ALTERNATIVE EXPLANATIONS OF CEO COMPENSATION: SOME EVIDENCE BASED ON THE CEO PAY SLICE

Martin Bugeja

University of Technology, Sydney

Zoltan P. Matolcsy

University of Technology, Sydney

Helen Spiropoulos

University of Technology, Sydney

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ABSTRACT

This paper uses the CEO Pay Slice (CPS) to present evidence on two alternative explanations of CEO pay, efficient contracting and managerial power. Based on a sample of 9,978 U.S. listed firms for the period 2001-2010, we find that the CPS reflects a rational allocation of decision authority between the CEO and senior executives, which is driven by firms' economic characteristics. We do not find evidence consistent with managerial power theory, as the CPS of newly appointed CEOs does not increase over time, nor do we find a difference between the CPS of newly appointed CEOs and the CPS of the prior CEOs in firms. Finally, we find no relation between the CPS and subsequent firm performance, or between a measure of excess CPS and subsequent firm performance. In addition, we show that most firms are quick to reduce excessive CPS levels. However, for a small subsample in which excessive CPS persists, we observe a negative relation between CPS and subsequent firm performance.

Keywords: CEO pay slice; Decision authority; Firm performance.

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1. Introduction

There are two main alternative and much debated explanations of CEO compensation: (i) efficient contracting (Jensen and Meckling, 1976, Smith and Watts 1982, and Bushman and Smith 2001), and; (ii) managerial power, based on capture theory and rent extraction (Bebchuk, Fried and Walker, 2002 and Bebchuk and Fried 2003, 2006). More recently Bebchuk, Cremers and Peyer (2011) argue that the CEO pay slice (CPS), defined as the proportion of compensation paid to the CEO out of the total compensation paid to the top five executives in the firm, is a manifestation of managerial power. Using the CPS as our setting, our objective is to contribute to this debate by testing the implications of both theoretical explanations for CEO compensation. Specifically, we first build on Bebchuk et al. (2011) and provide evidence that the level and changes in the CPS are driven by economic determinants which is consistent with both efficient contracting, and partially with managerial power. Second, we provide evidence on whether the CPS changes over time for newly appointed CEOs, and we compare the CPS of newly appointed CEOs to the CPS of the prior CEOs. Third, we calculate a measure of excess CPS and provide evidence of its persistence in firms. Finally, we provide evidence on the association between the CPS (and excess CPS) and subsequent accounting performance using a firm measure of ROA as well as the industry-adjusted measure of ROA used by Bebchuk et al. (2011).

The motivation of this paper is twofold. First, we contend that the CPS primarily reflects a rational allocation of decision authority between the CEO and other senior executives, which is driven by the economic characteristics of firms. We refer to this agency theory explanation of the CPS as 'CEO decision authority', which differs to the currently held explanation that the CPS reflects 'managerial power' (e.g. Bebchuk et al. 2011). While the agency theory explanation of the CPS can be explicitly tested, it is more difficult to test managerial power theory. As Murphy (2002) suggests, some of the implications of managerial power theory

cannot be directly tested, and proxies for 'powerful' CEOs are consistent with other explanations as well. However, unlike levels of CEO compensation which are determined by factors that also determine the levels of other executives' compensation (e.g. Murphy and Zabojnik 2007; Murphy and Zábojník 2004; Core et al. 1999; Murphy 1985; Smith and Watts 1992), the CPS is a measure of relative compensation and thus can provide additional insights into the efficient contracting and managerial power explanations for CEO pay.[1] For example, if the CPS is primarily driven by the allocation of decision authority arising from a firm's economic characteristics, the CPS of a firm's previous and newly appointed CEO would be the same and the CPS of newly appointed CEOs would not increase over time. Additionally, there would on average be no association between firm performance and CPS. On the other hand, managerial power suggests we would observe the opposite outcomes to those discussed above. We provide evidence on these outcomes.

The second motivation for this paper comes from the political and professional debate concerning levels of CEO compensation and pay differentials between CEOs and other employees in the firm. For example, in 2008 S&P 500 CEOs received pay packages worth on average $10.5 million, 344 times the earnings of the average American worker up from 30-40 times 30 years ago (Anderson et al. 2008). The increasing levels of CEO compensation have raised questions on the importance of the CEO in adding value to a firm relative to other employees (e.g. Newmark 2012; Collingwood 2009; Pfeffer and Sutton 2006), and have led to a proposal by the SEC that requires all companies to report the compensation gap between their chief executives and ordinary employees (Chon 2013). More recently a number of countries have enacted legislation that provides shareholders with the ability to vote against

[1] The correlation between the CPS and CEO total compensation is 0.39.

executive remuneration packages (the 'Say on Pay' legislation).[2] This regulatory change may lead to compression of the CPS or other executives' pay resulting in compensation levels that do not reflect the decision authority of executives, which in turn may have adverse implications for firm performance. Accordingly, we provide evidence on the association between CPS and firm performance, and between 'excess' CPS and firm performance.

The evidence in this paper is based on a sample of 9,978 firm-years of U.S. publicly listed companies between the years of 2001 and 2010. We find that the CPS reflects a rational allocation of decision authority which is driven by firms' economic characteristics. When a firm's characteristics indicate that decision authority is given to one or more executives other than the CEO, the CPS is lower. Economic characteristics of firms that determine the allocation of decision authority between the CEO and other executives include the degree of business diversification, research and development intensity, growth options, and whether the firm is regulated. Other factors reflected in the CPS include the market for managerial talent as indicated by a positive relation between CPS and the industry median CPS. In addition, using a sample of newly appointed CEOs we find no evidence that the CPS reflects agency problems and rent extraction by CEOs, as suggested in prior studies (Mande and Son 2012; Bebchuk et al. 2011; Henderson et al. 2010). An examination of excess CPS reveals that most firms with high levels of excess CPS reduce it over the subsequent two years. Furthermore, no relation is found between the CPS or Excess CPS and subsequent return on assets. These results suggest that on average firms' contract efficiently with executives. For a subsample of firms that fail to reduce excess CPS, a negative relation is observed between the CPS and subsequent return on assets indicating possible agency problems in those firms.

[2] See for example, Bryan-Low (2013); Buck and Johnson (2013); Burns and Minnick (2013); Carnegy (2013); Correa and Lel (2013); Cunat et al. (2013); Iliev and Vitanova (2013); Kimbro and Xu (2013); Greenblat (2012).

The findings in this paper make a number of important contributions. First, we provide evidence supporting the view that firms contract efficiently with executives as proxies used to capture CEO power are insignificant and/or we observe relations opposite to what managerial power theory predicts (Bebchuk and Fried 2006; Bebchuk and Fried 2003; Bebchuk et al. 2002).[3] These findings are important as following Bebchuk et al. (2011) accounting researchers are including the CPS as a proxy for poor governance (e.g. Mande and Son 2012; Feng et al. 2011; Jiraporn et al. 2011; Henderson et al. 2010).[4] However, without identifying the key drivers of CPS researchers ignore the possibility of multicollinearity and endogeneity when variables that may explain a portion of the CPS are used alongside the CPS in the same regression. For example, Mande and Son (2012) include the CPS in several logistic regressions of the likelihood of firms meeting or barely beating analysts' forecasts. They expect that 'powerful' CEOs, as proxied for by the CPS, are more likely to manage earnings. They find a positive and significant coefficient on CPS. However, they also include in the same regressions factors that may determine CPS such as the market-to-book ratio, return on assets, CEO share ownership and CEO-chair duality. As these factors could also determine CPS, the estimates in the regression are unreliable due to endogeneity concerns. This concern is amplified by the fact that when the authors use the level of CEO total pay rather than CPS, they find an insignificant coefficient which they note but do not tabulate. Given the results in this paper we caution against using the CPS as a proxy for managerial power, which we believe is difficult to observe.

Second, this paper contributes to the emerging stream of studies that examine pay differentials between managers within a firm. We show that although the total pay awarded to

[3] However, this paper does not develop a general theory of the CPS and as such one can only argue that the evidence is consistent with the efficient contracting view of executive compensation but not with the managerial power view of rent extraction.

[4] Using the CPS Bebchuk et al. (2011) provide evidence of an association between the CPS and industry-adjusted Tobin's q, industry-adjusted return on assets, acquirer returns and performance sensitivity of CEO turnover. The inference from these findings is that the CPS is not efficiently determined and that CEOs are extracting rents.

the top five executives has increased over time, the CPS by and large has remained the same. Furthermore, we find no relation between the CPS and firm performance. These results support the efficient contracting perspective of executive compensation as opposed to alternative explanations for pay differentials within firms such as tournament theory and/or managerial power.

The structure of this paper is as follows. Section 2 presents a conceptual framework explaining how the CPS reflects a rational allocation of decision authority which is driven by firm characteristics and identifies variables which are consistent with managerial power. Following that, we discuss changes in the CPS of newly appointed CEOs, and finally the performance consequences of the CPS and excess CPS are discussed. Section 3 provides the main empirical results and sensitivity tests. Section 4 concludes the paper by providing a summary of the key findings and directions for further research.

2.0 Theory development

2.1 The allocation of decision authority and the economic determinants of the CPS

Implicit in the efficient contracting framework is that compensation is a reflection of the decision authority granted to an agent (Raith 2008; Banker and Datar 1989; Grossman and Hart 1983; Holmstrom 1979; Jensen and Meckling 1976). The greater the decision authority held by an agent the greater the cost to the principal of any value decreasing decisions made by that agent, particularly in the presence of information asymmetry. Hence, in corporations the level and structure of executives' compensation reflects their level of decision authority within the firm. Consistent with this perspective, studies have found that the level of incentive compensation and types of performance measures used in divisional managers' compensation contracts is related to the level and scope of their authority over investment and project decisions (Ortega 2009; Bouwens and Van Lent 2007; Wulf 2007; Aggarwal and

Samwick 2003; Barron and Waddell 2003; Wulf 2002). We contend that just as the compensation of an individual manager reflects decision authority, so does the CPS.[5] As such, a large CPS indicates that the CEO has the majority of decision authority among the senior executives, whilst a small CPS indicates that one or more other executives has significant decision authority.

There are relatively few studies that examine how decision authority is allocated among managers within firms. Exceptions include those that examine decentralisation, which is the delegation of decision authority from high level managers to lower level divisional managers (e.g. Brickley et al. 2009; Ortega 2009; Jensen and Meckling 2009; Abernethy et al. 2004; Christie et al. 2003; Bushman et al. 2000; Melumad and Reichelstein 1987). These studies emphasise that decentralisation occurs when a firm's economic and operating characteristics generate specific knowledge which is held by lower level managers.[6] By delegating authority to lower level managers, firms avoid the costs associated with transferring this knowledge to top management, achieve increased decision-making efficiencies (Jensen and Meckling 2009; Christie et al. 2003; Bushman et al. 2000; Melumad and Reichelstein 1987), and avoid suboptimal decisions that may arise due to cognitive constraints (Brickley et al. 2009; Williamson 1975).[7] Accordingly, we predict that the CPS is also driven by firms' economic and operating characteristics.

Discussed below are the economic characteristics of firms that we predict drive a rational allocation of decision authority between the CEO and other executives, and hence the CPS.

[5] The decision authority and responsibilities of each executive are impossible to identify without direct observation. For example, an examination of a selection of proxy statements reveals that not all firms have employment contracts with their CEO let alone other executives (the examination of proxy statements included all those available from companies listed in the Fortune 200 for the year 2011).

[6] Specific knowledge is defined by Fama and Jensen (1983) as knowledge that is costly to transfer and not easily observable; Jensen and Meckling (2009, p.49) list examples including idiosyncratic knowledge about people, places, organisations, customers, suppliers, time and place. Other authors have adopted the term 'specialised knowledge' to refer to the same phenomenon (e.g. Christie et al. 2003).

[7] Suboptimal decisions may be made unwittingly because one is unable to process and understand all the specific knowledge. This notion is known as "bounded rationality" (Simon 1955).

Industrial or Geographical Diversification. We define industrial or geographical diversification as a firm that operates respectively across different industries or geographical locations. Diversified firms are often associated with highly complex decision-making environments due to large amounts of specific knowledge and greater information asymmetry (Bushman et al. 2004; Duru and Reeb 2002; Reeb et al. 1998). For example, firms operating multiple businesses generate specific knowledge about specialised assets, institutional environments, technologies, operations and different corporate cultures, and firms operating across multiple geographic locations generate specific knowledge relating to markets, institutional environments and detailed transfer pricing policies (Duru and Reeb 2002; Reeb et al. 1998).

