecasts negative and more volatile market returns following policy change announcements. Several studies also examine how political instability influences the operations and decisions of businesses. Baker et al. (2016) finds that when political uncertainty increases, firms limit their investment activities and slow employment growth. Waisman et al. (2015) suggests that political uncertainty has an effect on business debt. They demonstrated that the uncertainty around the outcome of the U.S. presidential election causes a 34-bps increase in the spreads of corporate bonds. Chan et al. (2021) investigates how the unpredictability of economic policy influences the cost of raising equity capital. Political uncertainty influences the cost, volume, and timing of seasoned stock issues, according to the authors. Their findings suggested that underwriters and issuers delay offerings to offset the detrimental impact of political uncertainty on investor interest. According to King et al. (2021), multinational firms tend to allocate lower levels of capital to assets situated in nations that exhibit a higher level of political risk.

However, the aforementioned research focuses primarily on how aggregate political uncertainty impacts enterprises' operations and hence assumes that firms' responses to political uncertainty are homogeneous. This assumption is unreasonable. Hassan et al. (2019) created a unique measure to explore firm-level political uncertainty in order to examine the cross-sectional heterogeneity of firms. This is the first empirical proxy assessing firm-level political uncertainty. Gad et al. (2022) examines the impact of firm-level political risk on debt financing utilizing the metric created by Hassan et al. (2019) to demonstrate how borrower-level political uncertainty influences the cost and liquidity of public debt, the cost of private debt, and debt issuance decisions. Using a machine-learning-based firm-specific measure of political risk, Gorbatiykov et al. (2019) discover that political risk is reflected in stock returns. Companies are subject to a

turbulent policy environment during times of considerable political change. Saffar et al. (2019), for instance, analyze the effect of political uncertainty at the firm-level on bank loan contracting and find that enterprises with greater political uncertainty have higher bank loan costs. This effect is amplified for organizations with higher informational ambiguity and financial restrictions.

The connection between organizations' political unpredictability and their risk-taking behavior is currently unknown. On the one hand, businesses connected with higher levels of political unpredictability tend to take fewer risks. Information environments are influenced by political risks, and firms with greater political uncertainty at the firm-level are anticipated to have greater information risk (Kim et al. 2011; Bradley et al. 2016). More political unpredictability at the corporate level may result in higher external finance costs due to greater information asymmetry between lenders and borrowers and anticipated more erratic future cash flows (Brogaard and Detzel, 2015; Zhang et al. 2015). Thus, management would be less likely to raise external funds or take risks (Boubakri et al. 2013). More political unpredictability at the corporate level may also result in increased managerial conservatism (Dai and Ngo, 2020) to reduce threats to personal interests, such as job loss, management would favor investment options with less volatility in cash flows (Amihud and Lev, 1981; Gormley and Matsa, 2016). Substantial research (Bernanke, 1983; Bloom, 2009; Panousi and Papanikolaou, 2012; Akey and Lewellen, 2017; Jens, 2017; Wen et al. 2020) suggested a negative relationship between political uncertainty and corporate risk-taking. This is because uncertainty can make it more difficult for firms to assess the risks and potential rewards of new investments (Choi et al. 2021). Consequently, increased political uncertainty might dissuade companies from investing in riskier ventures.

On the other hand, during periods of high political uncertainty, companies often find themselves drawn to lobbying efforts, seeking increased access to politicians. This drive is fueled by the belief that during periods of heightened political uncertainty, access to government policies becomes a scarce and valuable resource, which could reduce information asymmetry and risk. Supporting this perspective, Hassan et al. (2019) argued that companies, in times of political uncertainty, are more likely to contribute to political campaigns, establish connections with politicians, and invest in lobbying activities. Wellman's (2017) findings reinforce the idea that politically connected businesses are less susceptible to the influence of policy uncertainty when making corporate investment decisions. Pham (2019) also highlights that in the face of increased policy uncertainty, firms with significant political connections tend to use less uncertain language in their financial reports, suggesting that improved information enables these firms to hedge against policy uncertainty. This alignment is consistent with the notion that enhanced information plays a crucial role in mitigating the impacts of uncertainty. Moreover, studies by Akey and Lewellen (2017), Asrat (2020) and Timbate and Asrat (2023) propose that the prevalence of political interference naturally leads firms and economic agents to form connections with politicians. This connection provides lobbyists with an informational advantage concerning future political events and their potential impact on the company. Examining data from 45 countries, Boubakri et al. (2013) find that politically connected firms, due to their close ties with the government, tend to take more risks, leading to less conservative investment decisions. In summary, there is no clear evidence on the direction of the relationship between firm-level political uncertainty and corporate risk-taking, and hence, examining how firm-level exposure to political uncertainty affects corporate risk-taking decisions and activities is an empirical research question. To empirically test the relation between firm-level political uncertainty and risk-taking, we propose the first hypothesis as follows:

H₁: *There is a relationship between firm-level political uncertainty and firms' risk-taking behavior.*

The role of corporate lobbying. According to prior studies, corporations' susceptibility to political uncertainty may play a substantial influence in propelling corporate lobbying efforts. According to studies, a firm's exposure to political uncertainty has a negative effect on its business outcomes, and this negative effect is particularly correlated with corporate lobbying expenditures aimed at gaining access to policymakers and obtaining confidential policy information during periods of high political uncertainty. Hassan et al. (2019) also suggests that firms lobby to actively manage political uncertainty, and they provide evidence that firms with significant political uncertainty spend more on lobbying. Their findings indicate that corporations would engage in more lobbying to mitigate greater political risk. Moreover, corporate lobbying operations enable corporations to acquire other economic rewards. Lobbying helps firms shape some legislation (Yu and Yu, 2011), gain preferential access to credit (Khwaja and Mian, 2005), receive preferential treatment to obtain government contracts (Agrawal and Knoeber, 2001), and receive assistance during corporate bailouts (Yu and Yu, 2011; Faccio et al. 2006). Choi et al. (2021) also documented that corporate lobbying mitigates the relationship between political uncertainty and corporate investment. With increasing political uncertainty, firms would spend more on lobbying and so continue to take risks. Thus, we hypothesize that the positive or negative link between the firms' exposure to political uncertainty and risk-taking is strengthened or weakened for firms with greater corporate lobbying activities, and we offer the following final hypothesis:

H₂: *The association between firms' exposure to political uncertainty and risk-taking is stronger or weaker for firms with greater engagement in lobbying activities.*

Data and methodology

Sample. This section explains how the data are obtained and how the variables are constructed. The data are obtained from a variety of sources. We first gather information for firm-level political uncertainty from the individual website of Hassan and his team¹. Firm-level financial data are obtained from the Compustat database. Furthermore, we collect the data for macroeconomic variables from the World Bank-World Development Indicators archive. Following the prior studies, we did not include financial companies (i.e., SIC codes 6000–6999) in our sample. Since the political uncertainty data is limited to the U.S. firms and the years between 2002 and 2021, we limit our data to the same geographical area and time period. We also drop those with missing values for firm-level political uncertainty, risk-taking, and financial information. To account for outliers, all variables are winsorized between 1% and 99%. The final sample comprises 32,695 observations spanning the period between 2002 through 2021.

