

Lobbying with the Competition: Do Firm Differentiation, Law Specificity, and Firm Strategy Matter?

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Abstract: In this paper, we examine how firms choose their lobbying participation given the competitive advantages that can be gained from: (1) firm-specific attributes in the form of differentiation, (2) specificity of tax laws under which firms operate, (3) and other tax strategy policies that firms have at their disposal to gain a competitive advantage. We use tax lobbying surrounding the 2004 American Jobs Creation Act and the 2017 Tax Cuts and Jobs Act as our empirical setting. We find that firm differentiation increases individual lobbying and decreases trade association lobbying when the laws being lobbied are narrow in scope. However, broader laws significantly reduce the relation between firm differentiation and individual lobbying. We also find that tax planning and tax lobbying is coordinated, and it is not impacted by law specificity. The findings from our study provide important insights into the circumstances under which firms will choose to lobby for laws and in what format firms will conduct their lobbying.

Keywords: corporate lobbying; firm differentiation; law specificity; firm strategy

Data Availability: Data used in this study are available from public sources identified in the paper.

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1. INTRODUCTION

An extensive and longstanding body of literature documents firm characteristics and managerial attributes associated with tax avoidance (e.g., Rego, 2003; Dyreng et al., 2008; Dyreng et al., 2010; Hanlon and Heitzman, 2010; Rego and Wilson, 2012; Chyz, 2013; Gaertner, 2014). This literature primarily focuses on the factors influencing managers' reporting and compliance of the existing tax laws. Researchers have devoted less attention to the factors that induce firms to pursue tax avoidance through shaping tax laws via lobbying. Lobbying enables individuals, non-profit organizations, and businesses to inform and to influence legislators of their opinions, expertise, and concerns and is constitutionally protected as a way for the people "to petition the government for a redress of grievances" (U.S. Constitution, 1st amendment). Our study focuses on factors that affect how firms choose their lobbying participation (i.e. none, individual, or collectively) given the competitive environment in which firms function. Unlike the majority of prior studies, we consider that a firm's actions depend not only on its own firm-specific characteristics, but also on the actions and abilities of other firms in the industry. Specifically, we examine how firms choose their lobbying participation given the competitive advantages that can be gained from: (1) firm-specific attributes in the form of differentiation, (2) specificity of tax laws under which firms operate, (3) and other tax strategy policies that firms have at their disposal to gain a competitive advantage.

We first examine whether firms consider the extent of their differentiation or corporate uniqueness from other firms, which subsequently affects their ability to gain a competitive advantage, when choosing lobbying participation. The ways in which firms are differentiated

from other firms can range from geographic dispersion to operating structure to product mix. In our study, we consider that firm differentiation allows companies to combine their particular attributes with tax laws to gain a competitive advantage. If firm differentiation is low, we expect that the firm is operating in a more competitive market and is unlikely to benefit from a policy change without its competitors also benefiting. This prediction is consistent with Bombardini and Trebbi (2012), who, using a trade lobbying setting, find that firms operating in more competitive markets are more likely to coordinate lobbying efforts for tariffs. We take this step to confirm that this result from other areas of lobbying translates to tax lobbying.

Next, we investigate how law specificity modifies the relation between firm differentiation and lobbying participation. In the trade lobbying setting, tariffs and subsidies are fairly narrow in scope and are directed at relatively small groups of products or businesses.¹ It is unknown whether the associations found in Bombardini and Trebbi (2012) hold where the specificity of laws being lobbied vary from affecting a single firm to affecting all firms in the economy. Friedman and Heinle (2019) build a theoretical model that predicts firms have more incentives to lobby collectively when regulatory policies are more uniform. Empirically, it is unclear how firm differentiation and law specificity will interact to determine lobbying participation. Thus, we build on this prior work using lobbying in a tax setting. As the preferred tax legislation becomes more general and benefits more firms, we expect the competitive advantages gained from firm differentiation to become less important in the lobbying

¹ The Harmonized Tariff Schedule of the United States (HTSUS) specifies which imported goods are subject to commodity duties. Goods are assigned a 10-digit classification code based on product description, product use, and/or the material used to construct it. The classification is typically narrow; for example, milk produces 42 unique 10-digit codes, with variations on considerations such as form factor, added sugar, fat content, volume imported in a calendar year (Harmonized Tariff Schedule of the United States (2019) Revision 9). The duty rate also varies within a single classification code by the exporting country.

participation level choice, and firms' lobbying decisions will be based primarily on firm size and tax savings.

Finally, we examine whether firms' other tax strategy policies are associated with their lobbying participation. In particular, we investigate whether a firm's tax lobbying corresponds with its tax planning strategy conditional on law specificity. The coordination of tax lobbying and tax strategies often requires information transfer between different departments within a firm – the tax department, which develops specific tax strategies, and the government relations department. The cost of transferring such information between these two groups likely depends on the type of knowledge required to be transferred, where knowledge can fall along a continuum where one end is general knowledge (easily transferred at relatively low cost) to specific knowledge (idiosyncratic and costly to transfer) (Jensen and Meckling, 1998; Robinson et al., 2010). We examine whether the specificity of the tax legislation affects the information transfer costs given that less specific legislation (i.e., tax rates) falls closer to the general knowledge end of the spectrum and would be less costly to transfer than very specific legislation (i.e., DPAD and repatriation holiday). We expect firms to lobby more for broad legislation when information transfer costs are lower than for specific legislation.

We use tax lobbying as our setting to examine these questions for several reasons. First, tax lobbying is appealing in that the types of laws lobbied in tax vary in specificity from those that impact only one firm (rifle-shot provisions) to those that impact every firm in the economy. This variation provides a perspective unlike most other types of lobbying that tend to affect a similar number of firms from law to law. Second, tax lobbying is one of the largest core lobbying areas and continues to grow. In 2018, tax was the second most lobbied issue after the federal budget and appropriations in terms of the number of clients engaged in lobbying efforts, which

indicates that it is a key issue for many businesses (Center for Responsive Politics, 2018).²

Finally, firms may use lobbying to complement or substitute for other firm strategies. In most firms, government relations departments, which coordinate lobbying efforts, are distinct from firm operations and other administrative responsibilities. Thus, it is an open empirical question whether firms' lobbying is well coordinated with other firm strategies. Tax lobbying can be a component of a firm's tax planning policies and strategies, another well-defined research area (tax avoidance). Therefore, unlike with other types of lobbying, using a tax setting we are able to examine how firms' lobbying behavior coordinates with other firm policies and strategies.

We test our predictions of the role of a competitive market on lobbying efforts as well as the coordination of tax lobbying with tax planning strategy using 2004 and 2017 tax-lobbying data from the Center for Responsive Politics. We choose these periods because they capture two unique lobbying periods that both led to major tax legislation. In 2004, two major tax changes were the domestic productions activity deduction (DPAD)³ and a tax holiday on repatriated foreign earnings.⁴ Although the general purpose of the DPAD was to help companies that engage in manufacturing in the United States with substantial tax breaks, the definition of what qualified as domestic production activities was ambiguous. As a result, many businesses including those not traditionally considered manufacturers (e.g., Starbucks and the American Institute of Architects) actively lobbied to qualify for the tax savings. Similarly, in an effort to stimulate the U.S. economy, the tax holiday on repatriated foreign earnings in 2004 provided U.S.

² The Center for Responsive Politics makes lobbying data available at <http://www.OpenSecrets.org/lobby/>.

³ The DPAD legislation replaced the extraterritorial income exclusion (ETI), which allowed firms with certain transactions that generate foreign trading gross receipts to exclude income from taxation. In March 2004, the WTO found the ETI to be in violation of international trade agreements, and the EU began imposing substantial monetary sanctions on the U.S. The creation of the DPAD was enacted to end these sanctions. The DPAD affects only firms with domestic production; thus it is similar in scope to trade lobbying tariffs/subsidies.

⁴ In 2004 U.S. corporations were taxed on their worldwide income regardless of where the income was earned. However, corporations were able to defer the payment of tax on their foreign earnings until the earnings were repatriated.

corporations a onetime tax holiday on their foreign earnings if they repatriated the earnings back to the U.S. This holiday was beneficial to corporations with large amounts of unrepatriated foreign earnings; whereas, the tax holiday had almost no impact on purely domestic firms and firms without unrepatriated foreign earnings. The second period of lobbying we examine is for the Tax Cuts and Jobs Act of 2017 (TCJA). In contrast to the 2004 legislation, the TCJA was pervasive and was touted to be the most sweeping legislation since the Tax Reform Act of 1986. The cornerstone of the 2017 legislation was a reduction in corporate tax rates from 35 to 21 percent, which impacted virtually all firms doing business in the U.S. regardless of industry or product.⁵

We begin our analyses with the 2004 tax lobbying period surrounding the passage of the DPAD and repatriation holiday, which offers a setting similar to trade lobbying (i.e. specific law). Consistent with prior literature, we find that firms are more likely to lobby collectively when firm differentiation is low (more competitive market) when the law targeted by lobbying is fairly specific. We also find that in this setting for specific laws, firms are more likely to lobby individually when firm differentiation is high. However, using 2017 tax lobbying where the lobbied-for law is broader in nature, firm differentiation has a significantly smaller impact on individual firm lobbying, consistent with our prediction that competitive advantages gained from firm differentiation become less important when the legislation benefits more firms. To alleviate concerns that these results are affected by year-specific differences and not differences in law specificity, we conduct additional robustness tests within each reporting year. We examine a subset of firms in 2004 to which the 2004 law changes likely would have appeared broad and a

⁵ We acknowledge that the corporate tax rate reduction was but one piece of the legislation; however, we focus on this piece as it affected a broad cross section of firms and served as a key component of the legislation. In a review of lobbying reports, the reduction in tax rates was commonly mentioned as the objective of the lobbying efforts. In supplemental analysis, we examine a narrower component of the TCJA to capture law specificity within an industry.

subset of firms in 2017 to which the 2017 law changes likely would have appeared specific. We find evidence that firm differentiation is positively associated with individual lobbying for specific laws but not for general laws, consistent with our main results.

In our final analysis, we examine the association between firms' tax lobbying and other tax planning strategies. Contrary to expectations, we document that firms' tax lobbying is coordinated with their other tax planning strategies regardless of law specificity. Our results suggest that tax aggressive firms use tax lobbying as an additional mechanism to reduce their tax burdens. Moreover, the coordination between the tax lobbying and tax planning groups in a firm occurs consistently for both specific and broad laws.

