

# Capital Structure, CEO Dominance, and Corporate Performance

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**Abstract** We use agency theory to investigate the influence of CEO dominance on variation in capital structure. Due to agency conflicts, managers may not always adopt leverage choices that maximize shareholders' value. Consistent with the prediction of agency theory, the evidence reveals that, when the CEO plays a more dominant role among top executives, the firm adopts significantly lower leverage, probably to evade the disciplinary mechanisms associated with debt financing. Our results are important as they demonstrate that CEO power matters to critical corporate outcomes such as capital structure decisions. In addition, we find that the impact of changes in capital structure on firm performance is more negative for firms with more powerful CEOs. Overall, the results are in agreement with prior literature, suggesting that strong CEO dominance appears to exacerbate agency costs and is thus detrimental to firm value.

**Keywords** Capital structure · Agency costs · Leverage · CEO dominance · CEO power

**JEL Classification** G32 · G34

## 1 Introduction

Most existing research employs firm-, industry-, and market-level characteristics to account for corporate behavior and performance. Rarely investigated is the role of individual

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executives in influencing corporate outcomes. In spite of this, the prevalent view in the business press and among managers themselves is that CEOs and other top executives represent key factors in determining corporate practices (Bertrand and Schoar, 2003). The primary contribution of this study is to examine the impact of an important CEO characteristic- CEO dominance among top executives- on a critical corporate outcome-capital structure policy. We thus contribute to the crucial debate over whether top managers matter to corporate decisions (Morellec, 2004; Lieberman and O'Connor 1972; Finkelstein and Hambrick, 1996; Pfeffer, 1997; Child, 1972; Hambrick and Mason, 1984; Tushman and Romanelli, 1985; Weiner and Manoney 1981; Bertrand and Schoar, 2003).

Modigliani and Miller (1958) show that capital structure is irrelevant under the assumption of perfect capital markets. Since then, researchers have developed a number of theories to introduce market imperfections into capital structure choices. One theory that has received strong empirical support is agency theory. The main thrust of agency theory is that capital structure is determined by agency costs arising from the divergence of ownership and control. Due to agency conflicts, managers may not always adopt leverage choices that are value-maximizing for shareholders. Instead, managers may select the degree of leverage that maximizes their private benefits.

Motivated by agency theory, this study explores the impact of CEO dominance among top executives on capital structure choices. Strong CEO power has been linked to a number of crucial corporate outcomes.<sup>1</sup> For instance, firms with powerful CEOs exhibit lower firm value, lower profitability, more negative market reactions to acquisition announcements, poorer credit ratings, and higher costs of debt. (Bebchuk, Cremers, and Peyer, 2011; Liu and Jiraporn, 2010). It appears that strong CEO dominance promotes managerial entrenchment, exacerbates agency conflicts, and ultimately jeopardizes firm value. Powerful CEOs may exercise their influence on leverage choices and make capital structure decisions that are beneficial to themselves but are not necessarily in the interests of the shareholders. We thus hypothesize that the strength of CEO power is related to capital structure decisions.

Although agency theory suggests that agency costs may make leverage choices deviate from the optimal level for shareholders, it is unclear whether the departure from the optimal leverage is positive or negative, i.e., whether agency costs lead to too much or too little leverage. For instance, on the one hand, managers may shun taking on debt because interest payments reduce the free cash flow available for consumption by managers (Grossman and Hart, 1982). On the contrary, managers may increase leverage, which reduces the equity base, in order to consolidate their voting power (Stulz, 1988). Hence, a priori, the existence of agency problems could lead to either too high or too low leverage.

We use a novel approach invented by Bebchuk, Cremers, and Peyer (2011) to determine CEO dominance. A CEO is considered more dominant or more powerful if his CEO pay slice is larger. The CEO pay slice (CPS) represents the fraction of the aggregate top-five compensation captured by the CEO. This particular measure of CEO dominance is shown to explain a rich set of corporate performance and other critical outcomes such as Tobin's  $q$ , accounting profitability, credit ratings and the cost of debt financing (Bebchuk, Cremers, and Peyer, 2011; Liu and Jiraporn, 2010). CPS offers several advantages over other indicators of CEO dominance. For instance, relative to CEO duality, CPS is a continuous variable that captures the fine gradation of CEO dominance better than dichotomous variables such as CEO duality.

<sup>1</sup> The literature in this area uses several expressions to refer to CEO dominance. In this study, we use CEO power, CEO dominance, and CEO centrality interchangeably.

Our empirical evidence reveals that, when the CEO plays a more dominant role, the firm adopts significantly lower leverage, i.e. there is an inverse association between CEO dominance and the degree of leverage. Although we do not find a significant cross-sectional association between CEO dominance and leverage, we do find that, within the same firm, when the CEO acquires more power, there is a correspondent decline in leverage. This relation survives even after we control for a host of firm-specific characteristics such as firm size, profitability, growth opportunities, non-debt tax shields, asset tangibility, governance quality and, free cash flow. Furthermore, we recognize that CEO dominance and leverage may be determined endogenously. As a result, we provide suggestive evidence that endogeneity is unlikely. CEO dominance is more likely to bring about lower leverage than vice versa. Finally, we show that the negative relation between CEO power and leverage is more pronounced for firms with high (low) credit ratings (costs of debt).

Most studies in capital structure simply investigate how choices of capital structure are affected by a particular set of variables. We argue that this is not adequate. It is imperative to examine the ultimate effect on firm performance. We examine whether the impact of changes in leverage on firm performance is a function of CEO dominance. To the extent that CEO dominance worsens agency costs through the adoption of sub-optimal leverage, the impact of changes in leverage on firm performance should be more negative in firms with more powerful CEOs than it is in firms with less powerful CEOs. We find empirical evidence consistent with this hypothesis. This conclusion holds regardless of how we measure firm performance, be it accounting profitability (ROA), stock returns, or Tobin's  $q$ . Overall, the evidence implies that strong CEO dominance exacerbates agency costs, promotes sub-optimal leverage, ultimately resulting in poorer firm performance. This conclusion is consistent with the empirical evidence in Bebchuk, Cremers, and Peyer (2011). Furthermore, our results corroborate Finkelstein (1992), who argues and demonstrates empirically that top managers' power plays a major role in strategic choice.

Our study contributes to several vital areas of the literature. First, we add to the literature that assesses the impact of managers on firm outcomes. In the management literature, there is a fierce debate over whether top executives matter. The early literature argues that managers do not matter (Lieberson and O'Connor 1972; Finkelstein and Hambrick, 1996; Pfeffer, 1997). On the contrary, several studies argue and present evidence that executives do matter (Child, 1972; Hambrick and Mason, 1984; Tushman and Romanelli, 1985; Weiner and Manoney 1981). In economics and finance, a large number of studies address related questions (Hermalin and Weisbach, 1988; Agrawal and Knoeber, 2001; Denis and Denis, 1995; Parrino, 1997; Huson, Malatesta and Parrino, 2001; Malmendier and Tate, 2003; and Bertrand and Schoar, 2003). We aptly contribute to the rich literature in this area by showing that CEO dominance influences critical corporate decisions such as capital structure choices. In particular, our evidence strongly complements Morellec (2004), implying that managerial dominance is a significant determinant of capital structure policy. Moreover, we demonstrate that the CEO's decisions on capital structure have a palpable impact on firm value.

