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Regulatory Repercussions in Finance

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Regulatory Repercussions in Finance

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Dedication

To my amazing parents Franz and Susan, who have always inspired and supported me in pursuing all of my dreams and endeavors. To my loving boyfriend Johnnie, who has been there for me through everything. To my sweet and caring Titas, Tita Jocelyn, Tita Marilyn, and Tita Marisa. To Kathleen, who I could always call on when I needed some kind words to get me through the difficult times. To my dear friends Catherine, Vannessa, Ashley, Tammie, Allie, Danijela, and Antoniette. To my dissertation advisor Dr. M. Kabir Hassan, who saw the potential in me to become a dedicated teacher, mentor, and researcher. I have learned so much from him by following his example. To Dean Williams, Dr. Olof Lundberg, Ms. Liane Carboni, and Renee Kern for their kindness and support. To Ms. Peggy Gaffney, Enjilee Dunn, and Marketa Janakova, with whom I enjoyed on of my favorite summer jobs working in the UNO College of Business. To Amanda Athey and Jamie Larson from the UNO Graduate School and the InnovateUNO panel for all of their help and support in the research for my dissertation. To my classmates and colleagues, Omer Unsal, Blake Rayfield, Makeen Huda, Nicolas Duvernois, Hasib Ahmed, Phuvadon Wuthisatian, Shadiya Hossain, Noura Metawa, Fatima Jebari, Rhada Boujlil, Huda Alsayed, and Nadejda. I am glad that I was able to go through this PhD journey with you. And finally, to my grandmother Josefa, in whose footsteps I am now following by becoming a professor. Grandma, I hope I make you proud. Mahal Kita.

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Abstract

This dissertation examines the impact of regulation and public policies on firm performance. Chapter 1, entitled "Political Contributions, Insider Trading, and CEO Compensation", determines why CEOs from politically-connected firms receive higher pay compared to their non-politically connected peers. We investigate whether insider trading can explain high CEO pay. Using hand-collected firm-level lobbying data, we examine whether politically-connected CEOs engage in insider trading after sponsored bills are introduced and passed in the U.S. legislative bodies. Our results show that politically-connected CEOs commit insider trading, which yields higher compensation packages. In addition, we also find that lobbying benefits firm performance. Politically-connected firms receive more government contracts, which increases firm value. Overall, political contributions benefit both CEOs and shareholders. Chapter 2, entitled "The Impact of Incarceration on Firm Performance" conducts analyses on the impact of incarceration on firms based in the United States. Through time series Granger Causality Vector Autoregression (VAR) tests by state, we find that incarceration can influence labor markets measured by the state's unemployment rate. We find that firms based in states with high incarceration underperform compared to firms based in states with low incarceration. This also holds true when examining prison reform data from the Pew Charitable Trust. Through differences in differences tests, we find that firms based in states with prison reform outperform firms based in states without prison reform. When controlling for firm and state macroeconomic factors, we find that increases in incarceration rates have a negative effect on firm performance.

Keywords: Insider Trading, Political Lobbying, Firm Performance, Incarceration, Labor Markets

Chapter 1

Political Contributions, Insider Trading, and CEO Compensation

1 Introduction

This study examines whether lobbying firms pay their CEOs more than firms that do not lobby and if these excess compensation costs are passed onto shareholders. Firms build political capital by operating lobbying offices in Washington D.C., being represented by Washington D.C. law firms, using political consulting firms, and using trade associations that represent the industry in which the firm is participating (Wilson, 1990). The primary objective of corporate lobbying is to influence favorable legislation that will provide competitive advantages to firms. These advantages may include beneficial taxation policies, defensive trade restrictions, and industry barriers to entry (Unsal, Hassan, Zirek, 2016). Our study examines the relationship between firm lobbying, CEO compensation, CEO insider trading, and firms being awarded government contracts. Our results indicate that firm lobbying leads to CEOs increasing their compensation through engaging in insider trading on political information and firm lobbying increasing government contracts and firm value. Brown, Huang, Siders, Lowry, and Shafer (2017) find a positive market reaction when CEOs visit the White House, which may stem from this occurrence being a positive signal that CEOs have inside access. In addition, CEOs that visit the White House receive more government contracts and are more privy to inside information, which reduces policy uncertainty.

Previous studies find that corporate lobbying can benefit firms. Corporate Political Activity (CPA) which encompasses campaign contributions, lobbying, contributions to Political Actions Committees, the operation of government relations offices, and executive testimonies, is both related and acts as a vital determinant of firm performance (Lux, Crook, and Woehr, 2011). Political lobbying increases firm performance and hence shareholder value (Hillman et al., 1999; Chen, Parsley, and Yang, 2010). Links between firms and government have a positive effect on firm value (Hillman et al., 1999). In addition, lobbying firms can outperform their peers as well as the market average (Kim, 2008).

Political connections can increase firm performance in the case of private firms in China when entrepreneurs are affiliated with the ruling political party (Li et al., 2008). Politically-connected CEOs may receive excess compensation for building political capital, with the anticipation that this investment will result in future benefits (Skaife, Veenman, and Werner, 2013). Politically connected firms can also increase firm value by receiving more government subsidies (Tao et al. (2017). Political lobbying is a means for building political connections and CEOs from firms that lobby are more likely to have higher compensation packages than their counterparts from firms that do not lobby (Unsal, Hassan, and Zirek, 2016).

Excess compensation may also stem from politically-connected CEOs engaging in insider trading from political information. Insider trading has created opportunities for firm insiders to profit off private information. This strategy may occur before public disclosures of positive information about the firm, such as before a firm securing a government contract, which increases firm performance and increases CEO compensation by profits made from insider trading. Political connections reduce the likelihood of firms being investigated and prosecuted by the U.S. Securities and Exchange Commission (Correia, 2014). There are also may be a legal loophole hindering prosecution of insider trading by firm management (Henning, 2013; Turner, 2015). This legal loophole may leave opportunities for CEOs to commit insider trading with limited or no legal repercussion.

Firm management has the ability to craft legislation for bills that the U.S. member can pass through Congress. This communication is conducted through lobbyist firms and provides both parties with access to inside political information (Attkinson 2012:1; Mayer and Mujumdar, 2014). The main purpose of firms utilizing lobbyists is to maintain political connections (Bertrand, Bombardini, and Trebbi, 2014). Attkinson states "A study by the watchdog group Public Citizen found that 43 percent of Members of Congress who left office between 1998 and mid-2005 went on to register as lobbyists." This suggests that not only lobbyists have access to congress members, the lobbyists a large portion of lobbyists were members of Congress and have a deeper understanding of the inner workings of Congress from firsthand experience. We examine the number of CEO stock transactions after a bill is passed in the U.S. Congress and House of Representatives to determine if there is a presence of CEO insider trading and to find out whether these transactions lead to additional CEO compensation.

We contribute to the current literature by further exploring whether corporate lobbying benefits firms or just CEOs by examining CEO insider trading and government contracts. We hypothesize that politically-connected CEOs enjoy large compensation packages from trading on inside political information and that firms also benefit from political connections through government contract awards. Our study is motivated by Goldman, Rocholl, and So (2008), who find that firms with politically-connected board members obtain more government contracts, and Skaife, Veenman, and Werner (2013) who find a correlation between corporate lobbying and CEO pay. We focus on political lobbying and whether it benefits the CEO, the firm, or both. Previous research examines the relation between political connections and government contracts, as well as political connections and management compensation. Bourveau, Coulomb, and Sangnier (2016) determine a link between political connections and insider trading in the French 2007 election and find that directors with connections to the President are more likely to engage in insider trading. Yet, there has not been a study specifically examining the relationship between political lobbying, insider trading, and CEO

compensation. In addition, we contribute to the existing literature by determining if the costs associated with political activity are passed onto shareholders.

Our sample consists of 2,788 unique firms and 5,201 unique CEOs with 14 percent of the sample being lobbying firms. The sample includes a total of 2,554 bills introduced and passed in the U.S. Senate and House of Representatives. In our event study, we find that firm lobbying is related to positive changes in firm value measured by the firms' cumulative abnormal returns (CARs). Our results reflect that firms receive positive market reaction after the bill is introduced and passed in the U.S. legislative bodies. Additionally, we document that CEOs in our sample commit insider trading by purchasing their shares two weeks and one week before the introduction of the sponsored bill. We find that lobbying increases the total number of insider transactions, which eventually leads to higher CEO pay. Through multivariate analysis of the three variables for firm lobbying, we find evidence that firm lobbying increases total CEO compensation packages, including stock options. To our knowledge, the influence of insider trading on CEO pay through lobbying has not been examined. We fill this gap in the existing literature by empirically testing a) whether CEOs exploit lobbying information; b) whether lobbying increases the likelihood of insider trading; and finally, c) whether lobbying increases CEO pay. Our study represents an initial analysis of a new panel data set of lobbying and insider trading relation.

The paper is structured as follows. In Section 2, we summarize the existing literature relating to firm political contributions, the impact of insider trading, firm procurement of government contracts, and potential firm costs and benefits of CEO stock-based compensation. Section 3 presents the discussion of the data and methodology used to determine the presence of insider trading, CEO compensation, and government contract procurement. Section 4 confers about the results from the empirical tests, Section 5 reviews the findings, and Section 6 concludes.

2 Literature Review

Several factors contribute to firms becoming politically active, which include the "institutional features of Congress," the size of the firm, government contracts, and the level of industry concentration (Schuler, Rehbein, and Cramer, 2002). Firms engage in political activism by PAC contributions, inside lobbyists (the number of lobbyists in their Washington D.C. office), and outside lobbyists (the number of outside lobbyists and political consultants). Firms that are in more concentrated industries may have less of a need for being politically-connected (Grier, Munger, and Roberts, 1991). Outside directors that have political, government, or law backgrounds are more prevalent in certain industries where political experience is considered necessary, such as manufacturing (Agrawal and Knoeber, 2001). Hillman and Hitt (1999) found that a combination of political tactics by firms shapes the competitive environment. Firms can build political

influence by providing pertinent policy information to regulators in a more efficient and cost-effective manner than their industry competitors (Hansen, 1991).

Whether or not firm lobbying is beneficial to firms has been studied extensively in the previous literature. In certain industries, such as the steel industry, firms that perceive to gain the most from political connections are the most active, despite the efficacy of determining the returns from political investment (Schuler, 1996). This may also contribute to investments in higher CEO compensation for CEOs that are willing to pursue a corporate political strategy and implement firm lobbying.

Firm lobbying can lead to reductions in a firm's effective tax rates (Richter, Samphantharak, and Timmons, 2009). Lobbying firms can outperform their peers as well as the market average (Kim, 2008). Research has also shown that firm lobbying can lead to higher financial performance (Chen, Parsley, and Yang, 2010). Corporate lobbying can also help fraudulent firms evade detection and provide the opportunity for managers to sell more of their shares (Yu and Yu 2012). Firm lobbying for trade protections in declining industries has been found to reward poor firm performance and hinder innovation. This finding has been countered, with investments from connected firms being shown to underperform investments made by firms without political connections (Duchin and Sosyura, 2012). Yet, Aggarwal, Meschke, and Wang (2009) find that political contributions are not an effective political capital investment. In contrast, Cooper, Gulen, and Ovtchinnikov (2010) find that firms that participate in the political contribution process result in higher rates of return.

Firms may engage in lobbying efforts to benefit management and not necessarily the firm. Skaife, Veenman, and Werner (2013) strengthen this argument by finding that corporate lobbying results in agency costs to be incurred by shareholders. Our results indicate that firm lobbying can benefit both the CEO and the firm, through acquiring additional government contracts and CEO insider trading.

Firm insiders engage in insider trading to increase their personal wealth. Insider trading has been found to have a negative effect on firms and their stock price. Insider trading can also reduce firm value, by increasing the cost of equity (Masson and Madhavan, 1991). Prior research has seen that information asymmetries offer the firm CEO the opportunity for insider trading for personal gain (Ahuja, Coff, and Lee, 2005). CEOs may consider insider trading as a means for increasing their compensation. CEO insider trading can create firm inefficiencies since the ability of CEOs to trade stock options contributes to firm agency problems (Bebchuk and Fershtman, 1994). CEOs also consider board positions upon retirement, which ties to the firm's stock returns. (Brickley, Linck, and Coles, 1999).

Differing conclusions have been made about the benefits of management stock-based compensation, where this type of compensation used for solely the management's benefit and not for the shareholder

(Yermack, 1997; Aboody and Kasznik, 2000). Insiders have strategically chosen disclosure policies and when to implement stock trades to maximize their personal trading profits, when there is a low risk of litigation (Cheng and Lo, 2006). The timing of news disclosure is conducted for the CEOs' benefit. CEOs delay good news and hurry the disclosure of bad news to maximize their stock option compensation (Aboody and Kasznik, 2000; Cheng and Lo, 2006).

Insider trading has been seen to act as an indicator that insiders have private information, based on analysis of trading activity surrounding public announcements (Damodaran and Liu, 1993). Mimicking trading patterns by U.S. senators may beat the market (Ziobrowski, Cheng, Boyd, and Ziobrowski, 2004), which indicates that U.S. senators are earning abnormal trading profits through knowledge of inside information. Our results support this by showing a presence of CEO insider trading before bills pass.

Given the lobbying and firm performance, we investigate how lobbying can benefit firms through government contracting. The level of a firm's political sensitivity impacts the level of scrutiny the government will put upon a firm (Watts and Zimmerman, 1990). Watts and Zimmerman (1990)'s political cost hypothesis states this. Government contracts are also of interest to firms, and political lobbying can obtain these contracts. However, regulators may already prefer to grant government contracts to domestic firms instead of foreign firms, because the profits of foreign firms do not contribute to domestic welfare (Branco, 1994). This preference for domestic firms may be the case, but political contributions can influence the selection of which domestic firms will receive the government contract. Firms that utilize government contracts span several industries and firms use political donations as well as political connections to strengthen their contractor bargaining power (Mills et al., 2012). Halchin (2006) overviews the federal procurement process and resources.

3 Hypothesis Development

3.1 Lobbying and CEO Pay

In our study, our motivation is to investigate if lobbying increases CEO wealth through insider trading. To test this, we first use lobbying expenditures and measure the relationship between compensation and political contributions to understand if the managers have private information by building political capital over the time. For this objective, we investigate our first hypothesis, the link between lobbying and CEO pay;

H.1: All other things equal, lobbying CEOs have greater compensation packages compared to non-lobbying peers. *($\beta_1 > 0$)*

$$CEO\ Pay = \beta_0 + \beta_1 LobbyingIndicators + \sum \beta_s\ Controls \quad (1)$$

Our dependent variable is total CEO compensation and CEO compensation including options. We use three sets of lobbying indicators. Lobbydum is a binary variable and equal to one if the firm is lobbying in year t. Ln(lobbyexp) is the log transformation of total lobbying expenditure, and ln(totalbills) is the log transformation of the total number of bills lobbied at year t. We use firm-specific control variables and report our findings.

3.2 CEO Pay and Insider Trading

Since our motivation is to document the relationship between CEO pay and insider trading, we believe that managers exploit the political information to increase their wealth, therefore; we first expect that successful lobbying activity increases firm value in terms of cumulative abnormal returns before announcement date of bills introduced in the House and the Senate.

H.2: All other things equal, lobbying firms obtain positive market reaction measured by cumulative abnormal returns (CAR);

We hand collect sponsored bills and introduction dates in US legislative bodies from the Congressional Bills database for responsible lobbying firms in our sample. We next employ the event study CAPM method where; $R_{i,t}$ is the actual return, $r_{f,t}$ is a risk-free return and $R_{M,t}$ is the return of a selected market index (we use Value Weight index from CRSP).

$$R_{i,t} - r_{f,t} = \propto_i + \beta_{i,M}\left(R_{M,t} - r_{f,t}\right) + \epsilon_{i,t} \quad (2)$$

We use different event windows around announcement dates, *CAR [-t, +t]*, where we introduce the null hypothesis, which is that cumulative abnormal return is equal to zero;

$$H_o: CAR = 0$$

3.3 Lobbying and Insider Trading

Bourveau, Coulomb, and Sangnier (2016) find that insider trading by politically-connected firm directors increases before and after the election. We examine this phenomenon in the United States exploring whether U.S. CEOs from lobbying firms increase their stock transactions once bills are introduced and become law. Our results confirm that lobbying firms are associated with positive CARs during the announcement dates when the sponsored bill is introduced and become law. Therefore, we hypothesize that CEOs from lobbying firms may engage in insider trading once they know the bill is introduced.

H.3: All other things equal, lobbying increases the number of insider transactions by CEOs before the sponsored bills are introduced and passed in US legislative bodies. *($\beta_1 > 0$)*

$$Transaction = \beta_0 + \beta_1\ LobbyingIndicators + \sum \beta_s\ Controls \qquad (3)$$

Our dependent variable is *Transaction*, and we calculate it in two different ways. We first calculate the total number of insider transactions by lobbying CEOs two weeks before the bill is introduced in the US legislative bodies, and secondly, we calculate the total number CEO insider transactions one week before the introduction of the bill. We find that lobbying indicators lead to higher insider transactions when legislators vote on the bill. In that case, we believe that insider transactions two weeks and one week before the bill is introduced may increase the CEO pay over the long run since firms receive positive CARs surrounding the announcement date;

3.4 Insider Trading and CEO Wealth

We examine whether CEOs that engage in insider trading have higher compensation. Henderson (2011) finds that opportunities to trade on inside information can be used to supplement CEO compensation. We determine whether CEOs that engage in insider trading have higher CEO wealth.

H.4: All other things equal, insider transaction increases CEO wealth; *($\beta_1 > 0$)*

$$CEO\ Pay = \beta_0 + \beta_1\ Transaction + \sum \beta_s\ Controls \qquad (4)$$

Our dependent variable is total CEO compensation and CEO compensation including options. We use the log transformation of the number of transactions two weeks and one week before the voted bill and document that insider trading increases CEO wealth. While we report that political engagement (i.e. lobbying) increases CEO wealth by managers exploiting the information (i.e. insider trading), we also test the firm performance of lobbying firms in our sample for potential agency cost problems.

3.5 Lobbying and Government Contracts

We believe that if lobbying increases CEO pay, however, fails to generate firm value; then it is the CEOs and not the shareholders that benefit from the lobbying activity. While the majority of finance literature (Chen, Parsley, and Yang, 2010; Kim, 2008; Hillman, Zardkoohi, and Bierman, 1999) points out that lobbying benefits firm performance, we measure the impact of lobbying by considering the impact of government contracting. Berrios (2006) finds that firms with inside contacts are given government contracts. Duchin and Sosyura (2012) find that politically connected firms are more likely to receive government investment. Goldman, Rochell, and So (2013) finds that firm lobbying results in an increase in

government contract awards after a U.S. House election where the firm is connected to the winning party. These political connections may be advantageous for firms in receiving more government contracts. Because of this, agency cost problems from firm lobbying may be mitigated by obtaining government contracts, due to the value added by government contracts, which offsets the costs incurred from politically-connected CEO excess compensation. We expect that lobbying firms may gain easy access to government contracts by spending an excess amount of lobbying expenditures, therefore;

H.5: All other things equal, lobbying increases the likelihood of gaining access to government contracts. *($\beta_1 > 0$)*

$$Contract = \beta_0 + \beta_1 LobbyingIndicators + \sum \beta_s Controls \quad (5)$$

We calculate the government contract variable by a) if the firm has at least one government contract, and b) the total number of government contracts associated with the firm. We report that larger lobbying expenditures increase both the likelihood of receiving a government contract, as well as the total number of contracts. In this case, we believe that lobbying creates firm value. Just in 2014, government contracts totaled $447 billion, which shows the revenue potential that has in contributing to firm value if a firm can secure government contracts.

3.6 Lobbying, Firm Value, and Government Contracts

We now examine this further and look to determine whether firm value increases with firm lobbying. Firm lobbying increases the likelihood of being awarded government contracts (Goldman, Rochell, and So, 2013). Elayan, Pukthuanthong, and Li (2004) find that government contract awards increase firm value. We hypothesize that lobbying firms receive more government contracts and these government contract awards increase firm value.

H.6: All other things equal, lobbying increases the firm value through government contracting *($\beta_1 > 0$)*;

$$FirmValue = \beta_0 + \beta_1 LobbyingIndicators + \sum \beta_s Controls \quad (6)$$

We calculate the firm value in terms of long-term buy-and-hold abnormal returns (BHAR) for +12, +24, and +36 months after firm lobbying activity. We introduce lobbying indicators and an interaction term of lobbying multiplied by government contracting to understand if lobbying firms who are government contractors have better performance compared to non-lobbying firms. Lobbying benefits both CEOs and firms in different ways. Lobbying provides CEOs access to inside information, which they can use to profit from insider trading. Lobbying also provides additional access to government contracts (Hillman,

Zardkoohi, and Bierman, 1999) and government contracts increase firm value. We find that lobbying increases stock performance as well as shareholder wealth, which is consistent with our expectations.

4 Methodology

We measure lobbying activities in three ways. In Table 1, *lobbydum* is equal to 1 if the firm has lobbying activity in the given year, 0 otherwise. Second, we use a log transformation of the total amount of lobbying expenditures. Third, we calculate the number of bills a firm has lobbied. 14 percent of the firms included in the sample are lobbying firms, with the average amount of lobbying expenditures being greater than 303,000 USD and the maximum expenditure amount being 45 million USD.