Given it is efficient to allocate decision authority to those with specific knowledge (Jensen and Meckling 2009; Christie et al. 2003; Bushman et al. 2000; Melumad and Reichelstein 1987), it is expected that diversified firms do not concentrate decision authority in the CEO but instead allocate it to a number of executives who possess knowledge specific to the diversified operations. The executives with decision authority receive higher levels of compensation thus increasing the total pay awarded to the top five executives and reducing the CPS.

R&D intensity. R&D is considered a means of growth for a firm but it differs to other growth options such as mergers and acquisitions or strategic partnerships because the CEO is deemed to possess the vision for the firm and hence is responsible for selecting and allocating resources to R&D projects (unlike mergers and acquisitions which must be approved by the board of directors). Indeed there are numerous examples in the media of CEOs' decisions to increase/reduce or redirect R&D efforts.[8] Hence we expect CEOs of firms reliant on R&D

[8] E.g. CEO of Ericsson, Hans Vestberg, choosing not to outsource the company's R&D efforts and preferring to invest in R&D over purchasing companies because he thinks it's more profitable (Marek 2014), and 3M CEO

have greater decision authority and as a result we expect R&D intensity to be positively related to the CPS.

Growth options. Growing firms experience greater uncertainty and have more specific knowledge, such as knowledge that is time-specific and which must be acted upon quickly to take advantage of competitive opportunities. For these reasons it is efficient for growth firms to allocate decision authority to a number of executives, who typically work longer and harder than managers in non-growth firms and receive higher levels of compensation in order to encourage value-enhancing investments (Core et al. 1999; Gaver and Gaver 1993; Smith and Watts 1992).[9] Therefore, a negative relation is expected between growth options and the CPS.[10]

2.2 Regulation and labour market effects

Regulated firms. Highly regulated firms are typically capital intensive and provide essential services to the public (e.g. utilities and telecommunications). Managers of regulated firms have little discretion because regulatory agencies fix the price of outputs based on a cost of capital applied to the value of assets and also restrict the types of investments and projects these firms can undertake. This institutional environment is largely responsible for regulated firms having lower growth, uncertainty, cash flow variance and information asymmetry (Smith and Watts 1992).

Because regulated firms are monitored by both the board of directors and regulators who impose limitations on their operations, there is no need for the CEO in these firms to have significant decision authority. Consistent with this view CEOs in regulated firms receive

Inge Thulin increasing the firm's R&D budget and focusing on an internal measure of new product revenue (Caruso-Cabrera 2013).

[9] Compensation research includes firm growth options as a control variable (often measured by the market to book ratio) and finds consistent results (e.g. Conyon et al. 2011; Core et al. 2008; Abernethy et al. 2004).

[10] The board of directors retains the right to vote on major investments such as acquisitions which further reduces the CEO's individual decision authority.

lower compensation (Bryan and Hwang 1997) which may also reflect the fact that these firms do not require a talented CEO. Therefore, the CPS is expected to be lower in regulated firms as no single executive has significantly greater decision authority than another.

Labour market. It is often claimed by companies that benchmarking CEO pay is a necessary and efficient way to provide competitive pay packages and retain human capital.[11] Others view benchmarking as inefficient because it can lead to increases in compensation that are not tied to firm performance. Studies examining both hypotheses have found evidence consistent with the former view. For example, Bizjak et al. (2008) find that benchmarking is used extensively by firms; that most firms target the median level of executive compensation of the peer group, and; that changes in compensation to levels above the median are driven by new CEOs who exhibit better performance and are not related to proxies of 'poor' governance. Similarly, Bizjak et al. (2011) document that on average peer firms are chosen based on economic factors that reflect the managerial labour market in which the firm competes (such as size, industry, accounting performance, market-to-book, and geographic and product diversity). They also find that governance factors are not related to the choice of peer groups with higher compensation levels, and that the benefit to CEOs of inflating peer group pay is relatively small. The existing evidence supports that labour market considerations based on firms' economic characteristics play a role in the setting of executive pay, therefore we predict a positive relation between the market rate of CPS and the CPS.

2.3 Proxies for the managerial power theory explanation of the CPS

Given the currently held view that the CPS reflects managerial power, we include on our analysis proxies for managerial power consistent with those used in prior studies.

[11] Since 2006 the SEC requires compensation committees to report peer-group comparisons of executive pay in proxy statements if it is material in determining pay (Releases No. 33-8732A, 34-54302A).

CEO tenure. Managerial power theory argues that the CPS is higher for CEOs with longer tenures as these CEOs have 'captured' the board of directors and negotiate higher compensation levels for themselves. However, within the agency theory framework there is no economic reason to expect the CPS to increase as a function of the number of years of service of a CEO. Especially since the CPS is a ratio which is not affected by increases in executive compensation levels over time.

CEO-chair. Some argue that CEO-chair duality increases managerial power and the CEO's ability to extract rents (Bebchuk and Fried 2006; Bebchuk and Fried 2003; Bebchuk et al. 2002; Core et al. 1999), however there is limited evidence to support this view. An alternative explanation is that CEOs who possess large amounts of specific information occupy the chairman role because they are better able to inform the board and care more about firm value than an independent chairman would due to their own stock ownership, incentive compensation and reputational concerns (Brickley and Zimmerman 2010, pg. 239). Furthermore, CEOs that act as chairperson are expected to be compensated more to reflect their additional responsibilities. Accordingly, we expect a positive relation between the CPS and CEO-chair duality.

Founder-CEO. Proponents of managerial power argue that founder-CEOs are entrenched and hold considerable power over the board which allows them to set their own compensation (e.g. Masulis and Zhang 2013; McNabb and Martin 2002). Therefore, according to the managerial power perspective the CPS should be larger for CEOs that are founders of the firm. Alternatively, it can also be argued that founder-CEOs possess unique intrinsic attributes and have close personal identification with the firm since it is largely their creation. These reasons explain why founder-CEOs outperform non-founder-CEOs (Adams et al. 2009; He 2008; Anderson and Reeb 2003) and for less compensation (He 2008).

Executive directors. Managerial power theory suggests that the greater the number of inside directors on the board the lesser the 'quality' of governance and thus the CEO has more power to attain excessive compensation levels (see for example, Bebchuk et al. 2002). An alternative view is that executives that possess specific knowledge relevant to decisions should be part of the higher level decision making process. This knowledge is valuable to the board of directors and one way of accessing it is through direct interaction with the executives themselves. By appointing those executives directors the board gains the opportunity to question them during meetings, is able to better monitor their use of decision authority, and imposes director reputational effects that may further motivate executives to act in the interest of the firm. If the managerial power perspective is dominant then as the proportion of inside directors increases so too should the CPS. Alternatively, if the agency based perspective holds then there should be a negative relation between the proportion of inside directors and the CPS.

Outsider CEO. Outside CEOs are not entrenched and thus have no power over the board of directors to inflate their own compensation levels. This situation is the opposite to that of inside CEOs who are argued to have considerable power over the board of directors due to their long tenures and history at the firm. Therefore, according to the managerial power perspective the CPS is expected to be lower for outside CEOs.

In contrast, firms may hire an external CEO to enhance or alter current business operations and thus award greater decision authority to the incoming CEO in order to enable them to make changes. In fact, recent descriptive evidence shows an increase in the number of externally appointed CEOs and that externally hired CEOs receive up to 15.3% more

compensation than internally hired CEOs (Murphy and Zabojnik 2007; 2004).[12] Therefore, under the efficient contracting perspective we expect no relation between outside CEOs and the CPS.

2.4 CPS of newly appointed CEOs

Under the efficient contracting view, on average, a newly appointed CEOs compensation would be consistent with his/her decision authority, which in turn is driven by the firm's economic characteristics (Gabaix and Landier 2008; Rajan and Wulf 2006; Core et al. 2003; Barron and Waddell 2003; Murphy 1999; Smith and Watts 1992). Equally, under this explanation the CPS would also reflect the decision authority allocated to the other top four executives. Hence, the CPS would not change over time beyond changes in the economic characteristics of the firm. On the other hand, under the managerial power view, an incoming CEO, has not had time within the firm to capture the board of directors. However, with the passage of time the new CEO may capture existing directors or may appoint new directors whom he/she can capture (Coles et al. 2014). Under this scenario managerial power theory suggests that the CPS of the newly appointed CEO would increase over time. As these two alternative explanations lead to conflicting predictions, we treat this as an empirical issue without any predictions.

Comparing the CPS of a newly appointed CEO to the CPS of the previous CEO also enables us to test different implications of the efficient contracting and managerial power perspectives. Efficient contracting suggests that on average, the CPS of the newly appointed CEO would be the same as the CPS of the prior CEO. Implicit in this prediction is that at the point of changing CEOs, the firm is not going through fundamental economic changes such

[12] Some view these findings as an indication of managerial talent because the hurdle for becoming a CEO is higher for an outsider than for an insider who already possesses firm-specific knowledge (Jian and Lee 2011; Milbourn 2003; Murphy 1986, 1985).

as a major acquisition and/or merger or restructuring. Hence, the relative decision authority of the executives would not change. On the other hand, managerial power theory would suggest that the prior CEO would have had time to capture the board, unlike the newly appointed CEO. Accordingly, all other things being equal, the CPS of the previous CEO would be significantly higher than the CPS of the newly appointed CEO. Since we cannot discriminate between the two explanations, we treat them as an empirical issue.

2.5 Performance consequences of the CPS

To date, research on the link between firm-performance and executive compensation has produced mixed results and alternative views exist regarding the efficiency of contracts between firms and executives.[13] Within the agency theory framework an efficient contract is viewed as one that maximizes the value to shareholders after considering transaction costs and payments to employees (Core et al. 2003; Grossman and Hart 1983; Holmstrom 1979). If firms contract efficiently with executives there should be no relation between executive compensation and subsequent firm performance. On the other hand, if compensation contracts are inefficient then agency costs arise and firm performance is lower (e.g. Brown et al. 2012; Matolcsy and Wright 2011; Chalmers et al. 2006; Ittner et al. 2003; Core et al. 1999).

One may question whether lower CEO compensation translates into lower subsequent firm performance, however given we expect that the CPS reflects a rational allocation of decision authority between the CEO and other executives, it is reasonable to expect negative performance consequences if this allocation is inefficient. For example, giving the CEO the majority of decision authority when there is high information asymmetry within the firm

[13] For examples in the area of pay-for-performance see Ang et al. (2002), Hermalin and Wallace (2001), Hall and Liebman (1998), Jensen and Murphy (1990b), and Murphy (1986). For a comprehensive review see Bushman and Smith (2001).

creates knowledge transfer costs and may also result in value destroying decisions due to cognitive constraints. Given this decision authority perspective, the probability of experiencing negative performance consequences in relation to the CPS is greater than when looking at CEO compensation alone.

Limited evidence exists on the performance consequences of the CPS and it is currently viewed as reflecting managerial power rather than efficient contracting. For example, Bebchuk et al. (2011) find a negative association between lagged CPS and industry-adjusted Tobin's q and industry-adjusted return on assets, and suggest that the CPS reflects rent extraction by CEOs. However, we argue that the CPS is lower in large growth option firms measured by market-to-book ratio, and thus negatively related to Tobin's q. Further, large growth option firms would exhibit greater growth compared to the industry median therefore providing a possible explanation for the negative association between CPS and industry-adjusted ROA.

This paper is of the view that on average firms contract efficiently with executives. If firms contract efficiently, there should be no relation between compensation contracts and subsequent firm-performance. That is, the costs of compensation contracts are balanced with the gains in subsequent firm-performance. Accordingly, it is predicted that: CPS is not associated with subsequent firm-performance.

Although we adopt the efficient contracting perspective, we acknowledge that it is possible to observe inefficient compensation contracts within a cross-sectional sample of firms at a given point in time due to the evolving nature of contracts and the learning process of firms (Brown et al. 2012; Matolcsy and Wright 2011; Core et al. 2003). For example, there may be a fundamental change in the firm's economic characteristics due to a merger or acquisition or when a firm divests a number of businesses. These events alter the information environment

and decision authority of one or more executives resulting in inefficient compensation contracts. However, due to firms' desire to contract efficiently with executives these contracts are likely to be adjusted in the short term and hence have no performance consequences. Therefore, even if the CPS is observed to be high or excessive in one period it is also predicted that: Excess CPS is not associated with subsequent firm performance.