Second, we also make contributions to a significant body of literature that employs agency theory to explain capital structure (Hirshleifer and Thakor, 1989; Harris and Raviv, 1990; Stulz, 1990; Jensen and Meckling, 1976; Jensen, Jensen 1986a, b; Williamson, 1988; Diamond, 1989; Morellec, 2004). We demonstrate that strong CEO power aggravates agency conflicts and leads to sub-optimal capital structure decisions. Third, we contribute to the area of the literature that investigates the impact of governance on corporate performance (Gompers, Ishii, and Metrick, 2003; Bebchuk, Cohen, and Ferrell, 2008; Bebchuk, Cremers, and Peyer, 2011; Liu and Jiraporn, 2010; Siera, Talmor, and Wallace,

2006; Davis, 2001). Consistent with prior literature, we show that strong CEO power is associated with poorer corporate performance. Finally, our study is related to the fledging, albeit growing, literature that uses CEO pay slice (CPS) to measure CEO dominance (Bebchuk et al. 2011; Liu and Jiraporn, 2010; Keys, Mukherjee, Seru, and Vig, 2009; Henderson, Masli, Richardson, and Sanchez, 2008; Fracassi and Tate, 2009; Grinstein, Weinbaum, and Yehuda, 2008). Notably, Bebchuk et al. (2011) find that firms with dominant CEOs experience lower value. Our evidence complements their findings by demonstrating that one mechanism through which strong CEO dominance jeopardizes firm value is the adoption of sub-optimal capital structure.

The remainder of this article is organized as follows. Section 2 discusses the pertinent literature and develops the hypotheses. Section 3 addresses the sample construction and describes the relevant data. Section 4 presents the empirical results. Finally, Section 5 concludes.

## 2 Literature review and hypothesis development

### 2.1 CEO dominance

CEO dominance indicates how much decision-making power is concentrated in the hands of the CEO. There are multiple dimensions to the concept of “power”, some of which are not easily observable. Finkelstein (1992) identifies four sources of power: structural power, ownership power, expert power, and prestige power. Structural power is the most commonly cited in the literature and is based on formal organizational structure and hierarchical authority (Brass, 1984; Hambrick, 1981; Perrow, 1970; Tushman and Romanelli, 1985). Like Adams, Almeida, and Ferreira (2005), our study focuses on structural power, especially the power of the CEO over the top executive team. We do not argue that all forms of CEO power should affect capital structure.

### 2.2 The role of CEO dominance on corporate outcomes

The notion that variation in senior executives’ choices is crucial to the understanding of firm behavior is behind the management and organizational behavior literature on managerial discretion. Finkelstein and Hambrick (1996) offer an exhaustive review on this important topic. This issue is part of an interesting debate over whether managers “matter” for corporate decisions and outcomes. Hannan and Freeman (1977) play down the impact of managerial discretion on corporate performance because of organization and environmental constraints that limit the scope of managerial actions. By contrast, Hambrick and Mason (1984) and Tushman and Romanelli (1985) contend that executive leadership is a basic driving force behind the evolution of organizations. The literature on this topic is rich and varied and also spans several areas of research, including management, economics, and finance. For conciseness, we discuss only the most recent studies that provide direct empirical evidence on this debate.

Recent empirical evidence demonstrates that strong CEO dominance appears to exacerbate agency costs and has an adverse impact on firm performance. In a recent crucial study, Bebchuk, Cremers, and Peyer (2011) report that strong CEO dominance is associated with lower firm value as measured by Tobin’s  $q$  and with poorer accounting profitability. Furthermore, firms with more dominant CEOs are more likely to make unwise acquisitions that destroy value, as measured by the market reaction to the acquisition

announcement. They argue that the poor performance may be attributed to the agency conflict because strong CEO power is also related to several instances of agency-related outcomes. In particular, strong CEO power is related to higher odds of the CEO receiving a “lucky” option grant at the lowest price of the month and a higher tendency to reward the CEO for luck in the form of positive industry-wide shocks. In addition, firms with powerful CEOs show a lower likelihood of CEO turnover controlling for prior performance and lower firm-specific variability in stock returns over time.

The rich results in Bebchuk et al. (2011) constitute a solid piece of evidence that CEO dominance is a critical variable that affects several important corporate outcomes. Moreover, the mechanism through which CEO power influences these outcomes seems to be related to agency costs. Specifically, the evidence suggests that strong CEO power allows the CEO to act in manners advantageous to himself but not necessarily to the shareholders, thereby worsening the agency conflict.

In a related study, Liu and Jiraporn (2010) explore the agency conflict between shareholders and bondholders. They report that bondholders regard CEO dominance as a critical determinant of the cost of debt. In particular, firms where the CEO plays a more dominant role incur significantly higher costs of debt in terms of bond yields. Similarly, firms with more powerful CEOs also experience lower credit ratings. Additional analysis also reveals that, as CEO dominance strengthens, the firm experiences a higher degree of informational asymmetry, making it more difficult for bondholders to monitor managers’ actions. All in all, the evidence suggests that CEO dominance fosters managerial entrenchment, worsens the asset substitution problem, and reduces reporting transparency. As a result, bondholders demand higher returns from firms with more dominant CEOs.

In a similar vein, Adams, Almeida, and Ferreira (2005) investigate how CEO power influences performance variability. They hypothesize that powerful CEOs are less likely to have to compromise with other top executives, resulting in more extreme decisions, either beneficial or deleterious to the firm. The evidence corroborates this hypothesis, suggesting that variability in firm performance increases with the degree of CEO influence because extreme decisions are more likely to be taken when the CEO is more dominant. Finally, Morse, Nanda, and Seru (2011) report that powerful CEOs “rig” the incentive part of their compensation. In particular, powerful CEOs induce their boards to shift the weight on performance measures towards the more favorable measures. Furthermore, they also document a decline in future firm performance and value for firms where the rigging of incentive pay takes place. All of the aforementioned studies demonstrates that a vital CEO characteristic, i.e. CEO power, does have a material impact on corporate outcomes.

### 2.3 The role of leverage in alleviating the agency conflict

Leverage has been argued to alleviate agency costs in several ways. First, one way to reduce agency conflicts is to cause managers to increase their ownership in the firm (Jensen and Meckling, 1976). By increasing the use of debt financing, effectively displacing equity capital, and shrink the equity base, thereby increasing the percentage of equity owned by management. Second, the use of debt increases the probability of bankruptcy and job loss. This additional risk may further motivate managers to decrease their consumption of perks and increase their efficiency (Grossman and Hart, 1982). Finally, the obligation of interest payments resulting from the use of debt helps resolve the free cash flow problem (Jensen 1986a, b).

