CEO power, corporate governance, and firm leverage

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ABSTRACT

This study empirically examines the effect of corporate governance on the relation between CEO power and firm leverage. Results from OLS and industry fixed effects regressions show that CEO power is positively associated with firm leverage. However, this association is driven by the strength of corporate governance as powerful CEOs tend to choose higher levels of debt only when corporate governance is strong. When corporate governance is weak, CEO power does not seem to have any effect on firm leverage. Overall, results indicate that strong corporate governance mitigates the severity of manager-shareholder conflicts and induces powerful CEOs to choose higher leverage.

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1. Introduction

Most of the recent research on capital structure follows agency theory (Jensen and Meckling, 1976) which posits that managers do not make value increasing financing decisions. It argues that managers tend to choose lower levels of debt to protect their firm specific human capital and financial wealth from higher risks of bankruptcy (Amihud and Lev, 1981; Smith and Stulz, 1985; Friend and Lang, 1988). Managers may also choose sub-optimal levels of debt because higher levels of debt constrain their ability to divert free cash flows and pursue personal benefits at the expense of shareholders (Grossman and Hart, 1980; Jensen, 1986). However, agency issues may also lead to higher levels of debt. For example, Harris and Raviv, (1988) and Stulz, (1988) argue that entrenched managers actually take more than optimal levels of debt in order to inflate their equity voting power by reducing firm equity base. This increased equity helps in protecting them from external takeover threats. Overall, the research provides two implications. First, firm leverage is determined not only by market frictions like taxes and bankruptcy costs (e.g., Fischer et al., 1989), but also by the severity of agency problems present in manager-shareholder relationships (Morellec et al., 2012). Second, managers can take less or more debt than desired by the diversified shareholders.

This study argues that CEO power exacerbates the severity of agency problems present in manager-shareholder relationships and is an important determinant of firm leverage. An increase in power further misaligns the interests of managers and shareholders by enhancing managerial ability to influence financing decisions. More powerful CEOs are more likely to change firm leverage to extract personal benefits than the CEOs with less power. However, strong corporate governance effectively monitors powerful CEOs and induces them to make optimal financing decisions (Morellec et al. (2012). This study hypothesizes that strong corporate governance significantly influences the relation between CEO power and firm leverage by mitigating the severity of manager-shareholder relationships.

In order to test this hypothesis, I collect a sample of large US corporations for the period 1992-2016 by combining datasets from various sources. I use an index of power that measures the degree of CEO power and the governance index of Gompers et al. (2003) to measure the strength of corporate governance. Results show that CEO power is positively related to both book leverage and market leverage. However, this relation is driven by the strength of corporate governance as CEO power is positively associated with both book leverage and market leverage when corporate governance is strong. When corporate governance is weak, CEO power does not seem to have any significant effect on firm leverage.

The empirical results of this study are robust to alternative measurements of corporate governance and firm leverage. Results are similar when I run instrumental variable (IV) regressions to treat potential endogeneity of CEO power and firm leverage. Similarly, results remain robust when I drop all firm year observations that have zero leverage to address sample selection bias. Finally, results don't change when I use a two year lag between leverage and CEO power or divide the sample into weak and strong governance instead of using interaction variables.

This study contributes to the literature on firm leverage in two distinct ways. First, it adds to the scant literature on CEO power and firm leverage by showing that corporate governance significantly alters the association between CEO power and firm leverage. Previous studies have examined the relation between CEO power and firm leverage (e.g., Berger et al., 1997; Jiraporn et al., 2012; Chintrakarn et al., 2014) and corporate governance and firm leverage (e.g., Morellec et al., 2012; Liao et al., 2015) separately. This study shows that strong corporate governance is the primary driver of the relation between CEO power and financing decisions.

Second, it contributes to the literature that views CEO power as a multidimensional concept (e.g., Finkelstein, 1992; Tang et al., 2011; Han et al., 2016; Sheikh, 2018). Most of the previous studies on CEO power and capital structure use measures of power that reflect only one or two dimensions of power like duality/ founder status or CEO pay slice (CPS). This study constructs an index of power that encompasses structural, ownership and expert

dimensions of power drawn from Finkelstein (1992). This measure is a significant improvement over other measures that categorize CEO as being either powerful or not powerful or use only one dimension of power. This index is composed of seven different sources of power and captures the degree of CEO power.

The remainder of the study is organized as follows. Section 2 reviews related literature and develops testable hypotheses. Section 3 explains sources of data, measurement of primary variables and outlines empirical methodology. Section 4 discusses results and tests the robustness of the empirical results. Section 5 concludes.

2. Motivation and hypotheses

2.1. CEO power and firm leverage

Ever since the seminal paper of Modigliani and Miller (1958), significant research has gone into analyzing the determinants of firm capital structure. Besides the trade-off and pecking order theories, agency theory (Jensen and Meckling, 1976) has been at the center stage of this research. Unlike other theories, agency theory argues that CEO personal incentives play a critical role in the choice of firm financing decisions. It postulates that in modern corporations where ownership is separate from control, managers tend to choose lower levels of debt for two primary reasons. First, managers are risk-averse and undiversified as most of their human capital and financial wealth is tied to their firms (Amihud and Lev, 1981; Smith and Stulz, 1985; Holmstrom, 1999). An increase in debt exposes managers to higher risk and induces them to reduce leverage. Second, higher levels of leverage impose internal discipline on managers by constraining their ability to divert free cash flows to pursue personal benefits (Grossman and Hart, 1980; Jensen, 1986; Zwiebel, 1996). Managers therefore tend to take lower than optimal levels of debt to protect the value of their firm specific wealth from the increased likelihood of bankruptcy associated with higher levels of debt (Jensen, 1986; Friend and Lang, 1988).

The conflicts of interest between managers and shareholders become worse when CEOs gain influence and power. An increase in power increases managerial entrenchment and enhances their ability to influence the choice of leverage (Sheikh, 2022). Agency theory suggests that powerful CEOs tend to use their power to reduce firm debt. Berger et al. (1997) find that entrenched (powerful) CEOs seek to avoid debt and leverage increases after events that reduce managerial entrenchment (e.g., involuntary turnover, unsuccessful tender offers). Jiraporn et al., (2012) also find that when the CEOs plays a dominant role in the top management, firms adopt significantly lower levels of debt.

Although most of the studies argue that managerial entrenchment induces managers to reduce debt, there are a number of studies that make counter arguments. Harris and Raviv (1988) and Stulz (1988) for example contend that managers may actually prefer higher than optimal levels of debt to increase their voting power by reducing the equity base. The increased voting power protects them from external take over market. Zwiebel (1996) shows that managers of best performing firms engage in empire building and tend to increase firm leverage as they become entrenched. Chintrakarn et al., (2014) show that the relationship between CEO power and firm leverage is nonmonotonic and CEOs avoid debt until their power is sufficiently consolidated.