Measuring risk-taking. We employ different measures of corporate risk-taking. Our primary measure (RISK_1) is the standard deviation of a firm's return on assets (ROA) from the industry average return on assets (ROA) over three future years. Return on assets (ROA) is defined as the ratio of earnings before interest and taxes (EBIT) to the total assets of a firm (see Acharya et al. 2011; Langenmayr and Lester, 2018; Tran 2019). Following Boubakri et al. (2013) and Faccio et al. (2016), our second measure (RISK_2) is calculated by taking the difference between the highest and lowest levels of annual earnings before interest, taxes, depreciation, and amortization (EBITDA) scaled to total assets over four future years. The third measure (RISK_3) uses the volatility of firms' EBITDA scaled to total assets over four future years (see Basu et al. 2019; Boubakri et al. 2013). The fourth measure (RISK_4) uses the standard deviation of ROA in

overlapping four years, including the current year and three consecutive future years [t, t + 3]. Finally, we also use the standard deviation of earnings before interest and taxes (EBIT) scaled to sales over four years, including the current year and three consecutive future years [t, t + 3].

Measuring firm-level political uncertainty. We measure our independent variable using quarterly earnings conference calls, as Hassan et al. (2019) do, in which analysts and other market participants discuss released quarterly earnings with top management. A machine learning algorithm is used on the transcripts of these calls to determine how much of the conversation focuses on political topics. To verify which political topics are being conversed, the algorithm separates all two-word combinations ("bigrams") from training libraries that contain comprehensive groups of political, \mathbb{P} , and non-political (N) topics, \mathbb{N} . These sets are identified using an undergraduate textbook on American politics, supplemented by newspaper papers from the national politics divisions of the main U.S. newspapers, an undergraduate financial accounting textbook, and newspaper articles on corporate events. The political uncertainty empirical proxy is created by calculating the number of entirely political bigrams in combination with a synonym for risk or uncertainty and then scaling it by the total quantity of bigrams in the transcript (to adjust for the length of the transcript) as follows:

$$P_UNCERTAINTY_{i,t} = \frac{\sum_{b \in \mathbb{P}} (1[b_e P \setminus N] \times 1[|b - r| < 10]) \times \frac{f_{b,p}}{B_p}}{B_{it}}$$

where r is the point of the closest synonym of risk or uncertainty, $b = 0, 1, \dots$, and B_{it} indexes bigrams in the call of firm i at time t . Each bigram is weighted with a score that reflects how strongly it is associated with politics, where $f_{b,p}$ is the frequency of bigram b in the overall political training library, and $B_{\mathbb{P}}$ is the total number of bigrams in the training library. Hassan et al. (2019) checked this empirical proxy through a series of validity checks.

With this firm-level political uncertainty measure developed by Hassan et al. (2019), we can distinguish the effects of aggregate political uncertainty and firm-level political uncertainty and therefore conduct a cross-sectional investigation on how firms are treated or behave differently when confronting the same aggregate political uncertainty. This measure is available quarterly for almost all firms listed in the U.S. We use the annually standardized value of the quarterly measured political shocks, constructed analogously by considering the use of positive and negative words during or near the discussion.

Control variables. Following the prior literature, we include firm- and country-level characteristics in the model. Control variables for economic factors are included to isolate macroeconomic effects (such as the business cycle) on firm-level political uncertainty. Following Tran (2019), we include a set of macroeconomic control variables: gross domestic product per capita (LnGDP), inflation (INFLATION), and unemployment (UNEMPLOY). Gross Domestic Product per Capita (LnGDP) is measured as the natural logarithm of gross domestic product per capita in 2010 constant U.S. dollars, which measures the result of the country's total economic growth. We expect this measure to be positively related to firm risk-taking. Inflation (INFLATION) is defined as the average rate of price change in the economy as a whole. Following prior literature, we define unemployment (UNEMPLOY) as a ratio of the number of people unemployed to the civilian labor force.

In addition, we include the following control variables for possible firm-level effects: company size (SIZE), tangibility (PPE), financial leverage (LEVERAGE), Tobin's q (TOBIN'S Q), cash-to-

assets ratio (SLACK), Z-score (Z-SCORE), and firm age (AGE). Company size (SIZE) is a proxy for economies of scale and is described as the natural logarithm of firm total assets. According to previous research (Boubakri et al., 2013; Li et al. 2013; Hope, 2003), small firms are generally more risk-seeking than large firms, so we anticipate a negative relationship between firm size and our risk-taking measure. We also control the tangibility of a company's assets (PPE). Tangibility (PPE) is defined as the ratio of net total property, plant, and equipment to total assets (Timbate, 2021). We expect a negative relation between tangibility and risk-taking. Leverage (LEVERAGE) is defined as the sum of long- and short-term debt to total assets, which captures a firm's degree of leverage. Tran (2019) shows that firms with higher financial leverage are more likely to expropriate their creditors, and thus such firms tend to take more risk. TOBIN'S Q is calculated as the sum of the market value of equity and the book value of debt scaled by total assets. TOBIN'S Q captures investment opportunity and firm growth, and thus we expect a positive relationship with our risk-taking measure. Z-SCORE is calculated following Altman (1968). We include Z-SCORE to capture firms' financial health and probability of default. Z-SCORE is calculated as: "[1.2 X working capital divided by total assets) + (1.4 X retained earnings divided by total assets) + (3.3 X income before interest expense and taxes divided by total assets) + (0.6 X market value of equity divided by total liability) + (1.0 X sales divided by total assets)]". SLACK is defined as the ratio of cash to total assets. Loss (LOSS) is an indicator variable coded 1 if net income before extraordinary items is negative and 0 otherwise. We include LOSS in our estimation to capture a firm's ability to pay its debt. We control the effects of firm age (AGE), as this factor reflects a firm's operational experience. AGE is the natural logarithm of the number of years since a firm has been registered in Compustat. We expect that younger firms will engage in more risk-taking behavior. We include both industry fixed effects and standard errors clustered by firm-level in our regression.

Summary statistics. Table 1 below describes the summary statistics for the firm-level political uncertainty, risk-taking, and all the control variables for the period covering 2002 to 2021. As it is depicted in Panel A of Table 1, the average corporate risk-taking measure has a spread of over 0.038 to 0.123. The average company has a total asset of US\$6.56 billion, with financial leverage of 0.223, firm asset tangibility of 0.248, and a ratio of cash to total assets of 21.4 percent.

Panel B of Table 1 presents the correlations matrix result for the variables of interest. The results show that the aggregate firm-level political uncertainty ($P_UNCERTAINTY_{i,t}$) and corporate risk-taking ($RISK_1$) are positively associated. We also find that firm-level political uncertainty is negatively correlated to inflation and positively related to the ratio of cash to total assets (SLACK) and an indicator variable for loss. Most of the control variables are significantly correlated to the dependent variable ($RISK_1$) except for leverage, PPE, unemployment and inflation.

