

Does Corporate Tax Lobbying Affect a Firm's Tax Rate?

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Abstract

Corporate lobbying has undergone a large amount of growth in the past decade and it continues to overshadow political campaign contributions. However, empirical studies on the topic are limited. By using a unique dataset of U.S. firms with publicly available financial information, I assess the benefits accrued to firms from lobbying for tax purposes. I find that firms that spend more on registered lobbying pay lower effective tax rates. In particular, an increase of 1% on lobbying expenditures lowers effective tax rates by 0.852 percentage points for the average firm that lobbies. When aggregated across all firms, for \$7 billion of total tax lobbying expenditure, this results in a massive amount tax savings of roughly \$65 billion. Therefore, the marginal return for an additional \$1 of lobbying is \$9.

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I. Introduction

This paper examines the effect of corporate lobbying for tax purposes on a company's tax rate. In an efficient market, the corporate lobbying industry would not survive without providing value to the company. However, the exponential growth of the industry implies significant benefit accrued to corporations from their lobbying activities. Clearly, assessing the impact of non-monetary policies such as healthcare regulation is difficult. Therefore, the tax law is one of the only legislations that can be used to accurately quantify lobbying returns.

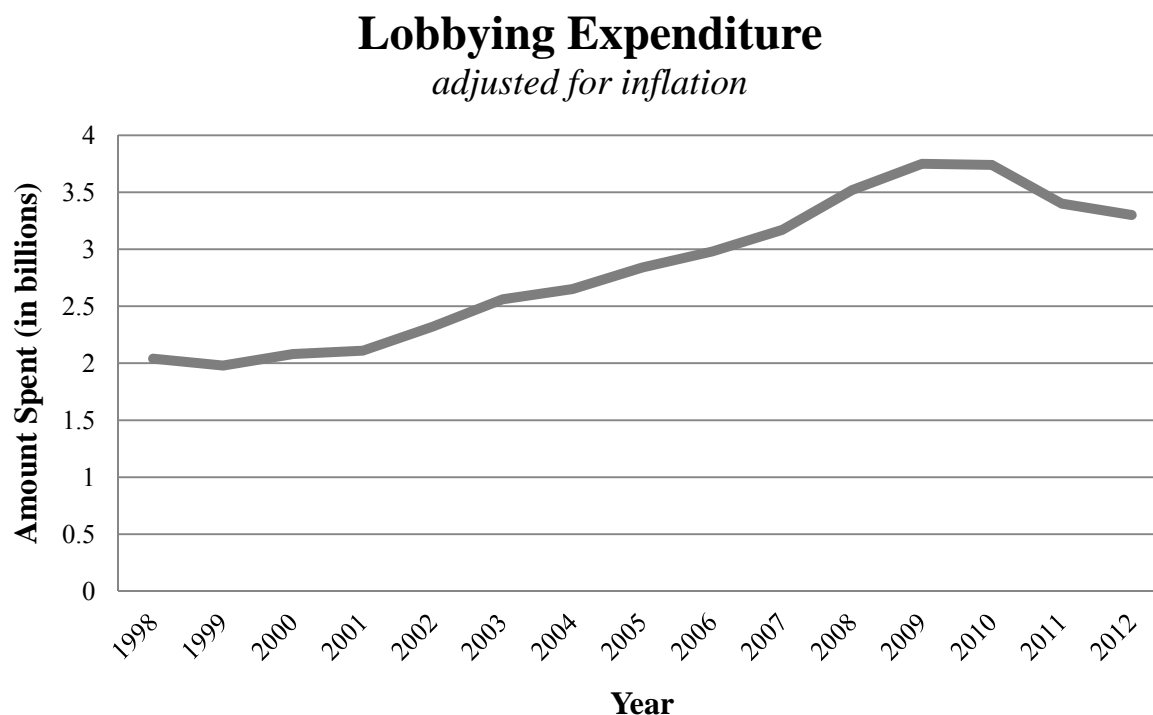
My research is motivated by several factors. Firstly, as seen in Figure 1 below, the lobbying industry has increased immensely and it has had an increasingly important role in the corporate and political system of the United States. Since 2008, the total amount spent by firms on lobbying was over \$3 billion each year, increasing two-fold in under a decade¹. It has been the subject of an important political debate and, to this day, remains a highly contentious issue. Secondly, while firms have varying politically related interests, all firms want to keep taxes low in order to increase net profits. Therefore, lobbying for tax purposes is among the largest lobbying issues in the country. Finally, the aggregate consequences of this paper are significant. If a firm is able to decrease its tax rates from lobbying, when combined across all firms, the government relinquishes the collection of a large amount of taxes.

By matching corporate lobbying expenses with firm-level data of 740 firms ranging from 2002 to 2010, I find a systematic link between firms' lobbying expenditures and their tax rates. Specifically, I estimate that an increase in firms' lobbying expenditures by 1% reduces their effective tax rates by 0.85 percentage points. In addition, I find that the marginal return on \$1 of

¹ "Lobbying Database", *Open Secrets* <http://www.opensecrets.org/lobby/index.php>

lobbying expenditure is \$9 in tax savings. Therefore, my finding suggests that corporate lobbying yields quantifiable tax benefits to firms across all industries.