The above discussion shows that there is no consensus on how powerful CEOs influence firm leverage and the relationship between CEO power and firm leverage is still an empirical question. I therefore formulate the following null hypothesis:

Hypothesis 1: CEO power is negatively related to firm leverage.

2.2. CEO power, corporate governance, and firm leverage

Current research shows that firm leverage is determined by the severity of agency problems arising from

manager-shareholder conflicts (Morellic et al., 2012). Since strong corporate governance helps in alleviating the severity of agency problems through effective monitoring of managers, it exerts a significant influence on the relation between CEO power and firm leverage. Morellic et al. (2012) develop a trade-off model to examine the importance of manager-shareholder conflicts in the choice of capital structure. They show that strong corporate governance persuades managers to increase firm leverage. In an empirical study, Liao et al., (2015) find that managers tend to adopt higher levels of debt and the speed of adjustment of leverage towards the shareholders' desired level becomes faster as the quality of corporate governance improves. Sun et al. (2016) find a nonmonotonic relationship between managerial share ownership and the debt ratio. Jiaporn and Gleason (2007) however find that firm debt and the strength of shareholders' rights is negatively related, suggesting that firms adopt higher debt ratios where shareholder rights are more restricted.

The above discussion shows that corporate governance exerts significant influence on the relation between CEO power and firm leverage. The association between CEO power and firm leverage can significantly change when corporate governance changes. I therefore formulate the following hypothesis:

Hypothesis 2: Strong corporate governance influences the relation between CEO power and firm leverage.

3. Data, sample selection and measurement

3.1. Sample selection

I collect a sample of US firms by combining datasets from various sources. Since the data on CEO compensation and firm specific wealth are available only from 1992, the sample covers the period 1992-2016. The data on CEO pay slice (CPS), pay gap, tenure, equity ownership, and titles are drawn from S&P Execucomp database. Information on board independence and corporate governance is extracted from Institutional Shareholders' Service (formerly RiskMetriks). Data on CEO founder status are hand collected using Lexis Nexis Academic Universe. Data on firm financials like sales, debt, profitability, and leverage are derived from Compustat. I drop firms in the financial sectors and in the regulated industries (SIC codes in the range 4910-4949 and 6000-6999) following previous studies. The final sample consists of 34,239 firm year observations (2,810 companies). However, the actual observations used in each regression are less due to missing observations on some control variables and due to one year lag between measures of firm leverage and CEO power.

3.2. Measuring CEO power

There is no universal definition of CEO power in the literature. Generally, CEOs are considered powerful if they can influence strategic decisions despite potential opposition from their boards. Most of the early studies use CEO status as founder/chair of the board to measure CEO power (Weisbach, 1988; Brickley et al., 1994; Yermack, 1996; Agrawal and Knoeber, 1996; Rosenstein and Wyatt, 1997; Adams et al., 2005; Villalonga and Amit, 2006; Fahlenbrach, 2009). Some of the recent studies use CEO pay slice (CPS) as a measure of CEO power (Bebchuk et al., 2011; Jiraporn and Chintrakarn, 2013; Chintrakarn et al., 2014; Lee et al., 2015). These proxies of CEO power are good, but they measure only a specific aspect of power and ignore many important dimensions that influence CEO ability to influence firm strategic decisions.

Finkelstein (1992) argues that CEO power should be analyzed with four broad dimensions: structural, ownership, expert, and prestige. Structural power relates to the influence from formal hierarchical organizational structure. Ownership power is based on CEO relationship with the founding family and ownership of firm equity. Expert power is gained though long successful careers as managers. Prestige power is the overall reputation and image of the CEO in the market. Tang et al., (2011) however argue that the prestige dimension of CEO power is not

a proximal measure relative to other dimensions and should not be included in a measure of CEO power. I follow previous studies that treat CEO power as a multidimensional concept (Tang et al., 2011; Han et al., 2016; Sheikh, 2019) and construct an index of CEO power based on seven sources that encompass structural, ownership, and expert dimensions of power.

Although CEO stock ownership is a part of CEO ownership power, I do not include it in the power index because it also provides incentives to the CEOs to change firm leverage. The agency theory argues that a higher level of firm specific wealth aligns managerial and shareholder interests and reduces agency costs. It, however, also exposes the already poorly diversified risk-averse CEOs to more firm specific risk and induces them to reduce firm risk. Instead, I include CEO firm specific wealth to control for CEO incentives as a control variable.[1] The description of the individual components of the power index is given below.

3.2.1. Structural power: Structural power is measured with CEO pay slice, CEO pay gap, CEO duality/triality and board independence.

CEO pay slice. Bebchuk et al. (2011) argue that CEO pay slice (CPS) measured by the ratio of CEO compensation to the aggregate total compensation of top five executives in the management reflects the relative influence and power of the CEO and measures CEO centrality in the executive team. I follow Bebchuk et al. (2011) and construct CPS accordingly. I create a variable CPS power that equals 1 if CPS is greater than the sample median CPS and 0 otherwise.

CEO pay gap. The gap between CEO compensation and the next highest paid executive also reflects CEO power and importance relative to the second most powerful executive in the management team. I construct CEO pay gap (CPG) as the difference between CEO and the next highest paid executive's compensation as a ratio of the total compensation of the top five executives. The indicator variable CPG power equals 1 if the CPG is greater than the sample median CPG and 0 otherwise.

CEO duality/triality. Previous studies on CEO power use the concentration of titles in CEO position as a measure of power (Adams et al., 2005; Tang et al., 2011; Morse et al., 2011). Concentration of the titles of "CEO", "chair" of the board, and "president" of the company reduces board's monitoring power and increases CEO power (Hayward and Hambrick, 1997). Duality equals 1 if the CEO is also the chair of the board and triality equals 1 if the CEO is also the president of the company besides being the chair of the board and 0 otherwise.

Board independence. Most of the early studies used board structure to measure CEO power. Independent directors are more effective in monitoring the CEO (Fama and Jensen, 1983). A higher proportion of outside/independent directors on the board restricts CEOs ability to make unilateral decisions. I create an indicator variable board power that equals 1 if the proportion of independent directors on the board is less than the sample median proportion of independent directors and 0 otherwise.

3.2.2. Ownership power: Ownership power is measured with CEO status as a founder.

Founding family. CEOs that are either founders or are related to the founding family tend exert more power and influence on their boards and enjoy greater discretion in making key strategic decisions. Founders or founding family CEOs build powerful relations with their boards over a period of time. They are also more likely to appoint their own directors and other executives to the team. I construct a variable family power that equals 1 if the CEO is either founder or related to the founding family and 0 otherwise.

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[1] CEO firm specific wealth is the sum of the value of stock and option portfolio held by the CEO. For more details, please see Coles et al., (2006). The data on firm specific wealth are available at https://sites.temple.edu/lnaveen/data/

3.2.3. Expert power: CEO tenure is used to measure expert power.

CEO tenure. CEOs that stay on their jobs for long time tend to weaken the monitoring ability of their boards by building influential relations (Hermalin and Weisbach, 1988; Goyal and Park, 2002; Ryan and Wiggins, 2004). Longer tenures also indicate a history of successful performance and value creation. I construct tenure power that equals 1 if CEO tenure is greater than the sample median tenure and 0 otherwise.