Our study contributes to the corporate tax lobbying literature. First, our study differs from most tax lobbying studies because we incorporate and directly measure both individual and trade association lobbying decisions. The majority of corporate tax lobbying studies focus on firms' direct contributions to lobbyists, and generally disregard trade association lobbying. Second, our study examines tax lobbying within a competitive environment while prior studies have focused on each firm individually ignoring what their competitors are doing.

We also extend the broader lobbying literature. Because the effect of tax laws can range from one to all firms, tax lobbying provides an opportunity to examine the effects law specificity on lobbying. Our study complements studies in the political economy literature (e.g., Pecorino, 2001; Bombardini and Trebbi, 2012), which focus on product market concentration and lobbying cooperation, and adds to our understanding of factors affecting lobbying choices. Our findings also provide empirical evidence supporting implications of the Friedman and Heinle (2019) model, which predicts that firms have more incentives to lobby collectively when regulatory policies are more uniform.

Finally, our study gives insight into how lobbying decisions are made within the firm and whether those decisions are coordinated with other corporate strategies. We specifically show that tax lobbying and tax planning appear to be coordinated. And that coordination holds regardless of the specificity of the law being lobbied or the whether the lobbying is done individually or collectively.

2. BACKGROUND

2.1 Corporate Political Activity

Corporate political activity is generally defined as an attempt to influence government policy for favorable outcomes, such as hindering competitors or changing regulatory oversight (Keim and Baysinger, 1988; Hillman and Hitt, 1999; Hillman et al., 2004). There are many ways in which firms can choose to engage in political action to gain competitive advantages. In our study, we focus on lobbying, which is often transactional in Hillman and Hitt's (1999) classification of corporate political activity. We also consider Hillman and Hitt's (1999) delineation of participation level (individual vs. collective) and examine how this choice relates to other firm tax strategies. Although other studies have studied corporate political connections, contributions, efficacy, motivations, and results (e.g., Hillman et al., 1999; Cooper et al., 2010; Aggarwal et al., 2011; Chaney et al., 2011; Lux et al., 2011; Hadani and Schuler, 2013; Chen et al., 2015; Hutchens et al., 2016), we still know little about how firms lobby in a competitive environment, how that changes as laws change, or how lobbying fits with other strategies of the firm.

We study lobbying as the mechanism for corporate political activity instead of political donations for several reasons. In terms of spending, total lobbying each year is typically an order of magnitude larger than the amount given in campaign contributions. For instance, the

OpenSecrets.org reports that PAC contributions to candidates was roughly \$500 million in the 2017/2018 election cycle whereas firms spent over \$6.8 billion on lobbying during the same period. We also focus on lobbying because the available data are more detailed than that for political donations. Lobbying reports must be filed detailing the general purpose or goal of the lobbying. In comparison, the political donation data reveals to whom the donations go and what congressional committees the recipients serve; however, many congress members serve on multiple committees making it more difficult to isolate the relevant issues when compared to lobbying. Finally, Brown et al. (2015) provides evidence that PAC donations relate to a relational approach to political action whereas lobbying is directed toward a transactional (information) approach and influencing political figures. For our research question, we believe the transactional approach is more relevant than the relational approach consistent with the literature upon which we rely to develop our model and hypotheses.

2.2 Corporate Lobbying Generally

Researchers in economics, accounting, finance, and management share an interest in corporate lobbying. Across these disciplines, fundamental questions relate to why and how firms lobby. A number of studies assert that firms lobby to improve performance (Hillman et al., 2004; de Figueiredo and Silverman, 2006; Cooper et al., 2010; Hutchens et al., 2016); however, a recent meta-analysis suggests that the association between firm lobbying and firm performance is tenuous (Hadani et al., 2017). Prior research also shows that firms choose their lobbying participation level, either individually and/or collectively through trade associations (de Figueiredo and Richter, 2014).⁶ Recent trade lobbying research examines this choice both

⁶ Other distinctions in political activity studied include whether firms use a relational or transactional approach (Pittman, 1976; Zardkoohi, 1985; Brown et al., 2015; Barrick and Brown, 2017) and whether firms focus on a financial strategy using PAC contributions or an informational strategy by lobbying (Roberts and Bobek, 2004; Alexander et al., 2009; Chen et al., 2015; Brown et al., 2015, Christensen et al., 2016; Baloria and Klassen, 2017).

theoretically and empirically to better understand the determinants of the choice (Bombardini and Trebbi, 2012; Kim, 2017; Friedman and Heinle, 2019). Although conventional wisdom suggests that in competitive markets, firms are more likely to lobby individually to retain the competitive advantages from their lobbying efforts, Bombardini and Trebbi (2012) find theoretical and empirical results consistent with firms acting cooperatively rather than individually in trade lobbying when they have more similar products. Kim (2017) finds evidence consistent with Bombardini and Trebbi (2012) and shows that firms with more differentiated products trade lobby more and are less likely to trade lobby cooperatively through a trade association. Similarly, Osgood (2016) examines how industry product differentiation affects international trade strategy preferences and finds that more differentiated industries prefer trade protection while more similar industries prefer trade liberalization policies.

2.3 Tax Lobbying

In a similar vein to the general lobbying literature, the prior literature on tax lobbying examines tax political activities to explain the mechanism through which political activity can benefit a firm and to quantify the return of political activity (see Barrick and Brown (2018) for a review). Early studies do not find evidence of an empirical connection between firms' political activities and effective tax rates (e.g., Forman, 1988). However, subsequent research finds more consistent results that political activity provides firm specific benefits (Alexander et al., 2009; Richter et al., 2009; Hill et al., 2013; Chen et al., 2014; Brown et al., 2015; Meade and Li, 2015; Chen et al., 2018). The more consistent results are likely due to two method improvements:

These studies focus on whether firms engage occasionally as a response to a specific issue or use a more regular, ongoing and systematic approach to their political activity.

improved political activity data made available in the late 2000s and more direct measures of the impact of the political activity through firms' changes in tax burdens.⁷

More recent research provides evidence that industry peers are an important part of the tax lobbying process and incorporates tax lobbying through trade associations (Hula, 1999; Barrick and Frischmann, 2018). Using a small hand-collected sample, Barrick and Frischmann (2018) find that trade association lobbying leads to decreases in future ETRs. Further, they find that board membership in trade associations is associated with more future tax lobbying individually and through trade associations. However, since firms are not required to report amounts given to trade associations, our understanding of this activity is limited.

Our study seeks to provide additional evidence on the strategic nature of tax lobbying by examining firms' decisions to lobby individually, lobby through a trade association, or not to lobby at all depending on the net benefits derived from the enacted tax law. We focus on three primary issues: 1) firm differentiation (which reflects market competitiveness), 2) the specificity of the legislative issues, and 3) the relation between the lobby decision and firms' tax policies. In the next section, we develop our hypotheses.

2.4 Hypotheses

To examine firms' decisions to lobby in a competitive environment, we first develop a stylized game theory model that examines the factors driving a firm to lobby individually (i.e. directly pays lobbyists), lobby collectively (i.e., through a trade association), or to not lobby at all. These choices are consistent with lobbying strategies reported by Barrick and Brown (2017).

⁷ A few additional studies suggest that the relation between tax lobbying and effective tax rates may be nuanced. The benefits from political activity can vary depending on whether firms use influence (lobbying) or access (PAC contributions) (Brown et al., 2015) and whether tax lobbying is proactive or defensive in nature (Meade and Li, 2015). Both Hill et al. (2013) and Kim and Zhang (2016) conclude that firms can manage their tax risk by engaging in political activity because the increased political influence creates connections to reduce future penalties or IRS audits.

For the competitive environment, we examine firm differentiation that can affect a firm's competitive advantage as it relates to taxes. For example, if there are many firms that sell similar products within an industry, they are less differentiated and therefore function in a more competitive environment. In contrast, geographical dispersion can indicate firm differentiation and a less competitive environment. We detail the lobbying game in Appendix B. Our model provides the following conclusions: 1) firms more closely related to other firms within their industry are more likely to lobby through trade associations; 2) firms that are differentiated from others are more likely to lobby individually; 3) larger firms are more likely to lobby both individually and through trade associations; and 4) industries without a few dominant corporations (more competitive) are more likely to lobby through trade associations. These conclusions are largely consistent with Bombardini and Trebbi's (2012) trade lobbying results.

We then adapt our model to predict how lobbying would change with law specificity. In an analytical study of financial institutions, Friedman and Heinle (2019) predict that firms have more incentives to lobby collectively when regulatory policies are more uniform, highlighting the importance of law specificity in corporate lobbying. The study suggests that law specificity will impact the size and composition of collective lobbying groups. Our paper differs from Friedman and Heinle (2019) in that we examine how law specificity can affect the relation between firm differentiation and lobbying. Our stylized model suggests that the potential tax-related advantages gained from firm differentiation is dependent on the law specificity. When a law is specific and applies to select firms only, firm differentiation within an industry will affect firms' mode of lobbying because affected firms can gain a large tax-related competitive advantage over their competitors. Accordingly, we expect that for tax laws with narrower scopes, firm differentiation is a driver of whether firms will lobby individually or through a trade

association consistent with the Bombardini and Trebbi (2012). On the other hand, for a broad-based law such as a change in base tax rate, firm differentiation is less critical in affecting firms' mode of lobbying as all firms will be impacted by the law and individual firms are less likely to gain a significant tax-related competitive advantage over competitors. Thus, we expect that for broader-based tax laws, differentiation will have a reduced impact on whether firms lobby either individually or through a trade association. Stated formally:

H1A: Firm differentiation is positively associated with lobbying individually and negatively associated with lobbying through trade associations when law specificity is high.

H1B: The impact of firm differentiation on the decision to lobby individually or through a trade association decreases when law specificity is low.