If on the other hand excessive CPS levels persist, it may indicate a failure in the firm's governance structure. As there is no equilibrium model of the optimal governance structure for a firm, it is impossible to accurately determine if a firm's governance is failing at any given time. If governance is 'weaker' for any reason in a given period, CEOs have an opportunity to negotiate rents into their compensation contract resulting in a large excess CPS. This opportunity is increased by the fact that compensation committees generally take guidance from CEOs concerning the compensation of other executives, therefore CEOs may recommend lower compensation levels for one or more executives in order to ensure they earn significantly more than their peers.[14] Therefore, excess CPS that persists for several periods may be reflective of greater agency problems within the firm. Accordingly, it is predicted that: CPS is associated with lower subsequent firm performance for firms with persistent high excess CPS.

There may also be cases in which CEOs are consistently underpaid resulting in a low CPS. Giving the CEO too little decision authority may result in a lack of strategic direction for the firm and an inefficient management team. However, there are plausible explanations as to why one may observe such cases and not expect any impacts on performance. For example,

[14] To investigate the idea that CEOs are involved in the allocation of decision authority to executives, compensation disclosures in proxy statements and compensation committee charters of companies listed in the Fortune 200 for the year 2011 were read. In 188 of the 193 statements it was disclosed that at the compensation committee's request the CEO provides input on the performance evaluation and incentives of each individual executive (however, the CEO does not do so for his or her own compensation). Of the Fortune 200 companies of 2011, seven did not provide information on this topic either because they were mutual funds or private companies.

some CEOs are motivated by factors other than remuneration or have already amassed large personal wealth.[15] Furthermore, firms are less likely to consistently underpay their CEOs or they risk losing the CEO to another firm. Given the range of explanations for a low CPS, we mainly focus only on high excess CPS which is argued to capture agency problems.[16]

The following section discusses the sample and data used to test these predictions.

3.0 Experimental design

3.1 Sample

The initial sample consists of US listed public companies in ExecuComp from 1993 to 2010 that report compensation for the CEO and the next four highest paid executives.

[Insert Table 1 about here]

Company financial data is obtained from Compustat Fundamentals Annual, company segment data from Compustat industry segment files, and governance and CEO data from the Corporate Library. Non-missing data is required for all the variables. Finally, because of sign-on bonuses, greater incentive compensation for newly hired CEOs, and the effects of termination payments for retiring CEOs, the sample is restricted to firms in which the CEO has at least one year of tenure and is in office at the end of the fiscal year.[17] These data requirements result in a final sample of 9,978 firm-year observations from 2001 to 2010 of which 1,926 are unique firms. This sample selection process is summarised in Table 1.

[15] For example, Steve Jobs, former CEO of Apple Inc. chose to take only $1 per year in pay due to his large personal wealth from shareholdings of Apple Inc. and Walt Disney Co.

[16] Nevertheless, we also test the performance consequences for firms with persistent low levels of excess CPS which is discussed in section 4.2 Sensitivity and Additional Tests.

[17] CEOs are identified first using the Corporate Library which identifies the CEO of each firm-year and lists their full name, title and other descriptive variables. These CEOs are then matched to the executives in Execucomp to obtain compensation data. This is done due to the difficulty in identifying CEOs for some Execucomp firm-years due to missing CEOANN data or multiple CEOs for some firm-years.

To examine the performance consequences of the CPS, firms must have non-missing data required to compute subsequent firm-performance over two years. Therefore, when testing the performance consequences of the CPS, the total sample is reduced to 8,340 firm-year observations between 2001 and 2009, respectively. To identify firms with persistent high excess CPS, the CEO must be in office for three consecutive years which reduces the sample to 5,131 firm-years. From this subsample 538 (10.5%) have high excess CPS that they fail to reduce over the subsequent two years. This number is reduced to 536 for testing due to two observations missing required data.

3.2 Variable measurement

3.2.1 Measurement of the CPS

The CPS is computed as the percentage of total compensation paid to the CEO out of the total compensation paid to the five highest paid executives in the firm.[18] Total compensation is as reported in ExecuComp's TDC1, which includes salary, bonus, other annual pay, the total value of restricted stock and options granted that year, long-term incentive payouts, and all other total compensation. In additional tests we measure the CPS using equity-based compensation which can be argued to provide greater incentives to managers with decision authority (Mehran 1995; Jensen and Murphy 1990a), however we find almost identical results possibly because the majority of executives' compensation is given in the form of equity.

3.2.2 Economic determinants of the CPS

To capture industry and geographic diversification a revenue-based Herfindahl-Hirschman index is computed (as used in Rose and Shepard, 1997) which considers the degree of a firm's

[18] There are no firms in the sample with less than 5 executives (Table 1).

diversification by taking into account the relative importance of different segments.[19] Industrial (*BUShhindex*) and geographic (*GEOhhindex*) diversification are computed as:

$$BUShhindex\ (GEOhhindex) = 1 - \sum_{i=t}^{NUMSEG}\left[\frac{Segment\ sales_i}{Company\ sales}\right]^2$$

Where *segment sales* are the sales reported for the business (geographic) segment in Compustat Industry Segment Files and *company sales* is the total firm sales. A higher index indicates a more diversified firm.[20]

R&D intensity (*RDintensity*) is measured as the ratio of annual research and development expense to sales. There are a large number of firms for which R&D expenditure is not reported in Compustat and no indication is given as to whether the data is missing or was not reported separately in the firm's financial statements. Firms may not report separately their R&D expenditure from their cost of goods sold or (COGS) or selling, general and administrative expenses (SG&A) if the amount is immaterial. Therefore, to control for this, the missing R&D data is set equal to zero and an 'R&D missing' indicator variable (*RDmissing*) is set equal to one.

Growth options are measured using the firm's market-to-book value (*MBV*) calculated as (market value of equity + book value of liabilities)/(book value of assets). While it is debated what market-to-book ratio actually captures, this paper follows the number of prior studies that use market-to-book ratio as a proxy for growth options.[21] Regulated firms (*REGULATED*) are identified following prior studies that use an indicator variable equal to

[19] Other measures of diversification used in the literature include variations of Hirfindahl-Hirschman indices (Bushman et al. 2004; Rose and Shepard 1997), indicator variables, and the number of business segments reported (Bebchuk et al. 2011; Denis et al. 2002).

[20] Using this measure a firm with two equal sized segments is ranked as more diversified than a firm with two unequal segments For example, one firm with two equal sized segments has a DIVERSE measure equal to $1 - (2*0.5^2) = 0.50$. One firm with two segments of sizes 90% and 10% has a DIVERSE measure of $1 - (0.9^2 + 0.1^2) = 0.18$.

[21] See for example, Kumar and Krishnan (2008), Christie et al. (2003), and Smith and Watts (1992).

one if the primary business of a firm is utilities, communications or transport (Christie et al. 2003; Bryan and Hwang 1997).[22]

To capture labour market effects (benchmarking practices) the industry median CPS is calculated using 4-digit GICS codes (*IndmedCPS*). Most firms construct their peer groups using similar firms within the same industry (Bizjak et al. 2011; Bizjak et al. 2008) therefore the industry median CPS is a good proxy for benchmark practices used by firms to offer competitive pay. Bebchuk et al. (2011) calculate an industry median CPS using 4-digit SIC groups, however upon examining the distribution of 4-digit SIC groups in Execucomp by year, there are not enough firms in each 4-digit SIC group to obtain an effective benchmark. For example, in each year 22% of 4-digit SIC groups contain only 1 firm, 40% 4-digit SIC groups have two or less firms and 53% have three or less firms in each year. This is prior to losing observations from merging Execucomp with other data sources, and is why Bebchuk et al. (2011) achieve R-squares above 20%.[23] 4-digit GICS groups offer a better alternative and can be obtained by merging Execucomp with Compustat fundamentals data. For example, each year 96% of GICS groups contain 9 or more firms, the other 4% contain 5 or more firms. Furthermore, Bhojraj et al. (2003) show that GICS outperforms other industry classification schemes including SIC and NAICS in explaining firm returns and financial ratios, which are the characteristics that compensation committees consider when identifying peer groups (Bizjak et al. 2011). Hence, GICS is better at identifying firms with similar operating characteristics for comparison and control purposes.

3.2.3 Proxies for managerial power

[22] The SIC codes used include 4000-4100, 4600-4700, and 4800-4900, however sensitivity tests are performed using the corresponding 4-digit GICS codes.

[23] To test this, we run our regressions using the same measure of industry median CPS as Bebchuk et al. (2011). The results report R-squares above 27% hence confirming the problems associated with using 4-digit SIC groups (see Appendix 2).

CEO tenure (*CEO_Tenure*) is measured as the number of years of service of the CEO since taking office.[24] CEOs who are chairman of the board (*CEO_Chair*) are identified using Corporate Library data and missing values are filled in by searching Compustat's annual title variable for the strings 'CHMN' and 'CHAIRMAN'. *CEO_Chair* is an indicator variable equal to one if the CEO holds the chairman position. Founder CEOs (*CEO_Founder*) are identified using Corporate Library data in addition to searching Execucomp's 'TITLE' data item for founders.[25] Executive directors (*Execdirs*) is measured as the proportion of directors on the board that are also executives in the firm. CEOs hired from outside the firm are identified by comparing the date the executive became CEO to the date the executive joined the company (Execucomp's 'BECAMECEO' and 'JOINED_CO' data items). An indicator variable (*CEO_Outsider*) is set to one if the CEO was hired externally and 0 if the CEO was already an executive in the firm.

3.2.4 Control variables

A number of controls are included for other factors that may influence the level of CEO compensation and thus the CPS. First, accounting and market performance measures are included as prior research has shown that these measures are used in the determination of CEO compensation (Core et al. 1999; Murphy 1999; Sloan 1993; Murphy 1985). Accounting and market performance are measured using return on assets (*ROA*), the buy and hold annual stock return (*RET*) (adjusted for stock splits and dividends), and basic earnings per share before extraordinary items (*EPS*).[26] While compensation contracts are determined ex-ante the

[24] *CEO_Tenure* data is taken from the Corporate Library datasets and any missing values are computed using Execucomp's 'BECAMECEO' date. This method results in less missing data for CEO tenure.
[25] Founder descendants are not included in the definition of Founder CEOs.
[26] An alternative would be to use industry-adjusted firm-performance measures to proxy for the use of relative performance measurement used in compensation contracts. However, relative performance measures are not used widely in firms and prior empirical evidence on the topic is mixed (see for example, Guojin et al. 2011). Therefore, raw firm-performance measures are favoured over industry-adjusted firm-performance measures. EPS is included because like Murphy (1999) an examination of proxy statements of Fortune 200 firms for the

level of compensation awarded for the fiscal year depends upon the performance of the executives in the fiscal year and not last year's performance, therefore performance measures are not lagged.[27]

Second, an industry-adjusted measure of firm-size is included (*IndadjlnSale*) measured as the firm's natural logarithm of sales minus the industry median natural logarithm of sales (using 4-digit GICS groups). This measure controls for relative firm size within an industry. The CPS is calculated as a ratio and thus controls for firm-specific factors affecting the total amount of pay given to the top five executives. However, larger and more complex firms are expected to require more talented executives (Murphy 1985) and may pay a greater 'talent' premium for their CEO.

Third, an indicator variable (*CEO5pct*) equal to 1 is included if the CEO holds 5% or more of the company's shares. Equity ownership is argued to provide greater incentives to CEOs to increase firm performance and hence may result in lower compensation (Core et al. 2003; Ittner et al. 2003; Core et al. 1999). Furthermore, CEOs with large share ownership may receive lower compensation due to dividend payments that have more favourable tax rates. Finally, a control is included for the total number of executives reported by firms in Execucomp (*TotalExecsRpt*). Firms are only required to report compensation for the CEO, CFO and three other highest paid executives in their firm; however some firms report compensation for as many as fourteen executives. In these firms it may be that decision authority is allocated to many senior executives, making those executives more important. Therefore, the total number of executives reported by a firm in a given year may represent organisational structures and operating characteristics not captured by existing proxies.

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year 2011 showed that EPS is still commonly used as a performance metric in executive compensation contracts.

[27] In addition to firm disclosures in proxy statements, Banker et al. (2013) provide evidence supportive of this statement apart from salary which is related to past performance.

3.2.5 Measurement of subsequent firm performance and controls

Following prior research, subsequent firm-performance is measured using return on assets (Brown et al. 2012; Matolcsy and Wright 2011; Chalmers et al. 2006; Core et al. 1999). Using an accounting-based measure of performance avoids the bias inherent in security prices which are affected by market-wide factors and perceptions of the market. Additionally, current security prices should already reflect the value of efficient compensation contracts or conversely the loss of value from inefficient compensation contracts. Return on assets is measured over the one-year (*ROA1*) and two-year average (*ROA2*) subsequent to when compensation was awarded and is calculated as EBIT divided by average total assets.