Table 1
Summary Statistics

Variables	N	Mean	Median	Std.Dev	Min	Max
Panel A. Political characteristic at CEO level						
Total Lobbying Amount	26,131	303,082.20	1,498,310.00	0.00	0.00	45,500,000
N. of Bills Lobbied	26,131	1.92	8.91	0.00	0.00	232.00
Lobbydum	26,131	0.14	0.35	0.00	0.00	1.00
Panel B. CEO and Insider Characteristic						
CEO Compensation	25,980	5,366.94	9,263.62	3,093.04	0.00	600,347
CEO Compensation (Opt. Included)	26,078	6,157.78	27,918.14	2,689.29	0.00	3,300,331
CEO Salary	26,131	731.71	405.38	680.00	0.00	8,100
CEO Bonus	26,131	500.59	1,594.71	0.00	0.00	76,951
CEO Cash	26,131	1,232.30	1,730.54	861.35	0.00	77,926
CEO Stock Awards	15,470	1,857.24	3,289.17	803.56	-7230.19	131,940
CEO Option Awards	15,470	1,125.00	2,872.81	267.40	-725.28	90,693
CEO Non-Equity Incentive	15,470	1,019.85	1,733.51	513.04	-299.62	46,259
%Insider CEO	26,131	0.01	0.12	0.00	0.00	1.00
Insider Transaction - One Week	26,131	0.03	0.99	0.00	0.00	62.00
Insider Transaction - Two Weeks	26,131	0.14	9.93	0.00	0.00	1,567.00
Panel C. Control Variables						
Size	25,617	7.43	0.07	1.72	0.00	13.13
ROA	25,968	0.02	0.03	0.55	-33.00	46.45
Leverage	25,887	0.24	0.20	0.95	0.00	120.94
HHI	25,980	0.21	0.16	0.18	0.01	1.00
Tobin's Q	25,597	1.86	1.40	1.86	-0.99	147.35
Sales Growth	25,821	0.14	0.07	2.54	-1.00	378.91

Table 1 provides descriptive statistics of our sample, reporting the full sample summary statistics for measures of lobbying variables, and control variables, CEO pay and insider trading variables and firm-level control variables. Panel A summarizes lobbying characteristics of firms used in this study. Panel B lists calculated summary statistics of CEO pay and insider trading variables. Panel C lists calculated summary statistics for control.

In Table 2, we conduct a univariate analysis. Table 2 documents the difference between lobbying and non-lobbying firms in terms of lobbying characteristics. We compare lobbying firm versus non-lobbying firms. In Panel A, we document that lobbying firms are larger in size and more profitable. On the other hand, non-lobbying firms have higher Tobin's Q and sales growth, and the difference between lobbying and non-lobbying firms is statistically significant, which provides additional support for this positive relationship between lobbying and firm performance, as seen in Chen, Parsley, and Yang (2010). Positive relations between political connections have also been found in Germany (Niessen and Ruenzi, 2010).

Table 2
Univariate Test

Variable	N	Lobby [1]	N	Non-lobby [2]	Difference [1]-[2]	T-statistics
Panel A. Firm Characteristic						
Ln(Size)	2,485	9.17	23,132	7.19	1.98	[52.60]***
ROA	2,485	0.04	23,132	0.03	0.01	[2.60]**
BookLeverage	2,485	0.25	23,132	0.24	0.01	[0.60]
Herfindahl Index	2,485	0.21	23,132	0.22	-0.01	[-0.46]
Tobin's Q	2,485	1.67	23,132	1.80	-0.13	[4.79]***
Sales Growth	2,485	0.07	23,132	0.15	-0.08	[-2.65]***

Table 2 reports the univariate analysis between our sample firms. In column (1), we define lobbying group if the firm is defined as a lobbyist in our sample. In column (2), non-lobby refers to firms with no lobbying engagement. In column (1)-(2), we report the differences in means of given variables and T-test results. In Panel A, we compare sample means based on lobbying activity. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

5 Data

a) *Firm Data and CEO Characteristics*

We use COMPUSTAT database to identify the publicly traded firms in our study. We calculate firm-specific variables from COMPUSTAT database. We then use ExecuComp database and merge it with COMPUSTAT to obtain CEO characteristics along with compensation variables. Our sample begins in 2000 and ends in 2014.

b) Stock Returns

We use CRSP daily returns for the event study on market reaction. We also obtain CRSP monthly returns for calculating the buy-and-hold abnormal returns where the Value Weighted Index is the benchmark.

c) Insider Trading Data

We collect insider trading data from Form 4 reported by the U.S. Securities Exchange and Commission (SEC)[1]. The SEC filings include detailed insiders (i.e., officers, directors, and shareholders who own more than 10% of ownership) transactions at the personal level.

d) Lobbying Data

Lobbying data is collected from Center for Responsible Politics (CRP)[2] and merged with COMPUSTAT database to identify the publicly traded firms. The CRP database includes lobbying expenditure and bills which are sponsored by firms in our sample. In addition to CRP database, we also use Congressional Bill database[3] to track the full history of bills (including introduction days at US legislative bodies) lobbied by firms in our sample.

e) Government Contracts

We hand collect the government contracting data by using Federal Procurement Data System[4] and match it with publicly traded firms in our sample to identify the number of government contracts that firms obtain in a given year.

6 Findings

6.1 CEO compensation packages of lobbying and non-lobbying CEOs

In Table 3, we divide our sample into lobbying firms versus non-lobbying firms and find that CEOs from lobbying firms have larger compensation packages measured in all forms. CEOs from lobbying firms have higher cash salary bonuses, stock awards, option awards, and overall total compensation in comparison to their non-lobbying peers and the differences are statistically significant. Firms may pay higher compensation to attract and maintain politically-engaged CEOs (Huilonga, Minb, Yapinga, and Lianshenga, 2010). Shareholders value management engaging in lobbying activities on their behalf (Hill, Kelly, Lockhart, and Ness (2013). We conduct a multivariate analysis to explore this further by measuring the relation between firm lobbying and CEO pay.

[1] We also cross-check the validity of our data with one reported in following websites (http://insidertrading.org/ or http://openinsider.com/)
[2] www.opensecrets.org/lobbying
[3] http://www.congressionalbills.org/
[4] https://www.fpds.gov/fpdsng_cms/index.php/en/

Table 3
Lobbying and CEO Compensation: Univariate Analysis

Variable	N	Lobby [1]	N	Non-lobby [2]	Difference [1]-[2]	T-statistics
Cash	2,515	1,442.53	23,616	969.09	473.44	[12.89]***
Salary	2,515	1,056.60	23,616	726.32	330.28	[33.89]***
Bonus	2,515	385.85	23,616	242.76	143.09	[4.18]****
Stock Award	2,149	3,703.88	13,321	1,559.32	2,144.56	[22.72]***
Option Award	2,149	2,145.55	13,321	960.36	1,185.19	[16.80]***
Non-Equity Incentive Plan	2,149	2,014.10	13,321	859.45	1,154.65	[21.16]***
Total Compensation	2,513	9,589.14	23,467	4,595.88	4,993.26	[29.43]***
Total Compensation (Inc. Options)	2,515	11,310.73	23,563	5,985.06	5,325.67	[12.43]***

Table 3 reports the univariate analysis between lobbying firms our sample firms. In column (1), we define lobbying group if the firm is defined as a lobbyist in our sample. In column (2), non-lobby refers to firms with no lobbying engagement. In column (1)-(2), we report the differences in means of given variables and T-test results. We compare sample means based on lobbying activity and CEO pay characteristics. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 4 reflects the results from investigating if lobbying leads to higher compensation packages. We use two measures for compensation and define them as total compensation and total compensation including options. We use the same lobbying indicators and find that CEOs from lobbying firms do have higher compensation packages compared to their non-lobbying peers. Additionally, our results indicate that total lobbying expenditures and the total number of bills lobbied increase CEO pay. [5]

There is a positive relationship between total CEO compensation and lobbying expenditure, with this excess compensation leading to agency costs (Skaife, Veenman, and Werner, 2013). We believe that lobbying leads to higher CEO pay. This excess CEO pay comes from profits made from insider trading. Because of this, excess compensation may not be associated with agency costs. We try to explain this through empirical tests of firm performance and other channels of CEO pay resulting from insider trading.

[5] We also find that lobbying increases cash salary bonuses and other CEO pay packages, but to conserve space, we only report the total compensation packages.

Table 4
Lobbying and CEO Compensation: Multivariate Analysis

Dependent Variable	Ln(Total Comp)$_{t+1}$	Ln(Total Comp)$_{t+1}$	Ln(Total Comp)$_{t+1}$	Ln(Total Comp Opt. Inc)$_{t+1}$	Ln(Total Comp Opt. Inc)$_{t+1}$	Ln(Total Comp Opt. Inc)$_{t+1}$
Sample						
	(1)	(2)	(3)	(1)	(2)	(3)
Lobbydum$_t$	0.100			0.095		
	[0.001]***			[0.001]***		
Ln(LobExp)$_t$		0.035			0.036	
		[0.012]**			[0.001]***	
Ln(Total Bill)$_t$			0.055			0.047
			[0.045]***			[0.035]***
Ln(Size)$_t$	0.409	0.406	0.411	0.396	0.393	0.399
	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***
ROA$_t$	-0.122	-0.119	-0.125	-0.045	-0.042	-0.049
	[0.021]**	[0.025]**	[0.019]**	[0.602]	[0.627]	[0.572]
BookLeverage$_t$	0.136	0.136	0.137	0.406	0.404	0.405
	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***
HHI$_t$	-0.035	-0.037	-0.034	-0.035	-0.037	-0.034
	[0.678]	[0.662]	[0.685]	[0.678]	[0.661]	[0.690]
Tobin's Q$_t$	-0.107	-0.106	-0.107	-0.097	-0.096	-0.098
	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***
Sales Growth$_t$	0.001	0.001	0.001	0.001	0.001	0.001
	[0.278]	[0.278]	[0.285]	[0.064]*	[0.065]*	[0.067]*
Constant	5.261	5.270	5.247	5.215	5.231	5.197
	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***
Industry & Year Fixed	YES	YES	YES	YES	YES	YES
Num.Cluster	2,634	2,634	2,634	2,546	2,546	2,546
N	24,344	24,344	24,344	21,996	21,996	21,996
R^2	38%	38%	38%	39%	39%	39%

Table 4 exhibits the relationship between CEO compensation and lobbying for our sample firms. In column (1) to (3), our dependent variable is CEO total compensation. In column (4) to (6), our dependent variable is CEO compensation including the option. Lobbydum is equal to one if the firm has lobbying activity, zero otherwise. Ln(LobExp) is the log transformation of lobbying expenditure at the firm level. Ln(Total Bill) is the log transformation of the total numbers of bill sponsored. Other control variables are calculated from COMPUSTAT. We add period (year) binary variables and industry binary variables but omit the coefficients. Std. Errors are clustered at the firm level. Numbers in parentheses are p-values. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

6.2 Association between firm lobbying and firm performance

Next, we try to explain CEO pay and firm performance and if lobbying benefits the firm. To determine if lobbying increases stock prices, we conduct an event study analysis and measure the market reaction when the sponsored bill is introduced in the U.S. legislative bodies. Table 5 reflects these results. In Panel A, we report several different event windows when the bill is introduced. We find that lobbying firms receive positive market reaction when the bill successfully overcomes legal procedures. In addition, we find that market reaction is positive and significant for lobbying firms once the sponsored bill becomes law. The passing of a bill may be a positive market signal that indicates the effectiveness of a firm's political connections. Also, firms lobby Congress to push bills which provide these firms competitive advantages. These competitive advantages, such as beneficial tax rates and deregulation, can increase firm value. For instance, on December 5, 2016, the Senate passed a bill that boots biomedical research and speeds Federal Drug Administration approvals. This bill greatly benefits pharmaceutical companies, who have contributed substantial political donations to Congressional campaigns.[6]

Table 5
Event Study: Bill Introduced

Panel A. Short-Term Event Study

Date	CAR	T-Test	Prob.
[0,+1]	1.00%	17.96	[0.001]***
[0,+2]	1.00%	14.59	[0.001]***
[0,+3]	0.89%	11.30	[0.001]***
[-1,+1]	1.00%	14.73	[0.001]***
[-2,+2]	1.05%	11.94	[0.001]***
[-3,+3]	0.96%	9.22	[0.001]***
[-4,+4]	0.84%	7.12	[0.001]***

Table 5 reports market responses to the sponsored bill being introduced and passed in the U.S legislative bodies. CAR refers to the cumulative abnormal returns (CAR) for lobbying firms when their sponsored bill is successful in legal procedures. In Panel A, we perform short-term event study where CAPM model is used to calculated CARs of event windows.

$$R_{i,t} - r_{f,t} = \alpha_i + \beta_{i,M}(R_{M,t} - r_{f,t}) + \varepsilon_{i,t}$$

Where $R_{i,t}$ is the actual return and $R_{M,t}$ is the return of a selected market index (CRSP value weight index). In Panel B, we use cumulative abnormal returns as the dependent variable and regress it on firm-level lobbying variable and other control variables. Std. errors are clustered at the firm level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

[6] Hughes, S., & Burton, T. M. (2016, December 05). Senate Clears Path for Bill to Speed FDA Drug Approvals. Retrieved January 25, 2017, from http://www.wsj.com/articles/senate-clears-path-for-bill-to-speed-fda-drug-approvals-1480981609

In Panel B of Table 5, we measure the market reaction in a multivariate analysis by regressing cumulative abnormal returns on lobbying expenditures. We find that increases in lobbying expenditure increase the cumulative abnormal returns, controlling for firm-specific characteristics. Our findings suggest that greater lobbying expenditure leads to greater market reaction for the firms in our sample. Positive market reactions occur when politically-connected individuals are nominated to a firm's board of directors, which shows that markets value a firm's political connections (Goldman, Rochell, and So, 2008). Bills being introduced and passed in the U.S. legislative bodies may also be a positive signal to the market that the firm's political capital is increasing. These findings are in line with Chen, Parsley, and Yang, (2010), who found a positive relation between lobbying expenditures and firm financial performance by examining the relation between current lobbying and future performance, lobbying to change in financial performance and the first-differenced equation of the first measure.

Table 5: Panel B. Lobbying and Cumulative Abnormal Returns

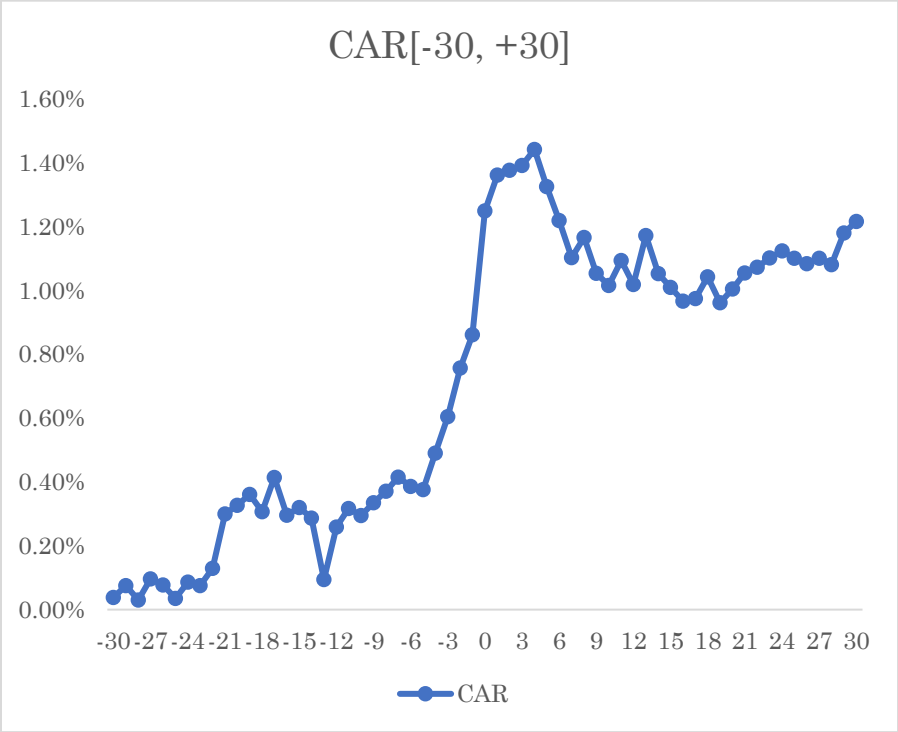
Dependent Variable	CAR[-1,+1]	CAR[-2,+2]	CAR[0,+1]
Sample			
	(1)	(2)	(3)
$Ln(LobExp)_t$	0.112	0.223	0.236
	[0.001]***	[0.001]***	[0.001]***
$Ln(Size)_t$	-0.003	-0.003	-0.003
	[0.001]***	[0.001]***	[0.001]***
ROA_t	-0.047	-0.046	-0.017
	[0.221]	[0.445]	[0.441]
$BookLeverage_t$	0.006	0.013	0.003
	[0.415]	[0.139]	[0.671]
HHI_t	0.002	-0.002	-0.010
	[0.526]	[0.593]	[0.039]**
Tobin's Q_t	0.002	0.002	0.001
	[0.001]***	[0.116]	[0.506]
Sales $Growth_t$	0.011	0.028	0.024
	[0.001]***	[0.001]***	[0.001]***
Constant	0.008	-0.001	-0.001
	[0.179]	[0.907]	[0.975]
Industry & Year Fixed	YES	YES	YES
Num.Cluster	417	417	417
N	2,505	2,505	2,505
R^2	3%	3%	3%

Figure 1 represents the market reaction where we plot cumulative abnormal returns. We show that before the bill is introduced, lobbying firms obtain positive price movements two weeks before the bill

announcement date. The cumulative abnormal returns reach the highest point in event intervals of four or five days. We aim to investigate the positive price movement by insider trading in the following section.

Figure 1

Lobbying and CAR: Bill Introduced & Passed



6.3 Association between lobbying and CEO stock transactions

Given the positive market reaction, we investigate the presence of CEO insider trading. We examine if CEOs from lobbying firms exploit their inside information and engage in stock trades before the introductions of bills in the U.S. legislative bodies. CEOs can trade on inside information. An example of this is Wells Fargo CEO John Stumpf, who sold Wells Fargo shares for a profit of $26 million before settling a long-run investigation against Wells Fargo.[7] Jagolinzer, Larcker, Ormazabal, and Taylor (2016) find that politically connected insiders have information advantages and exploit them before government intervention announcements. Our hypothesis states that CEOs may commit insider trading before the introductions of the bills. Political connections may reduce the likelihood of CEOs being prosecuted for insider trading. To test this hypothesis, we calculate the number of insider transactions before the bill introduction date. Table 6 reflects the total number of CEO insider transactions that occur both two weeks

[7] Kristof, K. (2016, October 14). CEO sold millions in Wells Fargo stock before fraud revelations. Retrieved January 25, 2017, from http://www.cbsnews.com/news/wells-fargo-ceo-john-stumpf-sold-millions-in-company-stock-before-bank-fraud-revelations/

and one week before the bill introduction date. We measure the relation between lobbying and insider trading activity by regressing two weeks of the total number of stock transactions and one week of the total number of stock transactions made by CEOs before the introduction of the bill. Our results are presented in Table 6 where we measure the relationship between lobbying and insider transactions.

Table 6
Corporate Lobbying and Insider Trading

Dependent Variable	Ln(TwoWeeks)	Ln(TwoWeeks)	Ln(TwoWeeks)	Ln(OneWeek)	Ln(OneWeek)	Ln(OneWeek)
Sample						
	(1)	(2)	(3)	(1)	(2)	(3)
$Lobbydum_t$	0.136			0.075		
	[0.001]***			[0.001]***		
$Ln(LobExp)_t$		0.036			0.019	
		[0.001]***			[0.001]***	
$Ln(Total\ Bill)_t$			0.133			0.074
			[0.001]***			[0.001]***
$Ln(Size)_t$	0.009	0.010	0.005	0.006	0.006	0.004
	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***
ROA_t	-0.003	-0.003	-0.001	-0.002	-0.002	-0.001
	[0.298]	[0.244]	[0.700]	[0.292]	[0.242]	[0.511]
$BookLeverage_t$	-0.003	-0.003	-0.005	0.001	0.001	0.000
	[0.278]	[0.286]	[0.124]	[0.434]	[0.394]	[0.948]
HHI_t	-0.001	-0.001	-0.005	-0.008	-0.007	-0.010
	[0.944]	[0.974]	[0.632]	[0.279]	[0.309]	[0.147]
$Tobin's\ Q_t$	0.003	0.003	0.004	-0.001	-0.001	0.001
	[0.251]	[0.273]	[0.104]	[0.456]	[0.369]	[0.877]
$Sales\ Growth_t$	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	[0.924]	[0.967]	[0.431]	[0.828]	[0.795]	[0.664]
Constant	-0.073	-0.080	-0.044	-0.041	-0.046	-0.024
	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***
Industry & Year Fixed	YES	YES	YES	YES	YES	YES
Num.Cluster	2,763	2,763	2,763	2,763	2,763	2,763
N	25,387	25,387	25,387	25,387	25,387	25,387
R^2	6%	5%	5%	5%	5%	5%

Table 6 exhibits the relationship between insider transaction and lobbying for our sample firms. In column (1) to (3), our dependent variable is log transformation of the total number of insider transactions by CEOs two weeks before the bill is introduced. In column (4) to (6), our dependent variable is log transformation of the total number of insider transaction by CEOs one week before the bill is introduced. Lobbydum is equal to one if the firm has lobbying activity, zero otherwise. Ln(LobExp) is the log transformation of lobbying expenditure at the firm level. Ln(Total Bill) is the log transformation of the total number of bill sponsored. Other control variables are calculated from COMPUSTAT. We add period (year) binary variables and industry binary variables but omit the coefficients. Std. Errors are clustered at the firm level. Numbers in parentheses are p-values. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Our results reflect that lobbying firms do have more insider trading activity in those two weeks and one-week time periods. Thus, our findings confirm that lobbying increases CEO insider trading activity where managers are more likely to exploit inside information. We believe that lobbying increases insider trading activity, because legislation that is beneficial to the firm is being passed, which will be a positive signal to the market and CEOs engage in insider trading to profit from this information.

