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LOBBYING EXPENDITURES AS AN INDICATOR OF THE PERFORMANCE OF COMPANIES IN THE US PHARMACEUTICAL MARKET

L. S. Shalev, J. Freixanet

St. Petersburg State University,

7–9, Universitetskaya nab., St. Petersburg, 199034, Russian Federation

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In the corporate political activity literature, abundant research has examined the lobbying activity in the United States and its relationship with firms' financial performance. Lobbying in the US emerged at the same time as the state itself, and the democratic system of government contributed to its rapid development. However, there have been few studies of firms headquartered outside the United States and that examine how nationality affects their lobbying activity. This paper relies on institutional theory to argue that high lobbying expenditures by multinational corporations would increase its annual revenue. It also argues that this effect is moderated by the nationality of the firm and its size. The formulated hypotheses were tested using a sample of 51 pharmaceutical companies spanning the fifteen-year period 2005–2020 and representing 12 countries. As moderators, two measurements of the size of the company were used: total assets and the number of employees. The obtained findings support the hypothesis on the relationship between lobbying expenditure and annual revenue, as described above. However, the findings do not support the arguments about a moderating effect of size on this relationship. The study is limited to the one specific sector. However, due to the universality of measurement, further comparative studies between sectors in different countries are possible. The study results enhance the understanding of the factors that determine corporate political activity and provide insights for further development of the topic and the extension of knowledge. This study holds important implications for firms' personnel policy, lobbying strategy optimisation and business location management.

Keywords: lobbying, financial performance, political risk, corporate political activity, firm size.

INTRODUCTION

In a politically and economically turbulent environment, the risks pharmaceutical companies face, especially in clinical-trial design and execution, drug approval, product quality, and global commercial practices, are increasing in both frequency and mag-

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nitude. The relevance of the topic of this study is primarily due to the trend towards strengthening the position of interest groups in the United States political system; an increase in their influence on the process of making domestic political decisions, and an increase in the importance of informal channels for lobbying the interests of individual corporations, ideological associations, countries and ethnic groups. American multinational companies (MNEs) are not only actively influencing US international economic policies to facilitate their overseas expansion. At the same time, their overseas expansion also emboldens them to influence the US domestic regulations [Feng, 2018].

Competitive interest groups have become an integral part of Washington's current policy-making system and are now directly integrated into the US political system, especially pharma [Kim, Milner, 2019]. Their lobbying expenditures are the highest among other industries in the USA (Appendix 1). The pharmaceutical industry has increased its lobbying activity in the US year after over the past 20 years, with the exception of the period from 2010 to 2014 (Appendix 2). It can be explained by sweeping health care reform — ObamaCare, signed into law in 2010. Scrounging up all the money to pay for ObamaCare's massive coverage expansion brought deep pay cuts to hospitals and health plans. And for those industries, it fundamentally changed the rules of the game [Norman, Karlin-Smith, 2016]. But in spite of the many lawsuits, large settlements, scandals (like Mylan's EpiPen, Opioid Epidemic or Daraprim) Big Pharma is still going strong.

This paper aims to investigate the effect of lobbying expenditure to annual revenue of firms. This aim is accomplished by testing the theoretical model in the context of pharma companies, which provides an avenue to test existing theories and models due to the heterogeneity of the continent. Based on the above, our key research questions are: what is the effect of pharma firm's lobbying expenditures on annual revenue and how this effect is moderated by size of the firm and its location?

The rest of the paper is organized as follows. The first section provides the overview on context of research. The second section provides an overview of the theory that underpins this research, which will also lead to the formulation of the hypotheses. The third section describes the data and methodology used in data analysis. The section fourth and conclusions are devoted to the results, discuss the implications to lobbying research and provide limitations and avenues for future research.

CONTEXT

The pharmaceutical and health products industry, which includes not only drug manufacturers but also traders in medicines and nutritional and dietary supplements, is invariably on top when it comes to federal campaign contributions.

The industry's political generosity increased in the years leading up to the Medicare Prescription Drug, Improvement, and Modernization Act passed by Congress in 2003. Since then, industry spending levels have fluctuated around 30 million US dollars, including during the 2014 election cycle when the number was almost 32 million US dollars. 2012 was the cycle when the industry contributed the most — more than 50.7

million US dollars. The pharmaceutical industry has traditionally supported Republican candidates, with the exception of the 2008 and 2010 cycles. During the 2014 cycle, Republicans received 58% of industry contributions, while Democrats received only 42%. As America's opioid crisis has been building up over the past two decades, the pharmaceutical industry has benefited from the epidemic and spent millions of dollars to maintain its power.

In the US pharmaceutical industry has flourished because it has become part of the world's largest and most dynamic economy. This growth was also facilitated by generous funding from the government. The National Institutes of Health saw federal funding rise to nearly 100 million US dollars by 1956. This investment facilitated the development of drugs over the coming decades.

Meanwhile, as the industry grew rich with its growing product portfolio, the potential ethical conflicts of making money from the sale of medical products became increasingly apparent. G. Merck addressed this issue directly in 1950, stating that: "We try never to forget that medicine is for the people. It is not for profit" [Vagelos, Galambos, 2006, p. 171]. Nevertheless, scandals continued, and further legal regulation was needed.

The thalidomide scandal in 1961 prompted increased regulation and testing of drugs before licensing, with a new amendment to US Food and Drug Administration's (FDA) regulations requiring proof of efficacy and accurate disclosure of side-effects for new drugs. Thalidomide has been found to have teratogenic properties and poses the greatest risk in early pregnancy. The likelihood of having a baby with physical deformities appears after taking just one tablet of thalidomide during this time period. The Kefauver Harris Amendment was adopted in 1962 [The thalidomide tragedy..., 2009].

