

Easing Restrictions to Corporate Influence: Regulatory Capture and the Electric Utility Industry

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Abstract

Can firms influence their regulatory environments by making campaign contributions? To answer this question, I exploit a natural experiment in which the repeal of a federal law exogenously lifted restrictions to corporate political influence across U.S. states. Specifically, I study the 2005 repeal of the the Public Utility Holding Company Act of 1935, which legalized electric utility campaign contributions in 30 states as a consequence of existing state campaign finance law. Using a difference-in-differences identification strategy, I find that state public utility commissions authorized higher electric utility returns on equity in treated states compared to control states. This increase coincided with a large and significant increase in utility campaign contributions in treated states, supporting the contention that firms can influence their regulatory outcomes through political strategy. Further, consistent with theoretical expectations that firms lobby politicians with marginally hostile preferences, I find that utilities strategically targeted contributions to the Democratic party, who authorized higher returns than Republicans in treated states. This article contributes to the broad literature on the influence of money in politics by estimating the plausibly causal effect of campaign contributions on regulatory outcomes.

1 Introduction

With the increasing quantity of corporate money permeating politics, regulatory capture theory proposes that regulated firms will earn a return on their political investments by securing favorable regulatory environments. The theory suggests that profit-maximizing firms would only contribute to political candidates if the perceived benefits outweigh the costs (Stigler, 1971; Peltzman, 1976; Spiller, 1990; Snyder Jr, 1991), but attempts to support regulatory capture theory with empirical evidence is scarce and have produced varied results (Gordon and Hafer, 2005; de Figueiredo Jr and Edwards, 2007; Stratmann and Monaghan, 2017; Fournaies and Fowler, 2021). In this article, I argue that corporate campaign contributions significantly influence regulatory outcomes in the electric utility industry, where firm profits are strongly tethered to state political climates. By contributing to state politicians and political parties, I find that utilities are able to influence state regulatory commissions in their favor and earn returns on their political investments of over 800%.

Electric utility companies are highly regulated, as public utility commissions (PUCs) can set prices, deny investment projects, and set quality of service standards for regulated utilities in their state. As a consequence of their dependence on favorable regulatory conditions, electric utilities have a strong incentive to “capture” regulatory commissions as an asset (Stigler, 1971). Although utilities cannot contribute to appointed regulators themselves, they may be able to influence these regulators by contributing to the politicians who appoint and oversee them. As PUCs set a utility’s authorized return on equity (ROE), the return on capital investment a utility is permitted to earn in compensation for shareholder risk, it is no surprise that electric utilities comprised approximately 32% of all industry contributions to state parties from 2000-2015. In contrast with several articles finding that firms do not benefit from their campaign contributions on average (Fournaies and Fowler, 2021; Fowler et al., 2020; Ansolabehere et al., 2004, 2003), I find that electric utility campaign contributions influenced the PUC-authorized ROEs in the firms’ interest and resulted in increased economic rents for corporate shareholders.

The goal of this article is to empirically estimate the average increase in authorized ROE electric utility companies can secure by contributing to political campaigns in the states they are regulated. To accomplish this estimation, I exploit the 2005 repeal of the Public Utilities Holding Company Act of 1935 (PUHCA),

which was initially implemented to quell electric utility holding companies' political and market power by, among other provisions, prohibiting them from contributing company funds to local, state, and federal political campaigns, regardless of whether state law permitted or prohibited this practice. When PUHCA was repealed in 2005, electric utility campaign contributions were legalized in 30 treated states, but remained prohibited in 20 control states, as a consequence of existing state campaign finance law. Notably, while all electric utilities could employ their corporate political action committees (PACs) to make political contributions, PUHCA's repeal legalized the use of corporate treasury funds to contribute to politicians and parties in treated states.

State campaign finance data indicate that utilities operating in treated states contributed significantly more to state politicians and political parties after PUHCA's repeal. I find significant heterogeneity in utility preferences for political parties, as utilities targeted campaign contributions towards the Democratic party as a result of campaign finance legalization. Using difference-in-differences and event study research designs, I find that while ROEs authorized in treated and control states did not differ with any statistical significance prior to PUHCA's repeal, ROEs authorized in treated states were approximately 0.45 percentage points higher than those authorized in control states after PUHCA's repeal. Further, I find that only Democratic governors' ROE preferences were significantly affected by the easing of restrictions to utility influence. I develop a conceptual framework, consistent with Snyder Jr (1991), to explain why Democrats received higher contributions and authorized higher ROEs than Republicans as a result of campaign finance legalization. As utilities' regulatory preferences are more closely aligned with Republicans than Democrats, I argue that utilities have more to gain from exerting lobbying efforts towards Democrats.

This article is closely related to the growing body of research estimating the effect of campaign contributions on regulatory outcomes. Using an instrumental variable approach, de Figueiredo Jr and Edwards (2007) and Stratmann and Monaghan (2017) find that an increase in campaign contributions is associated with favorable regulatory outcomes in the telecommunications and healthcare industries, respectively. In contrast, Fourinaies and Fowler (2021) exploit within-state variation in campaign finance law, and find that regulated insurance firms do not benefit from more favorable regulatory outcomes as a result of relaxed campaign finance restrictions. I contribute to this literature by exploiting a shock to campaign finance regulation

that exogenously legalized campaign contributions for a subset of utility companies, and find positive and significant returns to campaign contributions.

This article is also closely related to the literature assessing how institutional characteristics of PUCs influence their regulatory decisions (Besley and Coate, 2003; Holburn and Spiller, 2002; Fremeth and Holburn, 2012; Fremeth et al., 2014; Holburn and Bergh, 2006; Bonardi et al., 2006). Notably, PUCs authorize lower ROEs when a consumer advocate lobbies on behalf of consumers (Fremeth et al., 2014). In addition, the method of selecting commissioners may significantly shape their incentive structures, as elected regulators respond to voter preferences by authorizing lower prices than appointed regulators (Besley and Coate, 2003). My results are consistent with these findings, as I demonstrate that treatment effects are larger when I drop observations from states that elect their PUCs from the sample.

Lastly, this article supports regulatory capture theory, an influential theory of regulation which proposes that industry can acquire regulation as an asset (Posner, 1974; Stigler, 1971; Priest, 1993). Theoretical literature finds that campaign contributions can provide strong incentives for politicians to govern with the firm's interests in mind (Stigler, 1971; Denzau and Munger, 1986; Snyder Jr, 1991; Besley and Coate, 2003). This paper is among the first to empirically estimate the effect of campaign contributions on regulatory outcomes, providing empirical support for this large body of theoretical literature.

I proceed with this article as follows. Section 2 describes a conceptual framework provide intuition behind the results of this natural experiment. Section 3 provides relevant background campaign finance regulation, and presents an overview of the ratemaking process. Specifically, I describe the regulatory process in which utility rates are set, and discuss the rationale behind the use of the ROE authorized in a rate case as the appropriate regulatory outcome for this analysis. Section 4 describes the data used in this analysis, and Section 5 discusses the empirical specification employed. Section 6 presents the results from this analysis, and Section 7 concludes.

2 Conceptual Framework

I begin by describing a conceptual framework closely related to the natural experiment analyzed in this article. Many studies analyze an environment consisting of a subset of the following agent types: firms,

government, regulators, and voters (Grossman and Helpman, 1996; Besley and Coate, 2003; Spiller, 1990; Denzau and Munger, 1986; Snyder Jr, 1991). In these models, competing principals attempt to influence an agent’s decision. For instance, Spiller (1990) developed a model in which the government and firm compete for the regulator’s favor by rewarding it with budgets and bribes, respectively, for preferred outcomes. To simplify the framework, I assume that governors have sufficient control over regulators, such that the regulator chooses policies consistent with the preference of the governor. This simplifying assumption is reasonable as politicians are often better able to influence a regulator’s incentive structure than firms are. For example, while firms may be able to influence regulators with promises of future employment (Spiller, 1990), politicians can influence regulators through job offers, budgets, and disciplinary public hearings (Stratmann, 2017). Further, governors are able to quickly take control of PUCs after inauguration (Lim and Yurukoglu, 2018).

Next, I assume that governors are heterogeneous over regulatory policy preferences. While not all members of the same party are alike, I assume that the difference between average regulatory preferences of the two parties is significant. Consistent with the literature, I assume that Democratic governors have policy preferences farther away from utilities than do Republican governors¹. Denzau and Munger (1986) argues that firms seek to maximize support while minimizing cost, and finds that the cost to influence politicians hostile to the firm’s interests is greater than the cost to influence friendly politicians. Snyder Jr (1991) produces similar results, arguing that a firm need not bribe friendly politicians, but rather marginal hostile politicians whose support can be gained. Lastly, Holburn and Vanden Bergh (2008) argue that firms target contributions towards hostile politicians when regulators are friendly.

The implications from these models are central to my findings. To illustrate, consider a simplification of Snyder Jr (1991), in which a regulatory environment consists of a monopolistic firm and a regulatory regime (G). The regulatory regime consists of two types, friendly (R) and hostile (D), and must choose one of two policies, P_l or P_h , for the firm. Both the firm and R prefer P_h , while D prefers P_l . Assume $P_l < P_h$. There are two environments in which the regulatory game is played: one in which campaign contributions are legal

¹Lim and Yurukoglu (2018) find that Republican commissions are associated with higher ROEs. Holburn and Bergh (2006) find that Democrats were significantly more likely to institutionalize consumer advocates. Fremeth et al. (2014) finds that consumer advocates are associated with significantly lower authorized ROEs, but rate case initiation and authorized ROE is positively associated with Democratic commissions

(T) and one in which campaign contributions are prohibited (C). In environment C, the firm does not have the ability to influence the regime's preferences, while in T, the firm can make campaign contributions (B) to the regime to influence its optimal choice of P.