6.4 Association between CEO insider transactions and CEO wealth

CEO political networks can have an impact on their compensation (Aslan and Grinstein, 2011). We examine this further by determining whether CEO insider trading leads to higher CEO wealth. Insider trading gives the CEO an opportunity to make substantial profits, and this may contribute to CEO wealth. Firms who restrict insider trading pay executives more than firms who do not restrict insider trading. This indicates that opportunities for CEO insider trading can be used as part of CEO compensation packages (Henderson, 2011; Roulstone, 2003). We examine whether insider trading can explain CEO pay and benefit CEOs. We test for insider trading by comparing insider CEOs to non-insider CEOs and then measure CEO wealth. We define the group as an insider if the CEO of the firm has an insider transaction at least two weeks before the bill is introduced and non-insider refers to firms with no insider transaction at CEO level.

Our univariate results are presented in Table 7. We find that CEOs who commit insider trading before the bill introduction date have greater cash, salary, bonus, and overall total compensation packages compared to CEOs who have no insider trading activity. Profits made from insider trading activity may boost CEO compensation and hence CEO wealth. These results confirm our earlier findings that CEOs with private political information may benefit from insider trading and the difference is statistically significant. CEOs may have larger compensation packages compared to their non-lobbying peers from the additional investment by firms for CEOs to gain political capital that will influence legislation and benefit the firm (Skaife, Veenman, and Werner, 2013). CEO pay may also be larger primarily from the portfolio optimization and trading profits made from inside political information (Henderson, 2011).

Table 7
Insider Trading and CEO Compensation

Variable	N	Insider [1]	N	Non-insider [2]	Difference [1]-[2]	T-statistics
Cash	375	1,759.93	25,756	1,017.03	742.90	[5.74]***
Salary	375	1,117.31	25,756	763.70	353.62	[15.44]***
Bonus	375	642.62	25,756	253.34	389.28	[3.06]***
Stock Award	363	3,878.49	15,107	1,808.67	2,069.82	[6.95]***
Option Award	363	2,504.32	15,107	1,091.86	1,412.46	[8.43]***
Non-Equity Incentive Plan	363	2,112.64	15,107	993.59	1,119.05	[8.47]***
Total Compensation	375	10,522.36	25,605	5,162.32	5,360.04	[12.78]***
Total Compensation (Inc. Options)	375	13,911.32	25,703	6,549.93	7,361.39	[8.10]***

Table 7 reports the univariate analysis between insider firms our sample firms. In column (1), we define insider group if the CEO of the firms have insider transaction at least two weeks before the bill is introduced. In column (2), non-insider refers to firms with zero insider transaction at CEO level. In column (1)-(2), we report the differences in means of given variables and T-test results. We compare sample means based on insider activity and CEO pay characteristics. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

We also test the effect of insider trading on CEO pay, we also conduct a multivariate test and report our findings in Table VIII, with the dependent variable as total CEO pay and the total CEO pay including options.

We regress CEO on insider trading characteristics and in Column 1 and 2, we find that the total number of transactions two weeks and the total number of transactions one week before the bill introduction date increases the total CEO pay. Similarly, in Column 3 and 4, we find that insider trading actions increase total compensation, including options[8]. These results may reveal the fact that insider trading increases the CEO wealth in our sample and is important to understand the benefit of political capital. This finding is relevant to understanding the motivations behind CEOs' decisions on firm lobbying policy.

Table 8
Insider Trading and CEO Compensation

Dependent Variable	$Ln(Total\ Comp)_{t+1}$	$Ln(Total\ Comp)_{t+1}$	$Ln(Total\ Comp\ Opt.\ Inc)_{t+1}$	$Ln(Total\ Comp\ Opt.\ Inc)_{t+1}$
Sample				
	(1)	(2)	(3)	(4)
Ln(TwoWeeks)	0.091		0.149	
	[0.001]***		[0.001]***	
Ln(OneWeek)		0.034		0.039
		[0.001]***		[0.001]***
$Ln(Size)_t$	0.375	0.385	0.613	0.451
	[0.001]***	[0.001]***	[0.001]***	[0.001]***
ROA_t	0.112	0.113	0.183	0.133
	[0.019]**	[0.024]**	[0.039]**	[0.019]**
$BookLeverage_t$	0.125	0.128	0.204	0.151
	[0.001]***	[0.001]***	[0.001]***	[0.001]***
HHI_t	-0.032	-0.035	-0.052	-0.041
	[0.620]	[0.120]	[0.321]	[0.113]
$Tobin's\ Q_t$	-0.098	-0.100	-0.160	-0.118
	[0.001]***	[0.001]***	[0.001]***	[0.001]***
$Sales\ Growth_t$	0.255	0.263	0.417	0.309
	[0.001]***	[0.001]***	[0.001]***	[0.001]***
Constant	4.827	4.992	7.892	5.859
	[0.001]***	[0.001]***	[0.001]***	[0.001]***
Industry & Year Fixed	YES	YES	YES	YES
Num.Cluster	2,634	2,634	2,546	2,546
N	24,344	24,344	21,996	21,996
R^2	38%	38%	39%	39%

Table 8 exhibits the relationship between insider transaction and CEO pay for our sample firms. In column (1) to (2), our dependent variable total CEO compensation. In column (3) to (4), our dependent variable is total CEO compensation including options. Ln(TwoWeeks) is the log transformation of the total number of CEO transactions two weeks before the lobbying bill is introduced and passed. Ln(OneWeek) is the log transformation of the total number of CEO transactions one week before the lobbying bill is introduced and passed. Other control variables are calculated from COMPUSTAT. We add period (year) binary variables and industry binary variables but omit the coefficients. Std. Errors are clustered at the firm level. Numbers in parentheses are p-values. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

[8] Our results do not change when we include other pay packages, such as CEO bonus, cash, and salary.

We also test the effect of insider trading on CEO pay, by examining a cross-sectional analysis. We create a sub-sample and only keep the firms that have insider trading activity reported. We report our findings in Table 9. In Table 9, our cross-sectional analysis documents that the greater number of insider trading leads to higher CEO pay. This result is compelling due to CEOs from lobbying firms enjoying greater compensation packages not only for engaging in lobbying but also from committing insider trading activity. Higher equity incentives are linked to higher executive total pay (Denis and Xu, 2013).

Table 9
Insider Trading and CEO Pay: Cross-Sectional Analysis

Dependent Variable	Ln(Total Comp)$_{t+1}$	Ln(Total Comp)$_{t+1}$	Ln(Total Comp Opt. Inc)$_{t+1}$	Ln(Total Comp Opt. Inc)$_{t+1}$
Sample				
	(1)	(2)	(3)	(4)
Ln(TwoWeeks)	0.101		0.036	
	[0.001]***		[0.001]***	
Ln(OneWeek)		0.016		0.087
		[0.001]***		[0.001]***
Ln(Size)$_t$	0.412	0.183	0.149	0.993
	[0.001]***	[0.001]***	[0.001]***	[0.001]***
ROA$_t$	-0.123	-0.054	-0.045	-0.292
	[0.021]**	[0.011]**	[0.001]***	[0.061]*
BookLeverage$_t$	0.138	0.061	0.050	0.332
	[0.001]***	[0.001]***	[0.001]***	[0.001]***
HHI$_t$	-0.035	-0.016	-0.013	-0.089
	[0.684]	[0.298]	[0.248]	1.619
Tobin's Q$_t$	-0.108	-0.048	-0.039	-0.259
	[0.001]***	[0.001]***	[0.001]***	[0.001]***
Sales Growth$_t$	0.001	0.001	0.001	0.003
	[0.280]	[0.125]	[0.101]	[0.679]
Constant	5.309	2.377	1.925	12.890
	[0.001]***	[0.001]***	[0.001]***	[0.001]***
Industry & Year Fixed	YES	YES	YES	YES
Num.Cluster	440	440	440	440
N	2,982	2,982	2,982	2,982
R^2	26%	26%	26%	26%

Table 9 exhibits the cross-sectional analysis of the relationship between insider transaction and CEO pay for our sample firms. In column (1) to (2), our dependent variable total CEO compensation. In column (3) to (4), our dependent variable is total CEO compensation including options. Ln(TwoWeeks) is the log transformation of the total number of CEO transaction two weeks before the lobbying bill is introduced and passed. Ln(OneWeek) is the log transformation of the total number of CEO transaction one week before the lobbying bill is introduced and passed. Other control variables are calculated from COMPUSTAT. We add period (year) binary variables and industry binary variables but omit the coefficients. Std. Errors are clustered at the firm level. Numbers in parentheses are p-values. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

6.5 Association between lobbying and procurement of government contracts

Our primary concern is that lobbying may increase CEO wealth, but may have no effect (or reduce) firm value. Previous studies find that lobbying does not benefit firms (Hadani and Schuler, 2013). In this case, if lobbying does not create wealth for firms, then it is only CEOs, not the shareholders who enjoy the political spending. This would lead to agency costs, which may stem from the firms compensating CEOs for being politically engaged in expectation of future regulatory benefits (Skaife, Veenman, and Werner, 2013). To test the effect of lobbying on firm performance, we gather government contracting data and measure whether lobbying increases access to receiving government contracts. Access to government contracts can increase firm value.

Table 10
Corporate Lobbying and Government Contract

Dependent Variable	$Contract_{t+1}$	$Contract_{t+1}$	$Contract_{t+1}$	Ln(Total $Contract)_{t+1}$	Ln(Total $Contract)_{t+1}$	Ln(Total $Contract)_{t+1}$
Sample						
	(1)	(2)	(3)	(4)	(5)	(6)
$Lobbydum_t$	1.085			1.119		
	[0.001]***			[0.001]***		
$Ln(LobExp)_t$		0.397			0.335	
		[0.001]***			[0.001]***	
$Ln(Total\ Bill)_t$			0.802			1.180
			[0.001]***			[0.001]***
$Ln(Size)_t$	0.450	0.419	0.437	0.127	0.121	0.084
	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***
ROA_t	0.237	0.247	0.233	-0.021	-0.022	-0.013
	[0.573]	[0.565]	[0.571]	[0.268]	[0.256]	[0.287]
$BookLeverage_t$	-0.357	-0.392	-0.319	0.094	0.089	0.076
	[0.317]	[0.278]	[0.366]	[0.001]***	[0.001]***	[0.001]***
HHI_t	0.681	0.674	0.648	0.631	0.618	0.592
	[0.045]**	[0.051]*	[0.058]*	[0.056]*	[0.063]*	[0.054]*
$Tobin's\ Q_t$	-0.411	-0.400	-0.394	-0.732	-0.788	-0.719
	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***
$Sales\ Growth_t$	-0.155	-0.157	-0.169	-0.081	-0.078	-0.066
	[0.276]	[0.274]	[0.225]	[0.001]***	[0.001]***	[0.001]***
Constant	-4.740	-4.579	-4.614	-0.812	-0.778	-0.499
	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***
Industry & Year Fixed	YES	YES	YES	YES	YES	YES
Num.Cluster	2,639	2,639	2,639	2,639	2,639	2,639
N	25,112	25,112	25,112	25,112	25,112	25,112
R^2	17%	17%	17%	17%	17%	17%

Table 10 exhibits the relationship between obtaining government contract and lobbying for our sample firms. In column (1) to (3), our dependent variable is Contract which is equal to one if firm earns at least one government contract, zero otherwise. In column (4) to (6), our dependent variable is log transformation of the total number of contract earned by firms. Lobbydum is equal to one if the firm has lobbying activity, zero otherwise. Ln(LobExp) is the log transformation of lobbying expenditure at the firm level. Ln(Total Bill) is the log transformation of the total number of bill sponsored. Other control variables are calculated from COMPUSTAT. We add period (year) binary variables and industry binary variables but omit the coefficients. Std. Errors are clustered at the firm level. Numbers in parentheses are p-values. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

We regress government contracting indicators on firm-level lobbying activities and find that lobbying increases the likelihood of receiving government contracts. These results are in Table 10. Furthermore, we find that lobbying also increases the total number of contracts granted to firms by government officials. We propose that lobbying may build political capital which could provide easier access to government granted contracts. Political lobbying can influence the amount of government contracts a firm receives (Do, Lee, and Nguyen, 2015; Goldman, Rocholl, and So, 2013). To test the effect of government contracting and lobbying, we measure the firm performance followed by lobbying activity.

6.6 Association between government contracts and firm value

Lobbying benefits firms through legislation that may provide competitive advantages for firms. This includes government contracts, where political lobbying influences the selection of which firm is awarded the government contract. This practice is common for firms that rely on government contracts and is considered a type of market strategy (Schuler, Rehbein, and Cramer, 2002). This process of political connections increasing government contract awards and hence firm value is found at the national level in Goldman, Rocholl, So (2013) and state level in Do, Lee, and Nguyen (2015).

In Table 11, we examine the relationship between the long-term buy-and-hold abnormal returns and lobbying activity. We calculate +12, +24, and +36 months of buy-and-hold abnormal returns and test whether lobbying maximizes shareholder wealth. The results in Column 1 indicate that lobbying firms have better stock performance compared to non-lobbying peers. In addition, the interaction term of lobbying multiplied by government contracting is significant and positive. This result indicates that lobbying firms who obtain government contracts have higher stock returns and that the coefficient is statistically significant. Our results are similar for +24 and +36 months of abnormal returns reported in Column 2 and 3. These results may reveal that lobbying does not only benefit CEO wealth but also increases the firm value, which mitigates the agency problem. Overall, our findings may build the understanding of the importance of political information, as well as political engagement, at the firm and CEO level. Government contracts can be very lucrative, totaling over $6.27 trillion from 2000 to 2014 and receiving these contracts can thereby benefit firms and increase firm value.[9]

[9] Annual Review of Government Contracting [Review]. (2014). *Bloomberg Government*. Retrieved January 23, 2017, from http://www.ncmahq.org/docs/default-source/default-document-library/pdfs/exec15---ncma-annual-review-of-government-contracting-2015-edition

Table 11

Corporate Lobbying and Stock Returns

Sample	All		
Dependent Variable	BHAR-12	BHAR-24	BHAR-36
	(1)	(2)	(3)
$Lobbydum_t$	0.039	0.054	0.072
	[0.001]***	[0.001]***	[0.001]***
$Lobbydum*GovCont_t$	0.043	0.083	0.074
	[0.028]**	[0.042]**	[0.033]**
$GovCont_t$	-0.011	-0.038	-0.044
	[0.466]	[0.184]	[0.333]
$Ln(Size)_t$	-0.032	-0.066	-0.093
	[0.001]***	[0.001]***	[0.001]***
ROA_t	-0.205	-0.403	-0.483
	[0.014]**	[0.013]**	[0.066]*
$BookLeverage_t$	0.077	0.176	0.298
	[0.001]***	[0.001]***	[0.001]***
HHI_t	-0.032	-0.059	-0.081
	[0.216]	[0.299]	[0.356]
Tobin's Q_t	0.004	0.003	0.014
	[0.474]	[0.789]	[0.444]
Sales $Growth_t$	0.001	0.001	-0.001
	[0.018]**	[0.028]**	[0.032]**
Constant	0.220	0.591	0.819
	[0.001]***	[0.001]***	[0.001]***
Industry & Year Fixed	YES	YES	YES
Num.Cluster	2,516	2,430	2,318
N	22,679	21,682	19,271
R^2	5%	6%	5%

Table 11 exhibits the relationship between obtaining a government contract, lobbying and firm performance for our sample firms. In column (1) to (3), our dependent variable is buy-and-hold abnormal returns calculated for +12,+24, and +36 months period where benchmark index is CRSP Value Weighted portfolio. Lobbydum is equal to one if the firm has lobbying activity, zero otherwise. GovCont is a binary variable and equal to one if firm earns at least one government contract, zero otherwise. Lobbydum*GovCont is an interaction term where Lobbydum is multiplied by GovCont. Other control variables are calculated from COMPUSTAT. We add period (year) binary variables and industry binary variables but omit the coefficients. Std. Errors are clustered at the firm level. Numbers in parentheses are p-values. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

For final robustness of our results, we conduct propensity score matching (PSM) and report our findings in Table XII. In Panel A, we document the descriptive statistics of our matched sample for the quality of the PSM. Treatment groups refer to lobbying firms, while control group refers to non-lobbying firms. We show that there is no difference between our new sample, specifically in terms of firm size, and use it to conduct multivariate tests. In Panel B and Panel C, we confirm our initial findings; lobbying leads to greater CEO compensation, respectively. The positive relationship between lobbying and insider trading remain same in Panel D, where lobbying increases the number of insider transactions two weeks before the bill is

introduced. The increased number of transaction eventually benefits the CEO wealth in Panel E; we find that greater insider trading yields to higher CEO pay.

Table 12
Propensity Score Matching

Panel A. Descriptive Statistics of Matched Sample

Variable	Treatment (Lawsuit) [1]	Control (Non-Lawsuit) [2]	%Bias	T-statistics	P-values
	N=2,485	N=2,485			
Ln(Size)	9.041	9.049	-0.50	-0.20	0.839
ROA	0.047	0.039	3.00	1.50	0.134
Book Leverage	0.251	0.259	-1.00	-1.58	0.115
Herfindahl Index	0.227	0.228	-0.40	-0.18	0.861
Tobin's Q	1.711	1.724	-0.80	-0.54	0.590
Sales Growth	0.082	0.095	-0.70	-1.93	0.054*

Panel B. Dependent Variable	Ln(Total Comp)$_{t+1}$		
Sample			
	(1)	(2)	(3)
Lobbydum$_t$	0.012 [0.001]***		
Ln(LobExp)$_t$		0.335 [0.062]*	
Ln(Total Bill)$_t$			0.478 [0.022]**
CONTROLS	YES	YES	YES
Industry & Year Fixed	YES	YES	YES
N	4,970	4,970	4,970
R^2	12%	12%	12%

Panel C. Dependent Variable	Ln(Total Comp Opt. Inc)t+1		
Sample			
	(1)	(2)	(3)
Lobbydum$_t$	0.901 [0.001]***		
Ln(LobExp)$_t$		0.556 [0.029]*	
Ln(Total Bill)$_t$			0.899 [0.041]**
CONTROLS	YES	YES	YES
Industry & Year Fixed	YES	YES	YES
N	4,970	4,970	4,970
R^2	12%	12%	12%

Panel D. Dependent Variable	Ln(TwoWeeks)	Ln(TwoWeeks)	Ln(TwoWeeks)
Sample			
	(1)	(2)	(3)
$Lobbydum_t$	0.779		
	[0.001]***		
$Ln(LobExp)_t$		0.513	
		[0.001]***	
$Ln(Total\ Bill)_t$			0.889
			[0.001]***
CONTROLS	YES	YES	YES
Industry & Year Fixed	YES	YES	YES
N	4,970	4,970	4,970
R^2	11%	11%	11%

Panel E. Dependent Variable	$Ln(Total\ Comp)_{t+1}$	$Ln(Total\ Comp)_{t+1}$	$Ln(Total\ Comp\ Opt.\ Inc)_{t+1}$
Sample			
	(1)	(2)	(3)
Ln(TwoWeeks)	0.091		0.149
	[0.001]***		[0.001]***
Ln(OneWeek)		0.034	
		[0.001]***	
CONTROLS	YES	YES	YES
Industry & Year Fixed	YES	YES	YES
N	4,970	4,970	4,970
R^2	11%	11%	11%

Table 12 exhibits the propensity score matching results to obtain the matched sample in the study. In Panel A, we document the descriptive statistics for the matched sample. In Panel B, we use the matched sample where our dependent variable is total compensation. In Panel C, we utilize the matched sample where out dependent variable is log transformation of CEO salary including options. In Panel D, we use the matched sample, and our dependent variable is two weeks of insider transaction by CEOs. In Panel E, we use the matched sample, and our dependent variables are log transformation of CEO compensation and log transformation of CEO compensation including options, respectively. Other control variables are calculated from COMPUSTAT. We add period (year) binary variables and industry binary variables but omit the coefficients. Std. Errors are clustered at the firm level. Numbers in parentheses are p-values. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

7 Conclusion

In this study, our motivation is to determine why politically-connected CEOs are paid more than their non-politically-connected rivals and whether this excess compensation leads to agency costs. We try to explain this by determining whether CEOs from politically-active firms are paid more than their peers that are not politically active, whether firm lobbying impacts firm performance, whether politically-connected CEOs engage in insider trading, and whether politically-connected CEOs receive higher compensation packages from engaging in insider trading. Our results reflect that politically-connected CEOs have higher compensation packages compared to their peers. This may stem from CEOs using political capital as a means of negotiation for higher compensation (Henderson, 2011). We also conjecture that politically-connected firms do not suffer from agency costs from this excess CEO compensation due to increases in firm value from government contracts awards granted from being politically-connected.