The National Institute for Clinical Excellence has recommended thalidomide for multiple myeloma, a bone marrow cancer. The decision marks a watershed in the drug's slow return to respectability. It had been avoided for many years, but in the 1990s it was shown to be effective in treating leprosy [Laurance, 2011].

"The golden age" of drug development took place in the wider context of the post-war boom, the general context of mass improvements in living standards and technological optimism that characterised the 1940s to early 1970s, and the development of cold war science competition. As the barriers to entry into drug production were raised, there was considerable consolidation in the industry. Similarly, the processes of internationalisation that had begun before the war continued, with Pfizer opening subsidiaries in eight countries in 1951 alone [Company timeline...].

As the 1970s drew to a close, a shift began to occur in the way the pharmaceutical industry focused its efforts. In 1977, Tagamet, an ulcer drug, became the first ever "blockbuster" drug, earning its makers more than 1 billion US dollars a year and its creators a Nobel Prize [Li, 2014]. This marked a new shift as companies competed to be the developer of the next big blockbuster, and many achieved great success. Eli Lilly & Company launched the first selective serotonin reuptake inhibitor, Prozac, in 1987, once again revolutionising mental health practice [Whitaker, 2010]. The first statin was made by Merck/MSD ("MSD" writing is used outside the US and Canada) and was also approved in 1987.

The Hatch–Waxman Act of 1984 regulated the production of generics in the US by establishing a simplified registration procedure for generics: no preclinical or clinical trials were required. Generic manufacturers in the US have benefited from the Hatch–Waxman Act by being able to register bioequivalent drugs under a fast-track procedure without duplicating efforts to conduct efficacy and safety studies [McDonald, Ugryumov, Kolesnikov, 2018].

At this point, industry attention shifted to marketing to maintain market share, to lobby politicians to protect commercial interests, and to lawyers to enforce legal requirements for intellectual property rights. These activities caused, and still cause, greater suspicion of the industry as a whole.

Companies have become involved in outsourcing various aspects of their processes and buying up smaller companies that perhaps retain more of the innovative entrepreneurship of the 19th century pioneers [Boehner, 2008].

The United States is the world leader in per capita spending on prescription drugs, representing 30 to 40% of the global market. Many global pharmaceutical companies also have a presence in the US. In addition, a paper written by A. Daemmrich for Harvard Business School reports that in 2007, 40% of the world's approximately 6 500 drugs in clinical development were produced in the USA [Daemmrich, 2013]. In the US, the majority of the pharmaceutical wholesaler business is concentrated in a few companies that hold the majority of the market share [Ellis, 2016].

To sum up, the institutionalisation of industry lobbying in the USA took place throughout the 20th century in order to set the rules of the game for this new institution. But regulation has not always brought the welfare of the state as a whole, which is why there has been a trend towards industry deregulation.

THEORETICAL BACKGROUND AND HYPOTHESES

The hypothesis is developed using insights from institutional theory. According to J. Boddewyn [Boddewyn, 2016] the institutional theory may help in understanding distances (economic, administrative, psychic, institutional and others), constraints (normative, cognitive and regulative) and the importance of relational over contractual relationships. Thus, institutions can reduce transaction costs necessary for decision making, as we will discuss next.

Lobbying as a determinant of corporate financial performance. Gaining and maintaining access become central goals of firms' political activities [Schuler, Rehbein, Cramer, 2002]. In search of competitive advantage in their respective industries (and outside of them) MNEs look for ways to access and then influence the policy process. When market power is artificially maintained by government intervention, the particular type of inefficiency may result — rent seeking.

According to M. Khan and K. S. Jomo [Khan, Jomo, 2000] rent seeking is the unproductive resources spent by firms in attempting to influence policymakers. An example of rent-seeking in a modern economy is spending money on lobbying by interest groups

for government subsidies in order to be given wealth that has already been created, or to impose regulations on competitors, in order to increase market share [Carter, 2021]. F. Baumgartner and B. Leech [Baumgartner, Leech, 2001] highlighted their own classification of interest groups: enterprises, trade associations, non-profit and civil groups, professional associations, institutions, trade unions, governments and others.

According to [North, 1990], the emergence of numerous and powerful lobbying groups trying to use the state for their economic purposes was the political consequence of the industrial revolution. As a result, erosion of the effective institutional structure established in the XIX century is observed. D. North believed that when institutions begin to serve the interests of individual social troupe, “the disintegration of the previous system of property rights” occurs and it replaces “the struggle on the political arena for the distribution of income created by the potential of the second economic revolution” [North, 1990, p. 75]. In such a situation, economic progress can slow down or even suspend.

Even when the current rules and organizational forms become ineffective, the costs needed to change them can be extremely huge. In this case, the preservation of less efficient institutions is preferable. To stimulate the markets and prevent predation from the government, the state should have taken credible obligations to limit his behaviour, observing both government procedures (for example, parliament had exceptional tax control) and the rights of citizens [Levi, Weingast, 2019].

In recent years, lobbying activities of interest groups have often been viewed in the context of campaign finance — a separate block of studies is devoted to political action committees and the problem of corruption arising from the weak regulation of their activities [Cao et al., 2018]. The analysis of material and cash contributions in favour of parties or politicians and their statistical analysis are presented in [Baumgartner, Gray, Lowery, 2009; De Figueiredo, Richter, 2014; Hall, Deardorff, 2006; Groll, McKinley, 2015; Peele, Bailey, Caine, 2010]. The authors are also involved in the issues of modern lobbying in the United States.

