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Two Faces of Corporate Lobbying: Evidence from the Pharmaceutical Industry

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Abstract

This paper addresses two side effects of corporate lobbying on firm value in the pharmaceutical industry. Employing corporate lobbying and the Food and Drug Administration (FDA) approval data for the period from 1998 to 2013, we find that lobbying firms have a 67.3 percent higher chance that their new prescription drugs are approved by the FDA than non-lobbying firms. On the 3-day window surrounding FDA approval announcements, lobbying firms yield, on average, a 1.1% higher market reaction than non-lobbying peers. However, we also find that insiders in lobbying firms abnormally purchase their own stocks prior to FDA approvals. These opportunistic purchases substantially increase a firm's litigation risk. Our evidence highlights the ambivalence of lobbying. While lobbying enhances firm value, it also offers an opportunity for insiders to trade their shares first by exploiting private information that eventually hurts firm value.

JEL classification: J52, J53, L25

Keywords: Corporate lobbying; FDA approval; insider trading; litigation

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1. Introduction

Corporate political investment appears in various forms: through electing former politicians to a corporate board, donating to Political Action Committees (PACs), and/or lobbying. Corporate political activities are not always equally effective and therefore, are not equally employed. For instance, Milyo, Primo and Groseclose (2000) find that lobbying expenditures at the U.S. federal level are five times that of PAC campaign contributions. Along with a growing role of corporate lobbying, there are on-going debates as to whether corporate lobbying creates or hurts value for the shareholders. However, existing empirical evidence is largely inconclusive on the issue (e.g., positive relation (Chen, Parsley and Yang (2015), Chen*, et al.* (2015), Hill, Kelly, Lockhart and Ness (2013), Kim (2008), Shaffer, Quasney and Grimm (2000)); negative relation (Yu and Yu (2012), Coates (2011), Igan, Mishra and Tressel (2011); neutral relation (Hersch, Netter and Pope (2008), Lenway, Jacobson and Goldstein (1990)).

In this article, we investigate how corporate lobbying influences firm value in the pharmaceutical industry. Pharmaceutical companies spend a vast amount of research and development (R&D) funds to develop new drugs every year. The best way to cash out their investment is winning an approval from the Food and Drug Administration (FDA) to commercialize their newly-developed drugs. However, winning FDA approval is rigorous, expensive, time consuming, and sometimes take more than ten years to complete[1]. According to Hay, Thomas, Craighead, Economides and Rosenthal (2014), the overall success rate from Phase I to FDA approval is nearly 9 percent. The approval rate would be even lower (less than 0.1 percent) if it included "Pre-Clinical Phase," a stage during which researchers look for potential

[1] The phases in the FDA approval process consist of pre-clinical Phase, Phase I, Phase II, Phase III, New Drug Application (NDA)/Biologics License Application (BLA), and Phase IV in order. Each phase take, on average, three and a half years, one year, two years, three years, one/two years, respectively.

new compounds to target selected diseases. The 2015 industry profile [2] released by Pharmaceutical Research and Manufactures of America (PhRMA) reports that the average R&D expenditure of PhRMA members[3] is $51.2 billion and domestic R&D (total R&D) as a percentage of domestic sales (total sales) is 23.4 percent (17.9 percent) in 2014. Therefore, for pharmaceutical companies, winning FDA approval is picking the 'money fruits' after the years of their efforts to develop new drugs. In this respect, pharmaceutical companies would give up a great deal to get the FDA approval. One of the popular and effective tools for gaining FDA approval is lobbying[4]. The Center for Responsive Politics (CRP) data show pharmaceutical firms spend more than $1.6 billion lobbying the Congress and the Obama administration for the 7-year span from 2009 to 2015.

Using corporate lobbying expenses and FDA approvals data, we address the following questions: (1) Does corporate lobbying improve/deteriorate firm value? (2) Through which channel does corporate lobbying affect firm value? We select the top 200 pharmaceutical companies based on annual market capitalization at the end of each year for the period from 1998 to 2013. We limit our empirical analyses to large pharmaceutical companies because they are able to lobby and are incentivized to lobby in order to realize high expected returns on their substantial R&D expenditures.

We first explore the likelihood a firm wins FDA approval with or without lobbying. Based on our sample, in 2010, about 43 percent[5] of pharmaceutical firms are actively engaging in lobbying by spending over 177 million dollars aiming at influence on over 1,400 bills in favor of their products. Given the nature of motivation for lobbying, it is plausible to expect that active lobbying positively influences outcome of the FDA approval. Consistent with our hypothesis, we find that lobbying firms have a 67.3 percent higher chance of getting FDA approvals than non-

[2] http://www.phrma.org/sites/default/files/pdf/2015_phrma_profile.pdf
[3] http://www.phrma.org/about/member-companies

[5] For corresponding year, about 12% of firms listed in Compustat engage in lobbying.

lobbying pharmaceutical firms. In addition, stock market reactions are more positive for lobbying firms on the FDA drug approval announcement than those for non-lobbying firms. On average, over the three-day event period (-1 to +1 day) surrounding the announcement dates, the cumulative abnormal returns are 110 basis points greater for lobbying firms than non-lobbying firms. The difference is statistically significant at the one percent level. Our finding strongly supports the political capital view that corporate political strategies such as lobbying enhance firm value (e.g., Faccio (2006)).

Recent political finance literature demonstrates that corporate political strategies do not always add value to firm. For instance, Bebchuk and Jackson (2010) find a decision on corporate political spending is made by a few insiders that may deviate from the interests of majority shareholders. Motivated by prior studies, we examine whether insiders exhibit rent-seeking behavior exploiting private information obtained from lobbying activities associated with FDA approvals. We find that lobbying firms are significantly associated with insider trading upon the FDA approval announcements. During the two weeks prior to FDA approval, insiders in lobbying firms abnormally buy shares of their own companies compared to those in non-lobbying firms. This opportunistic purchasing substantially increases a firm's litigation risk which eventually hurts firm value. In addition to negative market reaction upon litigation filings, lobbying firms pay on average $866,337 to settle SEC allegations. Our finding strongly suggests that lobbying exacerbates agency problems.

Our paper contributes to growing literature that shows how lobbying affects firm value. While a number of studies show that U.S. public firms actively make use of lobbying, outcomes of political actions are empirically mixed. For instance, Hill*, et al.* (2013), Chen*, et al.* (2015), and Antia, Kim and Pantzalis (2013) find evidence that corporate lobbying increases firm value. On the contrary, Borisov, Goldman and Gupta (2015) show that firms which had employed Jack Abramoff, one of top American lobbyists, experienced great loss in firm value after his guilty

conviction. Pharmaceutical industry lobbying draws attention from citizens, academia, and politics because lobbying firms often influence legislative activities to deliver results in favor of their product at the expense of customers. By looking at one of the most politically active industries, we find corporate lobbying is not always beneficial to shareholders and could cause a new dimension of agency problems.

The rest of the paper is organized as follows: Section 2 provides related literature and develops hypotheses, Section 3 describes data for the analysis, Section 4 reports results, and Section 5 concludes the paper.