FIGURE 1: TOTAL LOBBYING EXPENDITURE IN THE U.S. (adjusted for inflation)



The common perception among the public and lobbyists is that lobbying expenditures provide high returns to contributors. Yet, academic research has found inconclusive results.² Even though the amount spent on lobbying is an order of magnitude larger than what is spent on campaign contributions, much of the prior empirical literature focuses on the narrower subset of political spending.³ From the lower amount of research done on lobbying, my paper has several advantages over the previous literature. Firstly, I use tax rates, an explicit measure of assessing the impact of lobbying expenditures. Secondly, I constructed a unique panel 740 individual

² See Ansolabehere, de Figueiredo, and Snyder (2003)

³ For example, Cooper, Gulen, and Ovtchinnikov (2010)

firms across 9 years. Finally, I use more appropriate quantitative methods and include several variables that were omitted in previous literature.

The next section of the paper discusses the prior literature on corporate lobbying. Section III describes the framework and methodology used, followed by section IV which provides details of my data. Section V lays out the results of the analysis while section VI contains some cautions and robustness checks. I conclude and discuss possible avenues for further research in section VII.

II. Prior Literature

Despite the depth of literature on political spending, much of it is directed towards political action committees rather than towards lobbying.⁴ However, as Brasher and Lowery (2006) report, the latter has been overlooked even though it is considerably larger in dollar terms.⁵ In addition, much of the literature focuses on the process of lobbying and how the channels through which firms are able to exert influence rather than the outcome of that influence.⁶ Granted, the processes of exerting influence are important, the result obtained is equally as important, if not more, particularly in the case of corporate lobbying.

However, there has been some research done on lobbying outcomes. Most have focused on corporate spending on specific bills and therefore, have failed to detect broader benefits that firms receive from lobbying.⁷ Alexander, Scholz, and Mazza (2009) considered a tax holiday on repatriated earnings created by the American Jobs Creation Act of 2004 and found that firms lobbying for this provision had a return in excess of \$220 for every \$1 spent on lobbying.⁸ Yet, we cannot extrapolate this result to other forms of lobbying, as the act only provided a one-time tax break to firms.

Furthermore, several others have measured the effect of corporate lobbying on annual stock prices.⁹ However, even after controlling for firm specific drivers of performance, yearly stock prices still contain significant noise and may not adequately represent the impact of

⁴ See Ansolabehere, de Figueiredo, and Snyder (2003) for a summary of the literature on campaign contributions

⁵ See Brasher and Lowery (2006)

⁶ See Bertrand, Bombardini, and Trebbi (2011) and Blanes-i-Vidal, Draca, and Fons-Rosen (2011)

⁷ For example, Hoyt and Toma (1993)

⁸ See Alexander, Scholz, and Mazza (2009)

⁹ See Hill, Kelly, and Van Ness (2011), Chen, Parsley, and Yang (2010), and Kim (2008)

lobbying. Daily stock prices would be a better measure; however, daily data on lobbying is unavailable. Therefore, by specifically considering the impact of tax lobbying on tax rates, I use a clearer measure that minimizes the concerns arising from the use of annual stock prices.

Given the limited research done on corporate lobbying, it is unsurprising that not many researchers have looked at the effects of tax lobbying in particular. However, it remains the subject of much scrutiny and debate.¹⁰ As mentioned earlier, Alexander, Scholz, and Mazza (2009) looked at one particular bill that provided a tax break. In addition, similar to my research, Richter, Samphantharak, and Timmons (2009) observed the impact of tax lobbying on a firm's tax rates. They found that, for the average firm that lobbies, an increase in registered lobbying expenditures by 1% lowers the effective average tax rates in the range of 0.5 to 1.6 percentage points.¹¹

While my research question closely resembles that of Richter et al. (2009), my methodology and quantitative methods differ from theirs and my paper intends to include variables, such as lobbying by industry trade associations, which they have not considered. In addition, their analysis only spans from 1998 to 2004, whereas my paper includes a larger time frame and particularly focuses on the later years when corporate lobbying expenditures increased dramatically. Because of the longer time span, I also have a larger sample of firms in my dataset.

¹⁰ See recent articles such as: Christopher Rowland, "Tax lobbyists help businesses reap windfalls", *Boston Globe* (March 2013) <http://www.bostonglobe.com/news/politics/2013/03/16/corporations-record-huge-returns-from-tax-lobbying-gridlock-congress-stalls-reform/omgZvDPa37DNISqj0G95YK/story.html> and/or The Editorial Board, "One Industry's Hold on the Senate", *New York Times* (April 2013) http://www.nytimes.com/2013/04/02/opinion/one-industrys-hold-on-the-senate.html?hp&_r=1&

¹¹ See Richter, Samphantharak, and Timmons (2009)

III. Framework and Methodology

Corporate Lobbying Activities

Before moving on to the details of the methodology and data, explaining how lobbying works will set the context for the econometric specifications discussed later. Corporate lobbying is an act of transmitting information from corporations to lawmakers. It is not a monetary transaction that results in specific legislation. The lobbying expenses that firms incur go to registered lobbying firms or in-house lobbying operations, not to the lawmakers. These expenses include lobbyists' salaries, overhead expenses, and other related expenses. The lobbyists conduct research on the specific issue and hold meetings with the relevant lawmakers and agencies to argue on behalf of the corporation. Interestingly, Bertrand, Bombardini, and Trebbi (2011) found that while expertise on the issues is central to the lobbying process, lobbyists with personal connections earned a larger premium as opposed to those with expertise.