## 2.4 Hypothesis development

Existing research on the determinants of capital structure shows that a large amount of variation remains unexplained after controlling for firm-level characteristics such as firm size, growth opportunities and profitability (Titman and Wessels, 1988; Smith and Watts, 1992; and Bradley, Jarrell, and Kim, 1984). One vital objective of this study is to ascertain whether manager-specific characteristics such as CEO dominance, as opposed to firm, industry, or market factors, can in part account for these unexplained differences.

We use agency theory to explain variation in capital structure choices. Previous literature shows that the CEO who plays a more dominant role is more likely to exacerbate agency costs, resulting in poor firm performance (Bebchuk et al. 2011). Prior literature also suggests that leverage represents a disciplinary mechanism that helps mitigate agency problems (Jensen and Meckling, 1976; Grossman and Hart, 1982; Jensen 1986a, b). Thus, we hypothesize that dominant CEOs are motivated to adopt leverage choices that deviate from the optimal level. In other words, the strength of CEO power ought to be related to capital structure choices; the more powerful the CEO, the more likely that he is able to adopt sub-optimal leverage. This is the central hypothesis of this study. A priori, however, it is not clear whether powerful CEOs prefer too much or too little debt. We develop two hypotheses as follows.

### 2.5 Do dominant CEOs reduce leverage?

Powerful CEOs may avoid debt for a number of reasons. First, unlike a typical shareholder who holds diversified portfolios, the CEO has his human capital as well as a significant portion of his wealth tied up in the firm. Thus, the CEO may be under-diversified and exhibit strong risk avoidance (Fama, 1980; Amihud and Lev, 1981). One way to lower firm risk is to adopt lower leverage. Second, the CEO may lower leverage to minimize the disutility from being subject to the performance pressure that large fixed payments entail (Jensen 1986a, b). Furthermore, the CEO may reduce leverage for fear of losing his job in case of a bankruptcy brought about by excessive debt (Harris and Raviv, 1988; and Stulz, 1988).

There is empirical evidence in favor of this hypothesis. Berger et al. (1997) report that entrenched CEOs seek to avoid debt. Leverage levels are lower when CEOs do not face incentives from ownership and compensation or pressure from active monitoring. Jung, Kim, and Stulz (1996) show that a substantial portion of equity issuers are firms with poor investment opportunities that have not exhausted their debt capacity. These firms also invest more than similar firms issuing debt. Their results suggest that agency costs of managerial discretion cause certain firms to issue equity when debt issuance would have better consequences for firm value.

### 2.6 Do dominant CEOs increase leverage?

Although several arguments contend that managerial entrenchment should be associated with less than optimal leverage, it can be argued as well that powerful CEOs may adopt higher than optimal leverage. For instance, Stulz (1988) speculates that managers might increase leverage as a means of consolidating their own voting power. Zwiebel (1994) develops a theoretical model that predicts that managers of the best-performing firms engage in the greatest degree of empire building, and that managers adopt increasing debt levels as their tenure increases.

Finally, it can be argued that higher leverage may substitute for shareholders' diminished ability to remove the CEO when the CEO plays a dominant role. This notion relies critically on the fact that firms need to raise money in the external capital markets, at least, occasionally. To be able to raise external funds on attractive terms, a firm must establish a reputation for moderation in expropriating from shareholders. One way to establish such a reputation is by adopting high leverage, which commits managers to paying out large fixed payments and therefore reduces what is left for expropriation. A reputation for good treatment of shareholders is worth more for firms with more powerful CEOs as these CEOs are better able to exploit the shareholders. Hence, the need for higher leverage to establish a reputation is greater for such firms. By contrast, for firms with weak CEOs, the need for such a reputation mechanism is weaker, and thus, so is the need for higher leverage.<sup>2</sup> This view thus posits that, all else equal, leverage should be higher in firms with powerful CEOs than in those with weak CEOs.

### 3 Sample formation and data description

#### 3.1 Sample construction

The original sample is compiled from the Executive Compensation (EXECUCOMP) database. Then, the sample is narrowed down by eliminating firms of which accounting and financial variables are not available in COMPUSTAT. We follow the custom in the literature and exclude financial firms, whose SIC codes range from 6000 to 6999. Financial firms tend to have accounting and financial characteristics that are unique. In addition, their capital structure is likely influenced by regulation, for instance, the capital adequacy requirements. The final sample consists of 7,888 observations from 1,264 unique firms from 1992 to 2004. The sample distribution by year is shown in Table 1.

#### 3.2 Measuring CEO dominance using CEO pay slice (CPS)

Because CEO dominance is not directly observable, it is necessary to construct a variable that empirically captures CEO dominance. The measurement of power has been a major stumbling block in investigations of various phenomena in the literature (March, 1966; Pfeffer, 1981). One of the serious problems has been an overreliance on perceptual indicators of power and a lack of objectivity in the resulting measures (Finkelstein, 1992). Several previous studies use perceptual measures of power (Pfeffer, 1981; Perrow, 1970; Hinings et al. 1974), Hambrick, 1981; and Tushman and Romanelli, 1985). Recognizing the potentially unreliable nature of the perceptual measures of power, several other studies argue in favor of more objective power indicators (Pfeffer, 1981; Hills and Mahoney, 1978; Pfeffer, Salancik, and Leblebici, 1976; and Provan, 1980).<sup>3</sup>

One way to capture CEO power more objectively is to examine his relative compensation among top executives (Finkelstein, 1992; Bebchuk et al. 2011). Bebchuk,

<sup>2</sup> This view is predicated on an argument made by La Porta et al. (2000) for the substitution effect between corporate governance and dividend payouts.

<sup>3</sup> For instance, Pfeffer (1981) asserts that perceptual measures assume that social actors are knowledgeable about power within their organizations; informants are willing to divulge what they know about power distribution; and such a questioning process will not itself create the phenomenon under study.

**Table 1** Sample Distribution by Year. The original sample is compiled from the Executive Compensation (EXECUCOMP) database. Then, the sample is narrowed down by eliminating firms of which accounting and financial variables are not available in COMPUSTAT. Financial firms, whose SIC codes range from 6000 to 6999, are excluded

Year	Frequency	Percent	Cumulative Percent
1992	120	1.5%	1.5%
1993	380	4.8%	6.3%
1994	422	5.3%	11.7%
1995	478	6.1%	17.7%
1996	483	6.1%	23.9%
1997	472	6.0%	29.9%
1998	688	8.7%	38.6%
1999	673	8.5%	47.1%
2000	703	8.9%	56.0%
2001	693	8.8%	64.8%
2002	886	11.2%	76.0%
2003	905	11.5%	87.5%
2004	985	12.5%	100.0%
Total	7, 888	100.0%	

Cremers and Peyer (2011) argue that the CEO's pay slice (CPS) captures the relative significance of the CEO in terms of abilities, contribution or power. As such, CPS provides a useful proxy for the relative centrality of the CEO in the top management team. This particular measure of CEO power is especially interesting because Bebchuk et al. (2011) find that CPS has strong explanatory power for a rich set of critical corporate outcomes, including firm value as measured by Tobin's q, accounting profitability, and stock market reactions to acquisition announcements.