2. Literature Review and Hypotheses

2.1. Corporate lobbying literature

Two strands of literature are closely related to our research. One strand of literature focuses on determinants of corporate political engagement. Many papers in this strand report key factors influencing the likelihood that firms engage in corporate political activity. The factors which influence on lobbying activities include industry government regulation (Pittman (1977)); within-industry concentration(Masters and Keim (1985), Hill*, et al.* (2013)); size of firm(Salamon and Siegfried (1977), Ansolabehere, Snyder and Tripathi (2002); Hill*, et al.* (2013)); cash flow and investment opportunities(Hill*, et al.* (2013))]. Bonardi, Hillman and Keim (2005) also argue that the decision to become politically active depends on how attractive the political market is. In sum, firms will be more apt to engage in political activity when participating in the political market increases the likelihood of achieving their goal that maximizes shareholders' wealth.

According to The Center for Responsive Politics (CRP), the pharmaceuticals/health products industry is consistently a top industry in terms of lobbying expenditures per year ($179.05 million in 2015). Also it reports that pharmaceutical industry lobbying firm conduct lobby activities to ensure a quicker approval process for drugs and products entering the market, and rely less on randomized controlled trials when deciding whether or not to put a new drug on

the market. When lobbying is successful, lobbyists will be able to put more new drugs on pharmacy shelves at a faster pace.

The other strand of literature explores the effect of corporate political investment on financial outcomes. Many empirical studies in this line of literature have been attempting to answer to the question - Does Corporate Political Activity help firms to achieve their financial objectives. Many studies conclude that connected firms receive specific benefits from political connection. Specifically the value of political connections lead to better access to finance (Claessens, Feijen and Laeven (2008); Leuz and Oberholzer-Gee (2006)), and/or lower taxation(Richter, Samphantharak and Timmons (2009)), government bailouts (Faccio, Masulis and McConnell (2006)), and higher market returns (Faccio (2006); Goldman, Rocholl and So (2009), Fisman (2001), Jayachandran (2006), Fan, Wong and Zhang (2007), Aggarwal, Meschke and Wang (2012)).

However, the evidence to support the statement that corporate lobbying improves the corporate financial bottom line is inconclusive (e.g., positive relation (Chen*, et al.* (2015), Chen*, et al.* (2015), Hill*, et al.* (2013), Kim (2008), Shaffer*, et al.* (2000)); negative relation(Yu and Yu (2012), Coates (2011), Igan*, et al.* (2011); neutral relation (Hersch*, et al.* (2008), Lenway*, et al.* (1990)).

2.2. Insider trading literature

The legal rules of the U.S. place significant limits on the freedom of corporate insiders to engage in trading in securities of organizations in which they are insiders .A large body of literature reports that insider trading allows insiders to profitably exploit their private information and realize significant trading profits. Because insiders' motive for trading is often neither observable nor verifiable, they often can openly make abnormally profitable trades (Jaffe (1974)).

Damodaran and Liu (1993) argue that there is substantial evidence that insider trading is present around corporate announcements and that this insider trading is motivated by private

information. Agrawal and Nasser (2012) documents the existence of abnormal insider trading by executives prior to takeover announcements and Arshadi and Eyssell (1991) documents and there is an association between pre-announcement run-ups and informed trading. Manne (1966) and Denis and Xu (2013) argue that insider trading represents a form of compensation for managers.

de Figueiredo and Richter (2014) define "lobbying" as the transfer of information in private meetings and venues between interest groups and politicians, their staffs, and agents. Corporate political investment in lobbying offers advantage to pharmaceutical firms such as gaining the confidence that it will more likely receive favorable decision. Seyhun (1986) argues that insiders who are expected to be more knowledgeable are more successful predictors of future abnormal stock price changes. Bebchuk and Fershtman (1991) identified that the presence of insider trading may cause agency costs under certain conditions.

2.3. Hypotheses

Our main focus is to examine whether lobbying firms utilize the information of FDA drug approval announcement and engage in insider trading activity prior to information leakage. At the same time, we acknowledge the potential for lawsuits for the firms with insider trading activity. To estimate our parameters, lobbying indicators (including lobbying expenditure, number of bills lobbied, and number of issues lobbied) are considered the main explanatory variables. Further, we also include a set of firm level control variables to measure the relationship between: a) FDA drug approval and lobbying; and b) insider trading and likelihood of lawsuit. For this purpose, we hypothesize that;

H.1: All other things equal, lobbying influences FDA drug approval outcome ($\beta_1 > 0$)

$$\bullet\ FDA\ Approval = \beta_0 + \beta_1 LobbyingIndicators + \sum \beta_s\ Controls \qquad (1)$$

FDA Approval is the dependent variable and equal to one if a firm receives confirmation from FDA, within one year after submitting their drug approval application. For lobbying indicators, we run three separate logistic regressions introducing: log transformation of lobbying expenditure, log transformation of number of total bill lobbied and an indicator variable equal to one if firm has a lobbying activity. Controls are firm-level variables such as R&D, Firm Size, ROA, Tobin's Q, Book Leverage and Tangibility. Our hypotheses also examine whether lobby-active firms are more likely to get drug approval by spending their resources on political connections. Hence, we expect lobbying firms to receive greater market reaction compare to non-lobbying firms once the confirmation is announced by FDA. For this reason; we conduct an event study to measure the effect of announcement;

H.2: FDA drug approval announcement event is positively associated with changes in the market value of the firm in terms of cumulative abnormal stock returns;

$$AR_{i,t} = R_{i,t} - R_{M,t} \qquad (2)$$

Where $R_{i,t}$ is the actual return and $R_{M,t}$ is the return of a selected market index (we employ Value Weight index from CRSP).

We measure the aggregated abnormal returns that are used in the study and define them as *Cumulative Abnormal Returns;*

$$CAR_{i(t1,t2)} = \sum_{t=t1}^{t2} AR_{i,t} \quad (3)$$

For the significance of the returns around announcement dates, our null hypothesis is cumulative abnormal return of lobbying firms and non-lobbying firms are equal to zero;

$$H_o: CARLobby = CARnonLobby = 0 \quad (4)$$

We calculate stock returns of FDA approved firms surrounding announcement dates (with various event windows) and reject the null hypothesis by estimating that lobbying firms receive greater return compared to non-lobbying firms, and the difference is statistically significant.

For the robustness check, we regress CAR on lobbying indicators while controlling for firm-level variables to determine how much lobbying firms receive higher return compared to non-lobbying firms by;

H.3: All other things equal, lobbying firms receives higher CAR during FDA drug approval announcement ($\beta_1 > 0$)

$$\bullet\ CAR = \beta_0 + \beta_1 LobbyingIndicators + \sum \beta_s\ Controls \qquad (5)$$

We introduce cross-sectional regression analysis to understand the relationship between CAR and lobbying activity. Our goal is demonstrating how much lobbying firms differ in terms of receiving positive abnormal return following FDA announcement compared to their non-lobbying competitors.

