Author #1 (Corresponding Author)	
Name	Jin Hyung Kim
Title	Assistant Professor
Affiliation	George Washington University School of Business
E-mail	jinhyung_kim@gwu.edu
Phone number	+1-202-994-0413
Author #2	
Name	Jingoo Kang
Title	Associate Professor
Affiliation	Nanyang Business School
E-mail	jingoo@ntu.edu.sg
Paper Information	
Title	Increased Risk in Financial Performance and Political Strategy: An Integrated Strategy Perspective
Abstract	Studies on nonmarket strategy have identified several factors that contribute to firms engaging in political strategy. However, studies have yet to provide a holistic picture of how a critical impact on corporate strategy can affect political strategy. Taking an integrated strategy perspective and using top management team literature, we argue that increasing stock market risk leads companies to engage in political strategy (i.e., lobbying) in an effort to align their overall corporate strategy to address the risk. Given the highly uncertain nature of political lobbying outcomes, we further argue that top management team characteristics are fundamental drivers of political strategy. We find that increasing stock market risk leads to increasing firm lobbying expenditures. We also find that top management team characteristics related to risk-taking behaviors and attitude toward uncertainty—team stock options and team diversity—drive company lobbying behaviors. This study contributes to the literatures on nonmarket strategy and top management teams.

INTRODUCTION

The nonmarket environments and corresponding nonmarket strategies of an organization have become major considerations in the formulation of its competitive strategy (Barber & Diestre, 2019; Blake & Jandhyala, 2019; Diestre, Barber, & Santaló, 2020). It is thus no surprise that scholars have paid attention to what drives the likelihood or intensity of firms' diverse nonmarket strategies (Dorobantu, Kaul, & Zelner, 2017; Odziemkowska & Henisz, 2021). Studies have shown that industry or organizational characteristics, such as the degree of regulation, resource dependence, firm size (e.g., Bombardini, 2008; Schuler, 1996; Werner, 2017), are good predictors of firms' nonmarket strategies. Although such studies have enriched our understanding of the antecedents of nonmarket strategy, what motivates and determines nonmarket behaviors of firms remains a question (Choi, Jia, & Lu, 2015).

The literature agrees that nonmarket strategy helps companies reduce environmental risks (Baysinger, 1984; Godfrey, 2005; Schuler, Rehbein, & Cramer, 2002; Luo, Kaul, & Seo, 2018) and achieve better economic gains or nonmarket outcomes (Flammer, 2013; Kim, 2019; Lee & Baik, 2010). However, it is also true that the expected payoff of nonmarket strategy is highly uncertain, which is even more pertinent to political strategy (Hadani, Bonardi, & Dahan, 2017; Hadani & Schuler, 2013). These characteristics of nonmarket and political strategy suggest that while firms facing market risks have an incentive to engage in nonmarket or political strategy, their level of engagement also will depend on how they tolerate the uncertainty of lobbying investment. In this study, we test this argument through an integrated strategy perspective.

An integrated strategy is a theoretical perspective that nonmarket strategy is formulated and implemented as a part of the overarching corporate strategy (Baron, 1995, 1997). Namely, nonmarket strategy must be formulated and executed as a subset of corporate strategy to achieve common shared organizational goals (Oberholzer-Gee & Yao, 2018; Greene & Yao, 2016). For

example, if there is a critical environmental shock or threat to a firm, it is reasonable to expect the firm to redeploy its resources to strategic activities, including its political strategy, that help it manage the shock. Therefore, in the wake of exogenous shock that influences various elements of corporate strategy (Lounsbury & Hirsch, 2010; Haveman, Russo, & Meyer, 2001), political strategy as one of the pillars of overall corporate strategy will also be reformulated and implemented to support corporate activities in managing the shock.

More specifically, we explore an experimental regulatory shock in the financial market that suddenly affected the volatility of firms' stock market performance. We propose that an exogenous shock to the stock market is one of the critical drivers of nonmarket strategy, particularly political strategy, and we argue that firms will engage in more lobbying to minimize the risks and threats driven by such a shock. Studies in finance and management illustrate that stock market performance is one of the main drivers of firms' strategic behaviors (Oxley, Sampson, & Silverman, 2009; Markovitch, Steckel, & Yeung, 2005) because it is one of the critical performance indicators a top management team (TMT) manages (Kim & Song, 2015; Servaes & Tamayo, 2014). Thus, if an unexpected regulatory shock is anticipated to affect the firm's stock market performance, the shock will induce top executives of the firm to address the shock (Shi, Connelly, & Cirik, 2018). We argue that political lobbying is one such strategic firm action.

Under the assumption that firms attempt to decrease the level of firms' total risk when they face a new risk (Jia, Gao, & Julian, 2020), corporate lobbying helps reduce overall firm risks (1) by preventing any radical change in regulatory environment (i.e., *reducing volatility*; Hall & Deardorff, 2006; Baumgartner, Berry, Hojnacki, Kimball, & Leech, 2009), and (2) by improving economic outcomes (e.g., winning government contracts) or influencing policy and regulatory process that favor firms (i.e., *enhancing economic or nonmarket performance*; Lee &

Baik, 2010; de Figueiredo & Silverman, 2006). However, because lobbying is an investment with a highly uncertain payoff, firms will vary in their levels of willingness to spend on lobbying. Hence, we predict that the TMT's attitude toward risk and tolerance of uncertainty is a main driver of lobbying in the wake of increased stock market risk.

Empirically, we explore lobbying activities of publicly traded companies in the United States affected by Rule 202T of Regulation SHO implemented by the U.S. Securities and Exchange Commission (SEC). In 2005, the SEC removed the uptick rule for a group of randomly selected pilot firms, making it significantly easier for traders to short-sell these stocks and substantially increasing their price volatility (De Angelis, Grullon, & Michenaud, 2017; Diether, Lee, & Werner, 2009; Grullon, Michenaud, & Weston, 2015). We predict that the pilot firms would have engaged more in lobbying to alleviate overall corporate risks and thus could better manage the stock price volatility risk. Our firm and year fixed-effects difference-in-differences (dif-in-difs) regression results strongly support our arguments that the pilot group engages in lobbying more than firms in the non-pilot group. Our results also show that TMT characteristics, which shape their risk-taking behaviors and attitudes toward uncertainty—compensation and diversity—are the main drivers of lobbying.

Our study intends to make the following contributions. First, it contributes to the nonmarket strategy literature, particularly on the antecedents of corporate political activities (Dorobantu et al., 2017). Our understanding of the antecedents of corporate nonmarket strategy is far from complete (Brasher & Lowery, 2006; Kim, 2019). Further, the nonmarket strategy literature has emphasized the importance of an integrated strategy perspective in understanding firms' nonmarket strategy (Baron, 1995, 1997), but research on this topic is scarce (Durand, Grant, & Madsen, 2017; Oberholzer-Gee & Yao, 2018). By showing the strong association

between corporate strategy, particularly related to the mitigating of stock market risk, and political strategy driven by an exogenous shock, we shed more light on this subject.

Second, this study contributes to the literature on top management teams (Hambrick, Cho, & Chen, 1996; Kor, 2003; Wiersema & Bantel, 1992). Top management teams play a critical role in a firm's strategic decision-making; thus, their motivations and incentives are important to understanding a variety of corporate activities (Carpenter & Sanders, 2002; 2004). Despite this importance, to the best of our knowledge, the role of top management in political strategy (i.e., corporate lobbying) and what drives team decisions has received little attention. By showing that a team's attitude toward risk-taking behaviors and the diversity of the team are critical factors in determining corporate nonmarket and political strategy, our study contributes to the intersection of the literature on top management teams and nonmarket strategy.

THEORY AND HYPOTHESES

The Antecedents of Political Lobbying

What drives or motivates firms to engage in nonmarket or political activities, particularly political lobbying? This question has received much attention from scholars across different disciplines, including strategy, political science, and economics (e.g., Bombardini, 2008; de Figueiredo & Tiller, 2001; Hansen & Mitchell, 2000; Kerr, Lincoln, & Mishra, 2014; Wright, 1996). Researchers found that observable firm and industry characteristics such as firm size and degree of industry regulation are good predictors of firms' political lobbying (e.g., Hadani & Schuler, 2013; Holburn & Vanden Bergh, 2014; Bombardini, 2008; Lenway & Rehbein, 1991; Schuler, Rehbein, & Cramer, 2002).

While these studies have enriched our understanding of the factors motivating a firm's engagement in political lobbying, it is not difficult to observe that a firm's lobbying behaviors are quite heterogenous even if companies are similar on many of the aforementioned observable

characteristics. For example, under the assumption that large firms typically spend more on lobbying (Brasher & Lowery, 2006; Bombardini, 2008), it is not unreasonable to anticipate a strong positive correlation between firm revenue or size and lobbying spending. However, there remain many exceptions. For instance, in 2002, Wyeth was the seventh-largest U.S. pharmaceutical company in terms of sales. However, its lobbying spending was not among the top 10; it spent just 41.6% of the top spender, Merck & Co. In contrast, Sanofi-Aventis, a French-based multinational pharmaceutical company, was not among the top 10 pharmaceutical company in sales, but its lobbying spending in the United States was among the top 10, and it spent 10% more on lobbying than Wyeth. Further, many biotech companies and rather smaller and less known pharmaceutical companies are heavily represented in corporate political lobbying.

Furthermore, companies in highly regulated industries are also expected to engage more in political strategy (Hadani & Schuler, 2013; Masters & Keim, 1985; Werner, 2015). Whereas firms in highly regulated industries are generally more likely to engage in and be active in various types of political strategies, it is also true that some top-ranked industries do not quite fit this profile (Baumgartner et al., 2009; Drutman, 2015). This implies that observable firm and industry characteristics do not sufficiently explain heterogeneity in corporate political lobbying, which calls for more rigorous scholarly research (Choi et al., 2015). In this paper, building on an integrated strategy perspective (Baron, 1995, 1997), we argue that an exogenous regulatory shock in a financial market can be an important determinant of political strategy after accounting for those observable characteristics because managing stock price and thus company value is assumed to be one of a top management team's most important motivations (Benner & Zenger, 2016; Litov, Moreton, & Zenger, 2012), which will lead them to use political strategies to effectively manage the shock.

Integrated Strategy and the Role of Exogenous Shock

An integrated strategy perspective indicates that a firm's nonmarket strategy should be understood as a subset of overarching corporate strategy aimed at maximizing firm performance (Oberholzer-Gee & Yao, 2018; Greene & Yao, 2016; Ahuja & Yayavaram, 2011). For example, a firm's political connection is closely knit to its location strategy, so that the firm can maximize performance through leveraging its political connection with local politicians and legislators (Jia, Zhao, Zheng, & Lu, 2021). The fundamental idea of integrated strategy is that a firm's nonmarket strategy is closely intertwined with corporate strategy; thus, nonmarket strategy is and should be formulated and implemented along with other corporate strategies to achieve the company's goals (Baron, 1995, 1997, 2013). Hence, nonmarket strategy will be reformulated and executed when corporate strategy requires changes. Strategy research has shown that exogenous shocks or events in the business environment often induce major strategic changes (Haveman et al., 2001; Morgeson, Mitchell, & Liu, 2015; Tilcsik & Marquis, 2013).

Among other things, an exogenous shock to the financial market has a strong impact on corporate strategy (Lounsbury & Hirsch, 2010; Eesley, Decelles, & Lenox, 2016). An impressive body of research has documented the significant influence of financial markets on firm strategy (Oxley, Sampson, & Silverman, 2009; Feldman, Amit, & Villalonga, 2019; Zhang & Wiersema, 2009; Kumar, Dixit, & Francis, 2015; Martinez-Moyano, McCaffrey, & Olivia, 2014; Singh, Mahmood, & Natarajan, 2017; Vaaler & McNamara, 2004). And, more recently, management and strategy scholars have begun to examine the impact of a particular type of investor, short-sellers, on firms' diverse strategies (e.g., Jia et al., 2020; Shi et al., 2018; Shi, Ndofor, & Hoskisson, 2020).