We follow Bebchuk et al.'s (2011) approach and define CPS (i.e., the CEO's pay slice) as the CEO's total compensation as a fraction of the combined total compensation of the top five executives (including the CEO) in a given company. Total compensation includes salary, bonus, other annual pay, long-term incentive payouts, the total value of restricted stock granted that year, the Black-Scholes value of stock options granted that year, and all other total compensation (EXECUCOMP item TDC1).

### 3.3 CEO pay slice vs. other indicators

Previous studies have used a number of indicators of power such as the number of titles captured by the CEO and CEO duality- where one person jointly serves as CEO and chairman of the board- (Adams et al. 2005; Harrison, Torres, and Kukalis, 1988; Davidson et al. 2004; Finkelstein, 1992, for instance). Bebchuk et al. (2011) point out that, relative to other measures of power, CPS is more advantageous for at least two reasons. First, because CPS is likely the product of many observable and unobservable dimensions of the firm's top executives and management model, it enables researchers to capture dimensions of the CEO's role in the top executive team beyond the ones captured by formal and easily observed variables such as whether the CEO also chairs the board. Second, because CPS is computed based on compensation information from executives who are all at the same firm,



it controls for any firm-specific characteristics that affect the average level of compensation in the firm's top executive team.

In addition to the reasons given by Bebchuk et al. (2011), CPS is also advantageous because it is a continuous variable. CEO duality, which is widely examined in the literature, is a dichotomous variable. As a measure of CEO power, it can classify a given CEO as either "powerful" or "not powerful" and nothing else in between. So, CEO duality is simply a coarse measure of CEO power. Other indicators previously used in the literature also suffer a similar drawback. For instance, Adams et al. (2005) used a dummy variable indicating whether or not the CEO is a company founder or not. Other studies use a dummy for whether the CEO is the only insider on the board of directors. Evidently, all of these dichotomous variables are not much more useful than CEO duality as each of them can be assigned only one of the two possible values.

Some studies utilize indicators that allow for more variation in CEO power. For instance, a few studies look at the number of titles captured by the CEO. Because a given CEO can hold as many titles as four (such as CEO, Chair, President, and COO), the value of this variable can range from one to four. Similarly, Ashbaugh-Skaife, Collins, and LaFond (2006) measure CEO power by counting the number of board committees on which the CEO serves; the more board committees he serves, the more decision-making influence he is expected to wield. There are typically three board committee; nominating, compensation, and audit. Thus, this measure of CEO power is limited to only a few values. Although these measures may be more refined than CEO duality, they still do not capture the fine gradation of CEO power very effectively. Given the complexity of the modern corporation, it is difficult to imagine that variation in CEO power can be captured by only a handful of variable values. CPS offers an interesting alternative because it is a continuous variable that can represent the fine nuances of CEO power.

Finally, as an index of CEO power, CPS is particularly interesting because it is linked to firm value, profitability, and stock returns. Moreover, it is shown to be related to several crucial agency-related outcomes such as CEO turnover and the timing of option grants (Bebchuk et al. 2011). Research using other indicators of CEO power has not produced such clear evidence on their effects on important corporate outcomes. For instance, in spite of a tremendous volume of research, it remains ambiguous whether CEO duality is ultimately beneficial or deleterious to firm value. For all the reasons discussed above, CPS appears to be an advantageous measure of CEO power.

In fact, this particular measure of CEO power has been employed in a large number of recent studies including Liu and Jiraporn (2010), Keys, Mukherjee, Seru, and Vig (2009), Henderson, Masli, Richardson, and Sanchez (2008), Fracassi and Tate (2009), Grinstein, Weinbaum, and Yehuda (2008). The fact that CPS has been adopted in various studies in just a short period time suggests that it is a useful measure of CEO power in a wide range of circumstances.<sup>4</sup>

### 3.4 Leverage

Following the literature, we utilize two alternative measures for leverage. First, book leverage is calculated as the book value of total debt divided by the book value of total

<sup>4</sup> CPS could be interpreted as a measure of "tournament incentives", where executives compete for a promotion with larger CEO pay as the ultimate prize. A large CPS may represent larger tournament incentives that motivate executives to work more diligently to obtain the prize. It is difficult, however, to reconcile this interpretation of CPS with Bebchuk et al.'s (2011) findings that imply governance problems, such as lower firm value, poorer accounting profitability, higher likelihood of awarding the CEO a "lucky" option grant at the lowest price of the month, and lower sensitivity of CEO turnover to firm performance. It is not clear why these empirical results would be related to the tournament incentives.

assets. Second, market leverage is computed as the book value of total debt divided by the sum of the book value of debt and the market value of equity. These two measures are continuous variables that take values between 0 and 1. We employ these two measures of leverage as Berger, Ofek and Yermack (1997).

### 3.5 Descriptive statistics

Table 2 shows the summary statistics for the sample. The sample firms, on average, are large and profitable. The average ROA and EBITDA ratio are 4.21% and 13.90% respectively. The EBITDA ratio is EBITDA divided by total assets. Following the literature, we use the fixed-assets ratio to capture asset tangibility. The fixed-assets ratio is calculated as fixed assets to total assets. The average fixed-assets ratio is 31.06%. Non-debt tax shields may substitute for the tax deductibility of interest payments. We compute non-debt tax shields as the ratio of the sum of depreciation and amortization to total assets. The average non-debt tax shields are 4.81%. We capture growth opportunities by using the ratio of capital expenditures to total assets. This ratio averages 6.13% for the sample.

Our two measures of leverage-book leverage and market leverage-average 23.23% and 21.52% respectively. These figures are generally consistent with the debt ratios in other studies. Our measure of CEO dominance- the CEO's pay slice (CPS)- averages 36.52%, just slightly larger than the average CPS in Bebchuk et al. (2011), 34.4%.

## 4 Empirical results

### 4.1 Leverage and CEO dominance

We hypothesize that CEO dominance affects capital structure choices. To test this hypothesis, we conduct a regression analysis where the dependent variable is the firm's leverage level. Because capital structure can be influenced by industry effects (Miao, 2005), we use industry-adjusted leverage.<sup>5</sup> The primary variable of interest is the CEO's pay slice (CPS), which gauges the degree of CEO dominance. To the extent that CEO dominance has a palpable effect on leverage, the coefficient of CPS is expected to be significant.

We control for a number of firm-specific characteristics identified by the literature as germane to capital structure choices. We control for firm size by using the logarithm of total assets. The composition of the firm's assets has been found to affect capital structure decisions (Titman and Wessels, 1988, and Mehran, 1992). Hence, we include the fixed-asset ratio. As in Johnson (1997), the fixed-asset ratio is the ratio of property, plant, and equipment to total assets.