First, we find that lobbying firms receive positive market reaction during the announcement dates of a successful lobbying activity through our event study. We find that firms receive positive cumulative abnormal returns and the results are statistically significant. This may provide a market signal that the firm is receiving a return on its investment in political capital. Investors may expect profits from political connections stemming from conflicts of interests, such as informational advantages from government contracts (Luechinger and Moser, 2014). In our findings, we document that lobbying increases the insider transactions enacted by CEOs. Our results contribute to understanding why building political capital may help CEOs exploit firm-level information.

Subsequently, we test whether firm lobbying increases the number of CEO insider transactions before the sponsored bills are introduced and passed in the US legislative bodies and if insider transactions increase CEO wealth. This is determined by examining lobbying expenditures to measure the relation between CEO compensation and political connections. Our results indicate that firm lobbying increases CEO wealth by insider trading. Our findings suggest that politically-connected CEOs enjoy greater compensation packages while insider transactions increase the CEO wealth as well as the total CEO pay.

Further, we test if lobbying benefits not only the CEOs but also the shareholders by examining the firm performance of the firms in our sample. We find that lobbying increases the likelihood of government contracting, which would yield positive abnormal returns. Our results show that firm value increases through the cumulative abnormal returns. The results highlight the importance of political connections, which benefits both CEO wealth and shareholder maximization.

We conclude that political lobbying benefits both the CEO and shareholders in different ways. CEOs benefit from political lobbying by using inside political information from the introduction and passing of a sponsored bill to trade their stocks and obtain profits, which add to their compensation and wealth. Firms

benefit from procuring government contracts through political influence, which increases firm and hence shareholder value. Firms may also benefit from political activity through first mover advantage (Oliver and Holzinger, 2008). Firms that have an idea that bills will be passed may have a head start on adapting to the legislation that will pass and thus can adapt faster than their competition. This is a topic that can be explored in the future.

References

Aboody, D., & Kasznik, R. (2000). CEO stock option awards and the timing of corporate voluntary disclosures. *Journal of Accounting and Economics*,*29*(1), 73-100.

Agrawal, A., & Knoeber, C. R. (2001). Do Some Outside Directors Play a Political Role?. *Journal of Law and Economics*, *44*(1), 179-98.

Aggarwal, R., F. Meschke, and T. Wang. (2009). Corporate Political Contributions: Investment or agency?. *Working Paper*, University of Minnesota.

Ahuja, G., Coff, R. W., & Lee, P. M. (2005). Managerial foresight and attempted rent appropriation: Insider trading on knowledge of imminent breakthroughs. *Strategic Management Journal*, *26*(9), 791-808.

Annual Review of Government Contracting [Review]. (2014). *Bloomberg Government*. Retrieved January 23, 2017, from http://www.ncmahq.org/docs/default-source/default-document-library/pdfs/exec15---ncma-annual-review-of-government-contracting-2015-edition

Aslan, H., & Grinstein, Y. (2011, July). Political contributions and CEO pay. In *AFA 2011 Denver Meetings Paper*.

Bebchuk, L. A., & Fershtman, C. (1994). Insider trading and the managerial choice among risky projects. *Journal of Financial and Quantitative Analysis*, *29*(01), 1-14.

Bertrand, M., Bombardini, M., & Trebbi, F. (2014). Is it whom you know or what you know? An empirical assessment of the lobbying process. *American Economic Review*, *104*(12), 3885-3920.

Bourveau, T. & Coulomb, R., and Sangnier, M. (2016). Political Connections and Insider Trading. Available at SSRN: https://ssrn.com/abstract=2832514 or http://dx.doi.org/10.2139/ssrn.2832514

Branco, F. (1994). Favoring domestic firms in procurement contracts. *Journal of International Economics*, *37*(1-2), 65-80.

Brickley, J. A., Linck, J. S., & Coles, J. L. (1999). What happens to CEOs after they retire? New evidence on career concerns, horizon problems, and CEO incentives. *Journal of Financial Economics*, *52*(3), 341-377.

Brown, J. R., Huang, J., Siders, D., Lowry, R., & Shafer, J. (2017, May 08). When CEOs Visit the White House, Their Companies Profit. Retrieved March 22, 2018, from https://www.politico.com/magazine/story/2017/05/08/why-trump-white-house-visitors-logs-should-public-215116

Carney, T. P. (2014, July 11). Why lobbying is a dud for most companies but benefits their CEOs. Retrieved March 21, 2018, from https://www.washingtonexaminer.com/why-lobbying-is-a-dud-for-most-companies-but-benefits-their-ceos

Chen, H., Parsley, D., & Yang, Y. W. (2010). *Corporate Lobbying and Financial Performance* (No. 21114). University Library of Munich, Germany.

Cheng, Q., & Lo, K. (2006). Insider trading and voluntary disclosures. *Journal of Accounting Research*, *44*(5), 815-848.

Cooper, M. J., Gulen, H., & Ovtchinnikov, A. V. (2010). Corporate political contributions and stock returns. *The Journal of Finance*, *65*(2), 687-724.

Correia, M. M. (2014). Political connections and SEC enforcement. *Journal of Accounting and Economics*, *57*(2), 241-262.

Damodaran, A., & Liu, C. H. (1993). Insider trading as a signal of private information. *Review of Financial Studies*, *6*(1), 79-119.

Denis, D. J., & Xu, J. (2013). Insider trading restrictions and top executive compensation. *Journal of Accounting and Economics*, *56*(1), 91-112.

Do, Q., Lee, Y. T. and Nguyen, B. D. (2015). Political Connections and Firm Value: Evidence from the Regression Discontinuity Design of Close Gubernatorial Elections. CEPR Discussion Paper No. DP10526. Available at SSRN: https://ssrn.com/abstract=2592348

Duchin, R., & Sosyura, D. (2012). The politics of government investment. *Journal of Financial Economics*, *106*(1), 24-48.

Elayan, F., Pukthuanthong, K., & Li, J. (2004). *The Determinants and Impact of Government Contract Award on the Market Value of the Winning Firms*. SSRN Working Paper Series.

Engelberg, J., Gao, P., & Parsons, C. A. (2012). The Price of a CEO's Rolodex. *The Review of Financial Studies*, *26*(1), 79-114.

Goldman, E., Rocholl, J., & So, J. (2009). Do politically connected boards affect firm value?. *Review of Financial Studies*, *22*(6), 2331-2360.

Goldman, E., Rocholl, J., & So, J. (2013). Politically Connected Boards of Directors and The Allocation of Procurement Contracts. *Review of Finance*, *17*(5), 1617-1648

Grier, K. B., Munger, M. C., & Roberts, B. E. (1991). The industrial organization of corporate political participation. *Southern Economic Journal*, 727-738.

Hadani, M., & Schuler, D. A. (2013). In search of El Dorado: The elusive financial returns on corporate political investments. *Strategic Management Journal*, *34*(2), 165-181.

Halchin, L. E. (2006, November). Overview of the federal procurement process and resources. Congressional Research Service, Library of Congress.

Hansen, J. M. (1991). Gaining access: Congress and the farm lobby, 1919-1981. Chicago: University of Chicago Press.

Henderson, M. T. (2011). Insider Trading and CEO Pay. *Vanderbilt Law Review*, *64*, 505.

Henning, P. J. (2013, April 08). The Fine Line Between Political Intelligence and Insider Trading. Retrieved March 21, 2018, from https://dealbook.nytimes.com/2013/04/08/the-fine-line-between-political-intelligence-and-insider-trading/

Hill, M. D., Kelly, G. W., Lockhart, G. B., & Ness, R. A. (2013). Determinants and effects of corporate lobbying. *Financial Management*, *42*(4), 931-957.

Hillman, A. J., & Hitt, M. A. (1999). Corporate political strategy formulation: A model of approach, participation, and strategy decisions. *Academy of Management Review*, *24*(4), 825-842.

Hillman, A. J., Zardkoohi, A., & Bierman, L. (1999). Corporate political strategies and firm performance: Indications of firm-specific benefits from personal service in the US government. *Strategic Management Journal*, *20*(1), 67-81.

Huilonga, L., Minb, Z., Yapinga, W., & Lianshenga, W. (2010). Political Connections, Compensation Incentive, and Employee Allocation Efficiency [J]. *Economic Research Journal*, *9*, 109-121.

Jagolinzer, A. D., Larcker, D. F., Ormazabal, G. and Taylor, D. J., Political Connections and the Informativeness of Insider Trades (2016). Rock Center for Corporate Governance at Stanford University Working Paper No. 222. Available at SSRN: https://ssrn.com/abstract=2836053

Jerke, B. W. (2010). Cashing in on Capitol Hill: Insider trading and the use of political intelligence for profit. *University of Pennsylvania Law Review*, 1451-1521.

Kim, J. H. (2008). Corporate lobbying revisited. *Business and Politics*, *10*(2).

Li, H., Meng, L., Wang, Q., & Zhou, L. A. (2008). Political connections, financing and firm performance: Evidence from Chinese private firms. *Journal of development economics*, *87*(2), 283-299.

Luechinger, S., & Moser, C. (2014). The value of the revolving door: Political appointees and the stock market. *Journal of Public Economics*, *119*, 93-107.

Lux, S., Crook, T. R., & Woehr, D. J. (2011). Mixing business with politics: A meta-analysis of the antecedents and outcomes of corporate political activity. *Journal of Management*, *37*(1), 223-247.

Mayer, W., & Mujumdar, S. (2014). Lobbying: Buying and utilizing access. *Economics: The Open-Access, Open-Assessment E-Journal*, *8*(2014-2), 1-35.

Masson, R. T., & Madhavan, A. (1991). Insider Trading and the Value of the Firm. *The Journal of Industrial Economics*, 333-353.

Mills, L. F., Nutter, S. E., & Schwab, C. M. (2012). The effect of political sensitivity and bargaining power on taxes: Evidence from federal contractors. *The Accounting Review*, *88*(3), 977-1005.

Niessen, A., & Ruenzi, S. (2010). Political connectedness and firm performance: Evidence from Germany. *German Economic Review*, *11*(4), 441-464.

Richter, B. K., Samphantharak, K., & Timmons, J. F. (2009). Lobbying and taxes. *American Journal of Political Science*, *53*(4), 893-909.

Roulstone, D. T. (2003). The relation between insider-trading restrictions and executive compensation. Journal of Accounting Research, 41(3), 525-551.

Rudy, B. C., & Johnson, A. F. (2016). The Chief Political Officer: CEO Characteristics and Firm Investment in Corporate Political Activity. *Business & Society*, 0007650316675606.

Schuler, D. A., Rehbein, K., & Cramer, R. D. (2002). Pursuing strategic advantage through political means: A multivariate approach. *Academy of Management Journal*, *45*(4), 659-672.

Schuler, D. A. (1996). Corporate political strategy and foreign competition: The case of the steel industry. *Academy of Management Journal*, *39*(3), 720-737.

Sobel, R. S., & Graefe-Anderson, R. L. (2014). The relationship between political connections and the financial performance of industries and firms. *Mercatus Center WP*, 14-18.

Skaife, H. A., Veenman, D., & Werner, T. (2013). Corporate lobbying and CEO pay. Available at SSRN: https://ssrn.com/abstract=2340501.

Turner, M. (2015, September 15). A legal loophole lets executives trade on insider information, and it seems to be rampant. Retrieved March 21, 2018, from http://www.businessinsider.com/study-on-insider-trading-by-executives-2015-9

Unsal, O., Hassan, M. K., & Zirek, D. (2016). Corporate lobbying, CEO political ideology, and firm performance. Journal of Corporate Finance, 38, 126-149.

Watts, R. L., & Zimmerman, J. L. (1990). Positive accounting theory: a ten year perspective. *Accounting review*, 131-156.

Wilson, G. (1990). Corporate Political Strategies. *British Journal of Political Science, 20*(2), 281-288. Retrieved from http://www.jstor.org/stable/193975

Yermack, D. (1997). Good timing: CEO stock option awards and company news announcements. *The Journal of Finance*, *52*(2), 449-476.

Yu, F., & Yu, X. (2012). Corporate lobbying and fraud detection. *Journal of Financial and Quantitative Analysis*, *46*(06), 1865-1891.

Ziobrowski, A. J., Cheng, P., Boyd, J. W., & Ziobrowski, B. J. (2004). Abnormal returns from the common stock investments of the US Senate. *Journal of Financial and Quantitative Analysis*, *39*(04), 661-67.

Chapter 2

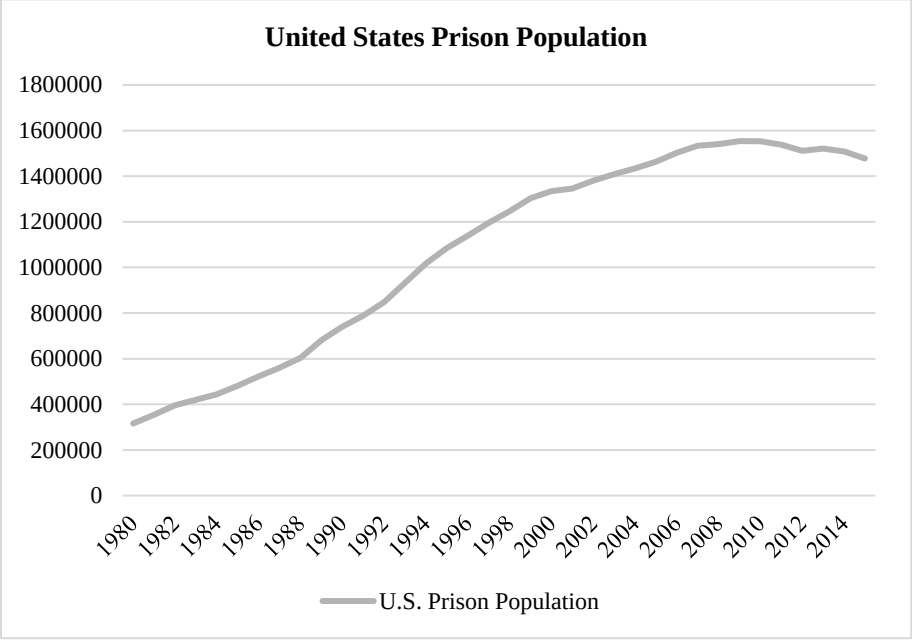
The Impact of Incarceration on Firm Performance

1 Introduction

Discerning the impact of incarceration is a vital topic that has been widely studied by government agencies at both the state and national level and by research institutions. It has been vastly studied in the context of incarceration's economic and societal impact but has yet to be explored on its impact on businesses. To add to this extensive literature, we conduct a study focusing on the effect of incarceration on firm performance. We achieve this by studying whether firms based with low incarceration outperform firms based in states with high incarceration. We also examine whether firms based in states with prison reform outperform firms based in states without prison reform.

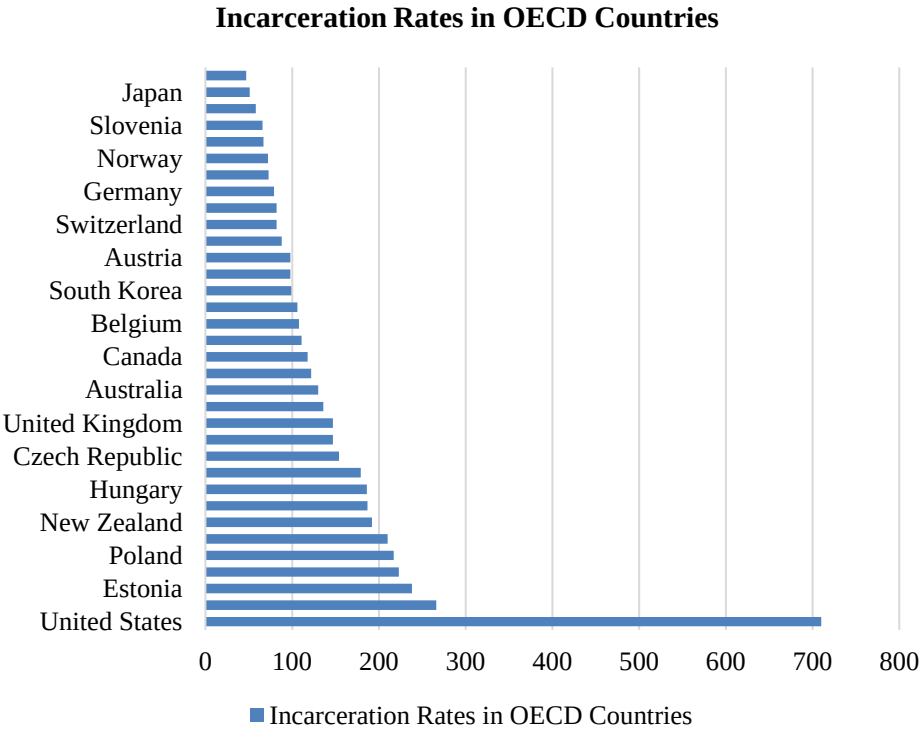
The drastic increase in incarceration rates in the United States has been a topic of contention both politically and economically. Incarceration rates not only affect the people who are incarcerated but their families and the rest of the population as well. A study by Schmitt and Warner (2010) estimates that in 2008 the United States had between 12 and 14 million ex-offenders of working age. Federal and state policies have driven up prison populations (Raphael and Stoll, 2013). Figure 1 illustrates this drastic growth in the prison population in the United States from 1980 until 2015. This growth is primarily resulting from severe regulations imposed from mandatory minimum sentencing from the War on Drugs, Tough on Crime and Three Strikes laws (Raphael, 2014).) The United States incarcerates more of its citizens than any other advanced nation. Figure 2 reflects the incarceration rate the United States in comparison to other Organisation for Economic Cooperation and Development (OECD) countries. This sweeping scale of incarceration is due to changes in the United States criminal justice system, not from changes in the level of criminal activity. The harsher sentencing of drug-related activity is one factor that has contributed to this extreme increase in incarceration. Western and Beckett (1999) have stated that “the criminal justice system is a U.S. labor-market institution.”

Figure 1: U.S. Prison Population from 1980-2015



Source: U.S. Bureau of Justice Statistics; The Sentencing Project

Figure 2: Incarceration Rates in OECD Countries



Source: The Hamilton Project from the Brookings Institute, Glaze, and Heberman (2013), Walmsley (2013)

Not only does incarceration take people out of the labor force, but it also inhibits them from seeking work in certain industries after they have served their prison sentence. For example, Louisiana has a total of 389 regulations restricting employment for people with a felony conviction, which is the highest of any state in the U.S. There are 300 regulations specifically for employment, 84 for occupational and professional licenses and certification, and 127 for business licenses and other property rights.[10] The breakdown of the types of regulations that are barriers to employment for people with a felony conviction can be seen in Table 1. Louisiana is far from the only state to have passed employment restrictions against people with a felony conviction. In fact, every state in the U.S. has at least 41 such restrictions, with an average of 123 per state and this adds up to more than 6,000 mandatory state-level restrictions on employment for ex-felons, with a further 112 such restrictions at the federal level (Fredericksen and Omli, 2016).

Table 1: Regulations Restricting Employment for People with a Felony Conviction, By State

	Restriction Category			
State	**Employment**	**Occupational and Professional License and Certification**	**Business License and Other Property Rights**	**Total***
AL	93	52	34	101
AK	62	54	18	75
AZ	113	88	45	133
AR	115	56	33	120
CA	94	94	67	171
CO	81	41	22	97
CT	51	30	23	57
DE	114	83	37	129
DC	72	35	21	75
FL	147	102	67	168
GA	86	59	48	147
HI	37	16	19	41
ID	128	57	43	145
IL	143	77	122	258
IN	138	102	43	160
IA	50	28	37	74
KS	80	28	40	1
KY	135	72	22	141
LA	300	84	127	389

Table 1 reflects the regulations restricting employment for people with a felony conviction, by state by each category of restriction. Source: The Job Gap Prosperity Series Jobs After Jail: Ending the prison to poverty pipeline, American Bar Association Criminal Justice Section *Since several regulations have restrictions in multiple restriction categories, the totals are not a reflection of the sum of the three categories.

[10] Fredericksen, Allyson, and Desiree Omli. "Jobs After Jail: Ending the Prison to Poverty Pipeline." The Job Gap Prosperity Series (2016): n. pg. Alliance for A Just Society. Web. https://jobgap2013.files.wordpress.com/2016/02/ajs_job_after_jail_report_final_pdf.pdf. Note that the number of regulations does not sum to 389, due to regulations overlapping in the listed categories.