Unlike a typical stock trading, where investors profit when stock prices rise (i.e., long position), the fundamental mechanism of short-selling is that short-sellers gain when a corporate

stock price plunges (Reed, 2013). Because their motivation is different from that of a typical investor, to make the stock price decline, for example, short-sellers sometimes use aggressive tactics such as spreading rumors to negatively shape investor perceptions of targeted firms (Khanna & Mathews, 2012); thus, the presence and active involvement of short-sellers typically impacts a firm's stock price negatively (Jiao, Massa, & Zhang, 2016; Massa, Zhang, & Zhang, 2015). Under the assumption that one of the crucial roles of corporate executives is to manage firm value and stock price (Kim & Song, 2015; Servaes & Tamayo, 2014), the existence and extensive activities of short-sellers will lead corporate executives to use counterbalancing strategies or tactics to minimize the risks driven by the short-sellers, thus helping the executives manage the perceived threats (Jia et al., 2020).

Therefore, in the wake of a financial market shock—here, increased short-selling risk—companies will attempt to devise and execute various strategies to address the shock more effectively and, thereby, minimize the potential negative consequences of short-selling (Jia et al., 2020; Shi et al., 2018). We argue that firms will engage more in political strategies as a subset of corporate strategies to maximize their intended goals in addressing the shock.

Corporate Political Lobbying to Reduce Risks While Increasing Performance

Lobbying is defined as communication between interest groups, including firms and political or regulatory players, and is considered one of the most important instruments in nonmarket strategy (de Figueiredo & Richter, 2014). Firms engage in political lobbying for two reasons: (1) *to reduce environmental risks and uncertainties in order to minimize negative consequences driven by nonmarket environments* and (2) *to achieve positive economic or intended policy outcomes* (Austen-Smith & Wright, 1994; Ellis & Groll, 2020; McKay, 2012).

First, lobbying helps firms reduce environmental risks or volatility. In general, the literature claims that maintaining the status quo in a policy arena is among the most important

reasons firms engage in lobbying (Drutman, 2015; Hall & Deardorff, 2006). Contrary to the general belief, lobbying rarely leads to dramatic policy changes. Baumgartner et al. (2009) examined 98 issues discussed in the U.S. Congress between the 106th and 107th sessions (1999–2002) and supplemented with qualitative analyses such as press releases, congressional statements, and hearings to see whether aggressive lobbying efforts can effectively affect and change policies. They found that each policy issue is extremely complex and that, because of this, as well as counterbalancing lobbying efforts by diverse interest groups, a lobbying effort by a group is unlikely to cause any significant change in a policy.

Further, the status quo is a general equilibrium driven by previous hard-fought policy efforts and, thus, interest groups, including firms, spending aggressively on lobbying to protect the status quo (Drutman, 2015). Therefore, unless there is a significant exogenous shock, policy change rarely occurs. Instead, counterintuitively, firms and interest groups devote significant resources to lobbying in order to protect the status quo (Franklin, 2014; Ellis & Groll, 2020). This implies that not engaging in lobbying may prevent a firm from successfully protecting the current status quo. Therefore, it is not unreasonable to argue that firms engage in lobbying to deter unexpected and/or undesirable policy changes that might negatively affect them; thus, lobbying can be considered a *risk-minimizing strategy* to manage future unexpected threats or volatility driven by nonmarket environment change.

Second, firms engage in lobbying to achieve positive or favorable economic or nonmarket outcomes (Hegde & Sampat; 2015; Lambert, 2019). For example, Richter, Samphantharak, and Timmons (2009) show that lobbying is effective in lowering tax rates in the year after lobbying, which is estimated between 0.5 to 1.6 percentage points of lower tax rates as lobbying expenditure increases by 1%. Kim (2019) also shows that foreign defense contractors can increase defense contract award amounts by spending more on lobbying. This is not only

limited to economic gains. Kerr and colleagues (2014) show that firms' efforts to influence high-skilled immigration policy (H1-B visas) have succeeded in securing the number of visas granted, but only for incumbent firms in the lobbying space. In sum, these studies present strong evidence that firms engage in lobbying because they expect positive economic or regulatory outcomes. Thus, it can be claimed that lobbying is regarded as a *performance-maximizing strategy* that could counterbalance the risks of negative market volatility.

Returning to short-selling, after the implementation of Regulation SHO, the companies randomly assigned to the pilot group have become more vulnerable to stock price volatility (De Angelis et al., 2017; Diether et al., 2009; Grullon et al., 2015). On one hand, firms in the pilot group have greater incentive to increase their lobbying spending *to maintain the status quo, which will help them hinder unexpected policy changes and thus minimize the potential policy risk to firm financial performance*. Similar to Shi et al. (2018) arguing that threat rigidity leads firms to minimize risk in the face of increasing short-selling threats, we expect that firms that become more vulnerable to short-selling may increase their lobbying spending to prevent future volatility or risks driven by changes in the nonmarket environment. This would help them strengthen the downward rigidity of their stock price.

On the other hand, firms also would engage in more lobbying *to achieve more positive outcomes which would increase the upside potential of their activities thus could reduce the impact of negative events* (Kim, 2019; Drutman, 2015). Therefore, similar to corporate social responsibility as a form of insurance that protects firms from negative shocks by increasing the likelihood of positive economic outcomes (Flammer, 2013; Godfrey, 2005; Luo et al., 2018), firms are more likely to spend on lobbying to maximize such outcomes.

In sum, under the assumption that political strategy is a subset of and thus must be aligned with corporate strategy (Baron, 1995, 1997), we have sufficient reason to believe that

changes in SEC regulations on short-selling may have induced more lobbying by firms. In particular, new regulatory experiment of SEC on short-selling would have made it necessary and immediate that firms exposed to the exogenous shock attempt to minimize overall corporate risks by both managing risks in policy environment and maximizing positive outcomes through political strategy. Therefore, we argue that firms under a greater risk of short-selling may have engaged more in lobbying.

Hypothesis 1: In response to increased stock price volatility, firms will engage more in lobbying.

Top Management Team Characteristics as a Driving Mechanism

The CEO and other senior executives jointly set a company's strategic goals and make major investment decisions (Hambrick et al., 1996; Kor, 2003; Wiersema & Bantel, 1992). The decision to engage in political lobbying is also an important C-suite or top management team (TMT) strategic decision (Drutman, 2015). Because investing in lobbying requires substantial expenditures but does not have a clear and predictable payoff schedule (Chen, Parsley, & Yang, 2015), it requires the involvement of senior management. Hence, we expect that TMT characteristics will help determine the level of firm engagement in political lobbying. In particular, we examine that (1) *how important the supposed risk-reduction effect of lobbying is to the TMT* and (2) *how receptive the TMT is to the uncertain nature of lobbying investment* will drive firm investment in lobbying suggested in hypothesis 1.

First, we argue that *the importance of the supposed risk-reduction effect of lobbying to the TMT will drive the firm's lobbying investment*. An important consequence of Regulation SHO is that it significantly increased the downward pressure on the stock price of pilot firms (Diether et al., 2009; Grullon et al., 2015; De Angelis et al., 2017). The removal of a short-selling restriction substantially increased the possibility that any news or event that is negative or

unfavorable for a firm can significantly lower its stock price, without limit. This increased downward risk on stock price should have moved managers to engage in lobbying because political lobbying helps firms reduce the downward risk in stock price (1) by lowering the probability of unexpected policy changes that could negatively impact firm performance (2) while increasing the probability of better economic and nonmarket outcomes (Baumgartner et al., 2009; Drutman, 2015; Hegde & Sampat, 2015). However, it is also true that executives on the TMT differ in their risk-aversion (or willingness to take risk) attitudes, which would influence their willingness to engage in lobbying. Thus, we posit that the TMT's risk aversion has a positive relationship with the firm's lobbying investment. That is, if the TMT is strongly against an increasing risk in stock price (i.e., high risk-aversion), it will be more willing to spend on lobbying to protect the stock price from risk. In contrast, if the TMT is more willing to tolerate an increasing risk in stock price (i.e., low risk-aversion), it is less likely to engage in lobbying despite the increasing stock price risk caused by Regulation SHO.

An important determinant of a TMT's risk-aversion/risk-taking behavior is its compensation (Carpenter & Sanders, 2002, 2004). Among other compensation components, particularly, stock options are considered most effective at mitigating risk-aversion by managers (Hall, 2000; Hall & Murphy, 2003; Sanders & Hambrick, 2007). Stock options curb risk-aversion (or promote risk-taking) because they protect managers' wealth from the downward risk in stock prices while rewarding managers for potential increases in stock value. Because stock options assign rights, not obligations, to buy stocks, option-holding managers do not suffer from significant damage in wealth even if the value of stock is depreciated. Hence, stock options can significantly reduce managers' concerns about a decline in stock prices.

In sum, even if there was an increased downward risk of stock value due to the regulatory change, we expect the TMT receiving more stock options to worry less about an

increased stock price risk and therefore to have fewer incentives to reduce such risk. Hence, we predict that when stock options take a greater portion of the TMT's total compensation, the team will be less keen to increase lobbying investments aimed at reducing the stock price risk. In other words, the positive relationship between short-selling risk and lobbying expenditures would be weaker among firms whose TMTs receive more stock options.

Hypothesis 2a: The positive relationship between short-selling risk and lobbying expenditures is weaker when the firm has a more option-laden TMT.

Second, we argue that *TMT receptivity of uncertainty will also motivate a firm's lobbying investment*. While political lobbying is assumed to give firms a potential risk-reduction benefit, it is a highly uncertain investment whose payoff is neither guaranteed nor clearly understood (Drutman, 2015; Hadani & Schuler, 2013). The expected payoff of lobbying is highly unpredictable and idiosyncratic; it could be either huge or close to zero. Thus, although corporate executives may agree with the risk-reduction benefits of lobbying, its uncertain nature makes them hesitant or even reluctant to engage in it (Schuler, 1996; Werner, 2012). Therefore, it is likely that their general tendency, whether the team is more (less) receptive to uncertainty of the lobbying outcome, will more (less) likely to drive their lobbying behaviors in the existence of greater stock market uncertainty.

More specifically, we consider TMT diversity to be among the characteristics affecting a team's receptivity toward uncertainty and argue that a diverse TMT is more tolerant and accepting of the uncertainty of lobbying investments. Perceived level of uncertainty is a negative function of the amount of information about a subject (Daft, Sormunen, & Parks, 1988; Duncan, 1972; Urbany, Dickson, & Wilkie, 1989). When a person has more information and knowledge about a certain subject, their uncertainty about it is reduced (Niemi-Kaija & Aaltio, 2019; Pacht, 1984). A group of people diverse in gender, age, and educational and professional background

has an important advantage because its members are highly likely to have an opportunity to learn more about diverse perspectives, knowledge, and experience (Boone & Hendriks, 2009; Certo, Lester, Dalton, & Dalton, 2006; Nielsen & Nielsen, 2013; Simons, Pelled, & Smith, 1999). Thus, a diverse TMT suggests that its members are more likely to have different perspectives on, understandings of, or experiences with lobbying. As a result, their perceived level of uncertainty about lobbying investment will decrease.

To sum up, a diverse TMT has (or thinks they have) more knowledge about lobbying and its payoff function and therefore feels less uncertain about it, which increases their comfort with the unknown or uncertain nature of lobbying and therefore their willingness to approve of it. Thus, TMT diversity will lead the team to engage more in lobbying. Therefore, we predict that firms with a less (more) diverse TMT are less (more) receptive to uncertainty in lobbying and thus less (more) willing to increase lobbying expenditures than firms with a heterogenous (homogenous) TMT.