The firm's utility function has the following form:

$$u(P_G, B) = -(P_G - P_h)^2 - B \quad (1)$$

where P_h is the firm's preferred policy, and $P_G \in \{P_l, P_h\}$ is the policy G implements. Note that the firm's utility is increasing in P_G and decreasing in B. Assume that for R and D, utility is increasing in B and decreasing in the distance between each type's preferred P and P_G . Accordingly, types R and D will implement the firm's preferred policy $P_G = P_h$ if the following condition is respectively met:

Type R:

$$B - (P_G - P_h)^2 \geq 0 \quad (2)$$

Type D:

$$B - (P_G - P_l)^2 \geq 0 \quad (3)$$

where the regime's reservation level is normalized to 0. Consider environment C, in which B is prohibited. For types R and D to meet their reservation level, each type must implement its preferred policy, such that type R implements $P_G = P_h$ and type D implements $P_G = P_l$. The firm is best off when the regime is type R, and has no means to mitigate its disutility when the regime is type D. Next consider environment T, in which firms are able to transfer B to the regime. In this scenario, type R still prefers to implement $P_G = P_h$, and any additional B it receives drives its utility above its reservation level. Accordingly, the firm has no incentive to transfer B to type R regimes. Alternatively, Type D still prefers $P_G = P_l$, and receives disutility when $P_G = P_h$. To achieve its preferred policy, the firm must compensate type D regimes for this disutility with $B \geq (P_h - P_l)^2$. Firms initiate this transfer if the marginal increase in utility from moving from $P_G = P_l$ to $P_G = P_h$ is greater than B.

This exercise provides three main findings. First, because friendly regimes implement the firm's preferred policy in both environments T and C, the legalization of campaign contributions does not have an impact on

R's choice of P_G . Second, because D prefers $P_G = P_l$, D only chooses $P_G = P_h$ when sufficiently compensated with campaign contributions. Lastly, it is in the firm's best interest to contribute only to hostile regimes whose favor can profitably be purchased.

This conceptual framework provides the intuition behind the natural experiment analyzed below. Specifically, the repeal of PUCHA transitioned 30 states from environment C to environment T, while 20 remained in environment C. This setting naturally lends itself to a difference-in-differences estimation strategy, allowing me to credibly test the predictions of Snyder Jr (1991). Based on the implications of the above framework, I expect utilities to target campaign contributions to Democratic candidates as a result of legalization. Further, I expect that Republicans will not change their ROE decisions as a result of legalization, but Democrats will significantly increase their authorized ROE if compensated sufficiently by the utilities.

3 Background

3.1 Federal Regulation

The debate about the effects of corporate campaign contributions can be traced back to the Gilded Age and subsequent Progressive Era in the United States, a time when corporations provided the overwhelming majority of campaign funds (Mutch, 2014). Prior to contribution disclosure laws, the public was largely unaware of the magnitude of such donations until a New York State investigation revealed that Theodore Roosevelt's 1904 presidential campaign had received substantial contributions from corporate interests, including J.P. Morgan & Co., New York Life Insurance, and Andrew Carnegie (Mutch, 2014). The scandal outraged the public, leading to the passage of the Tillman Act of 1907, which prohibits corporations from contributing corporate treasury funds to federal campaigns, but allows states the regulatory authority over state elections. Key to my identification strategy, states adopted heterogeneous campaign finance regulations, with some states prohibiting, and other states permitting, corporate campaign contributions in state elections. By 1920, 36 states had laws prohibiting corporations from contributing to political campaigns (Sikes, 1928). While the majority of these states still maintain this prohibition today, 17 of these 36 states subsequently legalized corporate campaign contributions, with the majority of legalization occurring in the

1960's and 1970's La Raja and Schaffner (2015).

The Public Utility Holding Company Act of 1935 (PUHCA) represented a significant exception to the federal government's hands-off approach to state campaign finance. PUHCA was enacted during the second wave of New Deal reforms, and was primarily implemented to curb the abuses of the 19 holding companies that owned 90% of the electric utility industry at that time (Fund et al., 1948). To achieve this, the Securities and Exchange Commission (SEC), the federal agency responsible for enforcing PUHCA, greatly simplified the holding company structure and designated holding companies as either "regulated" or "exempt" from its regulations. Exempt holding companies were required to limit their operation to a single state or contiguous geographic region (Feldman, 2021). Companies which elected to be regulated by PUHCA were able to operate across multiple states or non-contiguous geographic regions, but at the expense of compliance costs associated with PUHCA's regulations. Among the numerous regulations PUHCA imposed, regulated holding companies and their subsidiaries were prohibited from using corporate funds to contribute to any local, state, or federal campaign.

During the 70 years that PUHCA was in effect, regulated holding companies and their subsidiaries were unable to contribute to state elections, regardless of state campaign finance regulations. In addition to a prohibition on using corporate funds to contribute to political campaigns, regulated holding companies were barred from contributing to political parties and committees. Regulated holding companies were not barred from contributing to campaigns completely, however, as corporate funds could be used to administer corporate PACs, which consolidate individual donations from employees and shareholders to contribute to preferred political candidates.

Securing the repeal of PUHCA has been a long process with an unlikely alliance between the utilities and the SEC. The utility companies argued that PUHCA impeded efficient operations and limited industry growth, and the SEC argued in 1982 that it had achieved PUHCA's primary goal of breaking up the holding company pyramid structure, and therefore continued regulation was unnecessary (Thakar, 2008). When PUHCA was repealed through the passage of the Energy Policy Act of 2005, campaign finance regulation of the utility industry again returned to state control.

Starting in 2006, regulated holding companies and their subsidiaries could directly contribute to politi-

cians and party PACs in treated states, but remained unable to contribute in control states. At this time, 28 states allowed direct corporate contributions to political candidates, and 29 states allowed direct corporate contributions to party PACs. Further, campaign finance regulation varies within treated states, with 15 states allowing unlimited corporate contributions to party PACs and 14 states capping party contributions, but only 7 states allowing unlimited corporate contributions to candidates and 21 states capping candidate contributions. In general, I consider a state treated if either contributions to candidates or to party PACs is legal.

This variation in state campaign finance regulations is central to my identification strategy for estimating the causal effect of campaign contributions on regulatory outcomes. Specifically, I compare the difference in authorized ROE between treated and control states both before and after PUHCA’s repeal. My identification strategy is strengthened by the fact that many state campaign finance regulations defining treated and control states were implemented decades before the period of my analysis, providing plausible exogenous variation in the companies that are treated with campaign contribution legalization.

3.2 Ratemaking Overview

The ratemaking process for investor-owned utilities (IOUs) is primarily a cost reimbursement system, whereby IOUs petition their regulatory authority for reimbursement of operating and maintenance expense, tax expense, capital depreciation expense, and the weighted average cost of capital (WACC) incurred by the company during a representative test year. While capital investment and O&M expense are important regulatory outcomes that may draw criticism due to inordinate costs or inefficient management, the authorized WACC, which estimates a firm’s cost of capital, and mathematically operates as a firm’s return on capital investment, is a highly contested regulatory outcome. The electric utility industry is capital intensive, and firms finance capital investments primarily using long-term debt and common equity. The WACC considers both the company’s capital structure and the costs of debt and equity in its formulation. Specifically, per National Association of Regulatory Utility Commissioners standards, the WACC is calculated as follows:

$$WACC = \frac{E}{E + D} \cdot r_e + \frac{D}{E + D} \cdot r_d \quad (4)$$

Where D is debt, E is shareholder's equity, r_d is the cost of debt, and r_e is the cost of equity. While the cost of debt is contractually known, the cost of equity must be estimated, and is therefore subject to uncertainties, assumptions, and alternative methods of calculation. It is the PUC's responsibility to determine an ROE sufficient to compensate investors for the cost of equity, encourage firm capital investment, and ensure that rates are just and reasonable.

Two Supreme Court cases provided the foundation for the regulatory standards used by PUCs across the United States. Specifically, the Court found that a "just and reasonable" return on shareholders' investments should be "sufficient to assure confidence in the financial soundness of the utility, and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties" (*Bluefield Co. v. Pub. Serv. Comm.*, 1923, p. 693). Further, the Court determined that "the return on equity owner should be commensurate with returns on investments in other enterprises having corresponding risks," and that PUCs should not be "bound to the use of any single formula or combination of formulae in determining rates" (*Accord FPC v. Hope Natural Gas Company*, 1944, p. 602-603). The Court's decisions engendered a subjective regulatory framework for state PUCs. Consequently, due to the critical role of ROE in firm profitability and consumer surplus, the consumer advocate and the firm are incentivized to exert significant lobbying efforts towards the ROE, rather than towards objective aspects of the firm's rates.

In effort to persuade PUCs to adopt an ROE favorable to each agent's respective interests, agents employ financial models, such as the Capital Asset Pricing Model (CAPM), aimed at identifying the true cost of equity required to attract shareholder investment. Specifically, the CAPM estimates the cost of equity by estimating its β , a measure of firm risk relative to the overall risk of the market. The riskier a utility's stock is compared to the market, the more the investors expect to be compensated, warranting a higher authorized ROE. While both parties may employ CAPM to make their case, the results are highly contingent on various assumptions, such as identifying appropriate proxy groups and time periods for analysis. Consequently, petitioning parties in a rate case may present the same model with varying assumptions and recommend ROEs hundreds of basis points apart. For example, in a recent cost of capital proceeding in California, docketed as "Application 19-04-014", Pacific Gas and Electric lobbied California's PUC for a 12.00% ROE,

while California’s consumer advocacy group, Cal Advocates, lobbied for a 8.49% ROE. The Californian PUC split the difference, authorizing a 10.25% ROE. As a result of the highly subjective nature in which ROE is set, as well as the importance of ROE as the key regulatory outcome in a rate case proceeding, ROE is the ideal regulatory outcome variable for this research question.