Presumably the first research to examine the connection between corporate lobbying, quantified by the dollar amount of lobbying expenses, and corporate financial performance was conducted in the end of 2000s [Kim, 2008; Chen, Parsley, Yang, 2015]. Using a panel data of S&P 500 Index firms covering 1998–2004, J. Kim finds that lobbying depends more on managerial incentives and protection needs beyond industry structures than contributions do [Kim, 2008]. Lobbying expenditure as term was established in 2000s. Most research pay attention to specific industry — healthcare, for example [Weissenstein, 1996; Landers, Sehgal, 2004; Wouters, 2020]. B. Barber and L. Diestre reveal that firms’ lobbying strategies depend upon the level of intellectual property (IP) protection behind their drugs [Barber, Diestre, 2019]. Only in last five years due to emergence of good databases it allows to look deeper in corporate political activity of foreign firms. Recent research of V. Shirodkar, R. Konara and S. McGuire [Shirodkar, Konara, McGuire, 2017] support their argument, that sometimes MNEs’ overall experience and technological intensity reduce the imprinting effect of home institutions on lobbying expenditure.

In [Chen, Parsley, Yang, 2015] the authors show that lobbying has a positive impact on financial performance and that firms engaging in lobbying generate superior returns compared to competitors that do not. M. Hill and co-authors [Hill et al., 2013] concluded that shareholders capitalize lobbying activities that managers pursue on their behalf into the firm's share prices. In [Alexander, Mazza, Scholz, 2009] it is shown, that firms that lobbied for the American Jobs Creation act of 2004 generated 220 US dollars for every 1 US dollar spent on lobbying. M. J. Cooper and co-authors [Cooper, Gulen, Ovtchinnikov, 2010] show that there is a positive market return for contributing to candidates for political office.

On the other hand, several studies have found either no relationship or a negative relationship between corporate lobbying and average firm performance. M. Hadani and D. A. Schuler discuss a scenario using game theory whereby all firms compete against each other in the marketplace for access to political actors, and thus engage in an "arms race" of corporate lobbying for uncertain benefits [Hadani, Schuler, 2013]. Empirical evidence for this position is provided by J. M. De Figueiredo and B. S. Silverman who have found that in most circumstances, educational institutions do not receive any returns for their lobbying efforts [De Figueiredo, Silverman, 2006]. J. Wright finds that lobbying by tobacco firms does not have an impact on the tobacco price support system [Wright, 2004]. S. Ansolabehere and co-authors [Ansolabehere, Snyder, Ueda, 2004] compare Fortune 500 firms that contribute large amounts of soft money with those that do not and find no difference in their valuations. J. P. H. Fan and co-authors [Fan, Wong, Zhang, 2007] found that corporate political activities cause poor corporate governance and thus leads to poor firm performance or according to [Lee, Weng, 2013] to shrinking exporting activity. D. H. Meldrum consider the decrease of profits among the consequences of country risk [Meldrum, 2000].

However, there was no clear evidence firm's nationality effect of relationship between lobbying and corporate financial performance. In the research [Buckley, Dunning, Pearce, 1978] the nationality effects were shown to be strong influences on profitability and growth in all periods (1962–1967; 1967–1972; 1962–1972) when US firms were included in the sample, but less significant for differences among non-US firms.

So, it is interesting to look what the effect lobbying expenditure has on pharma companies' financial performance, including to look at nationality effect on it. The pharmaceutical product and medical supplies industry, which includes not only drug manufacturers, but also by drug traders, as well as food and biologically active additives, is invariably on top when it comes to contributions to the federal campaigns. Despite the wave of indignation and scandals, major players firmly entrenched in the market and, supporting the party at the same time, hold the robust position. And the rivalry of internal groups only enhances the already active lobbying activities.

Therefore, we hypothesize that:

Hypothesis H1a. Foreign pharma companies' annual revenue is positively influenced by lobbying activity.

Hypothesis H1b. American pharma companies' annual revenue is positively influenced by lobbying activity.

Effect of firm's size on corporate performance. One of the factors influencing company performance is firm's size [Devi, Khairunnisa, Budiono, 2017; Sritharan, 2015; Olawale, Ilo, Lawal, 2017]. The huge size of the company is a very impressive argument in order to negotiate the value of their inputs and then reduce their average costs. This will result in increased profitability for the company. However, it is also valuable to mention, that size of the firm also does not guarantee high intensity of lobbying activity. For example, Bloomberg L.P.¹ have spent only 20 million dollars in last 20 years. Strange for company with 169 locations and revenues 500 times higher than the lobbying expenditures. W. Kerr, W. Lincoln and P. Mishra found, that only 10% of the firms in their sample of publicly traded firms engage in lobbying in one or more years over 1998–2006 [Kerr, Lincoln, Mishra, 2014]. J. Sudrajat and co-authors argue, that the firm's size has no effect on firm's financial performance which is proxied by return-on-assets and has no effect on firm's financial performance which is proxied by market-to-book-value [Sudrajat et al., 2020].

Some researchers suggest that the firm size measurement can be carried out in several methods namely through sales, employees, assets or value add features [Zadeh, Eskandari, 2012; Dang, Li, 2018]. M. Pervan and J. Višić [Pervan, Višić, 2012] analyze the impact of firm's total assets on return on assets performance using fixed effects regression. The results reveal that size of the firm, natural logarithm of firms' total assets, influences return on assets (ROA) positively and significantly. S. Hashmi with co-authors argues number of employees may be the least statistically related proxy of firm size with financial policy. In this paper number of employees and total assets would be included in dataset to test statistical significance and their effect on lobbying-annual revenue relationship [Hashmi et al., 2020].

L. Johns and R. Wellhausen illustrate that supply chain linkages with local companies function as informal substitute for property rights, helping protect foreign firms operating in weakly institutionalized environments from government expropriation [Johns, Wellhausen, 2016]. Traditional MNCs whose clearly identifiable nationality may shield them from government expropriation [Wellhausen, 2014; Eden, Miller, 2004]. G. Deng and S. Kennedy using parallel surveys of companies and associations based in Beijing, find that firm nationality have very little effect on reported lobbying behavior [Deng, Kennedy, 2010]. F. Sadrieh and M. Annavarjula on US and Japanese firms sample found that foreign nationality is not a predictor of lobbying intensity [Sadrieh, Annavarjula, 2005]. In their model, firm performance is a dependent variable. In order to provide a more detailed view of the relationship between lobbying activity and firm profitability (annual revenue), the foreign nationality is going to be considered as a predictor.