Hypothesis 2b: The positive (negative) relationship between short-selling risk and lobbying expenditures is weaker (stronger) when the firm has a less (more) diverse TMT.

METHODS

Data and Sample

Our empirical setting is based on a policy experiment the SEC conducted between 2004 and 2007. In Rule 202T of Regulation SHO, the SEC announced the removal of a short-selling restriction (i.e., the uptick rule) for randomly selected pilot firms. The uptick rule prohibits short-selling when stock prices are declining thus can mitigate its negative impact on stock prices. The removal of this rule by the Regulation SHO experiment made it significantly easier for traders to short-sell stocks and substantially increased the risk of short-selling for the pilot firms (De Angelis et al., 2017; Diether et al., 2009; Grullon et al., 2015). The SEC identified Russell 3000

stocks traded on the NYSE, AMEX, and NASDAQ and ranked them for each stock exchange by average daily trading volume. In each stock exchange list, the SEC selected every third firm as a pilot firm. This stratified random sampling enabled the SEC to construct a sample representing the three U.S. major stock exchanges.

Our sample period includes two years of treatment (2005–2006) and two years of pretreatment (2003–2004). We have 10,048 firm-year observations for 2,747 unique companies included in the Russell 3000 index in our data set during our sample period (2003–2006). In our sample, there are 899 firms in the pilot group directly affected by the new short-selling practice, and 1,848 firms in the non-pilot group to which short-selling rules still applied. Tables 1 and 2 show the summary statistics for both treatment and control groups, illustrating that the two groups are similar and that firms are evenly distributed across industries. This confirms that our sample—treatment and control groups—is balanced. This balance helps ensure that the results we observe will be less biased by other unobservable firm or industry heterogeneity but are driven by the exogenous shock of Regulation SHO.

Please insert Tables 1 and 2 about here

Dependent Variable

We are interested in the effect of increased environmental risks—stock price volatility—driven by regulatory shock on corporate political behaviors, particularly corporate lobbying. Our fundamental argument is that firms may have spent more on lobbying to respond to the shock not only to negate the negative effect but also to increase positive gains so that they can mitigate the uncertainties and risks in stock market performance driven by the changes in the short-selling practice; thus, our dependent variable is the natural logarithm of *lobbying spending*. We obtained lobbying data from the Center for Responsive Politics, and, to ensure accuracy, we matched company names in both data sets and confirmed each name-match manually.

Explanatory Variables

We use dif-in-difs as our main analytical approach; thus, there are two binary variables indicating pilot and non-pilot groups (*pilot group*) and pre- and during-treatment periods (*during SHO*), and an interaction term between these two binary variables, which is the main variable of interest in our dif-in-difs model. In addition, to tease apart the underlying driving mechanism of firm lobbying behaviors after the shock, we constructed two additional mechanism variables—top management team (TMT)'s attitude toward risk-taking and homogeneity of the TMT. To measure TMT's attitude toward risk-taking driven by compensation (*compensation-induced attitude toward risk*), we calculated the value of each executive's stock option granted divided by their total annual compensation and then calculated an average for the TMT (Feltham & Wu, 2001; Hall & Murphy, 2002; Ryan & Wiggins, 2004). We measured homogeneity of the TMT (*top management team homogeneity*) by calculating the percentage of male executives on the team (Bear, Rahman, & Post, 2010). We obtain data for these variables from Compustat Capital IQ and BoardEx.[1] To further investigate our arguments that TMT characteristics are important drivers of firms' political engagement, we ran a regression with additional TMT characteristics and present the results in Table A1 in the Appendix.

Identification Strategy and Statistical Analysis

We use firm and year fixed-effects dif-in-difs regression as our main analytical approach following prior studies examining Regulation SHO (Shi et al., 2018; Jia et al., 2020). Thus, our main dif-in-difs regression equation is as follows;

$$Y_{i,t} = \beta_0 + \beta_1 Pilot\ group_i + \beta_2 During\ SHO_i + \beta_3 Pilot\ group_i * During\ SHO_i + \gamma' \boldsymbol{X}_{i,t} + \epsilon_i$$

[1] In Compustat, we use 'OPTION_AWARDS_BLK_VALUE' to compute the stock option granted to each executive and 'TDC1' to calculate the total compensation given to each executive. Thus, we divided 'OPTION_AWARDS_BLK_VALUE' by 'TDC1' for each executive and then average this calculated value to construct the final variable at the firm level (*compensation-induced attitude toward risk*).

where for each firm *i* in the sample, $Y_{i,t}$ is the natural logarithm of *lobbying spending* at time *t*, $Pilot\ group_i$ is a dummy variable indicating whether a firm is in the pilot group, and $During\ SHO_i$ is a dummy variable equal to 1 for years 2005 and 2006 and 0 for years 2003 and 2004. β_3 is the coefficient of an interaction term between $Pilot\ group_i$ and $During\ SHO_i$, *the coefficient of our interest which illustrates the dif-in-difs estimate*. We corrected standard errors for clustering at the treatment level following Bertrand, Duflo, and Mullainathan (2004) and related studies (e.g., Flammer, Toffel, & Viswanathan, 2021) that standard errors must be corrected for clustering at the level affected by the shock in the same way. In Table A2, we provide additional results in which the standard errors are corrected at both the treatment and firm levels. Although $Pilot\ group_i$ and $During\ SHO_i$ are included in the regression equation, the variables do not vary throughout the sample period, and because of the firm and year fixed effects, the coefficients of the $Pilot\ group_i$ and $During\ SHO_i$ have been automatically dropped from the equation; thus, we do not report β_1 and β_2 in the main regression tables.

Given that we are also interested in teasing apart the driving mechanism after the shock, we created a three-way interaction term between $Pilot\ group_i$, $During\ SHO_i$, and TMT characteristics, our two mechanism variables. The regression equation for the underlying mechanism analysis is

$$\begin{aligned} Y_{i,t} = \beta_0 + \beta_1 Pilot\ group_i + \beta_2 During\ SHO_i + \beta_3 Pilot\ group_i * During\ SHO_i \\ + \beta_4 TMT\ characteristics_i + \beta_5 Pilot\ group_i * TMT\ characteristics_i \\ + \beta_6 During\ SHO_i * TMT\ characteristics_i + \beta_7 Pilot\ group_i * During\ SHO_i \\ * TMT\ characteristics_i + \gamma' \boldsymbol{X}_{i,t} + \epsilon_i \end{aligned}$$

where $TMT\ characteristics_i$ is two mechanism variables—*compensation-induced attitude toward risk*) and *top management team homogeneity*—and the coefficients of the three-way interaction term, β_7, manifest whether TMT characteristics is really a main driver of the results we observe.

$\boldsymbol{X}_{i,t}$ is all other firm-level control variables included in the regression analysis—the natural logarithm of company assets to measure firm size (*total assets*), *return on assets* (ROA) to measure firm profitability, firm *leverage* calculated as total debts divided by total assets, and *cash reserves* constructed so that cash and cash equivalent are divided by total assets. We also included two variables related to company investment activities—company physical assets divided by firm total assets (*physical assets-to-asset ratio*) and total capital expenditure to total assets of a firm (*capital expenditure-to-asset ratio*). In every analysis unless otherwise noted, we included firm and year fixed effects. We further control for additional variables to rule out an alternative explanation, discussed in subsequent sections.

In principle, the fundamental assumption to be met in using dif-in-difs is that the dependent variable of interest must show the parallel trend for both treatment and control groups in the pretreatment period (years 2003 and 2004 in our study context). To validate the dif-in-difs parallel trend assumption, we first formally test the assumption. Following He and Tian (2016) that the growth rate of the dependent variable across the pre-shock sample period must not be different between the treatment and control groups, we first calculated the growth rate of lobbying spending of each firm for years 2003 (growth rate from 2002 to 2003) and 2004 (growth rate from 2003 to 2004). Then, we conducted a t-test for the growth rate between the treatment and control groups for both years 2003 and 2004 and for the whole pretreatment period. The t-test results confirm that the growth rates between the two groups are not statistically different and thus fail to reject the null hypothesis that their mean value is different from 0.[2] Second, we present the parallel trend in Figure 1, which illustrates the indiscernible

[2] The *p*-values for the two-tailed tests for growth rates between treatment and control groups (1) from 2002 to 2003 and (2) from 2003 to 2004 are 0.6453 and 0.4873, respectively. In addition, the same two-tailed tests for the growth rates for the whole pretreatment period (years 2003 and 2004) for the treatment group show a *p*-value<0.4025, which confirms that the pretreatment parallel trend holds; thus, the difference-in-differences conditions are met.

pattern in lobbying spending by the pilot and non-pilot groups during the pretreatment period (2003–2004).

Please insert Figure 1 about here

RESULTS

Table 3 presents the descriptive statistics and pairwise correlations of variables included in the main regression analyses. Table 4 presents our main dif-in-difs regression results, and Table 5 illustrates the dif-in-difs regression results with additional control variables to rule out alternative explanations. We present regression results of additional robustness checks in Tables A1 and A2 in the Appendix.

Please insert Tables 3 and 4 about here

In Table 4, models 1 through 3 include our main explanatory and mechanism variables only, and models 4 through 6 are our main models with firm-level control variables. Models 1 and 4 test hypothesis 1, and models 2 and 5 and models 3 and 6 test hypotheses 2a and 2b, respectively. The coefficients of the two-way interaction term in models 1 and 4 are statistically significant at the 0.1% and 1% levels, which strongly supports hypothesis 1. The results correspond to an approximately 6.7% to 7.5% increase in lobbying spending for the treatment group during the Regulation SHO period relative to the control group.

In a dif-in-difs model, the coefficient of interest to interpret is an interaction term itself, not two binary measures—pilot group versus non-pilot group (*pilot group*), and during SHO versus pre-SHO (*during SHO*) in our current study context. Thus, the statistical significance for these two binary variables is not our interest in interpreting whether there is any discontinuous effect after the shock. In other words, if the interaction term between the treatment and post-shock period is statistically significant, we can conclude that there is a treatment effect after the exogenous shock; our main results support this.

Returning to the results of the three-way interaction, given that *the main purpose of the three-way interaction in our analyses is not to see a different moderating effect of a third continuous variable on two binary variables but to understand what factors drive the post-shock results for the treatment group*, the main variable of interest in understanding whether these variables drive the treatment effect is, similarly, the three-way interaction term itself and its coefficient, not the coefficients of other variables. Having said this, the coefficients of three-way interaction terms for hypothesis 2a (models 2 and 5) and hypothesis 2b (models 3 and 6) are statistically significant at $p<0.01$ and negative, which supports our argument. We argue in hypothesis 2a that the TMT will perceive Regulation SHO as less threatening when they receive more stock options. And the negative coefficient supports hypothesis 2a. In hypothesis 2b, we expect TMT homogeneity (diversity) to negatively (positively) affect lobbying spending (negative [positive] three-way interaction coefficient) because homogeneity will increase information uncertainty, and the negative statistical significance strongly supports our argument.

Please insert Figures 2 and 3 about here

In Figures 2 and 3, we illustrate the effect of TMT on lobbying spending. Hypotheses 2a and 2b are tested to identify the fundamental driving mechanism; more specifically, we want to know the TMT characteristics that may affect lobbying behaviors of pilot firms under Regulation SHO. Thus, in interpreting the three-way interaction results, we show how the degree of two driving mechanism variables differentially affected lobbying behaviors before and after the shock of Regulation SHO. In Figure 2, the solid blue line shows an increase in lobbying spending when the ratio of average stock options to total compensation is low (mean minus one standard deviation); the dotted red line illustrates when the same compensation measure is high (mean plus one standard deviation). As predicted, TMTs with a higher percentage of stock options in total compensation did not increase lobbying spending as much as TMTs with a lower

percentage of stock options to total compensation. Figure 3 also supports our argument. Given that the mean value of the percentage of male executives is around 0.95, with a 0.06 standard deviation, the dotted red line shows an average value of TMT homogeneity (mean); the solid blue line shows a more diverse TMT (mean minus one standard deviation). As argued, after the Regulation SHO shock, more-diverse TMTs increased lobbying spending more than less-diverse TMT did. In sum, the two figures clearly illustrate and support our arguments.