Profitability may be relevant to capital structure decisions. Myers (1984) suggests that managers have a pecking order in which retained earnings represent the first choice, followed by debt financing, then equity. Thus, the pecking order hypothesis would imply a negative relationship between profitability and leverage. To represent profitability, we employ the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets. DeAngelo and Masulis (1980) contend that non-debt tax deductions substitute for the tax shield benefits of debt. As a result, firms with greater non-

<sup>5</sup> We identify each industry using the first two digits of the SIC. An industry adjustment is accomplished by calculating the difference between the firm's raw debt ratio and the median debt ratio of the industry in which the firm operates.

**Table 2** Descriptive Statistics. Book leverage is computed as the book value of total debt divided by the book value total assets. Market leverage is the book value of debt divided by the sum of the book value of debt and the market value of equity. Profitability is measured by earnings before interest, taxes, depreciation and amortization divided by total assets. The fixed-assets ratio is measured as the ratio of fixed assets to total assets. Non-debt tax shields are defined as the ratio of the sum of depreciation and amortization to total assets. Growth opportunities are measured by the ratio of capital expenditures to total assets. The Governance Index is from Gompers et al. (2003). Free cash flow is computed as earnings plus depreciation and amortization minus capital expenditures. The free cash flow ratio is the ratio of free cash flow to total assets. Industry is defined by 2-digit SIC codes

	Mean	S.D.	25th	Median	75th
Firm Characteristics					
Sales	4,861	13,200	572.35	1,393	4,038
Total Assets	5,017	17,703	550.07	1,348	3,716
ROA	4.21%	12.63%	1.73%	5.35%	9.14%
EBITDA Ratio	13.90%	13.84%	9.14%	14.39%	20.22%
Fixed-Assets Ratio	31.06%	20.95%	15.40%	25.94%	42.37%
Non-Debt Tax Shields	4.81%	3.06%	3.09%	4.28%	5.80%
Capital Exp. Ratio	6.13%	5.27%	2.79%	4.71%	7.71%
Leverage					
Book Leverage	23.23%	17.78%	9.76%	22.28%	33.43%
Market Leverage	21.52%	8.00%	5.01%	15.89%	30.90%
CEO Dominance					
CPS	36.52%	13.05%	28.79%	36.30%	43.80%

debt tax shields would be expected to have lower levels of debt. We define non-debt tax shields as the ratio of the sum of depreciation and amortization to total assets.

Myers (1977) identifies growth opportunities as a significant determinant of capital structure. Similarly, Rozeff (1982) finds empirical support for growth opportunities as a relevant variable. We control for growth opportunities by using the ratio of capital expenditures to total assets. John and Litov (2010) and Jiraporn and Gleason (2007) find that capital structure choices are strongly related to the quality of corporate governance, as measured by Gompers et al.'s (2003) Governance Index. We thus include the Governance Index as a control variable. Finally, Jensen (1986a, b) argues that firms with large free cash flows are more vulnerable to agency costs. Consequently, we use the ratio of free cash flow to total assets to control for the extent of potential agency conflicts.<sup>6</sup>

The regression results are shown in Table 3. First, we estimate OLS regressions with standard errors clustered at the firm level. In Model 1, the dependent variable is industry-adjusted book leverage. CPS does not carry a significant coefficient. Model 2 has industry-adjusted market leverage as the dependent variable. Likewise, the coefficient of CPS is not statistically significant.

We conduct a further analysis by running fixed-effects regressions. OLS takes into account the variation in the variables both across firms and across time. Fixed-effects regressions, however, focus exclusively on the variation within the same firm over time. In addition, this method is advantageous as it controls for unobservable firm-specific characteristics that may be omitted in the model specification. Table 3 exhibits the results of the firm-year fixed-effects regression analysis. Model 3 uses industry-adjusted book

<sup>6</sup> Free cash flow is computed as earnings plus depreciation and amortization minus capital expenditures.

**Table 3** OLS and Fixed-Effects Estimation of Industry-adjusted Leverage. Book leverage is computed as the book value of total debt divided by the book value total assets. Market leverage is the book value of debt divided by the sum of the book value of debt and the market value of equity. Profitability is measured by earnings before interest, taxes, depreciation and amortization divided by total assets. The fixed-assets ratio is measured as the ratio of fixed assets to total assets. Non-debt tax shields are defined as the ratio of the sum of depreciation and amortization to total assets. Growth opportunities are measured by the ratio of capital expenditures to total assets. The Governance Index is from Gompers et al. (2003). Free cash flow is computed as earnings plus depreciation and amortization minus capital expenditures. The free cash flow ratio is the ratio of free cash flow to total assets. Industry is defined by 2-digit SIC codes

Dependent Variable	OLS (clustered at firm level)		Fixed-Effects	
	Model 1 ( <i>t</i> -statistics)	Model 2 ( <i>t</i> -statistics)	Model 3 ( <i>t</i> -statistics)	Model 4 ( <i>t</i> -statistics)
	Industry-adjusted Book Leverage	Industry-adjusted Market Leverage	Industry-adjusted Book Leverage	Industry-adjusted Market Leverage
Intercept	0.1652 <sup>c</sup> (−6.56)	0.0817 <sup>b</sup> (2.52)	–	–
CEO Pay Slice (CPS)	−0.0121 (−0.55)	−0.0413 (−1.58)	−0.0241 <sup>b</sup> (−2.37)	−0.0642 <sup>c</sup> (−2.80)
Ln (Total Assets)	0.0165 <sup>c</sup> (5.42)	0.0163 <sup>c</sup> (3.47)	0.0112 <sup>c</sup> (3.87)	0.0313 <sup>c</sup> (4.83)
Profitability	1.122 <sup>c</sup> (4.76)	0.2917 (1.31)	0.4357 <sup>c</sup> (10.44)	0.2373 <sup>b</sup> (2.53)
Fixed-Assets Ratio	0.0537 <sup>b</sup> (2.39)	0.1276 <sup>c</sup> (4.55)	0.0542 <sup>b</sup> (2.38)	0.1556 <sup>c</sup> (3.03)
Non-Debt Tax Shields	0.4373 <sup>b</sup> (1.96)	0.3638 (1.14)	−0.1626 <sup>b</sup> (−2.08)	0.1595 (0.91)
Growth Opportunities	−1.8094 <sup>c</sup> (−6.11)	−1.2493 <sup>c</sup> (−4.87)	−0.8279 <sup>c</sup> (−14.03)	−0.9299 <sup>c</sup> (−7.00)
Governance Index (Gompers et al. 2003)	0.0026 <sup>b</sup> (1.98)	0.0020 (1.02)	0.0004 (0.37)	0.0008 (0.26)
Free Cash Flow Ratio	−1.5576 <sup>c</sup> (6.06)	−0.7756 <sup>c</sup> (−2.79)	−0.6930 <sup>c</sup> (−15.14)	−.5174 <sup>c</sup> (−5.02)
<i>F</i> -statistics	21.39 <sup>c</sup>	22.01 <sup>c</sup>	63.27 <sup>c</sup>	22.99 <sup>c</sup>
Adjusted R <sup>2</sup>	13.17%	6.32%	11.57%	4.54%