CEO power is the sum of seven indicator variables described above. This variable ranges between 0 and 7 and reflects the degree of CEO power. It is important to note that a CEO who is categorized as powerful in one dimension may not necessarily be powerful in other dimensions. Following previous studies (Han et al., 2016), I also create an indicator variable "high power" that equals 1 if the power index is greater than the sample median and 0 otherwise.

3.3. Measuring firm leverage

I use two measures of firm leverage: book leverage and market leverage following previous studies on capital structure (Berger et al., 1997; Jiaporn et al., 2012). Book leverage is calculated as the book value of total debt divided by the book value of total assets. Market leverage is the ratio of book value of total debt to book value of total debt plus the market value of equity. The market value of equity in turn is computed by multiplying the stock price with the total number of shares outstanding. Both of these measures are continuous and range between 0 and 1.

In additional regressions I also use net issuance of debt and net change in leverage as dependent variables (Bereger et al.,1997) to check the robustness of my results to a change in the measurement of leverage. Net issuance of debt equals long term debt issuance minus long term debt reduction plus changes in current debt as a ratio of total assets. Net leverage change equals net issuance of debt minus net issuance of equity as a ratio of total assets. Net issuance of equity is the difference between sale of common and preferred stock minus purchase of common and preferred stock.

3.4. Measuring corporate governance

I use the governance index of Gompers et al. (2003) to measure the quality of corporate governance. Gompers et al. (2003) construct a broad based index of corporate governance (G-index) using surveys of the Investor Responsibility Research Center (IRRC, then RiskMetriks and now ISS). The surveys provide 24 antitakeover provisions across five categories that restrict shareholder rights and reduce the quality of corporate governance. Five of the categories relate to delaying hostile takeover bids, shareholder voting rights, protection to executives and directors, state laws and other defenses. The G-index is constructed by adding one point for each antitakeover provision that reduces the quality of corporate governance. An increase in the index indicates a decrease in the quality of governance.

Data on G-index are available starting from 1990 for every other year because the surveys are updated every other year. Previous studies (e.g., Gompers et al., 2003) replace missing observations with the latest year's available data because there is not much year to year change in the index for individual firms. Following these studies, I replace missing observations with previous year's values. I then create categorical variables to measure weak and strong governance. Weak governance equals 1 if the G-index is greater than the sample median and 0 otherwise. Strong governance is 1-weak governance.

3.5. Empirical methodology

I estimate the determinants of firm leverage using CEO, firm, and governance variables. I use the following equation as benchmark regressions.

$$Leverage_{i,t+1} = \beta_0 + \beta_1 Power\ index_{i,t} + \sum_{j=2}^{n} \beta_j\ Control\ Variables_{i,t} + \varepsilon_{i,t} \tag{1}$$

where i denotes firm and t denotes time series dimension. Leverage is measured by book leverage and market leverage. The power index is the CEO power index that ranges between 0 and 7. Firm leverage is measured at period t+1 and CEO power and all other control variables at period t. I estimate equation (1) using ordinary least squares (OLS) with robust standard errors clustered at the firm level and industry fixed effects regressions using Fama-French 48 industry classification. The OLS regressions include both industry and year controls and the industry fixed effects regressions include only year controls. Besides CEO power index, I control various CEO, firm and governance variables given in the prior literature (e.g. Berger et al., 1997).

I use two CEO characteristics in the benchmark regressions: CEO age and firm specific wealth. CEO age is an important determinant of CEO risk aversion and firm leverage. Older CEOs tend to be more risk-averse and less likely to increase firm leverage. Agency theory argues that CEOs tend to reduce firm leverage to protect their firm specific wealth from the increased risk of bankruptcy attached to higher leverage. To control this, I include total value of stock and options held by a CEO to measure firm specific wealth and expect a negative sign on this variable.

Among firm characteristics firm size is known to have significant effect on leverage (Friend and Lang, 1988). I use log of total assets to measure firm size (Berger et al, 1997). Firms with higher profitability have sufficient internally generated funds and are less likely to rely on external debt. Rajan and Zingalese (1995) find a negative relation between firm profitability and debt. I measure profitability with the ratio of earnings before taxes, depreciation and amortization to total assets (EBITDA/assets). Higher levels of free cash flows increase CEO ability to divert corporate resources. I compute free cash flows as cash flows from operations minus capital expenditures divided by total assets.

Asset tangibility is another important determinant of firm leverage as firms can use tangible assets as collateral for more debt and collateral reduces agency problems (Degryse et al., 2012). I measure asset tangibility as the ratio of fixed assets to total assets. Previous studies find both a negative (DeAngelo and Masulis, 1980) and positive (Bathala et al., 1994) association between non-debt tax shield (NTDS) and firm leverage. I therefore include NTDS in all the regressions. It is measured as the sum of depreciation and amortization divided by total assets. I include R&D expenditures as a ratio of total assets to control for resource competition and capital expenditures to total assets to control for growth opportunities. Since there are numerous missing observations on R&D expenditures, I replace the missing observations with 0. However, to control for the systematic effect of missing observations I include a categorical variable that equals 1 if R&D expenditures are missing and 0 otherwise. Finally, I include year and industry controls in OLS regressions and year controls in industry fixed effects regressions.

Table 1 provides descriptive statistics of the variables used in the analysis. The average CEO in the sample is 56 years old and holds $33.3 million in the form of stock and stock options. The average firm in the sample has 20% book leverage and 18.52% market leverage. Net issuance of debt is 2% of total assets and net change in leverage is 2.7% of total assets. The average firm in the sample has $6.45 billion in assets. Its profitability, free cash flows and fixed assets ratio are 37.3%, 12.9% and 54.1% of total assets respectively. The average firm has non-debt tax shield, capital, and R&D expenditures of 4.65%, 5.8%, and 3.6% of assets respectively. Average G-index and E-index are approximately 8 and 3 respectively.