Please insert Table 5 about here

In Table 5, we attempt to rule out major alternative explanations by including additional control variables although randomly assigned pilot and non-pilot groups are balanced as shown in Tables 1 and 2. Models 1 through 3 control for variables related to lobbying intensity to rule out that lobbying intensity of a firm we observe under Regulation SHO is driven by not the shock but possibly by the characteristics or heterogeneity of pre-existing lobbying behaviors across companies (Durand, Hawn, & Ioannou, 2019). For example, firms that need to lobby more continuously or actively would hire in-house lobbyists, which might influence lobbying intensity (Jia, 2018). Another possibility is that firms that are more regulated or affected by policy will engage heavily in lobbying (Werner, 2017). Thus, the additional variables included are how much a firm spends on in-house lobbying (*in-house lobbying as a % of total lobbying spending*), average number of lobbyists hired in each lobbying transaction filed (*average number of lobbyists hired*), percentage of lobbying report to lobby Congress (*% of report lobbying Congress*), and the Herfindahl-Hirsch index of issues lobbied (*congressional issue Herfindahl-Hirsch index*). In particular, the last two variables account for heterogeneity of lobbying with regard to congressional issues and federal agencies lobbied. As expected, these variables have high power in predicting lobbying spending, our dependent variable; but even after controlling

for these lobbying related variables, the coefficients of our variables of interest in all models are statistically significant, which still strongly supports our hypotheses.

In models 4 through 6, we additionally included a variable of *short interests*. Short interests capture the volume of short positions taken for a company's stocks and indicate investors' negative sentiment toward the firm's prospect. Given that firms with more short interests are already under pressure from short-sellers, they may be more vulnerable or sensitive to additional pressure caused by Regulation SHO. Thus, by controlling for actual short interests, we can further mitigate the possible endogeneity in the Regulation SHO treatment. The results in models 4 through 6 remain unchanged but still support our argument.

Robustness Checks

In this section, we provide additional analytical results to support our main and driving mechanisms while ruling out alternative explanations.

Top management team characteristics (Table A1). In Table A1, we show further support to our mechanism analyses by testing additional TMT characteristics and seeing whether the regression results are aligned with our theoretical arguments. In models 1 and 2, we constructed our first driving mechanism, compensation-induced attitude toward risk, differently to support our argument that corporate lobbying after the shock will be driven by the TMT's perception of the shock driven by their compensation; thus, in model 1, we calculated the mean value of each executive's stock option granted and divided this by the total current compensation that includes only annual salary and bonus. In model 2, we further included TMT overconfidence using the mean of all TMT members' overconfidence measured by the vested in-the-money stock options divided by total compensation (Lee, Hwang, & Chen, 2017; Malmendier & Tate, 2005, 2008). Regardless of the new variables included in each model, the coefficients of the

three-way interaction terms are negative and statistically significant at $p<0.05$, which strongly supports our argument.

In Table A1, models 3 and 4, we measure TMT diversity in a different way. In model 3, we calculated the standard deviation of each top executive's tenure. Similarly, we measure the standard deviation of TMT age in model 4. Just as our argument that TMT diversity will increase lobbying spending because of increased information that can help the team feel less certain about the consequences of lobbying, the results still strongly support our second driving mechanism.[3]

Alternative analytical approach (Table A2). In Table A2, we provide the results of an alternative analytical approach. Although, in dif-in-difs, standard errors must be corrected for clustering at the level where the shock systematically affects in the same way (Bertrand et al., 2004), to further support that our results are robust, we use double clustering methods that correct standard errors for clustering at both the treatment and firm levels. We used the 'reghdfe' command in STATA, which allows us to do double-clustering, and the results are presented in models 1 through 3. Regardless, the coefficients of our variables of interest in all models are statistically significant, which manifests that our results are robust. In Table A2, models 4 through 6, we included industry fixed effects instead of firm fixed effects. It is plausible that firms in the same industry will behave similarly; thus, their nonmarket behaviors are also highly likely to be similar (Jia et al., 2020). In other words, industry fixed effects might need to be controlled for. Also, because of the firm fixed effects employed, the main binary variable indicating whether a firm is in the treatment group is dropped in the main analysis, and some may argue that this would change the direction of the coefficients. Although the statistical

[3] Note that we measure top management team homogeneity in the main regression; thus, the direction of the coefficients is negative. However, in these robustness checks, we measured a variance, a measure of heterogeneity (not homogeneity); thus, the directions of variables including the measures change to positive.

significance of the coefficients of the two- and three-way interaction term is the one we have to interpret to prove our hypotheses in dif-in-difs approach, we attempt to rule out these alternative explanations. Controlling for industry fixed effects does not change the results, but the coefficients of all three variables of interest in models 4 through 6 are statistically significant at the 0.1% level, which still strongly supports our hypotheses.

DISCUSSION

Companies manage many types of environmental shocks and changes (Haveman et al., 2001; Tilcsik & Marquis, 2013), and, in this process, components of corporate strategy are reconfigured and fine-tuned to effectively address them (Lounsbury & Hirsch, 2010); corporate political strategy is no exception. Most studies on nonmarket—particularly political—strategy have not fully considered an integrated strategy but only look at the effect of nonmarket or political strategy in isolation (Dorobantu et al., 2017; Durand et al., 2017); this significantly limits our understanding of which environmental or organizational factors can affect nonmarket strategy, and the interaction between nonmarket strategy and different components of corporate strategy (Oberholzer-Gee & Yao, 2018). In this study, we propose and show that an exogenous shock increasing a firm's stock market risk drives firms to engage more in lobbying to mitigate the risk. We further show that TMT characteristics, particularly those related to risk-taking behaviors and diversity, are an underlying mechanism that determines the post-shock changes in political lobbying.

This study contributes to several theories and suggests an interesting future research agenda. First, it contributes to nonmarket strategy research, particularly on the antecedents of political lobbying. Although many studies have highlighted the importance of industry and organizational characteristics in driving corporate political lobbying (e.g., Bombardini, 2008; Schuler, 1996; Werner, 2017), other than these observable characteristics, we still have limited

knowledge on what drives firms' political activities (Brasher & Lowery, 2006; Kim, 2019). By showing that a shock in financial market obliges firms to manage environmental risks and political strategy, our study helps explain the role of business environmental shock or change as an important precursor of political strategies.

We believe that future research needs to pay more attention to various types of environmental factors or other firm characteristics as antecedents of political strategy. For instance, returning to a pharmaceutical industry example earlier, we provided an example that many small or less known pharmaceutical companies are active in political lobbying. If lobbying is a public good whose benefits can be shared with firms in the same industry (Olson, 1965; de Figueiredo & Tiller, 2001), this is counterintuitive. Further, it is typically assumed that political activities of foreign firms are seen as undesirable (Hansen & Mitchell, 2000; Jia, 2018; Kim, 2019), but many foreign pharmaceutical companies actively engage in lobbying as well, as illustrated. This implies that some unidentified heterogeneity across firms might come into play. Thus, future studies need to better identify contributory factors that can lead firms to engage in political activities, nonmarket strategy in general.

Our study also sheds more light on the integrated strategy perspective (Baron, 1995, 1997), which focuses on interaction between corporate and nonmarket strategy. Although the importance of the integrated strategy perspective is well acknowledged by nonmarket strategy scholars, it is also true that our understanding of the interaction between other corporate strategies and nonmarket strategy remains far from complete (Durand et al., 2017; Oberholzer-Gee & Yao, 2018). By showing that firms will change strategic actions to address exogenous shock and that nonmarket and political strategy is one of these, the results of our study clearly support the idea of integrated strategy. Although our study is limited to political lobbying, future research might delve into how such shocks can also influence other types of nonmarket

strategies, which is beyond the scope of the current study. For example, although the risk of short-selling might be general to all types of firms, their strategic focus in dealing with this risk might vary. If the primary focus is to minimize the most relevant environmental risks, depending on a firm's industry or most immediate business risks, different nonmarket activities may be implemented. Examining how firms attempt to mitigate their environmental risks depending on the type of risk will help us paint a holistic picture of an integrated strategy with different components of nonmarket activities (Dorobantu et al., 2017).

Our study also contributes to top management team research. Many studies suggest that top management teams and their characteristics play an important role in determining many aspects of firms' nonmarket and political behaviors, including political strategies firms engage in and their intensity, but, to our best knowledge, studies examining the role of top management teams in nonmarket and political strategy are scarce. There are a few notable exceptions (e.g., Gupta, Briscoe, & Hambrick, 2017; Gupta, Nadkarni, & Mariam, 2019) but even these studies focus mostly on the effect of political ideology of top management team and do not examine various characteristics of top management team and its effects on nonmarket strategies. By showing that top management team characteristics, particularly related to attitudes toward risk- or uncertainty-taking, our study helps to better understand the role and importance of top management team characteristics on political strategy and lobbying.

Our results also have implications for corporate managers. Although we do not examine or measure the outcome of corporate lobbying after Regulation SHO, it is interesting to observe that companies under the new rule significantly increase their lobbying. As noted, that many corporate executives are hesitant or even reluctant to engage in political lobbying because of its uncertainties (Drutman, 2015; McDonnell & Werner, 2016; Hadani & Schuler, 2013), our results indicate that many companies use corporate political strategy to buffer environmental risks. This

might imply that despite a widespread belief about the effectiveness of corporate political strategy or lobbying, many corporate executives see political strategy as a useful tool to alleviate environmental risks in junction with other conventional corporate strategies. Therefore, corporate executives who yet attempt to engage in political strategy might want to consider a political activity to supplement their other strategic efforts to address environmental risks or uncertainties.

REFERENCES

Ahuja, G., & Yayavaram, S. 2011. Explaining Influence Rents: The Case for an Institutions-Based View of Strategy. *Organization Science*, 22, 1631–1652.

Austen-Smith, D., & Wright, J. 1994. Counteractive Lobbying. *American Journal of Political Science*, 38, 25–44.

Barber, B., & Diestre, L. 2019. Pushing for speed or scope? Pharmaceutical lobbying and Food and Drug Administration drug review. *Strategic Management Journal*, 40, 1194–1218.

Baron, D. 1995. Integrated Strategy: Market and Nonmarket Components. *California Management Review*, 37, 47–65.

Baron, D. 1997. Integrated Strategy, Trade Policy, and Global Competition. *California Management Review*, 39, 145–169.

Baron, D. 2013. *Business and Its Environment, 7th ed*. Upper Saddle River, NJ: Pearson Prentice-Hall.

Baumgartner, F., Berry, J., Hojnacki, M., Kimball, D., & Leech, B. 2009. *Lobbying and Policy Change: Who Wins, Who Loses, and Why*. Chicago, IL: University of Chicago Press.

Baysinger, B. 1984. Domain Maintenance as an Objective of Business Political Activity: An Expanded Typology. *Academy of Management Review*, 9, 248–258.

Bear, S., & Rahman, N., & Post, C. 2010. The impact of board diversity and gender composition on corporate social responsibility and firm reputation. *Journal of Business Ethics*, 97, 207–221.

Benner, M., & Zenger, T. 2016. The lemons problem in markets for strategy. *Strategy Science*, 1, 71–89.

Bertrand, M., Duflo, E., & Mullainathan, S. 2004. How much should we trust differences-in-differences estimates? *Quarterly Journal of Economics*, 119: 249–275.

Blake, D., & Jandhyala, S. 2019. Managing policy reversals: Consequences for firm performance. *Strategy Science*, 4, 111–128.