Controls are included to capture other factors that may influence subsequent performance. Risk is controlled for by including the standard deviation of ROA over the prior three years (*STD3ROA*). The natural logarithm of sales (*lnSALE*) and the previous ROA at year t-1 (*ROA*) are also included to control for size and past performance. For tests on the total sample, changes in CEO during years t+1 and t+2 are controlled for through the use of an indicator variable (*ChangeCEO1,2*). It is important to control for this factor because the incoming CEO can impact firm-performance which creates noise when testing for the relation between CPS of the CEO at time t and subsequent firm-performance over t+1 and t+2. Year and industry fixed effects (measured using 2 digit GICS codes) are also included.

3.3 Research design to test the determinants of the CPS

To investigate the economic and other determinants of the CPS the following ordinary least-squares regression (OLS) is estimated using the total pooled cross-sectional sample:

$$CPS_{it} = \alpha + \beta_1 \, BUShhindex_{it} + \beta_2 \, GEOhhindex + \beta_3 \, RDintensity_{it}$$

$$+ \beta_4 \, R\&Dmissing_{it} + \beta_5 \, MBV_{it} + \beta_6 \, Regulated_{it} + \beta_7 \, IndmedCPS_{it}$$

$$+ \beta_8 \text{ CEO\_Tenure}_{it} + \beta_9 \text{ CEO\_Chair}_{it} + \beta_{10} \text{ CEO\_Founder}_{it} + \beta_{11} \text{ Execdirs}_{it}$$

$$+ \beta_{12} \text{ CEO\_Outsider}_{it} + \lambda_n \text{CONTROLS}_{it} + \varepsilon_i \quad (1a)$$

All variables are as defined above in section 3.2. Although there is little to no variation in the CPS by year, year fixed effects are controlled for by the inclusion of year indicators. Eq. (1a) is also tested for firm fixed effects and random effects.[28] We also estimate a changes model to provide further evidence on the determinants of the CPS which, for brevity, we report in section 4.4 Sensitivity tests and additional analyses.

3.4 Research design to test the CPS of newly appointed CEOs

To investigate if newly appointed CEOs are able to 'capture' the board over time, we estimate Eq. (1) on a subsample of firms that experienced a change in CEO and that have data available for three subsequent years, excluding the year of appointment.[29] We include three additional variables in Eq. (1) which capture the newly appointed CEO's tenure: *Tenure1*, *Tenure2*, *Tenure3*, respectively. Second, to compare the CPS of newly appointed CEOs to the CPS of previous CEOs, we estimate Eq. (1) on a subsample of firms that experienced a change in CEO. We take the CPS of the CEO in the year prior to (after) leaving (joining) the firm and estimate Eq. (1) with the inclusion of an indicator variable to capture the newly appointed CEO (*NEW_CEO*), and an interaction term if the newly appointed CEO is an outsider (*NEW_CEO*CEO_Outsider*). This interaction controls for any additional pay awarded to newly appointed external CEOs. All variables are as previously defined.

[28] Fixed effects estimates use only within-firm differences, essentially discarding information about differences between firms. Therefore, if the determinants vary greatly across firms but vary little over time for each firm, then fixed effects estimates are imprecise.

[29] To identify newly appointed CEOs we use the date provided in Execucomp's BECAMECEO variable.

3.5 Research design to test the performance consequences of CPS

In addition to testing the relation between CPS and subsequent firm performance, we compute a measure of excess CPS (*EXCESS_CPS*). This measure is similar to prior studies that compute excess compensation (e.g. Core et al. 2008; Core et al. 1999) and studies that determine inefficient compensation structures (Brown et al. 2012; e.g. Matolcsy and Wright 2011). These studies estimate expected (efficient) compensation based upon firms' economic and CEO characteristics, and then subtract this estimate from actual compensation to arrive at excess compensation. In a similar fashion, excess CPS is equal to actual CPS less expected CPS:

$$EXCESS\_CPS_{it} = CPS_{it} - EXPECTED\_CPS_{it} \quad (2)$$

Where CPS_{it} is the actual CPS for firm *i* at year *t*, and $EXPECTED\_CPS_{it}$ is the expected CPS based on the estimates from running equation (1a) above, separately for each year. We estimate expected CPS using Eq. (1a) because the CPS is determined by factors related to the allocation of decision authority (as well as controls) which is not restricted to economic characteristics of firms alone. Additionally, efficient compensation contracts allow CEOs to incorporate some degree of 'rents', therefore any excess above that predicted by Eq. (1a) is more likely to reflect the excessive or 'inefficient' proportion of the CPS.[30]

To identify firms with persistent high excess CPS, observations are ranked into quartiles based on their value of EXCESS_CPS. Firms that fall into the largest quartile (quartile 4) three years in a row and that experience no change in CEO over the subsequent two years are those in which high excess CPS persist.

To determine if CPS is associated with firm-performance, each measure is separately regressed on subsequent ROA measures using both the total sample and the subsample of

[30] In sensitivity tests we also estimate *EXPECTED_CPS* using a stepwise regression of Eq. (1a) which includes only significant variables (discussed in section 4.4).

persistent excess firms. The following regression model is estimated consistent with prior studies (Chalmers et al. 2006; Core et al. 1999):

$$ROA_i = \alpha + \beta_1 CPS_{it} (EXCESS\_CPS_{it}) + \beta_2 lnSALE_{it} + \beta_3 STD3ROA_{it} + \beta_4 ROA_{it-1} + \beta_5 CHANGECEO1(2)_{it} + \lambda_n IND_i + \lambda_n YEAR_i + \varepsilon_i \quad (3)$$

Where *ROA* is the subsequent one-year and then average two-year performance measures respectively (*ROA1, ROA2*). All variables are as previously defined in section 3.2.5 above.

3.6 Descriptive Statistics

Table 2 presents the mean and median CPS figures by year (Panel A) and by high level industry groups measured using 2-digit GICS codes (Panel B).

[Insert table 2 about here]

It can be seen in Panel A that the CPS has remained quite stable over the sample period despite an increase in the total pay firms give to their top five executives. Panel B shows there is also limited variation in the CPS by industry.

Table 3 provides descriptive statistics for the total sample used to estimate Eq. (1a) (Panel A) and for the subsamples used to test subsequent performance (Panel B).[31] Economic determinants of the CPS have been winsorised to the 99.5 and 0.05 percentiles to remove the influence of outliers and data errors.

[Insert Table 3 about here]

Looking at Panel A, the mean *CPS* (*CPSE*) is 0.38 (0.41) and the mean total pay (total equity) given to the top five executives in a firm is $13,106,160 ($6,795,090). There is variation in

[31] The total sample in Panel B consists of all observations which have the required data available to test subsequent performance. The number of observations in the persistent excess subsample is 536 (compared to 538 firm-years identified) due to two observations missing data for one or more required variables.

the degree of business (*BUShhindex*) and geographic diversification (*GEOhhindex*) as indicated by their standard deviations (0.37 and 0.28 respectively) and minimum and maximum values, however almost half of the sample has missing R&D data as indicated by a mean *RDmissing* of 0.44. The market-to-book ratio has a mean of 1.82 and 9% of firms are regulated. On average the CEO has a tenure of 8.24 years, over half (57%) are also the Chairman of the board, 7% are founder CEOs and 18% of the board of directors are executive directors. Roughly 23% of CEOs are Outside CEOs and 9% hold more than 5% of the company's shares. The minimum number of executives reported by firms in the sample is 5 and the maximum is 14.

Table 4 presents a correlation matrix of all variables. There are no large correlations between variables. For example, the largest correlations are between *ROA* and *MBV* (0.56), and *ROA* and *EPS* (0.44). VIF and Tolerance tests were conducted when running OLS regressions further confirming that no multicolinearity concerns exist.

[Insert Table 4 about here]

4.0 Main Results

4.1 Results on the determinants of the CPS

Table 5 presents the results of estimating Eq. (1a) using OLS adjusted for heterskedasticity with White's (1980) heterskedasticity-adjusted standard errors.

[Insert Table 5 about here]

Columns (1) and (2) perform the same test with the exception of column (2) controlling for firm effects through the use of clustered standard errors by firm. Columns (3) and (4) replicate columns (1) and (2) respectively, with the exception that industry median CPS (*IndmedCPS*) is measured using 4-digit SIC codes as in Bebchuk et al. (2011). The F-stats

indicate that the regressions are significant (51.21, $p<0.01$) and the general significance of the variables across columns (1) and (2) (and 3 and 4) are similar which suggests that the determinants vary across firms but have little variation within firms over time. The adjusted R-squared for the regression of the CPS on the predicted determinants and controls is 11.96% (for columns 1 and 2). This R-squared is lower than that reported by Bebchuk et al. (2011) due to the authors having regressed roughly 22% of their observations on themselves (as discussed in section 3.2.2). This result is confirmed when we use the same 4-digit SIC codes to calculate industry median CPS and then re-estimate Eq. (1a) in columns (3) and (4). Doing so more than doubles the Adjusted R-squared to 27.56%.

The coefficients of all the economic determinants of the CPS have the predicted signs and are significant (apart from *GEOhhindex*). Industrial diversification (*BUShhindex*) is positive and significant (0.0106, $p<0.01$) indicating that as firms become more diversified across businesses the CEO receives a larger proportion of the compensation paid to the top five executives. This result is consistent with the findings of Rose and Shepard (1997) who document that a pay premium exists for CEOs of diversified firms due to increased job complexity and additional monitoring performed by the CEO of other executives. If firms that are highly diversified across businesses require a much larger executive team, considering only the top five executives in these firms understates the total pay given to executives with decision authority and overstates the CPS (capturing only the increase in CEO pay related to additionally job complexity and monitoring of the larger number of executives and senior managers). Including the control for the total number of executives reported by a firm (*TotalExecsRpt*) mitigates some of this effect but not all because firms are not required to report more than five executives in the proxy statements, hence this data cannot be accurately obtained for all firms. The *TotalExecsRpt* control is negative and significant (-0.0108, $p<0.01$) suggesting that this is a plausible explanation. Alternative tests

of *BUShhindex* are also tested and discussed in section 4.2 Sensitivity tests and additional analyses.

Geographic diversification (*GEOhhindex*) is negative but not significant. The sign is consistent with increased decision authority given to non-CEO executives, but its lack of significance is consistent with the view that information technology has made it easier to sell products in offshore markets without the need to establish a large presence and to monitor the actions of executives from a distance.[32] R&D intensity (*RDIntensity*) is positive but not significant. The lack of significance of R&D intensity is likely due to the large number of firms for which R&D expenditure data is missing in Compustat. Firms with R&D expenditure below a certain amount are not required to report the expense as a separate line item and hence it is not captured by Compustat. The *RDmissing* indicator variable is negative and significant as predicted (-0.0089, $p<0.01$), indicating that for the majority of firms in which R&D expenditure is missing and assumed to be zero, the CEO pay slice is lower. Taken together these results suggest that CEOs in firms with large R&D expenditures receive a higher CPS because they are responsible for selecting which R&D projects to pursue in directing the firm's strategy and hence receive greater incentives to add value to the firm. This is also consistent with prior studies that suggest compensation committees provide efficient incentives to mitigate the risk of CEOs cutting R&D expenditure (Cheng 2004) and that R&D expenditure is determined by the firm's operating and contracting environment (Hirschey et al. 2012).

Firm growth options as measured by market-to-book value (*MBV*) is negative and significant (-0.0093, $p<0.01$). This finding is in line with the prediction that decision authority is spread across a number of executives in high growth firms to encourage the pursuit of value

[32] Which may explain why global diversification has experienced an increasing trend among firms over time (Denis et al. 2002).

increasing opportunities that must be acted upon quickly. CEOs in regulated firms (*Regulated*) receive a lower CPS as indicated by a negative and significant coefficient (-0.0072, $p<0.10$). The additional monitoring of executives in regulated firms by regulatory bodies' results in lower managerial discretion and a need for less talented managers, hence the decision authority concentrated in the CEO relative to other executives is lower in regulated firms than nonregulated firms. The proxy for the labour market influence on the CPS (*IndmedCPS*) is positive and significant (0.5490, $p<0.01$). This result is expected given benchmarking practices used by firms to attract and retain talented executives.