Table 2 (panel A) provides statistics of the seven individual components of the power index. Average CEO pay slice (CPS) is 38.11% of the total pay of executive team which is similar to that provided by Bebchuk et al. (2011). The CEO is also the chair of the board about 43% of the time and chair and president about 17% of the time. The CEO is either the founder or related to the founding family 5.9% of the time. Average CEO tenure is 7 years and the

<div align="center">Table 1. Descriptive statistics.</div>

Variable	Mean	Median	Std. Dev.	Minimum	Maximum	Observations
CEO characteristics						
CEO age	55.583	56.000	7.602	27.000	96.000	34062
Firm specific wealth ($million)	33.331	16.046	38.278	2.344	122.235	27231
Leverage						
Book leverage	0.201	0.171	0.206	0.000	4.394	34064
Market leverage	0.185	0.127	0.203	0.000	1.000	34058
Net issuance of debt	0.020	0.000	0.218	-11.486	28.000	27679
Net leverage change	0.027	0.011	0.248	-11.689	28.000	27561
Firm characteristics						
Assets	6452	1229	25545	0.000	797769	34239
Non-debt tax shield	0.046	0.040	0.044	0.000	3.354	34104
Free cash flows	0.373	0.333	0.286	-7.023	3.846	33866
Profitability	0.129	0.135	0.300	-32.000	1.250	34057
Fixed assets ratio	0.541	0.547	0.217	0.000	1.000	33273
Capital expenditures	0.058	0.040	0.059	-0.033	1.205	33932
R&D expenditures	0.036	0.002	0.120	-0.808	14.860	34239
G-index (0-24)	8.099	8.000	2.488	1.000	18.000	30758
E-index (0-6)	2.979	3.000	1.614	0.000	6.000	30758

Notes: Table 1 provides descriptive statistics of the variables for the period 1992-2016. Book leverage is the book value of total debt divided by the book value of total assets. Market leverage is the book value of debt divided by the sum of the book value of debt and market value of equity. Non-debt tax shield is the ratio of sum of depreciation and amortization divided by total assets. Free cash flows is net income plus depreciation and amortization minus capital expenditures. Profitability is the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets. Fixed asset ratio is the ratio of fixed assets to total assets. R&D and capital expenditures are divided by total assets. G-index is the governance index of Gompers et al. (2003). E-index is the entrenchment index of Bebchuk et al. (2009). CEO firm specific wealth is the sum of the value of CEO stock and option holdings.

The average board is about 71% comprised of independent directors. The average power index is 2.42.

Panel B of table 2 provides correlation matrix of the components of CEO power index. It seems that almost all of the components are significantly correlated with each other. The highest correlation is between duality and triality which is as expected. The correlations are generally similar to Han et al., (2016) index of power.

<div align="center">Table 2. CEO power index.</div>

Panel A: CEO power index and its components						
Variables	Mean	Median	Std. Dev.	Minimum	Maximum	Observations
CPS	0.382	0.379	0.136	0.000	1.000	34017
CPG	0.191	0.171	0.137	0.000	1.000	33193
Duality	0.434	0.000	0.496	0.000	1.000	34239
Triality	0.178	0.000	0.383	0.000	1.000	34239
Outside directors	0.707	0.750	0.170	0.000	1.000	25812
Founding family	0.059	0.000	0.236	0.000	1.000	34239
Tenure	7.015	5.000	7.448	0.000	61.000	33337
Power index	2.417	2.000	1.458	0.000	7.000	34239

Panel B: Correlation matrix of the components of CEO power index							
	Variables	I	II	III	IV	V	VI	VII
I	CPS	1.000						
II	CPG	0.899*	1.000					
III	Duality	0.016*	0.025*	1.000				
IV	Triality	0.101*	0.129*	0.506*	1.000			
V	Outside directors	0.175*	0.193*	-0.047*	0.060*	1.000		
VI	Founding family	-0.111*	-0.103*	0.094*	-0.022*	-0.186*	1.000	
VII	Tenure	-0.023*	-0.034*	0.154*	0.030*	-0.142*	0.224*	1.000

Notes: Table 2 provides descriptive statistics of the various components of CEO power index. CEO pay slice (CPS) is the ratio to CEO compensation to the aggregate total compensation of top five executives including the CEO. CEO pay gap (CPG) is the

*ratio of the gap between total CEO compensation and the next highest paid executive to the aggregate total compensation of top five executives including the CEO. CEO duality equals 1 if the CEO is the chair of the board. Triality equals 1 if the CEO is the chair of the board and the president of the company. Board composition is the percentage of independent directors on the board. Founding family equals 1 if the CEO is either founder or related to the founding family. Tenure is the number of years the CEO has been in office. I then create indicator variables that equal 1 if CPS, CPG, and CEO tenure are above the sample median and board independence is below the sample median. The power index is the addition of all indicator variables and ranges between 0 and 7. *significant at 5% or better.*

4. Results

4.1. CEO power and firm leverage: Benchmark regressions

Table 3 provides results from the benchmark regressions of the effect of CEO power on firm leverage measured by book leverage and market leverage. Columns 1 and 3 give results from ordinary least squares (OLS) with robust standard errors clustered at firm level. Columns 2 and 4 report results from industry fixed effects regressions using Fama-French 48 industry classification. The coefficients on CEO power are positive and significant in all specifications indicating that an increase in CEO power is associated with higher levels of debt. It seems that powerful CEOs tend to increase both book leverage and market leverage. The results in table 3 reject hypothesis 1 that postulates that CEO power is negatively related to firm leverage.

Among other control variables, the coefficients on CEO age are all negative but significant only in book leverage regressions. The coefficients on CEO firm specific wealth are negative and significant suggesting that when firm specific wealth of CEOs increases, they tend to reduce firm leverage. The coefficients on strong governance are negative but significant only in one specification. Firm size has a positive and significant effect on leverage. Similarly, non-debt tax shield is positively related to firm leverage and free cash flows have negative effect on firm leverage. The coefficients on firm profitability and capital expenditure are all negative. Asset tangibility (fixed assets ratio) is positively related to firm leverage. R&D expenditures have a negative effect on market leverage but weak positive effect on book leverage. Overall, the results in the benchmark regressions show that CEO power is positively associated with firm leverage.

4.2. CEO power and firm leverage: Effect of corporate governance

In order to examine the effect of corporate governance on the relation between CEO power and firm leverage, I divide the sample into strong and weak corporate governance. Weak governance equals 1 if G-index of Gompers et al. (2003) is greater than sample median and zero otherwise. Strong governance is 1-weak governance. I then create interaction variables of power × weak governance and power × strong governance and do not include power variable in the regression. This simple transformation allows an easy and direct interpretation of the effect of strong and weak governance (Chakraborty et al., 2014). The coefficient on power × strong governance measures the effect of power on leverage when corporate governance is strong and the coefficient on power × weak governance measures the effect of power on leverage when corporate governance is weak.

Results are presented in Table 4. The coefficients on strong governance × power are positive and significant in all specifications. However, the coefficients on weak governance × power are not significant in any specification at any acceptable level. These results support hypothesis 2 and show that the positive association between CEO power and firm leverage is driven by corporate governance. It seems that strong corporate governance induces powerful CEOs to increase firm leverage. The coefficients on all other control variables have signs and significance similar to the benchmark regressions.

Table 3. CEO power and firm leverage: Benchmark regressions.