Therefore, through lobbying, the corporation simply provides information to lawmakers that may be useful to them. The lawmakers, then, act on that information either for the interest of the corporation or against it. This paper assesses whether lobbying activities, through influencing lawmakers, result in beneficial outcomes for corporations in the form of lower tax rates. The exact channels through which tax rates are affected have not been researched extensively and I discuss the possible avenues of further research in that area in section VII.

In my model, I will consider lobbying an investment for the firm, as the firm initially spends money in the hopes of a future gain from that investment. The underlying reasoning behind this is that a firm, in pursuing its goal to maximize profits, would make an investment

only if that investment yields a positive expected return. Investing in lobbying that is expected to have a negative return would not be consistent with our basic assumptions about corporations.

Furthermore, according to economic theory, the marginal return of an investment should be one dollar. However, there are some constraints to lobbying that may have an effect on my analysis. While corporations' lobbying expenditures are not restrained by law, with the new lobbying disclosure policies, corporations might have some public relations concerns if they lobby too much. The social stigma attached to lobbying might act as a constraint, leading to lower than optimal levels of lobbying and therefore, marginal returns greater than one dollar. It's also possible that corporations are constrained in other ways such as the number of issues, for example, tax breaks, that they could lobby for or the amount of political connections they can acquire.

In addition, I measure a firm's ex-post return on lobbying. It is possible that the firm's ex-ante expected return on lobbying, which is largely uncertain, is dollar-for-dollar. Finally, not every firm that lobbies receives benefits from lobbying. Therefore, there might be a certain lower bound of lobbying expenditure, before which a firm does not receive tangible benefits in their tax rates. While it might be in the best interest for the firm to increase their lobbying expenditure, they might have capital constraints that prevent them from doing so. Therefore, those firms that remain below that level may yield negative returns on their lobbying activities. On the other hand, there is probably also an upper bound after which lobbying ceases to be beneficial.

Tax Rates

In general, there are two types of tax rates that could be used for my analysis. The effective tax rate is the most widely reported tax rate in financial statements, which is computed from the reported income statement. As an average, the effective tax rate measures a company's income tax burden from all activities over a period of time. The effective tax rate can reflect overall tax planning at the firm level. Thus, lower effective tax rates may be attributed to more effective tax planning. It is generally measured as:

$$\text{Effective Tax Rate (ETR)} = \frac{\text{Income Taxes}}{\text{Pretax Income or Tax Base}}$$

The second type of tax rate is the statutory tax rate, which is the rate the firm faces on its last dollar of income. The statutory tax rate depends on the tax code and reflects what firms have to pay as taxes on their marginal income. In the U.S., for example, a firm that earns an additional dollar between \$100,000 and \$335,000 in taxable income has to pay a marginal tax rate of 39% on that additional dollar. Table 1 shows the corporate statutory tax rate schedule for companies in the U.S.

TABLE 1: CORPORATE TAX RATE SCHEDULE

Taxable Income Over	But Not Over	Tax Is	Of the Amount Over
\$0	50,000	15%	0
50,000	75,000	\$7,500 + 25%	\$50,000
75,000	100,000	13,750 + 34%	75,000
100,000	335,000	22,250 + 39%	100,000
335,000	10,000,000	113,900 + 34%	335,000
10,000,000	15,000,000	3,400,000 + 35%	10,000,000
15,000,000	18,333,333	5,150,000 + 38%	15,000,000
18,333,333	—	35%	0

Whereas the statutory tax rates for most firms are firms in the United States should be fairly similar, mostly between 25% and 40%, there are wide differences in effective tax rates

across firms. These differences could be due to the structure of statutory tax rates. For example, if a firm falls under the 25% statutory tax bracket, they pay only 15% on the first \$50,000 of taxable income which lowers their effective tax rate. Furthermore, tax credits or benefits reduce the taxes firms pay, which could lower the effective tax rate below the marginal tax rate.

It is very unlikely that firms lobby to change the corporate statutory tax rate schedule when lobbying for tax purposes. On the other hand, it is much more likely that they lobby to get a tax break or a tax credit, for example, for research and development. Therefore, I expect lobbying activity to impact the effective tax rate rather than the marginal tax rate. That is why I used effective tax rates in my analysis.

Empirical Model

According to empirical accounting literature, the effective tax rate can be reduced to the following basic regression:

$$ETR_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \dots + \beta_k X_{kit} + \varepsilon_{it}$$

where X_1, X_2, \dots, X_k are firm specific characteristics such as capital, leverage, return on assets, inventory, etc.¹² This regression drives my analysis and forms the basis for the rest of my empirical strategy. Using the regression model specified by Delgado, Fernandez-Rodriguez, and Martinez-Arias (2012), I use the following as my baseline model:

$$ETR_{it} = \beta_0 + \beta_1 Lobby_{it} + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \beta_4 Capital_{it} + \beta_5 Inventory_{it} \\ + \beta_6 ROA_{it} + \beta_7 Industry_Lobby_{it} + \varepsilon_{it}$$

¹² For example, Delgado, Fernandez-Rodriguez, and Martinez-Arias (2012)

where each observation is per firm per year and the variables are as follows:

- (1) $Lobby_{it}$ = natural log of total lobbying expenditure per firm per year
- (2) $Size_{it}$ = total dollar amount of assets
- (3) $Leverage_{it}$ = long term debt as a percentage of total assets
- (4) $Capital_{it}$ = property, plant and equipment as a percentage of total assets
- (5) $Inventory_{it}$ = inventory as a percentage of total assets
- (6) ROA_{it} = pretax income as a percentage of total assets
- (7) $Industry_Lobby_{it}$ = natural log of total industry trade association lobbying

IV. Data and Summary Statistics

I have compiled a dataset on lobbying, taxes and their economic determinants by merging the Senate Office of Public Records (SOPR) and the CRSP/Compustat database.