CEO tenure (*CEO_Tenure*) is not significant as managerial power theory would predict. CEOs who are chairman of the board (*CEO_Chair*) receive a larger CPS (0.0219, $P<0.01$). This finding is similar to findings of prior studies that examine the relation between CEO-chair duality and CEO compensation (e.g. Core et al. 1999), and in relation to the CPS (Bebchuk et al. 2011). Founder CEOs (*Founder-CEO*) receive a lower CPS indicated by a negative and significant coefficient (-0.0120, $p<0.01$). This finding runs counter to the managerial power argument that Founder CEOs are the most entrenched as they started the company and thus receive a higher CPS because they inflate their own pay. The proportion of the board that consists of executive directors (*Execdirs*) is negative and significant (-0.1719, $p<0.01$), suggesting that executives with specific information and hence decision authority are made directors to enable better advising of the board. Because these executives have greater decision authority they receive greater levels of incentives, hence reducing the CPS. This finding also runs counter to the managerial power argument that the greater the proportion of inside directors (executive directors) the more the CEO is able to extract higher levels of compensation. Outside CEOs (*CEO_Outsider*) receive a higher CPS as indicated by a positive and significant coefficient (0.0085, $p<0.01$). This finding is also not supportive of the managerial power explanation of CPS.

Of the control variables, all firm performance measures (*ROA, RET, EPS*) are positive and significant which is in line with prior findings that CEO pay is tied to firm performance measures. The industry-adjusted size control (*IndadjlnSale*) is positive but not significant, which is expected given that the CPS measure controls for firm specific factors affecting the size of the total pay awarded to the top five executives. The *CEO5pct* variable is negative and significant (-0.0447, $p<0.01$). This finding is in line with prior studies which document that CEOs with a large shareholding in a firm have significant incentives to perform and hence require less compensation. It may also be that CEOs with a large shareholding receive a portion of their compensation in the form of dividends which have more favourable tax rates.

4.2 Results on the CPS of newly appointed CEOs

Table 6 reports the results of estimating Eq. (1a) on the subsample of newly appointed CEOs over their first three years of tenure.

[Insert Table 6 about here]

Using the total sample of newly appointed CEOs (first column), the F-stat is significant at the 1% level and the adjusted R-squared is 12.51%. The coefficients on the test variables *Tenure1*, *Tenure2*, and *Tenure3* are all positive but insignificant. These results suggest that newly appointed CEOs are unable to capture the board of directors and inflate their compensation, as managerial power theory suggests. These results hold when we split the sample between newly appointed CEOs from outside the firm (second column) and newly appointed CEOs from within the firm (third column).[33]

Table 7 reports the results of testing if the CPS of newly appointed CEOs differs to the CPS of the previous CEO. The sample consists of the year prior to (after) the CEO leaving (joining) the firm.

[33] For the subsample of newly appointed CEOs from outside the firm, the *CEO5PCT* and *CEO_Founder* indicator variables are all zero and hence not included in the regression.

[Insert Table 7 about here]

Looking at all newly appointed CEOs and their predecessors (first column), the F-stat is significant at the 1% level and the adjusted R-squared is 9.12%. The test variable *NEW_CEO* is positive but insignificant indicating that the CPS of the newly appointed CEO is not statistically different from the CPS awarded to the prior CEO. The interaction term for newly appointed CEOs from outside the firm (*NEWCEO*CEO_Outsider*) is positive and significant but the *CEO_Outsider* variable is no longer significant. This result suggests that CEOs appointed from outside the firm receive a larger CPS than CEOs appointed from within the executive ranks. The second and third columns show the results after dividing the sample into those firms that hire external CEOs versus internal CEOs. The F-stats are significant at the 1% level and the adjusted R-squares are 19.84% for the outside CEO subsample, and 7.52% for the inside CEO subsample. *NEWCEO* is positive and significant for the subsample that hired an outside CEO (0.0565, $p<0.05$), but insignificant for the subsample that appointed a CEO from their existing executives. Overall these findings do not support the managerial power explanation for the CPS.

4.2 Results on the performance consequences of the CPS

Table 8 presents results from regressing CPS and EXCESS_CPS on return on assets measured over the subsequent one and two years. The first four columns pertain to tests using the total sample, and the last two columns report results from tests using the 'persistent excess CPS' subsample, respectively.

[Insert Table 8 about here]

For tests on the total sample, the F-stats indicate that all regressions are significant and the adjusted R-squares are 46% for subsequent ROA (*ROA1*), 29% for average 2-year ROA (*ROA2*), 43% for subsequent industry adjusted ROA (*AdjROA1*), and 34% for average 2-year

industry adjusted ROA (*AdjROA2*). The coefficients on *CPS* approximate zero and are not significant for any of the ROA measures. These results differ from those of Bebchuk et al. (2011) who document a negative and significant relation between the CPS and industry-adjusted ROA, despite using the same measure of industry adjusted ROA. The coefficients on *EXCESS_CPS* are also not significant for any of the measures of subsequent accounting performance. These results support our first two predictions and suggest that on average firms' CPS is efficient.

Of the control variables, *lnSale* and *ROA* are positive and significant for both *ROA1* and *ROA2*, indicating that firms with larger sales and higher previous return on assets experience higher subsequent return on assets. However, sales are negative and significant for both measures of industry adjusted ROA. *ChangeCEO1* and *ChangeCEO2* are also negative and significant across all measures of performance, indicating lower subsequent accounting returns for firms that experience a change in CEO during the next two subsequent years. This result is consistent with the earnings bath literature which expects that incoming CEOs engage in conservative accounting policies and conduct large write offs to reduce earnings in their initial year of employment.

For tests using the subsample of firms with persistent excess CPS, the F-stats indicate that the regressions are significant and the adjusted R-squares are roughly 48%. The coefficient on CPS is now negative and significant at the 5% level for subsequent one-year ROA (*ROA1*), and the 10% level for average two-year ROA (*ROA2*). Of the control variables, *lnSale* is now negative but only significant for *ROA1*, and *ROA* remains positive and significant for tests on both *ROA1* and *ROA2*. This result suggests that in firms which do not correct high levels of excess CPS, subsequent accounting performance is lower. Therefore, as most firms correct high excess CPS by reducing it in subsequent years (as illustrated in Table 1), firms that fail to do so may have greater agency costs and hence lower subsequent performance.

To investigate this notion further, we examine differences in some economic and governance characteristics between the firms that reduce high excess CPS (efficient contracting) and those in which high excess CPS persists. These results are reported in Table 9.

[Insert Table 9 about here]

A two sample t-test for differences in the mean and a median test for differences in the median between the two subsamples, shows that persistent excess CPS firms have CEOs who are more likely to be the founder of the company (*CEO_Founder*), own more than five percent of the company's shares (*CEO5pct*), and have longer tenures (*CEO_Tenure*). These CEOs receive a significantly greater CPS and CPSE, however there is no difference in the total pay or total equity pay given to the top five executives in each group. Interestingly, firms in the persistent excess CPS subsample are less likely to have a female on their compensation committee (*F_ccomp*), have a greater proportion of old directors (*Olddirs*), a greater proportion of executive directors (*Execdirs*) and less likely to have an independent nomination committee (*Independent nom com.*).

4.4 Sensitivity tests and additional analyses

A number of sensitivity tests are performed to test the robustness of estimating equation (1a). In testing the sensitivity of results to different subsamples, first we delete observations for which no segment data is recorded in Compustat industry segment files. This reduces the sample to 7,018 observations, however the sign and significance of the diversification measures remain the same. Second, we remove the restriction that firms must report at least five executives. Removing this restriction increases the sample size to 10,553 observations, and the results remain consistent with those reported in Table 5 apart from *RDIntensity* which

is now positive and significant at the 5% level.[34] Third, we delete observations with a CPS of zero. Deleting these observations reduces the sample to 9,961 observations but does not change the results originally reported in Table 5. Fourth, we estimate Eq. (1) using equity pay which consists of options and restricted stock granted. Doing so reduces the sample to 9,038 observations due to 940 observations that issue no equity to their top 5 executives, and we achieve almost identical results to those reported in Table 5.[35]

In testing the sensitivity of results to different variable measurements, we first use an alternative measure of *BUShhindex* which consists of a count of the number of unique 4-digit SIC codes that a firm operates across in a given year. In a separate test we also include an interaction term between *BUShhindex* with *GEOhhindex*. These alternative measures do not change the results originally reported and the coefficient on the interaction term is negative but insignificant. We also test the sensitivity of results to the inclusion of industry fixed effects for both measures of the CPS however they results are unaffected by industry fixed effects. Finally, the correlation between the CPS and CEO total compensation is 0.39 and when including CEOs' total compensation in Eq. (1a), despite endogeneity concerns, the results and significance of the determinant variables remain unchanged (CEOs total compensation is positive and significant).

As an additional test we estimate the following changes model on a subsample of firms that have at least two consecutive years of data for which the same CEO is in office:

$$\Delta CPS_{it} = \alpha + \beta_1 \Delta BUShhindex_{it} + \beta_2 \Delta GEOhhindex + \beta_3 \Delta RDintensity_{it}$$

[34] The significance of *R&DIntensity* may be the result of including smaller start up firms in the information technology sector that rely heavily on research and development.

[35] Prior to the introduction of FAS123 options granted were valued using Black-Scholes (Execucomp's OPTION_AWARDS_BLK_VALUE and restricted stock were recorded under RSTKGRNT), however from 2006 forward these items changed to the fair value method of valuation (Execucomp's OPTION_AWARDS_FV and STOCK_AWARDS_FV).

$$+ \beta_4 \Delta MBV_{it} + \beta_5 \Delta IndmedCPS_{it} + \beta_6 \Delta Execdirs_{it} + \lambda_n \Delta CONTROLS_{it} + \varepsilon_i \quad (1b)$$

Where Δ indicates the change between years *t* and *t-1* of the indicated economic determinants and controls. Controls include the change in *ROA*, *RET*, *EPS*, *IndadjLnSale*, and *TotalExecsRpt*. All variables are as previously defined, apart from Δ*Execdirs* which is measured as the change in the number of executive directors rather than the change in the ratio of executive directors. Results are unchanged after controlling for firm effects through the use of clustered standard errors by firm. The F-stat is significant at the 1% level and the adjusted R-squared is 2.64%. The coefficients on changes in industrial diversification (Δ*BUShhindex*) and geographical diversification (Δ*GEOhhindex*) are both negative, but only *BUShhindex* is significant. This result suggests that as a firm increases its business diversification the CPS reduces due to the allocation of decision authority to one or more other senior executives. The coefficient on changes in R&D intensity (Δ*RDintensity*) is positive and significant supporting the prior results of equation (1a), which suggests that as a firm increases its reliance on R&D it also increases the CEO's decision authority to pursue the R&D strategy and select value increasing projects. Changes in market-to-book value (Δ*MBV*) is not significant. This may be due to the fact that changes in *MBV* are small relative to the current value of *MBV*. Changes in the industry median CPS (Δ*IndmedCPS*) is positive and significant. This result supports the benchmarking and labour market influences on the CPS. Changes in the number of executive directors (Δ*Execdirs*) is negative but not significant, which is likely because the increase and decrease in this number is a maximum of 1. Of the control variables, changes in *ROA* is positive and significant. Changes in the number of executives reported by a firm in Execucomp (Δ*TotalExecsRpt*) is negative and significant. This result suggests that if a firm reports compensation for a greater number of executives in a given year, it is likely that the concentration of decision authority in the CEO

is reduced and a larger executive team is relied upon to make decisions regarding the firm. Overall these results confirm the findings from estimating Equation (1a) and provide further support that the CPS reflects rational allocation of decision authority between the CEO and one or more other executives which is driven by firms' economic characteristics.

A number of sensitivity tests are also performed with respect to the performance consequences of the CPS. First, the results of the relation between excess CPS and subsequent firm performance are influenced by the quality of the model used to estimate expected CPS for each firm-year. Therefore, to test the sensitivity of results in regards to using this approach, expected CPS is estimated by year using the results of a stepwise regression to estimate Eq. (1) which examines the determinants of the CPS. Eq. (3) is then estimated using the calculated *Excess_CPS*. The results remain are consistent with those reported in Table 8. Second, we examine the sensitivity of the results from estimating Eq. (3) to removing lagged *ROA* and replacing *lnSale* with the natural logarithm of total assets. Lagged *ROA* and *lnSale* are included in the regression alongside excess CPS, and could potentially impact the results if they are also associated with CPS and thus excess CPS. Results remain consistent with those reported in Table 8. Third, we include CEOs' total compensation in the regressions but results remain unchanged and total compensation is insignificant. Last, it could be argued that very low excess CPS could also be inefficient and thus have performance consequences, though we contend that unlike high levels of CPS, there are rational reasons to expect CEOs to be paid less than expected (e.g. due to CEOs' personal wealth and motivations other than money). Therefore, we estimate Eq. (3) for firms that fall in the lowest quartile of excess CPS and remain there for three consecutive years (387 observations, 191 unique firms). We find no relation between CPS and subsequent firm performance measures for these firms.