4 Data

To assess the relationship between campaign contributions and regulatory outcomes, I developed a novel dataset of electric utility campaign contributions using the National Institute on Money in Politics’s followthefmoney.org, which compiles state campaign finance reports. The dataset identifies utility campaign contributions to state candidates and political parties in every year for each of the holding companies in my sample. Because both operating companies and their holding companies contribute, I aggregate all contributions to the holding company level by year and state, and attribute this aggregate to its operating companies at the state level, resulting in a operating company by year panel structure within each state.

Contributions may come from both a utility’s corporate PAC and directly from the utility itself, but the data does not distinguish between the two. Consequently, while PUHCA’s repeal only legalized direct contributions for regulated holding companies in treated states, I am unable to disentangle a firm’s direct contributions from its PAC contributions. Nevertheless, I am able to observe total contributions to both candidates and parties over time, which allows me to examine whether contributions in treated states increased relative to control states after PUHCA’s repeal. Figure 1 presents average regulated IOU contributions to state party PACs in treated and control states from 2000-2015. The figure demonstrates the roughly three-fold increase in contributions to state party PACs by IOUs operating in treated states after PUHCA’s repeal in 2005. I assume that absent PUHCA’s repeal, corporate PAC contributions in treated states would have continued to trend closely with the observed corporate PAC contributions in control states.

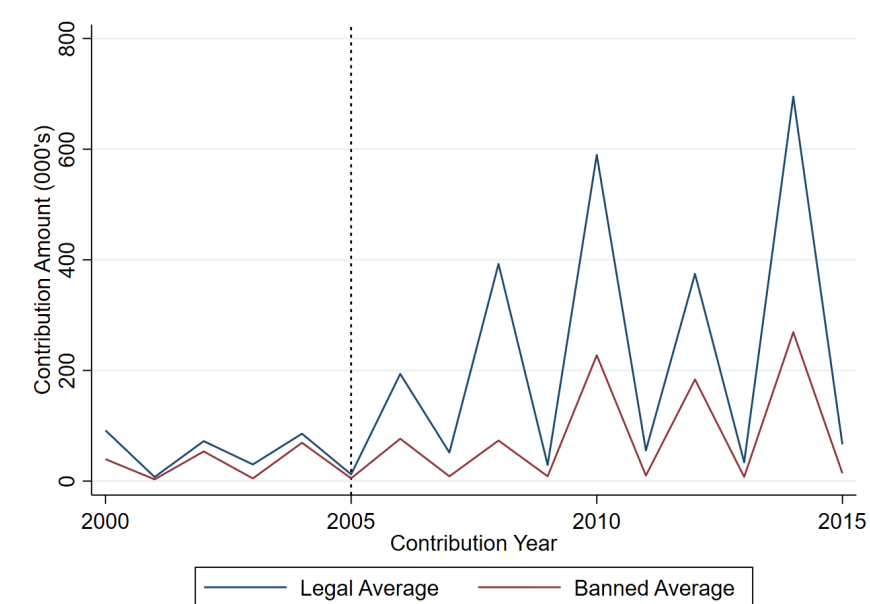


Figure 1: Average electric utility contributions to state party PACs (2000-2015). Legal Average is the average IOU contribution per year to state party PACs in states that allow corporate contributions to parties. Banned Average is the average IOU contribution to state party PACs in states that ban corporate contributions to parties. Data is restricted to IOUs regulated by PUHCA in 2004.

To define treated and control states, I use state campaign finance regulation data from the National Institute on Money in Politics’s Campaign Finance Institute, which provides the limitations on corporate spending in state elections from 1996-2018. Specifically, this data identifies states that prohibit corporate contributions, states that allow unlimited corporate contributions, and states that limit corporate contributions, as well as the value of these limitations.

There are two categories of treated and control states relevant to my analysis, as state laws governing corporate contributions distinguish between contributions to candidates and political parties. For example, in 2006, Texas prohibited corporations from contributing directly to candidates, but allowed unlimited corporate contributions to political party PACs. While PUHCA prohibited both activities, firms operating in Texas after PUHCA’s repeal could contribute to party PACs, but not directly to candidates. Although there is significant overlap between states that ban contributions to candidates and states that ban contributions to political parties, the two categories are not perfectly colinear, and may produce different estimates of the effect of legalization. I create two variables, *PartyLegal* and *CandLegal*, which equal one if a state

allows legal corporate contributions to state party PACs or to state candidates, respectively. Figures 2 and 3 present maps of the states indicating the legality of corporate contributions to governors and party PACs in 2006, respectively. Banned States are in red, limited states (i.e. Legal States which employ contribution limits) in blue, and unlimited states (i.e. Legal States which allow unlimited corporate contributions) in green. To simplify analysis, I create a third treatment variable, *Legal*, which equals one if a state is legal in at least one category. Although infrequent, a few states legalize or ban corporate contributions throughout my sample, thereby switching from control to treatment group, or vice versa. I discuss potential implications of this and check for robustness in Section 6.

The dependent variable in my analysis is the PUC-authorized ROE in every major rate case between 2000-2015, compiled by S&P Global.² I combine this data with a matrix containing utility-year observations for each firm from 2000-2015, such that ROE is observed in every year a rate case is authorized, and is missing otherwise.

²Rate cases are classified as major if the rate request exceeded \$5 million, or if the PUC's authorized rate increase exceeded \$3 million (Holburn and Bergh, 2006).

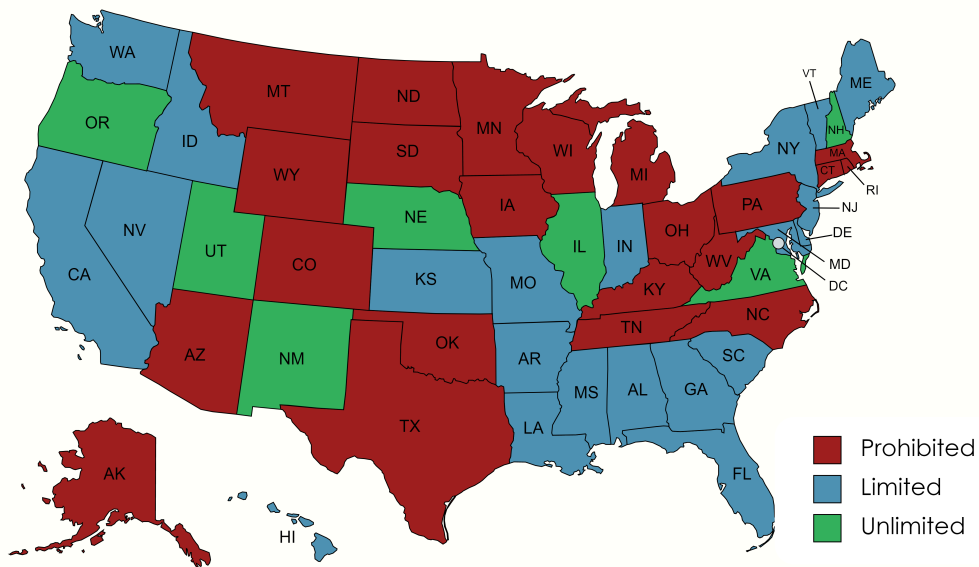


Figure 2: State Laws Governing Corporate Campaign Contributions to Governors, 2006. Prohibited States ban, Limited States cap, and Unlimited States allow unlimited direct corporate contributions.

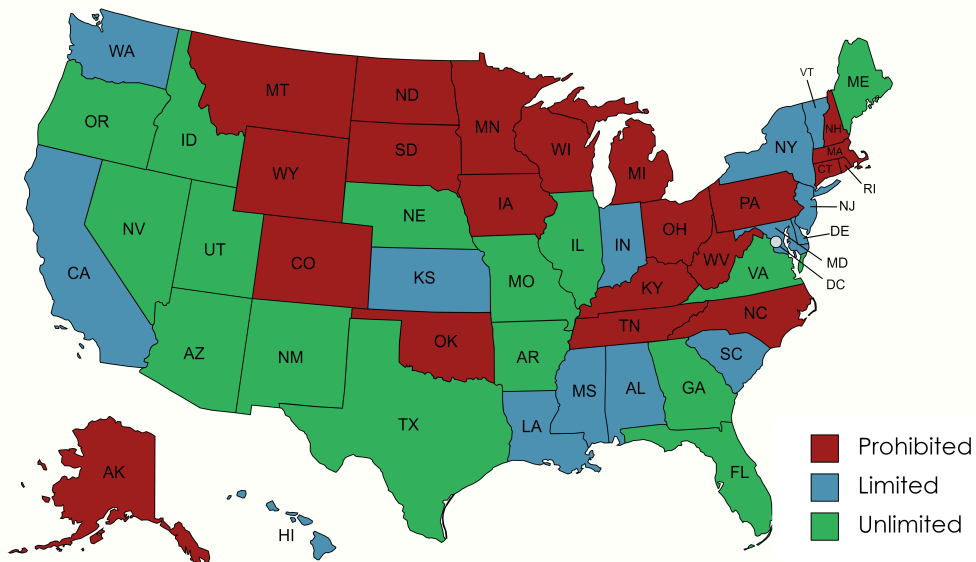


Figure 3: State Laws Governing Corporate Campaign Contributions to Party PACs, 2006. Prohibited States ban, Limited States cap, and Unlimited States allow unlimited direct corporate contributions.

I include several control variables measuring interest group pressure state politicians may face. The percent of manufacturing jobs in a state proxies for industry pressure, as manufacturers are high energy consumers, and therefore have a significant interest in lobbying for lower rates. The percent of utility jobs in a state proxies for utility influence in a state, and is expected to increase with authorized ROE. I obtain both variables from the Bureau of Labor Statistics. I also control for the annual percent change in per capita income in each state, obtained from the St. Louis Federal Reserve, to proxy for consumer pressure for lower utility rates. To control for the time-varying economic conditions specific to firms, I obtain each firms' Beta coefficient, a measure of firm risk and component of CAPM, from Wharton Research Data Service's Beta Suite.