Main empirical results

This part describes the main empirical analysis. We first present the impact of firm-level political uncertainty on the risk-taking behavior of companies. Then, we replace our dependent variable with alternative risk-taking measures for robustness checks. We also check the mitigating role of corporate lobbying incentives. In the end, we conduct additional cross-sectional tests to support our results.

Firm-level political uncertainty and risk-taking. We use the following regression model to test our first hypothesis.

$$RISK_1_{i,t} = \alpha + \beta_1 * P_UNCERTAINTY_{i,t} + \beta_X * X_{i,t} + \varepsilon_{i,t}, \quad (1)$$

where f denotes the firm, t is the time, and contains the set of control variables. Our dependent variable $RISK_1$ is defined as the standard deviation over three years of the difference between the firm's ROA and the industry's average ROA. ROA is measured as EBIT divided by assets. $P_UNCERTAINTY_{i,t}$ is firm i 's standardized yearly average political uncertainty score derived from the firm's quarterly earnings call transcripts. Following prior studies, we include firm-level control variables that capture a firm's fundamental characteristics. We also include a set of macroeconomic control variables, including the inflation rate (INFLATION), unemployment rate (UNEMPLOY), and gross domestic product (LnGDP). We also control industry fixed effects, and standard errors are clustered by firm.

Table 2 presents the main regression findings for the impact of firm-level political uncertainty on corporate risk-taking with and without controlling macroeconomic factors. In Table 2, column (1), we control firm characteristics and industry-fixed effects, and standard errors are clustered by firm. At the 1% level of significance, we find that firm-level political uncertainty is positively related to corporate risk-taking (coefficient = 0.004; t -statistic = 3.60). In particular, a one standard deviation rise in firm-level political uncertainty leads to a 2.53% increase in managers' risk-taking. This finding suggests that corporate managers react to higher firm-level political uncertainty by taking more risks. When we include macro-level variables, as shown in column (2), the effect of firm-level political uncertainty remains significantly positive, which indicates that the results are not driven by business conditions (coefficient = 0.004; t -statistic = 3.39).

In addition to the key explanatory variables, the coefficients of the firm characteristics in the regression are also significant and consistent with findings in the prior literature (Boubakri et al. 2013; Tran, 2019). For example, corporate risk-taking is negatively associated with firm size (coefficient = -0.008; t -statistic = -15.77) and Z-SCORE (coefficient = -0.005; t -statistic = -16.98) and is positively associated with TOBIN'S Q (coefficient = 0.015; t -statistic = 14.26); SLACK (coefficient = 0.061; t -statistic = 10.04); LOSS (coefficient = 0.006; t -statistic = 3.96); and AGE (coefficient = 0.003; t -statistic = 2.5). In General, the results in Table 2 below show that during periods of high firm-level political uncertainty, firms are more likely to engage in risk-taking behaviors.

Alternative measures of risk-taking. Following Boubakri et al. (2013) and Faccio et al. (2016), we replace the risk-taking measure ($RISK_1$) with four alternative measures of firm risk-taking: $RISK_2$, $RISK_3$, $RISK_4$, and $RISK_5$. Table 3 reports the results of the robustness tests with various measures of corporate risk-taking. We find that firm-level political uncertainty is positively related to all four alternative measures of risk-taking: $RISK_2$ (coefficient = 0.013; t -statistic = 2.63), $RISK_3$ (coefficient = 0.006; t -statistic = 2.71), $RISK_4$ (coefficient = 0.006; t -statistic = 2.45), and $RISK_5$ (coefficient = 0.172; t -statistic = 2.34). Our findings are robust to alternative measures of corporate risk-taking.

The role corporate lobbying. Studies document that firm-level political uncertainty appears to play a significant role in driving corporate lobbying intensity. Firms with high political uncertainty would have a strong incentive to lobby for different reasons. As a result, we anticipate (H_4) that the relationship between

Table 1 Descriptive statistics and correlation.

Variable	Mean	Std Dev	25%	Median	75%									
Panel A: Descriptive statistics														
P_UNCERTAINTY	-0.111	0.652	-0.508	-0.313	0.028									
RISK_I	0.103	0.110	0.038	0.070	0.123									
SIZE	6.557	1.949	5.200	6.524	7.883									
LEVERAGE	0.223	0.225	0.012	0.183	0.342									
PPE	0.248	0.233	0.068	0.160	0.361									
TOBIN'S Q	2.112	1.497	1.200	1.611	2.423									
SLACK	0.214	0.226	0.041	0.128	0.317									
LOSS	0.326	0.469	0.000	0.000	1.000									
Z-SCORE	3.580	6.184	1.350	3.000	5.181									
AGE	2.847	0.749	2.303	2.833	3.401									
LnGDP	10.80	0.106	10.740	10.790	10.88									
UNEMPLOY	6.521	1.730	5.083	5.784	8.069									
INFLATION	1.933	0.716	1.165	1.918	2.686									
Panel B: Correlation														
1	1	2	3	4	5	6	7	8	9	10	11	12	13	
P_UNCERTAINTY														
RISK_I	0.07													
SIZE	-0.03	-0.24												
LEVERAGE	0.05	0.01	0.27											
PPE	-0.01	0.01	0.32	0.30										
TOBIN'S Q	0.03	0.18	-0.24	-0.10	-0.23									
SLACK	0.08	0.20	-0.33	-0.35	-0.34	0.33								
LOSS	0.06	0.22	-0.29	-0.09	-0.09	0.05	0.29							
Z-SCORE	-0.03	-0.23	0.07	-0.30	-0.12	0.31	0.17	-0.31						
AGE	0.01	-0.11	0.22	0.07	0.17	-0.20	-0.32	-0.26	-0.05					
LnGDP	0.01	0.08	0.10	0.08	-0.01	0.06	-0.02	0.03	-0.06	0.11				
UNEMPLOY	0.04	0.04	-0.01	-0.03	0.01	-0.06	0.00	-0.01	-0.04	0.05	0.04			
INFLATION	-0.07	-0.04	-0.05	-0.06	-0.01	0.03	0.01	0.07	0.07	-0.08	-0.29	-0.30		

This table shows the summary statistics and correlations matrix for our variables employed in the regression's equations. In Panel B, statistically significant correlations at 5% significant level are written in bold.

a firm’s exposure to political uncertainty and risk-taking will be stronger for a firm with corporate lobbying incentives.

We collect corporate lobbying data from the Center for Responsive Politics (CRP) website, and corporate lobbying (LOBBY) is defined as the percentage of a firm’s total annual lobbying expenditure over its total market value of equity (MV) at the beginning of the fiscal year. If a public firm’s lobbying expenditures exceed US \$10,000 in a given year, it must file semi-annual reports outlining the issues it advocates for and the total amount spent on lobbying. Table 4 presents the regression results. We set LOBBY = 1 (or 0 otherwise) if the lobbying expenditure of a firm per its market value is in the top quartile among the firms

in the industry. The coefficient on the interaction term P_UNCERTAINTY*LOBBY is positive and significant (coefficient = 0.0059; t-statistic = 3.82), indicating that the effect of firm-level political uncertainty on risk-taking is stronger for firms that spend more money on corporate lobbying.