Finally, we examine whether tax lobbying efforts are consistent with firms' overall tax planning/avoidance. Following Hanlon and Heitzman (2010), we define tax avoidance as the reduction of explicit tax liability, which can be achieved through a range of tax planning activities. We consider tax lobbying as form of legal avoidance in Hanlon and Heitzman's (2010) continuum of tax planning strategies. Anecdotally, some firms have lobbied for favorable tax policies in conjunction with tax-reducing real activities and engaging in tax shelters. For example, the New York Times reports General Electric was able to significantly reduce its tax liability through both tax lobbying as well as "innovative accounting" that shifted the majority of profits overseas (Kocieniewski, 2011). In the academic literature, Mead and Li (2015) find that firms that tax lobby are more sophisticated tax-wise (as measured by lagged cash ETR) than those who lobby for non-tax issues, suggesting that firms who are more tax aggressive tend to also lobby to further minimize explicit taxes.

Although our model in Appendix B does not directly speak to the coordination between firms' tax lobbying efforts and their tax planning/avoidance strategies, it provides some

inferences on tax lobbying and tax policy. First, the availability of firm resources can connect tax lobbying with tax strategies. Consistent with prior literature, our model suggests that larger firms are more likely to lobby. Larger firms also tend to engage in more tax avoidance (Omer et al., 1993; Mills et al., 1998; Rego, 2003). These studies suggest that larger firms with the means and financial motivation to engage in more tax avoidance will be more likely to tax lobby.

Second, the coordination of tax lobbying and tax strategies between departments requires information transfer to ensure that specific tax strategies developed within the tax department are conveyed to the governmental relations department. Tax planning is generally developed by the tax group within a firm, which comprises CPAs and lawyers well-versed in the information-specific tax law. This group usually functions within the firm's financial group and under the direction of a tax director and the CFO. Lobbying, on the other hand, generally occurs through the government relations group, which may be located in various places within a firm but is rarely part of the financial group. Consequently, tax lobbying and tax strategy development are conducted by separate groups within the firm with employees of different backgrounds and talents. The cost of transferring information between these two groups likely depends on the type of knowledge required to be transferred, where knowledge can fall along a continuum where one end is general knowledge (easily transferred at relatively low cost) to specific knowledge (idiosyncratic and costly to transfer) (Jensen and Meckling, 1998; Robinson et al., 2010). The specificity of the tax legislation is likely to affect the information transfer costs. Broad based legislation (i.e., tax rates) falls closer to the general knowledge end of the spectrum and would be less costly to transfer than very specific (i.e., DPAD and repatriation holiday) legislation.

Give the above arguments above, we expect the coordination between lobbying and tax strategies to vary based on the type of tax legislation to be lobbied. We state our hypothesis as follows:

H2: Firm's tax lobbying is more positively associated with tax avoidance when tax legislation is broad-based than when it is specific.

3. EMPIRICAL DATA AND METHODOLOGY

3.1 Lobbying Data and Sample Selection

To evaluate model predictions and test our hypotheses, we obtain tax lobbying data from the Center for Responsive Politics website, opensecrets.org. We focus our analysis on tax lobbying in 2004 around the passage of the American Jobs Creation Act and tax lobbying in 2017 around the passage of the Tax Cut and Jobs Act.⁸ We examine the 2004 American Jobs Creation Act as a law change with narrow scope as its two main components, the repatriation tax holiday and the domestic production activity deduction, only affected select companies. The repatriation holiday benefited firms that had previously earned income abroad and wanted to repatriate cash to the U.S. As such, repatriation impacted some firms in an industry while having no effect on others. The domestic production activities deduction was intended only for firms producing goods within the U.S. However, the definition of “producing” and “goods” under this law was hotly debated and thus lobbied upon. In the end, some firms within an industry were able to receive a benefit from DPAD while others were left out (e.g. Starbucks successfully lobbied to be included based on how they roasted coffee beans at all their retail locations, while their competitors were left out). In contrast, although the Tax Cut and Jobs Act of 2017

⁸ Although the lobbying data from the Center for Responsive Politics identifies specific bills before the senate and house, our experience is that this data is not well reported and often inaccurate. Therefore, we examine all lobbying in 2004 and 2017 tagged as related to tax law.

contained some specific law changes, the centerpiece of the Act from a corporate tax perspective was a reduction in the corporate tax rate from 35 to 21 percent for all corporations, a much broader-scoped change.

Our analyses require manual matching of the tax lobbying data to Compustat and Center for Research in Security Prices (CRSP) identifiers. For individual tax lobbying, we match the ultimate parent organization name from opensecrets.org to publicly traded companies in Compustat. For trade association lobbying, we use a combination of information from IRS Form 990s and web searches to identify the board of directors of each trade association involved in tax lobbying per year.⁹ We then determine the firm of employment for each director during each tax lobbying year to link lobbying expenditures by the trade association to specific firms. Given that the majority of directors are named executives at other firms, we match over 98 percent of board members to their respective firms of employment.¹⁰

We allocate the tax lobbying expenditures of the trade association equally between directors. Firms that have an executive or manager on the trade association's board are typically members that pay dues to the organization and often direct the lobbying efforts of the trade association. Moreover, some trade associations use a tiered membership format in which only members in the highest tiers of membership can put an executive on the trade association's board. These highest tiers of membership require higher dues and a large portion of these higher dues are used for lobbying. We acknowledge that our approach to allocating trade association lobbying to firms includes noise because the actual lobbying expenditures of trade associations

⁹ We focus on trade associations that have spent at least \$50,000 on tax lobbying from 1998 to 2016. For some trade associations, the 2004 or 2017 form 990 is not available or does not list the board of directors. In these cases, we use the next available Form 990 with the board of directors listed.

¹⁰ We note that Friedman and Heinle (2019) suggest the hand collection of trade association membership as a proxy for firm collective lobbying.

may not be divided evenly between directors' firms of employment. However, it provides a reasonable estimation of how much firms are tax lobbying through trade associations.

When the DPAD was originally proposed, some industries clearly qualified for the deduction (e.g., auto manufacturing) while others did not (e.g., legal services). Given the limited application of the proposed law, we examine lobbying only in industries in which lobbying appeared to have a realistic chance of lowering tax bills. Subsequently, we exclude Global Industry Classification Standard industries (GICS) that are not likely to have production or development activities that would qualify for the deduction: utilities, transportation, banking, communication, insurance, real estate, trading, and miscellaneous from our sample for 2004. The industries that we retain are also likely to be affected by the repatriation tax; therefore also have incentive to lobby during the 2004 period for the tax holiday. To be consistent across time periods, we also remove the above industries for 2017.¹¹ Table 2, Panel B, reports the distribution of firm observations across industries for 2004 and 2017.

For control variables, we obtain financial information from Compustat, market data from CRSP, and contributions to political action committees (PAC) from opensecrets.org. After conditioning on data requirements for the models, our firm-level sample consists 4,245 firms for calendar year 2004 and 2,741 firms for calendar year 2017. We summarize the sample construction in Table 1.

3.2 Empirical Methods – H1A

To test whether firm differentiation is associated with lobbying when law specificity is high, we examine individual lobbying and trade association lobbying in 2004. Given that the two main tax issues lobbied in 2004, the domestic production activity deduction and the repatriation

¹¹ In untabulated tests, we find similar inferences when including these industries in the sample.

tax holiday, only applied to some firms, we use 2004 as our setting for a narrow scope law (i.e. high law specificity). We acknowledge that the decisions to lobby individually or through trade association are likely related and occur contemporaneously. If that is the case, the error terms will be correlated across the equations. To address this concern, we use seemingly unrelated regressions to estimate the models for individual and trade association lobbying jointly. We empirically test coefficients across equations using Wald tests to gain more insight into lobbying decisions.

For the first equation, we evaluate individual lobbying as a function of firm differentiation and control variables in a Tobit model. Our measure of individual lobbying is the natural logarithm of total individual lobbying expenditures plus one (*IndivLobbyExp_{it}*).¹² The full specification is as follows:

$$\begin{aligned} \text{IndivLobbyingExp}_{it} = & \beta_0 + \beta_1 \text{FirmDiff}_{it-1} + \beta_2 \text{LogSales}_{it-1} + & (A) \\ & \beta_3 \text{SimilarSales}_{it-1} + \beta_4 \text{MTB}_{it-1} + \beta_5 \text{Leverage}_{it-1} + \beta_6 \text{R\&D}_{it-1} + \\ & \beta_7 \text{CashFlow}_{it-1} + \beta_8 \text{MktShare}_{it-1} + \beta_9 \text{GeoSegments}_{it-1} + \beta_{10} \text{Capital}_{it} + \\ & \beta_{11} \text{Electoral}_{it} + \beta_{12} \text{PAC}_{it} + \varepsilon_{it} \end{aligned}$$

The variable of interest is firm differentiation (*FirmDiff_{it-1}*). H1A predicts that our coefficient on *FirmDiff_{it-1}* will be positively associated with individual lobbying and negatively associated with trade association lobbying. We proxy for *FirmDiff_{it-1}* in two ways. Our first measure is based on the ratio of domestic sales to total sales (domestic sales ratio). As tax laws are created by individual nations, firms that have more sales domestically will differ from those that have more sales internationally. The domestic sales ratio also estimates a firm's geographic dispersion and internal structure. These attributes contribute to firms' corporate uniqueness and enable firms to gain tax advantages when combined with specific tax laws. We calculate this

¹² In untabulated analysis, we use indicator variables to indicate whether a firm lobbies individually or not in logistic regressions. The findings are consistent with our main results.

measure of firm differentiation ($FirmDiff_DomSales_{it-1}$) as the absolute value of the firm's domestic sales ratio less the industry's average domestic sales ratio, scaled by the standard deviation of the industry's domestic sales ratio. That is, $FirmDiff_DomSales_{it-1}$ quantifies the distance between the firm's domestic sales ratio from the industry mean in terms of number of standard deviations; a value of one means that the firm's domestic sales ratio is one standard deviation away from the industry mean. We define industries using six-digit GICS.¹³

Our second measure of firm differentiation is based on the product similarity measure developed in Hoberg and Phillips (2010, 2016) (henceforth "HP"). Using textual analysis, HP estimate similarity scores between firm pairs based on the product descriptions in Form 10-Ks. For each firm, HP form an "industry" of peer firms using the similarity score.¹⁴ We compute a firm-pair-level differentiation score as one minus the similarity score so that higher values signify that the firms are more differentiated. Finally, we calculate firm differentiation as the mean differentiation scores for each firm across the HP-defined industry ($FirmDiff_HP_{it-1}$).