As an additional test, we examine the relation between Tobin's q, CPS and *EXCESS_CPS*. Bebchuk et al. (2011) find a negative relation between CPS and industry-adjusted Tobin's q, which they interpret to be an indication of poor firm performance. However, given that the CPS is lower for firms with large growth options, proxied using the market-to-book ratio (*MBV*), it is intuitive that there exists a negative relation between Tobin's q and the CPS, especially since the correlation between *Tobin's q* and *MBV* is 0.80 ($p<0.01$). Therefore, a negative relation is expected between CPS and Tobin's q. Tobin's q is measured consistent with Bebchuk et al. (2011), with the exception that the natural logarithm is taken to normalise the distribution and it is the firm's Tobin's q and not an industry-adjusted measure of Tobin's q. The expected negative relation between the *CPS* and *Tobin's q* is evident for both measures of Tobin's q, however, *EXCESS_ CPS* is negative but not significantly related to either measure of Tobin's q. These results provide little evidence to suspect that CPS reflects rent extraction and thus managerial power.

5.0 Conclusion

This paper provides evidence on the determinants of the CEO pay slice (CPS) and the relation between CPS and subsequent firm performance. Results are consistent with an agency theory explanation of the CPS, in that the CPS (and changes in the CPS) is at least partially driven by the economic characteristics of firms which determine the rational allocation of decision authority between the CEO and one or more other executives. We find no evidence that newly appointed CEOs are able to 'capture' the board of directors and increase their CPS over time. Nor do we find a statistical difference between the CPS awarded to a newly appointed CEO and the CPS of the previous CEO within firms. Given that the CPS is determined by the economic characteristics of firms, it may be possible to observe excess CPS at times when the economic characteristics of the firm change. However, on average most firms contract efficiently with executives as we observe that most firms with

high excess CPS reduce it the following year (or two years), and we find no relation between CPS or excess CPS and subsequent firm performance. However, for a small subsample of firms in which excess CPS persists, we find a negative relation between the CPS and subsequent firm performance indicating possible agency problems in those firms.

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Table 1
Sample Selection

Panel A: sample selection for testing the determinants of the CPS		
Observations with required data		11,803
Less:		
Observations with less than 5 executives	605	
Observations with CEO tenure less than 1 year	529	
Observations with retiring CEO	691	
Final Sample		9,978
Panel B: sample for testing the performance consequences of the CPS		
Total sample with required data		8,340
Observations with the same CEO and excess CPS rank for three consecutive years (years t, t+1, and t+2)	5,131	
Quartile 4 High Excess CPS Rank	1,357	
Obs. that reduce excess in the subsequent year (t+1)	578 (42.6%)	
Obs. that reduce excess in year t+2	241 (17.8%)	
Obs. with persistent excess	538 (39.6%)	
Persistent excess subsample with required data		536

Data is soured from the Corporate Library, Compustat Fundamentals Annual and Execucomp databases. The sample begins with all observations that have the required data for the independent and dependent variables. The final sample in Panel A results in 9,978 observations of which 1,926 are unique firms. In Panel B the total sample results in 8,340 observations of which 1,926 are unique firms, and the subsample with persistent high excess CPS results in 536 observations of which 235 are unique firms.

Table 2
Sample by Year and Industry for CPS using Total Pay

Panel A: Individual firms by year and means and medians of CPS and Total Pay

Year	% of Firms	Mean CPS	Median CPS	Mean Total Pay (000's)	Median Total Pay (000's)
2001	7.72	0.37	0.38	14,463	7,361
2002	8.32	0.38	0.38	12,537	7,931
2003	8.49	0.39	0.39	11,850	7,737
2004	9.39	0.38	0.39	19,296	8,590
2005	9.11	0.39	0.40	13,316	8,619
2006	10.78	0.38	0.39	13,930	8,552
2007	13.67	0.38	0.38	13,907	9,052
2008	11.81	0.38	0.39	13,264	8,965
2009	11.07	0.38	0.39	12,343	8,495
2010	9.63	0.40	0.40	14,762	10,700
Total	**100%**				

Panel B: Firm-years by industry and means and medians of CPS and Total Pay

Industry (2 digit GICS)	%Firm-years	Mean CPS	Median CPS	Mean Total Pay (000's)	Median Total Pay (000's)
Energy	5.42	0.39	0.40	16,167	11,423
Materials	6.77	0.42	0.42	10,617	8,212
Industrials	15.66	0.40	0.41	10,849	7,407
Consumer Discretionary	17.15	0.38	0.38	14,042	9,370
Consumer Staples	4.95	0.40	0.41	16,189	13,233
Health Care	10.30	0.39	0.39	14,568	10,207
Financials	14.06	0.36	0.36	14,823	8,544
Information Technology	19.22	0.36	0.37	13,056	7,666
Telecommunications	1.19	0.38	0.38	20,870	15,004
Utilities	5.26	0.41	0.41	9,558	7,555
Total	**100%**				

CPS is the ratio of the CEO's total compensation to the sum of the total compensation awarded to the highest five paid executives in the firm. *Total Pay* is the sum of the total compensation awarded to the highest five paid executives in the firm. Percentage of firm-years may not equal exactly 100% due to rounding.

Table 3
Descriptive statistics

Panel A: Descriptive statistics for the total sample (N=9,978)

Variable	Mean	Median	Std Dev	Min	Max
CPS	0.38	0.39	0.12	0.00	0.98
CPSE	0.41	0.43	0.19	0.00	1.00
BUShhindex	0.41	0.40	0.37	0.00	1.00
GEOhhindex	0.27	0.21	0.28	0.00	0.87
RDIntensity	0.04	0.00	0.08	0.00	0.64
RDmissing	0.44	0.00	0.50	0.00	1.00
MBV	1.82	1.47	1.06	0.68	7.25
Regulated	0.09	0.00	0.28	0.00	1.00
IndmedCPS	0.39	0.39	0.03	0.30	0.46
IndmedCPSE	0.42	0.42	0.05	0.28	0.52
CEO_Tenure	8.24	6.00	7.73	1.00	59.00
CEO_Chair	0.57	1.00	0.50	0.00	1.00
CEO_Founder	0.07	0.00	0.26	0.00	1.00
Execdirs	0.18	0.14	0.10	0.00	1.00
CEO_Outsider	0.23	0.00	0.42	0.00	1.00
ROA	0.09	0.08	0.09	-0.24	0.44
RET	0.31	0.11	0.90	-0.95	6.14
EPS	1.43	1.38	2.41	-11.01	10.88
IndadjSale	5,524.45	1,205.55	13,788.12	-1,116.18	114,426.73
CEO5pct	0.09	0.00	0.29	0.00	1.00
TotalExecsRpt	5.83	6.00	1.04	5.00	14.00
TotalPay	13106.16	8677.70	13535.23	1191.62	95221.13
TotalEquity	6795.09	3665.68	9225.81	0.00	64045.62

Panel B: Descriptive statistics of variables used in subsequent performance tests

Total Sample (N=8,340)					
Variable	Mean	Median	Std Dev	Q1	Q3
ROA1	0.09	0.08	0.09	0.04	0.13
ROA2	0.08	0.08	0.11	0.04	0.13
ExcessCPS	0.00	-0.00	0.11	-0.06	0.06
CPS	0.38	0.39	0.12	0.32	0.45
LnSale	7.49	7.38	1.52	6.48	8.54
Std3ROA	0.03	0.02	0.04	0.01	0.04
ROA	0.09	0.08	0.09	0.04	0.14
ChangeCEO1	0.11	0.00	0.31	0.00	0.00
ChangeCEO2	0.10	0.00	0.30	0.00	0.00
Persistent Excess subsample (N=536)					
ROA1	0.10	0.10	0.09	0.05	0.14
ROA2	0.10	0.09	0.09	0.05	0.14
ExcessCPS	0.16	0.14	0.09	0.09	0.20
CPS	0.54	0.52	0.09	0.47	0.58
LnSale	7.63	7.51	1.36	6.66	8.55
Std3ROA	0.03	0.02	0.03	0.01	0.04
ROA	0.10	0.09	0.09	0.04	0.14

CPS is the ratio of the CEO's total compensation to the sum of the total compensation awarded to the highest five paid executives in the firm. *CPSE* is the ratio of the CEO's equity compensation to the sum of the total equity compensation awarded to the highest five paid executives in the firm. *BUShhindex* is one minus the Herfindahl-Hirschman index for the firm's business segments or operating segments if business segments are unavailable. *GEOhhindex* is one minus the Herfindahl-Hirschman index for the firm's geographic segments. *RDIntensity* is the ratio of research and development costs to sales. *RDmissing* is an indicator variable equal to one if research and development costs are not disclosed or missing from Compustat. *MBV* is the firm's market-to-book ratio measured as market value plus total liabilities divided by total assets. *Regulated* is an indicator variable equal to one if the firm operates in a regulated industry. *IndmedCPS* is the median CPS for the 4-digit GICS code. *IndmedCPSE* is the median CPSE for the 4-digit GICS code. *CEO_Tenure* is the number of years of service of the current CEO. *CEO_Chair* is an indicator variable equal to 1 if the CEO is also the chair of the board, 0 otherwise. *CEO_Founder* is an indicator variables equal to 1 if the CEO founded the firm. *Execdirs* is the fraction of the board that consists of executive directors. *CEO_Outsider* is an indicator variable equal to one if the CEO was hired from outside the firm. *ROA* is return on assets. *RET* is the buy and hold stock return for the fiscal year adjusted for stock splits and dividends. *EPS* is the fiscal year's earnings per share before extraordinary items. *IndadjSale* is equal to the firm's *Sale* less the industry median S*ale* using 4-digit GICS code. *CEO5pct* is an indicator variable equal to one if the CEO owns five percent or more of the company's shares. *TotalsExecsRpt* is the number of executives reported by a firm in Execucomp for year *t*. *TotalPay* is the sum of the total compensation awarded to the highest five paid executives in the firm. *TotalEquity* is the sum of the equity compensation awarded to the five highest paid executives in the firm. *ROA1* (*ROA2*) is the annual return on assets over the subsequent year (and average over two years, respectively). *ExcessCPS* is the estimated excess CPS as described in equation (2). *CPS* is the total CEO's pay divided by the total pay given to the top five executives in the firm. *LnSale* is the natural logarithm of sales. *Std3ROA* is the standard deviation of the prior 3 years' return on assets. *ROA* is return on assets. *ChangeCEO1(2)* is an indicator variable equal to 1 if the firm experienced a change in CEO in the year t+1 (t+2).

Table 4 Pearson Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1) CPS	1.00	0.79	-0.05	-0.03	0.05	0.10	-0.05	0.01	0.00	-0.16	-0.07	0.10	-0.10	0.07	0.04	0.12	-0.10	-0.20	0.21	0.19	0.07
(2) CPSE		1.00	-0.05	-0.01	0.04	0.11	-0.08	0.04	-0.03	-0.17	-0.13	0.05	-0.11	0.01	-0.01	0.07	-0.06	-0.19	0.19	0.21	0.04
(3) RDIntensity			1.00	-0.41	0.30	-0.14	0.25	-0.14	0.17	-0.03	-0.02	-0.06	0.09	-0.21	-0.05	0.08	0.03	0.05	-0.12	-0.12	0.01
(4) RDmissing				1.00	-0.38	0.01	-0.23	-0.41	-0.11	0.04	0.05	0.03	-0.07	-0.07	-0.02	-0.22	0.01	-0.02	-0.03	0.01	-0.08
(5) GEOhhindex					1.00	0.12	0.15	0.30	0.05	-0.08	-0.06	-0.00	-0.02	0.05	0.02	0.10	0.01	-0.07	0.11	0.10	0.19
(6) BUShhindex						1.00	-0.13	-0.14	-0.06	-0.03	-0.04	0.06	-0.04	-0.00	0.04	0.09	0.02	-0.09	0.21	0.22	0.12
(7) MBV							1.00	-0.12	0.08	0.07	0.02	-0.03	0.08	0.56	0.20	0.08	-0.03	0.12	-0.07	-0.13	0.05
(8) Regulated								1.00	-0.03	-0.05	-0.05	0.02	-0.02	-0.06	-0.02	0.01	0.05	-0.09	0.12	0.19	-0.18
(9) CEO_ Outsider									1.00	0.04	0.05	0.01	0.13	-0.04	0.01	-0.07	0.03	0.02	-0.06	-0.09	-0.05
(10)CEO5pct										1.00	0.40	0.10	0.30	0.04	0.02	-0.01	-0.00	0.25	-0.07	-0.08	-0.09
(11) CEO_ Tenure											1.00	0.26	0.34	0.02	-0.04	-0.00	-0.05	0.25	-0.03	-0.05	-0.07
(12) CEO_ Chair												1.00	0.12	0.02	0.01	0.10	-0.04	-0.15	0.13	0.12	0.08
(13) CEO_ Founder													1.00	-0.00	0.02	-0.05	-0.00	0.14	-0.05	-0.06	-0.06
(14) ROA														1.00	0.06	0.44	-0.09	0.05	0.11	0.03	0.12
(15) RET															1.00	0.20	-0.03	0.07	0.08	0.02	0.02
(16) EPS																1.00	-0.06	-0.09	0.15	0.11	0.19
(17) TotalExecsRpt																	1.00	0.04	-0.07	-0.06	0.08
(18) Execdirs																		1.00	-0.17	-0.19	-0.12
(19) IndmedCPS																			1.00	0.72	-0.06
(20) Indmed CPSE																				1.00	-0.09
(21) Indadj LnSale																					1.00

All variables are as previously defined. Most correlations are significant at the 1% level. Note for dichotomous variables: the point biserial correlation is equivalent to the Pearson correlation between two variables where one is dichotomous.