Because of the Lobbying Disclosure Act of 1995 (LDA) and the Honest Leadership and Open Government Act of 2007, organizations are required to register and report information on their lobbying activities to the Senate Office of Public Records (SOPR). Two types of registrants are required to report under the LDA – lobbying firms and organizations that conduct in-house lobbying. Under the LDA, lobbying firms are required to file a separate report for each of their clients. The report must specify the revenue generated from that client, the issues for which the firm was engaged in lobbying, the federal agencies contacted and the names of individual lobbyists serving that particular client.

Through SOPR, I have access to lobbying data across different firms and industries. By narrowing down the issue to taxation/internal revenue code, I was able to produce a tax lobbying dataset and annualized lobbying expenses for all firms and matched the firm names with their unique ticker symbols. One caveat, however, is that firms or lobbyists are not required to specify the issue for any lobbying activity. Therefore, if firms lobby for tax purposes but do not report the issue, I may not capture all of the lobbying activity that has occurred for tax purposes. Despite that, I get a fairly large sample of more than 3,500 observations with 740 firms across 9 years. The SOPR data reliably covers all firms' registered lobbying expenditures from 2002 to 2010.

In addition, I annualized the lobbying expenditures by industry trade associations such as the National Banker's Association. These associations conduct vast amounts of lobbying for their respective industries and therefore, in theory, must have an effect on the tax rates across industries. I used the General Industry Classification Standard, developed by MSCI and Standard & Poor's, to classify each trade association in a specific industry and merged the trade association dataset with the firm level data. I then merged the individual firm SOPR data with the financial accounting data on all firms in the CRSP/Compustat database.

The CRSP/Compustat merged database contains financial information for all publicly traded companies, both active and inactive. The CRSP data contains security level historical descriptive information and market data on stocks while the Compustat data contains annual income statement, balance sheet, cash flow, pension, supplemental, and descriptive data items for active and inactive companies. This dataset was able to provide tax information for each company in addition to other financial variables such as inventory, debt, assets, etc.

Additionally, I removed 113 observations which I considered tax rate outliers, including tax rates above one hundred percent or below negative one hundred percent. I consider the implications of this removal in section VI. To measure the effective tax rate, I include other standard firm-level characteristics as explanatory variables in my analysis, in addition to lobbying. Typically, these variables include some measures of size, leverage, capital intensity, inventory intensity, and return on assets. Furthermore, my paper adds another explanatory variable, lobbying expenditures by industry trade associations, as described before.

Descriptive statistics from my dataset are included in Table 2 below:

TABLE 2: DESCRIPTIVE STATISTICS (*dollar amounts in millions*)

Variable	Obs.	Mean	Std. Dev.	Min	Max
Year	3521	2006	2.56	2002	2010
Lobbying Expense	3521	\$2.05	\$4.41	\$0.002	\$71.30
Total Assets	3521	\$83,262.56	\$267,255.5	\$7.70	\$3,001,252
Taxes Paid	3521	\$658.78	\$1836.04	-\$20,612	\$36,530
Pre-Tax Income	3521	\$2137.16	\$6056.87	-\$108,761	\$103,051
Long Term Debt	3517	\$12,756.77	\$42,175.43	\$0	\$486,876
Total Inventory	3468	\$6,041.54	\$34,866.33	\$0	\$472,266.2
Property, Plant & Equipment	3414	\$8,298.33	\$15,302.33	\$0	\$199,548
Effective Tax Rate	3521	24.81%	\$19.83	-98.29%	98.99%
Industry Trade Association Lobbying Expense	3521	\$7.62	\$9.09	\$0	\$49.6

Below, Figure 2 shows the distribution of lobbying expenditures per firm per year while Figure 3 shows the distribution of effective tax rates per firm per year:

FIGURE 2: DISTRIBUTION OF LOBBYING EXPENSE

after removing outliers (> 5,000,000)