Following prior literature, we include control variables for several factors that affect lobbying (i.e., Hillman et al., 2004; Cooper et al., 2010; Hill et al., 2013). For firm characteristics, we start with $LogSales_{it-1}$ or the natural logarithm of the firm's total sales in year $t-1$ plus one. Prior research and our model in Appendix B suggest that the sales size of a firm is an important predictor of lobbying with larger firms spending more on lobbying (Hillman et al., 2004; Barrick and Brown, 2018). We also include market-to-book ratio (MTB_{it-1}), book leverage ($Leverage_{it-1}$), R&D expense scaled by total assets ($R\&D_{it-1}$), and operating cash flows ($CashFlow_{it-1}$) because firms with more growth opportunities and slack are more likely to engage in political activities (Hillman et al., 2004). In addition, we control for the degree to which the

¹³ In untabulated tests, we find similar results using Fama-French 48 industry classification.

¹⁴ HP calibrates industries to the same coarseness as three-digit SIC codes.

industry includes firms that have similar sales volume, calculated as one minus the market concentration for the industry ($SimilarSales_{it-1}$). We expect that the likelihood of firms having similar sales volume within an industry increases as market concentration decreases. Market concentration is the Herfindahl-Hirschman Index, scaled to 0 to 1. We include the firm's market share in the industry based on sales ($MktShare_{it-1}$) and the number of geographic segments ($GeoSegments_{it-1}$) to control for relative sales volume and diversification (Hillman et al., 2004).

Finally, our model controls for political engagement characteristics that may affect lobbying: political action committee contributions, distance to the state capital, and the number of electoral votes for the state in which the firm is headquartered. We include PAC contributions using the natural log of PAC contributions plus one (PAC_{it}) because campaign contributions are another potential method by which firms curry favor with politicians (Cooper et al., 2010).

$Capital_{it}$ is the natural logarithm of distance in miles plus one between the zip code of the firm's headquarters and the zip code of the state's capital building, where both federal and state politicians typically maintain offices. Closer proximity between the firm's managers at headquarters and politicians may reduce the need to lobby (Hill et al., 2013). We control for number of electoral votes for the state in which the firm is headquartered ($Electoral_{it}$) because firms may be more likely to lobby if there is a greater number of politicians to inform and influence (Hill et al., 2013).

In our second equation, we examine collective lobbying as a function of firm differentiation and control variables. Similar to our tests for individual lobbying, we estimate a Tobit model using the natural logarithm of the total trade association lobbying expenditures by firm plus one, $TALobbyExp_{it}$, as the dependent variable to examine trade association lobbying

expenditures.¹⁵ Our variable of interest is $FirmDiff_{it-1}$, which is measured as either $FirmDiff_DomSales_{it-1}$ or $FirmDiff_HP_{it-1}$ as previously defined. H1A predicts a negative association between $FirmDiff_{it-1}$ and trade association lobbying. To account for factors that may affect trade association lobbying, we include control variables from equation (A). The full specification is as follows:

$$TALobbyExp_{it} = \beta_0 + \beta_1 FirmDiff_{it-1} + \beta_2 LogSales_{it-1} + \beta_3 SimilarSales_{it-1} + \beta_4 MTB_{it-1} + \beta_5 Leverage_{it-1} + \beta_6 R\&D_{it-1} + \beta_7 CashFlow_{it-1} + \beta_8 MktShare_{it-1} + \beta_9 GeoSegments_{it-1} + \beta_{10} Capital_{it} + \beta_{11} Electoral_{it} + \beta_{12} PAC_{it} + \varepsilon_{it} \quad (B)$$

We winsorize continuous variables in equations (A) and (B) at the 1st and 99th percentiles to reduce the influence of outliers. All regressions are estimated with robust standard errors by clustering on six-digit GICS industry classifications to adjust for unobserved industry effects (Petersen, 2009). Appendix A provides detailed descriptions of the variables.

3.3 Empirical Methods – H1B

To test whether the relations between firm differentiation and lobbying changes under a broad law, we compare lobbying behavior between 2004 and 2017. Although tax lobbying in 2004 was for law changes that only affected a portion of firms, tax lobbying in 2017 focused on a broad rate change that impacted the majority of firms. We modify equations (A) and (B) to include an indicator variable for lobbying in 2017 ($LowSpecificity$) and interact the variable with $FirmDiff_{it-1}$. Our full specification is as follows:

$$LobbyingExp_{it} = \beta_0 + \beta_1 FirmDiff_{it-1} + \beta_2 (FirmDiff_{it-1} * LowSpecificity) + \beta_3 LowSpecificity + \beta_4 LogSales_{it-1} + \beta_5 SimilarSales_{it-1} + \beta_6 MTB_{it-1} + \beta_7 Leverage_{it-1} + \beta_8 R\&D_{it-1} + \beta_9 CashFlow_{it-1} + \beta_{10} MktShare_{it-1} + \beta_{11} GeoSegments_{it-1} + \beta_{12} Capital_{it} + \beta_{13} Electoral_{it} + \beta_{14} PAC_{it} + \varepsilon_{it} \quad (C)$$

¹⁵ We set trade association lobbying expenditures to zero if the amount is less than 25 percent of the firm's individual lobbying expenditures because firms may join a trade association for other reasons than lobbying, such as networking and advertising. We find similar, but weaker, results when including all trade association lobbying expenditures.

$LobbyingExp_{it}$ represents the amount of money spent on lobbying and is measured as $IndivLobbyExp_{it}$ when examining individual lobbying and as $TALobbyExp_{it}$ when examining trade association lobbying. As previously, $FirmDiff_{it-1}$ is measured as either $FirmDiff_DomSales_{it-1}$ or $FirmDiff_HP_{it-1}$. H1B predicts that coefficient on the interaction between $FirmDiff_{it-1}$ and $LowSpecificity$ will be negative when individual lobbying ($IndivLobbyExp_{it}$) is the dependent variable and positive when trade association lobbying ($TALobbyExp_{it}$) is the dependent variable. All other variables are as defined above. As with Equations (A) and (B), we cluster our standard errors by six-digit GICS industry classification and run Equation (C) with both $IndivLobbyExp_{it}$ and $TALobbyExp_{it}$ using seemingly unrelated regression.

3.4 Empirical Methods – H2

To examine coordination between firms' tax lobbying efforts and overall tax planning/avoidance (H2), we test lobbying expenditures as a function of tax planning/avoidance. We measure overall firm tax planning/avoidance ($3yrCashETR_t$) as the ratio of the sum of cash taxes paid in years $t-2$, $t-1$, and t over the sum of pretax income in the same three years. Observations with negative pretax income over the three years are set to missing. Following prior studies, we winsorize values of $3yr_CashETR_{it}$ to zero and one. We interact $3yrCashETR_{it}$ with $LowSpecificity$ to test whether coordination between tax lobbying and tax planning varies between a specific law (2004) and a broad law (2017). Specifically, we estimate the following equations:

$$\begin{aligned}
 LobbyingExp_{it} = & \beta_0 + \beta_1 3yrCashETR_{it} + \beta_2 (3yrCashETR_{it} * \\
 & LowSpecificity) + \beta_3 LowSpecificity + \beta_4 FirmDiff_{it-1} + \\
 & \beta_5 LogSales_{it-1} + \beta_6 SimilarSales_{it-1} + \beta_7 MTB_{it-1} + \beta_8 Leverage_{it-1} + \\
 & \beta_9 R\&D_{it-1} + \beta_{10} CashFlow_{it-1} + \beta_{11} MktShare_{it-1} + \\
 & \beta_{12} GeoSegments_{it-1} + \beta_{13} Capital_{it} + \beta_{14} Electoral_{it} + \beta_{15} PAC_{it} + \varepsilon_{it}
 \end{aligned} \tag{D}$$

For Equation (D), $LobbyingExp_{it}$ can be $TotalLobbyExp_{it}$, $IndivLobbyExp_{it}$, or $TALobbyExp_{it}$ when examining trade association lobbying. $TotalLobbyExp_{it}$ represents both individual and trade association lobbying because coordination between tax planning and tax lobbying may not depend on whether the lobbying is done through a trade association or individually. All other variables are as described above. H2 predicts that coefficient on the interaction between $3yr_CashETR_{it}$ and $LowSpecificity$ will be negative showing greater coordination between groups when a law is broad. We cluster our standard errors by six-digit GICS industry classification. Following the previous analyses, we estimate Equation (D) with $IndivLobbyExp_{it}$ and $TALobbyExp_{it}$ as the independent variables using seemingly unrelated regression.

4. RESULTS

4.1 Descriptive Statistics

Table 2 reports the descriptive statistics for the 4,245 firms in 2004 and the 2,741 firms in 2017. In Panel A, we find that in 2004, on average, firms spent \$1.7 million (natural logarithm = 0.523) on individual tax lobbying and \$1.7 million (natural logarithm = 0.530) on trade association tax lobbying. We find that in 2017, on average, firms spent \$3.7 million (natural logarithm = 1.272) on individual tax lobbying and \$2.4 million (natural logarithm = 0.872) on trade association tax lobbying. $LogSales_{it-1}$ has a mean of 4.626 for 2004 and 5.582 in 2017. $FirmDiff_DomSales_{it-1}$ has a mean of 0.632 for 2004 and 0.647 for 2017 while $FirmDiff_HP_{it-1}$ has a mean of 0.853 for 2004 and 0.847 for 2017.¹⁶ We find that the means of our variables are generally statistically different between 2004 and 2017.

¹⁶ In untabulated analysis, we find that our two measures of firm differentiation are significantly positively correlated (0.062).

Panel B, Table 2 summarizes the distribution of the combined 6,986 firms from 2004 and 2017 across four-digit GICS industry groups. Approximately 12 percent of the firms are classified as Technology Hardware & Equipment, followed by 11 percent classified as Health Care Equipment & Services and ten percent classified as Capital Goods.

4.2 Empirical Results for H1A – Firm Differentiation under Specific Tax Law (2004)

We present the results of estimating equations (A) and (B) using 2004 data in Table 3. Overall, we find evidence consistent with H1A. In Panel A, we find a positive coefficient on $FirmDiff_DomSales_{it-1}$ when predicting $IndivLobbyExp_{it}$ (3.906, one-sided p -value < 0.01) and a negative coefficient when predicting $TALobbyExp_{it}$ (-2.931, one-sided p -value < 0.05), indicating that firms increase individual lobbying and decrease collective lobbying as firm differentiation increases. Similarly, Panel B reports a positive coefficient on $FirmDiff_HP_{it-1}$ when predicting $IndivLobbyExp_{it}$ (53.566, one-sided p -value < 0.05) and a negative coefficient when predicting $TALobbyExp_{it}$ (-104.313, one-sided p -value < 0.01). In both panels, the coefficients on firm differentiation are statistically different between Columns (1) and (2) at the 1% significance level. Together, our results suggest that firm differentiation is positively associated with individual lobbying and negatively associated with trade association lobbying when tax law specificity is high.