Following that, we are also motivated to investigate the insider trading activity before the FDA drug approval if the lobbying firm are more likely to get drug confirmation after engaging political activity;

H.4: All other things equal, lobbying engagement prior to FDA announcement increases the insider trading of responsible firms ($\beta_1 > 0$)

$$\bullet\ Log(NumInsiderTradingActivity) = \beta_0 + \beta_1 LobbyingIndicators + \sum \beta_s\ Controls \qquad (6)$$

Log(NumInsiderTradingActivity) is the dependent variable and refers to the number of transaction by corporate insiders (i.e. CEO and board) at different time intervals. We analyze different time intervals as a) number of transactions one month before FDA approval, b) number of transaction two weeks before FDA approval, c) number of transaction one week before FDA approval. Lobbying indicators are the same firm-level lobbying involvement and controls are firm specific control variables. The detailed definitions of variables are described in Appendix.

In addition to our first four hypotheses, we investigate the relation between insider trading and SEC lawsuit filings. Since insider trading is considered illegal by SEC, actions could be taken

after shareholders' complaints.[6] Therefore, we hypothesize that insider trading activity before FDA approval increases the likelihood of SEC lawsuit filings against corporations who violates shareholder rights.

H.5: All other things equal, insider trading prior to FDA announcement increases the likelihood of SEC lawsuit. *(β_1>0)*

$$\bullet\ SECLawsuit = \beta_0 + \beta_1\ Log(NumInsiderTradingActivity) + \sum \beta_s\ Controls \qquad (7)$$

Dependent variable SEC lawsuit is equal to one if firm is facing lawsuit one year after insider trading activity prior to FDA drug approval announcement. Our main explanatory variable Log(NumInsiderTradingActivity) is the number of insider transaction one month, two weeks or one week before the FDA confirmation. The sign and the magnitude of β_1 refer to the increased likelihood of SEC lawsuit for firms if they have insider trading activity. Controls are firm specific control variables. The detailed definitions of variables are described in Appendix.

3. Data

3.1. Firm Data

We use the COMPUSTAT database to identify pharmaceutical firms based on SIC code and Fama French 12 Industry Classification: Industry 10 (Health, Healthcare, Medical Equipment and Drugs). We sort firms by size (market cap) and select top 200 large firms in every year. Our sample begins in 1998 and ends in 2013. The sample includes 582 unique firms. Our sample has 211 unique firms which engage lobbying activity during sample period of 1998 and 2013 in which for a total of 3200 firm-year observation. To calculate firm-specific control variables, we use COMPUSTAT and Center for Research Security Prices.

3.2. FDA Drug Approval Data

[6] http://www.sec.gov/answers/insider.htm

We collect FDA drug approval cases from official FDA Agency documentation[7] and match the drug approved firms with ExecuComp to identify the firms in our sample. For our sample period, we identify 80 unique firms that have at least one drug approved by FDA. Moreover, we use FDA database to calculate the total number of drug approval for firms yearly. In addition, we also collect confirmation announcements from approval cases to conduct the event study for responsible firms.

3.3. Insider Trading Data

We gather insider trading data from Thomson Reuters Insider Fillings which contains transaction activity of insiders at personal level. Under insiders' data, we use Stock Transaction database to calculate the number of transactions before FDA drug approval of responsible firms. For our sample span, we have 442 unique insiders[8] in 30 distinct firms.

3.4. Lobbying Information

Lobbying information is collected from Center for Responsible Politics (CRP)[9]. The database contains U.S firms which engage in lobbying in calendar year. We match ExecuComp with CRP database to identify the publicly traded firms which are registered as lobbyist between 1998 and 2013. Moreover, CRP database includes additional information such as number of bills lobbied, number of issues lobbied, total amount spent on lobbying and the lobbying agency (i.e. U.S House or U.S Senate). We also use Congressional Bill database[10] to identify lobbied bill which are passed in both Senate and House of Representatives.

[Insert Table 1 here]

Table 1 shows the lobbying characteristics for the firms in our sample over the period of 1998 and 2013. *#LOBFirms* represents the total number of firms which engage lobbying activity (i.e.

[7] http://www.fda.gov/Drugs/InformationOnDrugs/
[8] Insiders are classified as; Directors, Committees, Officers, Affiliates, Beneficial Owners and Others.
[9] www.opensecrets.org/lobbying
[10] http://www.congressionalbills.org/

spending lobbying expenditure and lobbying at least one bill) in a given year. We also report the percentage of lobbyist firm in the sample, as well as total number of bills lobbied and total lobbying amount spend by responsible firms for given years. We observe the proportion of firms who engage in lobbying rapidly increases after early 2000s, as well as total number of bills lobbied and total lobbying expenditure. By 2013, we document that 42% of firms in our sample are lobbyists and they lobbied 1193 bills while spending approximately $154 million on average. These observations are consistent with the findings of Milyo*, et al.* (2000) and Chen*, et al.* (2015), in that the amount of lobbying expenditures increases over times and more firms choose lobbying as a tool to achieve their goals.

Table 2 reports descriptive statistics for lobbying activities, FDA approvals, and other control variables. As shown in Table 2, an average pharmaceutical firm spends $570,000 on lobbying each year during our sample period. Also Table 2 display that 35 percent of firms in the pharmaceutical industry lobbied in a given year and the average number of bills that firms lobbied in a year is 4.24.

[Insert Table 2 here]

Table 3 presents comparison of lobbying activities and firm characteristics based on their FDA approval status. 50 percent of firms that lobbied received FDA approval for their drug application while only 33 percent of firms that did not lobby get FDA approval. This difference is statistically significant (17 percent with t-statistics 6.3). In addition, the firms that get FDA approval spend $1.8 million on lobbying but the firms that did not receive FDA approval spends only $410,000, on average (difference in lobbying expenditure is $1.39 million with t-statistics 6.12).

[Insert Table 3 here]

3.5. Security Exchange Commission Lawsuit Data

To examine the firm level litigation process, we use Stanford Law School Securities Class Action Clearinghouse database[11]. The information in the database contains major characteristics of lawsuits which are initiated by SEC actions; the reason for lawsuit (insider trading, large trade reporting, false and misleading statement, manipulation), the announcement of litigation date, the duration of lawsuit and the outcome (settlement and dismissal). The data also contains total settlement amount paid by firms in case of mutual settlement decision. We match Stanford Law School Securities Class Action database with ExecuComp in order to measure the relationship between insider trading and lawsuit probability.

4. Empirical Results

4.1. Lobbying activity and FDA drug approval

In this section we test whether lobbying activity increases the likelihood of FDA approvals. Table 4 presents the results of our logistic regressions. We regress FDA approval dummy on lobby activity variables with other control variables.

[Insert Table 4 here]

The results in Table 4 show that corporate lobbying activities predict FDA drug approval. The estimated coefficients on the lagged level of *Lobbydum* and *LobbyAmount* are 0.722(p-value=0.32) and 0.058(p-value=0.037), respectively. Given the fact that only 39[12] novel drugs classified as new molecular entities (NMEs) and biological license applications (BLAs) were approved by the FDA in 2012, the findings presented in Table 5 suggests that corporate lobbying activities result in higher probabilities of success of drug development.