Therefore, we suggest that:

¹ Bloomberg Finance L.P. *Bloomberg*. URL: <https://www.bloomberg.com/profile/company/0006612D:US?sref=6pbtu985> (accessed: 28.08.2021).

Hypothesis H2. The relationship between lobbying activity and annual revenue is positively moderated by nationality of the firm.

Hypothesis H3. The relationship between lobbying activity and annual revenue is positively moderated by firm's size.

After developing the hypotheses, the data for hypotheses to be tested were collected.

METHODOLOGY

Sample. We followed a quantitative approach to determine the relationship between Annual Revenue and lobbying activity. Corporate lobbying is measured by expenditure totals disclosed in legally required US Senate Office of Public Records filings. The data are based on the databases, such as OpenSecrets² and Macrotrends³. OpenSecrets.org. — a constantly updated database from The Center for Responsive Politics (CRP). It is a non-profit research group based in Washington DC that monitors the effect of money and lobbying on elections and public policy. Macrotrends — the research platform, containing screener with over 50 performance and fundamental criteria financial data.

Initially, thinking to conduct an analysis of only five largest non-American companies in the pharmaceutical market: Roche (Switzerland), Novartis (Switzerland), GlaxoSmithKline (the UK), Sanofi (France), Takeda Pharmaceutical Co (Japan). However, for more reliable results, the base was expanded. First, using the consolidated tables on lobbying costs, the top 100 lobbying companies were selected for a certain year and then were switched together. At the time interval from 1998 to 2020, there were about 400 organizations (corporations, trade associations, NPOs, etc.) Then, during the review, about 300 organizations were excluded, due to low lobbying activity, bankruptcy, mergers with other companies, takeovers, etc. The Center of Responsive Politics does not include bribes and other forms of obtaining political influence and has been used in several studies on lobbying in the past [Duso, Jung, 2007; Mattozzi, 2008; Goldman, Rocholl, So, 2009]. Our final sample consists of 51 firms spanning the fifteen-year period 2005–2020, representing 12 countries (Appendix 3). Altogether, there are 666 firm-year observations.

The total expense incurred by a pharmaceutical company on lobbying in the USA in a given year was measured by lobbying expenditure. This is our independent variable. *DUM_international* is a dummy variable capturing nationality of company, with the value of 1 for non-American companies and 0 if otherwise. To deal with the skewed distribution, log transformation of AnnualRev, TotalAssets, TotalLiabilities, Employees variables is applied.

It is still necessary to mention that initially planned to use 12 political risk indicators (only for the USA) to explore which of the risks affect the lobbying activity of pharmaceutical companies. However, due to the insufficiency of observations (19) they were deleted from dataset. Political risks are by definition considered to countries or ad-

² OpenSecrets.org. URL: <https://www.opensecrets.org> (accessed: 13.08.2021).

³ Macrotrends.net. *Macrotrends LLC*. URL: <https://www.macrotrends.net> (accessed: 22.08.2021).

ministrative units (regions, states...). Governments of those administrative units are the ones that can increase or decrease the political risk of their territories. Therefore, there are not political risk indicators for companies. Modelling political risk at the corporate level must make use of good measures of quantifiable variables and systematic analysis that can reduce large quantities of data, according to accepted causal models, to probabilistic estimates of possible events in an efficient fashion [De la Torre, Neckar, 1988]. Nevertheless, there are some attempts to build a political risk indicator for companies [Restrepo, Correia, Población, 2012; Jiménez, Luis-Rico, Benito-Osorio, 2014; Costa, Figueira, 2017; Hassan et al., 2019]. However, none of it is applicable to research topic, and to build new one requests much time.

Measures. In an attempt to achieve the objective of this study, the model specified below is adopted:

$$AnnualRev_{it} = \beta_0 + \beta_1 LobbyExp_{it} + \beta_2 TotalLiabilities_{it} + \varepsilon_{it}. \quad (1)$$

To test the hypotheses GLS random effects (*RE*) model is adopted because collected data contain repeat observations for the same companies across years, which may result in two problems: incorrect estimation of the regression coefficient variances and ineffective estimates of the regression coefficients [Gujarati, 2003; Asteriou, Hall, 2011]. Previous studies [Gelb et al., 2020; Shirodkar et al., 2022] have demonstrated that RE can be used to address this issue. Thus, the analysis using the initial fixed effects and random effects approaches is combined, considering the differences between them.

In addition, the Mundlak estimator was used [Mundlak, 1978]. Mundlak proved that the estimator of the parameter related to the average over time of time-varying variables corresponds to the difference between the within estimator (which is not biased because of endogeneity) and the between estimator (which may be biased because of endogeneity) [Dieleman, Templin, 2014]. It confirms the fact that the Mundlak estimator is providing the same results as fixed effects [Mundlak, 1978; Yang, 2022]. In addition to that, to check the need to exclude the added mean variables from the models, Wald test for the joint significance of these variables is carried out. The correlation between the company-specific unobservables in Annual revenue and the regressors in the model was checked by the Wald test for the joint significance of the Mundlak variables. Wald test showed the joint significance of the regressors that form the Mundlak estimator ($p = 0.0000$). In this regard, they cannot be excluded from the model as useless regressors. Also, cluster-robust estimator is used, allowing only within-cluster covariances and restricting others to zero.

Moreover, to evaluate the effects of nationality and firm size on lobbying investment, moderation should be conducted:

$$Y = \beta_0 + \beta_1 X + \beta_2 Z + \beta_3 (X \cdot Z) + \varepsilon_0, \quad (2)$$

where β_1 indicates the main effect of X on Y ; β_2 indicates the main effect of Z on Y ; β_3 indicates the interaction effect of X and Z , i.e., the effect of X on Y , given the presence of Z [Berrington de González, Cox, 2007].