Bombardini, M. 2008. Firm Heterogeneity and Lobby Participation. *Journal of International Economics*, 75, 329–348.

Boone, C., & Hendriks, W. 2009. Top Management Team Diversity and Firm Performance: Moderators of Functional-Background and Locus-of-Control Diversity. *Management Science*, 55, 165–180.

Brasher, H., & Lowery, D. 2006. The Corporate Context of Lobbying Activity. *Business and Politics*, 8, Article 1.

Carpenter, M., & Sanders, G. 2002. Top management team compensation: The missing link between CEO pay and firm performance? *Strategic Management Journal*, 23, 367–375.
Carpenter, M., & Sanders, G. 2004. The effects of top management team pay and firm internationalization on MNC performance. *Journal of Management*, 30, 509–528.
Certo, T., Lester, R., Dalton, C., & Dalton, D. 2006. Top Management Teams, Strategy and Financial Performance: A Meta-Analytic Examination. *Journal of Management Studies*, 30, 813–839.
Chen, H., Parsley, D., & Yang, Y. 2015. Corporate Lobbying and Firm Performance. *Journal of Business Finance and Accounting*, 42, 444–481.
Choi, S., Jia, N., & Lu, J. 2015. The Structure of Political Institutions and Effectiveness of Corporate Political Lobbying. *Organization Science*, 26, 158–179.
Daft, R., Sormunen, J., & Parks, D. 1988. Chief executive scanning, environmental characteristics, and company performance: An empirical study. *Strategic Management Journal*, 9, 123–139.
De Angelis, D., Grullon, G., & Michenaud, S. 2017. The Effects of Short-Selling Threats on Incentive Contracts: Evidence from an Experiment. *The Review of Financial Studies*, 30, 1627–1659.
de Figueiredo, J., & Tiller, E. 2001. The Structure and Conduct of Corporate Lobbying: How Firms Lobby the Federal Communications Commission. *Journal of Economics & Management Strategy*, 10, 91–122.
de Figueiredo, J., & Silverman, B. 2006. Academic Earmarks and the Returns to Lobbying. *Journal of Law and Economics*. 49, 597–625.
de Figueiredo, J., & Richter, B. 2014. Advancing the Empirical Research on Lobbying. *Annual Review of Political Science*, 17, 163–185.
Diestre, L., Barber, B., & Santaló, J. 2020. The Friday Effect: Firm lobbying, the timing of drug safety alerts, and drug side effects. *Management Science*, 66, 3677–3698.
Diether, K., Lee, K., & Werner, I. 2009. It's SHO Time! Short-Sale Price Tests and Market Quality. *Journal of Finance*, 64, 37–73.
Dorobantu, S., Kaul, A., & Zelner, B. 2017. Nonmarket strategy research through the lens of new institutional economics: An integrative review and future directions. *Strategic Management Journal*, 38, 114–140.
Drutman, L. 2015. *The Business of America is Lobbying: How Corporations Became Politicized and Politics Became More Corporate*. New York, NY: Oxford University Press.
Duncan, R. 1972. Characteristics of Organizational Environments and Perceived Environmental Uncertainty. *Administrative Science Quarterly*, 17, 313–327.
Durand, R., Grant, R., & Madsen, T. 2017. The expanding domain of strategic management research and the quest for integration. *Strategic Management Journal*, 38, 4–16.
Durand, R., Hawn, O., & Ioannou, I. 2019. Willing and Able: A General Model of Organizational Responses to Normative Pressures. *Academy of Management Review*, 44, 299–320.
Eesley, C., Decelles, K., & Lenox, M. 2016. Through the mud or in the boardroom: Examining activist types and their strategies in targeting firms for social change. *Strategic Management Journal*, 37, 2425–2440.
Ellis, C., & Groll, T. 2020. Strategic Legislative Subsidies: Informational Lobbying and the Cost of Policy. *American Political Science Review*, 114, 179–205.

Feldman, E., Amit, R., & Villalonga, B. 2019. Family firms and the stock market performance of acquisitions and divestitures. *Strategic Management Journal*, 40, 757–780.
Feltham, G., & Wu, M. 2001. Incentive efficiency of stock versus options. *Review of Accounting Studies*, 6, 7–28.
Flammer, C. 2013. Corporate social responsibility and shareholder reaction: The environmental awareness of investors. *Academy of Management Journal*, 56, 758–781.
Flammer, C., Toffel, M., & Viswanathan, K. 2021. Shareholder activism and firms' voluntary disclosure of climate change risks. *Strategic Management Journal*, 42, 1850–1879.
Franklin, G. 2014. *Raisin Bran and Other Cereal Wars: 30 Years of Lobbying for the Most Famous Tiger in the World*. Bloomington, IN: iUniverse LLC.
Godfrey, P. 2005. The relationship between corporate philanthropy and shareholder wealth: A risk management perspective. *Academy of Management Review*, 30, 777–798.
Greene, H., & Yao, D. 2016. Navigating Natural Monopolies: Market Strategy and Nonmarket Challenges in Radio and Television Audience Measurement Markets. In de Figueiredo, J., Lenox, M., Oberholzer-Gee, F., and Vanden Bergh, R. (Eds.) *Strategy Beyond Markets (Advances in Strategic Management, Vol. 34)*. Emerald Group Publishing: Bingley, 367–411.
Grullon, G., Michenaud, S., & Weston, J. 2015. The Real Effects of Short-Selling Constraints. *The Review of Financial Studies*, 28, 1737–1767.
Gupta, A., Briscoe, F., & Hambrick, D. 2017. Red, blue, and purple firms: Organizational political ideology and corporate social responsibility. *Strategic Management Journal*, 38, 1018–1040.
Gupta, A., Nadkarni, S., & Mariam, M. 2019. Dispositional Sources of Managerial Discretion: CEO Ideology, CEO Personality, and Firm Strategies. *Administrative Science Quarterly*, 64, 855–893.
Hadani, M., Bonardi, J-P., & Dahan, N. 2017. Corporate political activity, public policy uncertainty, and firm outcomes: A meta-analysis. *Strategic Organization*, 15, 338–366.
Hadani, M., & Schuler, D. 2013. In search of El Dorado: The elusive financial returns on corporate political investments. *Strategic Management Journal*, 34, 165–181.
Hall, B. 2000. What you need to know about stock options. *Harvard Business Review*, 78, 121–121.
Hall, B., & Murphy, K. 2002. Stock options for undiversified executives. *Journal of Accounting and Economics*, 33, 3–42.
Hall, B., & Murphy, K. 2003. The Trouble with Stock Options. *Journal of Economic Perspectives*, 17, 49–70.
Hall, R., & Deardorff, A. 2006. Lobbying as Legislative Subsidy. *American Political Science Review*, 100, 69–84.
Hambrick, D., Cho, T., & Chen, M. 1996. The Influence of Top Management Team Heterogeneity on Firms' Competitive Moves. *Administrative Science Quarterly*, 41, 659–684.
Hansen, W., & Mitchell, N. 2000. Disaggregating and Explaining Corporate Political Activity: Domestic and Foreign Corporations in National Politics. *American Political Science Review*, 94, 891–903.
Haveman, H., Russo, M., & Meyer, A. 2001. Organizational Environments in Flux: The Impact of Regulatory Punctuations on Organizational Domains, CEO Succession, and Performance. *Organization Science*, 12, 253–273.
He, J., & Tian, X. 2016. *Do short sellers exacerbate or mitigate managerial myopia? Evidence from patenting activities*. SSRN working paper. https://ssrn.com/abstract=2380352

Hegde, D., & Sampat, B. 2015. Can Private Money Buy Public Science? Disease Group Lobbying and Federal Funding for Biomedical Research. *Management Science*, 61, 2281–2298.
Holburn, G. & Vanden Bergh, R. 2014. Integrated Market and Nonmarket Strategies: Political Campaign Contributions around Merger and Acquisition Events in the Energy Sector. *Strategic Management Journal*, 35, 450–460.
Jia, N. 2018. "Make and/or buy" decisions of corporate political lobbying: An integration of economic efficiency and legitimacy perspectives. *Academy of Management Review*, 43, 307–326.
Jia, Y., Gao, X., & Julian, S. 2020. Do firms use corporate social responsibility to insure against stock price risk? Evidence from a natural experiment. *Strategic Management Journal*, 41, 290–307.
Jia, N., Zhao, B., Zheng, W., & Lu, J. 2021. No Free Lunch After All: Corporate Political Connections and Firms' Location Choices, *Organization Science*, forthcoming.
Jiao, Y., Massa, M., & Zhang, H. 2016. Short selling meets hedge fund 13F: An anatomy of informed demand. *Journal of Financial Economics*, 122, 544–567.
Kerr, W., Lincoln, W., & Mishra, P. 2014. The dynamics of firm lobbying. *American Economic Journal: Economic Policy*, 6, 343–379.
Khanna, N., & Mathews, R. 2012. Doing battle with short sellers: The conflicted role of blockholders in bear raids. *Journal of Financial Economics*, 106, 229–246.
Kim, Y., & Song, M. 2015. Management Earnings Forecasts and Value of Analyst Forecast Revisions. *Management Science*, 61, 1663–1683.
Kim, J. 2019. Is your playing field unleveled? U.S. defense contracts and foreign firm lobbying. *Strategic Management Journal***,** 40, 1911–1937.
Kor, Y. 2003. Experience-based top management team competence and sustained growth. *Organization Science*, 14, 707–719.
Kumar, S., Dixit, J., & Francis, B. 2015. The impact of prior stock market reactions on risk taking in acquisitions. *Strategic Management Journal*, 36, 2111–2121.
Lambert, T. 2019. Lobbying on Regulatory Enforcement Actions: Evidence from U.S. Commercial and Savings Banks. *Management Science*, 65, 2545–2572.
Lee, J., Hwang, B., & Chen, H. 2017. Are founder CEOs more overconfident than professional CEOs? Evidence from S&P 1500 companies. *Strategic Management Journal*, 38, 751–769.
Lee, S., & Baik, Y. 2010. Corporate Lobbying in Antidumping Cases: Looking into the Continued Dumping and Subsidy Offset Act. *Journal of Business Ethics*, 96, 467–478.
Lenway, S., & Rehbein, K. 1991. Leaders, Followers, and Free Riders: An Empirical Test of Variation in Corporate Political Involvement. *Academy of Management Journal*, 34, 893–905.
Litov, L. Moreton, P., & Zenger, T. 2012. Corporate strategy, analyst coverage, and the uniqueness paradox. *Management Science*, 58, 1797–1815.
Lounsbury, M., & Hirsch, P. 2010. 'Markets on trial: toward a policy-oriented economic sociology'. In Lounsbury, M. and Hirsch, P. (Eds.) *Markets on Trial: The Economic Sociology of the U.S. Financial Crisis: Part B (Research in the Sociology of Organizations, Vol. 30 Part B)*. Emerald Group Publishing Limited: Bingley, 5–26.
Luo, J., Kaul, A., & Seo, H. 2018. Winning us with trifles: Adverse selection in the use of philanthropy as insurance. *Strategic Management Journal*, 39, 2591–2617.