Table 5

Pooled cross-sectional regressions of the CEO Pay Slice (N=9,978)

$CPS_{it} = \alpha + \beta_1 BUShhindex_{it} + \beta_2 GEOhhindex_{it} + \beta_3 RDIntensity_{it} + \beta_4 RDmissing_{it} + \beta_5 MBV_{it} + \beta_6 Regulated_{it} + \beta_7 IndmedCPS_{it} + \beta_8 CEO\_Tenure_{it} + \beta_9 CEO\_Chair_{it} + \beta_{10} CEO\_Founder_{it} + \beta_{11} Execdirs_{it} + \beta_{12} CEO\_Outsider_{it} + \lambda_n Controls_{it} + \mu_{it}$

				Bebchuk et al. (2011) measure of IndmedCPS using 4-digit SIC	
Parameter	**Predicted sign**	**CPS (1)**	**CPS Firm Clustering (2)**	**CPS (3)**	**CPS Firm Clustering (4)**
Intercept	?	0.2816***	0.2816***	0.1824***	0.1824***
		(14.10)	(10.35)	(14.19)	(10.80)
BUShhindex	+/-	0.0106***	0.0106**	0.0075***	0.0075*
		(3.29)	(2.09)	(2.61)	(1.73)
GEOhhindex	+/-	-0.0041	-0.0041	0.0000	0.0000
		(-0.89)	(-0.57)	(0.00)	(0.00)
RDintensity	+	0.0254	0.0254	0.0438**	0.0438*
		(1.37)	(0.96)	(2.50)	(1.79)
RDmissing	-	-0.0089***	-0.0089*	-0.0025	-0.0025
		(-3.30)	(-1.90)	(-1.02)	(-0.61)
MBV	-	-0.0093***	-0.0093***	-0.0083***	-0.0083***
		(-5.51)	(-4.04)	(-5.30)	(-4.04)
Regulated	-	-0.0072*	-0.0072	-0.0014	-0.0014
		(-1.78)	(-1.03)	(-0.38)	(-0.22)
IndmedCPS	+	0.5940***	0.5940***	0.7970***	0.7970
		(13.53)	(9.40)	(42.90)	(30.67)
CEO_Tenure	+/-	0.0000	0.0000	-0.0000	-0.0000
		(0.25)	(0.15)	(-0.05)	(-0.03)
CEO_Chair	+	0.0219***	0.0219***	0.0171***	0.0171***
		(8.73)	(5.39)	(7.52)	(4.79)
CEO_Founder	-	-0.0120***	-0.0120**	-0.0170***	-0.0170**
		(-3.46)	(-2.17)	(-3.25)	(-2.19)
Execdirs	-	-0.1719***	-0.1719***	-0.1228***	-0.1228***
		(-13.13)	(-8.60)	(-10.24)	(-6.83)
CEO_Outsider	+	0.0085***	0.0085**	0.0071***	0.0071*
		(3.12)	(1.95)	(2.83)	(1.80)
ROA	+	0.1145***	0.1145***	0.0983***	0.0983***
		(5.56)	(4.02)	(5.23)	(4.02)
RET	+	0.0025*	0.0025	0.0025**	0.0025*
		(1.76)	(1.42)	(2.01)	(1.66)
EPS	+	0.0021***	0.0021***	0.0012**	0.0012*
		(3.86)	(2.87)	(2.45)	(1.82)
IndadjlnSale	+	0.0011	0.0011	0.0008	0.0008
		(1.49)	(0.85)	(1.15)	(0.67)
CEO5pct	-	-0.0447***	-0.0447***	-0.0324***	-0.0324***
		(-7.43)	(-4.14)	(-6.06)	(-3.62)
TotalExecsRpt	-	-0.0108***	-0.0108***	-0.0099***	-0.0099***
		(-8.17)	(-6.27)	(-8.18)	(-6.23)
Year indicators		Yes	Yes	Yes	Yes
Adj. R-Squared		**0.1196**	**0.1196**	**0.2756**	**0.2756**
F Value		51.21***	51.21***	141.55***	141.55***

This table represents pooled cross-sectional regressions of CPS on its predicted determinants. * indicates significance at the 10% level, ** the 5% level, and *** the 1% level, respectively. T-statistics in column (1) are based on White's (1980) heteroskedasticity-adjusted standard errors due to the presence of heterskedasticity. Column (2) reports the same regression with clustered errors to control for firm effects. *CPS* is the ratio of the CEO's total compensation to the sum of the total compensation awarded to the highest five paid executives in the firm. *BUShhindex* is one minus the Herfindahl-Hirschman index for the firm's business segments or operating segments if business segments are unavailable. *GEOhhindex* is one minus the Herfindahl-Hirschman index for the firms geographic segments. *RDIntensity* is the ratio of research and development costs to sales. *RDmissing* is an indicator variable equal to one if research and development costs are not disclosed or missing from Compustat. *MBV* is the firm's market-to-book ratio measured as market value plus total liabilities divided by total assets. *Regulated* is an indicator variable equal to one if the firm operates in a regulated industry. *IndmedCPS* is the median CPS for the 4-digit GICS code (SIC code) in columns 1 and 2 (3 and 4). *CEO_Tenure* is the number of years of service of the current CEO. *CEO_Chair* is an indicator variable equal to 1 if the CEO is also the chair of the board, 0 otherwise. *CEO_Founder* is an indicator variables equal to 1 if the CEO founded the firm. *Execdirs* is the fraction of the board that consists of executive directors. *CEO_Outsider* is an indicator variable equal to one if the CEO was hired from outside the firm. *ROA* is return on assets. *RET* is the buy and hold stock return for the fiscal year adjusted for stock splits and dividends. *EPS* is the fiscal year's earnings per share before extraordinary items. *IndadjSale* is equal to the firm's *Sale* less the industry median S*ale* using 4-digit GICS code. *CEO5pct* is an indicator variable equal to one if the CEO owns five percent or more of the company's shares. *TotalsExecsRpt* is the number of executives reported by a firm in Execucomp for year *t*.

Table 6
Pooled cross-sectional regressions of the CEO Pay Slice on the tenure of newly appointed CEOs

Parameter	Predicted sign	CPS (N=654)	CPS of Outside CEOs (N=119)	CPS of Inside CEOs (N=535)
Intercept	?	0.5649***	0.7102***	0.1122
		(4.92)	(3.54)	(0.75)
Tenure1	**+/-**	**0.0464**	**-0.0016**	**0.0842**
		(0.72)	**(-0.02)**	**(0.92)**
Tenure2	**+/-**	**0.0681**	**0.0230**	**0.1063**
		(1.06)	**(0.24)**	**(1.16)**
Tenure3	**+/-**	**0.0754**	**0.0134**	**0.1166**
		(1.17)	**(0.14)**	**(1.27)**
BUShhindex	+/-	-0.0040	-0.0055	-0.0045
		(-0.39)	(-0.23)	(-0.38)
GEOhhindex	+/-	-0.0077	0.0202	-0.0215
		(-0.47)	(0.43)	(-1.17)
RDintensity	+	-0.1099*	-0.4176***	-0.0302
		(-1.74)	(-3.30)	(-0.41)
RDmissing	-	-0.0255***	-0.0082	-0.0247**
		(-2.70)	(-0.32)	(-2.37)
MBV	-	0.0026	0.0163*	-0.0009
		(0.50)	(1.77)	(-0.13)
Regulated	-	0.0145	-0.0312	0.0175
		(1.12)	(-0.94)	(1.24)
IndmedCPS	+	0.3671**	-0.1760	0.4993***
		(2.56)	(-0.47)	(3.13)
CEO_Chair	+	0.0324***	0.0288	0.0312***
		(4.14)	(1.37)	(3.60)
CEO_Founder	-	-0.0689***		-0.0591
		(-1.67)		(-1.41)
Execdirs	-	-0.1362**	-0.0270	-0.1300**
		(-2.68)	(-0.17)	(-2.32)
CEO_Outsider	+	0.0084		
		(0.89)		
ROA	+	-0.0325	-0.0316	-0.0313
		(-0.49)	(-0.28)	(-0.35)
RET	+	-0.0010	-0.0079	0.0020
		(-0.22)	(-0.75)	(0.38)
EPS	+	0.0037*	-0.0055	0.0040**
		(2.06)	(-0.80)	(2.08)
IndadjlnSale	+	0.0019	-0.0044	0.0040
		(0.82)	(-0.73)	(1.57)
CEO5pct	-	0.0492		0.0450
		(1.06)		(0.96)
TotalExecsRpt	-	-0.0032	-0.0000	-0.0036
		(-0.81)	(-0.00)	(-0.83)
Year indicators		Yes	Yes	Yes
Adj. R-Squared		0.1251	0.1336	0.1341
F Value		4.22***	1.70**	4.06***

This table represents pooled cross-sectional regressions of CPS on its predicted determinants. * indicates significance at the 10% level, ** the 5% level, and *** the 1% level, respectively. *CPS* is the ratio of the CEO's total compensation to the sum of the total compensation awarded to the highest five paid executives in the firm. *Tenure1(2,3)* is an indicator variable capturing the year of tenure of the CEO. *BUShhindex* is one minus the Herfindahl-Hirschman index for the firm's business segments or operating segments if business segments are unavailable. *GEOhhindex* is one minus the Herfindahl-Hirschman index for the firms geographic segments. *RDIntensity* is the ratio of research and development costs to sales. *RDmissing* is an indicator variable equal to one if research and development costs are not disclosed or missing from Compustat. *MBV* is the firm's market-to-book ratio measured as market value plus total liabilities divided by total assets. *Regulated* is an indicator variable equal to one if the firm operates in a regulated industry. *IndmedCPS* is the median CPS for the 4-digit GICS code. *CEO_Chair* is an indicator variable equal to 1 if the CEO is also the chair of the board, 0 otherwise. *CEO_Founder* is an indicator variables equal to 1 if the CEO founded the firm. *Execdirs* is the fraction of the board that consists of executive directors. *CEO_Outsider* is an indicator variable equal to one if the CEO was hired from outside the firm. *ROA* is return on assets. *RET* is the buy and hold stock return for the fiscal year adjusted for stock splits and dividends. *EPS* is the fiscal year's earnings per share before extraordinary items. *IndadjSale* is equal to the firm's *Sale* less the industry median S*ale* using 4-digit GICS code. *CEO5pct* is an indicator variable equal to one if the CEO owns five percent or more of the company's shares. *TotalsExecsRpt* is the number of executives reported by a firm in Execucomp for year *t*.