4.3 Empirical Results for H1B – Firm Differentiation under Specific vs Broad Tax Law

We next present the results of estimating equation (C) using 2004 and 2017 data in Table 4. We report a negative and significant coefficient for the interaction term, $FirmDiff_DomSales_{it-1} \times LowSpecificity$ (-2.344, one-sided p -value < 0.05) when the individual tax lobbying expense is the independent variable (Panel A, Column 1). This result suggests that firm differentiation becomes less important for individual lobbying when the lobbied tax laws are broader.

Interestingly, the coefficient on the interaction term is insignificant (one-sided p -value > 0.10) when examining trade association tax lobbying (Column 2) indicating that law specificity does not affect the relation between firm differentiation and trade association tax lobbying. We report similar results when proxying for firm differentiation using $FirmDiff_HP_{it-1}$. The findings are unchanged with a fully-interacted model (interact $LowSpecificity$ with all independent variables) in untabulated analyses.

Overall, we find evidence consistent with H1B for individual lobbying. Our results for H1A and H1B suggest that firms are aware of their competitors and the competitive advantages gained from firm differences for tax purposes. However, when firms are less likely to gain a competitive advantage over peers given that a tax law benefits most firms, companies reduce expenditures via individual lobbying. Contrary to predictions, we do not find evidence consistent with H1B for trade association lobbying. One possible reason is that firms choose to lobby through a trade association based on having low firm differentiation from their competitors, but these decisions are sticky and are not sensitive to the specificity of the laws being lobbied. We also note that our proxy for trade association lobbying contains some noise and may limit our ability to find a result.

4.4 Empirical Results for H2 – Tax Planning and Law Specificity

In our third set of tests, we examine the associations between tax lobbying and tax planning and test whether the associations vary with law specificity. We find results consistent with tax lobbying and tax planning activities being coordinated. Specifically, in Table 5, we document a negative and significant coefficient on $3yrCashETR_{it}$ across all measures of lobbying expenditures (total, individual, and trade association). The findings are consistent for both measures of firm differentiation, $FirmDiff_DomSales_{it-1}$ (Panel A) or $FirmDiff_HP_{it-1}$ (Panel B).

However, we do not find evidence that the coordination between tax planning and tax lobbying is dependent on law specificity; the coefficient for the interaction term, $3yrCashETR_{it} \times LowSpecificity$, is not statistically different for any specification in Table 5. Together, the results suggest that the coordination between the tax lobbying and tax planning groups in a firm occurs for both specific and broad laws.

4.5 Additional Analyses

One potential concern of comparing 2004 and 2017 lobbying is that our main findings are driven by year-specific differences and not differences in law specificity. Moreover, our sample periods are separated by thirteen years, further introducing potential legal, economic, and political changes that affect our results. To alleviate this issue, we conduct additional robustness tests within each reporting year. We first examine a subset of firms in 2004 to which the 2004 law changes likely would have appeared broad. We also test a subset of firms in 2017 to whom the 2017 law changes likely would have appeared specific.

For 2004, we examine firms in the Capital Goods industry (four-digit GICS industry 2010) to focus on a group that was likely impacted by the domestic production activity deduction and the repatriation tax holiday in similar ways. Capital goods are items that are manufactured and sold to other businesses to be used in other products (i.e. not sold to end consumers). We use this industry group in our robustness group because these firms generally qualified easily as production activity firms. Moreover, although the firms likely still varied in domestic production and need for repatriation, we expect this group had less variation than most other types of manufacturing.

We conduct univariate tests for lobbying and firm differentiation using the 499 firms in the Capital Goods industry in 2004. We define firm differentiation using $FirmDiff_DomSales_{it-1}$

for brevity. In Panel A of Table 6, we find a negative but insignificant correlation (-0.039 , p -value > 0.10) between individual lobbying, $IndivLobbyExp_{it}$, and firm differentiation, $FirmDiff_DomSales_{it-1}$. We also report a positive but insignificant correlation (0.024 , p -value > 0.10) between trade association lobbying, $TALobbyExp_{it}$, and firm differentiation, $FirmDiff_DomSales_{it-1}$. These correlations suggest that firm differentiation is not associated with lobbying when tax law is not specific, consistent with H1B and our findings in section 4.3.¹⁷

For 2017, we examine firms in the Food, Beverage & Tobacco industry (four-digit GICS industry 2017). This subset of firms was affected not only by the broader tax rate change but also by more specific provisions for alcoholic beverages. The tax law lowered the federal alcohol excise tax rates for importers of beer, wine and distilled spirits. As such, the law affected beverage companies of these commodities differently than other beverage companies, food companies, and tobacco companies.¹⁸

Using the 118 firms in the Food, Beverage & Tobacco industry in 2017, we find a positive and significant correlation (0.146 , p -value < 0.10) between individual lobbying, $IndivLobbyExp_{it}$, and firm differentiation, $FirmDiff_DomSales_{it-1}$. We also document a negative but insignificant correlation (-0.053 , p -value > 0.10) between trade association lobbying, $TALobbyExp_{it}$, and firm differentiation, $FirmDiff_DomSales_{it-1}$. Our findings using this subset of 2017 firms are generally consistent with our 2004 results for high law specificity. Overall, the correlations in this section suggest that our main results in sections 4.2 and 4.3 are not driven by

¹⁷ The subsample reduces to 408 when we condition on data availability to construct the control variables included in the main analyses. In untabulated multivariate analyses, the coefficient for $FirmDiff_DomSales_{it-1}$ is not statistically significant for either individual or trade association lobbying.

¹⁸ The Beer Institute acknowledged the importance of this legislation for the industry and stated that “we at the Beer Institute plan to do everything that we can to convince lawmakers that this much-needed and beneficial tax relief should be renewed or even made permanent,” suggesting ongoing lobbying efforts (<https://www.beerinstitute.org/tax-relief-brewers-beer-importers-will-provide-solid-economic-benefits/>).

year-specific or period differences and what is unique about our 2004 versus 2017 result is law specificity.

5. CONCLUSION

In this paper, we investigate the role of firm differentiation (competitive environment) in determining companies' lobbying participation, whether this relation is moderated by the specificity of legislative issues being lobbied, and whether lobbying activities are coordinated with other firm strategies. Using lobbying around the American Job Creation Act of 2004, we find evidence that firms lobby individual (collectively) when firm differentiation is high (low) and when the lobbied-for tax law is highly specific. We also document that the relation between firm differentiation and lobbying, in particular individual lobbying, weakens significantly in the case where the tax law is broad, such as a blanket tax rate reduction in 2017, and therefore affects firms more uniformly.

We also use the tax lobbying setting to study whether (1) companies' lobbying decisions correspond with their tax planning strategies and (2) the relation depends on law specificity because of coordination costs between the tax and governments relations departments. Our study provides support that tax lobbying efforts are consistent with other tax planning strategies. However, we do not find evidence that law specificity has an effect on this relation.

Our paper furthers our understanding of corporate tax lobbying by examining lobbying in a competitive environment. In particular, we provide predictions and empirical evidence of how firm differentiation affects whether firms will lobby and the avenue through which they choose to lobby (individually or through trade association). This understanding of how firms tax lobby is particularly important as lawmakers consider additional changes to the tax code. Our study also furthers the literature examining tax planning. By demonstrating that firms strategically tax

lobby to obtain the best return on their tax planning expense considering their competitors' actions, we learn that tax planning is not focused solely on compliance but is strategic in nature. Finally, we further the general corporate lobbying literature by understanding how the role of firm differentiation changes from specific to broad laws and by examining how corporate lobbying behavior coordinates with other corporate activities.

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Appendix A: Variable definitions

Variable	Definition
<i>3yrCashETR</i>	Sum of cash taxes paid for years $t-2$ to t scaled by the sum of pretax income for years $t-2$ to t . The variable is set to missing if the three year sum of pretax income is negative (i.e. loss firm). We winsorize <i>3yrCashETR</i> to range from zero to one.
<i>Capital</i>	Log of distance in miles plus one between the zip code of the firm's headquarters and the zip code of the state's capital building.
<i>CashFlow</i>	Operating income before depreciation net of interest expense, income taxes, and common dividends, all scaled by total assets.
<i>Electoral</i>	Number of electoral votes for the state in which the firm is headquartered.
<i>FirmDiff</i>	Firm differentiation within an industry using by either <i>FirmDiff_DomSales</i> or <i>FirmDiff_HP</i> .
<i>FirmDiff_DomSales</i>	Firm differentiation calculated as the absolute value of the firm's domestic sales ratio (domestic sales to total sales) less industry's average domestic sales ratio, scaled by the standard deviation of the industry's domestic sales ratio. It quantifies the distance between the firm's domestic sales ratio from the industry mean in terms of number of standard deviations.
<i>FirmDiff_HP</i>	Firm differentiation calculated as the average differentiation scores for each firm (e.g., on average, how differentiated is the firm from other firms in the industry). We compute a firm-pair differentiation score as one minus the similarity score from Hoberg and Phillips (2010, 2016).
<i>GeoSegments</i>	Number of geographic segments.
<i>IndivLobbyExp</i>	Log of individual tax lobbying expenditures plus one. Tax lobbying is all lobbying expenses listed in Opensecrets.org related to a tax law. If lobbying is related to more than one issue, we assume the amount related to taxation is proportional to the number of issues lobbied.
<i>Leverage</i>	Leverage calculated as the sum of long-term debt and debt in current liabilities divided by total assets.
<i>LobbyExp</i>	Lobbying expenditures using <i>TotalLobbyExp</i> , <i>IndivLobbyExp</i> or <i>TALobbyExp</i> .
<i>LogSales</i>	Log of sales plus one.
<i>LowSpecificity</i>	An indicator variable equal to one when the law being lobbied for is low specificity and zero otherwise. It is measured as an indicator of the year 2017.
<i>MktShare</i>	Market share of company in six-digit GICS industry.