4.2. Lobbying activity and stock market response

[11] http://securities.stanford.edu/filings.html

[12] The number of new drugs approved by FDA in 2012 is the highest number of approvals since 1997 and the average number of approval per year over the past decade is 26 (See Hay*, et al.* (2014))

To see whether lobbying activities add value, we run an event study around announcements of FDA drug approvals. If lobbying activities enhance firms' financial bottom line, the lobbying should be associated with a positive cumulative abnormal return (CAR) and should be greater in market reaction than the non-lobbying upon FDA approval announcements. We calculate the market-adjusted CARs for a variety of event windows around the announcement dates. The event date is defined as the announcement date for FDA approving New Drug Application (NDA). When an NDA comes in, FDA has 60 days to decide whether to file it so that it can be reviewed. If the application is incomplete, FDA can refuse to file the application.

The results reported in Panel A of Table 5 indicate that stock market responses more favorably to the FDA drug approvals for lobbying firms than non-lobbying firms. The differences are statistically significant at the one percent level. This initial evidence is tested in a multivariate setting.

To measure a firm's lobbying effect on stock market reaction to the FDA approval announcement, we use a dummy variable for lobbying activities, taking a value of 1 firm lobbied at least one bill in a given year and zero otherwise as well as a continuous lobbying expenditure variable for a given year. We regress CARs on the dummy and the continuous variable. As shown in Table 3, firm characteristics (e.g., firm size, financial performance, and R&D expenditure) of the lobbying and the non-lobbying samples are different, we control for those variables with year fixed effect in our regressions.

[Insert Table 5 here]

Panel B of Table 5 presents results of multivariate tests for the market-adjusted CAR differentials for the three-day (five-day) periods around the FDA drug approval announcement dates across lobbying and non-lobbying firms using OLS with robust standard errors clustering at the firm-level. The column (1) and (3) report the results. The coefficients associated with the

dummies for lobbying activities are positive and statistically significant. On average, CARs over the three-day event period are 102 basis points greater for lobbying firms than non-lobbying firms. The result with the dummy variable is confirmed with lobbying expenditure variable. Although the coefficients are smaller compared to those of the dummy variable, they are still positive and significant and echo the findings in the univariate test.

4.3. Lobbying activity, insider trading and litigation risk

Table 6 presents univariate test results for differences in insider trading activities and SEC litigations between the lobbying and the non-lobbying firms. de Figueiredo and Richter (2014) are defined "lobbying" as the transfer of information in private meetings and venues between interest groups and politicians, their staffs, and agents. More importantly through lobbying firms collect more information and reduce information asymmetries to make appropriate decision. Agrawal and Nasser (2012) documents the existence of abnormal insider trading by executives prior to takeover announcements and Arshadi and Eyssell (1991) documents and there is an association between pre-announcement run-ups and informed trading. Combined with two lines of literature we demonstrate how insiders of lobbying firms in the pharmaceutical industry utilize their private information through insider trading and shows that their actions consequently increase higher litigation risk.

[Insert Table 6 here]

The results in Table 6 indicates that higher percent (8 percent higher with t-statistics 2.97) of firms that lobbied engages in insider trading activity than the non-lobbying firms. Also it appears that the number of insider trading of firms that lobbied is significantly higher than those of firms that did not lobby in a week prior to FDA approval. By contrast, we do not find that there is difference in insider purchases two-weeks before FDA approval. In addition, the results indicate that firms that lobbied have higher numbers of Securities and Exchange Commission's (SEC)

legal enforcement actions due to insider trading. Consequently lobbying firms pay, on average, $866,337 more to settle SEC allegations. Our finding on insider trading suggests that with more information from lobbying firms that lobbied are more likely engaged in insider trading, resulting in SEC legal enforcement action. To more adequately control for factors that could influence the likelihood of insider trading, we estimate the effect of lobbying on insider trading in the multivariate setting.

[Insert Table 7 here]

The coefficient estimates in all the columns ((1) to (6)) in Table 7 are positive and statistically significant after controlling for firm characteristics. This result confirms the finding in the univariate test above, and suggests that top executives of lobbying firms in the pharmaceutical industry more likely engage in insider trading based upon the information they collected from lobbying activity.

[Insert Table 8 here]

Lastly we investigate whether insider trading activities of top executives of lobbying firms cause higher SEC litigation. In column (1) and (2) of Table 8 we regress the dummy variable for SEC litigation against the insider trading variables. Across each column we find evidence of a significantly positive relation between insider trading and litigation, suggesting that lobbying activities prior FDA approval increases the probability of SEC litigation. To test direct link between lobbying actives and SEC litigation, we include interaction terms of insider trading and lobbying dummy variables in the model (3) and (4) of Table 8. We find that the interactions terms in the columns are insignificant.

5. Conclusion

This paper addresses two-side effects of corporate lobbying activities on firm value by examining FDA drug approvals. Using data on corporate lobbying expenses of pharmaceutical

firms and FDA approvals between 1998 and 2013, we shed light on the bright and dark sides of corporate lobbying on corporate financial performance.

First, we explore the positive implication of corporate lobbying on firm value. We find that firms that lobbied have 67.3 percent higher chance of getting FDA approvals than firms that did not lobby after controlling for key determinants for FDA approval such as firm size, R&D expenditure and year fixed effect. Given the fact that only 39[13] novel drugs classified as new molecular entities (NMEs) and biological license applications (BLAs) were approved by the FDA in 2012, the finding suggests that corporate political investment in lobbying offer advantage to a pharmaceutical firm such as gaining the confidence that it will more likely receive favorable decision.

We also find the stock market responded more favorably to the FDA drug approvals for lobbying firms than non-lobbying firms. On average, CARs over the three-day event period (-1 to +1 day) are 110 basis points greater for lobbying firms than non-lobbying firms. The difference is statistically significant at the one percent level. This initial evidence is tested in a multivariate setting. Our multivariate estimate points to a robust, positive relationship between corporate lobbying and CARs. Combined with earlier results, these findings suggest that not only is corporate lobbying related to higher chance of getting FDA approval, but it is also positively related to stock market response.

Lastly we explore the negative implication of corporate lobbying on firm value. We first document evidence that a significantly higher percentage of firms that lobbied engage in insider trading. During a week prior to FDA approval, insider trading of firms that lobbied is significantly higher than those of firms that did not lobby. Specifically, insider purchase of firms that lobbied are 15 percent higher than those of firms that did not lobby after controlling for

[13] The number of new drugs approved by FDA in 2012 is the highest number of approvals since 1997 and the average number of approval per year over the past decade is 26 (See Hay*, et al.* (2014))

factors such as firm size, R&D expenditure and year fixed effect. Interestingly firms that lobbied faced higher Securities and Exchange Commission's (SEC) legal enforcement actions due to insider trading. Consequently, lobbying firms pay, on average, $866,337 more to settle SEC allegations. Our finding on insider trading suggests that with more information from lobbying firms that lobbied are more likely engaged in insider trading, resulting in SEC legal enforcement action.