I also collected variables measuring the time-varying political and institutional characteristics of state governments and PUCs. I use data on commissioner party affiliation and number of commissioners from Michigan State's Institute of Public Utilities to calculate the party in majority control of a PUC in state s and year t . In addition, I use data published by Ballotpedia³ to control for gubernatorial party affiliations and majority parties in state senates and houses. Previous research suggests that the level of conflict within a state legislature can play a significant role in the legislature's influence over PUCs (Fremeth and Holburn, 2012; Fremeth et al., 2014; Bonardi et al., 2006). To control for this political conflict, I create a variable, Legislature Rivalry⁴, which is bounded between zero, indicating legislative dominance by a political party, and one, indicating that a state legislature is evenly controlled by both parties. I calculated Legislature Rivalry using data obtained from The Council of State Governments.

The number of electric utilities operating within a state varies between states, with as few as one IOU operating in some states (e.g. Rhode Island), and as many as 9 IOUs operating other states (e.g. Texas). Holding companies often own several utilities operating in several different states. For example, American Electric Power, one of the largest holding companies, owns electric utilities operating in 11 different states. Importantly for my analysis, PUHCA only applied to holding companies with subsidiaries operating in non-contiguous geographical regions. Holding companies with subsidiaries operating in contiguous geographical regions were exempt from PUHCA's regulations, and therefore were able to contribute to political campaigns

³https://ballotpedia.org/State_government_trifectas

⁴Legislature rivalry_{st} = $1 - \frac{(\text{Majority party seats in Legislature} - \text{Minority party seats in Legislature})}{\text{Total seats in Legislature}}$

and parties in Legal States throughout my sample.

To identify holding companies regulated by PUHCA, I use the SEC's identification of all holding companies registered under PUHCA as of December 31, 2004.⁵ I corroborate this information with the annual filings regulated holding companies are required to file with the SEC via Form U5A. Two holding companies, Black Hills Corp. and PNM Resources, registered with the SEC only days before the SEC's online list was compiled, and never filed an annual report demonstrating compliance with PUHCA's regulations. As PUHCA was repealed in 2005 via the Energy Policy Act of 2005, the latest annual reports demonstrating compliance covered the year 2004, before Black Hills Corp. and PNM Resources were registered. Accordingly, I define these two holding companies as exempt in my main results. Tables 9 and ??, contained in the Appendix, indicate that my results are not sensitive to whether the regulated holding company group includes or excludes these two holding companies.

An operating company within a state may experience several changes in parent holding companies throughout the sample period. As one of PUHCA's primary mandates was to restrict utility size and prevent acquisitions and mergers, PUHCA's repeal opened the door to industry consolidation for both regulated and exempt holding companies. As a result, an operating company owned by an exempt holding company in 2005 may be owned by a regulated holding company in 2008, or vice versa. I define an operating company as regulated if it was owned by a regulated holding company in 2004. The resulting number of regulated and exempt operating companies is 85 and 72, respectively.

Table 1 contains descriptive statistics of the variables discussed in this section. Political variable means indicate that control and treated states do not differ considerably in average party leadership of state government. Notably, while the ROE authorized in control states is larger on average than treated states, rate base authorized, party contributions, and candidate contributions are all larger in treated states.

⁵The SEC list is available here: <https://www.sec.gov/divisions/investment/opur/regpucacompanies.htm>

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>Panel A Treated States</i>					
<i>ROE Authorized (%)</i>	164	10.13	0.64	8.72	12.88
<i>Rate Base Authorized (\$M)</i>	123	2393.42	1944.67	68.06	8276.94
<i>Beta</i>	844	0.34	0.28	-0.30	1.28
<i>Republican Governor</i>	392	0.52	0.50	0.00	1.00
<i>Republican Senate</i>	392	0.54	0.50	0.00	1.00
<i>Republican House</i>	392	0.49	0.50	0.00	1.00
<i>Republican Commission</i>	392	0.24	0.42	0.00	1.00
<i>Independent Commission</i>	392	0.24	0.43	0.00	1.00
<i>Number of Commissioners</i>	392	4.06	1.15	3.00	7.00
<i>Appointed Commission</i>	392	0.80	0.40	0.00	1.00
<i>Percent Manufacturing Jobs</i>	392	8.00	2.93	2.84	18.40
<i>Percent Utility Jobs</i>	392	0.35	0.10	0.13	0.66
<i>Percent Change Per Capita Income</i>	392	3.42	2.83	-6.70	12.30
<i>Legislative Rivalry</i>	392	0.75	0.16	0.23	1.00
<i>Party Contributions (000's)</i>	844	168.7	672.56	0.00	8442.50
<i>Candidate Contributions (000's)</i>	844	48.50	123.40	0.00	886.73
<i>Panel B Control States</i>					
<i>ROE Authorized (%)</i>	86	10.39	0.60	9.17	12.30
<i>Rate Base Authorized (\$M)</i>	71	1514.82	1473.43	50.49	6988.29
<i>Beta</i>	516	0.36	0.30	-0.30	1.24
<i>Republican Governor</i>	264	0.50	0.50	0.00	1.00
<i>Republican Senate</i>	264	0.53	0.50	0.00	1.00
<i>Republican House</i>	264	0.52	0.50	0.00	1.00
<i>Republican Commission</i>	264	0.36	0.48	0.00	1.00
<i>Independent Commission</i>	264	0.11	0.31	0.00	1.00
<i>Number of Commissioners</i>	264	3.61	1.16	3.00	7.00
<i>Appointed Commission</i>	264	0.83	0.37	0.00	1.00
<i>Percent Manufacturing Jobs</i>	264	9.02	3.08	2.71	17.72
<i>Percent Utility Jobs</i>	264	0.40	0.15	0.19	0.82
<i>Percent Change Per Capita Income</i>	264	3.75	3.36	-10.40	15.40
<i>Legislative Rivalry</i>	264	0.72	0.22	0.19	1.00
<i>Party Contributions (000's)</i>	516	68.77	228.28	-28.75	2415.00
<i>Candidate Contributions (000's)</i>	516	32.83	76.42	0.00	381.85

Control States are states that prohibit both corporate candidate and party contributions. Treated States are states that allow corporate candidate contributions, party contributions, or both.

5 Methodology

In an ideal setting for research, companies would be randomly selected to make campaign contributions to state politicians, and the researcher could run an OLS regression of ROE on campaign contributions with limited endogeneity concerns. In reality, the threat of endogeneity complicates estimates of the effect of campaign contributions on regulatory outcomes, as it is difficult to demonstrate that campaign contributions cause different regulatory outcomes than would otherwise occur. Corporations strategically employ their resources to maximize profits, and therefore only contribute to campaigns when it perceives that the contribution will result in higher returns for the firm. Provided these constraints, the next best empirical setting is one in which some corporations are randomly selected to strategically employ campaign contributions while others are prohibited from doing so. My identification strategy exploits a shock that generates the second scenario by legalizing corporate campaign contributions in a random subset of states, while maintaining a prohibition in the remaining states.

Specifically, while PUHCA was in effect, regulated utility holding companies and their subsidiaries were prohibited from contributing to any political party or campaign regardless of state campaign finance law. Upon PUHCA's repeal, these companies could directly contribute in treated states, but remained unable to contribute in control states. Exploiting this empirical setting, I employ the following reduced form difference-in-differences identification strategy to determine the effects of legalizing campaign contributions on authorized ROE:

$$ROE_{its} = \theta POST_t + \gamma Legal_{its} + \delta Legal_{ist} * POST_t + \beta X_{its} + \alpha_s + \lambda_t + \epsilon \quad (5)$$

$POST$ is an indicator variable taking a value of 1 if ROE is authorized after 2005, the year PUHCA was repealed. $Legal$ is an indicator variable taking a value of 1 if utility i operates in a state s that allows direct corporate contributions to candidates or parties in year t . This standard two-way fixed effects model allows me to identify the effect of legalizing campaign contributions on authorized ROE by comparing the average difference in ROE between treated and control states both before and after PUHCA's repeal. State fixed effects allow me to control time-invariant characteristics of each state, such as institutional quality of the

PUC, political culture of the state, and business culture of the state. Year fixed effects allows me to control for the economic and political characteristics common to all states and companies in the year the ROE was authorized.

I include several economic and political control variables. Political controls include party affiliations of the state’s house, senate, governorship, as well as the annual measure of legislative rivalry for the state. I do not control for PUC party affiliation due to concern of overcontrol bias (Cinelli et al., 2020). Specifically, easing restrictions to utility influence may enable utilities to successfully lobby for friendlier regulatory commissions, making political party affiliation a bad control for this analysis Angrist and Pischke (2008). Instead, I analyze the composition of PUCs as an outcome variable of interest in this analysis.

Economic controls include the company’s CAPM Beta coefficient, the percent of utility and manufacturing jobs in the state, and the percent change in per capita income from the prior year in a state. I restrict my analysis to IOUs regulated under PUHCA by the SEC, comparing regulated companies in treated states to regulated companies in control states. My preferred specifications cluster the standard errors by state and year to address correlations caused by treatment at the state level as well as between ROEs authorized in the same year (Abadie et al., 2017).

To determine if treatment effects are heterogeneous by governor party affiliation, I modify (5) by fully interacting right hand side variables with *RepGub*, a binary variable which takes the value of 1 when a Republican is governor of the state. The resulting triple interaction, *RepGub* $\times$ *Legal* $\times$ *POST*, allows me to determine if there is a significant difference in treatment effects between Republican and Democratic governors.

Proper identification of the effect of campaign contributions on ROE requires that two conditions be met. First, the probability a company in a given state files a rate case must be independent from the treatment. Rate cases occur at the discretion of the PUC or utility, and therefore are nonrandom, and depend on several factors, including the change in the costs of operations since the company last filed a rate case, and the current political climate of the state. For each company *i*, I only observe a new value for ROE when a rate case is authorized in year *t*, resulting in an unbalanced panel with nonrandom selection. Therefore, my data would suffer from selection bias if utilities operating in treated states were more likely to file a rate case

after legalization than in control states, requiring a correction for this bias. Second, the ROE authorized in control and treated states must follow parallel trends in the years prior to legalization. In particular, ROEs authorized in treated and control states must be correlated in the years preceding PUHCA’s repeal, such that the difference in ROEs authorized in treated and control states is constant over time. I demonstrate that both conditions are satisfied after presenting my initial results.