Therefore, there are two models to look at:

$$AnnualRev_{it} = \beta_0 + \beta_1LobbyExp_{it} + \beta_2TotalAssets_{it} + \beta_3(LobbyExp_{it} \cdot TotalAssets_{it}) + \epsilon_0, \quad (3)$$

$$AnnualRev_{it} = \beta_0 + \beta_1LobbyExp_{it} + \beta_2Employees_{it} + \beta_3(LobbyExp_{it} \cdot Employees_{it}) + \epsilon_0. \quad (4)$$

Furthermore, one more model is included, with dummy variable (Nationality) as moderator:

$$AnnualRev_{it} = \beta_0 + \beta_1LobbyExp_{it} + \beta_2DUM_international_{it} + \beta_3(LobbyExp_{it} \cdot DUM_international_{it}) + \epsilon_0. \quad (5)$$

Table 1 provides information with regard to variable definitions and exact data sources.

Table 1. Variables description, measurement and sources

Variable	Description and Data source
<i>LobbyExp</i>	Lobby expenditures are expenditures that attempt to influence politics. They include donations to political campaigns, efforts to influence lawmakers on potential legislation, or any other communications that attempt to influence politicians or political functions; log
<i>AnnualRev</i>	Annual revenue is the total amount of money a company makes during a given 12-month period from the sale of products, services, assets or capital; log
<i>TotalAssets</i>	Total assets are the assets owned by the entity that has an economic value whose benefits can be derived in the future; log
<i>TotalLiabilities (Control variable)</i>	Total liabilities are the combined debts and obligations that an individual or company owes to outside parties. revenues can be part of Total Liabilities; log
<i>Employees</i>	Annual number of employees by one company; log
<i>DUM_international</i>	Dummy variable for nationality of company, with the value of 1 for non-American companies and 0 if otherwise

Based on: OpenSecrets.org. URL: <https://www.opensecrets.org> (accessed: 13.08.2021); Macro-trends.net. *Macrotrends LLC*. URL: <https://www.macrotrends.net> (accessed: 22.08.2021); Bloomberg Enterprise Data. *Bloomberg L.P.* URL: <https://data.bloomberg.com> (accessed: 28.08.2021).

RESULTS

Descriptive statistical analysis aims to provide an overview of the data used in this study. Table 2 presents mean values, standard deviations of each variable and the pairwise correlation results.

Table 2. Descriptive statistics and correlation matrix, $N = 613$

Variable	Mean	Standard deviation	DUM_ international	AnnualRev	TotalAssets	TotalLiabilities	Employees	LobbyExp
DUM_intern~l	0.3921569	0.4885308	1					
AnnualRev	22.42207	2.11059	-0.0196	1				
TotalAssets	22.94399	2.01483	0.101*	0.745***	1			
Totalliabilities	22.33725	2.057554	0.118**	0.764***	0.822***	1		
Employees	9.429689	1.805429	0.0948*	0.792***	0.796***	0.819***	1	
LobbyExp	14.30605	1.229046	0.125**	0.564***	0.672***	0.670***	0.605***	1

Note: * — $p < 0.05$; ** — $p < 0.01$; *** — $p < 0.001$.

Dummy variable (residence of company) is positively correlated with annual revenue (*AnnualRev*), total assets (*TotalAssets*), total liabilities (*TotalLiabilities*) and number of employees (*Employees*). Lobbying expenditure (*LobbyExp*) is positively correlated with the rest of variables as can be stated about correlation between remaining variables. Table 3 shows the regression results.

Table 3. Lobbying activity to corporate annual revenue, 2005–2020

Variable	Model 1	Model 2	Model 3
LobbyExp	0.292** (2.66)	0.277** (2.87)	0.288** (3.82)
TotalLiabilities	0.232** (4.67)	0.122 (1.88)	0.199** (5.11)
M_LobbyExp	-0.531** (2.71)	-0.111** (5.42)	-0.391* (2.28)
M_TotalLiabilities	0.783** (5.35)	0.41** (6.17)	0.744** (6.65)
Cons	3.316* (2.25)	1.201 (0.93)	2.842** (2.67)
N	425	241	666

Notes: Model 1 — only American companies (31); Model 2 — only non-American companies (20); Model 3 — all companies (51); t -statistics in parentheses; * — $p < 0.05$; ** — $p < 0.01$; *** — $p < 0.001$; N — sample size (number of observations).

Table 3 shows that across the regressions, nevertheless if we pick the sample of American pharma companies (Model 1), foreign ones (Model 2) or in general (Model 3), there is positive relationship between lobbying expenditures and annual revenue of firm. This relationship based on history and size of these companies. The most active interest groups are the health industry. Despite the presence of powerful non-profit organizations, political activity committees (PACs and SuperPACs), MNEs are still get in Top 10 Donors list.

However, it is also worth answering that the list of the most active from year to year rarely changes due to the fact that this industry is characterized by constant acquisitions and mergers. Therefore, some companies have been active in lobbying for only a few years before disappearing. In addition, the database contains companies that are actively involved in lobbying, but at the same time are subdivisions of larger companies from the list. Thus, hypotheses *H1a* and *H2b* are confirmed.

Second part of our study is look at effect of size and nationality of the firm on relationship between lobbying activity and annual revenue (Table 4). Variables involved in interactions are not categorical, so *i*. is needed — this would be *nat.id* — Nationality variable.