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Table 1
Time Variation in Corporate Lobbying

Table 1 provides the yearly distribution of our sample that consists of 3,200 firm-year observations for 200 pharmaceutical firms and 392 unique CEOs between 1998 and 2013. *LOBamt* is defined as total amount spent in lobbying activities in USD. *LOBdum* is a binary variable and equal to one if firm lobbied at least one bill in a given year, zero otherwise. *BillSpon* is defined as total number of bills lobbied including all topics. The lobbying amount is the total amount spent in lobbying activities in a given year ($ thousands).

Year	*#Firms*	*#LOB Firms*	*%LOB Firms*	*BillSpon*	*LOBamt*
1998	200	41	21%	306	45.94
1999	200	42	21%	384	60.88
2000	200	52	26%	452	58.15
2001	200	56	28%	473	60.87
2002	200	56	28%	490	69.62
2003	200	74	37%	574	70.83
2004	200	76	38%	663	91.59
2005	200	78	39%	773	102.50
2006	200	83	42%	740	125.70
2007	200	87	44%	872	157.20
2008	200	85	43%	1,235	165.70
2009	200	84	42%	1,462	216.40
2010	200	86	43%	1,436	177.40
2011	200	81	41%	1,274	165.50
2012	200	82	41%	1,289	161.60
2013	200	84	42%	1,193	154.50

Table 2
Descriptive Statistics

Table 2 provides descriptive statistics of our sample that consists of 3,200 firm-year observations for 200 pharmaceutical firms and 392 unique CEOs between 1998 and 2013. We use ExecuComp database to identify pharmaceutical firms, which are larger in size and located in S&P 1500 plus. *LOBamt* is defined as total amount spent in lobbying activities in USD. *LOBdum* is a binary variable that equals to one if firm lobbied at least one bill in a given year, and zero otherwise. *FDAdum* is a binary variable that equals to one if a firm wins the FDA approval in a given year, and zero otherwise. *FDAApprov* is the number of FDA approval that a firm wins in a given year. *BillSpon* is defined as total number of bills lobbied including all topics. To measure firm-specific control variables, we use COMPUSTAT and CRSP. Definitions of variables are in the Appendix.

Variables	**N**	**Mean**	**Median**	**Std.**	**Min**	**Max**
LOBamt	3,200	0.57	0.00	2.22	0.00	59.90
LOBdum	3,200	0.35	0.00	0.48	0.00	1.00
BillSpon	3,200	4.24	0.00	10.65	0.00	150.00
FDAdum	3,200	0.13	0.00	0.33	0.00	1.00
FDApprov	3,200	0.48	0.00	1.81	0.00	19.00
Ln(Assets)	3,200	6.88	6.64	1.71	1.26	12.26
Tobin's Q	3,200	3.99	0.08	10.12	0.72	522.94
ROA	3,200	-0.03	0.18	0.41	-16.14	1.25
Tangible	3,200	0.17	0.04	0.14	0.00	0.99
R&D	3,200	0.12	20.00	0.17	0.00	4.39

Table 3
Univariate Analysis

Table 3 provides univariate result of our sample that consists of 3,200 firm-year observations for 200 pharmaceutical firms and 392 unique CEOs between 1998 and 2013. The FDA approved and FDA non-approved sub-samples consist of 419 and 2,781 firm-year observations, respectively. We report the mean differences of lobbying characteristics and firm characteristics between FDA approved and non-approved firms. *LOBamt* is defined as total amount spent in lobbying activities in USD. *LOBdum* is a binary variable and equal to one if firm lobbied at least one bill in a given year, zero otherwise. *BillSpon* is defined as total number of bills lobbied including all topics. *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Definitions of variables are in the Appendix.

	(1)FDAdum=1	*(2)FDAdum=0*	*Difference [(1)-(2)]*	*t-stat*
	N=419	N=2,781		
LOBdum	0.50	0.33	0.17***	[6.30]
LOBamt	1.80	0.41	1.39***	[6.12]
Billspon	9.64	3.57	6.07***	[7.16]
Log(Asset)	8.45	6.64	1.81***	[19.12]
Tobin's Q	3.28	4.09	-0.81***	[-3.47]
ROA	0.05	-0.03	0.08***	[8.61]
Tangible	0.18	0.16	0.01**	[2.31]
R&D	0.10	0.12	-0.02***	[-3.48]

Table 4
Lobbying and FDA Approval

Table 4 reports logistic regression results estimating the relation between FDA drug approvals and lobbying activities of our sample over the period of 1998 to 2013. The dependent variable, $Prob(FDAdum)_{t+1}$, is a binary variable taking a value of one if a firm receives approval confirmation from FDA in a given year, otherwise zero. *LOBamt* is defined as total amount spent in lobbying activities in USD. *LOBdum* is a binary variable and equal to one if firm lobbied at least one bill in a given year, zero otherwise. *BillSpon* is defined as total number of bills lobbied including all topics.In parentheses are *p*-values. All models are estimated with year fixed effect. ***, **, and * indicate statistical significance at 1%, 5% and 10% level, respectively. Definitions of other variables are in the Appendix.

	(1)	(2)	(3)	(4)	(5)	(6)
	$Prob(FDAdum)_{t+1}$			$Ln(FDApprov)_{t+1}$		
$LOBdum_t$	0.722**			0.707**		
	[0.032]			[0.035]		
$Ln(LOBamt)_t$		0.058**			0.056**	
		[0.037]			[0.041]	
$Ln(BillSpon)_t$			0.397			0.387*
			[0.049]			[0.058]
$Ln(Asset)_t$	0.546***	0.544***	0.551***	0.555***	0.553***	0.560***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
$Tobin's\ Q_t$	0.002	0.002	0.002	0.001	0.002	0.002
	[0.636]	[0.629]	[0.639]	[0.955]	[0.938]	[0.938]
ROA_t	1.699***	1.699***	1.718***	1.571**	1.570**	1.588**
	[0.001]	[0.001]	[0.001]	[0.021]	[0.022]	[0.021]
$Tangible_t$	-1.021	-1.038	-1.059	-1.000	-1.018	-1.039
	[0.223]	[0.223]	[0.217]	[0.334]	[0.324]	[0.313]
$R\&D_t$	3.179***	3.165***	3.223***	3.016***	2.998***	3.059***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Constant	-5.777***	-5.762***	-5.106***	-6.250***	-6.233***	-6.276***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Year Fixed	YES	YES	YES	YES	YES	YES
N	3,200	3,200	3,200	3,200	3,200	3,200
Adj. R^2 (or Pseudo R^2)	17%	18%	18%	18%	18%	18%

Table 5
FDA Approval Announcement Dates

Table 5 reports market responses to announcements of FDA drug approvals of the lobbying and the non-lobbying sub-samples. *LOBamt* is defined as total amount spent in lobbying activities in USD. *LOBdum* is a binary variable and equal to one if firm lobbied at least one bill in a given year, zero otherwise. *BillSpon* is defined as total number of bills lobbied including all topics. Market adjusted model is used to calculated CARs of event windows.

$$AR_{i,t} = R_{i,t} - R_{M,t}$$

Where $R_{i,t}$ is the actual return and $R_{M,t}$ is the return of a selected market index (CRSP value weight index). Panel B reports regression results estimating the relation between market responses upon FDA drug approval announcements and lobbying activities of our sample over the period of 1998 to 2013. The dependent variable is cumulative abnormal returns measured by market adjusted model. ***, **, and * indicate statistical significance at 1%, 5% and 10% level, respectively. Definitions of variables are in the Appendix.