	Book leverage $_{t+1}$		Market leverage $_{t+1}$	
Variables	OLS	Industry Fixed Effects	OLS	Industry Fixed Effects
CEO power	0.0026*	0.0017**	0.0034***	0.0025***
	(0.076)	(0.040)	(0.010)	0.000
CEO age	-0.0006*	-0.0006***	0.0001	0.0001
	(0.072)	0.000	(0.817)	(0.521)
Firm specific wealth	-0.0048**	-0.0049***	-0.0188***	-0.0188***
	(0.038)	0.000	0.000	0.000
Strong governance	-0.0052	-0.0036	-0.0057	-0.0049**
	(0.367)	(0.154)	(0.287)	(0.028)
Log (assets)	0.0117***	0.0107***	0.0196***	0.0164***
	0.000	0.000	0.000	0.000
Non-debt tax shield	0.3304**	0.3537***	0.2600***	0.3122***
	(0.011)	0.000	(0.002)	0.000
Free cash flows	-0.0088	-0.0352***	-0.0269**	-0.0594***
	(0.759)	0.000	(0.039)	0.000
Profitability	-0.1325	-0.1037***	-0.2350***	-0.1994***
	(0.342)	0.000	0.000	0.000
Fixed assets ratio	0.1598***	0.1975***	0.1573***	0.1810***
	0.000	0.000	0.000	0.000
Capital expenditures	-0.2185*	-0.1824***	-0.2696***	-0.2690***
	(0.054)	0.000	0.000	0.000
R&D expenditures	0.1024	0.1356***	-0.2667***	-0.2147***
	(0.222)	0.000	0.000	0.000
R&D missing	0.0400***	0.0372***	0.0359***	0.0293***
	0.000	0.000	0.000	0.000
Industry controls	Yes	No	Yes	No
Year controls	Yes	Yes	Yes	Yes
Observations	23,571	23,571	23,571	23,571
R-squared (overall)	0.0791	0.046	0.1718	0.1089

Notes: Results are from OLS with robust standard errors clustered at firm level and industry fixed effects based on Fama-French 48 industry classification. Power is the sum of seven categorical variables. Book leverage is the book value of total debt divided by the book value of total assets. Market leverage is the book value of debt divided by the sum of the book value of debt and market value of equity. Weak governance equals 1 if G-index is greater than sample median. Strong governance is 1-weak governance. Non-debt tax shield is the ratio of sum of depreciation and amortization divided by total assets. Free cash flows is net income plus depreciation and amortization minus capital expenditures. Profitability is the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets. Fixed asset ratio is the ratio of fixed assets to total assets. R&D and capital expenditures are divided by total assets. CEO firm specific wealth is the sum of the value of CEO stock and option holdings. Industry and year controls not reported. *, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.

4.3. CEO power and firm leverage: Using instrumental variable (IV-GMM) regressions.

This study examines the effect of CEO power on firm leverage assuming that CEO power impacts firm leverage. However, there may be concerns about endogeneity of power and leverage due to reverse causality. In order to test the robustness of the empirical results, I use instrumental variable (IV-GMM) regressions to treat endogeneity of CEO power. The IV-GMM estimation implements two-step efficient generalized method of moments (GMM) estimator and generates efficient estimates of the coefficients as well as consistent estimates of the standard errors.[2] Following Khanna et al. (2015) I use sudden exogenous non-CEO top executive/director deaths (unrelated to

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[2] STATA executes this estimation with the ivreg2, gmm2s robust command. For more details, please see Baum et al (2003)

Table 4. CEO power and firm leverage: Effect of corporate governance.

	Book leverage $_{t+1}$		Market leverage $_{t+1}$	
Variables	OLS	Industry Fixed Effects	OLS	Industry Fixed Effects
Power× strong governance	0.0040**	0.0036***	0.0046***	0.0040***
	(0.031)	0.000	(0.004)	0.000
Power× weak governance	-0.0003	-0.0011	0.0016	0.0004
	(0.860)	(0.366)	(0.419)	(0.737)
Strong governance	-0.0159*	-0.0158***	-0.0137*	-0.0144***
	(0.090)	(0.001)	(0.087)	(0.001)
CEO age	-0.0006	-0.0006***	0.0001	0.0001
	(0.110)	0.000	(0.828)	(0.541)
Firm specific wealth	-0.0049**	-0.0050***	-0.0189***	-0.0189***
	(0.037)	0.000	0.000	0.000
Log (assets)	0.0129***	0.0107***	0.0196***	0.0164***
	0.000	0.000	0.000	0.000
Non-debt tax shield	0.3091**	0.3524***	0.2593***	0.3112***
	(0.015)	0.000	(0.002)	0.000
Free cash flows	-0.0084	-0.0346***	-0.0265**	-0.0590***
	(0.771)	0.000	(0.041)	0.000
Profitability	-0.137	-0.1044***	-0.2354***	-0.2000***
	(0.327)	0.000	0.000	0.000
Fixed assets ratio	0.1733***	0.1982***	0.1576***	0.1816***
	0.000	0.000	0.000	0.000
Capital expenditures	-0.2009*	-0.1814***	-0.2688***	-0.2682***
	(0.076)	0.000	0.000	0.000
R&D expenditures	0.0962	0.1348***	-0.2669***	-0.2154***
	(0.269)	0.000	0.000	0.000
R&D missing	0.0456***	0.0371***	0.0358***	0.0293***
	0.000	0.000	0.000	0.000
Industry controls	Yes	No	Yes	No
Year controls	Yes	Yes	Yes	Yes
Observations	23,571	23,571	23,571	23,571
R-squared (overall)	0.0878	0.0643	0.1719	0.1092

*Notes: Results are from OLS with robust standard errors clustered at firm level and industry fixed effects based on Fama-French 48 industry classification. Power is the sum of seven categorical variables. Book leverage is the book value of total debt divided by the book value of total assets. Market leverage is the book value of debt divided by the sum of the book value of debt and market value of equity. Weak governance equals 1 if G-index is greater than sample median. Strong governance is 1-weak governance. Non-debt tax shield is the ratio of sum of depreciation and amortization divided by total assets. Free cash flows is net income plus depreciation and amortization minus capital expenditures. Profitability is the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets. Fixed asset ratio is the ratio of fixed assets to total assets. R&D and capital expenditures are divided by total assets. CEO firm specific wealth is the sum of the value of CEO stock and option holdings. Industry and year controls not reported. *, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.*

performance pressures) and yearly industry average turnover ratio of top-four non-CEO executives/directors as instruments. Executive/director death is the number of top executives/directors who left their positions due to death during the current CEOs tenure up to the current year. Executive/director deaths and yearly industry average turnover ratio are highly correlated with CEO power but are unlikely to have any direct effect on firm leverage except through CEO power.[3]

Results are given in Table 5. The coefficients on executive/director death and industry average turnover ratio are negative in the first stage regressions (not reported to save space). However, the coefficients on

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[3] I also ran regressions of executive/director deaths and yearly industry average turnover ratio on firm leverage and found statistically insignificant coefficients.

executive/director death in the strong governance sample in both book leverage and market leverage regressions are negative but not significant. In the second stage regressions, the coefficients on CEO power (instrumented) are positive and significant only in strong governance samples and not significant in weak governance samples. Thus, CEO power has a positive and significant effect on firm leverage only when corporate governance is strong even when CEO power is treated as endogenous. The coefficients on all other control variables have signs and significance similar to the benchmark regressions.