Table 1 continued: Regulations Restricting Employment for People with a Felony Conviction, By State

State	Restriction Category: Employment	Occupational and Professional License and Certification	Business License and Other Property Rights	Total*
ME	79	28	25	88
MD	87	40	35	109
MA	61	26	32	70
MI	64	34	32	94
MN	62	34	33	78
MS	89	49	41	104
MO	100	48	31	110
MT	57	35	19	61
NE	100	62	37	112
NV	57	28	25	88
NH	222	128	95	240
NJ	96	53	51	125
NM	43	39	35	88
NY	96	58	63	149
NC	102	71	40	120
ND	35	24	11	41
OH	220	118	65	224
OK	179	86	46	193
OR	88	47	38	100
PA	72	34	43	119
RI	30	28	35	74
SC	52	31	38	83
SD	44	31	20	52
TN	152	87	50	172
TX	226	133	81	248
UT	101	61	48	115
VT	39	19	21	41
VA	80	40	55	127
WA	38	48	40	96
WV	133	90	42	143
WI	100	83	88	161
WY	79	27	13	83

Table 1 reflects the regulations restricting employment for people with a felony conviction, by state by each category of restriction. Source: The Job Gap Prosperity Series Jobs After Jail: Ending the prison to poverty pipeline, American Bar Association Criminal Justice Section *Since several regulations have restrictions in multiple restriction categories, the totals are not a reflection of the sum of the three categories.

Former prisoners also face the stigma of having a criminal record and face a difficult time in obtaining consistent employment. Firms exhibit reluctance in hiring ex-offenders and as well as the limited actual hiring of former prisoners (Holzer, Raphael, and Stoll, 2003b). Criminal background checks are added to firm hiring practices as a way to extract a job applicant's criminal record (Holzer, Raphael, and Stoll, 2004). Ex-offender difficulty in finding jobs can disrupt labor markets. Estimates by Schmitt and Warner (2010) indicate that ex-offenders decrease overall employment rates as much as 0.8 to 0.9 percentage points. This decrease reaches as much as 1.5 to 1.7 percentage points for male employment rates and as much as 6.1 to 6.9 percentage points for less-educated men. This loss of employment impacts labor markets, firms, and the U.S. economy as a whole. In 2008, incarceration led to an estimated loss of $57 to $65 billion in the U.S. (Schmitt and Warner, 2010).

Not only does incarceration lead to loss of worker productivity, but it is also one of the major costs that state governments must confront. Raphael (2011) states that incarceration has limited effect in preventing crimes and tend to be less serious forms of property crime and low-level drug offenses, and should be revaluated in relation the excessive monetary costs that are associated with incarceration. Corrections is the third highest expenditure that state governments face, ranked below Medicaid and education (Travis et al., 2014). This drastic increase of government spending on corrections since 1980 is attributable mainly to the increase in the prison population. Henrichson and Delaney (2012) state that corrections expenditures have quadrupled over the past 20 years. In 2010, they surveyed and found that the 40 states that participated had a total taxpayer cost of imprisonment of $38.8 billion. Economy League of Greater Philadelphia (2011) find that helping find former prisoners employment can decrease recidivism and also results in an increase in earnings and tax revenues as well as reduce "costs on criminal justice agencies, social services, government cash transfers, and prevented victim costs."

Korniotis and Kumar (2013) find that state-specific macroeconomic indicators have the power to predict state portfolio returns. We hypothesize that incarceration is a state macroeconomic indicator that can influence firm performance. We contribute to the existing literature by conducting an initial study on the effect of incarceration on firm performance and exploring whether incarceration impacts labor markets through state-level unemployment rates. We also find that incarceration rates and unemployment rates are related through time series Granger Causality tests for each state. We conduct several tests to determine whether there is a relationship between incarceration and firm performance. We run a differences in differences test on firms based in states with and without prison reform and find that firms based in states with prison reform outperform firms based in states without prison reform. We conduct a differences in means test, grouping firms headquartered in high and low incarceration states. We find that there are differences in firm performance, and these differences are significant. Through pooled OLS and random

effects regressions, we test whether incarceration rates impact firm performance measured by return on assets. Our results indicate that incarceration negatively impacts firm performance. This is also confirmed through GMM estimation.

2 Literature Review

Schmitt and Warner (2010) use data from the Bureau of Justice to detail the dire economic consequences of pervasive incarceration throughout the U.S. A felony conviction renders people much less employable, costing the U.S. economy between $57 and $65 billion annually. This problem is an important one to attempt to remedy because if current trends continue, the portion of ex-felons in the working-age population will continue to increase, thereby causing even greater potential losses to the U.S. economy.

The problem of excessive incarceration is especially pronounced in the Southern region of the United States. As Bender (2002) finds, the huge growth in the private-prison industry has been concentrated in Southern states, aided by persistent lobbying and campaign contributions to both major political parties. Such political action by the private-prison industry has yielded an impressive influence on public policy regarding incarceration. The private-prison industry enjoyed considerable growth in the late 1990s. While the growth tapered off in the early 2000s, the industry has continued to seek out taxpayer-subsidized profits by turning its eye to mental hospitals and addiction-treatment centers. The cozy relationship between the private-prison industry and state legislatures ensures that corrections companies "maintained their key role of housing prisoners and receiving taxpayer money."

Western et al. (2001) corroborate the stance that incarceration has a negative impact on labor force participation and lifetime earnings. Moreover, they find that the negative impact is weighed disproportionately on low-skill minority males. This negative impact on the economy is a relatively recent phenomenon, as the incarceration rate remained relatively stable from 1900-1970 before exploding more than fourfold between 1970-1999. Additionally, the earning penalty that prisoners face can range from 10 up to 30 percent. Incarceration can become the turning point for young men that leads to the decline in their earnings mobility (Western, 2002). Western (2002) goes on to state that, "the U.S. penal system has grown beyond disciplining the deviant few, to imposing a systemic influence on broad patterns of social inequality."

More recently, Blanks (2014) writes in the Washington Post that excessive incarceration has exacerbated the negative effects of the Great Recession. People with criminal records have a much harder time finding employment. In certain jurisdictions, ex-offenders are banned outright from jobs in certain industries. The stigma against ex-offenders has resulted in more than half of ex-offenders being unemployed a year after

release. The difficulties ex-offenders face reintegrating into society "perpetuate a cycle of poverty and incarceration for hundreds of thousands of Americans and their families" (Blanks, 2014). This results in a decline of communities that suffer from incarceration and re-entry into communities (Morenoff and Harding, 2014). Worse yet, the negative impact of incarceration is disproportionately levied geographically, socio-economically, and racially. Aizer and Doyle (2015) provide sobering evidence that the incarceration problem also applies to juveniles. Juveniles who are incarcerated are more likely to drop out of high school and be incarcerated as adults. Aizer and Doyle (2015) posit that easing the juvenile incarceration rate would increase human capital accumulation.

The implications of the labor market on finance have been established by studies such as Benzoni et al. (2007). Many studies have found a link between the returns to human capital and market returns. As labor income and stock returns are correlated, it stands to reason that depressed labor income would have negative consequences on the stock market. One key reason for negative shocks to labor income is decreased labor market participation due to increased incarceration rates. Hence, it is plain to see that incarceration is intimately tied to socioeconomic well-being through the mechanism of firm performance. Our paper confronts this issue and seeks to determine the impact of incarceration on labor markets and firm performance.

3 Data and Methodology

Our data encompasses a time span of 15 years from 1995 to 2011. We examine publicly-traded firms based in the United States. We obtain firm financial data from Compustat and firm stock data from the Center for Research in Security Prices (CRSP). CRSP and Compustat data are merged using firm ticker and financial year. This merged dataset is then merged with the Bureau of Justice Statistics (BJS) data by survey year and state. State macroeconomic data comes from the Bureau of Economic Analysis (BEA) and U.S. Department of Commerce. Current population data, per capita personal income, and unemployment rate are from the U.S. Bureau of Labor Statistics (BLS). As in Brushwood et al. (2016), Korniotis and Kumar (2013), Achary et al. (2014), and Dougal et al. (2015), we use the firm headquarters state, which is listed in Compustat, as a proxy for location. We have a total of 131,215 observations and 17,755 firms. Table 2 includes the summary statistics for the incarceration variables, prison reform variables, firm control variables, and state macroeconomic variables.

Table 2: Summary Statistics

Variables	Mean	Median	Std. Dev.	Min	Max
Panel A. Incarceration Variables					
Log (Incarceration Rate)	-9.134	-9.076	0.457	-10.352	-8.117
Incarceration Rate	0.012	0.011	0.005	0.003	0.030
Total Custody	63528.750	44232	55694.270	823	172298
Panel B. Firm Control Variables					
Return on Assets	0.010	-3.36	418.110	-130077	1208
Log (Debt)	3.445	3.758	3.201	-6.908	14.531
Log (Size)	4.836	4.890	2.460	-11.043	14.414
Tangible	0.227	0.1289456	0.247	0	1.667
Dividend	0.365	0	0.481	0	1
Research and Development	4.337	0.0459503	148.885	-218.737	25684.400
Capital Expenditures	107.923	3.6	682.127	-401.609	33143
Market to Book Ratio	23.756	1.495712	921.841	0.009	194537.700
Collateral to Assets	0.296	0.0008976	11.271	0	1000
Panel C. Macroeconomic Variables					
Log (Per Capita Income)	10.459	10.453	0.199	9.859	11.000
Percentage change in GDP	0.044	0.045	0.029	-0.144	0.174
Unemployment Rate	5.685	5.241667	1.983	2.300	13.783
Log (Population)	19.723	19.75936	0.923	16.278	21.249
Panel D. Indicator Variables					
Below Median	0.442	0	0.497	0	1
Foreign Operations	0.574	1	0.494	0	1
Retail Industry	0.051	0	0.221	0	1
Number of States	0.236	0	0.425	0	1

Table 2 reflects the summary statistics of the firm, state macroeconomic, and state incarceration variables for our sample. The variables used in the interaction variables to address endogeneity issues are Below Median, Foreign Operations, Retail Industry, and Number of States.

3.1 The Impact of Incarceration on Unemployment Rates

Western and Beckett (1999) find that in the long run, U.S. incarceration rates raises unemployment by reducing the job prospects of ex-convicts. The incarcerated prison population is heavily concentrated among the young and less educated, with the majority of criminal offenders being younger than 30 years of age. This is the vital time when individuals are entering the job market or pursuing education to participate in the job market. To explore whether incarceration impacts unemployment, we conduct a Granger Causality test through Vector Autoregression (VAR).

We use state-level labor force data obtained from the local area employment statistics of the U.S. Bureau of Labor Statistics. We obtain the incarceration rate from the U.S. Department of Justice and determine the optimal lags through the Akaike Information Criteria (AIC). Our first hypothesis is as follows:

Hypothesis 1: An increase in incarceration rates causes an increase in the unemployment rate at the state-level.

For testing the VAR, we use the following equations:

$$Y_t = Y_{t-1} + \beta_2 X_t$$

$$X_t = \gamma_1 Z_{t-1} + \gamma_2 Y_t$$

where Y_t is the unemployment rate, and Z_t is the incarceration rate. We conduct this regression using these simultaneous equations to determine whether there is a relationship between the incarceration rate and the unemployment rate. We conduct the Granger Causality tests to establish the presence and direction of causation between incarceration rates and unemployment rates.

3.2 The Impact of Prison Reform on Firm Performance

We also want to see whether states passing prison reform can be impactful on firms. Figure 3 reflects the reduction in incarceration in states after prison reform. Because prison reform may lead to reducing incarceration, our next hypothesis examines the impact of states passing prison reform on firm performance, which is the following:

Hypothesis 2: All other things equal, firms that are based in states with prison reform will experience higher firm performance as measured by Return on Assets.

We conduct a differences in differences test using prison reform initiatives passed by state governments. We use prison reform data collected by the Pew Charitable Trust[11] to segment which states have passed prison reform and which have not. Differences in differences (DiD) tests are a type of fixed effects estimation and are used to estimate the treatment effects through a comparison of the pre- and post-treatment difference in the reaction of a treatment and control group.

[11] The Pew Charitable Trusts, "33 States Reform Criminal Justice Policies Through Justice Reinvestment," http://www.pewtrusts.org/en/
research-and-analysis/fact-sheets/2016/11/33-states-reform-criminal-justice-policies-through-justice-reinvestment

Figure 3: U.S. State Prison Incarceration Rates

Pre- and Post- State Prison Reform from 2006-2011

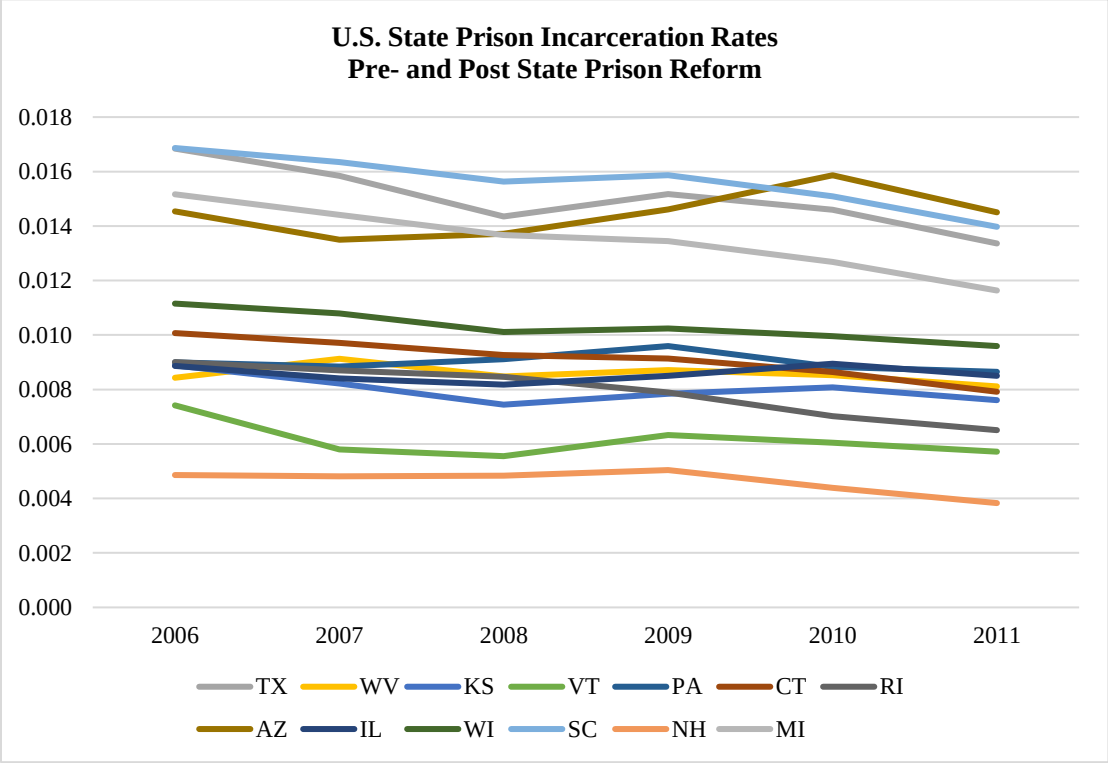


Figure 3 illustrates the impact of prison reform policies on state incarceration rates for selected states from 2006 until 2011. Prison reform data was referenced from the Pew Charitable Trust; incarceration rates were created using the total number of prisoners incarcerated from incarceration data from U.S. Department of Justice Statistics database, the state population is from the U.S. Bureau of Labor Statistics (BLS).

3.3 The Impact of Incarceration on Firm Performance

The main objective of this study is to determine if there is a relationship between incarceration rates and firm performance. To do this, we test the following hypothesis:

Hypothesis 3: Firms that are based in states with high incarceration rates will have lower firm performance (measured by Return on Assets) compared to firms based in states with low incarceration.

We conduct differences in means tests, segmenting data by firms located in states with low and high incarceration rates. We compare the means to see if there is any difference between the mean of the firm performance (measured by return on assets) of firms based in states with high incarceration compared to firms based in states with low incarceration. We consider states with low incarceration if they have an

incarceration rate above the 25th percentile and states with high incarceration if they have an incarceration rate above the 75th percentile.

To expand upon Hypothesis 3 and include both firm-control and state-level macroeconomic control variables, we conduct multiple panel data regressions. This leads to our fourth hypothesis:

Hypothesis 4: All other things equal, incarceration rate has a negative impact on firm performance as measured by Return on Assets.

Since we are using panel data, we conduct a random effects and pooled OLS regression, clustered by firm through firm gvkey using the following equation:

$$ROA_{i,t} = \beta_1 Log(DT)_{i,t} + \beta_2 Log(SIZE)_{i,t} + \beta_3 TAN_{i,t} + \beta_4 DIV_{i,t}$$

$$+\beta_5 CAPEX_{i,t} + \beta_6 MB_{i,t} + \beta_7 CA_{i,t} + \beta_8 Log(IR)_{i,t} + \beta_9 Log(PCI)_{i,t} + \beta_{10} Log(\%\Delta GDP)_{i,t}$$
$$+ \beta_{11} Log(POP)_{i,t} + \beta_{12} UNEMP_{i,t} + \varepsilon_{i,t}$$

where $ROA_{i,t}$ is the return on assets, used as the dependent proxy variable measuring firm performance calculated as income before extraordinary items divided by total assets. $Log(DT)_{i,t}$ is the natural logarithm of firm total debt. $Log(SIZE)_{i,t}$ is the natural logarithm of firm size, measured by the firm's closing stock price multiplied by the number of shares outstanding. $TAN_{i,t}$ is the firm's total net property plant and equipment divided by total assets. $DIV_{i,t}$ is a binary dummy variable that takes the value of 1 if a firm issues dividends, 0 otherwise. $CA_{i,t}$ is the ratio of a firm's collateral to assets calculated by the sum of property, plant, and equipment and inventory divided by total assets. $Log(IR)_{i,t}$ is the natural logarithm of the incarceration rate calculated by the state's aggregate prisoners in custody divided by the state population. $Log(PCI)_{i,t}$ is the natural logarithm of state per capita personal income. $Log(\%\Delta GDP)_{i,t}$ is the natural logarithm of the percentage change in state gross domestic product. $Log(POP)_{i,t}$ is the natural logarithm of the state population. $UNEMP_{i,t}$ is the annual state unemployment rate.

3.4 Limitations and addressing endogeneity issues

Firms can have multiple subsidiaries, and these can be dispersed throughout several states, which can create issues with determining whether state-level incarceration has an impact on the firm's performance. To address this issue, we follow Brushwood et al. (2016), using four main measures of assessing the likelihood of a firm having geographically dispersed operations:

Measure 1: an indicator variable that takes the value of 1 if a firm's book value of assets is below the median value within its 3-digit SIC industry, 0 otherwise. The rationale for this is that smaller firms tend to have localized operations.

Measure 2: whether a firm has foreign operations. This takes the value of 1 if a firm reports having foreign operations zero, and 0 otherwise.

Measure 3: an indicator variable that takes the value of 1 if a firm is in the retail industry and 0 otherwise. The rationale for this is that retailers tend to have more diversified geographic operations.

Measure 4: the number of different states mentioned in a firm's 10-K filing.

To find Measures 2 and 4 we use subsidiary data provided by Dyreng and Markle (2016).

To conduct further robustness checks and address endogeneity, we conduct GMM estimation.

4 Findings

4.1 Incarceration Rates and Distribution of Firms by State

Incarceration rates and the distribution of firms by state can be seen in Table 3. In 2000, Minnesota had the lowest incarceration rate, with .04 percent of the state population being incarcerated. At 2.6 percent, Delaware had the highest incarceration rate in 2000. In both 2005 and 2010, Massachusetts had the lowest incarceration rate, at .04 percent in 2005 and .03 percent in 2010. Delaware again had the highest incarceration rate at 2.6 percent in 2005 and 1.7 percent in 2010. These incarceration rates may be impacted by states shifting prison populations to jails to accommodate the rise in state prisoners. In 2000, there were only three firms headquartered in Alaska, which was the fewest of any U.S. state. Alaska had an incarceration rate of 1.4 percent. Conversely, in 2000 California had the most firms at 1585. California had an incarceration rate of 1.4 percent. This same pattern can be seen in 2005 with Alaska having four firms and an incarceration rate of 1.3 percent. California again had the highest number of firms at 1336 and an incarceration rate of 1.2 percent. In 2010, Alaska again had the fewest firms, 4, and an incarceration rate of 1.1 percent. California had the most firms, 1315, with an incarceration rate of 1 percent.