Variable	Definition
<i>MTB</i>	Market to book ratio as market value of equity divided by book value of equity.
<i>PAC</i>	Log of PAC contributions plus one.
<i>R&D</i>	R&D expense scaled by sales.
<i>SimilarSales</i>	Degree to which industry is composed of firms of similar sales volume calculated as one minus the market concentration. Market concentration is measured as the Herfindahl-Hirschman Index, scaled to 0 to 1.
<i>TALobbyExp</i>	Log of trade association tax lobbying expenditure plus one. We focus on trade associations that have spent at least \$50,000 for tax lobbying from 1998 to 2016. We also set firm-level trade association lobbying expenditures equal to zero if they are less than 25 percent of the firm's individual lobbying expenditures because firms may join a trade association for other reasons besides lobbying, such as networking and advertising.
<i>TotalLobbyExp</i>	Sum of <i>IndivLobbyExp</i> and <i>TALobbyExp</i> representing all the money the firm paid in tax lobbying expenses during the year according to opensecrets.org .

Appendix B: Lobbying Game

We use a stylized game theory model to study firms' lobbying decisions in a competitive environment. Our game has two players in a two firm industry: Player 1 represents the player whose preferred lobbying outcome we model, and Player 2 represents the other firm in the industry. We focus on a two firm industry to develop our game; however, we note that our predictions regarding Player 2 would apply to all other players in an n-player game or industry.

In our game, each player can take one of three actions, each of which have an associated lobbying cost: (1) to lobby individually (e.g., pays lobbyists directly) with cost of C_d , (2) to lobby cooperatively with the other player (e.g., lobbies through a trade association) with cost of C_{ta} , or (3) to not lobby with cost of zero.¹⁹ We assume that $C_d > C_{ta} > 0$ because a firm lobbying directly bears the entire cost of lobbying while lobbying through a trade association allows the cost to be shared among a number of firms. We denote the probability of the desired legislative change occurring as ρ .²⁰

The benefits of lobbying in a competitive environment come from a potential cost competitive advantage, which allows a firm to produce equivalent goods at a lower price than competitors (Porter, 1998). Some competitive advantages come from government interference (patents, tax breaks, etc.), barriers to entry, or superior processes or service. We focus on a competitive cost advantage that is created by a tax law change due to lobbying.

¹⁹ We note that firms may choose to both lobby individually and through a trade association, which is a limitation of the model but allows us to clearly delineate the incentives to lobby individually versus through a trade association. In our empirical analysis, we allow for and test for such possibilities. We also acknowledge that the cost of influencing tax regulation through lobbying will vary based on the connections and relationships the firm has developed (Brown et al., 2015) as well as the lobbying strategy taken (Hillman and Hitt, 1999). However, for parsimony we assume that any firm or group of firms lobbying for a particular tax regulation will have to pay the same amount.

²⁰ We acknowledge that the efficacy of lobbying is an important topic (e.g. Brown et al., 2015; Hillman and Hitt, 1999; Lux et al., 2011) but would unnecessarily increase the complexity of our models. Accordingly, we simply assume it is constant regardless of firm type or how the lobbying is being accomplished.

Because taxes represent an expense to the firm, a reduction of this expense due to lobbying provides a competitive cost advantage relative to competitors that do not benefit from a reduction. If competitors gain a similar cost reduction, then the advantage ceases to exist. In a competitive industry in which all companies fully benefit from a tax law change, firms may not gain a competitive advantage over direct competitors; however, each firm in the industry may be better off because they have gained a competitive cost advantage over other industries that produce substitute goods. Accordingly, the benefit a company receives from tax lobbying depends not only on its own tax savings, but also on the possible tax savings of its competitors both within and outside of their industry.

As such, we classify the benefit of lobbying into a within-industry and an outside-industry competitive advantage. For both, we define the competitive advantage as the excess per unit tax benefit a player receives from lobbying over another firm. We then multiply the per unit benefit by volume to scale the size of the benefit. We define each players' payout as follows:

$$\text{Player 1:} \quad P_1 = \rho[(b_1 - b_2)V_1 + (b_1 - b_o)V_1] - C \quad (\text{B1})$$

$$\text{Player 2:} \quad P_2 = \rho[(b_2 - b_1)V_1 + (b_2 - b_o)V_2] - C \quad (\text{B2})$$

where b_i is the per unit benefit for each player and b_o is the per unit benefit firms outside Player 1's industry; V_i is the volume of units each player produces; ρ is the probability of the desired legislative change; and C represents the lobbying cost (C_d , C_{ta} , or 0). Thus in equation (B1) the term $(b_1 - b_2)V_1$ represents Player 1's within-industry competitive advantage and $(b_1 - b_o)V_1$ represents Player 1's outside-industry competitive advantage. Though similar to Player 1's payout, Player 2's payout in (B2) comes from the advantage Player 1 gains over Player 2 (a

disadvantage for Player 2), the competitive advantage Player 2 gains over firms outside the industry and the cost to lobby.²¹

Player 1 often receives greater benefits because we construct the game such that the players lobby for Player 1's preferred tax regulation. If Player 2 is very similar to Player 1, it derives benefits from lobbying similar to those for Player 1's. However, substantial product and structural differentiation in the industry enables Player 1 to gain significantly more benefits from lobbying than Player 2 (Barrick and Brown, 2017). Accordingly, we state Player 2's per unit benefit in terms of Player 1's per unit benefit as:

$$b_2 = \varphi b_1 \tag{B3}$$

where φ is the within-industry similarity and $(1 - \varphi)$ is the within-industry differentiation. φ varies from zero (total differentiation) to one (no differentiation) and designates the degree to which products and structure vary within an industry. If there is no differentiation, then a tax law change would have the same impact on the tax outcomes of all firms within an industry. If there is high differentiation, a tax law change may impact only one firm within an industry. Similarly, we state the benefit of firms outside the industry in terms of Player 1's benefit as follows:

$$b_0 = \omega b_1 \tag{B4}$$

where ω is the outside-industry similarity and $(1 - \omega)$ is the outside-industry differentiation.

We substitute equations (B3) and (B4) into equations (B1) and (B2), respectively, and simplify payouts for each player to discuss the implications of the model:

$$P_1 = \rho[(1 - \varphi)b_1 V_1 + (1 - \omega)b_1 V_1] - C \tag{B5}$$

$$P_2 = \rho[(\varphi - 1)b_1 V_1 + (\varphi - \omega)b_1 V_2] - C \tag{B6}$$

²¹ Given that Player 2 lobbies for Player 1's preferred tax law change, Player 2's concern is the competitive advantage Player 1 could gain over Player 2. Therefore, we use Player 1's within-industry competitive advantage, which is based on Player 1's volume, when defining the payout for Player 2.

We assume ρ and C are fixed in our model, and thus the player payout is a function of the per unit benefit to Player 1 (b_1), the within-industry differentiation ($1 - \varphi$), the outside-industry differentiation ($1 - \omega$), and volume (V). Both players' payout has a linear and positive relation with volume and the per unit benefit.

Discussion of Model Implications

Player 1's within-industry competitive advantage is strongest when there is high within-industry differentiation (φ is close to zero). When within-industry differentiation is low (φ is close to one), Player 1 no longer receives a within-industry competitive advantage and its only benefit comes from the competitive advantage gained from outside-industry differentiation. Player 1's outside-industry competitive advantage is strongest when outside-industry differentiation is high (ω is zero) and ceases to exist as outside-industry differentiation decreases (ω is one).

For Player 2, the within-industry competitive advantage is a disadvantage as it represents the advantage Player 1 has over Player 2 with a tax law change. Therefore, Player 2's within-industry competitive advantage is a negative value when within-industry differentiation is high (φ is close to zero) and approaches zero as within-industry differentiation is low (φ is close to one). Player 2's benefit derives from its outside-industry competitive advantage, which is strongest when outside-industry differentiation is high (ω is close to zero). Thus, Player 2 maximizes benefits from lobbying when within-industry differentiation is low and outside-industry differentiation is high.²²

²² To extend our model to an N-player game, we can view Players 3 through N as having the same basic relationship with Player 1 as Player 2 does in our 2-player game. We require only two changes to modify Player 2's payout in equation (10) to apply to Players 3 through N. First, the volume of Player 2, V_2 , changes to reflect the volume of each specific player, V_N . Second, because φ as defined above represents the relation between b_1 and b_2 , we modify φ for each specific player, φ_N . These two changes do not alter the behavior and preferences of Players 3 through N compared to Player 2. Accordingly, we continue to model a two-player game for parsimony but note that our implications apply to an N-player game and to our empirical analysis where industry size is not limited to two firms.

To facilitate the presentation, we simplify the payouts in equations (B5) and (B6) to B_1-C and B_2-C , respectively, where B_1 and B_2 summarize the competitive advantage from differentiation as outlined above. We examine these payouts using a game theory matrix:

		Player 2		
		<u>Lobby Individ</u>	<u>Trade Assoc</u>	<u>Not Lobby</u>
Player 1	<u>Lobby Individ</u>	B_1-C_d, B_2-C_d	B_1-C_d, B_2-C_{ta}	B_1-C_d, B_2
	<u>Trade Assoc</u>	B_1-C_{ta}, B_2-C_d	B_1-C_{ta}, B_2-C_{ta}	$-C_{ta}, 0$
	<u>Not Lobby</u>	B_1, B_2-C_d	$0, -C_{ta}$	$0, 0$

Suppose Player 1 chooses to lobby individually while Player 2 chooses not to lobby (top right corner of matrix). Player 1 receives a payout of $B_1 - C_d$ (benefits from lobbying less the cost of lobbying individually) and Player 2 receives a payout of B_2 (benefits from lobbying). However, B_1 is not necessarily equal to B_2 as discussed above.

We use a Nash equilibrium to determine player-preferred actions. For example, each player, in taking a particular action, is playing a best response to the others' strategy choice.²³ We narrow the nine action profiles down to four possible Nash equilibria (indicated in bold font): (1) Player 1 does not lobby while Player 2 lobbies individually, (2) Players 1 and 2 both lobby through a trade association, (3) Player 1 lobbies individually while Player 2 does not lobby, and (4) neither Player 1 nor Player 2 lobby.