Additional tests

In this section, we perform several checks to support our results. First, we investigate the effect of firm-level political uncertainty based on firm size. Second, we test whether concerns regarding firm-level political uncertainty intensified after the financial crisis. Third, we investigate the effect of topic-specific political uncertainty on our risk-taking measures. Finally, we perform a robustness check for endogeneity.

Large versus small firms. In this subsection, we investigate if the effect of firm-level political uncertainty on risk-taking is affected by firm size. The literature (see, for example, Acs and Audretsch, 1988) emphasizes a variety of determinants that affect investment decisions for large and small firms. Cohen and Klepper (1996) provide evidence that larger firms have an advantage in investing, as their larger output enables them to reinvest. Other studies (Brown et al. 2012; Brown and Petersen, 2011) demonstrate that firm size matters for investment, as small firms often rely on external equity financing but have less capacity to access capital markets and are more financially constrained (Beck et al. 2005; Fama and French, 1992). Larger firms are less financially constrained and may easily handle the situation and, hence, assume higher levels of risk. However, smaller firms could be more sensitive to political uncertainty, as they usually face significant financial insecurity and have fewer financial resources to mitigate political risk. We thus predict that small firms are less likely to take risks.

We split our sample into two groups and classify firms above the industry median size (total assets) as large firms and the rest as small firms. As shown in column (1) of Table 5, the effect of firm-level political uncertainty has a greater statistical significance and magnitude on larger firms’ risk taking (coefficient = 0.0055; t-statistic = 3.45), and the p value of the difference in the P_UNCERTAINTY coefficient between small and large firms is 0.000. This result supports the view that larger firms are more likely to manage the impact of political uncertainty and take more risks.

Table 2 The effect of firm-level political uncertainty on risk-taking.

	(1) RISK_1	(2) RISK_1
P_UNCERTAINTY	0.004*** (3.60)	0.004*** (3.39)
SIZE	-0.008*** (-15.77)	-0.008*** (-16.47)
LEVERAGE	-0.006 (-1.15)	-0.007 (-1.26)
PPE	0.008 (1.54)	0.011** (2.16)
TOBIN'S Q	0.015*** (14.26)	0.014*** (13.90)
SLACK	0.061*** (10.04)	0.060*** (9.96)
LOSS	0.006*** (3.96)	0.006*** (3.72)
Z-SCORE	-0.005*** (-16.98)	-0.005*** (-16.58)
AGE	0.003** (2.50)	0.001 (1.27)
LnGDP		0.088*** (11.60)
UNEMPLOY		0.003*** (6.48)
INFLATION		0.006*** (5.32)
Industry F.E.	Yes	Yes
Year F.E.	Yes	No
Clustered by Firm	Yes	Yes
N	32,695	32,695
Adj. R ²	0.343	0.349

The table below presents the main regression findings for the relationship between firm-level political uncertainty on corporate risk-taking. The dependent variable RISK_1 is the standard deviation of the difference between a firm’s ROA from the industry-year average ROA calculated over the coming three years. ROA is defined as ratio of EBIT over assets. P_UNCERTAINTY is the firm’s annually standardized firm-level political uncertainty. The first column controls company-level control variables only, and the second column controls macroeconomic variables as well. ***, **, and * show levels of significance at 1%, 5%, and 10%, respectively.

Table 3 Alternative risk-taking measures.

	(1) RISK_2	(2) RISK_3	(3) RISK_4	(4) RISK_5
P_UNCERTAINTY	0.013*** (2.63)	0.006*** (2.71)	0.006** (2.45)	0.172** (2.34)
SIZE	-0.039*** (-16.22)	-0.018*** (-15.58)	-0.018*** (-15.78)	-0.096*** (-3.30)
LEVERAGE	-0.011 (-0.45)	-0.000 (-0.04)	-0.003 (-0.26)	-0.070 (-0.21)
PPE	0.074*** (2.91)	0.029** (2.49)	0.034*** (2.75)	0.137 (0.36)
TOBIN'S Q	0.049*** (10.65)	0.023*** (10.62)	0.023*** (10.40)	0.197*** (3.09)
SLACK	0.254*** (9.99)	0.116*** (9.73)	0.118*** (9.64)	4.900*** (10.49)
LOSS	0.038*** (5.08)	0.013*** (3.83)	0.017*** (4.75)	0.651*** (5.26)
Z-SCORE	-0.018*** (-14.06)	-0.008*** (-13.79)	-0.008*** (-13.78)	-0.073*** (-3.58)
AGE	-0.017*** (-3.12)	-0.009*** (-3.85)	-0.009*** (-3.48)	-0.199*** (-2.69)
LnGDP	0.327*** (10.78)	0.162*** (11.40)	0.166*** (11.21)	2.426*** (5.78)
UNEMPLOY	-0.031*** (-13.83)	-0.016*** (-14.86)	-0.016*** (-14.60)	-0.160*** (-5.59)
INFLATION	-0.053*** (-9.57)	-0.028*** (-10.82)	-0.028*** (-10.41)	-0.242*** (-3.86)
Industry F.E.	Yes	Yes	Yes	Yes
Clustered by Firm	Yes	Yes	Yes	Yes
N	32,695	32,695	32,695	32,695
Adj. R ²	0.221	0.212	0.212	0.132

This table represents the findings for the alternative risk-taking measures. RISK_2 is the difference between the highest and lowest levels of annual EBIT to total assets over four-year periods. RISK_3 is the volatility of firms’ EBITDA to total assets over the coming four-year period. RISK_4 is the standard deviation of ROA over overlapping four-year periods [t, t + 3]. ROA is defined as the ratio of EBIT over assets. RISK_5 is the standard deviation of EBIT over sales over overlapping four years [t, t + 3]. ***, **, and * show levels of significance at 1%, 5%, and 10%, respectively.

Table 4 The role of corporate lobbying.

	RISK_1
P_UNCERTAINTY	0.0006* (1.83)
LOBBY	0.0002* (1.71)
P_UNCERTAINTY*LOBBY	0.0059*** (3.82)
SIZE	-0.0091*** (-16.20)
LEVERAGE	-0.0166*** (-2.71)
PPE	0.0156** (2.50)
TOBINQ	0.0166*** (14.00)
SLACK	0.0528*** (8.43)
LOSS	0.0099*** (5.51)
Z-SCORE	-0.0052*** (-15.57)
AGE	0.0019 (1.29)
LN_GDP	0.0839*** (8.15)
UNEMPLOY	-0.0005 (-0.77)
INFLATION	-0.0029* (-1.84)
Industry Fixed Effect	Yes
Clustered by Firm	Yes
N	19,748
Adj. R ²	0.385

The table below presents the findings for moderation test examining the role of corporate lobbying intensity. Corporate lobbying intensity is calculated as a firm's annual lobbying expenditure divided by its beginning-of-year total market value. LOBBY is an indicator variable coded 1 if firm's corporate lobbying intensity is ranked in the highest quartile in the industry and 0 otherwise. Corporate lobbying expenditure data are obtained from the Center for Responsive Politics (CRP) website. ***, **, and * show levels of significance at 1%, 5%, and 10%, respectively.

Table 6 Before and after the financial crisis: subsample analysis.