Malmendier, U., & Tate, G. 2005. CEO overconfidence and corporate investment. *Journal of Finance*, 60, 2661–2700.
Malmendier, U., & Tate, G. 2008. Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of financial Economics*, 89, 20–43.
Markovitch, D., Steckel, J., & Yeung, B. 2005. Using Capital Markets as Market Intelligence: Evidence from the Pharmaceutical Industry. *Management Science*, 51, 1467–1480.
Martinez-Moyano, I., McCaffrey, D., & Olivia, R. 2014. Drift and Adjustment in Organizational Rule Compliance: Explaining the "Regulatory Pendulum" in Financial Markets. *Organization Science*, 25, 321–338.
Massa, M., Zhang, B., & Zhang, H. 2015. The Invisible Hand of Short Selling: Does Short Selling Discipline Earnings Management? *The Review of Financial Studies*, 28, 1701–1736.
Masters, M., & Keim, G. 1985. Determinants of PAC Participation Among Large Corporations. *The Journal of Politics*, 47, 1158–1173.
McDonnell, M., & Werner, T. 2016. Blacklisted businesses: Social activists' challenges and the disruption of corporate political activity. *Administrative Science Quarterly*, 61, 584–620.
McKay, A. 2012. Negative Lobbying and Policy Outcomes. *American Politics Research*, 40, 116–146.
Morgeson, F., Mitchell, T., & Liu, D. 2015. Event System Theory: An Event-Oriented Approach to the Organizational Sciences. Academy of Management Review, 40, 515–537.
Nielsen, B., & Nielsen, S. 2013. Top management team nationality diversity and firm performance: A multilevel study. *Strategic Management Journal*, 34, 373–382.
Niemi-Kaija, K., & Aaltio, I. 2019. Dealing with the Experience of Imperfection in a Finnish Public Sector Organization. *Human Organization*, 78, 169–178.
Oberholzer-Gee, F., & Yao, D. 2018. Integrated Strategy: Residual Market and Exchange Imperfections as the Foundation of Sustainable Competitive Advantage. *Strategy Science*, 3, 463–480.
Odziemkowska, K., & Henisz, W. 2021. Webs of influence: Secondary stakeholder actions and cross-national corporate social performance. *Organization Science*, 32, 233–255.
Olson, M. 1965. *The Logic of Collective Action*. Cambridge, MA: Harvard University Press.
Oxley, J., Sampson, R., & Silverman, B. 2009. Arms Race or Détente? How Interfirm Alliance Announcements Change the Stock Market Valuation of Rivals. *Management Science*, 55, 1321–1337.
Pacht, A. 1984. Reflections on perfection. *American Psychologist*, 39, 386–390.
Reed, A. 2013. Short selling. *Annual Review of Financial Economics*. 5, 245–258.
Richter, B., Samphantharak, K., & Timmons, J. 2009. Lobbying and Taxes. *American Journal of Political Science*, 53, 893–909.
Ryan, H. Jr., & Wiggins, R. III. 2004. Who is in whose pocket? Director compensation, board independence, and barriers to effective monitoring. *Journal of Financial Economics*, 73, 497–524.
Sanders, G., & Hambrick, D. 2007. Swinging for the Fences: The Effects of Ceo Stock Options on Company Risk Taking and Performance. *Academy of Management Journal*, 50, 1055–1078.
Schuler, D. 1996. Corporate political strategy and foreign competition: The case of the steel industry. *Academy of Management Journal*, 39, 720–737.
Schuler, D., Rehbein, K., and Cramer, R. 2002. Pursuing Strategic Advantage Through Political Means: A Multivariate Approach. *Academy of Management Journal*, 45, 659–672.

Servaes, H., & Tamayo, A. 2014. How Do Industry Peers Respond to Control Threats? *Management Science*, 60, 380–399.
Shi, W., Connelly, B., & Cirik, K. 2018. Short Seller Influence on Firm Growth: A Threat Rigidity Perspective. *Academy of Management Journal*, 61, 1892–1919.
Shi, W., Ndofor, H., & Hoskisson, R. 2020. Disciplining Role of Short Sellers: Evidence From M&A Activity. *Journal of Management*, 47, 1103–1133.
Simons, T., Pelled, L., & Smith, K. 1999. Making use of difference: Diversity, debate, and decision comprehensiveness in top management teams. *Academy of Management Journal*, 42, 662–673.
Singh, K., Mahmood, I., & Natarajan, S. 2017. Capital Market Development and Firm Restructuring During an Economic Shock. *Organization Science*, 28, 552–573.
Tilcsik, A., & Marquis, C. 2013. Punctuated Generosity: How Mega-events and Natural Disasters Affect Corporate Philanthropy in U.S. Communities. *Administrative Science Quarterly*, 58, 111–148.
Urbany, J., Dickson, P., & Wilkie, W. 1989. Buyer Uncertainty and Information Search. *Journal of Consumer Research*, 16, 208–215.
Vaaler, P., & McNamara, G. 2004. Crisis and Competition in Expert Organizational Decision Making: Credit-Rating Agencies and Their Response to Turbulence in Emerging Economies, *Organization Science*, 15, 687–703.
Werner, T. 2012. *Public Forces and Private Politics in American Big Business*. New York, NY: Cambridge University Press.
Werner, T. 2015. Gaining Access by Doing Good: The Effect of Sociopolitical Reputation on Firm Participation in Public Policy Making. *Management Science*, 61, 1989–2011.
Werner, T. 2017. Investor Reaction to Covert Corporate Political Activity. *Strategic Management Journal*, 38, 2424–2443.
Wiersema, M., & Bantel, K. 1992. Top Management Team Demography and Corporate Strategic Change. *Academy of Management Journal*, 35, 91–121.
Wright, J. 1996. *Interest Groups and Congress: Lobbying, Contributions, and Influence*. Boston, MA: Allyn and Bacon.
Zhang, Y., & Wiersema, M. 2009. Stock market reaction to CEO certification: the signaling role of CEO background. *Strategic Management Journal*, 30, 693–710.

Figure 1: Illustration of Parallel Trend in the Pre-Treatment Period

This figure presents the trend of lobbying spending between 2003 and 2006 to show the pre-shock parallel trend for the pilot and non-pilot groups.

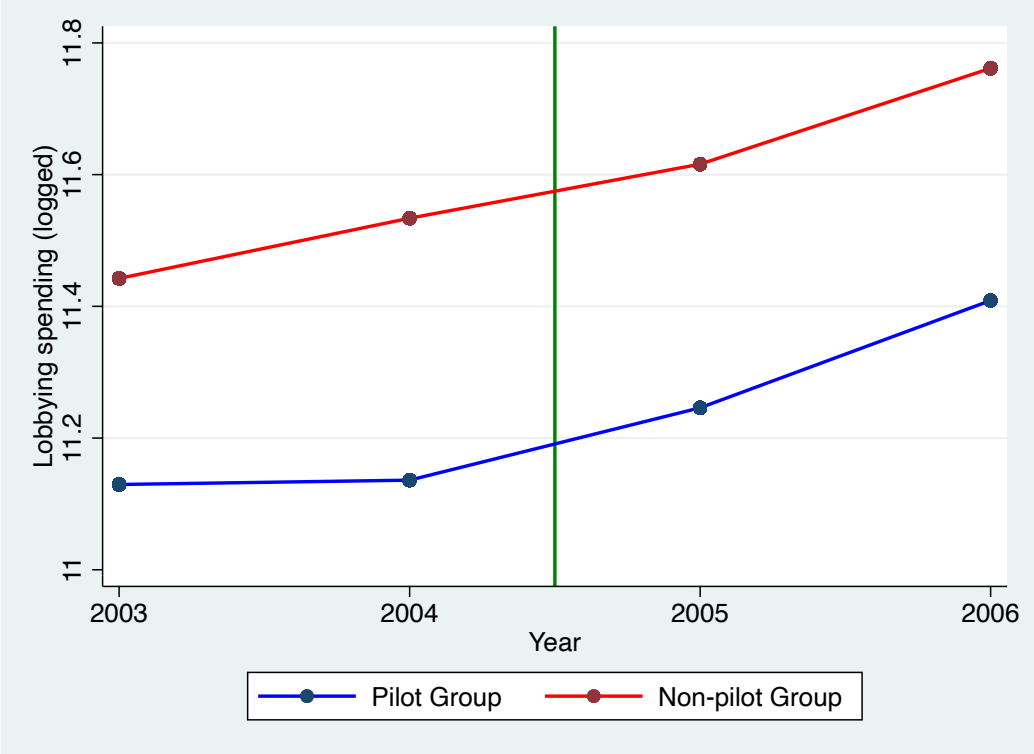

Figure 2: Effect of Compensation-Induced Attitude toward Risks on Lobbying Spending for the Pilot Group

This figure presents the effect of TMT's compensation-induced attitude toward risk for the pilot group on lobbying spending after the regulatory shock.

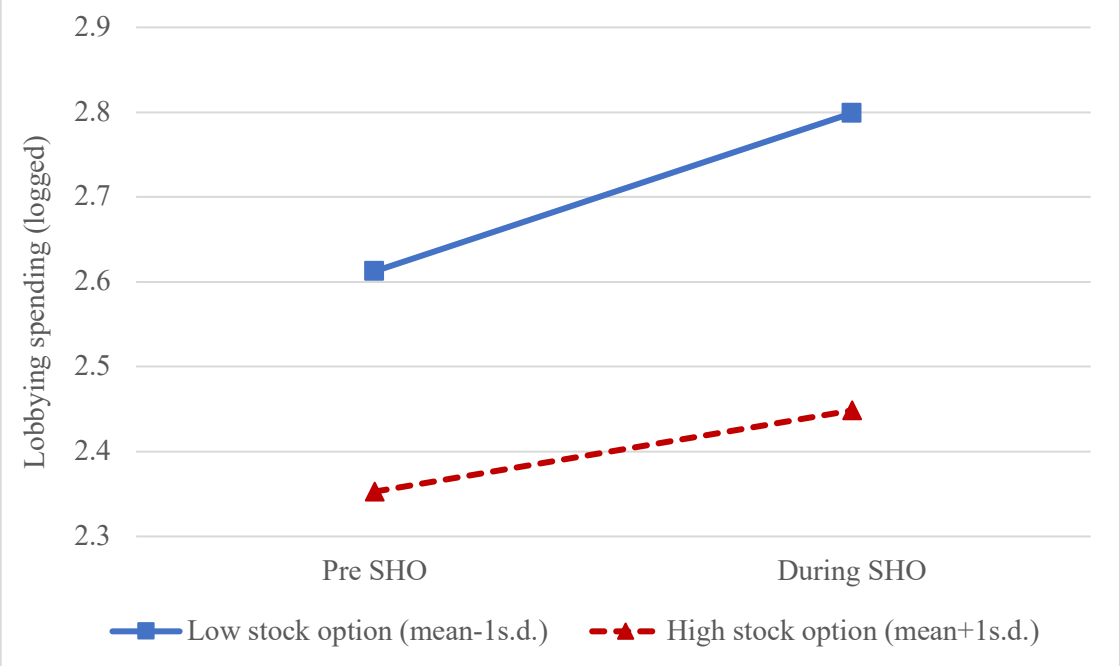

Figure 3: Effect of Top Management Team Homogeneity on Lobbying Spending for the Pilot Group

This figure presents the effect of TMT homogeneity (diversity) for the pilot group on lobbying spending after the regulatory shock.