Table 4. Moderation/interaction on relationship between lobbying expenditure and firms' annual revenue

Variable	<i>AnnualRev</i>	<i>AnnualRev</i>	<i>AnnualRev</i>
1	2	3	4
<i>LobbyExp</i>	1.035** (4.23)	2.474** (4.98)	0.842** (14.80)
<i>Employees</i>	2.123** (6.11)		
<i>LobbyExp_Employees</i>	-0.087** (3.49)		
<i>TotalAssets</i>		2.066** (6.85)	
<i>LobbyExp_TotalAssets</i>		-0.101** (4.70)	
<i>DUM_international</i>			4.829** (2.95)
<i>LobbyExp_nationality</i>			-0.392** (3.35)
Switzerland	0.068 (0.27)	0.444* (1.97)	1.845** (3.47)
Germany	-0.151 (0.44)	0.247 (0.81)	1.634** (2.78)
United Kingdom	-0.701** (3.28)	-0.235 (1.26)	0.959* (1.99)
France	-0.438 (1.34)	-0.168 (0.56)	1.636** (2.89)
Ireland	-0.213 (1.47)	-0.809** (5.37)	-0.521 (1.19)
Israel	-0.151 (0.47)	-0.125 (0.42)	1.003 (1.79)
Netherlands	-1.596* (2.08)	-0.913 (1.11)	0.625 (0.57)

Denmark	-0.800* (2.52)	-0.031 (0.10)	0.702 (1.28)
Japan	0.099 (0.26)	-0.112 (0.35)	1.436* (2.53)
Spain	-1.191** (2.66)	-0.924* (2.35)	0.135 (0.22)
Australia	-2.571** (4.72)	-1.889** (3.62)	
<i>Cons</i>	-0.433 (0.13)	-26.912** (3.89)	10.764** (13.28)
<i>N</i>	613	666	674
<i>R</i> ²	0.67	0.61	0.39

Notes: 1) * — $p < 0.05$; ** — $p < 0.01$; 2) in parentheses there are standard errors; 3) *N* — sample size (number of observations).

As expected, all of the coefficients are significant. It means that the effect of lobbying expenditure on annual revenue depends on the level of staff number (or total assets). However, the interaction coefficient is negative, for all moderators in all models. It means if the staff number (total assets) increases, the effect of lobbying expenditures on firm's annual revenue decreases (or alternatively, if number of employees (total assets) declines, the effect of lobbying expenditures on firm's annual revenue increases).

Moving on to the effect of nationality, speaking about the effect of the number of employees, as a result, one can conclude that it affects only several countries. For case of Number of Employees — United Kingdom; Spain, Australia; for case of Total Assets — Ireland, Australia; for case of Nationality dummy variable — Switzerland, Germany, France. Why only these countries are connected with this effect can be described providing theoretical framework. And this can be a continuation of the study in which the political risk indices will be involved, which will increase knowledge in the activities of a foreign lobby. Nevertheless, according to the results, hypotheses *H2* and *H3* are not confirmed. The results of the study are presented in Table 5.

Table 5. Summary of hypotheses and results

Hypothesis	Statement	Outcome
<i>H1a</i>	Foreign pharma companies' annual revenue is positively influenced by lobbying activity	Confirmed
<i>H1b</i>	American pharma companies' annual revenue is positively influenced by lobbying activity	Confirmed
<i>H2</i>	The relationship between lobbying activity and annual revenue is positively moderated by nationality of the firm	Not confirmed
<i>H3</i>	The relationship between lobbying activity and annual revenue is positively moderated by firm's size	Not confirmed

The results are consistent with the findings in [Alexander, Mazza, Scholz, 2009; Chen, Parsley, Yang, 2015; Hill et al., 2013]. This study highlights different methods of measuring the firm size. As it was possible to see, lobbying has a positive effect on annual revenue. So, lobbying can serve here not only to increase profits but also insurance from poor performance and will also allow maintaining strong connections with the government. At the same time, all possible ways they try to circumvent the law, for example, concerning taxation, because of which many companies are registered in other countries while conducting their operations on American land.

CONCLUSIONS

Since 1980, the pharmaceutical industry has gained unprecedented, privileged access to the state in the US and the European Union, enabling it to work in collaboration with its allies in the executive and legislative branches of government to bring about regulatory reforms in its commercial interests. This has made it possible for the industry and government to advance a pro-business deregulatory agenda in the pharmaceutical sector, including reforms of drug regulatory agencies themselves, such as appointments of more industry-friendly heads of the regulatory agencies, increased dependence of the agencies on industry fees, extension of informal consultation between regulators and firms, and responsiveness to commercial, rather than health, priorities in terms of how quickly regulatory review of new drugs is completed.

The potential policy implication is to strengthen legislative regulation of the industry, particularly with regard to transparency of contacts between officials and representatives of pharmaceutical companies in the United States [Piller, You, 2018] and Europe [Webb et al., 2022]. Also, provide policies to promote competition in markets for pharmaceutical products. As the public remains concerned about the high and rising drug prices, federal and state policymakers continue to demonstrate interest in proposals to lower prescription drug costs. [Dolan, Garfield, Rudowitz, 2021]. Following the introduction of such initiatives, such companies are usually affected in various ways and need to prepare accordingly [Heusler, 2020].

The pandemic and its economic consequences have added further complications to what was already a risky launch environment. In such circumstances, newcomers need to find new markets and make their products available at an affordable price in developing countries. J. Spritz and M. Wickham found, that pharmaceuticals make many times more money than other comparable firms, and they do not spend that profit on R&D [Spitz, Wickham, 2012]. Large companies, on the other hand, need to increase steady investment in R&D or reconsider the launch strategy. For a pharmaceutical company looking to reinvent its commercial model, the launch of new products is a golden opportunity to try out new techniques and gauge their impact before rolling them out more widely. Innovations developed for new drugs that prove valuable for commercial success will reshape the commercial strategy of the whole company. On the other hand, Big Pharma can further increase their lobbying activities in order to prevent increased regulation of the industry.