	(1)	(2)
	Before	After
	RISK_1	RISK_1
P_UNCERTAINTY	0.0035*** (2.53)	0.0054*** (3.31)
SIZE	-0.0076*** (-12.70)	-0.0104*** (-13.96)
LEVERAGE	-0.0036 (-0.58)	-0.0179** (-2.39)
PPE	-0.0030 (-0.53)	0.0269*** (3.81)
TOBIN'S Q	0.0139*** (11.05)	0.0165*** (10.52)
SLACK	0.0563*** (6.76)	0.0591*** (7.87)
LOSS	0.0035* (1.66)	0.0085*** (3.89)
Z-SCORE	-0.0047*** (-13.43)	-0.0053*** (-11.80)
AGE	0.0015 (1.08)	0.0020 (1.44)
LnGDP	0.0432* (1.76)	0.0763*** (5.45)
UNEMPLOY	0.0012 (1.12)	-0.0080*** (-3.23)
INFLATION	0.0119*** (6.90)	-0.0108*** (-4.58)
Industry F.E.	Yes	Yes
Clustered by Firm	Yes	Yes
N	11,704	19,206
Adj. R ²	0.383	0.372

Table 6 describes the cross-sectional variations centered on the financial crisis effects. The dependent variable in all of the regressions is RISK_1. "Before" shows the period before the crisis (2002 to 2007) and "After" denotes the period following the crisis (2009 to 2021). ***, **, and * show levels of significance at 1%, 5%, and 10%, respectively.

Table 5 Company size: subsample analysis.

	Firm Size	
	Large	Small
	RISK_1	RISK_1
P_UNCERTAINTY	0.0055*** (3.45)	-0.0003 (0.27)
SIZE	-0.0008 (-1.50)	-0.0225*** (-15.30)
LEVERAGE	0.0118** (2.38)	0.0017 (0.23)
PPE	0.0047 (1.08)	0.0238** (2.56)
TOBIN'S Q	0.0004 (0.40)	0.0140*** (12.00)
SLACK	0.0265*** (4.20)	0.0613*** (8.12)
LOSS	0.0104*** (5.02)	-0.0002 (-0.09)
Z-SCORE	0.0002 (0.51)	-0.0044*** (-14.51)
AGE	-0.0014 (-1.38)	-0.0010 (-0.48)
LnGDP	0.0991*** (12.15)	0.0867*** (6.90)
UNEMPLOY	0.0047*** (8.01)	0.0008 (1.13)
INFLATION	0.0067*** (5.12)	0.0047** (2.57)
p-value of the difference in the P_UNCERTAINTY coefficients	0.000	
Industry F.E.	Yes	Yes
Clustered by Firm	Yes	Yes
N	16,350	16,343
Adj. R ²	0.357	0.358

Table 5 describes cross-sectional variations based on company size. The unit of observation is a firm-year. We classify a firm as 'Large' if the firm's size, measured by its total assets, is above the median size in the industry. Firms smaller than the median industry size are labelled 'Small'. The dependent variable in the regressions is RISK_1. ***, **, and * show levels of significance at 1%, 5%, and 10%, respectively.

Subsample analysis: before and after the financial crisis. Based on the Federal Open Market Committee (2009) and the International Monetary Fund, uncertainty about U.S. fiscal, regulatory, and monetary policies contributed to a sharp economic decline from 2008 to 2009 and a gradual recovery afterward. Recent studies (for example, Baker et al. 2016; Julio and Yook, 2012) provide evidence that political uncertainty was more pronounced

in the wake of the financial crisis. Therefore, in this section, we divide the sample period into two sub-periods. We predict that before 2008, the relationship between firm-level political uncertainty and the risk-taking behavior of firms was relatively weak because most firms did not pay enough attention to political uncertainty. Due to the dramatic depressive effect of the financial crisis, awareness of political uncertainty could increase after the crisis. As a result, we anticipate that the relationship between firm-level political uncertainty and risk-taking will be stronger in the sample period following the crisis (2008). The results are presented in Table 6.

Table 6 shows that before 2008, the coefficient on firm-level political uncertainty is significant, and its magnitude of 0.0035 is smaller than after 2008 (coefficient = 0.0054; t-statistic = 3.31). In general, the results in Table 6 are consistent with our prediction that the 2008 financial crisis drew managers' attention to political uncertainty. However, the impact of the financial crisis on the relationship between political uncertainty and corporate risk-taking is modest Table 6.

Topic-specific political uncertainty. In the previous sections, we investigated the effect of aggregate firms' exposure to political uncertainty on risk-taking. A study by Hassan et al. (2019) provides evidence that firms engage in lobbying activities on the political topics they are most concerned about. To examine whether corporate managers examine the uncertainty related to topic-specific issues instead of the aggregate, we analyze the effects of the risk related to the following political topics: economy and budget (Econ_U), environment (Env_U), trade (Trade_U), institutions and political process (Ins_U), health care (Health_U), security and defense (Secure_U), tax (Tax_U), and technology and infrastructure (Tech_U). We use the first equation and replace it with topic-specific political uncertainty metrics Table 7.

The results of topic-specific political uncertainty are described in the table below. We find that firms consider firm-level political uncertainty regarding certain topics when evaluating investment

Table 7 The effects of topic-specific political uncertainty on risk-taking activities.

	(1) RISK_1	(2) RISK_1	(3) RISK_1	(4) RISK_1	(5) RISK_1	(6) RISK_1	(7) RISK_1	(8) RISK_1
Econ_U	0.0005*** (3.18)							
Env_U		0.0001 (0.80)			0.0002*** (2.69)	0.0003** (2.44)		
Trade_U			0.0001 (1.41)	0.0004** (2.30)			0.0003** (2.55)	
Inst_U								
Health_U								
Secure_U								
Tax_U								
Tech_U								
SIZE	-0.0084*** (-16.47)	-0.0084*** (-16.46)	-0.0084*** (-16.46)	-0.0084*** (-16.47)	-0.0084*** (-16.46)	-0.0084*** (-16.46)	-0.0084*** (-16.47)	0.0004** (2.01)
LEVERAGE	-0.0067 (-1.30)	-0.0066 (-1.28)	-0.0067 (-1.29)	-0.0067 (-1.29)	-0.0068 (-1.32)	-0.0066 (-1.28)	-0.0066 (-1.28)	-0.0084*** (-16.46)
PPE	0.0108** (2.18)	0.0104** (2.09)	0.0104** (2.10)	0.0106** (2.14)	0.0106** (2.13)	0.0108** (2.17)	0.0106** (2.13)	-0.0066 (-1.27)
TOBIN'S Q	0.0145** (13.91)	0.0144** (13.88)	0.0144** (13.88)	0.0144** (13.90)	0.0144** (13.91)	0.0144** (13.89)	0.0144** (13.89)	0.0107** (2.15)
SLACK	0.0609*** (10.07)	0.0608*** (10.03)	0.0608*** (10.04)	0.0608*** (10.04)	0.0606*** (10.01)	0.0608*** (10.04)	0.0609*** (10.05)	0.0144** (13.87)
LOSS	0.0062*** (3.79)	0.0062*** (3.78)	0.0062*** (3.79)	0.0062*** (3.77)	0.0062*** (3.77)	0.0062*** (3.77)	0.0063*** (3.82)	0.0608*** (10.04)
Z-SCORE	-0.0049*** (-16.59)	-0.0049*** (-16.55)	-0.0049*** (-16.54)	-0.0049*** (-16.57)	-0.0049*** (-16.59)	-0.0049*** (-16.56)	-0.0049*** (-16.56)	0.0062*** (3.77)
AGE	0.0014 (1.26)	0.0015 (1.34)	0.0015 (1.34)	0.0014 (1.32)	0.0014 (1.31)	0.0014 (1.29)	0.0014 (1.31)	-0.0049*** (-16.56)
LnGDP	0.0884*** (11.63)	0.0878*** (11.55)	0.0878*** (11.55)	0.0880*** (11.58)	0.0880*** (11.58)	0.0882*** (11.60)	0.0879*** (11.56)	0.0014 (1.31)
UNEMPLOY	0.0031*** (6.45)	0.0031*** (6.59)	0.0031*** (6.61)	0.0031*** (6.54)	0.0031*** (6.51)	0.0031*** (6.57)	0.0031*** (6.50)	0.0879*** (11.56)
INFLATION	0.0060*** (5.27)	0.0059*** (5.18)	0.0059*** (5.18)	0.0059*** (5.22)	0.0059*** (5.21)	0.0060*** (5.24)	0.0059*** (5.21)	0.0031*** (6.55)
Industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0.0059*** (5.21)
Clustered by Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	32,695	32,695	32,695	32,695	32,695	32,695	32,695	Yes
Adj. R ²	0.349	0.349	0.349	0.349	0.349	0.349	0.349	Yes