Panel A. Event Studies

	(1) LOBdum=1	*(2) LOBdum=0*	*Diff[(1)-(2)]*
	N=478	N=746	
[-1,+1]	1.30%***	0.20%	1.10%***
	[7.78]	[1.52]	[4.54]
[0,+1]	1.06%***	0.20%**	0.86%
	[7.06]	[2.08]	[4.07]
[0,+3]	1.20%***	0.17%	1.03%***
	[5.61]	[0.96]	[3.55]
[-3,+3]	1.51%***	0.10%	1.41%***
	[5.58]	[0.42]	[3.82]

Panel B. Multivariate

	(1) CAR[0,+1]	(2) CAR[0,+1]	(3) CAR[0,+1]	(4) CAR[-1,+1]	(5) CAR[-1,+1]	(6) CAR[-1,+1]
$LOBdum_t$	0.010***			0.012***		
	[0.001]			[0.001]		
$Ln(LOBamt)_t$		0.001***			0.001***	
		[0.001]			[0.001]	
$Ln(BillSpon)_t$			0.005***			0.006***
			[0.001]			[0.001]
$Ln(Asset)_t$	-0.002**	-0.002**	-0.002**	-0.002**	-0.002**	-0.002**
	[0.020]	[0.020]	[0.018]	[0.026]	[0.028]	[0.028]
$Tobin's\ Q_t$	0.001	0.001	0.001	0.001	0.001	0.001
	[0.213]	[0.758]	[0.735]	[0.855]	[0.805]	[0.805]
ROA_t	0.040*	0.040*	0.041*	0.045*	0.045*	0.044*
	[0.057]	[0.055]	[0.049]	[0.073]	[0.071]	[0.069]
$Tangible_t$	-0.05	-0.007	-0.007	-0.008	-0.008	-0.007
	[0.131]	[0.608]	[0.688]	[0.687]	[0.408]	[0.760]
$R\&D_t$	-0.035	0.018	0.022	0.013	0.013	0.017
	[0.228]	[0.492]	[0.413]	[0.632]	[0.534]	[0.543]
Constant	0.022**	0.024**	0.024**	0.022**	0.023**	0.022**
	[0.019]	[0.017]	[0.018]	[0.019]	[0.023]	[0.023]
Year Fixed	YES	YES	YES	YES	YES	YES
N	1,220	1,220	1,220	1,220	1,220	1,220
Adj. R^2	4%	2%	4%	4%	3%	4%

Table 6
Univariate Analysis: Lobbying, Insider Trading, and Litigation Risk

Table 6 provides univariate analysis of SEC lawsuit characteristics of our sample between 1998 and 2013. The lobbying and the non-lobbying sub-samples consist of 478 and 746 lawsuit cases, respectively. *InsideBuydum_two* is a binary variable and equal to one if insider transactions occur two weeks before FDA drug approval announcement. *InsideBuy_two* is defined as total number of insider transaction two weeks before FDA drug approval announcement. *InsideBuydum_one is* a binary variable and equal to one if insider transactions occur one week before FDA drug approval announcement. *InsideBuy_one two* is defined as total number of insider transaction one week before FDA drug approval announcement. We report mean differences of insider trading and reasons of SEC litigation between the lobbying and the non-lobbying sub-samples. *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Definitions of variables are in the Appendix.

	(1) LOBdum =1	*(2) LOBdum=0*	*Difference [1]-[2]*	*t-stat*
	N=478	N=746		
%Firms with Insider Activity	0.33	0.25	0.08**	[2.97]
InsideBuydum_two	0.24	0.21	0.03	[1.57]
InsideBuy_two	3.50	2.50	0.80	[1.00]
InsideBuydum_one	0.18	0.14	0.04*	[1.82]
InsideBuy_one	2.30	0.90	1.40***	[3.20]
N. Ligations	0.04	0.02	0.02**	[2.57]
Reason : Insider Trading	0.04	0.02	0.02**	[2.20]
Reason : Large Trade Reporting	0.02	0.01	0.01	[0.90]
Reason : False Statement	0.02	0.01	0.01**	[1.94]
Reason : Manipulation	0.01	0.00	0.01***	[2.16]
Total Settlement Amount ($ thousands)	867.68	1.34	866.34**	[2.16]

Table 7
Lobbying Activity and Insider Trading

Table 7 reports logistic regression results estimating the relation between insider trading and lobbying activities of our sample over the period of 1998 to 2013. The dependent variables are *Ln(InsideBuy_two),* log transformation of total number of insider transactions two weeks before FDA drug approval, and *Ln(InsideBuy_one),* log transformation of total number of insider transactions one week before FDA drug approval. *LOBamt* is defined as total amount spent in lobbying activities in USD. *LOBdum* is a binary variable and equal to one if firm lobbied at least one bill in a given year, zero otherwise. *BillSpon* is defined as total number of bills lobbied including all topics. In parentheses are *p*-values. All models are estimated with year fixed effect. ***, **, and * indicate statistical significance at 1%, 5% and 10% level, respectively. Definitions of other variables are in the Appendix.

Dependent Variable						
Sample	*Ln(InsideBuy_two)*	*Ln(InsideBuy_one)*	*Ln(InsideBuy_two)*	*Ln(InsideBuy_one)*	*Ln(InsideBuy_two)*	*Ln(InsideBuy_one)*
	(1)	(2)	(3)	(4)	(5)	(6)
$LOBdum_t$	0.147**	0.104*				
	[0.024]	[0.053]				
$Ln(LOBamt)_t$			0.015***	0.013***		
			[0.001]	[0.001]		
$Ln(BillSpon)_t$					0.075***	0.064***
					[0.001]	[0.001]
$Ln(Asset)_t$	-0.088***	-0.054***	-0.100***	-0.067***	-0.102***	-0.069***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
$Tobin's\ Q_t$	0.030	0.024	0.029	0.022	0.028	0.021
	[0.247]	[0.285]	[0.260]	[0.317]	[0.275]	[0.334]
ROA_t	0.482	0.312	0.481	0.314	0.469	0.304
	[0.200]	[0.334]	[0.187]	[0.313]	[0.204]	[0.336]
$Tangible_t$	-1.280***	-0.911***	-1.331***	-0.955***	-1.326***	-0.950***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
$R\&D_t$	0.939	0.952	0.807	0.850	0.827	0.868
	[0.195]	[0.157]	[0.252]	[0.195]	[0.245]	[0.190]