a, b, c indicate statistical significance at the 10%, 5%, and 1% levels respectively

leverage as the dependent variable. CPS shows a negative and significant coefficient. Similarly, the coefficient of CPS is also negative and significant in Model 4 where the dependent variable is industry-adjusted market leverage.<sup>7</sup> It appears that the degree of CEO dominance is inversely related to leverage, i.e. when the CEO gains more power, leverage is reduced. The evidence is consistent with the notion that powerful CEOs exercise their influence to evade the disciplinary mechanisms associated with debt financing (Grossman and Hart, 1982; Jensen 1986a, b). In addition, the lower leverage may also reflect the CEO's propensity to avoid risk due to his under-diversification (Fama, 1980; Amihud and Lev, 1981)

As far as the control variables, it may be worth noting that the Governance Index does not produce a significant coefficient. Prior literature, notably, John and Litov (2010) and Jiraporn and Gleason (2007) find that the Governance Index is positively related to leverage. Our results, by contrast, indicate that the Governance Index is not a significant determinant of leverage. As the Governance Index is expected to capture the extent of agency problems (with a high index showing a more serious agency conflict), its effect may be subsumed by CPS, which can also reflect the degree of agency problems as well (Bebchuk et al. 2011).

<sup>7</sup> In alternative tests, we use industry-adjusted CPS and obtain similar results although the degree of significance is somewhat lower.

## 4.2 Potential endogeneity

Our hypothesis posits that dominant CEOs select leverage levels that may not be optimal for the firm. In other words, the direction of causality runs from CEO dominance to leverage. It could be argued, nevertheless, that the direction of causality might be reverse, i.e. low leverage may impose less discipline on the CEO and thus allows him to consolidate his power and play a more dominant role. This reverse argument, however, is less plausible. CEO power and CEO compensation are determined by several factors, especially by the governance structure of the firm, which tends to change slowly over time. It is rather difficult for a CEO to modify the firm's governance structure to consolidate his power, an act that often requires both shareholders' approval and a lengthy period of execution. By contrast, capital structure decisions are much more subject to managerial discretion and can thus be modified with much more ease and much less time. Thus, the likelihood is much more in favor of causality running from CEO dominance to leverage choices than vice versa. In fact, there is empirical evidence in support of this argument. Ciceksever, Kale and Ryan (2006) employ simultaneous equations to examine leverage choices, institutional ownership, and corporate governance. Their results demonstrate that managers view governance structure as pre-determined as they make decisions on capital structure policy.

It is often difficult to rule out endogeneity entirely. In any case, we execute two additional tests that should mitigate concerns for endogeneity. First, we investigate CPS around CEO changes to shed further light on the issue of endogeneity. Table 4 presents the results. We compare the CPS of CEOs joining low-leverage and high-leverage firms. If low-leverage firms are more optimally run by CEOs with high CPS, then we would expect to observe that the new CEOs of low-leverage firms have, on average, a significantly higher CPS than the new CEOs of high-leverage firms. We employ industry-adjusted leverage to classify firms into high-leverage and low-leverage firms based on the median. The results in Table 4 demonstrate that the CPS of new CEOs does not differ significantly between high-leverage and low-leverage firms. Furthermore, there is no significant difference in terms of changes in CPS around CEO turnover. The results in Table 4 therefore do not lend support to the notion that the negative association between CPS and leverage can be explained by a tendency of low-leverage firms to provide new CEOs with relatively high CPS. The direction of causality does not appear to run from leverage to CPS.

In addition, we employ the two-stage least squares (2SLS) technique to cope with possible endogeneity. This method requires instrumental variables that are related to CPS but that should not affect leverage except through CPS. First, we employ CEO turnover as an instrument. When a new CEO assumes office, his power is probably not as potent as it will be after he has occupied the position for a number of years. We construct a CEO turnover dummy, which is set to one if a new CEO is in office and zero otherwise. There are 555 CEO changes in our sample. Second, we rely on Bebchuk et al.'s (2011) finding that CPS exhibit variation across industries. We utilize the industry median of CPS as our second instrumental variable.<sup>8</sup> Although firm-level leverage might influence CPS in an individual firm, it is unlikely related to industry-level CPS. Managers in each given firm can influence their own firm's policies on leverage and executive compensation but they probably have little, if any, influence on other firms' policies in the industry. This is why industry-median CPS should serve as a valid instrumental variable. A similar technique based on industry structure is employed by a number of recent studies including John and Knyazeva (2006), Knyazeva (2009), and John and Kadyrzhanova (2008).

<sup>8</sup> The first two-digits of the SIC are used to identify industries.

**Table 4** Does Low Leverage Lead to Increases in CPS? An Investigation around CEO Turnover. Market leverage is the book value of debt divided by the sum of the book value of debt and the market value of equity. Year  $t$  is the year in which a new CEO assumes office. The sample is split based on the median of industry-adjusted leverage. Leverage is from year  $t$

	CPS ( $t + 1$ )	Change in CPS $t-1$ to $t + 1$
Ind-adj Book Leverage ( $t$ )		
High	33.39%	1.85%
Low	33.65%	1.25%
Difference ( $t$ -statistic)	-0.93	0.15
Ind-adj Market Leverage ( $t$ )		
High	33.78%	2.48%
Low	33.15%	0.39%
Difference ( $t$ -statistic)	0.21	0.51

Table 5 shows the results of the two-stage regressions. Model 1 shows the first-stage regression. As expected, the CEO turnover dummy produces a negative and significant coefficient, indicating that a new CEO is less powerful. Industry-median CPS exhibits a positive and significant coefficient as expected. The  $F$ -statistics reject the null hypothesis that the coefficients on the instruments are jointly zero. In Model 2, we replace CPS with predicted CPS from the first-stage regression. The coefficient of predicted CPS is negative and significant, corroborating our previous results. To ensure that our instruments are appropriate, we perform Sargan's (1958) test of over-identifying restrictions. The Sargan statistics are not significant. We are thus unable to reject the null hypothesis that our instrumental variables are uncorrelated with the residuals in the second-stage regression. In other words, our instruments are acceptable.

A few recent studies argue that industry averages might not serve as valid instrumental variables. As a consequence, we select another variable based on geography. Bouwman (2009) documents that executive compensation of firms situated in a proximate geographic area are related. We thus use the median CPS of firms located in the same area (based on ZIP) as our instrument. We expect this variable to be correlated with CPS. However, there is no a priori expectation why closely located firms would have similar leverage choices. We substitute geography-median CPS for industry-median CPS in the 2SLS analysis. The results remain robust, i.e. stronger CEO power is associated with lower leverage.<sup>9</sup>

In conclusion, although it is often hard, if not impossible, to eliminate endogeneity completely, our additional results help alleviate concerns for endogeneity and increase our confidence that CEO dominance more likely brings about lower leverage than vice versa.