Table 7 below presents the findings of the impacts of various categories of political uncertainty on corporate risk-taking. Our dependent variable in all of the regressions is RISK_1. Independent variables include topic-specific firm-level political uncertainty variables: - economy and budget (Econ_U), environment (Env_U), trade (Trade_U), institutions and political process (Ins_U), health care (Health_U), security and defense (Secure_U), tax (Tax_U), and technology and infrastructure (Tech_U). ***, **, and * show levels of significance at 1%, 5%, and 10%, respectively.

Table 8 Firm-level political uncertainty and risk-taking: the PSM approach.

	(1) RISK_1
P_UNCERTAINTY	0.009*** (3.10)
SIZE	-0.010*** (-7.71)
LEVERAGE	0.012 (0.82)
PPE	0.000 (0.00)
TOBIN'S Q	0.018*** (9.49)
SLACK	0.070*** (5.00)
LOSS	0.007 (1.58)
Z-SCORE	-0.006*** (-8.91)
AGE	0.002 (0.72)
LnGDP	0.104*** (4.89)
UNEMPLOY	0.003** (2.39)
INFLATION	0.007** (2.10)
Industry F.E.	Yes
Clustered by Firm	Yes
N	3,196
Adj. R ²	0.411

Table 8 below shows the results for the impact of firm-level political uncertainty on corporate risk-taking applying the PSM approach. ***, **, and * show levels of significance at 1%, 5%, and 10%, respectively.

decisions. Firms' risk-taking is positively associated with all of the specific political risk variables for trade-related political uncertainty. Comparatively, economy- and budget-related uncertainty is more related to corporate risk-taking. Thus, our results suggest that topic-specific political risk factors are also likely to drive managerial risk-taking behavior.

Endogeneity concerns. In this subsection, we discuss an alternative to the standard multivariate regression approach. Specifically, we use the propensity score matching method (PSM), which allows us to compare high and low levels of firm-level political risk among firms that otherwise share similar characteristics. To do so, we first construct the dummy variable, which equals one if a firm's political risk is in the top 30% that year in the treatment group and zero if it is in the bottom 50% as a control group. Next, to identify matching firms for the treatment group, we run a logistic regression on all variables. As there are no good predictors of political uncertainty at the firm-level, we incorporate all firm-related characteristics in the first-step regression. The fitted value captures the probability (i.e., propensity score) of being in the treatment group. We select a matching sample for each treatment sample based on the closest estimated probability without replacement. Following prior literature, we also require the matching sample to come from the same 2-digit SIC industry code and year. This procedure gave us a matched sample of 2,820, comprising 1,410 firm-year observations each in the treatment and control groups.

Table 8 describes the results of the propensity score matching technique. The coefficient is 0.009 (t-statistic = 3.10), indicating that corporate risk-taking in the treatment group is approximately 0.9% greater than in the matched sample. In general, the positive association between firm-level political uncertainty and managerial risk-taking is not likely to be determined by omitted variables.

Discussion and conclusion

Discussion. In recent years, the global economy has been characterized by the prominent presence of political uncertainty. The emergence of populism, nationalism, and trade disputes has

engendered a heightened level of uncertainty and instability within the business landscape. The presence of uncertainty can exert a substantial influence on the propensity of corporations to engage in risk-taking activities. A growing body of research suggests that political uncertainty has a negative impact on corporate risk-taking (Akey and Lewellen, 2017; Wen et al. 2020). This is because uncertainty can make it more difficult for firms to assess the risks and potential rewards of new investments (Choi et al. 2021). For example, according to Jens (2017), firm investment in states in the USA with a gubernatorial election has declined by 4.9% and the volatility was higher for firms about to elect a governor, with increased uncertainty linked to post-election investment. Brandon and Yook (2012) also documented that in election years, companies decrease their investment expenditures by an average of 4.8% compared to years without elections. Additionally, uncertainty can lead to increased financing costs (Bradley et al. 2016; Zhang et al. 2015), which can make it more difficult for firms to raise the capital needed to fund risky projects.

On the contrary, political risk may positively impact corporate risk-taking (Asrat, 2020). Companies that operate in high-risk countries may be more prone to make risky investments because they are more likely to be politically connected. Political ties can assist businesses in obtaining government contracts, obtaining advantageous regulatory treatment, and avoiding expropriation. Wellman (2017) argued that corporations create political relationships to lessen information asymmetry and better forecast which legislation would pass. As a result, businesses with political ties may be more ready to make riskier investments since they are more likely to be able to manage the political risks associated. This argument is supported by some empirical evidence. For example, a study by Boubakri et al. (2013) discovered that corporations in high-risk countries are more likely to engage in mergers and acquisitions (M&A), a type of risky corporate investment. Wellman (2017) found that politically linked enterprises are less affected by policy uncertainty in relation to their corporate investment decisions. According to Pham (2019), in the face of increased policy uncertainty, corporations with significant political connections use less uncertain language in their financial reports than non-connected rivals, consistent with improved information allowing linked firms to hedge policy uncertainty. Timbate and Asrat (2023) also discovered that corporations with higher political risk are more likely to manipulate their earnings, which is likewise a type of risky decision.