Table 3: Incarceration Rates and the Distribution of Firms by State

State	Incarceration Rate 2000	No. firms 2000	Incarceration Rate 2005	No. firms 2005	Incarceration Rate 2010	No. firms 2010
AK	0.014	3	0.013	4	0.011	4
AL	0.021	63	0.017	51	0.016	33
AR	0.018	33	0.016	27	0.015	20
AZ	0.019	121	0.015	102	0.016	91
CA	0.014	1585	0.012	1336	0.010	1315
CO	0.010	251	0.010	208	0.009	191
CT	0.012	197	0.010	162	0.009	129
DE	0.026	94	0.021	126	0.017	114
FL	0.015	509	0.013	384	0.012	312
GA	0.019	287	0.017	231	0.014	169
HI	0.010	20	0.008	13	0.006	16
IA	0.010	43	0.009	35	0.008	32
ID	0.012	15	0.011	20	0.010	20
IL	0.011	429	0.009	462	0.009	601
IN	0.010	131	0.012	106	0.011	91
KS	0.011	55	0.010	45	0.008	63
KY	0.010	58	0.010	50	0.009	44
LA	0.018	56	0.014	40	0.010	46
MA	0.004	507	0.004	460	0.003	459
MD	0.012	171	0.009	142	0.008	276
ME	0.005	14	0.005	12	0.004	11
MI	0.016	164	0.015	126	0.013	107
MN	0.004	233	0.004	181	0.004	136
MO	0.017	143	0.016	107	0.014	88
MS	0.018	33	0.015	22	0.012	19
MT	0.007	15	0.007	8	0.005	8
NC	0.014	183	0.013	159	0.012	145
ND	0.006	7	0.006	6	0.005	7
NE	0.008	35	0.007	31	0.006	26
NH	0.005	35	0.005	24	0.004	23
NJ	0.007	421	0.006	355	0.005	270
NM	0.007	16	0.007	10	0.006	5
NV	0.015	122	0.012	110	0.012	116
NY	0.011	941	0.008	867	0.006	940
OH	0.013	307	0.012	235	0.012	196
OK	0.018	71	0.015	69	0.013	70
OR	0.010	88	0.011	61	0.010	49
PA	0.010	405	0.009	356	0.009	338
RI	0.011	28	0.009	24	0.007	17

SC	0.021	58	0.018	46	0.015	38
SD	0.012	12	0.013	9	0.010	11
TN	0.009	119	0.007	108	0.007	89
TX	0.023	859	0.018	729	0.015	648
UT	0.008	97	0.007	74	0.006	61
VA	0.013	257	0.010	200	0.008	178
VT	0.008	15	0.008	10	0.006	8
WA	0.008	168	0.007	155	0.006	121
WI	0.010	108	0.012	92	0.010	85
WV	0.008	18	0.008	18	0.009	16
WY	0.009	7	0.006	7	0.007	5

Table 3 reflects the incarceration rate and number of firms for each state in the United States for the years 2000, 2005, and 2010. The incarceration rate is the ratio of the total amount of prisoners under custody in each state over the state population for each of the given years.

4.2 State Correction Expenditures Compared to Other Selected State Expenditures

Table 4 reflects the regional and state level capital expenditures associated with corrections in 1996 and 2001, expressed in thousands of U.S. dollars. There is an increase of 7,458,054,000 USD in total expenditures on corrections from 1996 to 2001. Regarding U.S. regions, in 1996, Southern states had the highest capital expenditures for corrections at 7,442,584,000 USD while the Midwest region had the lowest capital expenditures with 4,502,037,000 USD. In 2001, the Southern region again had the highest expenditures with 10,002,325,000 USD, while the lowest expenditures were found in the Northern region, with 6,056,762,000 USD. Corrections expenditures for the Southern region comprised 33.8 percent of total U.S. corrections expenditures in 1996 and 33.9 percent of total U.S. corrections expenditures in 2001.

Table 4: Total, operating, and capital expenditures and operating costs per State inmate and per U.S. resident, fiscal years 1996 and 2001

	1996					**2001**				
	Expenditures (1,000s of dollars)			**Annual operating costs**		**Expenditures (1,000s of dollars)**			**Annual operating costs**	
Region and State	**Total**	**Operating**	**Capital**	**Per inmate**	**Prisoners under State authority on 06/30/1996**	**Total**	**Operating**	**Capital**	**Per inmate**	**Prisoners under State authority on 06/30/2001**
Total	$22,033,214	$20,737,888	$1,295,326	$20,142	1,029,595	$29,491,268	$28,374,273	$1,116,995	$22,650	1,252,743
Northeast	$5,083,959	$4,690,704	$393,256	$28,996	161,773	$6,056,762	$5,712,994	$343,769	$33,037	172,925
Connecticut	497838	475367	22471	31912	14896	523960	506905	17055	26856	18875
Maine	51713	48206	3507	33711	1430	76479	75133	1346	44379	1693
Massachusetts	309674	304483	5191	26002	11710	413071	404862	8209	37718	10734
New Hampshire	42970	42429	541	20839	2036	62754	60279	2475	25949	2323
New Jersey	839308	827115	12193	30773	26878	799560	768661	30899	27347	28108
New York	2220586	1948752	271835	28426	68556	2807259	2547452	259807	36835	69158
Pennsylvania	978769	902244	76525	28063	32151	1203219	1183668	19551	31900	37105
Rhode Island	109596	108683	913	35739	3041	124333	121167	3165	38503	3147

Vermont	33505	33426	79	31094	1075	46128	44867	1261	25178	1782
Midwest	$4,502,037	$4,254,686	$247,351	$21,919	194,107	$6,327,346	$5,952,214	$375,132	$24,779	240,213
Illinois	740423	732824	7599	19351	37870	1011311	996738	14573	21844	45629
Indiana	338195	325700	12495	20188	16133	477628	449406	28222	21841	20576
Iowa	146069	143774	2295	24286	5920	188391	186298	2093	22997	8101
Kansas	170848	158454	12394	22242	7124	199843	182655	17189	21381	8543
Michigan	1167610	1161142	6468	28067	41371	1582611	1573273	9338	32525	48371
Minnesota	185983	184359	1624	37825	4874	253385	239953	13432	36836	6514
Missouri	262787	249414	13373	12832	19437	436081	362429	73652	12867	28167
Nebraska	69867	67904	1963	22271	3049	126857	99865	26992	25321	3944
North Dakota	10749	10584	165	17154	617	26796	24219	2577	22425	1080
Ohio	1014917	873584	141333	19613	44540	1277622	1201269	76354	26295	45684
South Dakota	34152	33582	570	17787	1888	37529	37030	499	13853	2673
Wisconsin	360439	313366	47073	27771	11284	709292	599080	110212	28622	20931
Total	$22,033,214	$20,737,888	$1,295,326	$20,142	1,029,595	$29,491,268	$28,374,273	$1,116,995	$22,650	1,252,743
South	$7,442,584	$6,990,526	$452,058	$15,338	455,756	$10,002,325	$9,750,580	$251,745	$16,479	563,818
Alabama	168989	165760	3229	7987	20753	228871	221774	7097	8128	27286
Arkansas	133729	124513	9216	13341	9333	199003	192611	6392	15619	12332
Delaware	87961	87253	707	17987	4851	166327	162397	3930	22802	7122
District of Col	213716	212148	1568	21296	9962	143700	143700	. . .	26670	5388
Florida	1224933	1100655	124278	17327	63521	1484799	1453799	31000	20190	72007
Georgia	560358	547490	12868	15933	34363	923505	900918	22586	19860	45363
Kentucky	208706	198775	9931	16320	12180	288438	274404	14034	17818	15400
Louisiana	316245	313463	2783	12304	25476	479260	459686	19573	12951	35494
Maryland	520263	480880	39382	22247	21616	645620	632749	12872	26398	23970
Mississippi	148852	143914	4938	11156	12900	266196	264503	1693	12795	20672
North Carolina	756829	733775	23054	25303	28999	863892	840347	23545	26984	31142
Oklahoma	198290	193567	4723	10601	18260	384060	377378	6682	16309	23139
South Carolina	315539	277868	37671	13977	19880	405238	373249	31989	16762	22267
Tennessee	350575	349177	1398	22904	15245	421807	421807	. . .	18206	23168
Texas	1713935	1565214	148721	12215	128140	2315899	2270959	44940	13808	164465
Virginia	476715	452358	24357	16306	27742	723767	699104	24663	22942	30473
West Virginia	46949	43716	3233	17245	2535	61944	61194	750	14817	4130
West	$5,004,632	$4,801,972	$202,661	$22,032	217,959	$7,104,834	$6,958,485	$146,349	$25,231	275,787
Alaska	116664	112350	4314	32415	3466	154650	154156	494	36730	4197
Arizona	418094	409167	8927	19091	21433	618571	609910	8661	22476	27136
California	3031047	2918845	112202	21385	136492	4166573	4107844	58729	25053	163965
Colorado	249833	234503	15330	21020	11156	466551	435037	31514	25408	17122
Hawaii	87417	83921	3496	23318	3599	117101	117101	. . .	21637	5412
Idaho	56957	55017	1940	16277	3380	95494	92821	2673	16319	5688
Montana	42448	41875	573	20782	2015	71994	71169	825	21898	3250
Nevada	121960	119026	2934	15370	7744	182092	180834	1258	17572	10291
New Mexico	125602	123892	1710	29491	4201	149077	148249	828	28035	5288
Oregon	254330	253421	909	31837	7960	404255	399436	4819	36060	11077
Utah	113394	111808	1585	32361	3455	133963	133683	281	24574	5440
Washington	357862	311122	46740	26662	11669	488314	459814	28500	30168	15242
Wyoming	29025	27024	2001	19456	1389	56199	48431	7768	28845	1679
Total	$22,033,214	$20,737,888	$1,295,326	$20,142	1,029,595	$29,491,268	$28,374,273	$1,116,995	$22,650	1,252,743
South	$7,442,584	$6,990,526	$452,058	$15,338	455,756	$10,002,325	$9,750,580	$251,745	$16,479	563,818
Alabama	168989	165760	3229	7987	20753	228871	221774	7097	8128	27286
Arkansas	133729	124513	9216	13341	9333	199003	192611	6392	15619	12332
Delaware	87961	87253	707	17987	4851	166327	162397	3930	22802	7122
District of Col	213716	212148	1568	21296	9962	143700	143700	. . .	26670	5388
Florida	1224933	1100655	124278	17327	63521	1484799	1453799	31000	20190	72007
Georgia	560358	547490	12868	15933	34363	923505	900918	22586	19860	45363

Kentucky	208706	198775	9931	16320	12180	288438	274404	14034	17818	15400
Louisiana	316245	313463	2783	12304	25476	479260	459686	19573	12951	35494
Maryland	520263	480880	39382	22247	21616	645620	632749	12872	26398	23970
Mississippi	148852	143914	4938	11156	12900	266196	264503	1693	12795	20672
North Carolina	756829	733775	23054	25303	28999	863892	840347	23545	26984	31142
Oklahoma	198290	193567	4723	10601	18260	384060	377378	6682	16309	23139
South Carolina	315539	277868	37671	13977	19880	405238	373249	31989	16762	22267
Tennessee	350575	349177	1398	22904	15245	421807	421807	. . .	18206	23168
Texas	1713935	1565214	148721	12215	128140	2315899	2270959	44940	13808	164465
Virginia	476715	452358	24357	16306	27742	723767	699104	24663	22942	30473
West Virginia	46949	43716	3233	17245	2535	61944	61194	750	14817	4130
West	$5,004,632	$4,801,972	$202,661	$22,032	217,959	$7,104,834	$6,958,485	$146,349	$25,231	275,787
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Washington	357862	311122	46740	26662	11669	488314	459814	28500	30168	15242
Wyoming	29025	27024	2001	19456	1389	56199	48431	7768	28845	1679

Table 4 reflects the total, operating, and capital expenditures and operating costs for each state inmate and U.S. resident for the fiscal years of 1996 and 2001 Source: Bureau of Justice Statistics from the reports State Prison Expenditures, 1996 and State Prison Expenditures, 2001. The data sources are the FY 1996 Survey of Government Finances, U.S. Census Bureau and FY 2001 Survey of Government Finances, U.S. Census Bureau. Note: For the 1996 data, expenditures exclude adult community corrections, juvenile corrections, and probation and parole services. Inmate counts used to calculate operating expenditures per inmate were based on prisoners under the jurisdiction of State correctional authorities from June 30, 1995, to June 30, 1996. See Methodology for details. Subtotals may not equal total due to rounding. For the 2001 data, forty-six States and the District of Columbia began their fiscal year in July and ended them in June. The exceptions were Alabama and Michigan—October to September; New York—April to March; and Texas—September to August. Subtotals may not equal total due to rounding. The following information is not reflected in the data: states have integrated jail-prison systems; the District of Columbia reported no capital outlays during FY 2001, a transition period during which its sentenced felons were being transferred to the Federal Bureau of Prisons; during FY 2001, Tennessee spent capital amounts from sources outside its Department of Correction; and Hawaii's Department of Public Safety, Corrections Division had nonrecurring expenditures which State budget officials excluded from the capital category.

The annual per capita costs placed on state residents in terms of U.S. dollars in 2001 can be found in Table 5. This table breaks down selected state expenditures in 5-year increments from 1986 until 2001. The total corrections expenditures per capita doubled from 1986 to 2001, increasing from $65 in 1986 to $134 in 2001. The total prison expenditures more than doubled as well, increasing from $49 in 1986 to $104 in 2001. Public welfare expenditures more than doubled, increasing from $425 in 1986 to $914 in 2001. This is not the case for education, which only increased by 56 percent from $842 to $1315. Healthcare costs increased less than total corrections and prison costs. The average percent change from 1986 to 2001 is the same for prison expenditures and public welfare expenditures, at 6.4 percent. These results indicate the

rising costs and funds that are allocated to total corrections and prisons. Ex-offenders also face obstacles to consistent employment and are subject to jobs with low wages, which can result in their family members being placed on public welfare. Addressing means reducing prison populations and helping prisoners to renter society and the labor market upon release can reduce this burden on state resident taxpayers and funds can be allocated more to health and education.

Table 5: Annual per capita costs, in 2001 constant dollars, for selected State expenditures, 1986-2001

	State expenditures as costs per resident					
Fiscal year	**Total corrections**	**Prisons**	**Health**	**Education**	**Public welfare**	**Natural resources**
1986	$65	$49	$78	$842	$425	$44
1991	98	76	109	998	632	52
1996	119	91	141	1143	849	56
2001	134	104	154	1315	914	61
Average annual percent change, 1986-2001*	6.2	6.4	5.8	4.2	6.4	3.3 %

Table 5 reflects the annual per capita costs of corrections along with other selected state expenditures in terms of 2001 constant USD. The data is obtained from the following reports: State Prison Expenditures, 2001 NCJ 202949, U.S. Census Bureau, Survey of State Government Finances, 1986-2001 editions; U.S. Census Bureau, Current Population Estimates and Projections, 1986-1996; and unpublished data from 2001 Current Population Estimates. Bureau of Economic Analysis, chain-type price indexes for the gross domestic product, 1959-2002, in Economic Report of the President, Table B-7, February 2003. *Based on total expenditures.

4.3 The Impact of Incarceration Rates on Unemployment Rates

We conduct Granger Causality VAR tests on time series data for each state, as seen in Table 6. We derive the VAR results to conduct the Granger Causality tests. The results from the VAR tests show that in all fifty states, there is a significant relationship between incarceration and unemployment rates. The state with the weakest significance is Wyoming, with the results being significant at the 10% level. Seven of the fifty states have significant Granger Causality results indicating that incarceration rates affect unemployment rates: Arkansas, Indiana, Kentucky, Montana, Nebraska, New Jersey, and Nevada. Ten of the fifty states have significant Granger Causality results suggesting that unemployment rates affect incarceration rates: Illinois, Massachusetts, Maine, North Dakota, New Mexico, New York, Ohio, Rhode Island, South Carolina, and Wyoming.

Table 6: Time Series Granger Causality Tests by State

		Vector autoregression								chi2 from Granger Causality Wald tests			
		UR				IR							
State	No. lags	UR		IR		UR		IR		UR		IR	
AK	1	0.65	***	-98.42		0		0.68	***	0.12		0.07	
AL	1	0.82	***	181.2		0		0.83	***	0.13		0.32	
AR	2	0.66	***	869.79	***	0		0.9	***	6.9	***	1.86	
AZ	3	-0.84	*	-1295.7		0		0.34	***	1.3		1.17	
CA	2	0.46		-773.08		0		0.53	***	0.61		0.7	
CO	2	0.46	*	1231.42	**	0	***	0.86	***	5.06	**	12.11	***
CT	1	0.95	***	152.78		0		0.79	***	0.24		2.25	
DE	1	0.86	***	44.17		0		0.78	***	0.05		1.39	
FL	4	-1	*	-993.47		-9.81E-06		0.45	***	0.27		0.07	
GA	3	1.32	**	1718.72	***	0	**	0.35	***	9.29	***	4.76	**
HI	2	0.51	***	-2357.72	***	0	***	0.43	***	16.57	***	10.03	***
IA	4	0.25		1392.66	***	0	***	0.56	***	14.78	***	14.52	***
ID	4	-2.26	***	-2022.74	***	0	***	0.72	***	12.332	***	7.9	***
IL	2	0.57	**	965.61		0	**	0.72	***	0.79		4.85	**
IN	4	0.3		4023.96	***	0		0.88	***	35.73	***	1.37	
KS	2	0.49	*	455.84		0		0.74	***	0.64		0.11	
KY	4	0.67	**	5761.53	***	0		0.02		38.04	***	0.04	
LA	1	0.45	*	-824.95		0		0.56	***	1.42		1.67	
MA	2	0.45	*	-4683.6		0	***	0.37	***	2.51		17.43	***
MD	3	-0.56	**	-4801.7	***	0	**	0.52	***	17.56	***	4.39	**
ME	1	0.89	***	1951.41		0	***	0.92	***	2.56		7.37	***
MI	4	0.67	*	5571.41	***	0	***	0.24	**	28.9	***	9.78	***
MN	4	0.09		3912.21	***	0	***	0.91	***	23.81	***	10.3	***
MO	4	0.45		1355.97	***	0	***	0.46	***	12.08	***	18.86	***
MS	1	0.94	***	833.2	*	0	**	0.73	***	3.55	*	5.34	**
MT	2	0.3		-2158.31	**	0		-0.06		6.34	**	0.13	
NC	1	0.9	***	438.48		-5.50E-06		0.87	***	0.6		0.19	
ND	1	0.73	***	50.55		0	***	0.93	***	0.08		7.95	***
NE	1	0.68	***	514.15	*	-5.19E-06		0.95	***	2.81	*	0.02	
NH	1	0.79	***	-238.93		0		0.67	***	0.08		1.78	
NJ	1	0.63	***	-2915.46	***	0.00E+00		0.86	***	8.27	***	0.35	
NM	3	-0.28		454.82		0	***	0.03		0.19		11.44	***
NV	4	-0.42		7915.01	**	0.00E+00		-0.57	***	6.34	**	0.56	
NY	4	-0.39	*	-3054.74	***	0	***	0.43	**	8.07	***	25.96	***
OH	3	0.52		1453.64		0.00E+00	***	0.39	***	1.26		7.52	***
OK	1	0.7	***	-70.37		3.70E-06		0.82	***	0.03		0.02	
OR	1	0.63	***	689.14		0.00E+00		0.98	***	1.96		1.33	
PA	2	0.49	*	470.61		0.00E+00		0.84	***	0.96		0.81	

RI	1	1.02	***	1208.08		0.00E+00	***	0.48	***	2.58		7.7	***
SC	1	0.89	***	126.83		0.00E+00	***	0.82	***	0.03		9.25	***
SD	3	-0.33		450.03	***	0.00E+00	***	0.8	***	7.07	***	9.29	***
TN	1	0.81	***	-1516.34		-2.12E-06		0.64	**	2.14		0.02	
TX	4	-1.2	***	-684.23	***	0.00E+00	**	0.08		16.46	***	5.12	**
UT	2	0.1		-580.98		0.00E+00		0.32	*	0.16		0.1	
VA	2	0.41		-152.3		0.00E+00		0.55	***	0.05		1.19	
VT	4	0.13		2501.91	***	0.00E+00	***	0.14		9.51	***	9	***
WA	4	-1.13	***	870.11		-6.13E-06		0.49	***	1.36		0.08	
WI	1	0.79	***	304.83		0.00E+00		0.96	***	1.81		0.64	
WV	3	0.61	*	1100.88		0.00E+00		0.93	***	0.74		0.52	
WY	3	-0.16		-146.57		0.00E+00	*	-0.24		0.02		2.89	*

Table 6 reflects the results from the time series Granger Causality Tests for the incarceration and unemployment rates for each state in the U.S. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

4.4 Prison Reform and Firm Performance

Next, we explore if prison reform has an impact on firm performance by grouping firms that are based in states that have undergone prison reform as the treatment group and firms that are not based in states that have undergone prison reform as the untreated group. Through a difference in difference test, we find that firms based in states with prison reform outperform firms that are based in states without prison reform, with firm performance measured by return on assets. This result suggests that prison reform may increase firm performance. The results from the differences in differences test are reflected in Table 7 and the total prison reforms are listed in Table 8. In Table 9, we show the percentage change from the year before to the year after prison reform. As reflected in the table, 14 of the 19 states that passed prison reform had a reduction in their state incarceration rate a year after the prison reform was passed. This result suggests that prison reform was effective in reducing prison populations, which had a positive impact on firm performance for firms based in states that had prison reform.