#### 4.3 Possible effect of the cost of debt

A recent study by Liu and Jiraporn (2010) reports that firms with more powerful CEOs experience lower credit ratings and incur higher costs of debt. Consequently, it is conceivable that powerful CEOs optimally adopt less leverage to avoid the high cost of debt. This may be why there is an inverse association between CEO power and leverage. If this is the case, then CEO power does not directly affect capital structure, but indirectly

<sup>9</sup> The results are not shown but available upon request.

**Table 5** Two-Stage Least Squares (2SLS) Regressions of Leverage. Book leverage is computed as the book value of total debt divided by the book value total assets. Market leverage is the book value of debt divided by the sum of the book value of debt and the market value of equity. Profitability is measured by earnings before interest, taxes, depreciation and amortization divided by total assets. The fixed-assets ratio is measured as the ratio of fixed assets to total assets. Non-debt tax shields are defined as the ratio of the sum of depreciation and amortization to total assets. Growth opportunities are measured by the ratio of capital expenditures to total assets. The Governance Index is from Gompers et al. (2003). Free cash flow is computed as earnings plus depreciation and amortization minus capital expenditures. The free cash flow ratio is the ratio of free cash flow to total assets. Industry is defined by 2-digit SIC codes

Dependent Variable	Model 1 ( <i>t</i> -statistics)	Model 2 ( <i>t</i> -statistics)
	First Stage CEO Pay Slice (CPS)	Second Stage Book Leverage
Intercept	-0.0258 (-0.80)	0.2223 <sup>c</sup> (2.98)
Predicted CEO Pay Slice (CPS)	-	-0.5812 <sup>a</sup> (-1.73)
CEO Turnover (1 if New CEO)	-0.0097 <sup>b</sup> (-1.97)	-
Industry-median CPS	0.7874 <sup>c</sup> (20.62)	-
Ln (Total Assets)	0.0110 <sup>c</sup> (3.26)	0.0335 <sup>c</sup> (5.02)
Profitability	0.1116 <sup>b</sup> (2.29)	0.4686 <sup>c</sup> (8.40)
Fixed-Assets Ratio	0.0037 (0.14)	0.0218 (0.89)
Non-Debt Tax Shields	-0.2226 <sup>b</sup> (-2.43)	-0.0657 (-0.61)
Growth Opportunities	-0.1165 <sup>a</sup> (-1.69)	-0.8660 <sup>c</sup> (-10.63)
Governance Index (Gompers et al. 2003)	0.0030 <sup>b</sup> (1.96)	-0.0020 (-1.01)
Free Cash Flow Ratio	-0.0685 (-1.28)	-0.7182 <sup>c</sup> (-13.87)
<i>F</i> -statistics	58.74 <sup>c</sup>	75.60 <sup>c</sup>
Adjusted R <sup>2</sup>	9.11%	13.78%
Sargan's (1958) Statistics	-	0.485

<sup>a</sup>, <sup>b</sup>, <sup>c</sup> indicate statistical significance at the 10%, 5%, and 1% levels respectively

influences leverage through the cost of debt. To investigate this possible channel, we execute the following additional tests.

Prior research has clearly shown that a firm's cost of debt is highly related to the firm's credit rating. Firms with better credit ratings likely experience lower costs of debt. We collect data on S&P credit ratings for the sample firms. Then, we convert the S&P credit ratings into credit scores and segregate the sample based on the median credit score. Thus, we have two subsamples with high and low credit ratings respectively. We then run a fixed-effects regression for each subsample. The logic is that firms with low credit ratings have a stronger motive to avoid debt due to the high cost of debt. If the CEO optimally chooses lower leverage out of concern for the high cost of debt, the negative relation between CEO power and leverage should be more pronounced for the sample firms with low credit ratings.

The results are shown in Table 6.<sup>10</sup> The coefficient of CPS is negative and significant only in the subsample with high credit ratings. Firms with higher credit ratings enjoy lower costs of debt. The motive to avoid leverage due to the high cost of debt is much less likely for these firms. The fact that CPS is significant for these firms suggests that CPS does not influence capital structure through the cost of debt. In conclusion, the empirical evidence does not lend support to the notion that powerful CEOs optimally adopt less leverage to avoid the high cost of debt.

<sup>10</sup> The dependent variable is industry-adjusted book leverage. Using market leverage yields similar results.

**Table 6** Fixed-Effects Estimation of Leverage by Credit Ratings. Book leverage is computed as the book value of total debt divided by the book value total assets. Profitability is measured by earnings before interest, taxes, depreciation and amortization divided by total assets. The fixed-assets ratio is measured as the ratio of fixed assets to total assets. Non-debt tax shields are defined as the ratio of the sum of depreciation and amortization to total assets. Growth opportunities are measured by the ratio of capital expenditures to total assets. The Governance Index is from Gompers et al. (2003). Free cash flow is computed as earnings plus depreciation and amortization minus capital expenditures. The free cash flow ratio is the ratio of free cash flow to total assets. Credit ratings refer to the Compustat S&P ratings where AAA ratings take on a value of 22 and D ratings with a value of 1. Industry is defined by 2-digit SIC codes

	Model 1 ( <i>t</i> -statistics) High Credit Ratings	Model 2 ( <i>t</i> -statistics) Low Credit Ratings
Intercept	-0.3167 <sup>b</sup> (-2.26)	0.0809 (1.43)
CEO Pay Slice (CPS)	-0.0448 <sup>b</sup> (-2.02)	-0.0098 (-0.63)
Ln (Total Assets)	0.0190 <sup>c</sup> (2.94)	-0.0018 (-0.48)
Profitability	0.7850 <sup>c</sup> (9.09)	0.4906 <sup>c</sup> (4.65)
Fixed-Assets Ratio	-0.0809 <sup>a</sup> (-1.92)	-0.0531 (-1.42)
Non-Debt Tax Shields	0.4878 <sup>c</sup> (2.78)	-0.0669 (-0.37)
Growth Opportunities	-1.2897 <sup>c</sup> (-10.88)	-1.0265 <sup>c</sup> (-6.34)
Governance Index (Gompers et al. 2003)	0.0029 (1.08)	0.0008 (0.40)
Free Cash Flow Ratio	-1.0942 <sup>c</sup> (-11.38)	-0.8956 <sup>c</sup> (-6.56)
<i>F</i> -statistics	14.80 <sup>c</sup>	16.31 <sup>c</sup>
Adjusted R <sup>2</sup>	67.6%	63.9%

<sup>a</sup>, <sup>b</sup>, <sup>c</sup> indicate statistical significance at the 10%, 5%, and 1% levels respectively