In general, given the importance of lobbying activities, pharmaceutical firms need to properly manage them in order to maximize their results. This may have implications in human resources, company strategies, and business location. First, regarding implications on personnel management, from a look into the industry it appears to be necessary to implement more quantity and better quality of training on how to conduct this activity, including more formalized publications and seminars. In this vein, export promotion organizations (EPOs) could as well develop specific programs aimed at helping firms in this industry to further advance in their internationalization process by providing them with tools and knowledge on how to improve their lobbying activity [Freixanet, Churakova, 2018; Freixanet, 2010; 2022].

Furthermore, considering that either nationality or size do not appear to play a role in the effects of lobbying endeavors, EPOs from different countries could offer such programs, and firms from different sizes use them. Second, firms need to adopt a more strategic perspective of lobbying. This could involve hiring process that considers the experience in these activities and the governmental contacts a candidate may provide. It would also involve managing the knowledge (both processes and contacts) pertaining to lobbying efforts. Finally, taking into account the lack of influence of companies' nationality, firms with headquarters in different locations may develop lobbying activities. However, for the success of these efforts, it is important that they create subsidiaries in the host country to have a closer contact with their clients and higher influence in government officials.

The present study has several limitations that suggest avenues for future research. On one hand, the study is limited to the pharmaceutical sector. However, it should be noted that this is a pilot study and it applies not only to pharmacological companies. Its generalisability could be extended to another sectors. However, it is also necessary to solve the problem of incorporating political risk indicators for companies, because for newcomers in the market it can be a great help for the arrangement of the road-map.

Another limitation to such study is a shortage of data or their misfortune due to market characteristics, which is especially true of pharmacology. Over the past 20 years, there were many acquisitions and mergers in this area, why lifespan of such companies is very short, which means that data will simply be lacking. In addition, the closeness of some companies does not allow to learn the exact financial indicators (like, shares of revenue by country) of what will suffer from the study database and, accordingly, research in general.

Also, quantitative research alone might not be enough to understand the effect of lobbying behavior on companies. Therefore, there is need for contextual research that uses a mixed method to understand the motives specific foreign companies and industry to lobby in the USA and their activity in general. However, the findings already can provide valuable insights about firms' personnel policy, lobbying strategy optimization and business location management. Identification of the current and emerging issues together provides practitioners in healthcare systems with an idea of available

techniques and strategies to solve problems in pharmaceutical management [Narayana, Pati, Vrat, 2012].

The discussions between economists and public health proponents are still ongoing and the implications of these power struggles for pharmaceutical policies are still unclear.

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Contact information

Lev S. Shalev — Postgraduate Student; st041536@gsom.spbu.ru

Joan Freixanet Solervicens — PhD; j.freixanet@gsom.spbu.ru

РАСХОДЫ НА ЛОББИРОВАНИЕ КАК ИНДИКАТОР ЭФФЕКТИВНОСТИ ДЕЯТЕЛЬНОСТИ КОМПАНИЙ НА ФАРМАЦЕВТИЧЕСКОМ РЫНКЕ США

Л. С. Шалев, Х. Фрейшанет

Санкт-Петербургский государственный университет
Российская Федерация, 199034, Санкт-Петербург, Университетская наб., 7–9

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В литературе по корпоративной политической деятельности достаточно много исследований, изучающих лоббистскую деятельность в Соединенных Штатах и ее связь с финансовыми показателями деятельности фирм. Лоббизм в США возник одновременно с самим государством, а демократическая система управления способствовала его быстрому развитию. Однако было проведено мало исследований фирм, штаб-квартиры которых находятся за пределами США, и того, как национальная принадлежность компаний влияет на их лоббистскую деятельность. В этой статье используется институциональная теория для доказательства того, что высокие лоббистские расходы транснациональных корпораций увеличивают их годовой доход. Также утверждается, что этот эффект смягчается национальностью фирмы и ее размером. Гипотезы проверяются на выборке из 51 фармацевтической компании из 12 стран, охватывающей период с 2005 по 2020 г. В качестве модераторов использовались два измерения размера компании — общие активы и количество сотрудников. Полученные результаты подтверждают гипотезу о взаимосвязи между расходами на лоббирование и годовым доходом, но опровергают аргументы о moderирующем влиянии размера на эту взаимосвязь. Исследование ограничено одним конкретным сектором. Однако благодаря универсальности измерений возможен дальнейший сравнительный анализ секторов в разных странах. Выводы исследования улучшают понимание факторов, определяющих политическую активность компании, и дают представление о развитии темы и расширении знаний. Они имеют важное значение для кадровой политики компаний, оптимизации стратегии лоббирования и управления местонахождением бизнеса.

Ключевые слова: лоббирование, финансовые показатели, политический риск, корпоративная политическая активность, размер фирмы.

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Шалев Лев Сергеевич — аспирант; st041536@gsom.spbu.ru
Фрейшанет Солирвисенс Хуан — PhD; j.freixanet@gsom.spbu.ru