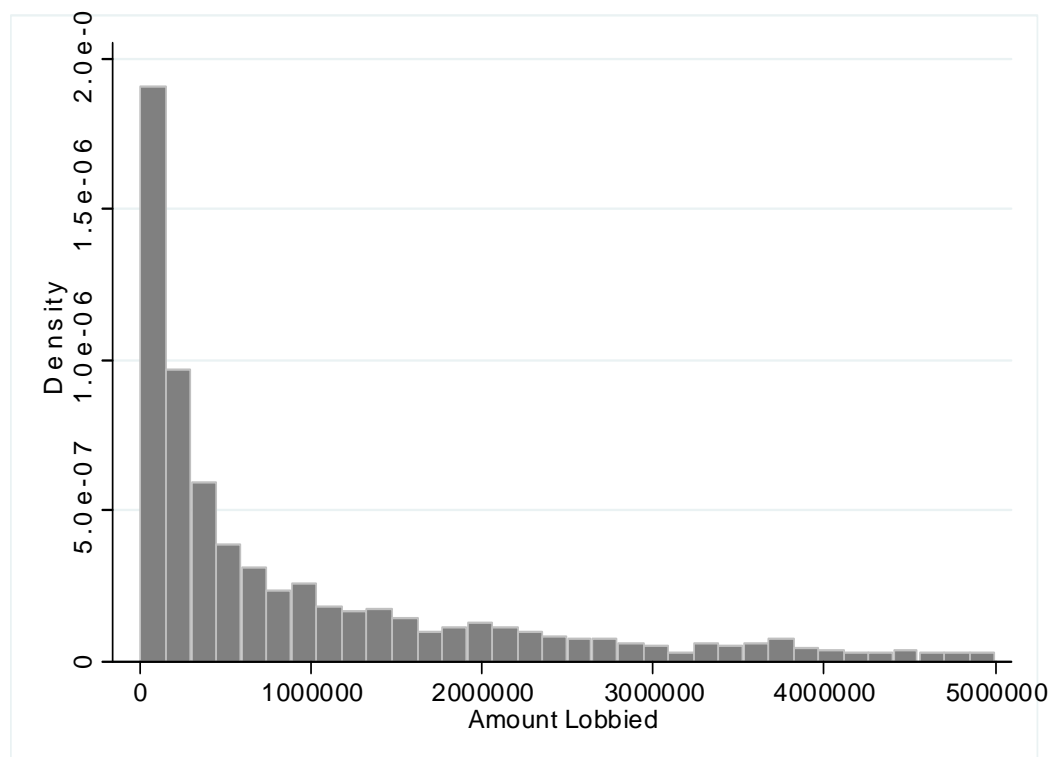
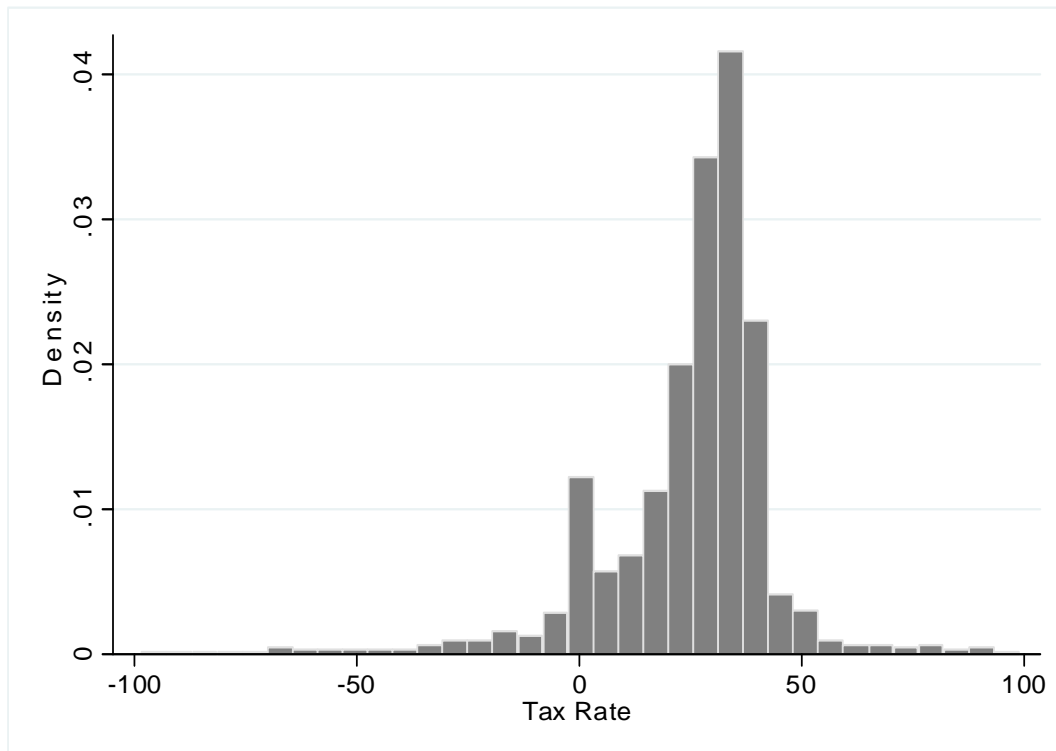


FIGURE 3: DISTRIBUTION OF EFFECTIVE TAX RATE

after removing outliers (< -100% and > 100%)



V. Results

Using the methodology and data described in sections III and IV, I conducted various OLS regressions, the results of which are outlined in Table 3 below. I used firm fixed effects for all of my regressions. While it was possible to use industry fixed effects instead of firm fixed effects, industry fixed effects would not have controlled for the unobserved heterogeneity between firms in the same industry. In addition, I added a macroeconomic variable, change in real GDP, which stays constant for each firm in a given year. This allows me to use time fixed effects while also controlling for macroeconomic factors. In Table 3 below, only column (3) has time fixed effects without controlling for the change in real GDP. It is also worth noting that the time fixed effects were not significant in my regression.