#### 4.4 Capital structure, CEO dominance, and firm performance

Most studies in capital structure only examine the determinants of capital structure choices. We argue that this is inadequate. It is necessary to investigate the ultimate impact on firm performance. We find that dominant CEOs tend to select sub-optimal leverage probably to avoid the discipline imposed by debt financing. The crucial question is whether the deviation from optimal leverage is substantial enough to affect firm value. To the extent that the departure from optimal leverage is motivated by agency conflicts and is of significant magnitude, it should show an adverse impact on firm performance.<sup>11</sup>

We explore this issue by investigating firm performance. It may not be appropriate to examine levels of firm performance in relation to levels of leverage and CEO dominance for doing so would be fraught with endogeneity. Instead, we first examine the impact of changes in leverage on changes in firm performance. Then, we test whether the effect of changes in leverage on changes in firm performance depends on the degree of CEO dominance. If CEO dominance worsens managerial entrenchment and exacerbates agency costs, the effect of changes in leverage should be more negative as CEO power strengthens. Our empirical analysis can be expressed as follows.

$$\Delta \text{Performance} = f(\Delta \text{Leverage}, \text{CPS}, \Delta \text{Leverage} \times \text{CPS}, \text{Controls})$$

Our focus is on the interaction term between CPS and changes in leverage. To the extent that more powerful CEOs hurt firm performance through sub-optimal leverage, the

<sup>11</sup> In a related study, Liu and Jiraporn (2010) find that staggered boards promote managerial entrenchment and allow managers to adopt sub-optimal leverage. However, the abnormal leverage attributed to staggered boards does not affect firm value.



coefficient of the interaction term is expected to be negative. We use a number of control variables including changes in firm size, changes in profitability and changes in growth opportunities. Gompers et al.'s (2003) Governance Index and Delaware incorporation are also included. These variables are found to affect agency costs and firm value in previous studies.

There are several ways to measure firm performance. We utilize three alternative variables. First, accounting profitability is a common measure of firm performance. We use ROA as our measure of accounting profitability. Second, the ultimate goal of the corporation is to maximize stockholders' wealth. Thus, we use stock returns as our second measure of performance. Stock returns are determined by the market and thus are less vulnerable to accounting manipulation than ROA. Third, a large number of studies employ Tobin's q to capture firm value (Demsetz and Lehn, 1985; Morck, Shleifer and Vishny, 1988; Lang and Stulz, 1994; Yermack, 1996; Gompers et al. 2003). We follow the custom in the literature and include Tobin's q as our third measure of performance. Our Tobin's q is calculated based on Chung and Pruitt (1994).

The results are shown in Table 7. We show three models for three different dependent variables, i.e. ROA, stock returns, and Tobin's q. The coefficient of the interaction term between CPS and changes in leverage is always negative and significant, whatever we use as our measure of firm performance. It appears that powerful CEOs harm firm value by making more adverse the impact of changes in leverage on firm value. This evidence is consistent with the prediction of agency theory. Also consistent with Bebchuk et al. (2011), we find that dominant CEOs seem to aggravate agency costs and jeopardize firm value. We complement Bebchuk et al. (2011) by demonstrating that one mechanism through which powerful CEOs reduce firm value appears to be the adoption of sub-optimal leverage.

**Table 7** Estimation of Changes in Accounting Profitability (ROA), Stock Returns, and Tobin's q. Market leverage is the book value of debt divided by the sum of the book value of debt and the market value of equity. Profitability is measured by earnings before interest, taxes, depreciation and amortization divided by total assets. The fixed-assets ratio is measured as the ratio of fixed assets to total assets. Non-debt tax shields are defined as the ratio of the sum of depreciation and amortization to total assets. Growth opportunities are measured by the ratio of capital expenditures to total assets. The Governance Index is from Gompers et al. (2003). Free cash flow is computed as earnings plus depreciation and amortization minus capital expenditures. The free cash flow ratio is the ratio of free cash flow to total assets. Industry is defined by 2-digit SIC codes

Dependent Variable	Model 1 ( <i>t</i> -statistics)	Model 2 ( <i>t</i> -statistics)	Model 3 ( <i>t</i> -statistics)
	Δ ROA	Δ Stock Return	Δ Tobin's q
Δ Leverage (Market) × CPS	-0.6866 <sup>c</sup> (-9.57)	-5.5547 <sup>c</sup> (-7.77)	-2.5410 <sup>c</sup> (-3.83)
Δ Leverage (Market)	0.1651 <sup>c</sup> (8.16)	0.9322 <sup>c</sup> (4.634)	0.4729 <sup>b</sup> (2.54)
CPS	0.0127 (1.05)	-0.1024 (-0.86)	0.2727 <sup>b</sup> (2.46)
Δ Ln (Total Assets)	0.0859 <sup>c</sup> (11.40)	-0.2256 <sup>c</sup> (-3.02)	-0.7903 <sup>c</sup> (-11.35)
Δ Profitability	-	0.5650 <sup>c</sup> (4.65)	1.0727 <sup>c</sup> (9.57)
Δ Growth Opportunities	-0.2078 <sup>c</sup> (-5.03)	-2.3746 <sup>c</sup> (-5.81)	0.3814 (0.97)
Governance Index (Gompers et al. 2003)	-0.0000 (-0.08)	-0.0027 (-0.47)	0.0049 (0.91)
Delaware Incorporated	0.0022 (0.70)	-0.0090 (-0.29)	-0.0056 (-0.20)
<i>F</i> -statistics	34.26 <sup>c</sup>	34.31 <sup>c</sup>	36.18 <sup>c</sup>
Adjusted R <sup>2</sup>	3.44%	3.92%	4.19%

<sup>a, b, c</sup> indicate statistical significance at the 10%, 5%, and 1% levels respectively

## 5 Concluding remarks

A plethora of studies in management, economics, and finance attempt to ascertain whether executives' characteristics matter to corporate outcomes. Motivated by agency theory, we investigate how CEO dominance influences capital structure choices. Prior literature shows that strong CEO power aggravates agency costs and leads to poor performance (Bebchuk et al. 2011; Liu and Jiraporn, 2010). Our fixed-effects results demonstrated that more powerful CEOs tend to adopt lower leverage, probably to evade the disciplinary mechanisms associated with debt financing. The evidence is also consistent with the notion that the CEO exhibits strong risk avoidance due to his under-diversification.

In addition, we relate the impact of apparently sub-optimal leverage to firm performance in order to determine whether the lower leverage can be attributed to agency conflicts. We find that changes in leverage have a more adverse impact on firm performance when the CEO plays a more dominant role. Our evidence, when combined with the results in Bebchuk et al. (2011), strongly suggests that strong CEO dominance exacerbates the severity of the agency conflict. Our results are important as they demonstrate that manager-specific characteristics such as CEO influence, as opposed to firm, industry or market factors, has a palpable impact on crucial corporate outcomes such as capital structure choices. This study contributes to the literature in capital structure as well as in agency theory. We also add interesting empirical evidence to the debate over whether top executives matter to corporate outcomes and ultimately to overall firm value.

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