Table 7: Difference in Difference Tests
Independent Variable: Return on Assets

Variables	Coefficient	Robust Standard Error	t	P>t	[95% Conf.	Interval]
No Prison Reform	1.42	1.44	0.98	0.33	-1.41	4.25
Prison Reform	2.94**	1.40	2.10	0.04	0.20	5.67
did3	-2.34	1.67	-1.40	0.16	-5.61	0.94
_cons	-3.49	1.39	-2.51	0.01	-6.22	-0.77

Table 7 reflects the differences in differences tests on firms that are based in states with prison reform compared to firms that are based in states without prison reform. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 8: Total Prison Reforms by state

Year	State	Total Prison Reforms
2007	TX	3
2007	WV	4
2007	KS	3
2008	VT	4
2008	PA	3
2008	CT	2
2008	RI	4
2008	AZ	1
2009	IL	5
2009	WI	2
2010	SC	19
2010	NH	4
2010	MI	7
2011	KY	19
2011	OH	13
2011	AL	2
2011	NC	12
2011	AR	14
2011	LA	12
2012	GA	15
2012	MO	6
2012	DE	8
2012	OK	4
2012	HI	9
2012	PA	6
2013	OR	12
2013	SD	14
2013	KS	9
2013	WV	11
2014	ID	12
2014	MS	19
2015	UT	17
2015	AL	17
2015	NE	14
2016	AK	21
2016	MS	16

Table 8 reflects the total number of prison reforms implemented by state governments for each corresponding state. Data referenced from the Pew Charitable Trust.

Table 9: Total Prison Reforms by state 2007-2011

Year	State	Total Prison Reforms	IR one year before Prison Reform	Year of Prison Reform	IR one year after Prison Reform	Percentage Change from year before to year after prison reform
2007	TX	3	0.017	0.016	0.014	-0.148
2007	WV	4	0.008	0.009	0.008	0.004
2007	KS	3	0.009	0.008	0.007	-0.162
2008	VT	4	0.006	0.006	0.006	0.091
2008	PA	3	0.009	0.009	0.010	0.086
2008	CT	2	0.010	0.009	0.009	-0.060
2008	RI	4	0.009	0.008	0.008	-0.094
2008	AZ	1	0.013	0.014	0.015	0.083
2009	IL	5	0.008	0.008	0.009	0.094
2009	WI	2	0.010	0.010	0.010	-0.016
2010	SC	19	0.016	0.015	0.014	-0.120
2010	NH	4	0.005	0.004	0.004	-0.240
2010	MI	7	0.013	0.013	0.012	-0.135
2011	KY	19	0.009	0.008	0.003	-0.677
2011	OH	13	0.012	0.011	0.004	-0.660
2011	AL	2	0.016	0.016	0.005	-0.663
2011	NC	12	0.012	0.011	0.004	-0.677
2011	AR	14	0.015	0.014	0.005	-0.686
2011	LA	12	0.010	0.009	0.003	-0.642

Table 9 reflects the total number of prison reforms implemented by state governments for each corresponding state. The state incarceration data is created by using the total men and women in custody divided by the state population for each given year. Prison reform data referenced from the Pew Charitable Trust. Incarceration data is from the U.S. Bureau of Justice Statistics. State Population is references from the U.S. Bureau of Labor Statistics.

4.5 High Versus Low Incarceration

Next, we conduct differences in means tests on firm characteristics, placing firms that are based in states with high incarceration in one group and firms that are based in states with low incarceration in another. We consider a "Low Incarceration" state as one that has an incarceration rate below the 25th percentile and a "High Incarceration" state as one that has an incarceration rate above the 75th percentile. Our results, detailed in Table 10, indicate that there are significant differences in several firm-level control variables between firms in Low Incarceration states and those in High Incarceration states. These firm-level control variables are *Return on Assets, Tangible, Dividend, Research and Development, Capital Expenditures, Log(Debt),* and *Log*(*Size)*. *Return on Assets*, our proxy variable for firm performance, indicates that incarceration negatively affects firm performance more for firms based in states with high incarceration

than firms based in states with low incarceration, and this result is significant. Also, firms that are based in states with low incarceration have less debt, are larger in size, issue fewer dividends, and invest in research and development more than firms that are based in states with high incarceration.

Table 10: Two-sample T-tests with Unequal Variances by Level of Incarceration

Variable	Mean		Std. Err.	Std. Dev.	95% Confidence Interval	
Return on Assets						
Group 0: Low Incarceration	-0.91		0.199	20.25	-1.301	-0.52
Group 1: High Incarceration	-3.574		2.196	233.154	-7.879	0.73
Combined	-2.299		1.149	168.958	-4.552	-0.047
Difference (0) – (1)	2.664	*	2.301		-1.845	7.173
T-statistic	1.1579					
Tangible						
Group 0: Low Incarceration	0.176		0.002	0.198	0.172	0.180
Group 1: High Incarceration	0.312		0.003	0.289	0.306	0.317
Combined	0.246		0.002	0.258	0.243	0.250
Difference (0) – (1)	-0.136	***	0.003		-0.143	-0.129
T-statistic	-39.731					
Dividend						
Group 0: Low Incarceration	0.282		0.004	0.450	0.274	0.289
Group 1: High Incarceration	0.360		0.004	0.480	0.352	0.369
Combined	0.321		0.003	0.467	0.315	0.326
Difference (0) – (1)	-0.079	***	0.006		-0.090	-0.068
T-statistic	-13.7418					
R & D						
Group 0	3.371		0.751	59.420	1.899	4.843
Group 1	1.660		0.659	42.755	0.369	2.952
Combined	2.683		0.521	53.351	1.661	3.705
Difference (0) – (1)	1.711	*	1.063		-0.373	3.795
T-statistic	1.609					
Capital Expenditures						
Group 0: Low Incarceration	66.572		4.179	417.073	58.380	74.764
Group 1: High Incarceration	111.084		4.880	497.588	101.517	120.650
Combined	89.303		3.228	460.482	82.977	95.630
Difference (0) – (1)	-44.512	***	6.449		-57.153	-31.871
T-statistic	-6.902					
Market to Book						
Group 0: Low Incarceration	12.02376		2.416	217.998	7.287	16.760
Group 1: High Incarceration	10.30127		1.634	153.126	7.098	13.505
Combined	11.12999		1.439	187.161	8.310	13.950

Difference (0) – (1)	1.722493		2.880		-3.922	7.367
T-statistic	0.5981					
Collateral to Assets						
Group 0: Low Incarceration	0.223		0.103	10.367	0.022	0.424
Group 1: High Incarceration	0.133		0.030	3.077	0.076	0.191
Combined	0.177		0.052	7.545	0.075	0.279
Difference (0) – (1)	0.089		0.104		-0.115	0.293
T-statistic	0.859					
Log (Debt)						
Group 0	2.840		0.042042	3.231	2.758	2.923
Group 1	3.510		0.037859	2.994	3.436	3.584
Combined	3.185		0.028377	3.130	3.129	3.240
Difference (0) – (1)	-0.670	***	0.056453		-0.781	-0.559
T-statistic	-11.867					
Log (Size)						
Group 0	4.831		0.021	2.299	4.790	4.873
Group 1	4.670		0.023	2.384	4.626	4.714
Combined	4.752		0.016	2.342	4.722	4.783
Difference (0) – (1)	0.162	***	0.031		0.101	0.223
T-statistic	5.1979					

Table 10 reflects two-sample t-tests with unequal variances for firms based in states segmented by low and high incarceration. A "Low Incarceration" state is one that has an incarceration rate below the 25th percentile while a "High Incarceration" state is one that has an incarceration rate above the 75th percentile. *Return on Assets* is calculated as income before extraordinary items divided by total assets. *Tangible* is the firm's total net property plant and equipment divided by total assets. *Dividend* is a binary dummy variable that takes the value of 1 if a firm issues dividends, 0 otherwise. *Log(Debt)* is the natural logarithm of firm total debt. *Log(Size)* is the natural logarithm of firm size, measured by the firm's closing stock price multiplied by the number of shares outstanding. *R&D* is calculated as research and development expenses divided by total sales. *Capital Expenditures* is calculated as capital expenditures divided by total assets. *Market to Book* is the sum of total liabilities, preferred stock/liquidating value, deferred taxes and investment tax credit, and price times common shares outstanding, over total assets. *Collateral to Assets* is the sum of the total net property, plant, and equipment and inventory divided by total assets.

4.6 Incarceration Rates and Firm Performance

We conduct a random effects and pooled OLS effects regression. Our dependent variable is firm performance, which is proxied by return on assets. We also include several firm-level and state macroeconomic control variables. We cluster the regressions by firm using the firm gvkey found in Compustat. The results from the pooled OLS regression can be found in Table 11. Our results indicate that incarceration rate has a negative effect on firm performance and this is significant at the 5% level.

Table 11

Pooled OLS Regression clustered by firm (gvkey) and state

Dependent Variable: Return on Assets

Variables	Coef.		Robust Standard Error	z	P>z	[95% Conf. Interval]	
Log (Incarceration Rate)	-0.352	**	0.160	-2.2	0.028	-0.666	-0.039
Log (Debt)	-0.017		0.016	-1.04	0.298	-0.049	0.015
Log (Size)	0.175	***	0.040	4.39	0	0.097	0.253
Tangible	0.227		0.286	0.79	0.428	-0.334	0.787
Dividend	-0.016		0.075	-0.22	0.829	-0.164	0.131
Research and Development	-0.001		0.001	-0.81	0.417	-0.002	0.001
Capital Expenditures	0.000	***	0.000	-2.66	0.008	0.000	0.000
Market to Book Ratio	-0.061	***	0.023	-2.63	0.009	-0.107	-0.016
Collateral to Assets	-1.180	**	0.568	-2.08	0.038	-2.294	-0.066
Log (Per Capita Income)	-1.325	**	0.635	-2.09	0.037	-2.571	-0.079
Percentage Change in State GDP	3.682	**	1.730	2.13	0.033	0.290	7.075
Unemployment Rate	-0.019		0.032	-0.58	0.562	-0.082	0.044
Log (Population)	-0.023		0.075	-0.31	0.755	-0.170	0.123
Below Median Book Value of Assets*Log (Incarceration Rate)	0.012		0.013	0.94	0.347	-0.013	0.038
Foreign Operations*Log (Incarceration Rate)	0.012	*	0.007	1.74	0.083	-0.002	0.025
Retail Industry*Log (Incarceration Rate)	-0.044	***	0.008	-5.71	0	-0.059	-0.029
Number of States*Log (Incarceration Rate)	-0.012	*	0.007	-1.65	0.099	-0.026	0.002
Constant	10.134	**	4.687	2.16	0.031	0.944	19.323

Table 11 reflects the pooled OLS regression results clustered by firm and state. The dependent variable is the return on assets, the proxy variable for firm performance. The main independent variable is Log (Incarceration Rate). Firm control variables are Log (Debt), Log (Size), Tangible, Dividend, R & D, Capital Expenditures, Market to Book, and Collateral to Assets. State-level macroeconomic control variables are Log (Per Capita Income), Percentage Change in State GDP, State Unemployment Rate, Log (Population). Interaction variables used to correct for endogeneity issues are Below Median Book Value of Assets*Log (Incarceration Rate), Foreign Operations*Log (Incarceration Rate), Retail Industry*Log (Incarceration Rate), and Number of States*Log (Incarceration Rate). *Return on Assets* is calculated as income before extraordinary items divided by total assets. *Tangible* is the firm's total net property plant and equipment divided by total assets. *Dividend* is a binary dummy variable that takes the value of 1 if a firm issues dividends, 0 otherwise. *Log(Debt)* is the natural logarithm of firm total debt. *Log(Size)* is the natural logarithm of firm size, measured by the firm's closing stock price multiplied by the number of shares outstanding. *R&D* is calculated as research and development expenses divided by total sales. *Capital Expenditures* is calculated as capital expenditures divided by total assets. *Market to Book* is the sum of total liabilities, preferred stock/liquidating value, deferred taxes and investment tax credit, and price times common shares outstanding, over total assets. *Collateral to Assets* is the sum of the total net property, plant, and equipment and inventory divided by total assets.

We also conduct random effects regressions to determine whether these results will be consistent with our pooled OLS regression results. As before, our dependent variable is return on assets to measure firm performance. Our results from the random effects regression can be found in Table 12. We find that incarceration has a negative effect on firm performance. This is consistent with our pooled OLS regression results.

Table 12: Random Effects Regression clustered by firm (gvkey) Random Effects Regression clustered by firm (gvkey)

Dependent Variable: Return on Assets

Variables	Coef.		Robust Standard Error	z	P>z	[95% Conf.	Interval]
Log (Incarceration Rate)	-0.386	**	0.167	-2.310	0.021	-0.713	-0.059
Log (Debt)	-0.032		0.028	-1.120	0.262	-0.087	0.024
Log (Size)	0.201	***	0.056	3.560	0	0.090	0.311
Tangible	-0.541		0.496	-1.090	0.275	-1.513	0.431
Dividend	-0.051		0.075	-0.670	0.502	-0.198	0.097
Research and Development	0.000		0.001	-0.800	0.422	-0.002	0.001
Capital Expenditures	0.000		0.000	-1.080	0.278	0.000	0.000
Market to Book Ratio	-0.059	**	0.023	-2.530	0.012	-0.105	-0.013
Collateral to Assets	-1.108	*	0.616	-1.800	0.072	-2.315	0.100
Log (Per Capita Income)	-1.416	***	0.536	-2.640	0.008	-2.465	-0.366
Percentage Change in State GDP	5.180	**	2.070	2.500	0.012	1.123	9.236
Unemployment Rate	-0.010		0.032	-0.310	0.759	-0.073	0.054
Log (Population)	-0.048		0.067	-0.710	0.478	-0.180	0.084
Below Median Book Value of Assets*Log (Incarceration Rate)	0.014		0.015	0.920	0.358	-0.016	0.044
Foreign Operations*Log (Incarceration Rate)	0.016		0.011	1.510	0.131	-0.005	0.037
Retail Industry*Log (Incarceration Rate)	-0.072	***	0.011	-6.290	0	-0.094	-0.049
Number of States*Log (Incarceration Rate)	0.000		0.007	-0.060	0.949	-0.014	0.014
Constant	11.159	**	4.442	2.510	0.012	2.453	19.865

Table 9 reflects the random effects results clustered by firm and state. The dependent variable is the return on assets, the proxy variable for firm performance. The main independent variable is Log (Incarceration Rate). Firm control variables are Log (Debt), Log (Size), Tangible, Dividend, R & D, Capital Expenditures, Market to Book, and Collateral to Assets. State-level macroeconomic control variables are Log (Per Capita Income), Percentage Change in State GDP, State Unemployment Rate, Log (Population). Interaction variables used to correct for endogeneity issues are Below Median Book Value of Assets*Log (Incarceration Rate), Foreign Operations*Log (Incarceration Rate), Retail Industry*Log (Incarceration Rate), and Number of States*Log (Incarceration Rate). *Return on Assets* is calculated as income before extraordinary items divided by total assets. *Tangible* is the firm's total net property plant and equipment divided by total assets. *Dividend* is a binary dummy variable that takes the value of 1 if a firm issues dividends, 0 otherwise. *Log(Debt)* is the natural logarithm of firm total debt. *Log(Size)* is the natural logarithm of firm size, measured by the firm's closing stock price multiplied by the number of shares outstanding. *R&D* is calculated as research and development expenses divided by total sales. *Capital Expenditures* is calculated as capital expenditures divided by total assets. *Market to Book* is the sum of total liabilities, preferred stock/liquidating value, deferred taxes and investment tax credit, and price times common shares outstanding, over total assets. *Collateral to Assets* is the sum of the total net property, plant, and equipment and inventory divided by total assets.

4.7 Addressing Endogeneity

Endogeneity in the panel data can be tackled by using GMM and the orthogonality conditions. However, this approach is not flawless. As the original model is expressed in levels, differencing the model may reduce the power of our tests by dropping variations in explanatory variables (Beck et al., 2000). Further, level variables may turn out to be weak instruments for first-differenced models (Arellano and Bover, 1995). For these reasons, our paper uses the 'system' GMM estimator suggested by Arellano and Bover (1995) and Blundell and Bond (1998). The system GMM estimation uses the first-differenced variables as instruments for the equations in levels in a 'stacked' system of equations. This stacked system of equations

includes both levels and difference equations. Such system GMM estimation provides efficient estimates by controlling time-invariant unobserved heterogeneity, simultaneity, and the dynamic relationship between current values of the explanatory variables and past values of the dependent variable.

In the model used in this paper, the system GMM estimates the relationship between incarceration rate and firm performance by including both past performance and fixed-effects to incorporate the dynamic features of such a relationship and time-invariant unobserved heterogeneity. Wintoki et al. (2012) followed a similar method in analyzing the relationship between governance and firm performance. The system GMM estimator also assumes that the correlation between endogenous variables and the unobserved (fixed) effect is constant over time. For this assumption, our paper includes level equations in GMM estimates and uses lagged differences as instruments for these levels. The difference-in-Hansen test of exogeneity tests this assumption (Eichenbaum, Hansen, and Singleton, 1988). The results indicate that the p-value of the difference-in-Hansen test is 0.488, implying the null hypothesis—that the additional instruments used in the system GMM are exogenous—is not rejected.

This paper uses year dummies as strictly exogenous variables. All other explanatory variables are assumed to be endogenous. We use three lag variables after two years of the current year for explanatory variables as instruments with year dummies (t – 3, t – 4, t – 5). We take a two-year gap in the lag period to account for possible second-order serial correlation of residuals. The AR(2) second-order serial correlation test yields a p-value of 0.364, implying that we cannot reject the null hypothesis of no second-order serial correlation. This indicates that the model includes sufficient lags to control for dynamic aspects of the relationship between incarceration rate and firm performance. The AR(1) test reveals a p-value of 0.000 implying that the residuals in first-differences are correlated. This validates the model specification, as such correlation is a requirement of system GMM model.

Table 11 presents the two-step system GMM dynamic panel data estimates clustered by firm. Our paper uses year fixed assets in the estimation. The standard errors are clustered by firm. The results indicate that incarceration rate is again negative and significant at the 5% level, implying that incarceration negatively affects firm performance. The lagged firm performance is also significant at the 1% level. Log (Size) and the interaction term of Below Median Book Value of Assets*Log (Incarceration Rate) are positive and significant, which suggests that the size of the firm has a positive impact on firm performance. The percentage change in GDP is positive and significant, but is weaker at the 10% significance level, suggesting that this weakly affects firm performance (ROA). The Hansen test for over-identification restriction (p-value = 0.043) fails to reject the null that all instruments are valid instruments. Although we have used sufficient instruments and found robust standard errors, such standard errors may be weakened by too many instruments.

Table 13: Two-step System GMM Dynamic Panel Data Estimation clustered by Firm (gvkey)

Dependent Variable: Return on Assets

Variable	Coef.		Robust Standard Error	t	P>|t|	[95% Conf.	Interval]
Lag ROA	0.253	***	0.056	4.53	0.000	0.144	0.363
Log (Incarceration Rate)	-2.798	**	1.353	-2.07	0.039	-5.452	-0.144
Log (Debt)	-0.001		0.011	-0.1	0.917	-0.023	0.021
Log (Size)	0.145	***	0.042	3.45	0.001	0.063	0.228
Tangible	-0.321		0.368	-0.87	0.383	-1.043	0.401
Dividend	-0.006		0.063	-0.09	0.925	-0.130	0.118
Research and Development	0.000		0.000	-0.87	0.386	0.000	0.000
Capital Expenditure	0.000		0.000	-0.56	0.578	0.000	0.000
Market to Book Ratio	0.005		0.004	1.15	0.252	-0.004	0.014
Collateral to Assets	1.325		2.526	0.52	0.600	-3.627	6.278
Log (Per Capita Income)	-2.891		2.214	-1.31	0.192	-7.232	1.451
Percentage Change in State GDP	1768.746	*	1032.321	1.71	0.087	-255.583	3793.075
Unemployment Rate	0.031		0.034	0.91	0.365	-0.036	0.098
Log (Population)	0.212		0.225	0.94	0.347	-0.230	0.654
Below Median Book Value of Assets*Log (Incarceration Rate)	54.161	**	23.599	2.3	0.022	7.885	100.437
Foreign Operations*Log (Incarceration Rate)	85.017		63.538	1.34	0.181	-39.578	209.612
Retail Industry*Log (Incarceration Rate)	54.798		58.143	0.94	0.346	-59.217	168.813
Number of States*Log (Incarceration Rate)	1.080		2.155	0.5	0.616	-3.146	5.307
AR (1) test p-value							0.000
AR (2) test p-value							0.364
Hansen test of over-identification p-value							0.043
Difference-in-Hansen test of exogeneity p-value							0.488

Table 10 reflects the Two-Step System GMM Dynamic Panel data results clustered by firm and state. The dependent variable is return on assets, the proxy variable for firm performance. The main independent variable is Log (Incarceration Rate). Firm control variables are Log (Debt), Log (Size), Tangible, Dividend, R & D, Capital Expenditures, Market to Book, and Collateral to Assets. State-level macroeconomic control variables are Log (Per Capita Income), Percentage Change in State GDP, State Unemployment Rate, Log (Population). Interaction variables used to correct for endogeneity issues are Below Median Book Value of Assets*Log (Incarceration Rate), Foreign Operations*Log (Incarceration Rate), Retail Industry*Log (Incarceration Rate), and Number of States*Log (Incarceration Rate). The year dummies are strictly exogenous variables only and all other explanatory variables are assumed to be endogenous. Three lagged variables after two years of current year are taken for each explanatory variable as instruments with the year dummies to account for possible second-order serial correlation of residuals. *Return on Assets* is calculated as income before extraordinary items divided by total assets. *Tangible* is the firm's total net property plant and equipment divided by total assets. *Dividend* is a binary dummy variable that takes the value of 1 if a firm issues dividends, 0 otherwise. *Log(Debt)* is the natural logarithm of firm total debt. *Log(Size)* is the natural logarithm of firm size, measured by the firm's closing stock price multiplied by number of shares outstanding. *R&D* is calculated as research and development expenses divided by total sales. *Capital Expenditures* is calculated as capital expenditures divided by total assets. *Market to Book* is the sum of total liabilities, preferred stock/liquidating value, deferred taxes and investment tax credit, and price times common shares outstanding, over total assets. *Collateral to Assets* is the sum of the total net property, plant, and equipment and inventory divided by total assets.