TABLE 3: BASELINE REGRESSION RESULTS

Dependent Variable Independent Variable	Effective Tax Rates				
	(1)	(2)	(3)	(4)	(5)
Lobby	-0.768** (0.34)	-0.148 (0.19)	-0.877** (0.40)	-0.928*** (0.36)	-0.852** (0.35)
Size		-2.37e-06 (1.87e-06)	-2.09e-05*** (7.32e-06)	-2.09e-05*** (7.21e-06)	-1.34e-05*** (4.73e-06)
Leverage		-7.154*** (2.56)	-13.145*** (4.85)	-13.025*** (4.85)	-13.198*** (4.81)
Capital Intensity		2.455* (1.46)	-10.286 (8.32)	-9.937 (8.23)	
Inventory Intensity		-3.682 (4.17)	4.810 (17.24)	4.469 (17.04)	
Return on Assets		35.390*** (2.98)	26.010*** (6.34)	25.685*** (6.25)	26.537*** (6.18)
Industry Lobbying		0.166 (0.25)	0.776 (0.60)	0.765 (0.55)	0.906* (0.54)
Change in Real GDP <i>equivalent to Year FE</i>		-0.101 (0.17)		-0.239 (0.18)	-0.224 (0.17)
Year FE	No	No	Yes	No	No
Firm FE	Yes	No	Yes	Yes	Yes
N	3521	3211	3211	3211	3369
Adj. R ²	0.3255	0.0766	0.3400	0.3396	0.3480

Unit of observation is per firm per year. Lobby is the natural logarithm of lobby expenditures. Size is the total assets of the firm in millions. Leverage is the ratio of the firm's long term debt to its total assets. Capital intensity is the net value of the firm's property, plant and equipment divided by its total assets. Return on assets is the ratio of firm's pre-tax income to its total assets. Inventory intensity is the firm's total inventory divided by its total assets. Industry Lobbying is the natural logarithm of each industry's trade association lobby expenditures. Standard errors are reported in parentheses. Tax outliers were removed before running regressions ($< -100\%$ & $> 100\%$)

My preliminary regression results strengthen the view that lobbying has a significant effect on effective tax rates. Using the regression results in Table 3 column (5), we can see that the effect of lobbying is significant at the 5% confidence level. Specifically, among firms that lobby, for every 1% increase in lobbying expense, the effective tax rate decreases by 0.85 percentage points. While their methodology and data was slightly different, Richter, Samphantharak, and Timmons (2009) similarly found that a 1% increase in lobbying decreases a firm's effective average tax rates by 0.5 to 1.6 percentage points for an average firm that lobbies.

Interestingly, the coefficient on industry trade association lobbying is positive and significant at the 10% level. While there could be other explanations for this finding, it is possible that these trade associations lobby for the benefit of smaller firms that don't have the resources to lobby. In addition, it would be interesting to see if lobbying by other firms within the same industry has a positive or negative effect on a firm's tax rates. As I mention in section VII, this is an area where further research might be beneficial.

Moreover, several of my independent control variables were insignificant. In particular, capital intensity, and inventory intensity remained insignificant and, when taken out in column (5), did not decrease the adjusted R^2 . However, the coefficient on lobbying became less significant and decreased in absolute value.

Overall, I find that among firms that lobby, firms that spend more on registered lobbying pay lower effective tax rates. I can also aggregate my result to calculate a rough measure of the

total taxes saved by all firms. In my nine year sample, the sum of the pretax income or tax base for all firms that lobbied was more than \$7.5 trillion. Multiplying the total pretax income with the tax decrease of 0.852 percentage points result in tax savings across all firms of roughly \$65 billion. This means that for a total of \$7 billion in tax lobbying expenditures firms were able to save \$65 billion. The average firm saves \$18 million in taxes for an expense of \$2 million. Therefore, for each additional \$1 spent on lobbying, they receive about \$9 of tax benefits.

VI. Robustness Checks and Caveats

Autocorrelation of errors

Autocorrelation violates the ordinary least squares assumption that the error terms are uncorrelated. While it does not lead to bias in the coefficient estimates, it leads to the standard errors of the estimates to be underestimated. Presence of such correlations in residuals complicates standard inference procedures that combine time-series and cross-sectional data, since these techniques typically require the assumption that the cross-sectional units are independent. When this assumption is violated, estimates of standard errors are inconsistent, and hence are not useful for inference.

In order to check for autocorrelation, I conducted two tests. Firstly, I conducted a Wooldridge test. Wooldridge derived a simple test for autocorrelation in panel-data models.¹³ Drukker provided simulation results showing that the test has good size and power properties in reasonable sized samples.¹⁴ According to the Wooldridge test, there is no autocorrelation in my errors. Table 4 summarizes the results:

TABLE 4: WOOLDRIDGE TEST FOR AUTOCORRELATION

Null Hypothesis:	F(1, 440)	Prob > F
no first-order autocorrelation	0.562	0.4537

¹³ See Wooldridge (2002)

¹⁴ See Drukker (2003)

In addition to the Wooldridge test, I created a model with the simple autoregressive form to estimate autocorrelation in my observed residuals:

$$u_t = \rho u_{t-1} + \varepsilon_t$$

I find that ρ is not statistically different from zero at the 99% confidence level and slightly negative at the 95% confidence level. Therefore, since rho is significantly different from 1, this suggests that my errors are not greatly correlated with each other. Table 5 shows my findings:

TABLE 5: AUTOCORRELATION REGRESSION RESULTS

$\rho = -0.0886$	
95% Confidence	99% Confidence
CI [-0.166, -0.011]	CI [-0.190, 0.013]

Lagged Lobbying Effect

Another important caveat to consider is the effect of lobbying in one year on tax rates in the following year. This implies that the effect or benefits of lobbying for a corporation is not experienced until the next year. While there hasn't been much research done on the time horizon of the effects of lobbying, let alone that of tax lobbying, such an empirical model is intuitive. Therefore, I conducted a regression using my data to find the effect of lobbying in one year on tax rates in the following year. I created two models; one with my control variables in year t-1 and the other with control variables in year t. However, my model is much stronger when using financial information from the same year as the taxes instead of financial information from the previous year.