6 Results

6.1 Difference-In-Differences

To implement my empirical strategy, I use an unbalanced panel of PUC-authorized ROEs to subsidiaries of regulated holding companies from 2000-2015. All models contain a full set of political controls, including party affiliations of the state’s house, senate, governorship, as well as the annual measure of legislative rivalry for the state, and economic controls, including the company’s CAPM Beta coefficient, the percent of utility and manufacturing jobs in the state, and the percent change in per capita income from the prior year in a state. I suppress control variable coefficient estimates from the tables for brevity, and present only the treatment coefficients and clustered standard errors.

The results are presented in Table 2. Models 1 and 4 estimate treatment effects of legalizing contributions to state party PACs on ROE, and Models 2 and 5 estimate treatment effects of legalizing contributions to candidates on ROE. Coefficient and standard error estimates for *PartyLegal* and *CandLegal* are very similar due to significant overlap between the two treatment groups. To generalize my results, I create a variable, *Legal*, which equals one if the state is legal in at least one category. The results are presented Models 3 and 6. The results indicate a positive and significant effect of legalizing electric utility campaign contributions on the ROE that PUCs authorize in a rate case.

Models 4-6 modify (5) by interacting a dummy variable, *RepGub*, which equals 1 when a Republican is governor, with right hand side variables. Note that for each model, the first coefficient is the estimated effect for Democratic governors, and the sum of the first and second coefficients is the estimated effect for Republican governors. While the treatment effect estimates for Democrats is well above the average

Table 2: ROE Differences-in-Differences

VARIABLES	Base Specification			Full Interaction Specification		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
PartyLegalxPOST	0.447** (0.194)			0.694*** (0.209)		
CandLegalxPOST		0.421** (0.192)			0.685*** (0.218)	
LegalxPOST			0.422* (0.199)			0.685*** (0.218)
RepGubxPartyLegalxPOST				-0.601* (0.303)		
RepGubxCandLegalxPOST					-0.550* (0.313)	
RepGubxLegalxPOST						-0.592* (0.310)
Constant	9.821*** (1.174)	9.822*** (1.207)	9.779*** (1.150)	9.719** (3.572)	9.811** (3.541)	9.440** (3.525)
Wald Test (P-Value)				0.60	0.40	0.60
Observations	250	250	250	250	250	250
R-squared	0.835	0.835	0.835	0.919	0.919	0.919
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	State, Year	State, Year	State, Year	State, Year	State, Year	State, Year
*** p<0.01, ** p<0.05, * p<0.1						

Note: Table presents coefficient estimates from estimating variations of (5). The dependent variable is authorized ROE. All models control for year fixed effects, state fixed effects, political party affiliations of a state's house, senate, and governorship, legislative rivalry, Beta coefficient, the percent of utility and manufacturing jobs in the state, and the percent change in per capita income from the prior year in a state. Models 1-3 estimate treatment effects associated with legalized contributions to parties, candidates, or either, respectively. Models 4-6 present coefficient estimates from full-interaction models, which modify (5) by interacting dependent variables with *RepubGub*. P-Values are presented for a Wald Test for the treatment effects for Republican Governors.

effects reported in Models 1-3, the estimates for Republicans is close to zero in magnitude. Further, Wald Test p-values suggest that Republicans are not significantly affected by the easing of restrictions to corporate influence. Significance of the triple interaction term indicates that treatment effects for Democratic governors are significantly larger than Republican Governors. If Republican ROE preferences are more closely aligned with the utilities than Democratic preferences⁶, as found by Lim and Yurukoglu (2018) and Holburn and Bergh (2006), this finding provides support for the theoretical expectations in Snyder Jr (1991). Specifically, because Democratic policy preferences are often not aligned with utility interests, utilities have the most to gain from targeting the Democratic party upon the legalization of campaign contributions.

⁶Further evidence that this assumption is valid comes from house roll call votes for the Energy Policy Act of 2005, which repealed PUHCA and was strongly supported by the utility industry. Republicans cast 73% of the total votes in favor of the repeal, and only 20% of the total votes against the repeal

6.2 Event Study

To provide validity for parallel trends in ROE authorized in treated and control states, I test whether ROE trends in treated and control states differ in the pretreatment period (2000-2005). Specifically, employing the variable *Legal*, which equals one if the state allows legal contributions to either candidates or parties, I estimate the following equation:

$$ROE_{i\tau s} = \sum_{\tau=2000}^{\tau=2004} \Lambda_{\tau} * \gamma_{\tau} Legal_{i\tau s} + \sum_{\tau=2006}^{\tau=2015} \Lambda_{\tau} * \gamma_{\tau} Legal_{i\tau s} + \beta X_{its} + \alpha_s + \epsilon \quad (6)$$

This equation modifies (5) by removing the Legal*POST interaction variable and instead interacting Legal with Λ_{τ} , dummy variables that equal one for each year τ . The omitted year in this estimation is 2005, the last year prior to the legalization of direct campaign contributions in treated states. I remove three observations associated with states that changed between treatment and control groups during this period⁷. I include political and economic controls, state fixed effects, and cluster standard errors by both state and year. Coefficient estimations and 95% confidence intervals of this interaction are presented in Figure 4.

Figure 4 indicates that, prior to legalization, which occurs at time zero, the ROEs authorized in treated and control states are statistically similar, providing evidence that the treatment and control groups trended similarly in the pretreatment period. Accordingly, the results contained in Table 2 are likely not biased by violation of the parallel trends assumption. Further, while coefficient estimates in the pretreatment period hover around zero, every coefficient estimate in the posttreatment period is positive, and a majority are statistically significant. These results further support the contention that legalizing campaign contributions provides regulated industries with increased potential to influence their regulatory outcomes.

⁷Colorado banned corporate contributions to candidates and parties in 2004. Wyoming legalized unlimited contributions from corporations to parties in 2012.

Regulated Electric Utility Company Event Study

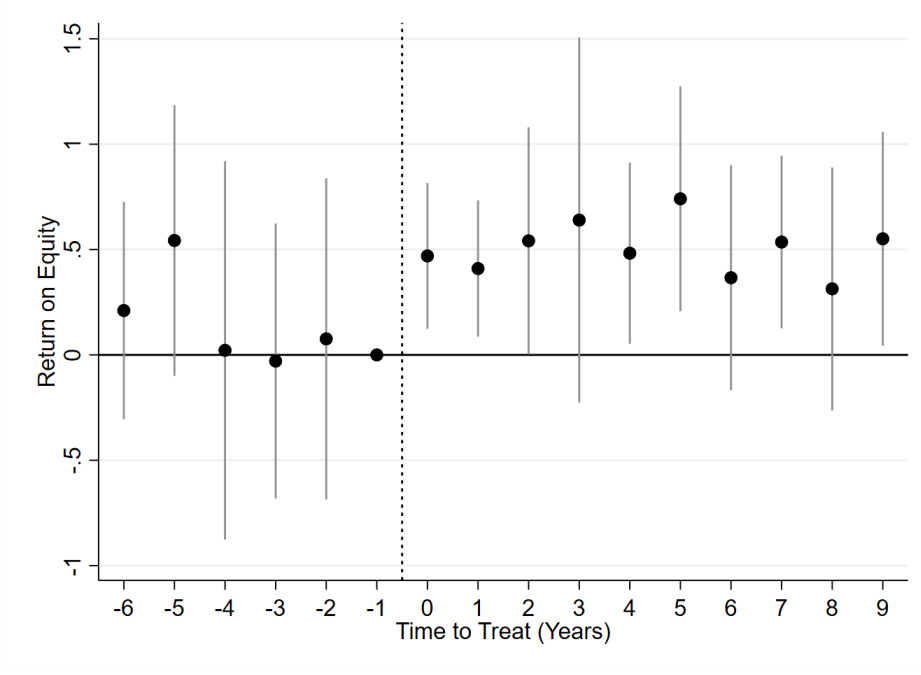


Figure 4: Sample restricted to regulated holding companies. Coefficients estimates and 95% confidence intervals from regressing ROE on Legal interacted with year dummies, state fixed effects, and political and economic controls (2000-2015). The coefficient for the period -1, representing the year of PUHCA’s repeal in 2005, is standardized to zero. Standard errors are clustered by State and Year.

6.3 Sample Selection

As a consequence of the nonrandom nature of the ROE authorization process, there is potential that the results in Table 2 suffer from selection bias. Prior research finds rate cases are nonrandom events as firms may strategically initiate rate cases in response to shocks to company operating costs and PUC regulatory climates, requiring the Heckman sample selection model to produce unbiased coefficient estimates (Fremeth et al., 2014; Bonardi et al., 2006). Of particular concern for my analysis is the possibility that companies operating in treated states respond to PUHCA’s repeal by altering their frequency of rate cases. For example, provided the increased ability to influence regulatory outcomes, it is plausible that companies operating in treated states are more likely to file a rate case to secure more favorable rates.