5 Conclusion

This paper explores the implications that incarceration has on firm performance. Previous studies have examined the economic impacts of prison reform, but none have studied this phenomenon from a finance perspective and determined the impacts of incarceration on firms and industries. The results from our Granger Causality VAR and Granger Causality OLS tests indicate that there is a significant relationship between incarceration and unemployment in all fifty states. From this, we find that incarceration rates and unemployment rates are related at the state level. This finding is significant for thirty of the fifty states in the U.S. These results provide evidence supporting Western and Beckett (1999) that find that in the long-run, incarceration increases unemployment.

Through differences in means tests, we find that firms based in states with low incarceration rates outperform firms that are based in states with high incarceration. Through a differences in differences test, our results suggest that firms based in states that have undergone recent prison reform outperform firms based in states that have not. Controlling for firm and state-level macroeconomic variables, our findings indicate that incarceration has a negative impact on firm performance, measured by return on assets. This also holds for the four measures to control for firms that may not be affected by state-level economic factors in the state where they are headquartered. In addition, our results determining a negative relationship between incarceration and firm performance are robust through GMM estimation.

These findings provide supportive evidence of the negative effects of mass incarceration. Mass incarceration not only has an impact on the people incarcerated, their families, their communities, and the overall economy. It confines prisoners to a labor market that has erratic and low wage earnings which can make them susceptible to a cycle of a "revolving door of prison release, crime, and incarceration" (Bushway, Stoll, and Weiman, 2007).

Mass incarceration also affects firms that are based in states with high levels of mass incarceration. These results have implications for both public and corporate policy. Holzer, Raphael, and Stoll (2003a) explore the various barriers to entry for former prisoners. On the supply-side, they find that certain characteristics can limit the earnings capacities of former prisoners, which include limited experience and cognitive skills, limited work experience, as well as substance abuse and other physical and mental health problems. On the demand-side, their study finds that employers are much more hesitant to hire former prisoners as opposed to other disadvantaged groups, such as welfare recipients, employer interest in hiring former prisoners depended up their establishment characteristics and what type of job they were seeking to fill, their interest varied according to the type of offense the former prisoner committed as well as the work experience the former prisoner had since their release, employer policy to facilitate background checks has increased over

the past decade. All of these factors impede former prisoners to obtain employment, and several of these issues can be rectified through updates to both governmental and corporate policy.

Several solutions have been proposed to reduce incarceration. Carson (2014) states that over 600,000 are released from prison each year. Firms such as Butterball where having issues with filling job positions and expanded their applicant pool and found that ex-offenders were excellent employees with lower on average turnover rates (Spanne, 2016). Creating ban the box corporate policies where firms ask potential employees about their prison records further along in the application process can enable firms access to a larger applicant pool as well as reduce prison populations and reduce state corrections expenditures, which is put onto the state taxpayer. Butterball has been such a corporate supporter of these initiatives on hiring ex-offenders, which the firm started the 30-2-2 initiative, with the objective of 30 employers in its headquarters to hire at least two former prisoners and track their performance of two years to reflect that ex-offenders can be both desirable and competitive job candidates. This initiative is now being adopted in New Orleans (Lipinski, 2013). Employers take whether former prisoners have work experience after their release (Holzer, Raphael, and Stoll, 2004). Providing transitional job programs can help former prisoners obtain employment. Corporations can participate in these programs, which will provide them a means of trial employment for potential job candidates.

Incarceration reforms are being adopted to reduce prison populations. State governments have implemented prison reforms through policy reforms on sentencing and pretrial, prison release, community corrections, and prison sustainability (such as establishing oversight councils, requiring fiscal impact statements, and requiring data collection)[12]. Entrepreneurship initiatives and organizations are being adopted to provide prisoners with the skills to start their own businesses. In addition, tax incentives are offered to firms that hire staff that was previously incarcerated. Firm managers may want to explore participating in prison training programs and hiring employees that were previously incarcerated to help reduce prisoner recidivism and prison populations.

6 Future Research

For future research, we will conduct a further examination of the regulations restricting employment for ex-offenders as provided by the American Bar Association Criminal Justice Section data in order to determine the nature of each regulation, how it restricts employment, and which industries it affects.

[12] The Pew Charitable Trusts, "33 States Reform Criminal Justice Policies Through Justice Reinvestment," http://www.pewtrusts.org/en/

References

Acharya, V. V., Baghai, R. P., & Subramanian, K. V. (2013). Wrongful discharge laws and innovation. *The Review of Financial Studies*, *27*(1), 301-346.

Aizer, A. and Doyle, J. (2015). Juvenile Incarceration, Human Capital, and Future Crime: Evidence from Randomly Assigned Judges. *The Quarterly Journal of Economics*, *130*(2), 759-803.

Arellano, M., Bover, O., 1995. Another look at the instrumental variable estimation of error-component models. Journal of Econometrics 68, 29–51.

Beck, T., Levine, R., Loayza, N., 2000. Finance and the sources of growth. Journal of Financial Economics, 58, 261–300.

Bender, E. (2002). "A Contributing Influence: The Private-Prison Industry and Political Giving in the South," The National Institute on Money in State Politics, April 2002.

Benzoni, L., Collin-Dufresne, P., & Goldstein, R. (2007). Portfolio Choice over the Life-Cycle when the Stock and Labor Markets Are Cointegrated. *The Journal of Finance*, *62*(5), 2123-2167.

Blanks, J. (2014, September 30). Our criminal justice system is making it really hard for people to find jobs. *The Washington Post.* Retrieved July 24, 2016, from https://www.washingtonpost.com/posteverything/wp/2014/09/30/our-criminal-justice-system-is-making-it-really-hard-for-the-poor-to-find-jobs/?utm_term=.25a6d95fae34

Blundell, R., Bond, S., 1998. Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics 87, 115–143.

Brushwood, J., Dhaliwal, D., Fairhurst, D., & Serfling, M. (2016). Property Crime, Earnings Variability, and the Cost of Capital. *Journal of Corporate Finance, 40*, 142-173.

Bursik, R. J. (1988). Social disorganization and theories of crime and delinquency: Problems and prospects. *Criminology, 26*(4), 519-552.

Bushway, S. D., Stoll, M. A., & Weiman, D. (Eds.). (2007). *Barriers to reentry?: The labor market for released prisoners in post-industrial America*. Russell Sage Foundation.

Carson, E. A. (2015, September). Prisoners in 2014. Retrieved February 16, 2016, from https://www.bjs.gov/content/pub/pdf/p14.pdf

Center for Economic and Policy Research. 2016. CPS ORG Uniform Extracts, Version 2.1. Washington, DC.

Chang, C. (2012, May 13). Louisiana is the world's prison capital. *The Times-Picayune*. Retrieved July 24, 2016, from http://www.nola.com/crime/index.ssf/2012/05/louisiana_is_the_worlds_prison.html

Cherry, T., & Kunce, M. (2001). Do policymakers locate prisons for economic development?. *Growth and Change*, *32*(4), 533-547.

Clear, T. (2007). Impact of incarceration on community public safety and public health. *Public health behind bars*, 13-24.

Clear, T. R., Rose, D. R., Waring, E., & Scully, K. (2003). Coercive mobility and crime: A preliminary examination of concentrated incarceration and social disorganization. *Justice Quarterly*, *20*(1), 33-64.

Doleac, J. L., & Hansen, B. (2016). *Does "ban the box" help or hurt low-skilled workers? Statistical discrimination and employment outcomes when criminal histories are hidden* (No. w22469). National Bureau of Economic Research.

Dougal, C., Parsons, C. A., & Titman, S. (2015). Urban vibrancy and corporate growth. *The Journal of Finance*, *70*(1), 163-210.

Dyreng, S. D., & Markle, K. S. (2016). The effect of financial constraints on income shifting by US multinationals. *The Accounting Review*, *91*(6), 1601-1627.

ECONOMIC PERSPECTIVES ON INCARCERATION AND THE CRIMINAL JUSTICE SYSTEM. (2016, April). Retrieved February 16, 2018, from https://obamawhitehouse.archives.gov/sites/default/files/page/files/20160423_cea_incarceration_criminal_justice.pdf

Economy League of Greater Philadelphia (2011, September). Economic Benefits of Employing Formerly Incarcerated Individuals in Philadelphia. Retrieved February 16, 2018, from http://economyleague.org/uploads/files/712279713790016867-economic-benefits-of-employing-formerly-incarcerated-full-report.pdf

Eichenbaum, M. S., Hansen, L. P., Singleton, K. J., 1988. A time series analysis of representative agent models of consumption and leisure choice under uncertainty. Quarterly Journal of Economics 103, 51–78.

Engel, M. R. (2007). *When a prison comes to town: siting, location, and perceived impacts of correctional facilities in the Midwest* (Doctoral dissertation, University of Nebraska).

Farkas, M. A. (1999). "Not in my backyard": The issues and complexities surrounding prison siting. *Criminal Justice Studies*, *12*(1), 95-109.

Fredericksen, Allyson, and Desiree Omli. "Jobs After Jail: Ending the Prison to Poverty Pipeline." The Job Gap Prosperity Series (2016): n. pg. Alliance for A Just Society. Web. https://jobgap2013.files.wordpress.com/2016/02/ajs_job_after_jail_report_final_pdf.pdf.

Garrett, B. L. (2017, March 31). Conservatives Are Leading the Way as States Enact Criminal Justice Reform. Retrieved September 05, 2017, from http://www.slate.com/articles/news_and_politics/trials_and_error/2017/03/conservatives_could_help_derail_trump_s_tough_on_crime_policies.html

Harding, D. J., & Winship, C. (2016). Population Growth, Migration, and Changes in the Racial Differential in Imprisonment in the United States, 1940–1980. *Social Sciences*, *5*(3), 32.

Hashimoto, M. (1981). Firm-Specific Human Capital as a Shared Investment. *The American Economic Review*, *71*(3), 475-482.

Henrichson, C., & Delaney, R. (2012, January). What Incarceration Costs Taxpayers. Retrieved February 16, 2018, from https://shnny.org/uploads/Price-of-Prisons.pdf

Holzer, H. J., Raphael, S., & Stoll, M. A. (2007). The effect of an applicant's criminal history on employer hiring decisions and screening practices: Evidence from Los Angeles. *Barriers to reentry*, 117-150.

Holzer, H. J., Raphael, S., & Stoll, M. A. (2003a). Employment barriers facing ex-offenders. *Urban Institute Reentry Roundtable*, 1-23.

Holzer, H. J., Raphael, S., & Stoll, M. A. (2004b). How willing are employers to hire ex-offenders. *Focus*, *23*(2), 40-43.

Holzer, H. J., Raphael, S., & Stoll, M. A. (2003b). *Employer demand for ex-offenders: Recent evidence from Los Angeles*. Institute for Research on Poverty, University of Wisconsin-Madison.

Hoffmann, F., & Lemieux, T. (2016). Unemployment in the Great Recession: A Comparison of Germany, Canada, and the United States. *Journal of Labor Economics*, *34*(S1), S95-S139.

Jones, Stephen R. G.; Riddell, W. Craig (2017): Unemployment, Marginal Attachment and Labor Force Participation in Canada and the United States, IZA Discussion Papers, No. 10769

Keefe, R. H., Lane, S. D., Rubinstein, R. A., Carter, D., Bryant, T., & Thomas, M. D. (2017). African American Fathers: Disproportionate Incarceration and the Meaning of Involvement. *Families in Society: The Journal of Contemporary Social Services*, *98*(2), 89-96.

King, R. S., Mauer, M., & Huling, T. (2003). *Big prisons, small towns: Prison economics in rural America*. Washington, DC: Sentencing Project.

Korniotis, G. M., & Kumar, A. (2013). State-Level Business Cycles and Local Return Predictability. *The Journal of Finance*, *68*(3), 1037-1096.

Martin, R. (2000). Community perceptions about prison construction: Why not in my backyard?. *The prison journal*, *80*(3), 265-294.

Leaders of Michigan's 30-2-2 Initiative Make Case for Hiring Employees with Criminal Records. (2015, June 17). Retrieved February 16, 2018, from https://csgjusticecenter.org/nrrc/posts/leaders-of-michigans-30-2-2-initiative-make-case-for-hiring-employees-with-criminal-records/

Lipinski, J. NOLA.com | The Times-Picayune. (2013, December 04). U.S. Attorney Kenneth Polite urges business community to work with ex-offenders. Retrieved February 16, 2018, from http://www.nola.com/business/index.ssf/2013/12/us_attorney_kenneth_polite_urg.html

Louisiana's criminal justice reforms will reduce its prison population. (2017, July 06). Retrieved September 05, 2017, from https://www.economist.com/blogs/democracyinamerica/2017/07/right-and-just

Merz, M., & Yashiv, E. (2007). Labor and the Market Value of the Firm. *The American Economic Review*, *97*(4), 1419-1431.

Miller, J. M., & Khey, D. N. (2016). Fighting America's Highest Incarceration Rates with Offender Programming: Process Evaluation Implications from the Louisiana 22nd Judicial District Reentry Court. *American Journal of Criminal Justice*, 1-15.

Morenoff, J. D., & Harding, D. J. (2014). Incarceration, Prisoner Reentry, and Communities. *Annual Review of Sociology*, *40*, 411–429. http://doi.org/10.1146/annurev-soc-071811-145511

Myers, D. L., & Martin, R. (2004). Community member reactions to prison siting: Perceptions of prison impact on economic factors. *Criminal Justice Review*, *29*(1), 115-144.

Oppel Jr, R. A. (2017, May 18). States Trim Penalties and Prison Rolls, Even as Sessions Gets Tough. Retrieved September 05, 2017, from https://www.nytimes.com/2017/05/18/us/states-prisons-crime-sentences-jeff-sessions.html

Raphael, S. (2014). The new scarlet letter. *Negotiating the US Labor Market with a Criminal Record, WE Upjohn Institute*.

Raphael, S. (2011). Incarceration and prisoner reentry in the United States. *The ANNALS of the American Academy of Political and Social Science*, *635*(1), 192-215.

Raphael, S., & Stoll, M. A. (2009). Why are so many Americans in prison?. *Do prisons make us safer*, 27-72.

Rose, D. R., & Clear, T. R. (1998). Incarceration, social capital, and crime: Implications for social disorganization theory. *Criminology*, *36*(3), 441-480.

Sampson, R. J., & Groves, W. B. (1989). Community structure and crime: Testing social-disorganization theory. *American journal of sociology*, *94*(4), 774-802.

Shichor, D. (1992). Myths and realities in prison siting. *NPPA Journal*, *38*(1), 70-87.

Schmitt, J. and Warner, K. (2010) "Ex-offenders and the Labor Market," Center for Economic and Policy Research, November 2010.

Spanne, A. (2016, February 04). Can hiring ex-offenders make a business more profitable? Retrieved February 16, 2018, from https://www.theguardian.com/sustainable-business/2016/feb/04/us-prison-system-ex-offenders-employment-walmart-target-civil-rights

State Advances in Criminal Justice Reform, 2016. (n.d.). Retrieved September 05, 2017, from http://www.sentencingproject.org/publications/state-advances-criminal-justice-reform-2016/

State-by-State Data. (n.d.). Retrieved October 1, 2017, from http://www.sentencingproject.org/the-facts/#detail?state1Option=U.S.%20Total&state2Option=0

State Prison Expenditures, 2001. (2004, June). Retrieved October 1, 2017, from https://www.bjs.gov/content/pub/ascii/spe01.txt

State Prison Expenditures, 1996. (1999, August). Retrieved October 1, 2017, from https://www.bjs.gov/content/pub/ascii/spe96.txt

State Reforms Reverse Decades of Incarceration Growth. (n.d.). Retrieved September 05, 2017, from http://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2017/03/state-reforms-reverse-decades-of-incarceration-growth

The Pew Charitable Trusts, "33 States Reform Criminal Justice Policies Through Justice Reinvestment," http://www.pewtrusts.org/en/

research-and-analysis/fact-sheets/2016/11/33-states-reform-criminal-justice-policies-through-justice-reinvestment

Travis, J., Western, B., & Redburn, F. S. (2014). The growth of incarceration in the United States: Exploring causes and consequences.

Western, B., Kling, J., & Weiman, D. (2001). The Labor Market Consequences of Incarceration. *Crime and Delinquency, 47*(3), 410-427.

Western, B., & Sirois, C. (2017). Racial Inequality in Employment and Earnings after Incarceration.

Wildeman, C. (2016). Incarceration and population health in wealthy democracies. *Criminology*, *54*(2), 360-382.

Wintoki, M.B., Linck, J.S. and Netter, J.M., 2012. Endogeneity and the dynamics of internal corporate governance. Journal of Financial Economics, 105(3), pp.581-606.

Appendix: Definition of Variables for Chapter 2

Data Descriptions for Variables for Chapter 2

Variable	Definition	Database
Incarceration Variables		
Log (Incarceration Rate)	The natural log of the incarceration rate.	U.S. Bureau of Justice Statistics; U.S. Bureau of Labor Statistics
Incarceration Rate	The ratio of total custody over the state population.	U.S. Bureau of Justice Statistics; U.S. Bureau of Labor Statistics
Total Custody	The sum of the total men in custody and total women in custody variables in the data from the Bureau of Justice Statistics.	U.S. Bureau of Justice Statistics
Firm-control Variables		
Total Debt	Total debt is used as a control variable and is the firm's total debt.	Compustat
Collateral to Assets	The sum of the total net property, plant, and equipment and inventory divided by total assets (Strebulaev and Yang, 2013).	Compustat
Dividend	A dummy variable used to distinguish firms that issue dividends. 1 if firms issue dividends, 0 otherwise.	Compustat
Return on Assets	The dependent variable measuring firm performance and is calculated as income before extraordinary items divided by total assets (Strebulaev and Yang, 2013).	Compustat
Tangibility	Tangibility is a control variable and is a ratio calculated by fixed assets divided by book assets (Strebulaev and Yang, 2013).	Compustat
Capital Expenditure	Capital expenditure is used as a control variable and is a ratio calculated by dividing capital expenditure by book assets (Strebulaev and Yang, 2013).	Compustat
Size	Ln (Total Assets) is used as a control variable for size and is the natural log of total assets.	Compustat

The construction of the firm-control variables was referenced from Strebulaev, and Yang (2013) and then were created using Compustat firm financial data. Creation of indicator variables was referenced from Brushwood et al. (2017). Construction of the state-macroeconomic and indicator variables was referenced from Brushwood et al. (2017).

Data Descriptions for Variables for Chapter 2

Variable	Definition	Database
State- Macroeconomic Variables		
Log (Per Capita Income)	The natural log of the state per capita income.	U.S. Bureau of Labor Statistics
Percentage change in GDP	The percentage change of the state gross domestic product (GDP).	U.S. Bureau of Economic Analysis
Unemployment Rate	The state unemployment rate.	U.S. Bureau of Labor Statistics
Log (Population)	The natural log of the state population.	U.S. Bureau of Labor Statistics
Population	The state population.	U.S. Bureau of Labor Statistics
Indicator Variables		
Below Median	An indicator variable that takes the value of 1 if a firm's book value of assets is below the median value within its 3-digit SIC industry, 0 otherwise. The rationale for this is that smaller firms tend to have localized operations.	Compustat
Foreign Operations	Whether a firm has foreign operations. This takes the value of 1 if a firm reports zero or missing foreign income and foreign taxes, and 0 otherwise.	EDGAR, Dyreng, and Markle (2016)
Retail Industry	An indicator variable that takes the value of 1 if a firm is in the retail industry and 0 otherwise. The rationale for this is that retailers tend to have more diversified geographic operations.	Compustat
Number of States	The number of different states mentioned in a firm's 10-K filing. To find this, we use subsidiary data provided by Dyreng and Markle (2016)	EDGAR, Dyreng, and Markle (2016)

The construction of the firm-control variables was referenced from Strebulaev, and Yang (2013) and they were created using Compustat firm financial data. Creation of indicator variables was referenced from Brushwood et al. (2017). Construction of the state-macroeconomic and indicator variables was referenced from Brushwood et al. (2017).

Vita

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