However, the conventional understanding of political risk has predominantly focused on its macro-level implications. Recent research has shed light on the significance of firm-level political risk. This concept encompasses the distinct political vulnerabilities that individual firms encounter as a result of their specific attributes and operating strategies (Hassan et al. 2019). Therefore, in this study, we investigate how political uncertainty at the firm-level affects corporate risk-taking. We use the firm-level political risk metric developed by Hassan et al. (2019). This metric utilizes quarterly earnings conference calls, when analysts and market actors discuss quarterly earnings with top management. A machine learning algorithm assesses political content in phone transcripts. To detect political themes, the approach separates two-word pairs ("bigrams") from training libraries with political (P) and non-political (N) topics. These sets are identified by an undergraduate American politics textbook, national politics papers from major U.S. newspapers, an undergraduate financial accounting textbook, and corporate event newspaper items. Finally, the empirical proxy is generated by combining the number of entirely political bigrams with a risk or uncertainty synonym and scaling it by the transcript's total bigrams.

We found that companies with higher levels of firm-level political uncertainty exhibited more risk-taking behavior. This was determined by using a sample of companies from the United States throughout the period of 2002–2021. After taking into account the characteristics of the company as well as other macroeconomic factors, this positive connection is confirmed to be significant at a 1% significance level. A one standard deviation rise in the level of political risk at the firm-level results in a 2.53% increase in the amount of risk that managers are willing to take. We have also discovered that the effect of political uncertainty at the firm-level is magnified for companies that spend more money on lobbying. While lobbying expenditures are amplifying the positive association between firm-level political risk and corporate risk-taking, it is important to note that this positive relationship is only meaningful for larger businesses that are larger than the median firm size in the industry as measured by total assets. Additionally, we demonstrate that the association is somewhat greater for the time periods that followed the financial crisis that occurred in 2008. Additional tests using the propensity score matching revealed that the positive link between firm-level political risk and managerial risk-taking is not likely to be because of variables that were not included in the analysis.

Conclusion. The effect of political uncertainty on firm outputs has drawn a great deal of interest from academics and policymakers in recent years, particularly since the post-financial crisis. We empirically examine the relationship between firm-level political uncertainty and risk-taking behavior. Using a sample of U.S. firms over the 2002–2021 period, we realize that firms with greater firm-level political uncertainty exhibit more risk-taking behavior especially when they are large. This positive association is significant at a 1% significance level after controlling for firm characteristics and other macroeconomic factors. We find that the firm-level political uncertainty effect is more amplified for firms with more lobbying spending. We also show that the relationship is slightly stronger for the periods following the 2008 financial crisis.

This study contributes to the existing literature in three ways. First, this study contributes to the literature by investigating the relationship between political risk and corporate risk-taking by focusing on firm-level political risk. The study adopts a new measure of political risk developed by Hassan et al. (2019) using computational linguistics, which is a robust proxy for firm-level political risk. The findings reveal a positive relationship between firm-level political risk and corporate risk-taking. The study also contributes to the strand of research exploring the relationship between political uncertainty and corporate investment and capital structure decisions. Previous research shows that higher political uncertainty is related to increased costs of external financing and reduced corporate investment. However, recent empirical research suggests that the link may depend on how the political risk indicator is measured. The current study provides direct evidence supporting the latter finding, showing that politically sensitive firms are more likely to take risks. Third, this study also sheds light to the strand of research focusing on the role of political connections in mitigating the negative effects of political uncertainty on a company. The findings in this study suggest that political connections could be a consequence of firm-level political risk, with a higher level of political uncertainty leading to a greater desire to become involved in political issues. The more informed managers are, the less uncertainty there will be, and the more they will be willing to take risks. Additionally, this study contributes to the popular research approach of event study, which considers macro-economic factors such as political scandals, financial crises, or natural disasters in terms of their impact at the firm-level rather than collectively.

However, this study is not without limitations. First, the corporate risk-taking measure we adopted is based on the ex-post variance of accounting outcomes. Future studies may consider the use of some ex-ante measures that reflect the uncertainty resulting from managerial decisions prior to the actual outcomes of those decisions. Additionally, our sample is limited to firms in the United States of America. However, it is possible to expect that firms in other (non-western) countries could not be able to manage political risk in an analogous way to the U.S. Therefore, future research may provide more insight by studying firms from diverse countries with diverse political settings.

Data availability

The data that support the findings of this study are openly available in Wharton data research services at <https://wrds-www.wharton.upenn.edu/> (available on subscription) and in Firm level risk at <https://www.firmlevelrisk.com/home> (freely available). Additionally, the data are available from the corresponding author upon reasonable request.

Received: 27 September 2023; Accepted: 12 February 2024;
Published online: 05 March 2024

Note

1 We thank Hassan for making the data available on his website.

References

- Acharya V, Amihud Y, Litov L (2011) Creditor rights and corporate risk taking. *Journal of Financial Economics* 102(1):150–166
- Acs ZJ, Audretsch DB (1988) Innovation in large and small firms: An empirical analysis. *American Economic Review* 678–690
- Agrawal A, Knoeber C (2001) Do Some Outside Directors Play a Political Role? *Journal of Law and Economics* 44(1):179–198
- Akey P, Lewellen S (2017) Policy uncertainty, political capital, and firm risk-taking. *Working paper*, University of Toronto
- Altman EI (1968) Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *Journal of Finance* 23:589–609
- Amihud Y, Lev B (1981) Risk reduction as a managerial motive for conglomerate mergers. *Bell Journal of Economics* 12(2):605–617
- Asrat DF (2020) Firm-level political uncertainty and risk-taking. *Thesis*, The Hong Kong Polytechnic University
- Baker R, Nicholas B, Steven J (2016) Measuring economic policy uncertainty. *Quarterly Journal of Economics* 131:1593–1636
- Basu S, Kaviani M, Maleki H (2019) Banking competition and firms' risk-taking. *Working paper*, Temple University
- Beck T, Demirgüç-Kunt A, Maksimovic V (2005) Financial and legal constraints to growth: Does firm size matter? *The Journal of Finance* 60(1):137–177
- Bernanke BS (1983) Irreversibility, uncertainty, and cyclical investment. *Quarterly Journal of Economics* 98(1):85–106
- Bloom N (2009) The impact of uncertainty shocks. *Econometrica* 77(3):623–685
- Boubakri N, Mansi S, Saffar W (2013) Political institutions, connectedness, and corporate risk-taking. *Journal of International Business Studies* 44(3):195–215
- Bradley D, Pantzalis C, Yuan X (2016) Policy risk, corporate political strategies, and the cost of debt. *Journal of Corporate Finance* 40:254–275
- Brandon J, Yook Y (2012) Political uncertainty and corporate investment cycles. *The Journal of Finance* 67(1):45–83
- Brogaard J, Detzel A (2015) The asset-pricing implications of government economic policy uncertainty. *Management Science* 61(1):3–18
- Brown JR, Petersen BC (2011) Cash holdings and R&D smoothing. *Journal of Corporate Finance* 17(3):694–709
- Brown J, Martinsson G, Petersen B (2012) Do financing constraints matter for R&D? *European Economic Review* 56(8):1512–1529
- Chan YC, Saffar W, Wei KC (2021) How economic policy uncertainty affects the cost of raising equity capital: Evidence from seasoned equity offerings. *Journal of Financial Stability* 100841
- Chatjuthamard P, Trepongkaruna S, Jraporn P, Jiraporn N (2021) Does firm-level political risk influence corporate social responsibility (CSR)? Evidence from earnings conference calls. *Financial Review* 56:721–741
- Choi W, Chung CY, Wang K (2021) Firm-level political risk and corporate investment. *Finance Research Letters*. <https://doi.org/10.1016/j.frl.2021.102307>