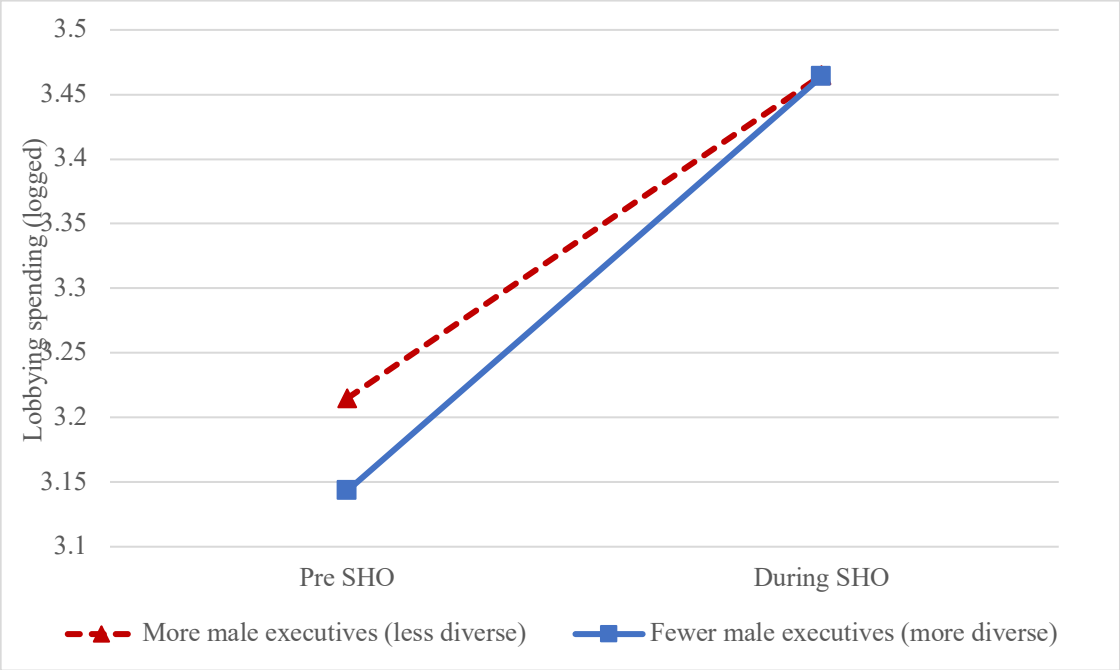

Table 1: Summary Statistics

This table presents summary statistics for variables included in the main regression analysis for the pilot and non-pilot groups.

	Pilot group	Non-pilot group	Difference (Pr(|T| > |t|)
Lobbying spending (logged)	1.897	2.000	0.230
Stock option granted	0.273	0.282	0.232
Top management team homogeneity	0.944	0.946	0.197
Total assets (logged)	7.144	7.151	0.843
Return on assets	0.008	0.022	0.001
Leverage	0.558	0.536	0.001
Cash reserves	0.013	0.011	0.284
Physical assets-to-asset ratio	0.212	0.223	0.021
Capital expenditure-to-asset ratio	0.041	0.041	0.756

Table 2: Distribution of Firm-Year Observations by Standard Industry Classification

This table presents the distribution of firm-year observation between pilot and non-pilot groups by Standard Industry Classification (SIC) 2-digit code for the sample period (2003–2006).

SIC 2-digit code	SIC Industry Name	Pilot Group		Non-pilot Group	
		Frequency	Percentage	Frequency	Percentage
Mining					
10	Metal, Mining	16	0.48	36	0.53
12	Coal Mining	4	0.12	16	0.24
13	Oil & Gas Extraction	90	2.72	210	3.12
14	Nonmetallic Minerals, Except Fuels	0	0.00	20	0.30
Construction					
15	General Building Contractors	23	0.69	53	0.79
16	Heavy Construction, Except Building	12	0.36	21	0.31
17	Special Trade Contractors	8	0.24	12	0.18
Manufacturing					
20	Food & Kindred Products	92	2.78	107	1.59
21	Tobacco Products	4	0.12	8	0.12
22	Textile Mill Products	4	0.12	11	0.16
23	Apparel & Other Textile Products	40	1.21	34	0.50
24	Lumber & Wood Products	20	0.60	24	0.36
25	Furniture & Fixtures	12	0.36	48	0.71
26	Paper & Allied Products	24	0.73	66	0.98
27	Printing & Publishing	35	1.06	80	1.19
28	Chemical & Allied Products	335	10.12	654	9.71
29	Petroleum & Coal Products	8	0.24	46	0.68
30	Rubber & Miscellaneous Plastics Products	40	1.21	34	0.50
31	Leather & Leather Products	12	0.36	29	0.43
32	Stone, Clay, & Glass Products	20	0.60	33	0.49
33	Primary Metal Industries	36	1.09	71	1.05
34	Fabricated Metal Products	34	1.03	70	1.04
35	Industrial Machinery & Equipment	199	6.01	361	5.36
36	Electronic & Other Electric Equipment	258	7.79	495	7.35
37	Transportation Equipment	68	2.05	148	2.20
38	Instruments & Related Products	195	5.89	381	5.65
39	Miscellaneous Manufacturing Industries	24	0.73	52	0.77
Transportation and Public Utilities					
40	Railroad Transportation	15	0.45	16	0.24
41	Local & Interurban Passenger Transit	0	0.00	4	0.06
42	Trucking & Warehousing	12	0.36	71	1.05
44	Water Transportation	24	0.73	6	0.09
45	Transportation by Air	14	0.42	0	0.00
46	Pipelines, Except Natural Gas	3	0.09	48	0.71
47	Transportation Services	19	0.57	13	0.19
48	Communications	84	2.54	250	3.71

SIC 2-digit code	SIC Industry Name	Pilot Group		Non-pilot Group	
		Frequency	Percentage	Frequency	Percentage
49	Electric, Gas, & Sanitary Services	152	4.59	251	3.73
Wholesale Trade					
50	Wholesale Trade – Durable Goods	76	2.30	89	1.32
51	Wholesale Trade – Nondurable Goods	48	1.45	48	0.71
Retail Trade					
52	Building Materials & Gardening Supplies	4	0.12	8	0.12
53	General Merchandise Stores	46	1.39	36	0.53
54	Food Stores	20	0.60	41	0.61
55	Automotive Dealers & Service Stations	14	0.42	56	0.83
56	Apparel & Accessory Stores	50	1.51	86	1.28
57	Furniture & Home furnishings Stores	14	0.42	32	0.47
58	Eating & Drinking Places	36	1.09	80	1.19
59	Miscellaneous Retail	50	1.51	139	2.06
Finance, Insurance, and Real Estate					
60	Depository Institutions	222	6.71	558	8.28
61	Non-depository Institutions	29	0.88	66	0.98
62	Security & Commodity Brokers	55	1.66	98	1.45
63	Insurance Carriers	81	2.45	223	3.31
64	Insurance Agents, Brokers, & Service	26	0.79	26	0.39
65	Real Estate	21	0.63	12	0.18
67	Holding & Other Investment Offices	85	2.57	102	1.51
Services					
70	Hotels & Other Lodging Places	0	0.00	29	0.43
72	Personal Services	20	0.60	15	0.22
73	Business Services	292	8.82	792	11.75
75	Auto Repair, Services, & Parking	12	0.36	16	0.24
78	Motion Pictures	15	0.45	24	0.36
79	Amusement & Recreation Services	47	1.42	54	0.80
80	Health Services	39	1.18	126	1.87
81	Legal Services	0	0.00	4	0.06
82	Educational Services	17	0.51	19	0.28
83	Social Services	3	0.09	4	0.06
87	Engineering & Management Services	44	1.33	140	2.08
Non-classifiable Establishments					
99	Non-Classifiable Establishments	8	0.24	36	0.53
	Total	3,310	100%	6,738	100%

Table 3: Descriptive Statistics and Pairwise Correlations

This table presents descriptive statistics and pairwise correlations of variables for the main analysis at the firm level. * denotes significance at the 5% level.

	Variables	Mean	S.D.	Min.	Max.	1	2	3
1	Lobbying spending (logged)	1.931	4.445	0	17.245	1		
2	Pilot group (1: Yes, 0: No)	0.329	0.470	0	1	0.011	1	
3	During SHO (1: Yes, 0: No)	0.500	0.500	0	1	0.021*	0.000	1
4	Compensation-induced attitude toward risk	0.276	0.220	0	0.941	0.038*	0.020	-0.100*
5	Top management team homogeneity	0.945	0.061	0.5	1	-0.080*	0.014	0.002
6	Total assets (logged)	7.146	1.749	-0.569	14.449	0.176*	0.002	0.070*
7	Return on assets	0.013	0.175	-3.681	2.170	0.014	0.039*	0.012
8	Leverage	0.551	0.286	0.005	6.812	0.030*	-0.036*	0.029*
9	Cash reserves	0.013	0.105	-1.741	0.950	0.003	-0.010	-0.060*
10	Physical assets-to-asset ratio	0.216	0.224	0	0.951	0.073*	0.023*	-0.018
11	Capital expenditure-to-asset ratio	0.041	0.052	0.000	0.618	0.037*	-0.003	0.021*

	4	5	6	7	8	9	10	11
4	1							
5	0.012	1						
6	-0.076*	-0.137*	1					
7	0.015	-0.030*	0.251*	1				
8	-0.248*	-0.089*	0.4401*	-0.171*	1			
9	0.025	0.019	-0.050*	0.108*	-0.097*	1		
10	-0.149*	-0.018	0.089*	0.082*	0.035*	-0.054*	1	
11	0.058*	0.004	-0.085*	0.074*	-0.071*	-0.038*	0.672*	1

Table 4: Difference-in-Differences Firm Fixed-Effects Regressions for Lobbying Spending

This table presents the results of difference-in-differences fixed-effects regressions in which annual lobbying spending of a firm is the dependent variable. Models 1 through 3 include only the main explanatory and mechanism variables; models 4 through 6 include firm-level control variables in addition to the variables included in models 1 through 3. Models 1 and 4 test hypothesis 1, models 2 and 5 test hypothesis 2a, and models 3 and 6 test hypothesis 2b. Year and firm fixed effects are included in all models. Standard errors are corrected for clustering by the pilot and non-pilot groups (Bertrand, Duflo, & Mullainathan, 2004), and these are presented in parentheses. ***, **, *, and † denote significance at the 0.1%, 1%, 5%, and 10% levels, respectively.

DV: Lobbying spending	**Model 1 (Hypo 1)**	**Model 2 (Hypo 2a)**	**Model 3 (Hypo 2b)**	**Model 4 (Hypo 1)**	**Model 5 (Hypo 2a)**	**Model 6 (Hypo 2b)**
Interaction: Pilot group × During SHO	0.067***	0.222**	1.441**	0.075**	0.199*	1.340**
	(0.000)	(0.001)	(0.004)	(0.001)	(0.015)	(0.021)
Compensation-induced attitude toward risk		0.231			0.105	
		(0.061)			(0.078)	
Interaction: Pilot group × compensation-induced attitude toward risk		-0.659**			-0.692*	
		(0.006)			(0.041)	
Interaction: During SHO × compensation-induced attitude toward risk		0.250*			0.310*	
		(0.014)			(0.017)	
Interaction: Pilot group × During SHO × compensation-induced attitude toward risk		-0.595**			-0.515**	
		(0.003)			(0.004)	
Top management team homogeneity			0.092†			-0.097
			(0.007)			(0.039)
Interaction: Pilot group × top management team homogeneity			0.769*			1.264*
			(0.024)			(0.025)
Interaction: During SHO × top management team homogeneity			0.373**			0.253†
			(0.005)			(0.032)
Interaction: Pilot group × During SHO × top management team homogeneity			-1.463**			-1.407**
			(0.004)			(0.021)
Total assets (logged)				0.520†	0.517	0.620**
				(0.048)	(0.541)	(0.010)
Return on assets				-0.469	-0.152	-0.678
				(0.216)	(0.334)	(0.313)
Leverage				0.298*	0.222	0.044
				(0.016)	(0.279)	(0.039)
Cash reserves				-0.014	-0.572†	-0.142
				(0.087)	(0.067)	(0.080)
Physical assets-to-asset ratio				1.253	1.324	1.359
				(0.849)	(0.818)	(1.044)

Capital expenditure-to-asset ratio				0.905	-0.202	0.731
				(1.643)	(0.305)	(1.419)
Constant	1.813**	2.475*	1.583*	-2.152	-1.709	-2.983*
	(0.024)	(0.054)	(0.025)	(0.485)	(4.169)	(0.080)
Year fixed effects	Included	Included	Included	Included	Included	Included
Firm fixed effects	Included	Included	Included	Included	Included	Included
Number of firms	2,999	1,205	2,106	2,747	1,154	2,011
Number of observations	11,996	3,709	8,141	10,048	3,473	7,508

Table 5: Difference-in-Differences Firm Fixed-Effects Regression for Lobbying Spending with Additional Control Variables

This table presents the results of difference-in-differences fixed-effects regression in which annual lobbying spending of a firm is the dependent variable. Models 1 through 3 include variables related to lobbying intensity; models 4 through 6 include a variable of short interests in addition to the variables included in models 4 through 6 in Table 4. Models 1 and 4 test hypothesis 1, models 2 and 5 test hypothesis 2a, and models 3 and 6 test hypothesis 2b. Year and firm fixed effects are included in all models. Standard errors are corrected for clustering by the pilot and non-pilot groups (Bertrand, Duflo, & Mullainathan, 2004), and these are presented in parentheses. ***, **, *, and † denote significance at the 0.1%, 1%, 5%, and 10% levels, respectively.