Table 5 also provides statistics to test weak and over identification of the instruments used in the first stage. These tests help to check the validity and relevance of these instruments. The weak identification test statistic is Kleibergen-Paap (Cragg-Donlad) F-statistic. Comparing this F-statistic with Stock-Yogo's (Stock et al., 2002) critical values shows that the F-statistic exceeds critical values in the strong governance sample. We can thus reject the hypothesis that the instruments used in the first stage are weak or under-identified. However, the F-statistics are less than 10 in the weak governance sample which may be a little concern. The Hansen J statistic is calculated to test the hypothesis of over-identification and the relevance of instruments used in the first stage. This statistic is not statistically significant at any acceptable level in both samples rejecting the hypothesis of overidentification. Thus, the instruments used in the IV-GMM regressions are generally valid and relevant for empirically estimating the effect of CEO power on firm leverage.

Table 5. CEO power and firm leverage: Using instrumental variables (IV-GMM) regressions.

	Book leverage $_{t+1}$		Market leverage $_{t+1}$	
Variables	Strong governance	Weak governance	Strong governance	Weak governance
CEO power	0.0561**	0.0592	0.0685**	0.0793
	(0.046)	(0.106)	(0.013)	(0.113)
CEO age	-0.0025***	-0.0016	-0.0019**	-0.002
	(0.007)	(0.156)	(0.028)	(0.170)
Firm specific wealth	-0.0151**	-0.0230**	-0.0305***	-0.0418***
	(0.020)	(0.013)	0.000	(0.001)
Log (assets)	0.0156***	0.0117**	0.0189***	0.0255***
	0.000	(0.023)	0.000	0.000
Non-debt tax shield	0.3674***	0.4315*	0.4318***	0.1866*
	(0.009)	(0.077)	0.000	(0.070)
Free cash flows	-0.0131	-0.0737**	-0.0414**	-0.0472***
	(0.733)	(0.022)	(0.021)	(0.005)
Profitability	-0.1609	0.0805	-0.1818***	-0.2505***
	(0.339)	(0.307)	0.000	0.000
Fixed assets ratio	0.1917***	0.1712***	0.1874***	0.1023***
	0.000	0.000	0.000	0.000
Capital expenditures	-0.0917	-0.3544***	-0.2300***	-0.2382***
	(0.526)	0.000	(0.001)	0.000
R&D expenditures	0.1201	0.2427	-0.2161***	-0.1163
	(0.227)	(0.178)	0.000	(0.331)
R&D missing	0.0330**	0.0434***	0.0197**	0.0309***
	(0.045)	0.000	(0.045)	0.000
Industry controls	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes
K-Paap (Cragg-Donald) F statistic	11.423	8.420	11.321	6.620
Hansen J statistic	0.195	0.963	0.143	1.930
Observations	14053	9514	14053	9514

Notes: Results are from second stage 2SLS instrumental variable (IV-GMM) regressions. Power is the sum of seven categorical variables. Book leverage is the book value of total debt divided by the book value of total assets. Market leverage is the book value of debt divided by the sum of the book value of debt and market value of equity. Weak governance equals 1 if G-index

is greater than sample median. Strong governance is 1-weak governance. Non-debt tax shield is the ratio of sum of depreciation and amortization divided by total assets. Free cash flows is net income plus depreciation and amortization minus capital expenditures. Profitability is the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets. Fixed asset ratio is the ratio of fixed assets to total assets. R&D and capital expenditures are divided by total assets. CEO firm specific wealth is the sum of the value of CEO stock and option holdings. Industry and year controls not reported. *, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.

4.4. CEO power and firm leverage: Using alternative measures of leverage.

I use book leverage and market leverage to measure levels of debt. However, leverage ratios could change without a corresponding change in debt levels because debt to asset ratios may reflect cumulative result of years of separate decisions of debt and equity issuance (Mackie-Mason, 1990; Berger et al., 1997). It is important to see if the effect of governance remains same when leverage is measured as net new debt issued and net change in leverage. I therefore use net issuance of debt and net change in leverage as alternative measures of firm leverage. Net issuance of debt is the difference between total debt issued and total debt retired divided by total assets. Net change in leverage is the difference between net issuance of debt and net issuance of equity where net issuance of equity is computed as the difference between sale of common and preferred stock and the purchase of common and preferred stock divided by total assets.

Table 6. CEO power and firm leverage: Using alternative measures of leverage.

Variables	Net debt issued		Net leverage change	
	OLS	Industry Fixed Effects	OLS	Industry Fixed Effects
Power× strong governance	0.0014**	0.0015**	0.0023**	0.0019**
	(0.040)	(0.017)	(0.028)	(0.037)
Power× weak governance	0.0008	0.0009	0.0006	0.0006
	(0.231)	(0.192)	(0.484)	(0.581)
Strong governance	0.0028	0.0028	-0.0018	-0.0012
	(0.334)	(0.319)	(0.681)	(0.784)
CEO age	-0.0003***	-0.0003***	0.0001	0.0001
	(0.001)	0.000	(0.805)	(0.881)
Firm specific wealth	0.0023***	0.0021***	-0.0014	-0.0015**
	(0.001)	0.000	(0.132)	(0.038)
Log (assets)	0.0003	0.0002	0.0077***	0.0078***
	(0.680)	(0.757)	0.000	0.000
Non-debt tax shield	-0.3006***	-0.2747***	-0.3570***	-0.3275***
	0.000	0.000	0.000	0.000
Free cash flows	-0.0146**	-0.0186***	0.0306***	0.0296***
	(0.046)	0.000	0.000	0.000
Profitability	-0.0853**	-0.0851***	0.1790***	0.1723***
	(0.011)	0.000	0.000	0.000
Fixed assets ratio	0.0126*	0.0132***	0.0427***	0.0387***
	(0.054)	(0.005)	0.000	0.000
Capital expenditures	0.2657***	0.2772***	0.1803***	0.1570***
	0.000	0.000	0.000	0.000
R&D expenditures	-0.0122	-0.0415***	-0.0041	-0.0218
	(0.551)	(0.005)	(0.911)	(0.322)
R&D missing	0.0002	0.0005	0.0054*	0.0031
	(0.916)	(0.801)	(0.073)	(0.244)
Industry controls	Yes	No	Yes	No
Year controls	Yes	Yes	Yes	Yes
Observations	19,822	19,822	19,747	19,747
R-squared (overall)	0.0582	0.0532	0.0649	0.0718

Notes: Results are from OLS with robust standard errors clustered at firm level and industry fixed effects based on Fama-

French 48 industry classification. Power is the sum of seven categorical variables. Net issuance of debt is long term debt issued minus long term debt reduction plus changes in current debt divided by total assets. Net leverage change is net debt issued minus net equity issued divided by total assets. Weak governance equals 1 if G-index is greater than sample median. Strong governance is 1-weak governance. Non-debt tax shield is the ratio of sum of depreciation and amortization divided by total assets. Free cash flows is net income plus depreciation and amortization minus capital expenditures. Profitability is the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets. Fixed asset ratio is the ratio of fixed assets to total assets. R&D and capital expenditures are divided by total assets. CEO firm specific wealth is the sum of the value of CEO stock and option holdings. Industry and year controls not reported. *, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.