- Cohen WM, Klepper S (1996) Firm size and the nature of innovation within industries: The case of process and product R&D. *The Review of Economics and Statistics* 78(2):232–243
- Dai L, Ngo P (2020) Political uncertainty and accounting conservatism. *European Accounting Review* 30(2):277–307
- Faccio M, Marchica M, Mura R (2016) CEO gender, corporate risk-taking, and the efficiency of capital allocation. *Journal of Corporate Finance* 39:193–209
- Faccio M, Masulis W, McConnell J (2006) Political connections and corporate bailouts. *Journal of Finance* 61:2597–2635
- Fama EF, French KR (1992) The cross-section of expected stock returns. *Journal of Finance* 47(2):427–465
- Francis B, Hasan I, Zhu Y (2014) Political uncertainty and bank loan contracting. *Journal of Empirical Finance* 29:281–286
- Gad M, Nikolae V, Tahoun A, Van Lent L (2022) Firm-level political risk and credit markets. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.4163742>
- Gao P, Dermot M, Yaxuan Q (2019) Political uncertainty and public financing costs: Evidence from US gubernatorial elections and municipal bond markets. *Working paper*, University of Illinois at Chicago
- Gaur A, Settles A, Väätänen J (2023) Do economic sanctions work? Evidence from the Russia-Ukraine conflict. *Journal of Management Studies* 60(6):1391–1414
- Goodell JW, Bodey RA (2012) Price-earnings changes during US presidential election cycles: Voter uncertainty and other determinants. *Public Choice* 150(3):633–650
- Goodell JW, Vähämaa S (2013) US presidential elections and implied volatility: The role of political uncertainty. *Journal of Banking and Finance* 37(3):1108–1117
- Gorbatikov E, Van Lent L, Naik NY, Sharma V, Tahoun A (2019) Is firm-level political exposure priced? *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3480494>
- Gormley TA, Matsa DA (2016) Playing it safe? Managerial preferences, risk, and agency conflicts. *Journal Financial Economics* 122(3):431–455
- Hassan A, Stephan H, Laurence V, Ahmed T (2019) Firm-level political risk: Measurement and effects. *Quarterly Journal of Economics* 134:2135–2202
- Hope OK (2003) Firm-level disclosures and the relative roles of culture and legal origin. *Journal of International Financial Management and Accounting* 14(3):218–248
- Jens C (2017) Political uncertainty and investment: Causal evidence from U.S. gubernatorial elections. *Journal of Financial Economics* 124(3):563–579
- Jones ST, Banning K (2009) US elections and monthly stock market returns. *Journal of Economics and Finance* 33(3):273–287
- Julio B, Yook Y (2012) Political uncertainty and corporate investment cycles. *Journal of Finance* 67:45–83
- Khwaja A, Mian A (2005) Do lenders favor politically connected firms? Rent provision in an emerging financial market. *Quarterly Journal of Economics* 120:1371–1411
- Kim J, Song Y, Zhang L (2011) Internal control weakness and bank loan contracting: Evidence from SOX Section 404 disclosures. *The Accounting Review* 86(4):1157–1188
- King T, Loncan T, Khan Z (2021) Investment, leverage and political risk: Evidence from project-level FDI. *Journal of Corporate Finance*. <https://doi.org/10.1016/j.jcorpfin.2020.101873>
- Langenmayr D, Lester R (2018) Taxation and corporate risk-taking. *The Accounting Review* 93(3):237–266
- Li K, Griffin D, Yue H, Zhao L (2013) How does culture influence corporate risk-taking? *Journal of Corporate Finance* 23(0):1–22
- Li J, Shapiro D, Peng MW, Ufimtseva A (2022) Corporate diplomacy in the age of U.S.–China rivalry. *Academy of Management Perspectives* 36(4):1007–1032
- Luo J, Gong M, Lin Y, Fang Q (2016) Political connections and stock price crash risk: Evidence from China. *Economics Letters* 147:90–92
- Panousi V, Papanikolaou D (2012) Investment, idiosyncratic risk, and ownership. *Journal of Finance* 67(3):1113–1148
- Pantazis C, Strangeland DA, Turtle HJ (2000) Political elections and the solution of uncertainty: The international evidence. *Journal Banking and Finance* 24(10):1575–1604
- Pástor L, Veronesi P (2013) Political uncertainty and risk premia. *Journal of Financial Economics* 110(3):520–545
- Pham A (2019) Political risk and cost of equity: The mediating role of political connections. *Journal of Corporate Finance* 56:64–87
- Qi Y, Roth L, Wald J (2010) Political rights and the cost of debt. *Journal of Financial Economics* 95(2):202–226
- Saffar W, Yang W, Wei J (2019) The effect of firm-level political uncertainty on bank loan contracting. *Working paper*, The Hong Kong Polytechnic University
- Timbate L (2021) CSR and Corporate Taxes: Substitutes or Complements? *BRQ Business Research Quarterly* 26(4):327–346
- Timbate L, Asrat DF (2023) Firms' exposure to political risk and financial reporting quality. *Journal of Corporate Accounting & Finance* 35(1):1–18
- Tran QT (2019) Economic policy uncertainty and corporate risk-taking: International evidence. *Journal of Multinational Financial Management* 52–53:100605
- Waisman M, Ye P, Zhu Y (2015) The effect of political uncertainty on the cost of corporate debt. *Journal of Financial Stability* 16:106–117
- Wellman L (2017) Mitigating political uncertainty. *Review of Accounting Studies* 22(1):217–250
- Wen F, Li C, Sha H, Shao L (2020) How does economic policy uncertainty affect corporate risk-taking? Evidence from China. *Finance Research Letters*. <https://doi.org/10.1016/j.frl.2020.101840>
- Yu F, Yu X (2011) Corporate Lobbying and Fraud Detection. *Journal of Financial and Quantitative Analysis* 46(6):1865–1891
- Zhang G, Han J, Pan Z, Huang H (2015) Economic policy uncertainty and capital structure choice: Evidence from China. *Economic Systems* 39(3):439

Author contributions

LT contributed by conducting literature review and writing the paper. DK contributed by bringing the team together and contributing to the literature review and writing of the paper. DA contributed by bringing the research idea, conducting literature review and collecting data. HJ contributed by analyzing the data.

Competing interests

We (the authors) declare that this manuscript is group work, and we have no competing interests.

Ethical approval

This work uses publicly available secondary data and there are no ethical concerns involved.

Informed consent

This article does not contain any studies with human participants performed by any of the authors.

Additional information

Supplementary information The online version contains supplementary material available at <https://doi.org/10.1057/s41599-024-02824-w>.

Correspondence and requests for materials should be addressed to Dongil Kim.

Reprints and permission information is available at <http://www.nature.com/reprints>

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

© The Author(s) 2024, corrected publication 2024