Table 6 and 7 summarize my results:

TABLE 6: LAGGED LOBBYING EFFECT (CONTROLS IN YEAR T-1)

Dependent Variable Independent Variable	Effective Tax Rate, t
Lobby, t-1	-0.968** (0.44)
Size, t-1	-1.01e-05* (5.25e-06)
Leverage, t-1	-10.617 (8.53)
Return on Assets, t-1	-0.622 (9.08)
Industry Lobbying, t-1	1.128* (0.65)
Tax Rate, t-1	-0.089** (0.04)
Change in Real GDP <i>equivalent to Year FE</i>	-0.018 (0.17)
Year FE	No
Firm FE	Yes
N	2481
Adj. R ²	0.3445

TABLE 7: LAGGED LOBBYING EFFECT (CONTROLS IN YEAR T)

Dependent Variable Independent Variable	Effective Tax Rate, t
Lobby, t-1	-0.909** (0.43)
Size, t	-1.51e-05*** (5.73e-06)
Leverage, t	-21.396*** (7.10)
Return on Assets, t	18.706** (8.56)
Industry Lobbying, t	1.181* (0.65)
Tax Rate, t-1	-0.089** (0.04)
Change in Real GDP <i>equivalent to Year FE</i>	-0.082 (0.17)
Year FE	No
Firm FE	Yes

N 2481
Adj. R² 0.3575

I find that the effect of lobbying of a 1% increase in lobbying decreases tax rates in the following year by 0.9 percentage points. Although Richter et al. (2009) found a similar result, it is inconclusive whether there is a lag in the effect of corporate tax lobbying. This is certainly an area where further research can be beneficial. It is also worth noting that the effect of lobbying on taxes after two years is insignificant at the 5% level.

Tax Rate Sensitivity Analysis

As mentioned earlier, I eliminated a few outliers when conducting my analysis to ensure that my estimates were not being driven by them. Specifically, I removed any tax rates greater than one hundred percent and less than negative one hundred percent. Therefore, I wanted to examine the implication of the removal of outliers by seeing how sensitive my model is to those outliers. Table 8 below provides summary statistics on the tax rates in my dataset:

TABLE 8: TAX RATE DETAILED SUMMARY STATISTICS

Percentiles			
1%	-165.63	Smallest	-2124.86
5%	-15.31	Largest	4300.00
10%	0.00	Obs.	3633
25%	18.39	Mean	26.94
50%	29.44	Std. Dev.	142.80
75%	35.90	Variance	20390.61
90%	40.27	Skewness	11.36
95%	49.71	Kurtosis	351.21
99%	181.37		

Using the percentile information from Table 8, I ran several regressions to see the effects of removing certain outliers. Firstly, I looked at the effects of lobbying on effective average taxes without removing any outliers. Compared to my final result, I expected the coefficient on

lobbying to be higher in absolute value. This is because I had removed more positive outliers than negative since there were more observations with tax rates greater than 100 percent than there were with tax rates less than -100 percent. The higher the tax rate, the larger the potential effect of an increase in lobbying. As expected, my results state that an increase in lobbying expenditure of 1% leads to a decrease in effective average tax rates of more than 5 percentage points. This highlights the fact that the extreme positive outliers are driving this analysis.

Furthermore, I eliminated the top and bottom 1% of tax rates as well as the top and bottom 5% to conduct further stress tests. Judging from the other regressions, I expected the coefficient to decrease in absolute value as the dataset became narrower. In my regressions, I found the coefficient on the middle 99% and 95% of the dataset to be -1.075 and -0.375 respectively. Although this result is consistent with my prediction for the general direction of the coefficient, the large difference in magnitude is intriguing and possibly worth examining in further research.

Finally, the last two regressions I conducted were using the upper and lower quartiles of the dataset. This was done to further examine the differences between the large positive tax rates and the small or negative tax rates. Because of the results of the previous regressions, I expected the upper quartile to have a high coefficient in absolute value and the lower quartile to have a lower and/or insignificant effect on tax rates. My findings are consistent with this view. A 1% increase in lobbying decreases effective tax rates by 15 percentage points for firms that had a tax rate of greater than 35.9%. On the other hand, an increase in lobbying has a positive and insignificant effect on those firms with a tax rate below 18%.

The following table explains the results of the regressions mentioned above:

TABLE 9: TAX RATE SENSITIVITY REGRESSIONS

Dependent Variable Independent Variable	Effective Tax Rates				
	All Obs.	Middle 99%	Middle 95%	Upper 25%	Lower 25%
Lobby	-5.461** (2.39)	-1.075*** (0.416)	-0.375* (0.21)	-15.704* (8.75)	0.517 (6.43)
Size	-5.93e-06 (9.02e-06)	-1.61e-05*** (5.87e-06)	-2.28e-06 (1.96e-06)	-1.37e-05 (2.75e-05)	-8.47e-07 (6.47e-05)
Leverage	78.419 (52.57)	-10.927* (6.64)	-2.778 (3.00)	161.779 (128.02)	-29.578 (49.70)
Return on Assets	52.052** (24.42)	28.491*** (7.37)	20.188*** (4.26)	-108.863 (77.80)	47.786 (43.23)
Industry Lobbying	0.091 (4.71)	0.546 (0.67)	0.409 (0.32)	3.088 (20.11)	11.723 (11.80)
Change in Real GDP <i>equivalent to Year FE</i>	-1.079 (1.03)	-0.426* (0.22)	0.190* (0.10)	1.269 (4.10)	-5.387 (2.27)
Year FE	No	No	No	No	No
Firm FE	Yes	Yes	Yes	Yes	Yes
N	3472	3404	3119	858	863
Adj. R ²	0.1166	0.2385	0.5762	0.4575	0.4779