To evaluate these four possibilities, we focus on the details of the benefits of lobbying in equations (B5) and (B6). First, we examine the situation where Player 1 does not lobby and Player 2 lobbies individually. This outcome is Player 1's most preferred outcome: Player 1 maximizes its benefit while incurring no costs. However, Player 2 is not likely to benefit from this strategy. If any within-industry differentiation exists, then Player 1 gains a competitive

²³ Nash equilibria do not always represent the best outcome for both players but are the most likely outcomes given that all players are rational and trying to maximize their own payout given other players actions. Importantly, in any given game, multiple Nash equilibria can exist and all could be reasonable outcomes of the game.

advantage over Player 2. Thus, we deem this scenario unlikely and if Player 2 lobbies individually, it will lobby for its own preferred tax change rather than Player 1's. Second, we examine the action set where Player 1 lobbies individually and Player 2 does not lobby. This outcome is a Nash equilibrium when Player 1's within- and outside-industry competitive advantages from lobbying exceed the cost to lobby individually ($B_1 > C_d$). Increases of within-industry differentiation ($1 - \varphi$), outside-industry differentiation ($1 - \omega$), and volume (V) will increase Player 1's benefits (B_1). Accordingly, our model suggests the following propositions for individual lobbying:

P1a: Individual lobbying is more likely when firm sales volume is high.

P1b: Individual lobbying is more likely when within-industry differentiation is high.

P1c: Individual lobbying is more likely when outside-industry differentiation is high.

Third, we examine the action set where both players lobby through a trade association. This outcome is a Nash equilibrium when both players benefit more than the cost to lobby cooperatively. This situation is most likely when within-industry differentiation is low (φ is close to one). In addition, Player 2 is more willing to lobby for Player 1's preferred tax change when Player 1's volume is relatively smaller, reducing the within-industry competitive advantage that Player 1 can obtain over Player 2. Finally, outside-industry differentiation must be high Player 2 to lobby for Player 1's preferred tax change, which increases both Player 1 and Player 2's benefits from lobbying. As such, we suggest the following propositions:

P2a: Cooperative lobbying is more likely when no firm in the industry has significantly more sales volume than others.

P2b: Cooperative lobbying is more likely when within-industry differentiation is low.

P2c: Cooperative lobbying is more likely when outside-industry differentiation is high.

Finally, we examine the action set in which neither player lobbies. This outcome occurs if neither player can obtain a sustainable competitive advantage or if the possible competitive advantage is smaller than the cost to lobby. Although this scenario is possible, we are interested in examining when and why firms lobby, and therefore, do not focus further on this scenario.

Next, we expand our model to consider law specificity by multiplying the benefits from lobbying by σ , which represents law specificity and varies from zero (law affects all firms similarly) to one (law affects only one firm). This modifies equations (B5) and (B6) to:

$$P_1 = \sigma \cdot \rho [(1 - \varphi)b_1V_1 + (1 - \omega)b_1V_1] - C \quad (\text{B7})$$

$$P_2 = \sigma \cdot \rho [(\varphi - 1)b_1V_1 + (\varphi - \omega)b_1V_2] - C \quad (\text{B8})$$

If σ is close to one (very specific law), then equations (B7) and (B8) simplify to (B5) and (B6), respectively. Here, we expect propositions P1 and P2 to hold as discussed above. When σ approaches zero (very broad law), then the role of differentiation is less important: only firms with very large V will have benefits greater than their cost.

Above we develop propositions regarding outside-industry differentiation. Although this construct is clear in our model, empirically, it is difficult to measure because of lack of variation in the differentiation measures (e.g., we find that outside-industry differentiation is high for the majority of the sample). Also, our propositions suggest that outside-industry differentiation always increases the likelihood of lobbying whether individually or through a trade association; therefore, this relation does not affect how lobbying differs across law specificity or how it coordinates with other firm tax strategies. Consequently, we do not include measures of outside-industry differentiation in empirical tests.²⁴

²⁴ Our model and the resulting propositions focus on whether or not a firm will lobby and whether they will lobby individually or cooperatively. Also of interest is how much firms will spend to lobby. We note that with changes to our model, the same factors that drive the decision to lobby also drive the how much a firm is willing to spend.

TABLE 1: Sample selection

This table summarizes the sample selection process for the main analyses in Tables 3 and 4. We begin with all firms available in Compustat and CRSP for calendar years 2004 and 2017. We then identify observations with data necessary to calculate the control variables. We exclude GICS industry groups that are not likely to have production or development activities qualified for the deduction: utilities, transportation, telecommunication services, banks, diversified financials, insurance, real estate, and commercial and professional services. We also exclude observations that do not have data to calculate firm differentiation using domestic sales. Our final sample in 2004 (2017) consists of 4,245 (2,741) firm-year observations. When we proxy for firm differentiation using the Hoberg-Philips score, the sample size reduces to 3,280 and 2,233 for 2004 and 2017, respectively. The sample size is also smaller for other analyses because of data availability to calculate variables.

Panel A: 2004 sample

Firms in Compustat and CRSP for 2004	7,645
Less: observations missing data required to calculate variables	(1,889)
Less: observations of firms in excluded industries	(1,508)
Less: observations without firm differentiation (domestic sales)	(3)
Final sample	4,245

Panel B: 2017 sample

Firms in Compustat and CRSP for 2017	5,587
Less observations missing data required to calculate variables	(1,464)
Less observations of firms in excluded industries	(1,381)
Less: observations without firm differentiation (domestic sales)	(1)
Final sample	2,741

TABLE 2: Descriptive statistics

This table reports summary statistics for our sample. Panel A presents the firm-level descriptive statistics. Levels of significance are indicated by *, **, and ***, for 10, 5, and 1 percent, respectively. Panel B summarizes the distribution of firms across four-digit GICS industry groups. Continuous variables are winsorized at the 1st and 99th percentiles.

Panel A: Variables used in regressions

	2004			2017			Mean₂₀₁₇ – Mean₂₀₀₄
	Mean	Std Dev	N	Mean	Std Dev	N	
IndivLobbyExp _{it}	0.523	2.549	4,245	1.272	3.722	2,741	0.749***
TALobbyExp _{it}	0.530	2.212	4,245	0.872	2.639	2,741	0.342***
TotalLobbyExp _{it}	1.034	3.295	4,245	2.092	4.291	2,741	1.057***
FirmDiff_DomSales _{t-1}	0.632	0.483	4,245	0.647	0.471	2,741	0.014
FirmDiff_HP _{t-1}	0.853	0.017	3,280	0.847	0.027	2,233	-0.006***
3yrCashETR _t	0.138	0.204	3,680	0.194	0.212	1,548	0.056***
LogSales _{t-1}	4.626	2.438	4,245	5.582	2.655	2,741	0.955***
SimilarSales _{t-1}	0.922	0.049	4,245	0.909	0.058	2,741	-0.013
MTB _{t-1}	2.835	9.485	4,245	2.893	11.058	2,741	0.058
Leverage _{t-1}	0.316	0.580	4,245	0.336	0.533	2,741	0.020
R&D _{t-1}	0.488	2.770	4,245	0.985	4.382	2,741	0.497***
CashFlow _{t-1}	0.027	0.160	4,245	0.022	0.172	2,741	-0.005***
MktShare _{t-1}	0.005	0.016	4,245	0.009	0.226	2,741	0.004***
GeoSegments _{t-1}	2.133	1.723	4,245	2.530	2.118	2,741	0.396***
Capital _t	5.897	1.561	4,245	6.024	1.503	2,741	0.127***
Electoral _t	1.710	0.867	4,245	1.571	0.797	2,741	-0.139***
PAC _t	0.907	2.994	4,245	0.957	3.009	2,741	0.050

TABLE 2 (continued)*Panel B: Distribution of firms across industries for 2004 and 2017*

GICS Industry Group (four-digit)	N	Percent
Energy	478	8.67
Materials	326	5.91
Capital Goods	544	9.87
Automobiles & Components	85	1.54
Consumer Durables & Apparel	265	4.81
Media	255	4.63
Consumer Services	180	3.27
Retailing	327	5.93
Food & Staples Retailing	58	1.05
Food, Beverage & Tobacco	167	3.03
Household & Personal Products	65	1.18
Health Care Equipment & Services	584	10.60
Pharmaceuticals, Biotechnology & Life Sciences	533	9.67
Software & Services	197	3.57
Technology Hardware & Equipment	676	12.26
Semiconductors & Semiconductor Equipment	544	9.87
Media & Entertainment	228	4.14

TABLE 3: Multivariate analyses of individual and trade association lobbying as a function of firm differentiation when tax law specificity is high (2004)

This table reports the Tobit regression results of individual and trade association lobbying as a function of firm differentiation when the lobbied-for tax law is specific. We focus on 2004 to proxy for high tax law specificity. Robust standard errors, clustered by industry, are reported in parentheses. Levels of significance are indicated by *, **, and ***, for 10, 5, and 1 percent, respectively. We report one-tailed tests for firm differentiation variables.