Table 6 presents results from OLS and industry fixed effects regressions for this specification. The coefficients on the interaction of CEO power and strong governance are positive and significant in both net issuance of debt and net change in leverage. However, the coefficients on the interaction of CEO power and weak governance are not significant in either net issuance of debt or net change in capital structure. The results in table 6 show that CEO power is positively related to net change in leverage only when corporate governance is strong and has no impact on leverage in firms that have weak governance. Using change in net leverage and net issuance of debt does not change the effect of corporate governance on the relation between CEO power and firm leverage. The coefficients on other control variables have signs and significance similar to the coefficients in table 4.

4.5. CEO power and firm leverage: Using alternative definition of corporate governance.

I use Gompers et al. (2003) G-index to measure corporate governance. However, Bebchuk et al (2009) argue that there is no a priori reason to believe that all the 24 IRRC provisions contribute equally to firm value and stock returns. They construct another index incorporating only those provisions out of the 24 that protect the incumbents from removal and call this index the entrenchment index (E-index). The E-index is comprised of only six provisions. Four of these provisions (staggered boards, limits to shareholder amendments of the bylaws, supermajority requirements for mergers, and supermajority requirements for charter amendments) set constitutional limits on shareholder voting powers. The other two (poison pills and golden parachutes) make hostile takeover attempts more expensive.

I use Bebchuk et al. (2009) E-index to measure governance as a robustness check. I create two categorical variables. Weak governance equals 1 if the E-index is greater than the sample median and 0 otherwise. Strong governance is 1-weak governance. I then create interaction variables of power × strong governance and power × weak governance and do not include power in the regressions. Results are given in table 7. As before, the coefficients on strong governance × power are positive and significant in both OLS and industry fixed effects regressions. However, the coefficients on weak governance × power are not significant in either OLS or industry fixed regressions at any acceptable level. The coefficients on all other variables have similar signs and significance. Using an alternative measure of corporate governance does not seem to change the primary results of this study.

4.6. CEO power and firm leverage: Using sample of firms with non-zero debt.

The sample used in the above analysis does not distinguish between firms that have zero debt and firms that have positive levels of debt. To check the robustness of my results to the exclusion of zero debt companies, I run the basic model on a sample of firms that have positive debt. The results are given in Table 8. The coefficients on the interaction of power and strong corporate governance are positive and significant in all specifications. However, the coefficients on the interaction of power and weak corporate governance are not significant at any acceptable level. It seems that powerful CEOs tend to increase leverage when they have strong governance. Dropping the firms that have zero debt from the sample does not change the primary findings of this study. The coefficients on all other control variables have generally same signs and significance as the benchmark regressions.

Table 7. CEO power and firm leverage: Using alternative measures of governance.

Variables	Book leverage $_{t+1}$		Market leverage $_{t+1}$	
	OLS	Industry Fixed Effects	OLS	Industry Fixed Effects
Power× strong governance	0.0028*	0.0023**	0.0040***	0.0032***
	(0.086)	(0.017)	(0.009)	0.000
Power× weak governance	0.0012	0.0005	0.0024	0.0013
	(0.601)	(0.704)	(0.248)	(0.259)
Strong governance	-0.0053	-0.0052	-0.0079	-0.007
	(0.554)	(0.285)	(0.325)	(0.107)
CEO age	-0.0006	-0.0006***	0.0001	0.0001
	(0.116)	0.000	(0.803)	(0.502)
Firm specific wealth	-0.0050**	-0.0050***	-0.0190***	-0.0189***
	(0.035)	0.000	0.000	0.000
Log (assets)	0.0132***	0.0110***	0.0200***	0.0167***
	0.000	0.000	0.000	0.000
Non-debt tax shield	0.3109**	0.3541***	0.2612***	0.3128***
	(0.015)	0.000	(0.002)	0.000
Free cash flows	-0.0083	-0.0348***	-0.0261**	-0.0587***
	(0.773)	0.000	(0.044)	0.000
Profitability	-0.1369	-0.1041***	-0.2357***	-0.2000***
	(0.327)	0.000	0.000	0.000
Fixed assets ratio	0.1733***	0.1979***	0.1575***	0.1813***
	0.000	0.000	0.000	0.000
Capital expenditures	-0.2031*	-0.1833***	-0.2704***	-0.2699***
	(0.073)	0.000	0.000	0.000
R&D expenditures	0.0965	0.1358***	-0.2659***	-0.2141***
	(0.269)	0.000	0.000	0.000
R&D missing	0.0458***	0.0373***	0.0360***	0.0295***
	0.000	0.000	0.000	0.000
Industry controls	Yes	No	Yes	No
Year controls	Yes	Yes	Yes	Yes
Observations	23,571	23,571	23,571	23,571
R-squared (overall)	0.0874	0.046	0.1717	0.1089

Notes: Results are from OLS with robust standard errors clustered at firm level and industry fixed effects based on Fama-French 48 industry classification. Power is the sum of seven categorical variables. Book leverage is the book value of total debt divided by the book value of total assets. Market leverage is the book value of debt divided by the sum of the book value of debt and market value of equity. Weak governance equals 1 if E-index is greater than sample median. Strong governance equals 1-weak governance. Non-debt tax shield is the ratio of sum of depreciation and amortization divided by total assets. Free cash flows is net income plus depreciation and amortization minus capital expenditures. Profitability is the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets. Fixed asset ratio is the ratio of fixed assets to total assets. R&D and capital expenditures are divided by total assets. CEO firm specific wealth is the sum of the value of CEO stock and option holdings. Industry and year controls not reported. *, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.

4.7. CEO power and firm leverage: Using two year lag between leverage and CEO power.

The regressions used in this analysis have a year lag between leverage measures and other control variables. Next, I use two a year lag to see if the results are sensitive to a change in the lag period between leverage and CEO power. Specifically, I measure book leverage and market leverage at period t+2 and CEO power and other control variables at period t. Results are provided in table 9. As before, the coefficients on the interaction of CEO power and strong governance are positive and significant in all specifications. The coefficients on the interaction of CEO power and weak governance are not significant in any specification. I also use a three year lag and find similar results. These results show that the primary findings of this study are robust to a change in the lag period.

Table 8. CEO power and firm leverage: Dropping firms with zero debt.