DV: Lobbying spending	**Model 1 (Hypo 1)**	**Model 2 (Hypo 2a)**	**Model 3 (Hypo 2b)**	**Model 4 (Hypo 1)**	**Model 5 (Hypo 2a)**	**Model 6 (Hypo 2b)**
Interaction: Pilot group × During SHO	0.062*	0.134†	0.233*	0.081*	0.194†	1.348**
	(0.004)	(0.018)	(0.007)	(0.003)	(0.025)	(0.004)
Compensation-induced attitude toward risk		-0.260			0.109	
		(0.049)			(0.076)	
Interaction: Pilot group × compensation-induced attitude toward risk		0.217*			-0.706†	
		(0.009)			(0.056)	
Interaction: During SHO × compensation-induced attitude toward risk		0.096**			0.321*	
		(0.001)			(0.006)	
Interaction: Pilot group × During SHO × compensation-induced attitude toward risk		-0.333*			-0.509*	
		(0.013)			(0.011)	
Top management team homogeneity			-0.557*			-0.042
			(0.014)			(0.026)
Interaction: Pilot group × top management team homogeneity			0.884*			1.264**
			(0.015)			(0.018)
Interaction: During SHO × top management team homogeneity			0.251			0.165
			(0.040)			(0.027)
Interaction: Pilot group × During SHO × top management team homogeneity			-0.200**			-1.410**
			(0.002)			(0.007)
Total assets (logged)	0.102*	0.147	0.167*	0.584*	0.523	0.605*
	(0.008)	(0.249)	(0.013)	(0.044)	(0.540)	(0.025)
Return on assets	-0.161	-0.062	-0.255	-0.461	-0.161	-0.604
	(0.175)	(0.115)	(0.240)	(0.188)	(0.337)	(0.307)
Leverage	0.089†	-0.107	-0.159	0.331**	0.195	0.030
	(0.008)	(0.165)	(0.074)	(0.004)	(0.294)	(0.040)
Cash reserves	-0.065	-0.108	-0.103	0.043	-0.557	-0.117
	(0.082)	(0.365)	(0.113)	(0.175)	(0.097)	(0.075)
Physical assets-to-asset ratio	-0.281	0.199	0.168	1.464	1.311	1.443
	(0.345)	(0.898)	(0.715)	(0.893)	(0.747)	(0.858)

Capital expenditure-to-asset ratio	0.583	-0.157	1.213	0.924	-0.209	0.864
	(0.401)	(0.197)	(0.573)	(1.671)	(0.345)	(1.559)
% of report lobbying Congress	4.706**	5.679	4.568**			
	(0.048)	(0.998)	(0.009)			
In-house lobbying as a % of total lobbying spending	7.047**	7.765*	7.076**			
	(0.087)	(0.508)	(0.089)			
Average number of lobbyists hired	0.919*	0.693*	0.923*			
	(0.026)	(0.015)	(0.043)			
Congressional issue Herfindahl-Hirsch index	0.169†	0.143**	0.151†			
	(0.021)	(0.001)	(0.020)			
Short interests (in hundreds)				-0.000	0.006	0.026
				(0.000)	(0.013)	(0.008)
Constant	-0.159	-0.303	-0.307*	-2.659	-1.758	-3.036**
	(0.127)	(2.013)	(0.018)	(0.482)	(4.186)	(0.032)
Year fixed effects	Included	Included	Included	Included	Included	Included
Firm fixed effects	Included	Included	Included	Included	Included	Included
Number of firms	2,747	1,154	2,011	2,737	1,154	2,010
Number of observations	10,048	3,473	7,508	9,923	3,469	7,489

APPENDIX

Table A1: Difference-in-Differences Firm Fixed-Effects Regression of Lobbying Spending for Mechanism Analysis

This table presents the results of difference-in-differences fixed effects regression in which annual lobbying spending of a firm is the dependent variable to further support the driving mechanism of top management team characteristics. Model 1 employs compensation-induced attitude toward risk, which is calculated that the aggregate value of stock options granted to the executive is divided by total current compensation that only includes annual salary and bonus ('total_curr' variable at Compustat). We use top management team confidence in model 2, variance of tenure in the top management team in model 3, and variance of age in the top management team in model 4. Standard errors are corrected for clustering by the pilot and non-pilot groups (Bertrand, Duflo, & Mullainathan, 2004), and these are presented in parentheses. ***, **, *, and † denote significance at the 0.1%, 1%, 5%, and 10% level, respectively.

DV: Lobbying spending	Model 1	Model 2	Model 3	Model 4
Interaction: Pilot group × During SHO	0.127*	0.027	-0.125*	-0.723**
	(0.009)	(0.011)	(0.003)	(0.009)
Compensation-induced attitude toward risk (divided by total compensation)	-0.000†			
	(0.000)			
Interaction: Pilot group × Compensation-induced attitude toward risk (divided by total compensation)	-0.010†			
	(0.001)			
Interaction: During SHO × Compensation-induced attitude toward risk (divided by total compensation)	0.022			
	(0.005)			
Interaction: Pilot group × During SHO × Compensation-induced attitude toward risk (divided by total compensation)	-0.038*			
	(0.002)			
Top management confidence		-0.022		
		(0.005)		
Interaction: Pilot group × Top management confidence		0.025		
		(0.007)		
Interaction: During SHO × Top management confidence		-0.010		
		(0.003)		
Interaction: Pilot group × During SHO × Top management confidence		-0.077*		
		(0.005)		
Variance of tenure in top management team			0.026†	
			(0.002)	
Interaction: Pilot group × Variance of tenure in top management team			-0.061*	
			(0.002)	
Interaction: During SHO × Variance of tenure in top management team			-0.040**	
			(0.000)	
Interaction: Pilot group × During SHO × Variance of tenure in top management team			0.022*	
			(0.001)	

Variance of age in top management team				0.005
				(0.001)
Interaction: Pilot group × Variance of age in top management team				-0.007*
				(0.000)
Interaction: During SHO × Variance of age in top management team				-0.019**
				(0.000)
Interaction: Pilot group × During SHO × Variance of age in top management team				0.087**
				(0.001)
Total assets (logged)	0.276	0.731†	0.601**	0.620*
	(0.268)	(0.059)	(0.006)	(0.017)
Return on assets	-0.344	-0.389	-0.690	-0.699
	(0.114)	(0.285)	(0.307)	(0.285)
Leverage	0.246	0.238	-0.008	0.041
	(0.260)	(0.154)	(0.046)	(0.055)
Cash reserves	-0.656**	-0.247	-0.116	-0.130
	(0.008)	(0.049)	(0.091)	(0.102)
Physical assets-to-asset ratio	-0.173	0.739	1.328	1.363
	(0.800)	(0.792)	(1.189)	(1.025)
Capital expenditure-to-asset ratio	0.181	0.321	0.805	0.692
	(0.091)	(0.140)	(1.479)	(1.460)
Constant	0.417	-3.233*	-2.544*	-2.689*
	(1.703)	(0.177)	(0.163)	(0.064)
Year fixed effects	Included	Included	Included	Included
Firm fixed effects	Included	Included	Included	Included
Number of firms	1,152	1,248	2,011	2,011
Number of observations	3,467	4,410	7,504	7,504

Table A2: Difference-in-Differences Firm Fixed Effects Regression of Lobbying Spending

This table presents the results of difference-in-differences fixed effects regression in which annual lobbying spending of a firm is the dependent variable. In models 1 through 3, standard errors are corrected for clustering both at the treatment and firm levels using 'reghdfe' command in STATA which allows double-clustering at the different levels. Models 4 through 6 employs industry fixed effects instead of firm fixed effects. Models 1 and 4 test hypothesis 1, models 2 and 5 test hypothesis 2a, and models 3 and 6 test hypothesis 2b. Year and firm fixed effects are included in all models. The coefficients for the pilot group and during SHO are automatically dropped due to collinearity. Standard errors corrected for clustering are presented in parentheses. ***, **, *, and † denote significance at the 0.1%, 1%, 5%, and 10% level, respectively.

DV: Lobbying spending	**Model 1 (Hypo 1)**	**Model 2 (Hypo 2a)**	**Model 3 (Hypo 2b)**	**Model 4 (Hypo 1)**	**Model 5 (Hypo 2a)**	**Model 6 (Hypo 2b)**
Pilot group (1: Yes, 0: No)				0.073	0.332***	-1.671***
				(0.091)	(0.040)	(0.167)
During SHO (1: Yes, 0: No)				0.188***	0.399	0.056
				(0.049)	(0.261)	(0.064)
Interaction: Pilot group × During SHO	0.075**	0.199*	1.340**	0.073***	0.192***	1.370***
	(0.001)	(0.015)	(0.021)	(0.002)	(0.003)	(0.116)
Compensation-induced attitude toward risk		0.105			0.147***	
		(0.078)			(0.016)	
Interaction: Pilot group × compensation-induced attitude toward risk		-0.692*			-0.687***	
		(0.041)			(0.028)	
Interaction: During SHO × compensation-induced attitude toward risk		0.310*			0.318***	
		(0.017)			(0.008)	
Interaction: Pilot group × During SHO × compensation-induced attitude toward risk		-0.515**			-0.533***	
		(0.004)			(0.007)	
Top management team homogeneity			-0.097			-0.975***
			(0.039)			(0.193)
Interaction: Pilot group × top management team homogeneity			1.264*			1.817***
			(0.025)			(0.074)
Interaction: During SHO × top management team homogeneity			0.253†			0.157***
			(0.032)			(0.025)
Interaction: Pilot group × During SHO × top management team homogeneity			-1.407**			-1.443***
			(0.021)			(0.123)
Total assets (logged)	0.520†	0.517	0.620**	0.670***	0.730***	0.750***
	(0.048)	(0.541)	(0.010)	(0.053)	(0.104)	(0.012)
Return on assets	-0.469	-0.152	-0.678	-0.556*	-0.131	-0.735*
	(0.216)	(0.334)	(0.313)	(0.228)	(0.469)	(0.364)
Leverage	0.298*	0.222	0.044	0.298***	0.194	0.105***
	(0.016)	(0.279)	(0.039)	(0.017)	(0.325)	(0.007)

Cash reserves	-0.014	-0.572†	-0.142	-0.010	-0.546***	-0.139***
	(0.087)	(0.067)	(0.080)	(0.036)	(0.017)	(0.019)
Physical assets-to-asset ratio	1.253	1.324	1.359	0.921***	1.808*	1.065***
	(0.849)	(0.818)	(1.044)	(0.247)	(0.906)	(0.217)
Capital expenditure-to-asset ratio	0.905	-0.202	0.731	1.052	-0.422	1.064
	(1.643)	(0.305)	(1.419)	(1.137)	(0.421)	(0.692)
Constant	-2.045	-1.618	-2.979*	-2.259	-5.266*	-1.998
	(0.451)	(4.197)	(0.055)	(2.227)	(2.411)	(2.069)
Year fixed effects	Included	Included	Included	Included	Included	Included
Industry fixed effects				Included	Included	Included
Firm fixed effects	Included	Included	Included			
Number of firms	2,669	1,131	1,994	2,747	1,154	2,011
Number of observations	9,970	3,450	7,491	10,048	3,473	7,508