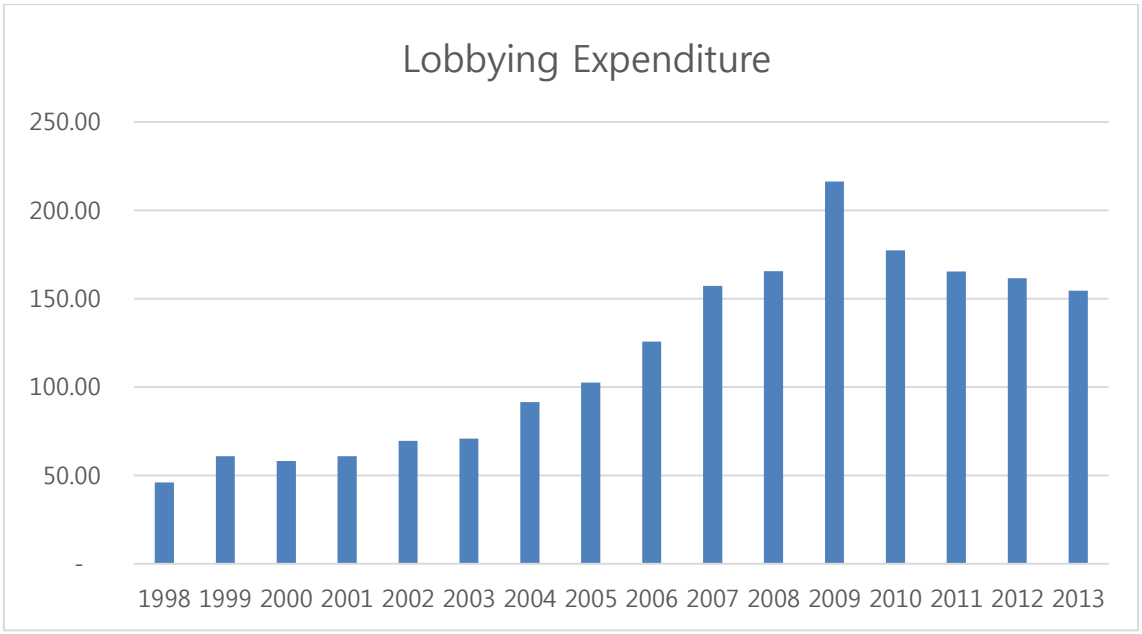
Constant	1.273***	1.273***	1.347***	0.848***	1.377***	0.873***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Year Fixed	YES	YES	YES	YES	YES	YES
N	1,220	1,220	1,220	1,220	1,220	1,220
R^2	5%	4%	6%	5%	6%	5%

Table 8
Insiders' Purchases and Probability of Being Sued

Table 8 reports logistic regression results estimating the relation between insider trading and lobbying activities of our sample over the period of 1998 to 2013. The dependent variables, $Prob(Litigdum)_{t+1}$,is a binary variable and equal to one if lawsuit filed against the firm one year after insider trading activity prior to FDA drug approval, zero otherwise. *Ln(InsideBuy_two),* log transformation of total number of insider transactions two weeks before FDA drug approval, and *Ln(InsideBuy_one),* log transformation of total number of insider transactions one week before FDA drug approval. *LOBdum* is a binary variable and equal to one if firm lobbied at least one bill in a given year, zero otherwise. In parentheses are *p*-values. All models are estimated with year fixed effect. ***, **, and * indicate statistical significance at 1%, 5% and 10% level, respectively. Definitions of other variables are in the Appendix.

	(1)	(2)	(3)	(4)
	$Prob(Litigdum)_{t+1}$	$Prob(Litigdum)_{t+1}$	$Prob(Litigdum)_{t+1}$	$Prob(Litigdum)_{t+1}$
$Ln(InsideBuy\_two)_t$	0.466***		0.143	
	[0.001]		[0.790]	
$Ln(InsideBuy\_one)_t$		0.419**		0.401
		[0.046]		[0.272]
$Ln(InsideBuy\_two)*LOBdum_t$			0.905	
			[0.207]	
$Ln(InsideBuy\_one)*LOBdum_t$				0.563
				[0.307]
$LOBdum_t$			-0.724	-0.721
			[0.287]	[0.324]
$Tobin's\ Q_t$	-0.678**	-0.671**	-0.478**	-0.471**
	[0.017]	[0.019]	[0.027]	[0.029]
ROA_t	4.912	4.744	3.91	3.741
	[0.208]	[0.832]	[0.200]	[0.809]
$Tangible_t$	7.098**	6.690**	6.098	6.690**
	[0.027]	[0.037]	[0.057]	[0.027]
$R\&D_t$	5.302	5.212	4.343	6.212
	[0.425]	[0.427]	[0.415]	[0.417]
Constant	-9.974***	-9.316***	-14.574***	-8.516***
	[0.001]	[0.001]	[0.001]	[0.001]
Year Fixed	YES	YES	YES	YES
N	1,220	1,220	1,220	1,220
Pseudo R^2	12%	13%	12%	13%

Figure 1
Lobbying Expenditure and Bills Sponsored by Year



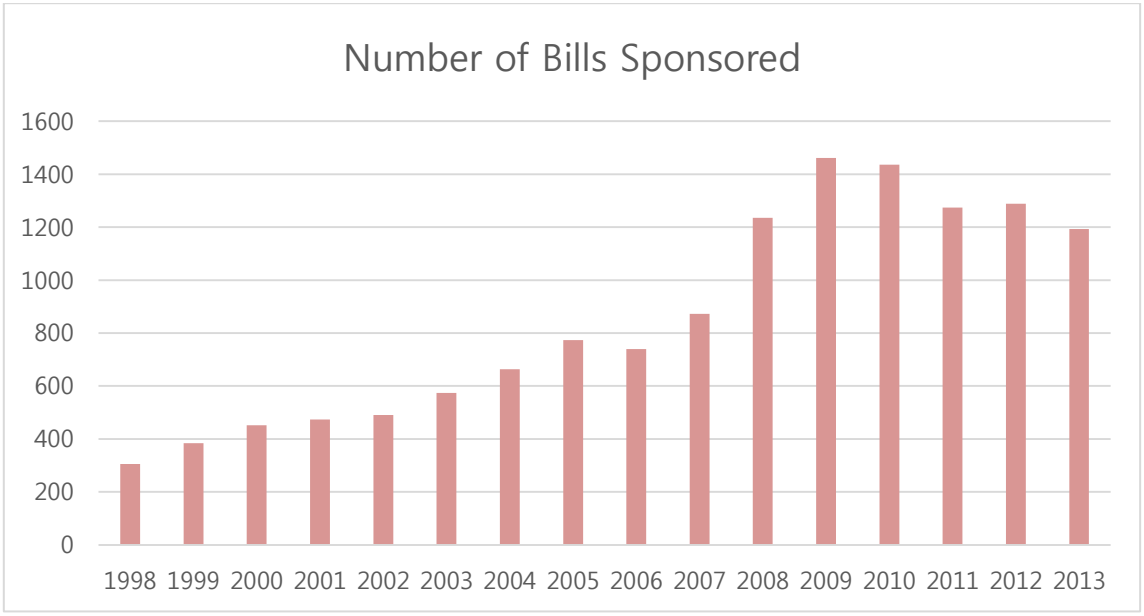


Figure 2
The Market Reaction on the FDA Approvals:
Lobbying vs. Non-Lobbying Firms