Variables	Book leverage $_{t+1}$		Market leverage $_{t+1}$	
	OLS	Industry Fixed Effects	OLS	Industry Fixed Effects
Power× strong governance	0.0037*	0.0033***	0.0049***	0.0043***
	(0.083)	(0.006)	(0.007)	0.000
Power× weak governance	-0.0002	-0.0011	0.0021	0.0009
	(0.916)	(0.405)	(0.288)	(0.472)
Strong governance	-0.0149	-0.0155***	-0.0141	-0.0154***
	(0.139)	(0.003)	(0.101)	(0.001)
CEO age	-0.0007*	-0.0007***	0	0.0001
	(0.077)	0.000	(0.989)	(0.610)
Firm specific wealth	-0.0034	-0.0037***	-0.0205***	-0.0209***
	(0.194)	0.000	0.000	0.000
Log (assets)	0.0026	0.0014	0.0135***	0.0107***
	(0.311)	(0.191)	0.000	0.000
Non-debt tax shield	0.3150**	0.3404***	0.3162***	0.3626***
	(0.026)	0.000	(0.001)	0.000
Free cash flows	-0.0132	-0.0343***	-0.0389**	-0.0714***
	(0.719)	0.000	(0.016)	0.000
Profitability	-0.1629	-0.1379***	-0.2987***	-0.2650***
	(0.363)	0.000	0.000	0.000
Fixed assets ratio	0.1434***	0.1672***	0.1364***	0.1631***
	0.000	0.000	0.000	0.000
Capital expenditures	-0.2169*	-0.2028***	-0.3016***	-0.3167***
	(0.077)	0.000	0.000	0.000
R&D expenditures	0.1715*	0.2074***	-0.3368***	-0.2941***
	(0.077)	0.000	0.000	0.000
R&D missing	0.0478***	0.0393***	0.0361***	0.0299***
	0.000	0.000	0.000	0.000
Industry controls	Yes	No	Yes	No
Year controls	Yes	Yes	Yes	Yes
Observations	19,728	19,728	19,728	19,728
R-squared (overall)	0.0746	0.0292	0.1651	0.0959

Notes: Results are from OLS with robust standard errors clustered at firm level and industry fixed effects based on Fama-French 48 industry classification. Power is the sum of seven categorical variables. Book leverage is the book value of total debt divided by the book value of total assets. Market leverage is the book value of debt divided by the sum of the book value of debt and market value of equity. Weak governance equals 1 if G-index is greater than sample median. Strong governance is 1-weak governance. Non-debt tax shield is the ratio of sum of depreciation and amortization divided by total assets. Free cash flows is net income plus depreciation and amortization minus capital expenditures. Profitability is the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets. Fixed asset ratio is the ratio of fixed assets to total assets. R&D and capital expenditures are divided by total assets. CEO firm specific wealth is the sum of the value of CEO stock and option holdings. Industry and year controls not reported. *, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.

5. Conclusion

Current research on capital structure shows that firm financing decisions are determined by the severity of agency problems in manager-shareholder relations. It suggests that managers can take more or less debt than is desired by shareholders. This study argues that an investigation of the influence of corporate governance on the relation between CEO power and firm leverage can help in explaining the mixed views on capital structure. It finds that CEO power is positively related to firm leverage. However, this positive association is driven by the strength of corporate governance. Specifically, it finds that CEO power has positive and significant effect on firm leverage only when corporate governance is strong and has no significant effect on leverage when governance is weak. Overall,

Table 9. CEO power and firm leverage: Using two year lag.

Variables	Book leverage $_{t+2}$		Market leverage $_{t+2}$	
	OLS	Industry Fixed Effects	OLS	Industry Fixed Effects
Power× strong governance	0.0035*	0.0031***	0.0045***	0.0039***
	(0.080)	(0.004)	(0.007)	0.000
Power× weak governance	-0.0002	-0.0009	0.0012	0
	(0.915)	(0.484)	(0.557)	(0.996)
Strong governance	-0.014	-0.0134***	-0.0142*	-0.0146***
	(0.157)	(0.007)	(0.089)	(0.001)
CEO age	-0.0007*	-0.0007***	-0.0001	-0.0001
	(0.050)	0.000	(0.812)	(0.646)
Firm specific wealth	-0.0043*	-0.0043***	-0.0166***	-0.0164***
	(0.062)	0.000	0.000	0.000
Log (assets)	0.0123***	0.0101***	0.0179***	0.0145***
	0.000	0.000	0.000	0.000
Non-debt tax shield	0.2620**	0.3105***	0.1553**	0.2086***
	(0.047)	0.000	(0.042)	0.000
Free cash flows	-0.0123	-0.0391***	-0.0314**	-0.0645***
	(0.647)	0.000	(0.017)	0.000
Profitability	-0.1023	-0.0692***	-0.2031***	-0.1661***
	(0.433)	0.000	0.000	0.000
Fixed assets ratio	0.1685***	0.1928***	0.1498***	0.1758***
	0.000	0.000	0.000	0.000
Capital expenditures	-0.1767*	-0.1552***	-0.2139***	-0.2083***
	(0.098)	0.000	0.000	0.000
R&D expenditures	0.1215	0.1643***	-0.2475***	-0.1899***
	(0.149)	0.000	0.000	0.000
R&D missing	0.0453***	0.0377***	0.0365***	0.0308***
	0.000	0.000	0.000	0.000
Industry controls	Yes	No	Yes	No
Year controls	Yes	Yes	Yes	Yes
Observations	22,581	22,581	22,581	22,581
R-squared (overall)	0.0772	0.039	0.1446	0.0877

Notes: Results are from OLS with robust standard errors clustered at firm level and industry fixed effects based on Fama-French 48 industry classification. Power is the sum of seven categorical variables. Book leverage is the book value of total debt divided by the book value of total assets. Market leverage is the book value of debt divided by the sum of the book value of debt and market value of equity. Weak governance equals 1 if G-index is greater than sample median. Strong governance is 1-weak governance. Non-debt tax shield is the ratio of sum of depreciation and amortization divided by total assets. Free cash flows is net income plus depreciation and amortization minus capital expenditures. Profitability is the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets. Fixed asset ratio is the ratio of fixed assets to total assets. R&D and capital expenditures are divided by total assets. EO firm specific wealth is the sum of the value of CEO stock and option holdings. Industry and year controls not reported. *, **, *** are statistically significant at the 1, 5 and 10% levels, respectively.

the empirical results suggest that strong corporate governance reduces the conflict between managers and shareholder and induces powerful CEOs to increase firm leverage.

Like all studies, this study has a few limitations. First, it uses a sample of large US corporations. The results of this study may not be generalized because corporate governance systems are significantly different from the US in many countries. Future research should use samples from other countries to check how corporate governance impacts the relation between CEO power and firm leverage. Second, this study uses data on non-financial and non-regulated industries. The corporate governance of regulated and financial industries is different from this sample. Future research should analyze data from financial and regulated industries to see if these results hold in those industries.

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Conflict of interest

The author claims that the manuscript is completely original. The author also declares no conflict of interest.

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