I estimate a linear probability model to test for selection bias associated with the treatment. To implement this test, I use a balanced company by year panel structure, and modify (5) by replacing the dependent variable with *Order*, a binary variable that equals 1 in years a rate case order authorizing an ROE is

Table 3: Sample Selection: Linear Probability of Observing Authorized ROE

VARIABLES	Base Specification			Full Interaction Specification		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
PartyLegalxPOST	0.0469 (0.0753)			0.0693 (0.116)		
CandLegalxPOST		0.0556 (0.0717)			0.0679 (0.111)	
LegalxPOST			0.0536 (0.0768)			0.0679 (0.111)
RepGubxPartyLegalxPOST				-0.0622 (0.115)		
RepGubxCandLegalx.POST					-0.0297 (0.102)	
RepGubxLegalxPOST						-0.0607 (0.108)
Constant	0.128 (0.401)	0.0295 (0.402)	0.0794 (0.417)	0.104 (0.882)	-0.338 (0.798)	-0.235 (0.855)
Wald Test (P-Value)				0.94	0.63	0.94
Observations	1,256	1,256	1,256	1,256	1,256	1,256
R-squared	0.160	0.160	0.160	0.200	0.198	0.198
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	State, Year	State, Year	State, Year	State, Year	State, Year	State, Year
*** p<0.01, ** p<0.05, * p<0.1						

Note: Table presents coefficient estimates from modifying (5) by replacing the dependent variable with *Order*, a binary variable that equals 1 in years a rate case order authorizing an ROE is issued. All models control for year fixed effects, state fixed effects, political party affiliations of a state's house, senate, and governorship, legislative rivalry, Beta coefficient, the percent of utility and manufacturing jobs in the state, and the percent change in per capita income from the prior year in a state. Models 1-3 estimate treatment effects associated with legalized contributions to parties, candidates, or either, respectively. Models 4-6 present coefficient estimates from full-interaction models, which modify (5) by interacting dependent variables with *RepubGub*. P-Values are presented for a Wald Test for the treatment effects for Republican Governors.

issued. The results are presented in Table 3, and demonstrate that sample selection is uncorrelated with the treatment. Further, I do not find differential effects for Republican and Democratic governors, indicating that utilities did not disproportionately file rate cases under different regimes as a result of the treatment. Consequently, I do not find evidence of sample selection selection bias.

The lack of sample selection may cast doubt on my findings, as one might expect politically connected firms to engage in more rate cases. There are many factors influencing a utility's decision to file for new rates, including the level of capital investments not yet included in base rates and changes in operating and borrowing costs (Fremeth et al., 2014; Bonardi et al., 2006). Further, provided the decreasing trend in interest rates throughout the course of this study, an IOU's authorized ROE would almost certainly decrease as a result of filing a rate case, incentivizing some IOUs to delay their next rate case until operating costs

increase more than the expected decrease in returns. In fact, in a recent Ohio bribery scandal involving First Energy and lobbyist-turned PUC Commissioner Samuel Randazzo, First Energy allegedly spent millions to avoid filing for new rates ⁸. Consequently, the evidence presented in this section indicates that the results in Table 2 are not biased by sample selection.

6.4 PUC Political Affiliation

I next discuss how political control of PUCs changed surrounding the repeal of PUHCA. I modify (5) by replacing the dependent variable with an indicator for either Republican governor (RepGub), Republican majority commission (RepComm), or Democratic majority commission (DemComm). I control for state and year fixed effects and cluster standard errors by state and year. The results are presented in Table 4.

Models 1-3 present coefficient estimates for an unbalanced panel, such that observations are only included for states in years an ROE is authorized and are weighted by number of rate cases. Models 4-6 present coefficient estimates for a balanced panel, such that each state in my sample is observed annually from 2000-2015. Models 1 and 4 test whether the balance of Republican governors changed as a result of utility campaign finance legalization, and indicate that Republican governors were not statistically more likely in treated states after legalization. Consequently, the results presented in Table 2 are unlikely driven by an imbalance in governor party affiliation.

Models 2-3 and 5-6 test for changes in PUC party affiliation resulting from legalization. The results indicate that the number of Republican majority PUCs significantly increased in treated states after PUHCA's repeal, while the number of Democratic commissions decreased. This result could be driven by the positive coefficient in Models 1 and 4, indicating that an increase in Republican governors naturally leads to an increase in Republican commissions, but the insignificant coefficients cast doubt on this hypothesis. Alternatively, it is likely that utilities in treated states were able to take advantage of the legalization of campaign contributions to effectively lobby state politicians to appoint Republican commissioners. These results are intuitive, as easing restrictions to utility influence is unlikely to have a significant effect on gubernatorial election outcomes, which are decided by a broad population with diverse interests, but is much more likely to have a significant effect on the composition of PUC regulators, which is incredibly important to the utilities

⁸<https://www.sec.gov/Archives/edgar/data/1031296/000103129621000071/ex101-8k7x22x21.htm>

Table 4: Institutional Balance: Linear Probability of Observing Party Control

Dependent Variable	Unbalanced Panel			Balanced Panel		
	RepGub Model 1	RepComm Model 2	DemComm Model 3	RepGub Model 4	RepComm Model 5	DemComm Model 6
LegalxPOST	0.297 (0.330)	0.501** (0.171)	-0.610*** (0.144)	0.188 (0.115)	0.116 (0.121)	-0.223** (0.103)
Constant	-0.466* (0.265)	0.272 (0.413)	0.185 (0.194)	0.541*** (0.0659)	0.198*** (0.0364)	0.151*** (0.0256)
Observations	250	250	250	648	648	648
R-squared	0.558	0.632	0.670	0.379	0.522	0.521
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	State, Year	State, Year	State, Year	State, Year	State, Year	State, Year
*** p<0.01, ** p<0.05, * p<0.1						

Note: Table presents coefficient estimates from modifying (5) by replacing the dependent variable with *RepGub*, *RepComm*, and *DemComm*. The sample in Models 1-3 is an unbalanced panel, such that observations are only included in years a state authorized an ROE. Models 4-6 present results from a full balanced panel. All models control for year and state fixed effects and cluster standard errors by state and year.

but relatively unimportant to the public (Besley and Coate, 2003). Following Cinelli et al. (2020), I view this change in PUC party affiliation as a mediator of the effect of campaign finance legalization, providing justification for omitting this important control variable from all regressions in this analysis.

6.5 Mechanism: Campaign Contributions

I now analyze how utilities strategically altered contributions to political candidates and party PACs as result of campaign finance legalization. In particular, I expect contributions to increase as a result of legalization. Further, consistent with the conceptual framework presented in Section 2, as well as the heterogeneous results presented in Table 2, I expect utilities to strategically target Democratic candidates upon legalization, as there is relatively more to gain from contributing to Democrats than Republicans.

To implement this analysis, I reestimate (5), this time with campaign contributions as the dependent variable. My contribution data is divided into IOU contributions to state party PACs and IOU contributions to state politicians. I further divide this data into contributions to Republican and Democrats. Accordingly, *PartyLegal* defines treatment and control groups when contributions to party PACs is the dependent vari-

Table 5: Campaign Contributions Differences-in-Differences

Dependent Variable Party Affiliation	Party Contributions (000's)			Candidate Contributions (000's)		
	Both Model 1	Democrats Model 2	Republicans Model 3	Both Model 4	Democrats Model 5	Republicans Model 6
PartyLegalxPOST	170.8*** (55.17)	120.4*** (40.66)	50.36 (32.65)			
CandLegalxPOST				12.96 (10.11)	12.64** (5.055)	0.322 (5.858)
Constant	1,390*** (407.6)	694.9** (282.9)	695.0** (340.0)	170.8*** (49.29)	66.60*** (24.60)	104.2*** (30.32)
Observations	1,360	1,360	1,360	1,360	1,360	1,360
R-squared	0.271	0.212	0.183	0.418	0.395	0.413
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Company FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Company	Company	Company	Company	Company	Company
*** p<0.01, ** p<0.05, * p<0.1						

Note: Table presents treatment effect estimates of legalizing campaign contributions on utility contribution amounts. The dependent variable in Models 1-3 is utility contributions to total party PACs, Democratic party PACs, and Republican party PACs, respectively. The dependent variable in Models 4-6 is utility contributions to all candidates, Democratic party candidates, and Republican party candidates, respectively. All models control for year fixed effects, company fixed effects, political party affiliations of a state's house, senate, and governorship, legislative rivalry, Beta coefficient, the percent of utility and manufacturing jobs in the state, and the percent change in per capita income from the prior year in a state. Standard errors are clustered by Company.

able, and *CandLegal* defines treatment and control groups when contributions to candidates is the dependent variable. The results of this analysis are presented in Table 5.

Model 1 estimates the effect of legalizing contributions to political parties, and indicates that utilities increased contributions to parties by approximately \$170,000 annually as a result of campaign contribution legalization. Further, Models 2 and 3 split this analysis into contributions to Democratic party PACs and Republican party PACs, respectively. Consistent with Snyder Jr (1991), the results indicate that utilities targeted their lobbying efforts towards Democrats rather than Republicans upon legalization. Models 4-6 analyze the effect of legalizing contributions to political candidates, and indicate that utilities significantly increased contributions to Democratic candidates, but not Republican candidates, as a result of legalization. This result provides further evidence that utilities strategically targeted Democrats, and provides assurance that the heterogeneous results in Table 2, indicating that only Democratic governors authorized higher ROEs as a result of campaign finance legalization, are not spurious. Overall, these outcomes substantiate

the proposition that corporations can use campaign contributions as an effective lobbying strategy to obtain more favorable regulatory outcomes.

6.6 Return on Investment

I conclude by calculating a back of the envelope estimate of the return on investment utilities achieved by contributing to state political parties. To simplify the analysis, I focus on contributions to party PACs, rather than to candidates. Table 2 indicates that the ROE authorized in states that allow corporations to contribute to political parties increased by approximately 0.45% on average as a result of legalization. Using (4), the ratemaking equation for a utility’s weighted average cost of capital, and assuming that a utility finances investments with 50% debt and 50% equity, a utility’s return on capital investment is calculated as $Return = Ratebase[0.5(0.0045)]$, where rate base is the net capital investments a utility is permitted to earn a return on at the time ROE is authorized. Table 1 indicates that the average rate base authorized for treated states is approximately \$2 billion. Consequently, the average increase in authorized returns for treated utilities is \$4.5 million. Treated utilities file for new rates every 3 years on average, and therefore incur approximately \$500,000 in contributions to party PACs, on average, between rate cases, per Table 5. Therefore, employing a Wald difference-in-differences estimator, which takes the ratio of first-stage and reduced-form estimates, and assumes that average treatment effects are stable over time and are equal in treatment and control groups (De Chaisemartin and d’Haultfoeuille, 2018), I estimate that a \$1 increase in contributions to party PACs increases corporate returns by \$9, resulting in a return on investment of 800%. Evidently, returns to political investments on regulatory outcomes may be more profitable than returns on legislative outcomes, as Kang (2016) estimates that energy sector returns to lobbying congress is approximately 130%.