The upper and lower quartile regressions also touch on a caveat in my analysis. I have not differentiated between preemptive and defensive lobbying. Defensive lobbying is done to express opposition to a potentially damaging legislation or regulation, while preemptive lobbying is done to advocate for specific favorable policies. For tax purposes, defensive lobbying would be used to oppose higher tax rates and preemptive lobbying would be used for advocating lower tax rates or a tax break. In essence, if the regulation of interest is passed, preemptive lobbying should have a negative effect on tax rates and defensive lobbying may have a positive effect on tax rates. Firms in the upper quartile of tax rates are most likely engaging in preemptive lobbying, in order to decrease their tax rates. Conversely, firms in the lower quartile of tax rates would possibly be more concerned about keeping their tax rates low and thus engaging in defensive lobbying. While the upper and lower quartile regression results do not capture all of

the firms engaging in preemptive versus defensive lobbying, it highlights the general distinction between the two. In addition, since my paper is concerned with preemptive lobbying or lobbying to reduce tax rates, this result draws attention to the fact that my estimates may be skewed due to the varying nature of both types of lobbying. Therefore, my final result can be considered a lower estimate of the true effect of preemptive tax lobbying.

Finally, another caveat to keep in mind is that lobbying by one firm may affect the tax rates of all firms in the industry. For example, if one firm in the renewable energy industry lobbies for a tax break for all companies in that industry and that specific legislation gets passed, that one firm's lobbying expense benefitted all companies' tax rates in the renewable energy industry. The effect of this factor has been lowered by adding the additional independent variable, industry association lobbying, to my analysis. However, I haven't accounted for lobbying by other companies within the same industry.

Keeping these caveats in mind, my results in this paper indicate that, among firms that lobby, firms with higher lobbying expenditures in one year pay lower effective tax rates that year. These findings are consistent with the growing trend seen in the lobbying industry. More and more firms are realizing the benefits associated with lobbying which is why we have seen a large growth in lobbying expenses. Therefore, I do not find it surprising that lobbying has a significant quantifiable payoff in at least one area, taxes.

VII. Discussion and Conclusion

My results indicate that there are substantial benefits for firms that lobby. Precisely, a 1% increase in lobbying expenditure decreases a firm's effective tax rates by 0.85 percentage points. In addition, I roughly calculated that the marginal increase of \$1 in lobbying provides \$9 in tax savings. Economic theory states that marginal return on investment should be \$1, barring any constraints to the amount that can be invested. If the marginal return is higher, firms should continue investing (or lobbying in this case) until the marginal return comes down to \$1.

I briefly discuss several possible constraints in section III. One such constraint is the negative impression attached to corporate lobbying. Because of the Lobbying Disclosure Act of 1995 (LDA) and the Honest Leadership and Open Government Act of 2007, lobbying activities have to be disclosed by firms and have come under regular scrutiny by the media and public. Therefore, firms might not spend too much on lobbying for public relations reasons.

Furthermore, since lobbying is heavily dependent on political connections, firms could also be constrained by the number of political connections they can acquire. Finally, there may not be enough issues or tax breaks to lobby for in a given year. All these constraints could potentially keep the marginal return on lobbying higher than \$1.

Another reason could be a potential lower bound of lobbying expenditure, below which lobbying is not beneficial for tax rates. For example, a firm that spends a small amount on lobbying possibly has low or even negative returns compared to a firm that spends a large amount on lobbying. In theory, the firm that lobbies a lot with a marginal return greater than one dollar should lobby more, while the firm that lobbies less with a low or negative return should

either stop lobbying entirely or lobby substantially more in order to rise above the lower bound. However, the firm that lobbies a lot already might have some capital constraints on the amount they can spend. Therefore, the selective mechanism that explains why a firm decides to lobby and how much to lobby is an area for potential research.

Another area for further research is to look at the difference in tax rates for firms that lobby versus firms that do not. This could give us an insight into the mechanisms through which tax benefits are accrued. Specifically, one could test the sensitivity of firm characteristics such as inventory, research and development, leverage, etc. in determining tax rates between firms that lobby and firms that do not. For instance, if the coefficient on research and development is different for firms that lobby, that could be a potential channel through which lobbying induced tax benefits accrue.

Finally, my research also introduces several questions about industry trade association lobbying. My analysis found that more lobbying by trade associations increases a firm's tax rates. This result is counter-intuitive and merits further exploration. In particular, it might be worth testing how industry trade association lobbying affects the taxes of those firms that choose not to lobby or are too small to lobby. In addition, as mentioned before, it is also worth exploring the effects on a firm's tax rates of lobbying by competitors in the same industry.

Because of the scarce amount of research done on this topic, many unanswered questions have emerged from my paper. My finding provides the foundation for more empirical and theoretical analysis on corporate lobbying, on both its mechanism and effect.

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