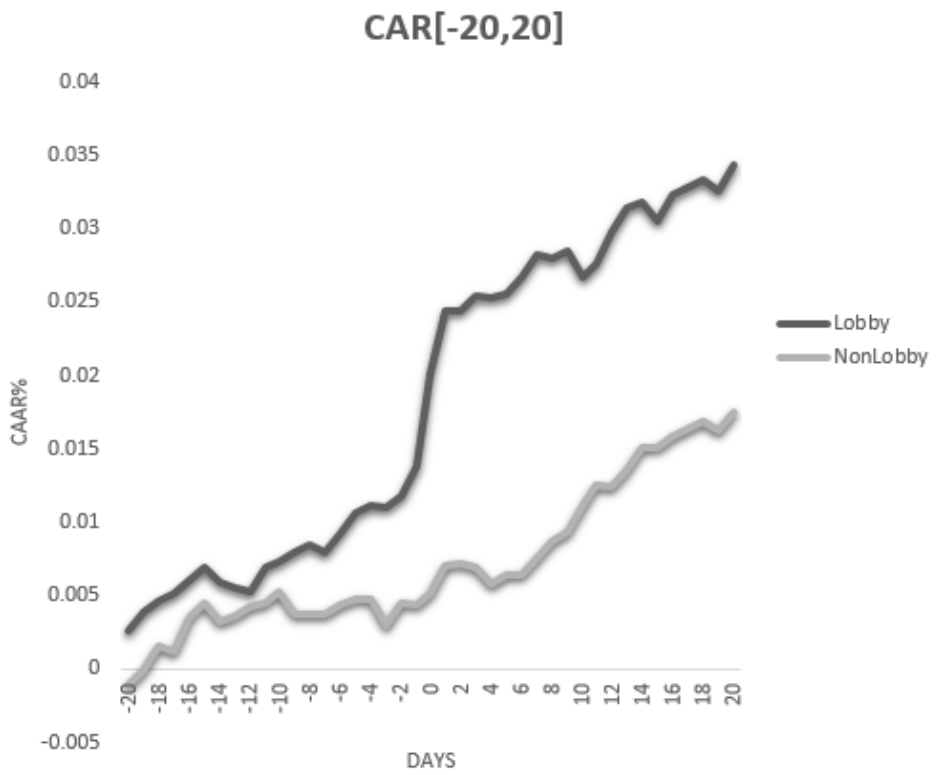
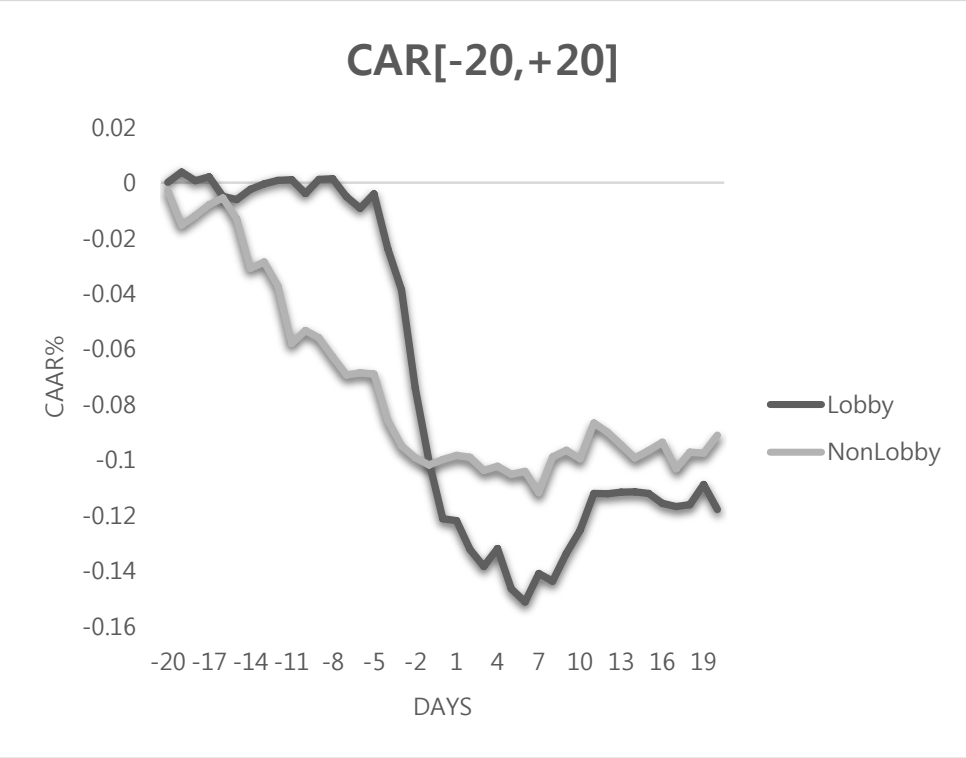


Figure 3
The Market Reaction on Litigations:
Lobbying vs. Non-Lobbying Firms



Appendix A
Definitions of Variables

Variables	Definition	Source
Panel A. Lobbying		
LOBamt	Total amount spent in lobbying activities in USD	CRP
LOBdum	Binary variable and equal to one if firm lobbied at least one bill in a given year, zero otherwise	CRP
BillSpon	Total number of bills lobbied including all topics	CRP
Panel B. Insider Transaction		
InsideBuy_two	Total number of insider transaction two weeks before FDA drug approval announcement	Thomson Reuters
InsideBuy_one	Total number of insider transaction one week before FDA drug approval announcement	Thomson Reuters
Panel C. Lawsuit Information		
Litigdum	Binary variable and equal to one if lawsuit filed against the firm, zero otherwise.	Stanford Law School
Reason : Insider Trading	Binary variable and equal to one if the reason of lawsuit is insider trading, zero otherwise.	Stanford Law School
Reason : Large Trade Reporting	Binary variable and equal to one if the reason of lawsuit is large trade reporting, zero otherwise.	Stanford Law School
Reason : False & Misleading Statement	Binary variable and equal to one if the reason of lawsuit is false/misleading statement, zero otherwise.	Stanford Law School
Reason : Manipulation	Binary variable and equal to one if the reason of lawsuit is manipulation, zero otherwise.	Stanford Law School
Total Settlement Amount	Total settlement amount paid by firms to the plaintiff.	Stanford Law School
Settle %	Percentage of settlement as an outcome from SEC lawsuit.	Stanford Law School
Dismiss %	Percentage of dismissal as an outcome from SEC lawsuit.	Stanford Law School
Total Duration of Lawsuit	Total duration of lawsuit.	Stanford Law School
Panel D. Control Variables		
Assets	The book value of a firm's assets[at]	COMPUSTAT
Tobin's Q	Market value of assets divided by book value of assets [(prcc_f*csho + at - ceq)/at)]	COMPUSTAT
Book Leverage	Debt in current liabilities plus long-term debt divided by assets [(dlc+dltt)/at]	COMPUSTAT
ROA	Earnings before interests and taxes divided by assets [ib/at]	COMPUSTAT
Tangibilty	Ratio of fixed assets to book assets [ppent/at]	COMPUSTAT
R&D	Research and development normalized by total asset [xrd/at]	COMPUSTAT