7 Conclusion

This article demonstrates a causal effect of legalizing direct campaign contributions from public utility holding companies on their authorized ROEs. Specifically, PUHCA, established in 1935, prohibited electric utility holding companies from making campaign contributions at the state, local, and federal level. When PUHCA

was repealed in 2005, holding companies were then able to directly contribute to campaigns in treated states, but were still prohibited from doing so in control states, as a result of existing campaign finance law. Using a difference-in-differences framework, I demonstrate that IOUs operating in treated states were able to drastically increase campaign contributions after legalization, thereby creating strong incentives for state politicians to pressure commissioners to treat the IOUs favorably. Commissioners, incentivized to appease political interests in effort to secure reappointment or increased budgets, obliged, authorizing significantly higher ROEs than their counterparts in control states. I find that the utilities' political investments were prudently incurred, raising corporate returns by \$9 for every \$1 incurred in political expenditures.

This article also provides an empirical test of the theoretical findings in Snyder Jr (1991), which predicts that firms will target contributions at politicians marginally hostile to its interests rather than at aligned firms. The assumption that Republicans are more closely aligned with utility policy preferences than Democrats is well supported in the literature (Lim and Yurukoglu, 2018; Holburn and Spiller, 2002). As Democrats are the politicians marginally hostile to a utility's interests, Snyder Jr (1991) predicts that the firms will strategically target campaign contributions at Democrats, but not Republicans. I find that this result holds in this empirical setting. Specifically, I find that utilities significantly increased contributions to the Democratic party as a result of campaign finance legalization. The utilities' strategy was effective, as Democrats in treated states authorized significantly higher ROEs after legalization than their Republican counterparts. Further, these results support the findings of Holburn and Vanden Bergh (2008), which argues that firms must contribute to hostile politicians when regulators are friendly. I find that treated utilities may have been able to lobby for a friendlier composition of PUCs after legalization, and therefore needed to target Democratic governors to achieve more favorable regulatory outcomes.

These findings provide further understanding regarding the effects of corporate money on the political process, suggesting that regulated industries may be able to alter their regulatory environments to achieve preferred policies by making campaign contributions to politicians. Further, these results suggests that PUCs are not fulfilling their legislative obligations to ensure that consumers receive quality service at just and reasonable rates. While I hesitate to generalize these findings to external settings, an overabundance of corporate influence may pose risks to our democratic institutions if politicians are not enacting policy in the

interests of their constituents.

Although this article demonstrates that lifting institutional barriers to corporate influence over the political process can result in negative consumer consequences, it also demonstrates that campaign finance regulations operate as intended. For instance, as a result of the prohibition of corporate contributions, IOU campaign contributions in control states did not dramatically increase, and consequently PUCs were not subjected to increased political pressure, as occurred in treated states. As the comprehensive effects of PUHCA's repeal on the electric utility industry remains unknown, further research is required to analyze other potential consequences of increased utility influence on state politics.

8 Appendix

8.1 Exempt Electric Utility Holding Companies

When PUHCA was implemented in 1935, electric utility holding companies had two options to comply with the nascent federal regulations. Holding companies could either limit their operation to a contiguous geographic region, thereby becoming exempt from PUHCA’s regulations, or operate companies across non-contiguous geographic regions, subjecting itself to PUHCA’s regulations. The analysis in the main text has compared regulated companies in Legal States with Banned States, and demonstrates a significant effect of legalizing utility campaign contributions on their regulatory outcomes. Because exempt companies are not subject to PUHCA’s regulations, exempt companies in Legal States could legally contribute throughout my sample, and therefore should not have been affected by PUHCA’s repeal. If ROEs authorized to exempt companies in treated states are statistically similar to exempt companies in control states before legalization, but exceed ROEs in control states after legalization, this could indicate either positive spillover effects from legalization or that some unobserved variable is driving my results rather than legalization.

Figure 5 presents the results of this event study analysis. The figure indicates that ROEs authorized in control and treated are not statistically similar prior to legalization, violating the parallel trends assumption for DD analysis. In particular, the upward trending coefficients in the pretreatment period of this figure suggests that authorized ROEs in treated states were already increasing relative to control states. Although very few coefficients are significantly different from zero in the posttreatment period, supporting the hypothesis that legalization, rather than a correlated unobservable shock, is driving the results for regulated holding companies, I am unable to engage in meaningful comparisons between regulated holding companies and exempt holding companies. Accordingly, I do not pursue further analysis of the exempt holding company placebo group in this article.

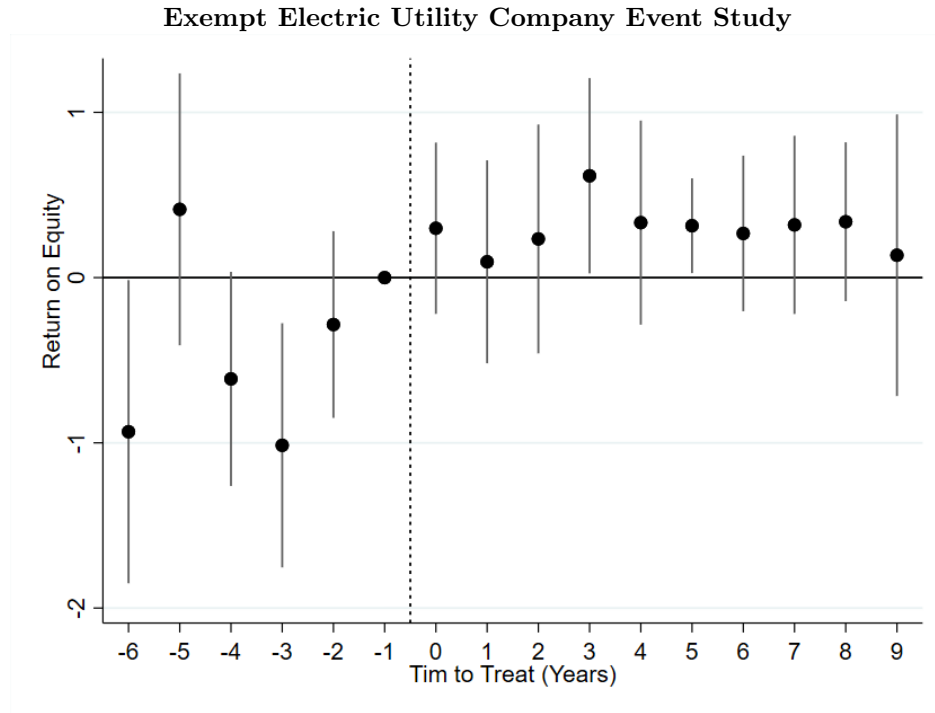


Figure 5: Sample restricted to exempt holding companies. Coefficients estimates and 95% confidence intervals from regressing ROE on Legal interacted with year dummies, state fixed effects, and political and economic controls (2000-2015). The coefficient for the period -1, representing the year of PUHCA's repeal in 2005, is standardized to zero. Standard errors are clustered by State and Year.

8.2 Appointed Vs. Elected PUCs

While PUCs are appointed by the governor and approved by the state legislature in the majority of states, PUCs are elected in 8 states. Previous research has demonstrated that elected PUCs respond to voter preferences to increase chances of reelection, and, as such, may be more insulated from industry and political pressure than their appointed counterparts (Joskow et al., 1996; Besley and Coate, 2003; Kwoka, 2002; Holburn and Spiller, 2002). My proposed path of influence is therefore distorted when commissioners are elected, as these commissioners do not rely on appeasing politicians for their positions. Provided this intuition, I expect treatment effects to be larger in states that appoint their PUCs than in states that elect them. To test this expectation, I remove all observations in elected states and reestimate variations of (5).⁹ My proposed mechanism for the divergence in ROE in control and treated States is supported if the estimated coefficients are larger or more significant than their counterparts in Tables 2 and 5.

The results are contained in Table 6. Authorized ROE is the dependent variable in Models 1-3, and contributions to party PACs and candidates are the dependent variables in Models 4 and 5, respectively. The results support my expectations. In particular, the treatment effect estimates for each model contained in 6 are larger than their counterpart models with both elected and appointed PUCs included. This result implies that the effect of legalizing corporate campaign contributions in elected states is minimal, and therefore depresses coefficient estimates when these observations are included in the sample. Although I am unable to make any definitive statements due to data constraints, it appears that elected PUCs are less susceptible to political influence. One may be concerned that in lieu of contributing to politicians, IOUs can contribute directly to commissioners, thereby establishing a direct channel of influence. This possibility is unlikely, however, as IOU contributions to commissioners only occur in two states, Louisiana and Oklahoma, and total just \$110,231 over 16 years.

Table 6: Difference-in-Differences Restricted to Appointed PUCs Only

VARIABLES	Authorized ROE			Campaign Contributions	
	Model 1	Model 2	Model 3	Model 4	Model 5
PartyLegalxPOST	0.552** (0.218)			191.1*** (69.91)	
CandLegalxPOST		0.509** (0.196)			17.42 (10.75)
LegalxPOST			0.520** (0.219)		
Observations	211	211	211	1,141	1,141
R-squared	0.859	0.857	0.859	0.354	0.669
Year FE	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	No	No
Company FE	No	No	No	Yes	Yes
Cluster	State, Year	State, Year	State, Year	Company	Company

*** p<0.01, ** p<0.05, * p<0.1

Note: Table reports coefficient estimates, clustered standard errors, and number of observations. The dependent variable for Models 1-3 is authorized ROE. The dependent variable for Models 4 and 5 is campaign contributions to party PACs and candidates, respectively. Models 1-3 contains state fixed effects and clusters by state and year. Models 4-5 contain company fixed effects and clusters by company. All models control for year fixed effects, political party affiliations of a state's house, senate, governorship, and PUC, legislative rivalry, Beta coefficient, the percent of utility and manufacturing jobs in the state, and the percent change in per capita income from the prior year in a state.