APPENDIX 1

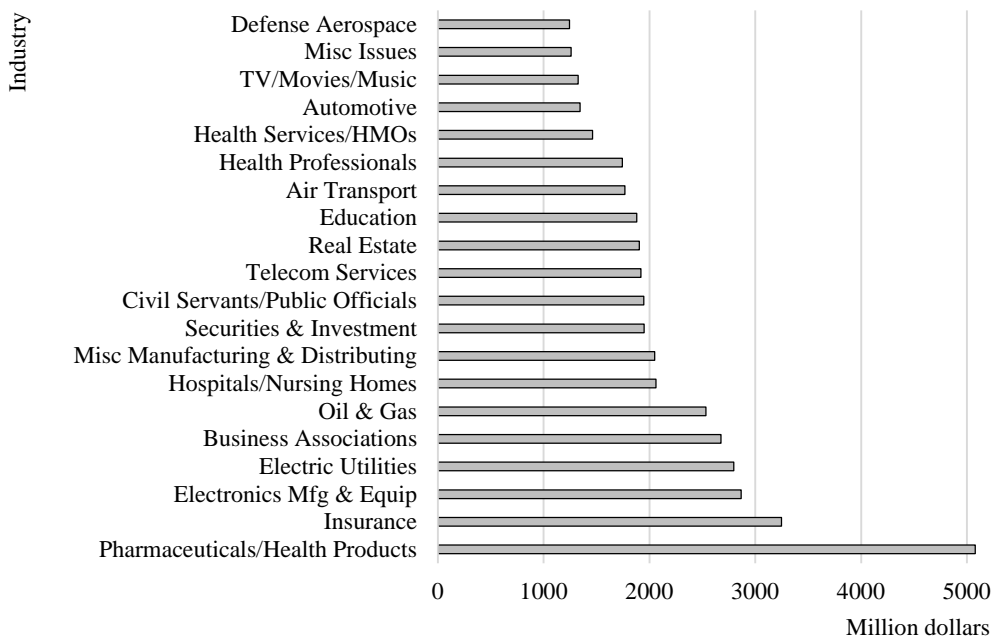


Figure. Top 20 lobbying industries in the USA, 1998–2021, million dollars

Based on: OpenSecrets. URL: <https://www.opensecrets.org> (accessed: 25.05.2022).

APPENDIX 2

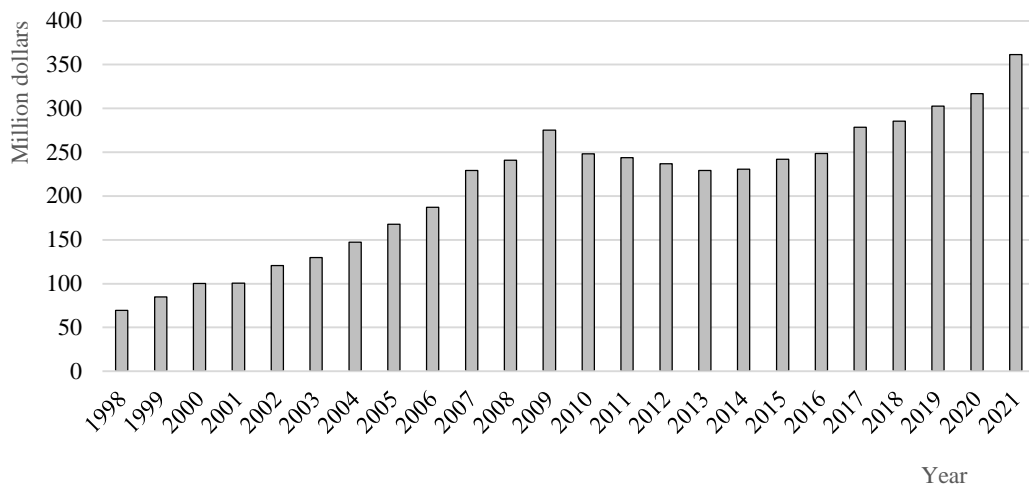


Figure. Lobbying expenditures of the pharmaceutical industry in the USA, 1998–2021, million dollars

Based on: OpenSecrets. URL: <https://www.opensecrets.org> (accessed: 26.05.2022).

Table. List of pharmaceutical companies (by top lobbying spending descending), 2005–2020

No	Company	Lobbying spending, US dollar
1	Pfizer Inc	187 639 918
2	Amgen Inc	166 095 000
3	Roche Holdings	109 355 324
4	Novartis AG	107 460 559
5	Eli Lilly & Co	106 210 110
6	Bayer AG	104 636 022
7	Merck & Co	103 480 010
8	Johnson & Johnson	99 881 000
9	GlaxoSmithKline	79 333 000
10	Sanofi	67 759 040
11	Bristol-Myers Squibb	65 910 776
12	Medtronic Inc	64 448 691
13	Abbott Laboratories	62 970 000
14	AstraZeneca PLC	60 730 213
15	Teva Pharmaceutical Industries	49 920 000
16	AbbVie Inc	48 650 000
17	Baxter International	40 099 000
18	Gilead Sciences	39 873 000
19	Novo Nordisk	33 968 100
20	Biogen / Biogen Idec	29 308 680
21	Takeda Pharmaceutical Co	28 730 333
22	Cardinal Health	28 684 400
23	Boston Scientific Corp	26 980 489
24	Alkermes Plc	26 946 285
25	AmerisourceBergen Corp	24 540 795

Lobbying expenditures as an indicator of the performance of companies in the US pharmaceutical market

26	McKesson Corp	20 788 438
27	Horizon Pharma	18 890 000
28	Vertex Pharmaceuticals	16 540 000
29	Smith & Nephew	15 925 000
30	Endo International	15 552 000
31	Becton Dickinson &	15 187 468
32	Edwards Lifesciences	14 074 558
33	Viartis / Mylan Inc	13 826 980
34	Alexion Pharmaceuticals	11 067 338
35	Invacare Corp	10 348 444
36	CSL Ltd	10170000
37	Herbalife International	9 905 000
38	Hill-Rom Holdings	8 480 000
39	Zimmer Biomet	7 101 912
40	Myriad Genetics	6 476 000
41	Steris Corp	5 905 000
42	Colgate-Palmolive Co	5 370 000
43	Grifols	5 179 000
44	Jazz Pharmaceuticals	4 500 000
45	Stryker	3 646 287
46	Philips	3 330 000
47	Perrigo Co	3 234 000
48	Novocure Inc	3 212 000
49	Amarin Corp	2 500 000
50	XOMA	2 450 000
51	ResMed	1 370 000

Based on: OpenSecrets.org. URL: <https://www.opensecrets.org> (accessed: 07.03.2022).