Table 7
Pooled cross-sectional regressions of the CEO pay Slice for newly appointed CEOs

Parameter	Predicted sign	CPS (N=790)	CPS of Outside CEOs (N=154)	CPS of Inside CEOs (N=636)
Intercept	?	0.2744***	0.1365	0.2967***
		(3.97)	(0.78)	(3.79)
NEWCEO*CEO_Outsider	**+/-**	**0.0459****		
		(2.44)		
NEWCEO	**+/-**	**0.0108**	**0.0565****	**0.0067**
		(0.94)	**(1.98)**	**(0.49)**
BUShhindex	+/-	0.0154	0.0155	0.0116
		(1.35)	(0.57)	(0.94)
GEOhhindex	+/-	0.0234	-0.0088	0.0241
		(1.49)	(-0.05)	(1.25)
RDintensity	+	-0.1504**	-0.0791	-0.1638
		(-2.33)	(-0.68)	(-1.47)
RDmissing	-	-0.0111	-0.0088	-0.0075
		(-1.19)	(-0.40)	(-0.67)
MBV	-	-0.0046	-0.0036	-0.0018
		(-0.85)	(-0.29)	(-0.29)
Regulated	-	0.0167	-0.0362	0.0231*
		(1.18)	(-1.09)	(1.79)
IndmedCPS	+	0.2996*	0.3541	0.3206*
		(1.86)	(0.87)	(1.80)
CEO_Tenure	+/-	-0.0000	-0.0016	0.0000
		(-0.10)	(-0.95)	(0.03)
CEO_Chair	+	0.0212**	-0.0107	0.0275**
		(2.24)	(-0.48)	(2.50)
CEO_Founder	-	-0.0184	-0.0985**	-0.0108
		(-0.92)	(-1.98)	(-0.47)
Execdirs	-	-0.0702	0.1486	-0.1225**
		(-1.49)	(1.21)	(-2.22)
CEO_Outsider	+	-0.0002		
		(-0.01)		
ROA	+	0.0732	0.0649	0.0450
		(1.13)	(0.54)	(0.64)
RET	+	0.0043	0.0088	0.0038
		(0.90)	(0.80)	(0.76)
EPS	+	0.0018	0.0042	0.0012
		(0.86)	(0.97)	(0.47)
IndadjlnSale	+	0.0064	0.0166**	0.0046
		(2.52**)	(2.56)	(1.53)
CEO5pct	-	-0.0446**	-0.0295	-0.0405
		(-2.13)	(-0.66)	(-1.58)
TotalExecsRpt	-	-0.0061	-0.0002	-0.0071
		(-1.63)	(-0.03)	(-1.30)
Year indicators		Yes	Yes	Yes
Adj. R-Squared		0.0912	0.1984	0.0752
F Value		3.83***	2.40***	2.91***

This table represents pooled cross-sectional regressions of CPS on its predicted determinants. * indicates significance at the 10% level, ** the 5% level, and *** the 1% level, respectively. *CPS* is the ratio of the CEO's total compensation to the sum of the total compensation awarded to the highest five paid executives in the firm. *NEWCEO* is an indicator variable representing newly appointed CEOs. *NEWCEO*CEO_Outsider* is an interaction term capturing newly appointed CEOs that were hired from outside the firm. *BUShhindex* is one minus the Herfindahl-Hirschman index for the firm's business segments or operating segments if business segments are unavailable. *GEOhhindex* is one minus the Herfindahl-Hirschman index for the firms geographic segments. *RDIntensity* is the ratio of research and development costs to sales. *RDmissing* is an indicator variable equal to one if research and development costs are not disclosed or missing from Compustat. *MBV* is the firm's market-to-book ratio measured as market value plus total liabilities divided by total assets. *Regulated* is an indicator variable equal to one if the firm operates in a regulated industry. *IndmedCPS* is the median CPS for the 4-digit GICS code. *CEO_Tenure* is the number of years of service of the current CEO. *CEO_Chair* is an indicator variable equal to 1 if the CEO is also the chair of the board, 0 otherwise. *CEO_Founder* is an indicator variables equal to 1 if the CEO founded the firm. *Execdirs* is the fraction of the board that consists of executive directors. *CEO_Outsider* is an indicator variable equal to one if the CEO was hired from outside the firm. *ROA* is return on assets. *RET* is the buy and hold stock return for the fiscal year adjusted for stock splits and dividends. *EPS* is the fiscal year's earnings per share before extraordinary items. *IndadjSale* is equal to the firm's *Sale* less the industry median S*ale* using 4-digit GICS code. *CEO5pct* is an indicator variable equal to one if the CEO owns five percent or more of the company's shares. *TotalsExecsRpt* is the number of executives reported by a firm in Execucomp for year *t*.

Table 8
Pooled OLS regressions of subsequent accounting performance on CPS and Excess CPS and controls

$ROA = \alpha + \beta_1 ExcessCPS_{it} + \beta_2 lnSale_{it} + \beta_3 Std3ROA_{it} + \beta_4 ROA_{it-1} + \beta_5 ChangeCEO1,2 + \beta_{k-j} Industry\ Indicators_{it} + \beta_{l-m} Year\ Indicators_{it} + \mu_{it}$

		Total Sample N=8,340								**Persistent Excess CPS subsample N=536**	
Parameter	**Predicted sign**	**ROA1**	**ROA2**	**AdjROA1**	**AdjROA2**	**ROA1**	**ROA2**	**AdjROA1**	**AdjROA2**	**ROA1**	**ROA2**
Intercept	?	-0.0177***	-0.0131*	3.8691***	3.3921***	-0.0160***	-0.0161**	3.9217***	3.1422***	0.0509**	0.0654**
		(-2.90)	(-1.72)	(5.50)	(4.70)	(-2.84)	(-2.31)	(5.94)	(4.68)	(2.15)	(2.25)
CPS		**0.0055**	**-0.0098**	**0.1705**	**-0.8203**					**-0.0756****	**-0.0620***
		(0.82)	**(-1.08)**	**(0.22)**	**(-0.97)**					**(-2.20)**	**(-1.85)**
ExcessCPS	-					**-0.0032**	**-0.0141**	**0.2808**	**-0.4788**		
						(-0.46)	**(-1.45)**	**(0.35)**	**(-0.53)**		
lnSale	+	0.0024***	0.0043***	-0.2775***	-0.1474*	0.0024***	0.0042***	-0.2766***	-0.1534**	-0.0043*	-0.0035
		(4.49)	(5.81)	(-3.92)	(-1.93)	(4.59)	(5.74)	(-3.91)	(-2.02)	(-1.80)	(-1.48)
Std3ROA	+	0.0496	-0.0167	18.0371***	10.7160***	0.0489	-0.0161	18.0300***	10.7618***	0.0242	0.0214
		(1.30)	(-0.34)	(4.94)	(3.14)	(1.29)	(-0.33)	(4.94)	(3.15)	(0.22)	(0.20)
ROA	+	0.6054***	0.5540***	64.8321**	58.6772***	0.6055***	0.5537***	64.8430***	58.6326***	0.6469***	0.6487***
		(43.61)	(30.84)	(45.11)	(37.21)	(43.65)	(30.82)	(45.17)	(37.20)	(19.35)	(19.39)
ChangeCEO1	-	-0.0108***	-0.0133***	-0.8609***		-0.0110***	-0.0134***	-0.8584***	-1.0265***		
		(-4.31)	(-3.89)	(-3.06)		(-4.41)	(-3.91)	(-3.05)	(-3.24)		
ChangeCEO2	-		-0.0078**				-0.0079**		-0.8184**		
			(-2.37)				(-2.38)		(-2.46)		
Industry Indicators		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Indicators		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Squared		0.4626	0.2906	0.4340	0.3419	0.4626	0.2907	0.4340	0.3418	0.4792	0.4778
F Value		327.30	149.49***	291.63***	189.35***	327.26***	149.56***	291.63***	189.30***	26.61***	25.47***

This table represents pooled cross-sectional regressions of subsequent accounting returns on CPS, predicted excess CPS and controls for size, risk and past performance. *ROA1* (*ROA2*) is the annual return on assets over the subsequent year (and average over two years). *AdjROA1* (*AdjROA2*) is the industry adjusted ROA over the subsequent year (and average over two years), calculated as the firm's ROA minus the median ROA of all firms within 4-digit SIC codes on COMPUSTAT. *CPS* is the total pay given to the CEO divided by the total pay given to the top five executives in the firm. *ExcessCPS* is the actual CPS less predicted CPS. *lnSale* is the natural logarithm of the firm's sales. *Std3ROA* is the standard deviation of the firm's prior three years' annual return on assets. *ROA* is the firm's ROA at year t-1 to when compensation was awarded. *ChangeCEO1(2)* is an indicator variable equal to 1 if the firm experienced a change in CEO in the subsequent year, t+1 (t+2), respectively. * indicates significance at the 10% level, ** the 5% level, and *** the 1% level, respectively. Heterskedasticity is present for tests on the total sample, hence T-statistics are based on White's (1980) heteroskedasticity-adjusted standard errors.

Table 9
Descriptive statistics for observations that fall in the highest quartile for Excess CPS (N=1,357)

	Obs. that reduce Excess CPS		Obs. with persistent Excess CPS		Difference	
Variable	Mean	Median	Mean	Median	T-statistic	Z-statistic
CPS	0.51	0.49	0.54	0.52	6.11***	6.2352***
CPSE	0.56	0.55	0.60	0.59	3.40***	4.77***
BUShhindex	0.41	0.40	0.42	0.39	0.06	-0.09
GEOhhindex	0.28	0.24	0.25	0.18	-2.29**	-1.31
RDIntensity	0.04	0.00	0.04	0.00	-0.99	-0.90
RDmissing	0.45	0.00	0.46	0.00	0.56	.56
MBV	1.98	1.54	1.87	1.59	-1.92*	0.91
Regulated	0.10	0.00	0.07	0.00	-2.28**	-2.19**
CEO_Tenure	7.63	5.00	9.80	7.00	4.75***	3.76***
CEO_Chair	0.52	1.00	0.57	1.00	1.80*	1.80*
CEO_Founder	0.07	0.00	0.11	0.00	2.32**	2.41**
Execdirs	0.19	0.14	0.20	0.17	1.86*	1.62
CEO_Outsider	0.24	0.00	0.21	0.00	-1.52	-1.52
ROA	0.09	0.08	0.10	0.09	0.95	2.68***
RET	1.04	-1.01	0.03	0.01	-1.42	0.91
EPS	1.32	1.32	1.59	1.65	1.95*	3.84***
CEO5pct	0.09	0.00	0.16	0.00	3.93***	4.12***
Sale	5,772.30	1,647.16	5,317.90	1,818	-0.75	0.91
TotalExecsRpt	5.94	6.00	5.98	6.00	0.75	0.33
TotalPay	16,750.05	11,005.95	16,650.14	11,159.97	-0.11	0.24
TotalEquity	10,099.56	5,410.10	9,812.78	5,870.26	-0.43	1.13
Independent comp com.	0.77	1.00	0.79	1.00	0.77	0.77
Independent nom com.	0.66	1.00	0.60	1.00	-1.98***	-1.98**
Bdsize	12.05	11.00	11.68	10.00	-1.37	-1.47
F_ccomp	0.46	0.00	0.36	0.00	-2.84***	-1.98**
Busydirs	0.07	0.00	0.07	0.00	0.18	-0.15
Olddirs	0.07	0.00	0.09	0.05	2.86***	2.43**

Not all data items are available for all observations, therefore for some variables N is lower. *CPS* is the ratio of the CEO's total compensation to the sum of the total compensation awarded to the highest five paid executives in the firm. *CPSE* is the ratio of the CEO's equity compensation to the sum of the total equity compensation awarded to the highest five paid executives in the firm. *BUShhindex* is one minus the Herfindahl-Hirschman index for the firm's business segments or operating segments if business segments are unavailable. *GEOhhindex* is one minus the Herfindahl-Hirschman index for the firm's geographic segments. *RDIntensity* is the ratio of research and development costs to sales. *RDmissing* is an indicator variable equal to one if research and development costs are not disclosed or missing from Compustat. *MBV* is the firm's market-to-book ratio measured as market value plus total liabilities divided by total assets. *CEO_Tenure* is the number of years of service of the current CEO. *CEO_Chair* is an indicator variable equal to 1 if the CEO is also the chair of the board, 0 otherwise. *CEO_Founder* is an indicator variables equal to 1 if the CEO founded the firm. *Execdirs* is the fraction of the board that consists of executive directors. *CEO_Outsider* is an indicator variable equal to one if the CEO was hired from outside the firm. *ROA* is return on assets. *RET* is the buy and hold stock return for the fiscal year adjusted for stock splits and dividends. *EPS* is the fiscal year's earnings per share before extraordinary items. *CEO5pct* is an indicator variable equal to one if the CEO owns five percent or more of the company's shares. *TotalsExecsRpt* is the number of executives reported by a firm in Execucomp for year *t*. *TotalPay* is the sum of the total compensation awarded to the highest five paid executives in the firm. *TotalEquity* is the sum of the equity compensation awarded to the five highest paid executives in the firm. *Independent comp com.* is an indicator variable equal to 1 if the compensation committee is comprised wholly of independent directors. *Independent nom com.* is an indicator variable equal to 1 if the nomination committee is comprised wholly of independent directors. *Bdsize* is the number of directors on the board. *F_ccomp* is an indicator variable equal to 1 if there is one or more female directors on the compensation committee. *Busydirs* is the proportion of directors that sit on 4 or more public boards. *Olddirs* is the proportion of directors ages over 70.