8.3 Multiple Treatment Groups

As demonstrated in Figures 2 and 3, treated states are diverse, as some treated states limit the level of corporate contributions at various caps, and other treated states allow unlimited corporate contributions. Under the assumption that an increase in IOU contributions results in an increase in authorized ROE, PUCs operating in unlimited states should authorize higher ROEs than PUCs operating in limited and banned states. To test this, I reestimate (5), using two treatment groups, limited and unlimited. The results of this analysis are contained in Table 7.

The results indicate a positive and significant effect for both unlimited and limited states. While the results are not entirely consistent with expectations, as the coefficients for *PartyLimitedxPOST* and *CandLimitedxPOST* exceed those for *PartyUnlimitedxPOST* and *CandUnlimitedxPOST*, coefficients for limited states are estimated with larger standard errors. As a limited state in one category, such as

⁹Elected states include: Georgia, Louisiana, Mississippi, New Mexico, North Dakota, Oklahoma, South Carolina, and South Dakota. I do not run separate regressions restricted to elected states due to insufficient sample size (i.e. I do not observe authorized ROE both before and after legalization in treatment and control groups).

Table 7: ROE Difference-in-Differences with Two Treatment Groups

VARIABLES	Base Specification			Full Interaction Specification		
	Model 1	Model 2	Model 3	Model 4	Model 4	Model 6
PartyUnlimitedxPOST	0.411** (0.172)			0.698*** (0.231)		
PartyLimitedxPOST	0.473* (0.253)			1.453 (1.616)		
CandUnlimitedxPOST		0.402* (0.203)			0.648** (0.235)	
CandLimitedxPOST		0.429 (0.249)			1.509* (0.721)	
UnlimitedxPOST			0.382** (0.174)			0.648** (0.250)
LimitedxPOST			0.440 (0.261)			1.305* (0.619)
RepGubxPartyUnlimitedxPOST				-0.539 (0.330)		
RepGubxPartyLimitedxPOST				-1.507 (1.691)		
RepGubxCandUnlimitedxPOST					-0.524 (0.464)	
RepGubxCandUnlimitedxPOST					-1.365 (0.822)	
RepGubxUnlimitedxPOST						-0.489 (0.352)
RepGubxLimitedxPOST						-1.358* (0.713)
Constant	9.710*** (1.211)	9.717*** (1.190)	9.682*** (1.164)	8.937** (3.529)	9.752** (3.428)	10.08** (3.513)
Observations	250	250	250	250	250	250
R-squared	0.838	0.835	0.838	0.925	0.923	0.924
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	State, Year	State, Year	State, Year	State, Year	State, Year	State, Year

*** p<0.01, ** p<0.05, * p<0.1

Note: Table reports coefficient estimates, clustered standard errors, and number of observations. The dependent variable is authorized ROE. All models control for year fixed effects, political party affiliations of a state's house, senate, governorship, legislative rivalry, Beta coefficient, the percent of utility and manufacturing jobs in the state, and the percent change in per capita income from the prior year in a state. Models 4-6 employ a full interaction model, in which a binary variable indicating a Republican is governor is interacted with right hand side variables.

CandLegal, can be unlimited in another category, such as *PartyLegal*, these coefficient estimates are potentially biased by not accounting for these omitted variables. Therefore, I create the variables *Unlimited*, which equals one if a state is unlimited in at least one category, and *Limited*, which equals one if a state is limited in both categories, or limited in one category and banned in the other. Consistent with the prior results, the effect of *Unlimited* is estimated with higher precision than the effect of *Limited*. Wald tests for treatment effect equality do not suggest differential treatment effects between the two treatment groups.

I next present the results of legalizing unlimited and limited campaign contributions on IOU contribution

Table 8: Campaign Contributions Difference-in-Differences with Two Treatment Groups

Dependent Variable Party Affiliation	Party Contributions (000's)			Candidate Contributions (000's)		
	Both Model 1	Democrats Model 2	Republicans Model 3	Both Model 4	Democrats Model 5	Republicans Model 6
PartyUnlimitedxPOST	326.1*** (86.68)	218.0*** (74.91)	108.1* (56.40)			
PartyLimitedxPOST	0.872 (27.18)	36.75** (18.25)	-35.88* (18.87)			
CandUnlimitedxPOST				49.41*** (17.57)	29.48*** (9.636)	19.94** (8.622)
CandLimitedxPOST				-4.970 (6.632)	3.218 (2.419)	-8.188 (5.061)
Constant	1,421*** (397.6)	567.9** (277.1)	852.6** (339.0)	149.7*** (47.18)	55.97** (23.59)	93.77*** (29.59)
Observations	1,360	1,360	1,360	1,360	1,360	1,360
R-squared	0.282	0.227	0.191	0.427	0.413	0.418
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Company FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Company	Company	Company	Company	Company	Company

*** p<0.01, ** p<0.05, * p<0.1

Note: Table presents treatment effect estimates of legalizing campaign contributions on utility contribution amounts. The dependent variable in Models 1-3 is utility contributions to total party PACs, Democratic party PACs, and Republican party PACs, respectively. The dependent variable in Models 4-6 is utility contributions to all candidates, Democratic party candidates, and Republican party candidates, respectively. All models control for year fixed effects, company fixed effects, political party affiliations of a state's house, senate, and governorship, legislative rivalry, Beta coefficient, the percent of utility and manufacturing jobs in the state, and the percent change in per capita income from the prior year in a state. Standard errors are clustered by Company.

amounts in Table 8. The results are consistent with expectations, as contributions are higher in states that allow unlimited contributions than states that limit contribution amounts. Further, these models uncover significant treatment effects previously obscured in Table 5. For instance, Models 4-6 indicate a positive and significant treatment effect of legalizing contributions to candidates on contribution amounts, whereas the counterpart models in Table 5 did not reveal significant effects. As demonstrated in Figure 2, the majority of *CandLegal* states cap contribution amounts, likely depressing the significant increases in contributions occurring in states with no cap. Lastly, unlike the models presented in Table 7, which are limited to only 250 observations spread across two treatment groups and one control group, the models in Table 8 are more precisely estimated with 1,360 observations.

8.4 Expanded SEC Holding Company List

Table 9: Authorized ROE DD Including Black Hills & PNM Resources

VARIABLES	Base Specification			Full Interaction Specification		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
PartyLegalxPOST	0.478** (0.214)			0.629** (0.222)		
CandLegalxPOST		0.487** (0.201)			0.611** (0.229)	
LegalxPOST			0.443* (0.222)			0.611** (0.231)
RepGubxPartyLegalxPOST				-0.371 (0.300)		
RepGubxCandLegalxPOST					-0.311 (0.283)	
RepGubxLegalxPOST						-0.352 (0.309)
Constant	8.891*** (1.342)	8.826*** (1.460)	8.769*** (1.351)	7.889* (3.761)	8.157** (3.827)	7.912* (3.812)
Wald Test (P-Value)				0.20	0.07	0.22
Observations	259	259	259	259	259	259
R-squared	0.820	0.819	0.822	0.908	0.908	0.908
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	State, Year	State, Year	State, Year	State, Year	State, Year	State, Year
*** p<0.01, ** p<0.05, * p<0.1						

Note: Table presents coefficient estimates from estimating variations of (5) with an expanded list of regulated holding companies. The dependent variable is authorized ROE. All models control for year fixed effects, state fixed effects, political party affiliations of a state's house, senate, and governorship, legislative rivalry, Beta coefficient, the percent of utility and manufacturing jobs in the state, and the percent change in per capita income from the prior year in a state. Models 1-3 estimate treatment effects associated with legalized contributions to parties, candidates, or either, respectively. Models 4-6 present coefficient estimates from full-interaction models, which modify (5) by interacting dependent variables with *RepubGub*. P-Values are presented for a Wald Test for the treatment effects for Republican Governors.

Table 10: Campaign Contributions DD Including Black Hills & PNM Resources

Dependent Variable Party Affiliation	Party Contributions (000's)			Candidate Contributions (000's)		
	Both Model 1	Democrats Model 2	Republicans Model 3	Both Model 4	Democrats Model 5	Republicans Model 6
PartyLegalxPOST	165.7*** (53.33)	118.7*** (39.44)	47.02 (31.27)			
CandLegalxPOST				13.07 (9.732)	12.35** (4.879)	0.720 (5.623)
Constant	1,429*** (395.9)	663.0** (281.9)	765.8** (326.7)	190.1*** (48.14)	76.72*** (24.74)	113.4*** (28.48)
Observations	1,408	1,408	1,408	1,424	1,424	1,424
R-squared	0.270	0.211	0.181	0.418	0.395	0.414
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Company FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Company	Company	Company	Company	Company	Company
*** p<0.01, ** p<0.05, * p<0.1						

Note: Table presents treatment effect estimates of legalizing campaign contributions on utility contribution amounts. The dependent variable in Models 1-3 is utility contributions to total party PACs, Democratic party PACs, and Republican party PACs, respectively. The dependent variable in Models 4-6 is utility contributions to all candidates, Democratic party candidates, and Republican party candidates, respectively. All models control for year fixed effects, company fixed effects, political party affiliations of a state's house, senate, and governorship, legislative rivalry, Beta coefficient, the percent of utility and manufacturing jobs in the state, and the percent change in per capita income from the prior year in a state. Standard errors are clustered by Company.

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