Panel A: Firm differentiation proxied by domestic sales

VARIABLES	(1) IndivLobbyExp _{it}	(2) TALobbyExp _{it}
FirmDiff_DomSales _{it-1}	3.906*** (1.235)	-2.931** (1.580)
LogSales _{it-1}	5.032*** (0.513)	3.476*** (0.552)
SimilarSales _{it-1}	-17.211** (8.261)	30.252* (17.490)
MTB _{it-1}	0.089 (0.099)	0.122** (0.061)
Leverage _{it-1}	-3.047 (4.244)	0.070 (1.396)
R&D _{it-1}	1.243*** (0.450)	-13.030 (10.661)
CashFlow _{it-1}	-16.714* (8.654)	-11.998* (6.377)
MktShare _{it-1}	-24.367 (27.429)	-48.805 (57.817)
GeoSegments _{it-1}	0.663* (0.378)	-0.422 (0.501)
Capital _{it}	-0.493 (0.529)	-0.229 (0.487)
Electoral _{it}	-0.305 (0.737)	-0.898 (0.903)
PAC _{it}	1.786*** (0.156)	0.219 (0.204)
Constant	-45.813*** (6.914)	-69.238*** (17.518)
Observations	4,245	4,245
Pseudo R ²	0.33	0.07

TABLE 3 (continued)*Panel B: Firm differentiation proxied by Hoberg-Philips score*

VARIABLES	(1) IndivLobbyExp _{it}	(2) TALobbyExp _{it}
FirmDiff_HP _{it-1}	53.566** (31.056)	-104.313*** (49.906)
LogSales _{it-1}	4.751*** (0.515)	2.901*** (0.609)
SimilarSales _{it-1}	-9.691 (11.251)	16.698 (17.449)
MTB _{it-1}	0.199 (0.128)	0.170* (0.102)
Leverage _{it-1}	-2.206 (4.875)	6.980** (2.724)
R&D _{it-1}	1.110*** (0.402)	-15.351 (10.751)
CashFlow _{it-1}	-18.662 (13.555)	-22.652** (9.703)
MktShare _{it-1}	-8.909 (25.371)	-33.713 (56.592)
GeoSegments _{it-1}	0.978** (0.430)	-0.486 (0.459)
Capital _{it}	-0.330 (0.582)	-0.190 (0.517)
Electoral _{it}	0.593 (0.685)	-1.451 (1.007)
PAC _{it}	1.797*** (0.158)	0.244 (0.190)
Constant	-98.164*** (26.715)	34.961 (53.233)
Observations	3,280	3,280
Pseudo R ²	0.30	0.06

TABLE 4: Multivariate analyses of individual and trade association lobbying as a function of firm differentiation contingent on law specificity

This table reports the regression results of individual and trade association lobbying as a function of firm differentiation contingent on law specificity. The indicator variable, *LowSpecificity*, is equal to one when the year is 2017 and equal to zero otherwise. Robust standard errors, clustered by industry, are reported in parentheses. Levels of significance are indicated by *, **, and ***, for 10, 5, and 1 percent, respectively. We report one-tailed tests for firm differentiation and interaction variables.

Panel A: Firm differentiation proxied by domestic sales

VARIABLES	(1) IndivLobbyExp _{it}	(2) TALobbyExp _{it}
FirmDiff_DomSales _{it-1}	3.558*** (1.191)	-3.259** (1.606)
FirmDiff_DomSales _{it-1} × LowSpecificity	-2.344** (1.408)	1.469 (1.628)
LowSpecificity	6.929*** (1.339)	1.069 (1.567)
LogSales _{it-1}	4.954*** (0.480)	3.442*** (0.378)
SimilarSales _{it-1}	-4.849 (8.205)	1.546 (12.933)
MTB _{it-1}	0.030 (0.047)	0.026 (0.044)
Leverage _{it-1}	-0.320 (1.943)	2.581** (1.121)
R&D _{it-1}	0.381*** (0.047)	-2.976 (1.866)
CashFlow _{it-1}	-5.829 (6.007)	0.681 (4.018)
MktShare _{it-1}	31.346** (15.859)	-74.405*** (27.799)
GeoSegments _{it-1}	0.521** (0.264)	-0.074 (0.292)
Capital _{it}	-0.662** (0.279)	-0.057 (0.388)
Electoral _{it}	-1.168* (0.620)	-0.634 (0.615)
PAC _{it}	1.323*** (0.117)	-0.044 (0.132)
Constant	-52.808*** (8.851)	-41.984*** (13.669)
Observations	6,986	6,986
Pseudo R ²	0.27	0.07

TABLE 4: (continued)*Panel B: Firm differentiation proxied by Hoberg-Philips score*

VARIABLES	(1) IndivLobbyExp _{it}	(2) TALobbyExp _{it}
FirmFirmDiff_HP _{it-1}	59.779** (30.699)	-101.617*** (46.084)
FirmDiff_HP _{it-1} × LowSpecificity	-80.160** (46.422)	58.343 (50.635)
LowSpecificity	73.717* (39.819)	-48.431 (43.387)
LogSales _{it-1}	4.765*** (0.482)	3.046*** (0.423)
SimilarSales _{it-1}	-2.106 (10.200)	-5.246 (12.939)
MTB _{it-1}	0.066 (0.062)	0.030 (0.051)
Leverage _{it-1}	-0.934 (1.999)	7.339*** (1.875)
R&D _{it-1}	0.313*** (0.057)	-4.490** (2.232)
CashFlow _{it-1}	-8.469 (8.232)	-6.858 (6.984)
MktShare _{it-1}	39.619*** (15.365)	-67.843** (27.773)
GeoSegments _{it-1}	0.613** (0.263)	-0.072 (0.262)
Capital _{it}	-0.577* (0.304)	-0.160 (0.429)
Electoral _{it}	-0.809 (0.657)	-0.813 (0.709)
PAC _{it}	1.337*** (0.117)	-0.020 (0.136)
Constant	-104.084*** (27.519)	52.529 (49.216)
Observations	5,513	5,513
Pseudo R ²	0.25	0.06

TABLE 5: Multivariate analyses of lobbying as a function of tax strategy and tax law specificity

This table reports the regression results of total, individual and trade association lobbying as a function of tax strategy contingent on tax law specificity. We proxy for tax strategy using three-year cash ETR measured from years t-2 to t. The indicator variable, *LowSpecificity*, is equal to one when the year is 2017 and equal to zero otherwise. Robust standard errors, clustered by industry, are reported in parentheses. Levels of significance are indicated by *, **, and ***, for 10, 5, and 1 percent, respectively. We report one-tailed tests for firm differentiation, cash ETR, and interaction variables.

Panel A: Firm differentiation proxied by domestic sales

VARIABLES	(1) TotalLobbyExp _{it}	(2) IndivLobbyExp _{it}	(3) TALobbyExp _{it}
3yrCashETR _{it}	-6.274*** (2.107)	-5.997** (3.492)	-6.138** (3.251)
3yrCashETR _{it} × LowSpecificity	2.766 (3.234)	2.836 (3.640)	1.245 (5.032)
LowSpecificity	2.470*** (0.914)	3.941*** (0.819)	1.801 (1.439)
FirmDiff_DomSales _{it-1}	0.286 (0.710)	2.876*** (0.934)	-2.505** (1.183)
LogSales _{it-1}	3.570*** (0.275)	5.494*** (0.380)	3.461*** (0.483)
SimilarSales _{it-1}	0.126 (7.532)	-2.180 (8.812)	1.223 (14.612)
MTB _{it-1}	0.090* (0.050)	0.104 (0.076)	0.094 (0.066)
Leverage _{it-1}	2.355** (1.145)	2.185 (2.256)	2.403 (1.492)
R&D _{it-1}	-0.898 (1.984)	7.164*** (1.399)	-13.895 (12.883)
CashFlow _{it-1}	-6.144 (4.672)	1.799 (8.828)	-6.365 (6.203)
MktShare _{it-1}	25.267** (11.673)	16.117 (13.526)	-73.171** (31.417)
GeoSegments _{it-1}	0.141 (0.193)	0.512* (0.291)	-0.012 (0.323)
Capital _{it}	-0.299 (0.263)	-0.828*** (0.290)	0.043 (0.455)
Electoral _{it}	-0.787* (0.438)	-1.001* (0.580)	-0.908 (0.694)
PAC _{it}	0.819*** (0.084)	1.224*** (0.108)	-0.058 (0.156)
Constant	-33.877*** (8.414)	-57.216*** (8.613)	-41.002** (16.514)
Observations	5,228	5,228	5,228
Pseudo R ²	0.17	0.28	0.06

TABLE 5 (continued)*Panel B: Firm differentiation proxied by Hoberg-Philips score*

VARIABLES	(1) TotalLobbyExp _{it}	(2) IndivLobbyExp _{it}	(3) TALobbyExp _{it}
3yrCashETR _{it}	-5.719*** (2.078)	-4.404* (3.611)	-6.007** (3.288)
3yrCashETR _{it} × LowSpecificity	2.310 (3.277)	1.496 (3.983)	0.455 (5.003)
LowSpecificity	2.407*** (0.870)	4.362*** (0.899)	1.513 (1.353)
FirmDiff_HP _{t-1}	-22.170 (27.991)	34.256* (28.397)	-61.193** (35.397)
LogSales _{it-1}	3.414*** (0.306)	5.350*** (0.400)	3.058*** (0.563)
SimilarSales _{it-1}	-0.744 (8.319)	1.987 (11.563)	-3.513 (14.761)
MTB _{it-1}	0.137** (0.057)	0.183** (0.093)	0.119 (0.087)
Leverage _{it-1}	4.946*** (1.727)	2.183 (2.588)	7.431*** (2.399)
R&D _{it-1}	-1.036 (2.487)	9.050*** (1.735)	-15.011 (13.113)
CashFlow _{it-1}	-8.072 (5.955)	0.682 (10.073)	-9.103 (8.012)
MktShare _{it-1}	25.162** (11.923)	22.255 (14.181)	-71.157** (32.385)
GeoSegments _{it-1}	0.201 (0.163)	0.623** (0.298)	-0.019 (0.334)
Capital _{it}	-0.331 (0.289)	-0.700** (0.309)	-0.114 (0.477)
Electoral _{it}	-0.804* (0.434)	-0.630 (0.611)	-1.162 (0.767)
PAC _{it}	0.801*** (0.084)	1.237*** (0.108)	-0.043 (0.164)
Constant	-13.330 (29.712)	-89.932*** (23.495)	17.784 (43.610)
Observations	4,235	4,235	4,235
Pseudo R ²	0.15	0.26	0.04

TABLE 6: Robustness tests of lobbying as a function of firm differentiation using specific industries

This table reports robustness tests for lobbying as a function of firm differentiation using specific industries. Panel A reports the Pearson correlations for individual lobbying, trade association lobbying, and firm differentiation within the Capital Goods industry group in 2004 (GICS industry group 2010). Panel B reports the Pearson correlations in the Food, Beverage & Tobacco industry group in 2017 (GICS industry group 3020). * denotes significance at the 10 percent level.

Panel A: Correlation table for Capital Goods industry group in 2004 (N=499)

	<i>IndivLobbyExp_{it}</i>	<i>TALobbyExp_{it}</i>
<i>TALobbyExp_{it}</i>	-0.046	
<i>FirmDiff_DomSales_{t-1}</i>	-0.039	0.024

Panel B: Correlation table for Food, Beverage & Tobacco group in 2017 (N=118)

	<i>IndivLobbyExp_{it}</i>	<i>TALobbyExp_{it}</i>
<i>TALobbyExp_{it}</i>	-0.114*	
<i>FirmDiff_DomSales_{t-1}</i>	0.146*	-0.053